QST

February, 1949
40 Cents

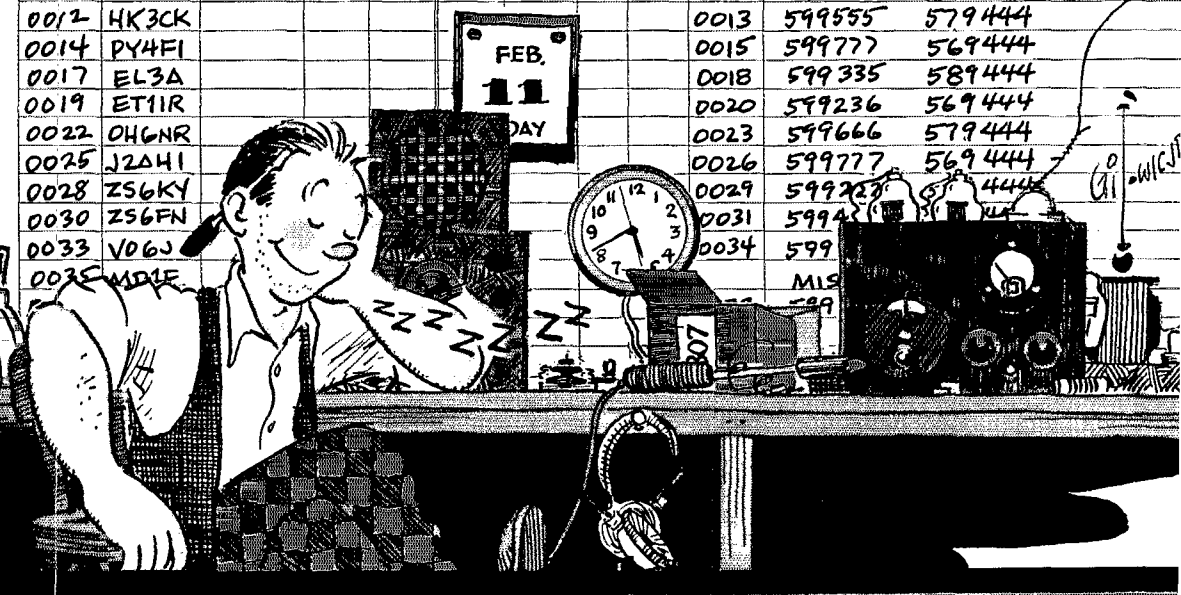
devoted entirely to

amateur radio

DATE TIME	STATION CALLED	CALLED BY	HIS FREQ. OR DIAL	HIS SIGNALS RST	MY SIGNALS RST	FREQ. MC.	EMIS-SION TYPE	POWER INPUT WATTS	TIME OF ENDING QSO	OTHER DATA
FEB.3										
0210	CQ					14	A-1	75		
0220	G8FM			579						
0226	ON4QF			589						
0235	OK1LM			579						
0240	PAØNG			579						

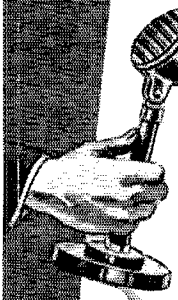
1949 DX CONTEST

							RECEIVED	SENT
FEB.12								
0001	KV4AA			14		125	0002 599000	579444
0003	PY1DS						0004 599777	579444
0005	PY1DH						0006 599010	569444
0007	LU3EL						0008 599555	579444
0009	CM2SW						0010 599333	589444
0012	HK3CK						0013 599555	579444
0014	PY4FI						0015 599777	569444
0017	EL3A						0018 599335	589444
0019	ET1IR						0020 599236	569444
0022	OH6NR						0023 599666	579444
0025	J2AH1						0026 599777	569444
0028	ZS6KY						0029 599223	444
0030	ZS6FN						0031 5994	
0033	VO6J						0034 599	
0035	MD1E						MIS	



PUBLISHED BY THE AMERICAN RADIO RELAY LEAGUE

Q In efficient rigs, what can you expect to find at the other end of the mike-cord?



A A KEN-RAD 6SJ7 QUALITY-MADE TUBE!

One goes with the other — your microphone and Type 6SJ7. Hams are alike in endorsing this pentode for audio-amplifier work, and experience has shown them how much Ken-Rad quality means to 6SJ7 performance.

Because of further amplification, the audio signal passed on by your 6SJ7 should be free from spurious effects. Here Ken-Rad superior design does a job by providing a filament that cuts "hum" 'way down. Also, Ken-Rad painstaking manufacture plays its part by building a tube with the least microphonic response.

Result for you...improved transmission; a clean signal to cut through the QRM!

The benefits of Ken-Rad better design, better manufacture, go beyond the 6SJ7. Throughout your rig, wherever superior tube performance will aid, it's the smart thing to *assure* this by plugging in Ken-Rad tubes of the types required.

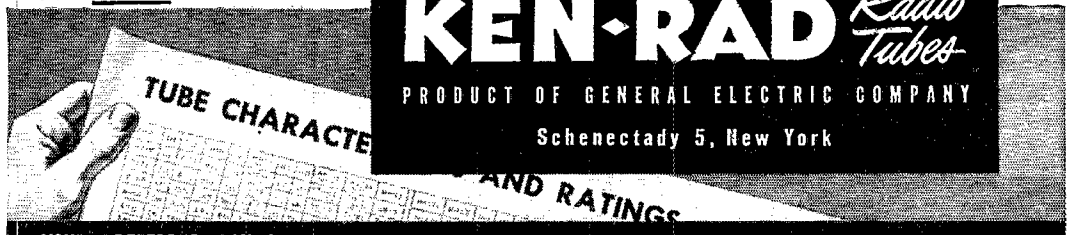
Ask your distributor or dealer to tell you more about the high standards met in building tubes marked "Ken-Rad." Then check this full-measure worth against Ken-Rad moderate prices. These fine tubes — in performance, in value — are real ham bargains!

6SJ7
SHARP-CUT-OFF DETECTOR-AMPLIFIER PENTODE

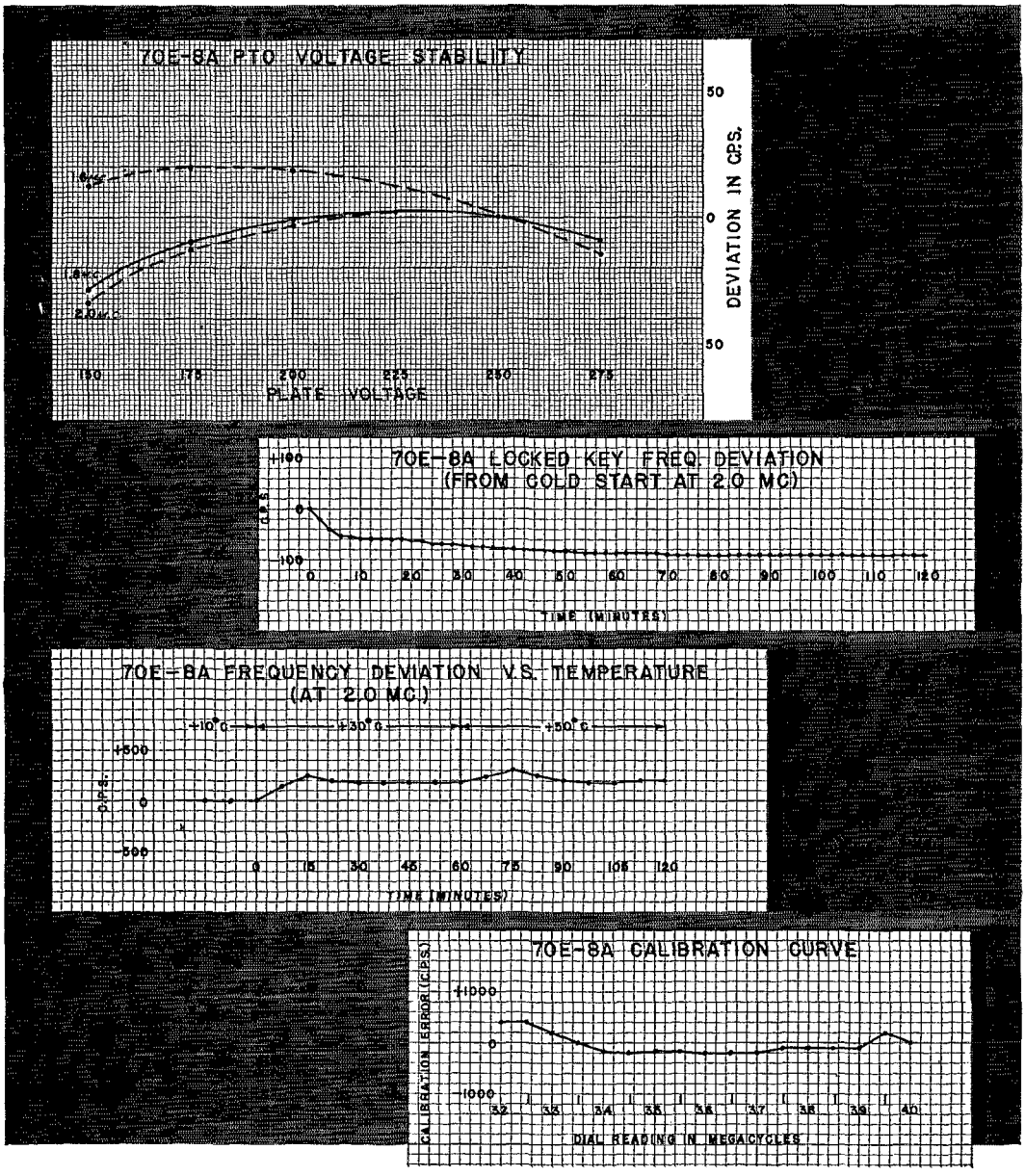
FOR KEN-RAD QUALITY, LOOK BEYOND THE DATA SHEET!

182-HA25-8850

KEN-RAD *Radio Tubes*
PRODUCT OF GENERAL ELECTRIC COMPANY
Schenectady 5, New York



YOUR PREFERRED SOURCE FOR AMATEUR TUBES IS YOUR NEARBY KEN-RAD DISTRIBUTOR OR DEALER



COLLINS 70E-8A Permeability Tuned Oscillator

The 70E-8A PTO is used as the VFO for the Collins 30K-1 and 32V-1 transmitters and the Collins 310B-1, 310B-3, 310C-1 and 310C-2 exciters. It is largely responsible for their extreme accuracy and stability. The curves on this page are plotted from actual data as measured in our engineering laboratory. The 70E-8A is also available separately from your Collins dealer at $40.00 complete with tube, slide rule and vernier dial, and instruction book.

COLLINS RADIO COMPANY, Cedar Rapids, Iowa

11 West 42nd Street, New York 18, New York — 458 South Spring Street, Los Angeles 13, Calif.

QST

FEBRUARY 1949

VOLUME XXXIII • NUMBER 2

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OFFICES

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West Hartford 7, Connecticut

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INDEXED BY
INDUSTRIAL ARTS INDEX

—CONTENTS—

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for *Smooth,* EFFICIENT VOLTAGE CONTROL

● THE VARIAC — the original continuously adjustable auto-transformer — is designed to give years of trouble-free service. The Type V-10 (*illustrated*) will handle up to 1.725 kva . . . meeting the total voltage-control needs of most amateur stations. It can be used for either behind-the-panel or table mounting. Unique unit brush construction makes brush replacement simple without tools; new molded terminal plate with barriers to prevent short-circuits; both solder and screw terminals provided; wiring diagram on terminal plate shows normal voltage between terminals; large, easy-to-grasp knob with extra large voltage calibration figures easy to read at a distance . . . these are only some of the many features found only in the VARIAC.

The Type V-10 has a rated current capacity of 10 amperes and a maximum of 15. Its no-load loss is only seventeen watts, compared to the usual high loss in a rheostat type of control. Output voltages are essentially independent of load with the VARIAC. VARIACS are correctly designed to provide the ideal method of varying a-c voltage . . . and to give output voltages 17% higher than that of the line.

TYPE V-10 VARIAC $33.00

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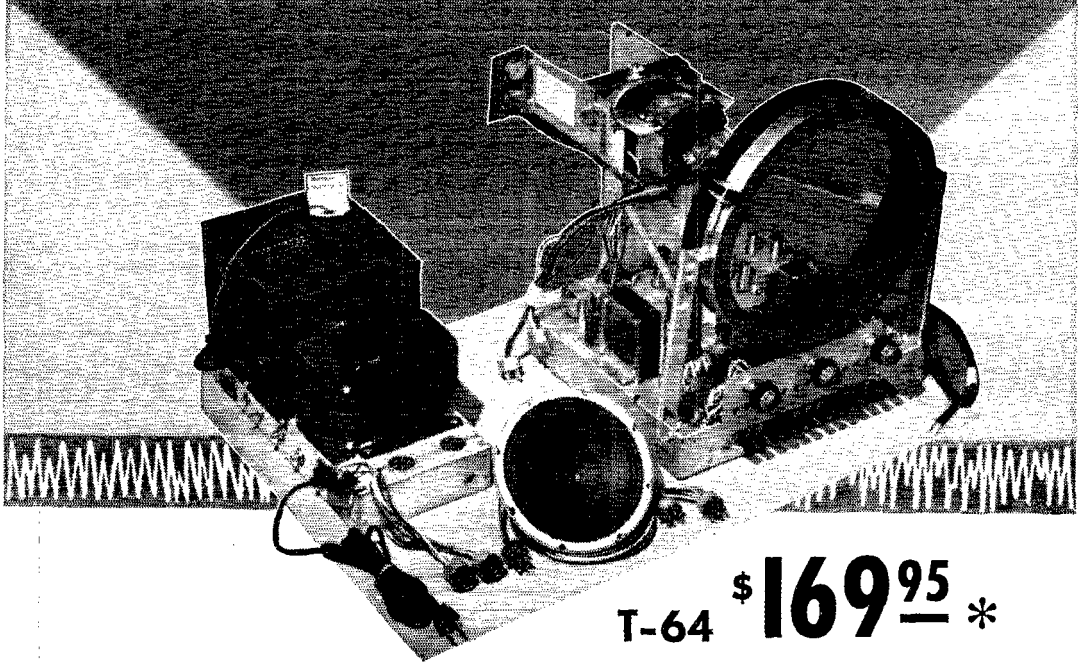

T-64 $169.95 *

. . . for 10-inch or 12-inch tube *

Our *improved* 10-inch chassis with new Dual Focus switch; one position gives completely linear 56 sq. in. picture; the other, a big circular telescopic 64 sq. in. view for dramatic close-ups.

Chassis taken right out of our regular production, factory-wired, completely aligned and tested. Regular RMA 90-day guarantee applies to all parts. Complete with speaker and all tubes except CR tube. See your local parts distributor or write to the factory for data sheet S-220-Q.

* **Regularly supplied with frame for 10-inch tube. Frame for mounting 12-inch tube approximately $8.50, including all necessary parts.**

QSL cards from the Gatti-Hallicrafters expedition were delayed due to postal difficulties. All cards, however, should be received shortly if they have not arrived by now.

the hallicrafters co.

4401 W. Fifth Ave., Chicago 24, Ill.

MANUFACTURERS OF PRECISION RADIO AND TELEVISION EQUIPMENT

Section Communications Managers of the ARRL Communications Department

Reports Invited. All amateurs, especially League members, are invited to report station activities on the first of each month (for preceding month) direct to the SCM, the administrative ARRL official elected by members in each Section. Radio Club reports are also desired by SCMs for inclusion in *QST*. **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* are invited to join the ARRL Emergency Corps (ask for Form 7).

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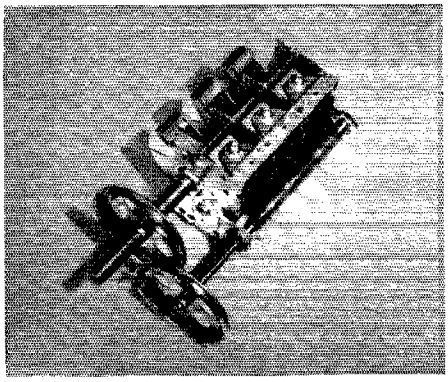
Two Reasons for Continued Popularity of the S-40A



SENSITIVITY . . . through high Q circuits. It's an engineering feat to get such sensitivity from one RF and two IF stages. Hallicrafters does it by going all out for proper $\frac{L}{C}$ ratio.

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OTHER FEATURES include temperature compensated oscillator, calibrated band-spread dial, series-type noise limiter, built-in speaker, 3-position tone control, range 540 kc to 43 Mc, 8 tubes plus rectifier.

DEPENDABILITY... achieved through controlled production, with parts pre-tested to insure uniform high quality. In addition to tests you'd normally expect, power transformers are tested for temperature rise, variable capacitors for tracking, resistors for noise, condensers for insulation resistance, and IF transformers for band width and stability. Coils are held to within 0.25% of prescribed inductance.

S-40A $99.50

the hallicrafters co.

4401 West Fifth Avenue, Chicago 24, Illinois

MANUFACTURERS OF *PRECISION* RADIO AND TELEVISION EQUIPMENT

THE AMERICAN RADIO RELAY LEAGUE, *INC.*,

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

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

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

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

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

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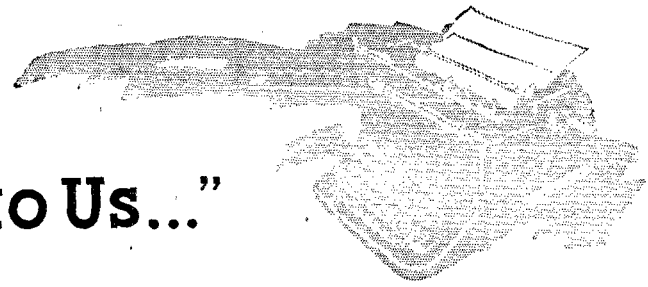

"It Seems to Us..."

THE A.R.R.L. INTERNATIONAL DX CONTEST

No DX man worthy of the name needs to be told that this month (and March, too) are the Big Months. The casual- and the non-DX man will get the idea from this month's cover, we hope. The annual League contest has gone through quite a few evolutionary stages, and we would like to take a little "time out" to review them, just to show you how the thing has grown.

The first contest, held in 1927, bore little resemblance to the present pattern. Long messages, complete with text and coded preamble, had to be sent, and a reply had to be routed via a *different* station. The contest ran for two solid weeks, and W and VE stations ("nu" and "nc" in those days) had to enter their stations officially before the contest started. The 7- and 14-Mc. bands took the entire load of the contest, with a leaning of the majority toward the former. By 1930 the rules had been revised a little, and a lot of presently well-known DX men were beginning to show up in the final results. The most foreign contacts were made by a W who "exchanged messages with 83 stations" and, to demonstrate how peachy conditions were, "17 Ws and VEs worked five continents."

In 1932, the "Calls Heard" department of *QST* was quite popular, and it seemed logical that a giant calling-and-listening contest would be well received. Times were split up around the world, with some continents transmitting while others listened. All calls heard were to be reported. While new DX was heard for the first time by many Ws and VEs (70 different countries, all told), and Ws and VEs got into spots they never expected to, the old thrill of a two-way contact was lacking, and the 1933 contest began to take the present form, with its exchanges of self-assigned serial numbers. W8CRA worked 42 countries in that shindig, and a lot of Ws finagled their WACs out of it. In 1936 the country quotas and band multipliers were introduced, to provide more DX for everyone and to encourage multiband operation. Participation continued to increase each year, only to be interrupted by the war. Since that time, however, the contests have been bigger than ever, and in 1948, as you know if you read the report, W2GWE and W4FU worked over 100 countries during the two week ends, enough to qualify for DXCC!

The history has been an interesting one, as we are sure you will agree if you dig back through your dusty files of *QST* and recapture the enthusiasm of those earlier days. The record is a proud one, we believe, but of course there has always been the unhappy side. Each year violators of the rules have been listed, in an attempt to stop out-of-band operation, whether deliberate or inadvertent. There have often been complaints that such-and-such a station used a whole regiment of operators, which is perfectly permissible, of course, so long as it is reported that way — which it isn't, always. There are always accusations that so-and-so ran more than a kilowatt, and we have just a *faint* suspicion that sometimes it is true. But the League organizes the contest and polices the event to the practical limit — beyond that, unreported multiple-operator work and augmented inputs are something we can only regret and despise.

During each year between contests we always receive letters or hear directly from honest and sporting amateurs who, deploring the practices of their less-honest brethren, feel that the League should "do something" about the violations of FCC and ARRL rules that occurred in the previous DX event and will probably show up again the following year. Well, we agree wholeheartedly that it is a pity that the otherwise splendid record of DX contests is always marred by a selfish few who won't play if they have to follow the same rules as everyone else. We'd like to see something done about it, too, and if we get proof that will stand up we'll do it. But most often we run into the attitude that no one wants to be a "squealer" and turn in a fellow amateur.

For our money, such reluctance isn't justified; the people we're talking about are no more "fellow hams" than the guy with loaded dice and marked cards or cold deck is a "fellow gambler" in the sporting sense of the phrase.

But maybe there is a way to relieve the individual amateur of the onus when some violator should be turned in. It strikes us that if anything is ever to be done about these infringements of ethics and fair play, it must come from local clubs and other groups. If they have a sincere desire for a clean contest, these organizations can not only raise the standards of conduct by their own spotless records, but they have it within their power to see to it that no amateur in their area is guilty of unfair and unethical tactics.

— *B. G.*

WITH all six continents displaying intense amateur activity, *QST* for February, 1924, sounds the call for an international organization of amateur societies. It is believed that such a union would help to solve the many problems of language, operating procedure and technique now cropping up on amateur wavelengths. President Maxim is carrying the idea abroad, having sailed to meet with representatives of European amateur groups.

It has been a busy winter on all operating fronts. Early recapitulation discloses that almost a dozen European countries are participating in the current Transatlantics, and that approximately 150 U. S. and Canadian amateur stations have been heard in the Antipodes during the recent Transpacifics. On the domestic scene, President Coolidge has sent Christmas greetings, via amateur radio, to the MacMillan Expedition in the Arctic.

"Low-Loss Tuners" is this month's main technical article, Technical Editor Kruse discussing the many design considerations involved. For examples of practical couplers, working models by Perry O. Briggs, 1BGF, Boyd Phelps, 1HX, and F. H. Schnell, 1MO, are presented. For the ham contemplating operation in the spectrum below 200 meters, the Technical Editor authors an equally informative article, "Amateur Wavemeters." Other equipment articles include H. H. Tilley's description of a unique circular mounting arrangement for using six UV-202s in parallel, E. J. Atkinson's notes on electrolytic rectifiers, and James L. Jenks' data on the improved Amrad "S"-tube rectifier.

ARRL has a new constitution, the result of many months of work and study by the League's officers and board of direction. Published in full this month, the new constitution provides for divisional representation of members instead of the director-at-large representation previously afforded.

The public-service record of amateur radio has been enhanced by two creditable performances — the work of 7GI and 7IP in bringing help to a stricken West Coast cannery, and that of 1ARY and Canadian 2CG in assisting telephone and telegraph companies during a breakdown of service between Burlington, Vt., and Montreal. Anticipating the communications needs of the nation's rail lines during emergencies, the ARRL Emergency Service Committee, A. L. Budlong secretary, announces newly-formulated plans to meet any contingency.

The transatlantic mail arrived in time to present in this issue pictures of the first French and English amateur stations to communicate two-way with the United States — Leon Deloy's F8AB, Nice and J. A. Partridge's G2KF, London. In the "Who's Who" section we have portraits of *QST's* capable illustrators, Carl D. Hoffman, 8UX, Clyde E. Darr, 8ZZ, and Harry R. Hick, ex-1ESS.

Our ranks are showing a steady growth! The latest Department of Commerce figures reveal the U. S. ham population as 16,570 strong.

Strays

Quartz for crystals is now being produced synthetically in high-grade quality under a program sponsored by the Signal Corps Engineering Laboratories, Fort Monmouth, N. J.

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If you are planning a mobile 3.9- or 14-Mc. 'phone station for your car but don't know what to do about a receiver/converter combination, W8MGQ reminds us that there are car radios built that include the broadcast band *and* shortwave. Some can stand a little bandspreading, but otherwise they should be a natural.

—•••—

A heart attack on December 4, 1948, added to the ever-growing list of Silent Keys the name of Morrill P. Mims, W1BDB, of Waban, Mass. Most of us still think of him as W5BDB, prewar, a call that was as well known on 20 and 10 'phone as any can hope to be in these days of multiple bands and specialized operation.

Author of a number of *QST* articles and developer of the "Signal Squirter," Mims was a graduate of Texas A. & M. (1922) and started his ham career about 1928 in Texarkana, Ark. During the war he was in charge of Raytheon's part of the Manhattan project, and left that company in June of 1946 to establish his own business as a manufacturers' representative in the New England area. Like many hams, he had a keen interest in photography, and at the time of his death was president of the Boston Camera Club. His passing at the untimely age of 49 will be greatly regretted by the very many amateurs who knew him both personally and by radio contact.

The "Little Slugger"

A 10-Meter Transmitter for Use in TV Areas

BY PHILIP S. RAND,* W1DBM

• The low-power transmitter described in this article incorporates the principles advocated by the author in earlier *QST* articles for eliminating TVI. Complete in itself, it is also a TVI-proof exciter for a high-power amplifier.

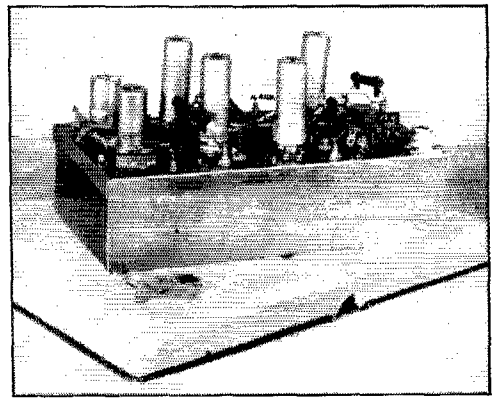
So you think narrow-band f.m. can't compare with a.m. for ten-meter DX through the week-end QRM? Within 36 hours from the time the last wire was soldered in place this unit, driving the pair of 813s TVI-treated as outlined in May *QST*, made WAC. It took that long because you have to hear 'em before you can work 'em, and the Asians didn't happen to be coming through at W1DBM until the third day the transmitter was on the air.

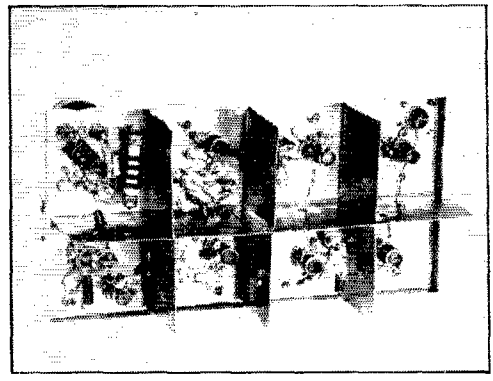
IN my two recent articles on TVI [1] certain steps were laid down for the elimination of TVI from existing transmitters and suggestions were made to be used in the design of new transmitters. The "Little Slugger" to be described follows out these ideas in practical form, and is easier to build than many rigs designed for beginners' construction.

There should be a reason for writing an article. Here is what prompted me to sit down and write this one. Last night during a QSO on 10 meters a visitor at the other end said: "I expect my ticket any day now and hope to work you with my own rig some day soon. It will consist of a VFO with 20-meter output driving an 813 doubler to ten, which will drive the 1-kw. final, consisting of a pair of 304TLs. The 813 will run about 300–400 watts input."

Now I'll bet dollars to peanuts that that 813 will not only have 100 watts output on 10 meters but also 25 to 50 watts on dear old TV Channel 2, and should make our friend very unpopular over a radius of at least 10 or 20 miles. Fellows, please let's not butt our heads against a stone wall; let's use them for what they were intended. Let's do our frequency multiplying in low-power stages where we can control the unwanted harmonics.

The "Little Slugger" is designed to do just this. It may be used as a complete low-power transmitter for the beginner, as a narrow-band f.m. exciter for the regular a.m. rig, or as a local rag-chew rig for use during TV hours. At any rate it will get the new ham off to a correct start in that it is one of the first ten-meter rigs we know of that has been designed especially for eliminating TVI. The "Little Slugger" was built to demonstrate the following principles: (1) frequency multiplying in low-power stages; (2) the use of good narrow-band f.m.; (3) adequate shielding and filtering; (4) proper r.f. by-passing; (5) use of fixed high-*Q* tank condensers plus variable tank



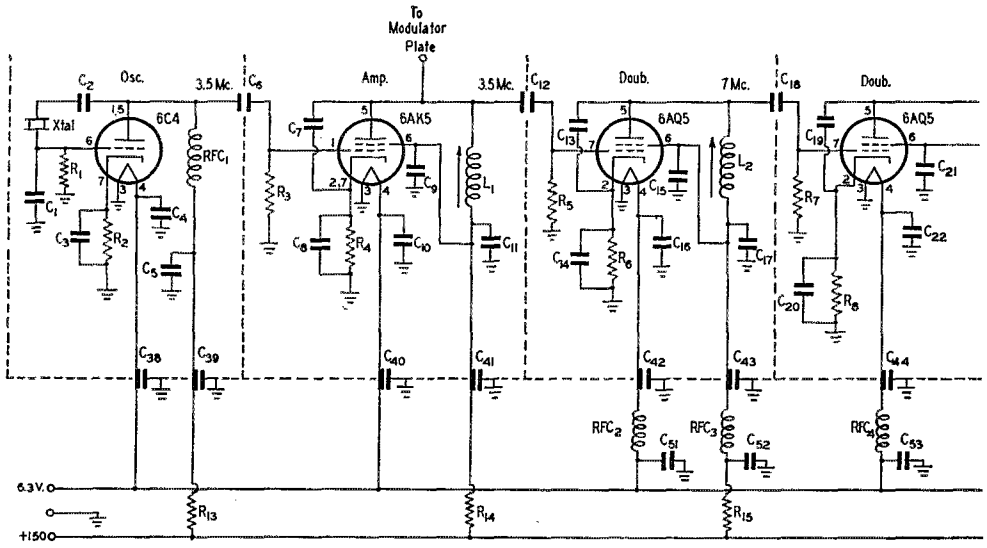


The miniature-tube exciter unit is not quite long enough to stretch across an open *Handbook*, in spite of its six stages and seven tuned circuits. A few resistors and r.f. chokes are mounted on top of the chassis, along with the tubes.

The lower photograph shows the "egg-crate" compartments, formed from thin copper sheet. Although the unit is small, there is ample room for all components.

* RFD 1, South Norwalk, Conn.

[1] Rand, "TVI *Can* Be Reduced," *QST*, May, 1948; Rand, "More on TVI Elimination," *QST*, December, 1948.



inductance; (6) use of an output harmonic filter; (7) use of short leads and compact layout; (8) use of low bias and drive and Class B operation.

It is not necessary that the physical layout be followed exactly. The main idea is to follow the general principles just outlined.

Circuit Details

In looking over the circuit diagram of the r.f. portion you will see nothing new or different with the possible exception of slug-tuned coils, ceramic condensers, and the output arrangement. It is a perfectly straightforward circuit utilizing miniature components, good shielding, short leads, and adequate filtering, plus link coupling and an output harmonic filter. The miniature 6AQ5 tubes in the exciter, Fig. 1, are run at only 150 volts on both plate and screen. The entire six-tube exciter draws only 75 ma. at that voltage.

The exciter portion starts off with a 6C4 Pierce crystal oscillator on 3.5 Mc. This is followed by a 6AK5 amplifier on the same frequency. This stage is reactance-modulated by a separate unit to produce phase modulation. Then come successive 6AQ5 doublers to 7, 14 and 28 Mc. The last doubler is link-coupled to the grid of a 6AQ5 straight amplifier on 28 Mc. This amplifier is link-coupled to a tuned output circuit which rejects everything except 28 Mc., and this output circuit is in turn linked to the following stage.

The push-pull amplifier, Fig. 2, uses a pair of 6AQ5s with a separate tuned output circuit similar to that used in the exciter. It operates at an input of about 20 watts.

You will note from the photographs that the exciter stages zigzag back and forth across the chassis as they progress through each of the "egg-crate" cells or compartments that make up the shielding. This was done only in the interests of compactness; almost any reasonable layout should work as well.

Fig. 1 — Circuit diagram of the frequency-multiplier unit. Broken lines show shield compartments.

C_1 — 250-$\mu\mu$fd. mica.

C_2, C_3, C_4, C_5, C_8, C_9, C_{10}, C_{11}, C_{14}, C_{15}, C_{16}, C_{17}, C_{20}, C_{21}, C_{22}, C_{23}, C_{26}, C_{27}, C_{28}, C_{29}, C_{32}, C_{33}, C_{34}, C_{35}, C_{36} — 0.001-μfd. ceramic stand-off type. (Electrical Reactance Corp. "Hi-Q.")

C_6, C_{12}, C_{13}, C_{18}, C_{19}, C_{24}, C_{30}, C_{31}, C_{37} — 50-$\mu\mu$fd. ceramic.

C_7 — 30-$\mu\mu$fd. ceramic.

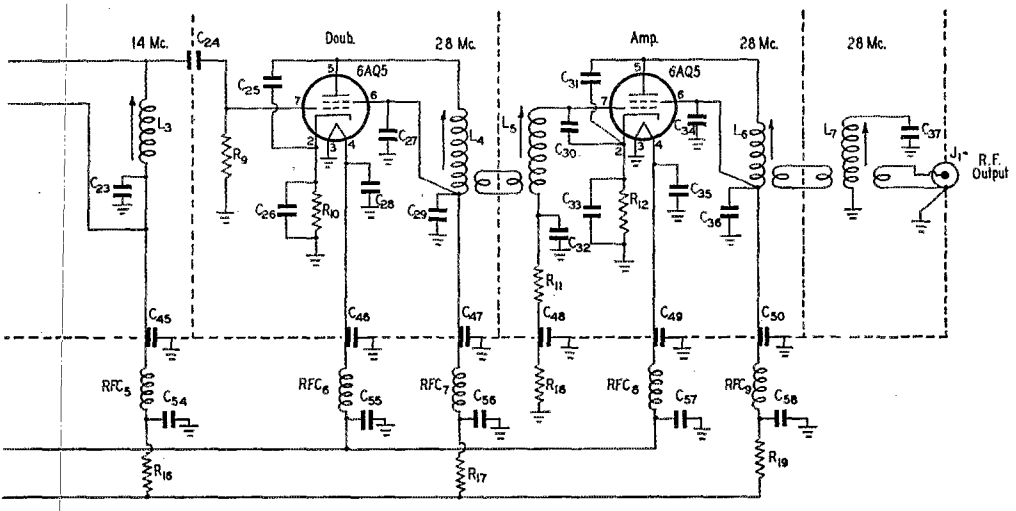
C_{25} — 40-$\mu\mu$fd. ceramic.

C_{38} to C_{50}, inc. — 50-$\mu\mu$fd. feed-through type. (Centralab FT "Hi-Cap.")

C_{51} to C_{58}, inc. — 500-$\mu\mu$fd. stand-off type. (Erie button mica.)

Slug-tuned coil forms were used throughout for convenience as well as because of their small size, and also to avoid the necessity for variable condensers. This allows us to use a fixed condenser of adequate size to by-pass the harmonics directly from the plate to cathode and at the same time the circuit can be tuned to resonance by means of the iron or brass slug inside the coil. The condenser referred to is of the miniature ceramic type with pigtails, and is soldered with as short leads as possible directly from the plate pin to the cathode pin on the 6AQ5 sockets.

The by-pass condensers for the heater, screen grid, cathode and "B" plus in each stage are of the ceramic stand-off type, mounted in a circle around the sockets and soldered directly to the respective pins with ¼ inch leads. The grid leaks and cathode resistors are also mounted right on the socket. The 50-$\mu\mu$fd. ceramic coupling condensers are insulated with spaghetti and are centered in a ¼-inch hole in the copper shield between stages.



R_1, R_3, R_5, R_7, R_9 — 50,000 ohms, ½ watt.
R_2, R_4, R_6, R_8, R_{10}, R_{12} — 100 ohms, ½ watt.
R_{11} — 10,000 ohms, ½ watt.
R_{13} to R_{19}, inc. — 25 ohms, ½ watt (metering resistors).
J_1 — Coax cable connector.
RFC_1 — 2.5-mh. r.f. choke.
RFC_2 to RFC_9, inc. — V.h.f. choke (Ohmite Z-1).
L_1 — (3.5 Mc.) — CTC LS-3 5-Mc. coil.
L_2 — (7 Mc.) — CTC LS-3 10-Mc. coil.
L_3 — (14 Mc.) — CTC LS-3 form with 12 turns No. 28, close-wound.
L_4 — (28 Mc.) — CTC LS-3 30-Mc. coil.
L_5 — (28-Mc. grid) — CTC LS-3 form with 7 to 9 turns, ½ inch long, No. 20.
L_6 — (28-Mc. plate) — Same as L_5.
L_7 — (28-Mc. output) — Same as L_5.

Filtering the Leads

It was thought that extra harmonic filtering might not be needed in this unit; however, with the exciter sitting three feet from the television receiver a faint pattern could be seen on the screen. V.h.f. chokes were therefore installed in each heater and plus-"B" lead, with additional 500-$\mu\mu$fd. ceramic condensers across them, and this slight trace of TVI disappeared. In fact, the exciter could then be operated without TVI from the same power supply that ran the booster amplifier on the TV receiver.

Wherever a power lead goes through the chassis or shielding it is by-passed by means of a 50-$\mu\mu$fd. ceramic feed-through condenser.

Output Circuit

The output harmonic filter is really a conventional antenna tuner in miniature, with the exception that the r.f. is linked both in and out. It consists simply of a parallel circuit tuned to 28 Mc. and having two links. It does such a good job of harmonic reduction that we now use one between each of our final amplifiers and the antenna. In fact it should be just as important a part of any transmitter as the power supply or metering circuits and really should be permanently built in.

The Push-Pull Amplifier

The push-pull 6AQ5 stage also uses slug-tuned coils. The design of suitable coils presented something of a problem, inasmuch as we wanted the slug to come into the coil uniformly with respect to the two tube plates. This was solved very easily by winding one half of the coil the full length of the coil form and then, after cementing on four small strips of polystyrene, winding the second half of this coil back over the first half. This puts the two ends of the coil at the bottom end while the center-tap comes at the top end. It looks somewhat strange at first but it is easy to do and works nicely.[2]

In the amplifier plate circuit the fixed tank condensers are 50-$\mu\mu$fd. silver micas instead of ceramics. However, the latter are used in the grid circuit, where the r.f. voltage is lower. Stand-off type ceramics are used for by-passing cathodes, screens, heaters and plus "B." The grid coil is covered by a copper can to shield it from the plate coil and there is a baffle plate between plate coil and output coil.

[2] Although it may not be especially important, inasmuch as the r.f. center-tap of the tank is established by the tank condensers, this type of construction results in some unbalance in the coil because the outer portion has more inductance than the inner and the two coils are not exactly balanced with respect to the tuning slug. A refinement would be to use "binocular" construction, two solenoids side by side, and tune them with two identical slugs mounted on a common adjustment mechanism. However, the construction of such a unit would not be as simple mechanically as the author's arrangement. — *Ed.*

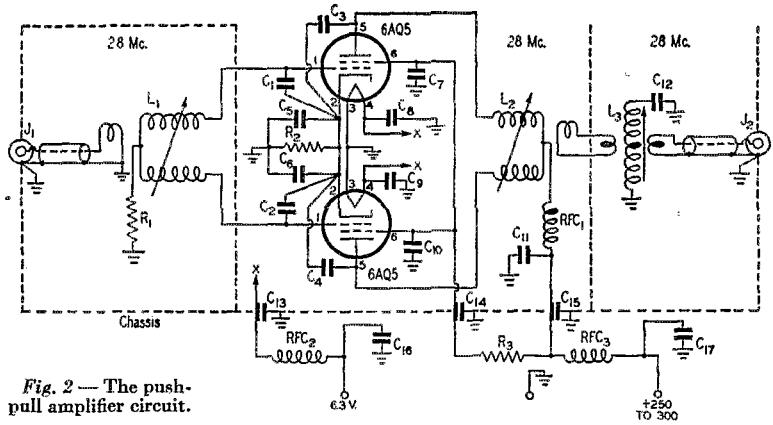
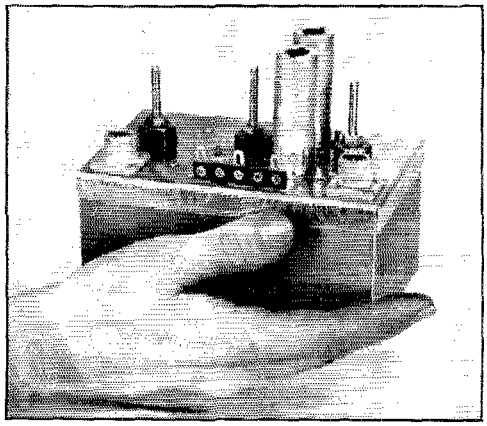
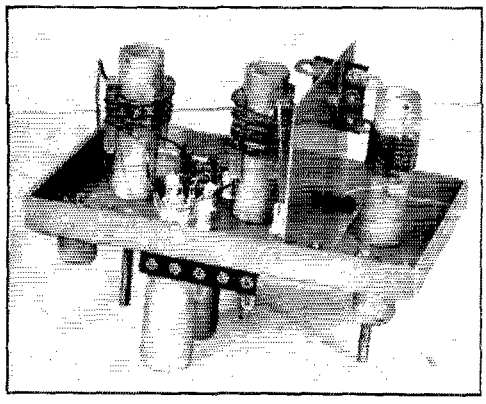


Fig. 2 — The push-pull amplifier circuit.

C_1, C_2 — 50-$\mu\mu$fd. ceramic.
C_3, C_4, C_{12} — 50-$\mu\mu$fd. silvered mica.
C_5, C_6, C_7, C_8, C_9, C_{10}, C_{11} — 0.001-μfd. ceramic, stand-off type. (ERC "Hi-Q.")
C_{13}, C_{14}, C_{15} — 50-$\mu\mu$fd. ceramic feed-through type. (Centralab FT "Hi-Cap.")
C_{16}, C_{17} — 500-$\mu\mu$fd. mica, button type.
L_1, L_2 — See text and Fig. 4.
L_3 — 8 turns No. 18, ⅝-inch diam., ⅝ inch long, spaced wire diameter.
J_1, J_2 — Coax cable connector.
R_1 — 10,000 ohms, ½ watt.
R_2 — 200 ohms, ½ watt.
R_3 — 15,000 to 30,000 ohms, depending on plate voltage. (Screen may be supplied from a fixed supply of 150 to 200 volts.)
RFC_1 — 2.5-mh. choke.
RFC_2, RFC_3 — V.h.f. choke (Ohmite Z-1).





The push-pull amplifier is a separate unit using a pair of 6AQ5s, running about 20 watts input. In the view at the bottom, the coil to the right of the shield plate is the antenna-coupler coil. Wiring of this circuit had not been completed at the time the photograph was taken. The grid and plate coils for the amplifier use an unusual method of construction to permit slug tuning without excessive unbalance.

Speech Amplifier and Modulator

Since the purpose in designing this exciter was to avoid TVI, the obvious type of modulation to employ was narrow-band f.m. This not only avoids modulation bars in the picture but, more important, allows you to run your amplifiers straight Class B.

The f.m. unit shown in the photographs and in Fig. 3 is simply a combination of well-known circuits, and uses miniature tubes only for the sake of compactness. The requirements were for f.m. that would work DX, that would punch through QRM, and that would sound like a.m. on an a.m. receiver, with none of the distortion that so many have and that has given f.m. such a bad name, nor with modulation so weak that the audio on the receiver has to be turned away up in order to hear it.

To meet these requirements it was decided to use crystal control, multiply the frequency at least eight times, use severe clipping, and restrict the audio range to from 500 to 2500 cycles. Since putting the transmitter on the air we have worked many DX stations and their usual answer to the question "Did you know we have been using n.f.m.?" at the end of a QSO is "No, are you?"

♦

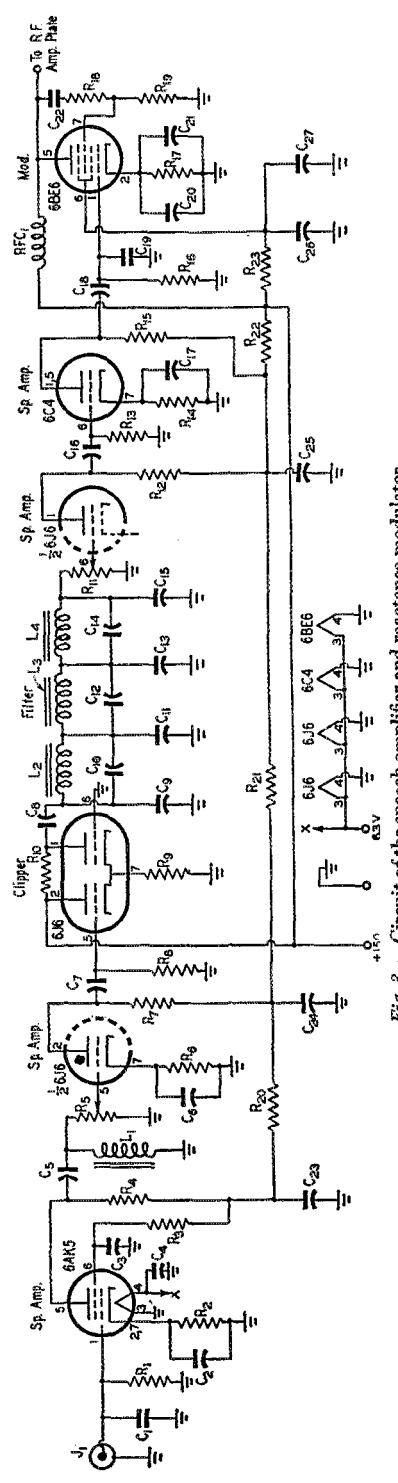


Fig. 3 — Circuit of the speech amplifier and reactance modulator.

C_1 — 100-$\mu\mu$fd. mica, button type.
C_2, C_6, C_{17}, C_{20} — 10-μfd. electrolytic, 25 volts.
C_3, C_{21} — 0.1-μfd. paper.
C_4 — 0.001-μfd. mica.
C_5, C_7, C_8, C_{15}, C_{18}, C_{27} — 0.01-μfd. paper.
C_9, C_{10}, C_{22} — 0.015 μfd.
C_{11} — 0.03 μfd.
C_{13} — 0.05 μfd.
C_{14} — 0.003 μfd.
C_{15} — 0.06 μfd.
C_{19} — 500-$\mu\mu$fd. mica.
C_{22} — 250-$\mu\mu$fd. mica.
C_{23}, C_{24}, C_{25}, C_{26} — 8-μfd. electrolytic, 450 volts.
R_1 — 2 megohms, ½ watt.
R_2 — 1000 ohms, ½ watt.
R_3, R_{13}, R_{16} — 1 megohm, ½ watt.
R_4 — 0.25 megohm, ½ watt.
R_5 — 1-megohm volume control.
R_6, R_{14} — 2000 ohms, ½ watt.
R_7, R_{12}, R_{15} — 0.1 megohm, ½ watt.
R_8 — 0.5 megohm, ½ watt.
R_9 — 5000 ohms, ½ watt.
R_{10} — 40,000 ohms, ½ watt.
R_{11} — 2000-ohm potentiometer.
R_{17} — 500 ohms, ½ watt.
R_{18} — 25,000 ohms, ½ watt.
R_{19}, R_{20} — 50,000 ohms, ½ watt.
R_{21} — 10,000 ohms, 1 watt.
R_{22} — 2000 ohms, 1 watt.
R_{23} — 15,000 ohms, 1 watt.
L_1 — 10-henry midget filter choke.
L_2, L_3, L_4 — 125 mh. (mounted in i.f. cans).
J_1 — Microphone connector.
RFC_1 — 2.5-mh. choke.

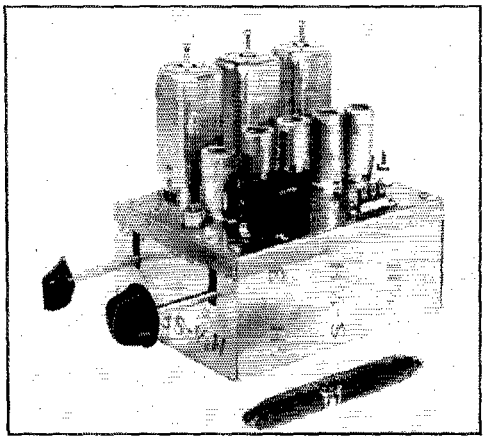
In checking out this unit with an audio oscillator and 'scope it was found that the greatest single contribution to good quality when clipping heavily was the elimination of the low-frequency response ahead of the clipper. This is done by tying a small a.c.-d.c. filter choke, 10 henrys or so, from grid to ground in a speech-amplifier stage. The reason is quite clear when you realize that the clipper makes square waves out of all the frequencies it clips, and a square wave is a sine wave plus an infinite number of harmonics. Now when a 2000-cycle tone gets clipped into a square wave and is passed through a filter having a 2500-cycle cut-off all the harmonics are filtered out, so you still have a 2000-cycle sine wave. But when a 100-cycle sine wave gets clipped and passes through a 2500-cycle filter you have the darndest mess you ever saw, because you not only have 100 cycles but 200, 300, 400 and so on up to the 25th harmonic.

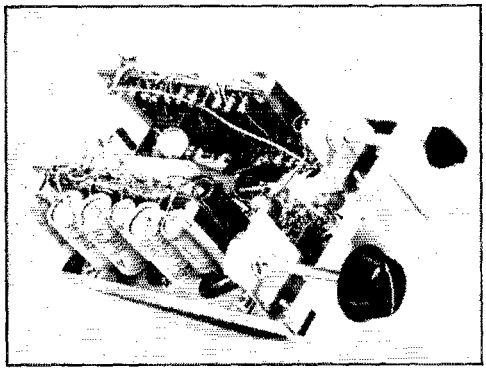
Also, by cutting off frequencies below 500 cycles you get rid of 60-cycle and 120-cycle hum from your first stage of audio, as well as audio pick-up of buzzing relays and low-frequency room echo. In other words, you have clear, crisp, clean-cut speech that is easily understood and that will take a lot of clipping without noticeable distortion.

Now when you take this kind of solid audio and deviate the full amount a receiver will take, you have the kind of n.f.m. that is hard to tell from a.m. by the usual methods. Of course if you think to tune to the exact center of the carrier there is a null, but unless there are other telltales of f.m. you don't think to do this.

Chassis Construction

All three chassis are made of 1/16-inch aluminum with a half-inch lip folded over so that the chassis forms the cover for a box. The box portion is made of the same material with the sides folded up to fit inside the cover. The approximate dimensions are as follows: exciter, 5 by 10 by 2½ inches; amplifier, 4 by 6 by 2½





The n.b.p.m. modulator is also a miniature unit, as shown by the cigar alongside. It incorporates speech clipping and filtering, along with low-frequency attenuation, to get maximum speech effectiveness. The microphone connector is at the left-hand edge and the reactance-modulator output connection is the feed-through at the far right. Internally, most of the parts are secured to mounting boards as shown by the lower photographs.

inches; modulator, 5 by 7 by 3 inches. Shielding is made up of soft sheet copper cut with tin shears, folded in a vise and soldered together. Two mounting boards run lengthwise in the modulator unit to hold the miscellaneous condensers and resistors. The three i.f. cans hold the 125-mh. r.f. chokes used in the audio filter.

The three small chassis are designed to be mounted together on a standard 17 by 13 by 3 chassis also containing the power supply and metering facilities. The front panel is an 8¾-inch standard relay rack panel and a complete copper screening shield covers the entire unit, which then goes into the relay rack.

The modulation and exciter chassis should be so placed in relation to each other that there is a short lead between the modulator plate and the 3.5-Mc. amplifier (6AK5) plate.

All slug-tuned coils except those in the two 28-Mc. amplifier stages are ready-wound CTC units. These coils are wound with heavier wire, with the turns adjusted to tune to 28 Mc. with the brass slugs pretty well out of the coil. (The iron half of the CTC slug has been removed.)

Tuning Procedure

The first step in tuning up is to check each of the tuned circuits with a grid dip oscillator to be sure they all tune to the proper frequencies. Plate voltage should then be applied to the crystal oscillator. Check on a receiver to determine if the crystal is oscillating. If so, apply plate voltage to each stage in succession and, with a plate meter connected in, tune each coil to resonance indicated by a dip in plate current. Adjust the link between the 28-Mc. doubler plate and the grid of the first 28-Mc. amplifier for optimum coupling, as indicated by maximum grid current. After the plate coil of the 6AQ5 amplifier is tuned to resonance the next step is to couple a 60-ma. flashlight bulb on a one-turn loop to the output coil and tune this for maximum brightness. The link between the plate and output coils should then be adjusted to show maximum bulb brightness and the two tuning slugs should be touched up slightly.

At this point it is interesting to note the effectiveness of the output circuit by putting the 56-Mc. coil in the "Gimmick" or "Little Gem" and checking for 56-Mc. signal. You probably won't find much unless your "Gimmick" is equipped with a 6-to-8 inch probe and a 0–100 μamp. meter. I found a 20-μamp. reading at the plate of the doubler, none at the grid of the amplifier, 10 μamp. at the plate of amplifier, and none at all in the output circuit. The "Gimmick" was coupled to the circuits as tightly as possible.

A short coax line should now be connected over to the push-pull 6AQ5 grid circuit and this grid coil should be tuned for maximum grid current. The links on each end of the coax should be adjusted for optimum coupling and the slugs should be touched up for resonance again. The grid currents should be ½ to 1 ma. for the first 6AQ5 amplifier and 1 to 2 ma. for the push-pull stage. Plate currents in the exciter stages should be somewhere around 15 to 20 ma. and in the push-pull stage around 50 to 70 ma., depending on the plate voltage. We run 300 volts on the plates of the push-pull stage.

Tuning the output filter on the push-pull stage is the same as already described; that is, the links and tuning are adjusted for maximum grid current to the following Class B amplifier in your rig, whatever that may be. If you are feeding an antenna with the push-pull 6AQ5s it is essential to have some means of indicating the power that is being put into the antenna, adjusting the two links and the tuning of the output coupler for maximum radiation. This also applies to tuning up this same type network between your regular final amplifier and your antenna. Too-tight or too-

loose coupling or improper tuning can give you considerably reduced output.

In our case the problem of output indication was very nicely solved by laying a 28-Mc. folded dipole made of 300-ohm ribbon on the attic floor, aiming the ten-meter beam at the house, and coupling the "Gimmick" with a 10-meter coil to the end of the feeder in the shack. We then could make adjustments to the output coupler links and tuning, always striving for maximum reading on the improvised field strength meter. We found that we actually got a higher reading with the coupler than without it.

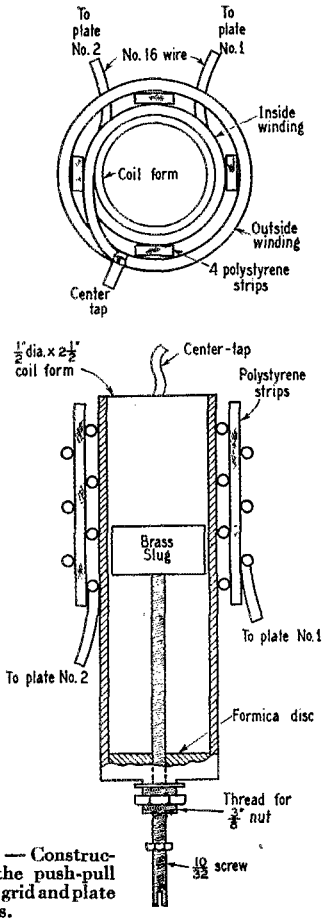


Fig. 4 — Construction of the push-pull amplifier grid and plate tank coils.

Any convenient constructional arrangement may be used for adjusting the position of the tuning slug. The slug itself is simply a short piece of brass rod small enough to fit inside the coil form and made to about the proportions shown in the drawing.

The coils are made by first taking a section of wire having twice the length necessary for four turns on the half-inch form and then soldering another conductor at its center for the center-tap. The inner coil is then wound on the form, the thin polystyrene strips doped in place, and the remainder of the wire wound over the strips. Having the same length of wire in both sections of the coil tends to compensate for the difference in inductance with difference in coil diameter. The tuning slug is not grounded.

Adjusting Deviation

Setting up the deviation to the proper value is done easily, regardless of what follows the exciter. The exciter is turned on alone and tuned in on the communication receiver on ten meters. The carrier should be absolutely clean. In our case a slight f.m. hum was observed, and upon investigation it was found to be coming from the power supply. It was completely cured by adding one more filter choke and two 20-μfd. electrolytic condensers to the power-supply filter.

The modulator unit is next connected in circuit and the clipping and deviation controls set at the halfway position. While you listen with a headset on ten meters, have the XYL talk into the mike. Remember only the exciter is running so you are not putting out a signal on the band to bother anyone! There should be a definite null when the carrier is tuned on the nose, but on tuning off either side about ½ to 1 "S" unit clear crisp speech should be heard. Now advance or retard the clipping and deviation controls, one in each hand, until settings are found where the audio sounds loudest and best. Bear in mind that too much clipping will give you some distortion even though you are not deviating enough. Too much deviation will make the signal too broad and distorted, and it will spatter beyond where you can get a reading on your "S"-meter. With the deviation correct and not enough clipping the audio will not sound so solid. With not enough deviation the audio will be nice and clean but just too weak to copy without turning the audio gain on the receiver away up.

Results

Your friends who are used to hearing your voice with plenty of bass won't like your quality at first now that you are cutting the lows at 500 cycles, but they will get used to it. Strangers you work will like your crisp quality. DX will say it's easy to copy through QRM.

This exciter was finished on a Saturday afternoon and immediately put on the air to see what it would do. It replaced our old exciter and the rig ended up in the old pair of 813s running 600 watts.[3]

With the beam southwest we called CQ-ZL at 5:10 P.M. and were answered by ZL1KN. Mac said it was the best n.f.m. he had heard and had thought it was a.m. The next contact was ZL1QX (who gave the same report) and was followed by XE2KW. On Sunday EA3HM, ZS6AM and LU3DH were worked. The band not being open to Japan, we had to wait until Monday to work J2BAE. Within 36 hours of soldering the last

(*Continued on page 122*)

[3] This amplifier was treated for TVI as described in May *QST* (see footnote 1). — *Ed.*

A "Plumber's Delight" Beam for 14 Mc.

More Ideas on Rotary-Beam Construction

BY WILLIAM I. ORR,* W6SAI

• Here are some more ideas on 14-Mc. rotary-beam construction, representing the collective thoughts of several top DX men on the subject. While you may not duplicate the antenna exactly, we'll give you odds that you'll get some new — and good — ideas.

WE were all set to go! W6SAI was balanced atop the 4 × 4 mast mounted on the roof. W6WKU was leaning precariously over the roof edge, ready to heave on the rope attached to the huge beam framework. W6TEZ was in the yard flexing his biceps, ready to boost the beam skyward.

The little woman, taking in all this preparation from the kitchen window, said, "Well! Things are pretty sad when it takes three hams and a hundred pounds of wooden framework just to hold three lil pieces of aluminum tubing up in the air."

WKU relaxed his hold on the rope and we all looked at each other. Sunny was right. It *was* silly to put all that framework up in the air to support three lil pieces of aluminum tubing.

"OK, fellows, forget it! Let's quit and have a beer," I said.

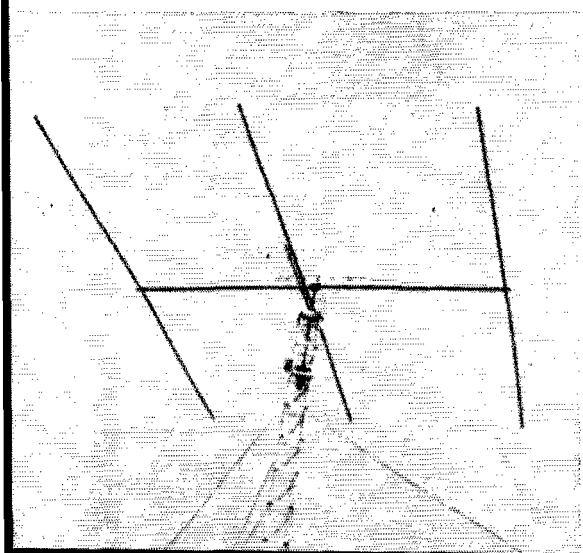
So ended the glorious antenna-raising party at W6SAI. We stood around and looked at the remains of a 14-Mc. beam that, by the power of a woman's tongue, had never left the ground. "Look at that beast," said TEZ, pointing at the beam, "a beautiful ladder frame, guy wires, egg insulators, braces and plates! Eighty-five pounds of junk just to support twenty pounds of elements. There certainly should be a better way of doing it!"

There was a better way of doing it. W6TEZ, VFR, WKU and I spent the better part of a year's worth of week ends finding out that better way and we sincerely hope that the following information will be of some assistance to someone on the verge of erecting a 14-Mc. rotary beam antenna.

* 1426 Camden Avenue, Los Angeles 25, Calif.

Electrical Design

The two main reasons for erecting a rotary beam are (1) to blot out the other guy and (2) to improve reception of the station you are working — or trying to work. Obviously the best answer to this problem is either a rotary Sterba curtain or a brace of rhombics. Unfortunately, the city ham, hampered by fifty-foot lots, building inspectors and neighbors, cannot resort to these simple and pleasant solutions. The best way out is a comparatively-light rotary beam, one giving maximum gain per unit of area, without overhanging the property line. Also, it must be passably neat looking, with a minimum of guys and bracing. We believe that the three-element wide-spaced beam is the best answer to all these requirements. It has high gain, it is not critical of adjustment and, although it isn't small, it can be made to *look* small by proper construction. At the same time, it can be made light enough (fifty pounds or less) for one man to handle alone. Finally, it takes a rhombic or the equivalent thereof for some other joker to override the signal from the beam.



The "plumber's delight" 14-Mc. beam at W6TEZ.

The final design we arrived at uses 12-foot spacing on the director side of the radiator and 10-foot spacing on the reflector side. The radiator is moved a little "to the left of center" to aid in mounting the beam. The supporting boom is 22 feet long. The director is 31 feet 2 inches long, the radiator 33 feet 3 inches long, and the reflector 34 feet 10 inches long. A "T"-match is used to couple the beam to a 600-ohm open-wire flat line.

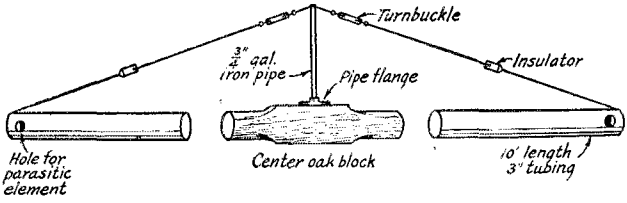


Fig. 1 — **The boom is made of two 10-foot lengths of dural tubing slipped over a 3-foot oak block and held in place with 2-inch wood screws. Guy wires from the center add strength to the boom structure.**

The "T" is four feet on a side and spaced about four inches below the radiator. It is made of 1-inch dural tubing. Please note that there is no black magic in the above figures. They were arrived at after a lot of talk and very little physical effort to verify them. However, the transmission line is reasonably flat (s.w.r. less than 2) and the beams manage to punch a hole through the QRM, so we can assume the figures are reasonably correct and practicable.

Mechanical Design

The lightest, simplest and easiest beam to build for 28 Mc. is the so-called "plumber's delight" — an array constructed entirely of metal, with no insulating members between the elements and the supporting structure. This basic design was adapted for 14-Mc. operation and has proved very satisfactory under some rather trying weather conditions. Four different beams have been built after the following pattern and they all give uniformly fine results. Best of all, they are easy to build, easy to install, and inexpensive.

Boom Design

The supporting boom consists of a 22-foot tube assembled from two 10-foot lengths of 3-inch diameter 24ST dural tubing of 0.072-inch wall thickness. The two sections are spliced together with a three-foot length of 6 × 6-inch oak, turned down at each end to fit inside the tubing. The center of the block is left square to provide a flat surface to attach to the vertical rotating pipe. At each extremity of this boom is cut a horizontal hole the exact diameter of the parasitic elements. In my case, 1⅝-inch diameter elements were used and a 1⅝-inch Greenlee socket punch was used to make the holes. A square should be used to align the center holes of the punch so that the elements will be at right angles to the boom.

A two-foot length of ¾-inch pipe, complete with flange mounting plate, is bolted to the top surface of the oak center block, and a single umbrella guy is run to each end of the boom. An egg insulator and a turnbuckle are placed in each guy. The 'buckles should be tightened until there is no sag in the boom when it is supported at the center (see Fig. 1), and then safety wired. Finally the center block should be given a good coat of paint or varnish to prevent it from splitting.

Element Design

Each of the three elements is composed of a 12-foot length of 1⅝-inch diameter, 0.050-inch wall, 24ST dural tube, with each end slotted for about four inches. This slotting operation can be done easily with a hack saw. Into each end of this tube is pressed a 12-foot length of 1½-inch-diameter 0.032-inch-wall 52ST tubing, as shown in Fig. 2. The correct element length is set by changing the overlap of the tubes. To prevent oxidizing at the joints, a special compound was obtained that is used in the aircraft industry to seal aluminum joints against oxidization. The best source of this compound, or paste, is in large aluminum electrical lugs that may be obtained at an aircraft-surplus supply store. These lugs are filled with the paste and are capped with a red plastic cover. The paste, I am told, is a mixture of grease and metal filings — the grease to keep the air from the joint and the metal filings to pass the current through the joint. A dozen of these

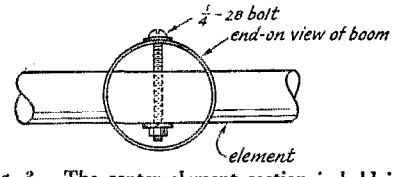


Fig. 3 — **The center element section is held in the boom with a ¼-28 machine screw, nut and lock washer. The guy wire attaches to the head of the bolt.**

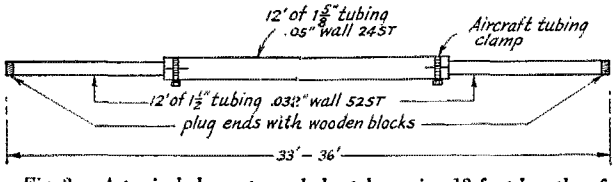


Fig. 2 — **A typical element, made by telescoping 12-foot lengths of tubing. The overlaps are treated to insure good electrical connection. (See text.)**

electrical lugs were bought and the paste extracted and smeared inside both ends of the three center tubing sections. As an added precaution after assembly, an expandable aircraft-tubing clamp was slipped over each joint and tightened.

Reflector and Director Assembly

Before the elements are assembled, the center-element sections of the reflector and director should be inserted in their respective holes in the ends of the boom and accurately centered. It is a good idea to slot these center sections after they have been passed through the boom holes instead of before, as the tubing expands slightly after it is slotted and it may be quite a job to compress it enough to get it through the boom holes. With the center sections aligned with respect to the boom, a ¼-inch hole is drilled and a ¼-28 machine screw is run through the top wall of the boom and through both walls of the element, as in Fig. 3. When this joint is tightened the element will be firmly anchored to the boom. Any play at this joint will lead to bad element vibration in a wind, so any slippage here

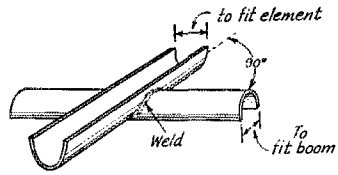


Fig. 4 — The clamp for the driven element is made by splitting 1-foot lengths of iron pipe and welding them together as shown.

should be shimmed out with thin brass strips inserted in the boom hole. The end tips may now be inserted in the reflector and director and the clamps tightened.

Radiator Assembly and Mounting

The radiator is placed atop the center boom, a little off center in order that it will clear the center stay. The radiator is attached to the boom by a special clamp, constructed as illustrated in Fig. 4. Two pieces of iron pipe a foot long each are obtained. These should be of proper inside diameters to slip tightly over the boom and radiator, respectively. These pipes are then cut lengthwise into two pieces and two of the halves welded to each other back-to-back at right angles to form a mounting that will sit astride the boom and provide a cradle for the radiator. This mounting should be bolted to the boom by means of three ¼-inch bolts 4 inches long. The mounting should be placed as close as possible to the center of the beam, so that at least two of the mounting bolts can pass through the oak block. The radiator is seated in the cradle and held in place by two adjustable aircraft-tubing clamps.

The "T"-Match

The "T"-match section is made of two 4-foot pieces of 1-inch diameter dural tubing joined together by a 1-foot piece of oak dowel rod (broomstick to you). The tubes are driven onto the rod until they are spaced two inches apart. Holes are

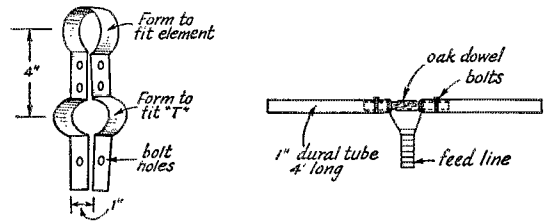


Fig. 5 — Details of the "T"-match assembly.

then drilled through the tubes on each side of the joint, and two machine screws are inserted for the connection of the transmission line. The "T" is connected to the antenna by two brass clamps, fashioned of 1-inch brass strip and formed as shown in Fig. 5.

The Supporting and Rotating Mechanism

The choice of power for rotation of the beams was the surplus "prop-pitch" motor available from many sources for a modest sum. These have performed excellently. A pipe flange was welded to the spline gear, and a threaded section of 1⅝-inch iron pipe was used as a supporting and rotating member. To prevent slipping of the threaded joint, it was pinned by a ¼-28 bolt after assembly. It is a good idea not to let the pipe exceed twelve feet in length or else it will develop axial twist in a heavy wind and allow the beam to whip about.

We all developed different systems for mounting the beam atop the pipe. Each of us had different mounting problems that necessitated different arrangements, so it might not be a bad idea to study them all. In all cases, the completed beam

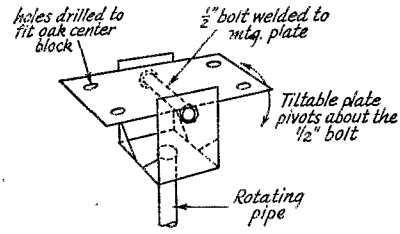


Fig. 6 — The mounting plate used in the W6SAI beam. Since the plate is supported at only one point, it is necessary to guy the boom to the rotating vertical member. (See photograph.)

is light enough to be pulled up a tower by a rope or passed up hand-over-hand. When it arrives at the top it can easily be swung into a horizontal position and dropped into some kind of a cradle at the top of the pipe. Now, while you are holding the beam at the top of the mast, let's look at the mounting cradles:

W6TEZ (or "Brute-Force") Method

Bill procured a large pipe flange that would thread onto the top end of his vertical supporting pipe and bolted it to the underside of his oak

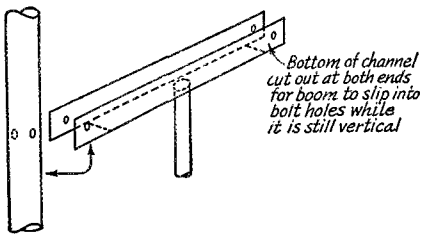


Fig. 7 — At W6VFR, the mounting plate is made from a length of "U"-channel iron cut and drilled as shown. The boom is raised vertically until one set of bolt holes is in line and a bolt is slipped through. The boom is then swung into its horizontal position and the other bolt is put in place.

center block. The beam was then pulled up the side of the tower by a rope and then he swung it up and over his head and set it down atop the vertical pipe. The prop-pitch motor was then started and the rotating vertical pipe screwed itself into the flange on the oak block. The joint was then pinned. This is an exceedingly simple scheme but it has two undesirable drawbacks: (1) it isn't easy to swing a three-element beam over your head when you are perched precariously atop a 45-foot tower, and (2) the beam cannot be tilted down for adjustment and repairs without completely removing it from the supporting pipe.

W6SAI Method

I had a tiltable iron mounting bracket welded at a local machine shop. It was welded to the supporting pipe and it provided a flat tiltable metal plate the exact size of the bottom of the oak center block. The plate was drilled to correspond to bolt holes in the block. The beam was passed up the mast hand-over-hand until the oak block centered with the mounting plate. It was a simple job to bolt the block to the plate and then swing the beam up into a horizontal position. It is held horizontally by two short guys running between the boom and the vertical pipe. (See Fig. 6 and photograph.)

W6VFR Method

Marv constructed a "U" channel into which the boom would fit and which had extended side flanges at each end, drilled to fit corresponding holes in the boom. The boom was hoisted atop the tower and positioned between the two flanges and a bolt run through the flanges and the boom. The boom was then swung up to a horizontal position and the second bolt put in place. (See Fig. 7.)

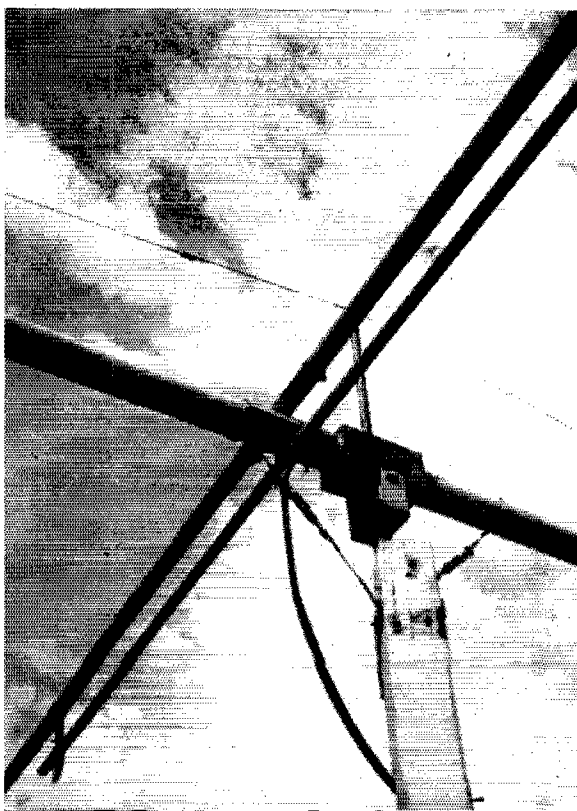
All these three methods are practical, so take your choice!

Once the beam is UP, the battle is over. Hook on a balanced line of 200 to 600 ohms and load to the transmitter. The beam will cover the complete 14-Mc. band with very little evidence of frequency discrimination. Keep the line well clear of metal objects that would tend to unbalance it, and you are all set to roll.

Afterthoughts

As any ham knows, once a piece of equipment is pronounced perfect, it is high time to tear it down and rebuild it. We haven't done that yet, but we do have some good ideas gained out of using the beam for over a year and they may prove of value.

1) An all-metal 14-Mc. beam often, for obscure reasons, will develop resonant vibrations at certain wind velocities if it is pointed into the wind.



♦

A close-up of the tiltable mounting plate used at W6SAI. The two short lower guys go to the rotating pipe and keep the boom horizontal. The saddle mounting for the driven element is also visible in this view.

Because of this, it is important that all joints be vibration-proof. In my case, I have a brisk onshore wind every afternoon that often reaches amazing proportions. If the beam is left head-on to the wind, the elements will start a periodic vibration that is harmless but annoying. In the distant future the beam is coming down and the reflector and director will be removed from the boom holes and two additional cradle clamps, similar to the antenna mounting clamp, are going to be made. The ends of the boom will be plugged with oak plugs and the clamps bolted to the ends of the boom. The reflector and director will rest in these clamps. This modification will provide a rigid joint and also allow the use of two umbrella guys to each end of the boom. The beam, as it is, is rigid enough for locations that are not too windy. It has stood up for a year so far with some winds of 40 m.p.h., and it doesn't look as if it will come down for some time!

2) It is a good idea to paint the whole beam with aluminum paint to prevent corrosion of the dural.

3) The boom can be constructed with square dural tubing instead of round. In some cases square tubing is more easily obtainable. Either type will work well. W6VFR is erecting a 4-element wide-spaced brute with a 28-foot boom made of square tubing. (Why anyone with 215 countries wants a four-element job is beyond me!) Tubing measuring about 2 by 4 inches on edge is satisfactory.

4) It is permissible to replace the oak center block with a splicing piece of dural tubing. This makes the beam easier to assemble but a little more floppy. The flop may be taken out by the umbrella guys, however. This substitution works better with square tubing as it provides a flat mounting surface.

5) In case of vibration, in the element tips, it can be damped out by plugging the tips with wood blocks.

After a year of operation we have found the beams to be well worth the effort. They perform in an excellent manner and have survived several bad windstorms that have wrecked other more pretentious beams. They are easy to service and neat-looking. They are not costly to build. What more could one want? (I know — a rhombic!)

NATIONAL EMERGENCY FREQUENCIES

C.W.	*'PHONE*
7100 kc. (day)	3875 kc.
3550 kc. (night)	

During periods of communications emergency these channels will be monitored by stations of the National Emergency Net for the handling of third-party personal-inquiry traffic.

A.R.R.L. QSL BUREAU

For the convenience of American and Canadian amateurs, the League maintains a QSL card distributing system which operates through volunteer district QSL managers in each call area. To secure such foreign cards as may be received for you, send your district manager a stationer's-size No. 10 stamped self-addressed envelope. If you have reason to expect a considerable number of cards, put on an extra stamp so that it has a total of six cents postage. Your own name and address go in the customary place on the face, and your station call should be printed prominently in the upper left-hand corner. If you have held other calls in previous years, submit an envelope for each such call to the proper manager — there are many thousands of uncalled-for cards in the files. All incoming cards are routed by Hq. to the *home district* of the call shown in the address.

W1, K1 — Frederick W. Reynolds, W1JNX, 83 Needham St., Dedham, Mass.
W2, K2 — Henry W. Yahnel, W2SN, Lake Ave., Helmetta, N. J.
W3, K3 — Jesse Bieberman, W3KT, Box 34, Philadelphia, Pa.
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 Ave., Oakland, Calif.
W7, K7 — Frank E. Pratt, W7DXZ, 5023 S. Ferry St., Tacoma, 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, Wis.
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, Manitoba.
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 — Jack Spall, VE8AS, P. O. Box 268, Whitehorse, Y. T.
KP4 — E. W. Mayer, KP4KD, P. O. 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 — J. W. McKinley, KL7CK, Box 1533, Juneau, Alaska.

Note: Bold-face listings indicate changes from last-published QSL Manager list. Remember this new address when sending your next envelope.

A Compact Converter for 6 and 10

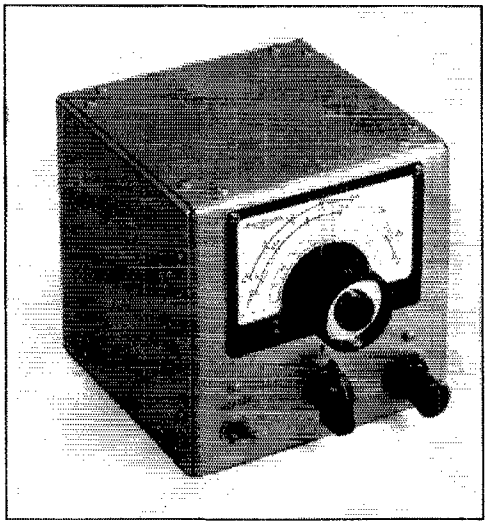
A Bandswitching Unit for Mobile or Home-Station Use

BY C. VERNON CHAMBERS,* W1JEQ

• Mobile operation is usually a one-band proposition, yet, at the power levels ordinarily employed, it is no problem at all to make a transmitter work on 11, 10 and 6 meters. Here is a bandswitching converter which will take care of the receiving end for the same ranges. Though designed primarily for mobile operation, its performance is good enough for the home station as well; and, since the i.f. is at the high end of the broadcast band, the converter may be used with almost anything in the way of a receiver.

A CONVERTER, to be used with the car broadcast receiver, is the generally accepted way of providing mobile reception on 6, 10 and 11 meters. Yet, because mobile operation is something of a sideline to most of us, we do not give the converter for the car as much thought as we would a similar unit for the home station. Most fellows contemplating mobile work buy a commercial unit as the simplest way out, and others build simple one-tube affairs which seldom give entirely satisfactory performance. Almost never do we find a mobile station with a converter which permits reception on 6, 10 and 11 meters at will.

One occasionally hears the complaint from 10-meter mobile enthusiasts that they have difficulty in making ground-wave contacts, often the most desirable sort of mobile QSOs, because of the QRM from sky-wave signals. When 10 is wide open, with signals from 2000 miles away knocking even the locals out of the picture, the 10-meter mobile man has the choice of taking the one-in-a-hundred answers he gets to his calls or waiting until the band goes dead in order to work the local gang. This would be a good time to be able to give 6 a whirl. Six does open up, of course, but only a fraction of the time that 10 is open, and ground-wave range is usually appreciably greater. It's an excellent band for mobile work — here's the receiving arrangement that will permit you to try it.



A bandswitching converter for 6, 10 and 11 meters. The pilot light at the lower right has an adjustable beam, for convenience in mobile work.

The mobile receiver must be a *good* one. At the home station we hook a converter onto a 4-element beam and feed it into a $400 communications receiver. In the car the converter has to do its stuff with a whip antenna and $39.95 broadcast set. Obviously, the converter for the car must be at least on a par with its home-station counterpart, if we are going to hear anything but the loud ones on 10 or 6! This one is just that — if mobile work loses its appeal the converter can be pulled out and used at the home station with good results.

Circuit Details

The converter circuit diagram is shown in Fig. 1. A 6AK5 broadband r.f. amplifier is followed by a 6J6 mixer-oscillator. The oscillator circuit is the ultraudion type, operating 1500 kc. below the signal frequency. The need for gang-tuned circuits is eliminated by the broadband r.f. amplifier; thus only the oscillator tuning condenser, C_1, requires adjustment during normal tuning operation. Band-changing is accomplished with a 5-section selector switch, shown on the diagram as $S_{1A, B, C, D, E}$.

Seven commercially-available coils are used, six of them being identical except for the setting of the slugs. The wide inductance range of the slug-tuned units makes it possible to use similar coils for the r.f., mixer and oscillator coils for both ranges. Padder capacitance is added across

*Technical Assistant, *QST*.

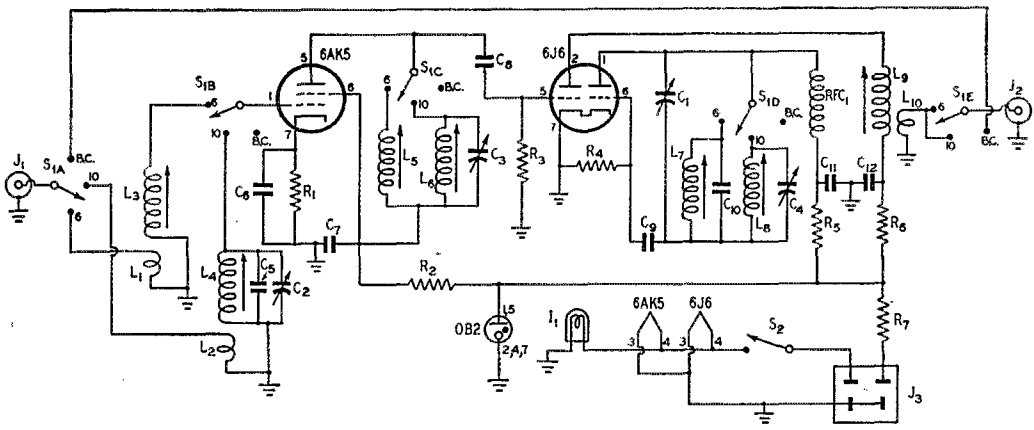


Fig. 1 — Circuit diagram of the bandswitching converter.

C_1 — 15-$\mu\mu$fd. variable reduced to one stator and 2 rotor plates (Millen 20015).
C_2, C_3, C_4 — 3-30-$\mu\mu$fd. mica trimmer (Millen 27030).
C_6, C_7 — 0.0015-μfd. ceramic (Centralab DA 018002A).
C_8, C_9 — 100-$\mu\mu$fd. ceramic (Centralab CC32Z).
C_5, C_{10} — 10-$\mu\mu$fd. ceramic (Centralab CC20Z).
C_{11} — 500-$\mu\mu$fd. ceramic (Centralab D6501).
C_{12} — 0.01-μfd. ceramic (Centralab DA018003A).
R_1 — 220 ohms, ½ watt.
R_2, R_6 — 680 ohms, ½ watt.
R_3 — 1.5 megohm, ½ watt.
R_4 — 12,000 ohms, ½ watt.
R_5 — 47,000 ohms, ½ watt.
R_7 — 5000 ohms, 10 watts.
L_1, L_2 — 4 turns No. 28 d.s.c. close-wound over ground ends of L_3 and L_4.
L_3, L_4, L_5, L_6, L_7, L_8 — 6 turns No. 20 enameled wire close-wound on ⅜-inch diameter form; slug-tuned; inductance range 0.35 to 1.0 μh. (Cambridge Thermionic Corp. Type LS3 — 30 Mc.).
L_9 — Scramble-type winding on ⅜-inch slug-tuned form; inductance range 325 to 750 μh. (Cambridge Thermionic Corp. Type LS3 — 1 Mc.).
L_{10} — 20 turns No. 28 d.s.c. scramble-wound next to L_9.
I_1 — Adjustable-beam dial-light assembly.
J_1, J_2 — Coaxial-cable jacks (Amphenol 75-PC1M).
J_3 — 3-prong cable connector (Jones P-303AB).
RFC_1 — 300-μh. r.f. choke (Millen 34300).
$S_{1A,B,C,D,E}$ — 2-gang 6-circuit bandswitch (two Centralab SS sections).
S_2 — S.p.s.t. toggle switch.

the 10-meter r.f. and mixer coils, L_4 and L_6, and across both oscillator coils, L_7 and L_8. Varying the slug position takes care of the necessary differences in coil inductance for all these positions.

A single whip antenna may be used for both broadcast and amateur reception. A jumper connection between sections *A* and *E* of S_1 completes the circuit between the antenna and the broadcast receiver, with the switch in the position marked *B.C.* on Fig. 1. A filament switch, S_2, is provided to remove the load of the converter tubes from the car battery when the receiver is being used for broadcast reception.

Broadbanding of the r.f. and mixer circuits is accomplished through the use of low-*Q* coils and tight coupling in the antenna circuit. The plate coil of the mixer is self-resonant at the i.f. frequency, giving a degree of broadness sufficient to permit tuning the receiver over a limited range near the high end of the broadcast band, providing a vernier effect.

Construction

The case and chassis were designed for the job, as no commercially-available units appeared suitable. All the metal components are formed from 1/16-inch aluminum stock. The interior view shows the "L"-shaped section which serves as the front panel and the bottom plate of the unit. The panel and the bottom areas are each 5 inches square. Lips, ½ inch wide, are folded over along the top and side edges of the panel and also along the sides of the bottom section. The rolled-over edges are drilled and tapped to accommodate 6-32 machine screws.

A three-sided portion and a square top plate complete the converter cabinet. The sides are 5 inches square and the rear wall is 5⅛ inches wide. All three sides are 5 inches high with ½-inch flanges folded over on the top edges and drilled and tapped for 6-32 screws. The sides and bottom edges of the case are drilled to clear machine screws; the holes should line up with the tapped holes of the panel-bottom assembly. A rectangular hole, 1⅞ inches high and 2 inches wide, is cut at the bottom left-hand corner (as seen from the rear of the converter) of the rear wall, to provide clearance for the cable connectors. The top plate for the converter measures 5 by 5 inches. Holes, drilled along the edges, allow the cover to be fastened to the flanges at the top of the cabinet.

The physical shape of the converter chassis can best be visualized by study of the interior views. The chassis is 5 by 4⅞ by 1¾ inches in size, with flanges ½-inch wide folded over along the front

and the bottom edges to provide a means of mounting. A 2¼ × 3¾-inch cut-out at the center of the chassis allows clearance for the bandswitch. A large round hole located in the rear wall of the chassis simplifies the job of finding the oscillator padder condenser when this control requires adjustment.

A vertical partition used as the mounting surface for the oscillator tuning condenser, C_1, also serves as the shield between the plate and the grid circuits of the r.f. amplifier. It is 3½ inches wide and 4¾ inches high, and is notched to clear the main chassis and the spacer bars and rotor arm of the bandswitch. The partition is held in place by a spade lug which passes through the chassis and by a mounting lip which is screwed to the bottom side of the cabinet. It is located 3 inches in from the front edge of the chassis.

The heater switch and the pilot-light assembly are mounted at the lower left- and right-hand corners of the front panel with the bandswitch at the center, 1⅝ inches up from the bottom edge. The selector-switch index plate should have a rotor-shaft length of at least 3 inches, and the switch wafers should be mounted on the shaft with the first separated from the index plate by 1-inch spacers and with the second wafer separated from the first by 1⅝ inches.

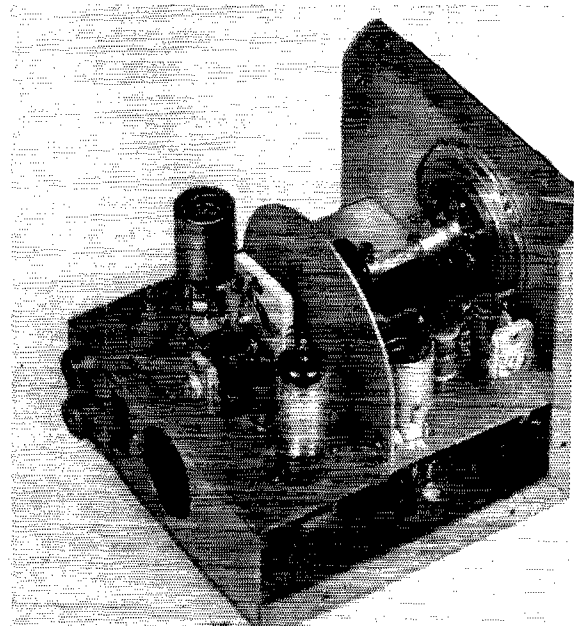
The National MCN dial is centered above the bandswitch with the control shaft 3 inches above the bottom edge of the panel. It is wise to cut the large mounting hole suggested in the dial mounting instruction sheet and then do the final fastening down of the dial after the tuning condenser and its mounting plate have been permanently secured in place.

The interior view of the completed converter shows the 6AK5 amplifier tube in front of the shield partition, with the grid inductances to the right of the tube. The padder condensers for 27 and 28 Mc. are mounted on the forward coil. From left to right across the rear of the chassis are the mixer-oscillator tube, five of the slug-tuned inductances, and the regulator tube. The i.f. output coil and the two oscillator coils are mounted below the chassis, as seen in the bottom view of the chassis subassembly. The r.f. plate coils are above the chassis to the left of the 0B2 regulator, the 28-Mc. coil being the one with the trimmer condenser mounted across the terminals.

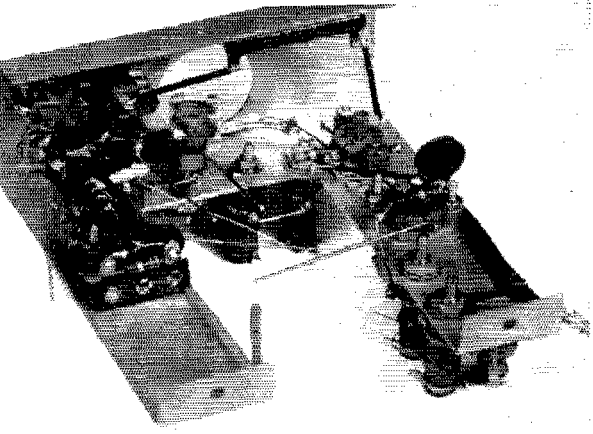
Construction will be simpler if the builder procures the CTC inductors described in the converter parts list. These coils have a wide range of inductance because of combination brass-and-iron tuning slug employed. The Type LS3 30-Mc. inductors will resonate at 50 Mc. with the tube and circuit capacitances, and only a small amount of padder capacitance is required to tune them to 27 and 28 Mc.

Coaxial jacks for the antenna and i.f. output cables are at the rear of the chassis to the left of the power-cable jack. They are closely grouped so that the input and output cables may be taped together to form a compact common cable.

Wiring of the converter can be done more readily if the subassembly method is employed. The bottom view of the chassis subassembly shows how the circuit components are closely grouped around the tube sockets, with wiring completed to the point of making connections to the bandswitch. The 2-terminal lug strip at the left of the chassis is used as a mount for the oscillator decoupling resistor, R_5, and as the tie point for C_{11}, RFC_1 and R_6. The various fixed condensers shown in the photograph are items of a new line of ceramic types now available from Centralab and others, and it can be clearly seen how their small physical size fits in with a piece of compact construction. The 10-watt resistor shown at the top right-hand corner of the view is the limiting resistor, R_7. Twin-Lead of the 75-ohm type is used to make connection between the antenna input jack and the bandswitch. The two wires enclosed in spaghetti at the right of the chassis are the 6.3-volt leads which go to the heater switch.



Interior view of the converter. Only the oscillator is tuned by the front-panel control, eliminating tracking problems.



Construction of the converter is made easier if as much wiring as possible is done before the assembling is completed. This bottom view of the chassis subassembly shows the wiring completed to the point of connection to the bandswitch.

Testing

The heater requirements of the converter are 6.3 volts at 0.625 amp. and the plate supply should deliver 200 to 250 volts at 25 to 30 ma. These may be drawn from the receiver with which the converter is to be used, or a separate supply may be employed. With power turned on, the plate voltage of the mixer and r.f. amplifier should measure 105 volts and the 6AK5 cathode resistor should provide a drop of approximately 2 volts. The 6AK5 cathode current should be about 8.5 ma. The regulator-tube drain will be about 8 ma.

Alignment of the converter is made most simple if a calibrated signal generator is available, otherwise amateur transmitter signals of known frequency may be used. The r.f. and i.f. circuits can be peaked on background noise. The oscillator should be on the low side of the signal frequency. It is possible to vary the bandspread of the converter tuning range over a wide range. With a fairly low order of padder capacitance, and with the inductance increased by the tuning slug, the 10- and 11-meter bands can be covered with one swing of the tuning dial. Anyone not interested in 11 meters can increase the bandspread on the 10-meter range by adding more padder capacitance and by decreasing the inductance of L_8. The converter as shown has 13 divisions of bandspread at 11 meters and 52 divisions at 10 meters, with the logging of frequencies made on the B scale of the dial. Bandspread for the 50-Mc. band is 48 divisions on the A scale. This spread may be increased by the same method.

Some operators favor a selected group of frequencies within a band. A slight improvement in the performance of the converter can be made in this case by peaking the r.f. amplifier circuits at a favorite spot rather than at the center of a band. There may be a tendency toward regeneration in the 50-Mc. r.f. amplifier, however, if the input and plate circuits are peaked at precisely the same frequency, making stagger-tuning desirable.

The converter has been used with various types of receivers serving as the i.f. system, including several table-model broadcast sets. Quite satisfactory performance can be obtained with any receiver except those having built-in loop antennas, though the communications type is much to be preferred, if the converter is to be employed for home-station use.

Reducing Spurious Responses

In localities where there are stations operating in the high f.m. band a converter or receiver having broadband r.f. stages will experience considerable interference on the 50-Mc. range. This results from the second harmonic of the oscillator beating with these signals, they having reached the mixer through the lack of selectivity in the front end. This trouble can be corrected in several ways, the simplest being the insertion of a 100-Mc. trap in the antenna lead.

Interference from the f.m. stations in the Connecticut Valley was reduced below the troublesome level with a fixed-tuned trap consisting of 7 turns of No. 18 enameled wire ½ inch in diameter, connected across a 5-$\mu\mu$fd. ceramic fixed condenser, and inserted in the lead between L_1 and the switch terminal. The turns may be spread apart or squeezed together to reduce the interference from the most troublesome signals. There is practically no change in the 50-Mc. operation otherwise, with the insertion of such a trap.

FEED-BACK

In case some of you have forgotten the technique, W2FXN points out that a single-ended condenser can be used for C_7 in the crystal-controlled converters described by W1DX in our December issue. The only other change necessary is to provide an r.f. return to ground from the center-tap on L_3, which is easily done through a 500- or 1000-$\mu\mu$fd. mica condenser. Bob built his converters on 5 × 6-inch sheets of copper, further to continue the policy of "building it just like *QST*, except . . ."

In the same article RFC_1 under Fig. 1 should read "National R-33," and CTC in the coil table stands for Cambridge Thermionic Corp., whose address is 445 Concord Ave., Cambridge 38, Mass.

Happenings of the Month

IS YOURS A 5-YEAR LICENSE?

If it isn't, OM, you're out of luck! The series of temporary FCC orders which automatically extended the terms of certain amateur licenses until the end of 1948 are no longer in effect. As of January 1, 1949, all valid amateur licenses are the new five-year-term tickets. So take a look at your license; if it is of the prewar three-year-term variety, it has expired and it will be necessary for you to qualify again by examination before you may engage in amateur operation.

PROOF OF USE REQUIRED FOR RENEWALS

While it will be several years before any holders of the five-year amateur licenses will have to renew, we call attention now to the fact that "proof of use" is again required as of January 1, 1949, as an essential to renewal. Each application for renewal must henceforth show proof of use as required by the pertinent provisions of Section 12.27 of the amateur rules:

§ 12.27. *Renewal of amateur operator license.* An amateur operator license may be renewed upon proper application showing that within the last six months of the license term the licensee has lawfully operated an amateur station or stations licensed by the Commission, and has thereby communicated by radiotelegraphy with at least three other such amateur stations in the United States. The applicant shall qualify for a new license by examination if the requirements of this section are not fulfilled. Application for renewal of an amateur operator license shall be filed not more than 120 days prior to date of expiration of such license and not later than the date of expiration.

Note that the contacts on which your proof of use are based need not have been effected from your own station; they may have been made while operating any amateur station. But they must be by radiotelegraphy — 'phone contacts won't qualify.

MISUSE OF AMATEUR 'PHONE STATIONS

Headquarters has had correspondence indicating some misunderstanding among amateurs concerning the conditions under which an unlicensed person may transmit by voice over an amateur 'phone station. Pertinent FCC regulations are quite clear-cut. Section 12.28 provides that "When an amateur station is used for telephony, the station licensee may permit any person to transmit by voice, provided that during such transmission call signals are announced as prescribed by Section 12.82 and a duly licensed amateur operator maintains actual control over the emissions, including turning the carrier on and off for each transmission and signing the station off after communications with each station have been completed."

This means that an unlicensed person may be permitted to call CQ, establish initial contact and make subsequent transmissions only if a duly-licensed amateur operator actually turns the carrier on and off and otherwise retains control over the station and, at the conclusion of communication with each station, signs the station off. It isn't enough for the licensed operator to be present and supervise such functions; he must actually perform them himself. So when Uncle Willy (unlicensed) insists it's *your* turn to make up the next round of sandwiches and get the beer from the kitchen, while he works a few, throw the book at him and sit tight.

Don't forget, too, that Section 12.136(b) prescribes that the name of such unlicensed person as may talk over a station must be entered in the log.

STAFF NOTES

It is with genuine regret that we announce the separation from Headquarters of Al Hill, W1QMI and ex-W6JQB, communications assistant in charge of handling DXCC certificates and manager of NTL for the past 16 months, and Bill Papanos, our efficient and faithful janitor for more than six years. Al returns to California to rejoin his family and associate himself with research work on guided missiles with Northrop Aviation — and, of course, to resume ham operation with his old call. Bill, it turns out, was once an expert grape-pruner back in his home-country, Greece, and when he took his vacation last year with a first trip to California, it was just too much for him; he's going out around Fresno way and expects soon to start fixing up those vines, but right! The best wishes of the entire Hq. staff to you, OMs; we'll miss you both! (What is it California winters have that Connecticut dittos don't?!)

ARE YOU LICENSED?

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

Harmonic Suppression in Class C Amplifiers

Effect of Operating Conditions and Circuit Components on Harmonic Output

BY FREDERICK Q. GEMMILL,* W2VLQ

DESIGNING Class C radio-frequency amplifiers to minimize harmonic generation and radiation is not an easy task. While the fundamentals have been outlined in *QST*,[1] this subject has not been fully explored. Recent experiences of the author are reported here in an effort to further general knowledge on this subject.

• The experimental work described by the author in this article brings to light some interesting and useful ideas for better suppression of harmonics. You'll welcome them if you're troubled with TVI.

Class C Amplifiers

The source of our harmonics lies in the pulse-shaped currents flowing in the grid, screen-grid, plate and filament or cathode circuits of the Class C radio-frequency amplifiers which form the basis of our transmitters. For analytical purposes these current pulses can be treated as parts of

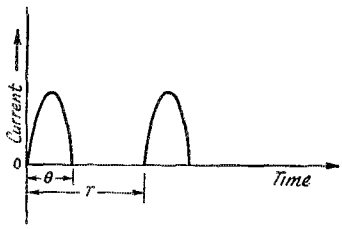


Fig. 1 — Typical current pulse shapes in grid and plate circuits of a Class C amplifier. When the time of one cycle T is expressed as 360 degrees of angle, θ is the "operating angle."

sine waves, as shown in Fig. 1. Analysis of the harmonic content of recurrent pulses of this nature shows that the amplitude and distribution of harmonics is a function of θ/T; that is, the "conduction angle" or "operating angle." At certain values of θ/T the amplitude of a particular harmonic becomes zero. Table I gives the first few zeros. Unfortunately, it is not possible for the second harmonic to become zero. However, by adjusting the conduction angle θ higher-order harmonics can be made to approach zero, one at a time.

Operating conditions — plate voltage, grid bias, excitation voltage, etc. — establish the grid- and plate-conduction angles and, hence, the harmonic content of the grid- and plate-current pulses. In general, the grid-conduction angle will be appreciably smaller than the plate-conduction angle.

While it is true that conduction angles cannot be varied without corresponding changes in efficiency, the fourth harmonic can be suppressed without any sacrifice in efficiency. An attenuation of 20 db. can be attained readily, as shown by the data in Table II, simply by proper adjustment of the grid bias and grid signal. These measurements were made on the output from the author's 14-Mc. transmitter using the set-up shown in Fig. 2.

When a given harmonic such as the 4th or 5th is causing interference, this transmitter adjustment can be very effective. Unfortunately, the particular plate-current conduction angle which cancels a given harmonic may cause the higher-order harmonic output to increase.

The Tank Circuit and Harmonic Output

The parallel-resonant tank circuit is the filtering device which changes the plate output-current waveform from a pulse to a sine wave with a small amount of harmonic content. As has been shown,[1] the tank circuit does this by reason of

TABLE I
Conduction Angles for Zero Output *vs.* Harmonic Order

Order of Harmonic	θ/T	*Conduction Angle, θ, in Degrees*
3 *	½	180
4	⅜	135
5	⅗	108

* NOTE: For this condition, all odd harmonics are also zero.

*82 Wyatt Road, Garden City, N. Y.

[1] Grammer, "Keeping Your Harmonics at Home," *QST*, Nov., 1946.

the difference in the impedance it offers at the fundamental and at harmonic frequencies.

The tank circuit may be represented as being driven by a constant-current generator of pulse waveshape as shown in Fig. 3. The output voltage E_o at fundamental frequency is $I_1 Z_o$ where I_1 is the fundamental component of the generator current and Z_o is the impedance of the tank under load. At parallel resonance $Z_o = \frac{L}{RC}$ and is a pure resistance. If the ratio L/R is assumed constant, C must be properly proportioned to match the impedance of the driving generator for maximum power output. The design charts for plate-tank tuning capacity given in the ARRL *Handbook* are based on this fact.

The currents in the two branches of the tank circuit are nearly equal and opposite in phase at resonance. Hence, for a given vector line current,

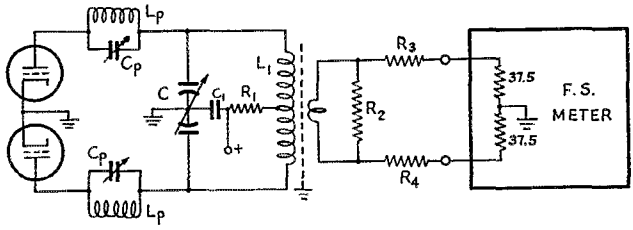


Fig. 2 — Experimental set-up for measuring relative harmonic output from a 14-Mc. push-pull amplifier. The field-strength meter used by W2VLQ was a Measurements Corp. model 58.

C — 50-$\mu\mu$fd. dual condenser (approximately 40-$\mu\mu$fd. active).
C_1 — 0.01-μfd. (Sprague "Hy-Pass" type).
C_p — See text.
L_1 — B & W 20-BVL.
L_p — See text.
R_1 — 100-ohm carbon, 2 watts.
R_2 — 75-ohm dummy antenna (Ohmite).
R_3, R_4 — 5000-ohm carbon, 1 watt.

the capacitor and inductor currents are many times larger than the line current, in fact larger by the factor $\frac{\omega L}{R}$ or Q. At harmonic frequencies, the branch currents are almost exactly opposite in phase, but the capacity current is always the larger. At the second harmonic, $\frac{4}{3}$ of the total second-harmonic current flows in the capacitor and $\frac{1}{3}$ in the coil. At the third harmonic, $\frac{9}{8}$ of the total third-harmonic current flows in the capacitor and $\frac{1}{8}$ in the coil.

The ratio of the fundamental to second-harmonic current in the capacitor is

$$\frac{I_{c1}}{I_{c2}} = \frac{3}{4}\frac{I_1}{I_2} Q. \qquad (1)$$

For the third harmonic, this ratio becomes:

$$\frac{I_{c1}}{I_{c3}} = \frac{8}{9}\frac{I_1}{I_3} Q \qquad (2)$$

where Q is the tank-circuit Q at fundamental frequency, I_{c1}, I_{c2}, and I_{c3} are the capacitor currents at fundamental, second and third harmonics respectively and I_1, I_2 and I_3 are the components of line current at the fundamental, second and third harmonics respectively. The equivalent expressions for the coil currents are:

$$\frac{I_{L1}}{I_{L2}} = 3\frac{I_1}{I_2} Q \qquad (3)$$

and

$$\frac{I_{L1}}{I_{L3}} = 8\frac{I_1}{I_3} Q. \qquad (4)$$

Equations (3) and (4) show the importance of Q in the ability of the tank circuit to discriminate against harmonic-output currents flowing in the tank coil.

TABLE II
Harmonic Output *vs.* Grid Bias for Constant Grid Signal

Grid Bias	*56-Mc. Output*
−150	100 μv.
−160	65
−165	30
−170	10
−175	35
−180	60
−190	110

In the above analysis, the tank circuit has been idealized. Actually, plate-lead inductance, tube output capacity and the tuning capacitor may resonate at a harmonic frequency. This, of course, causes harmonic currents of far-different values to flow through the tuning capacitor and tank coil than indicated by the foregoing analysis.

This phenomenon can be measured using the set-up of Fig. 2 by artificially lowering the resonance frequency f_o around the circuit formed by the plate lead and tuning capacitor by introducing small inductances L_p in the two plate leads. Table III gives typical results.

If the plate-lead inductances are shunted with a capacitor C_p to form a wavetrap and are tuned to a given harmonic, some interesting results are obtained. Harmonic-output data for two cases,

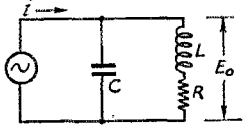


Fig. 3 — Tank circuit driven by constant-current generator.

first with a wavetrap in one lead with the other lead as short as possible, and second with wavetraps in both leads, are given in Table IV. No particular pains were taken to shield the wavetraps from the main plate tank circuit. The coils used had 5 turns, ½-inch diameter, and were tuned with 50-$\mu\mu$fd. capacitors.

These data illustrate the fact that different

TABLE III
Relative Harmonic Output *vs.* Resonant Frequency of Plate-Lead Tuning-Capacitor Circuit

Frequency	*Short Leads* $f_o = 262$ *Mc.*	*Long Leads* $f_o = 115$ *Mc.*
14 Mc.	460,000 μv.	460,000 μv.
28	1200	800
42	6500	7000
56	70	45
70	5000	8000
84	1540	4000
98	400	3600
112	480	12,000
126	600	2000
140	1800	1400

harmonics circulate around different circuits. The odd harmonics go around the tube plate circuits in series while the even harmonics go around the tube plate circuits in parallel. Note that a single trap tuned to 56 Mc. increased the output at 56 Mc. over two traps tuned to 56 Mc., while two traps tuned to 42 Mc. increased the 42-Mc. output greatly and two traps tuned to 70 Mc. increased the 70-Mc. output greatly. Coupling between the two traps and the main tank circuit is undoubtedly responsible for this increase in the 42- and 70-Mc. cases, while unbalance is responsible for the increase in the 56-Mc. case. Plate-lead wavetraps should be well shielded to eliminate this undesirable coupling, otherwise harmonic output can be increased greatly as shown by the above data.

Tuning the plate tank circuit to exact resonance has a noticeable effect on harmonic output. The minimum harmonic output usually coincides with minimum plate current, but not always. Variable-frequency operation must be examined carefully to determine what effect mistuning will have on harmonic output.

The tank circuit shown in Fig. 4-B has been found superior in over-all performance from the harmonic-output standpoint when compared with the circuit of Fig. 4-A. This result comes about because harmonic currents flowing in Circuit 1 do not flow through the power-supply by-pass capacitor C_1 and because Circuit 1 *generally* has a much higher resonance frequency. The circuit of Fig. 4-B has the following disadvantages:

1) The tuning capacitor must have sufficient voltage rating to withstand twice the plate power-supply voltage.

2) The by-pass capacitor C_1 must have sufficient r.f. current carrying capacity to handle the tank current at fundamental frequency and must have low impedance at this frequency. This circuit does have an advantage from the safety standpoint inasmuch as the rotor is grounded.

Push-pull circuits corresponding to the single-ended circuits of Fig. 4 are shown in Fig. 5. Introducing the d.c. plate voltage at the center of a push-pull tank coil is a complication which can materially affect the harmonic output from a push-pull amplifier. The center-tap circuit (Circuit 1) can resonate at harmonic frequencies and actually increase harmonic output, depending upon the r.f. choke used.

By-passing the center-tap to ground as shown in Fig. 5-C will make the center-tap assume ground potential for harmonic frequencies, but this makes Circuit 1 resonant at a frequency very near that of Circuit 2. For example, a continuous solenoid (B & W 20-JCL) tuned to 14 Mc. (Circuit 2) will resonate at 18 Mc. around the center-tap circuit (Circuit 1). A split coil (B & W 20-BVL) will resonate around the center-tap circuit at about 15 Mc. Harmonic output from the circuit of Fig. 5-C using a continuous solenoid was found to be considerably less than when using a

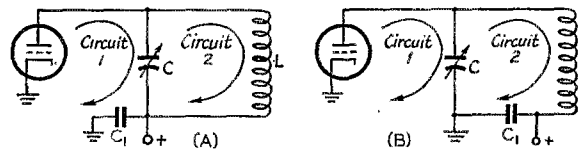


Fig. 4 — Typical single-ended tank circuits.

TABLE IV
Harmonic Output with Plate-Lead Wavetraps

Harmonic Frequency	*One Wavetrap at* 42 *Mc.*	56 *Mc.*	70 *Mc.*	*Two Wavetraps at* 42 *Mc.*	56 *Mc.*	70 *Mc.*
14	460,000 μv.	460,000 μv.	460,000 μv.	460,000 μv.	460,000 μv.	460,000 μv.
28	800	1000	1000	600	900	1000
42	750	7000	7000	90,000	8000	8000
56	400	20,000	500	180	3000	140
70	2200	3000	400	10,000	1700	160,000
84	1600	1200	2000	2800	900	550
98	540	440	600	1700	320	70
112	1600	800	640	10,800	1200	2000
126	600	1400	800	1680	880	480
140	1200	440	1400	12,000	1420	1420

TABLE V
Resonance Frequencies of Radio-Frequency Chokes

Manufacturer and Type	*Shunt-Resonant Frequencies*	*Series-Resonant Frequencies*	*Relative Q*
Ohmite Z-2 (Solenoid Type)	26.5 76 120 166 215	54 98 143 190 238	High
Ohmite Z-1 (Solenoid Type)	66 210	148 262	High
National R-100 2.5 mh. (Pie Type)	1.8 38.2 200	17.4 71	Low
Ward-Leonard 5-Watt 250-Ohm Wire-Wound Resistor	78	180	Low

split coil. In particular, the third-harmonic output materially increased when using a split coil.

Performance of Lumped Circuit Components at High Frequencies

The various circuit components represented by the electrical graphical symbols are not the ideal devices which we often assume. Consider the common mica by-pass capacitor and its ability to by-pass over a given frequency range. Lead inductance causes series resonance to occur at surprisingly low frequencies and prevents a very low impedance being attained at high frequencies. For example, a 0.01-μfd. mica capacitor with ½-inch leads will be series-resonant at about 10 Mc. If this capacitor were perfect, it would have an impedance of 1.6 ohms at 10 Mc. and 0.32 ohm at 50 Mc. Actually, this capacitor has approximately zero ohms impedance at 10 Mc. and 8 ohms at 50 Mc. While the low impedance of a series-resonant capacitor can sometimes be used to advantage, performance above resonance is poor because the impedance increases with frequency. Short, low-inductance leads are quite important when using conventional capacitors. Button-type mica capacitors have superior performance at high frequencies because their lead inductance is quite low. Newer capacitor designs, especially suited for radio-interference suppression, have no resonance frequencies up to approximately 200 Mc. and have very low impedance over a wide frequency range.

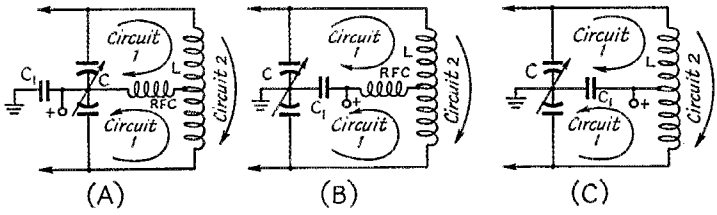


Fig. 5 — Typical push-pull tank circuits.

Radio-frequency chokes are not pure inductances; instead they generally have a number of resonant frequencies which in some cases are of fairly high *Q*. Data on several popular types as determined with a grid-dip oscillator (Measurements Corp. model 59) are given in Table V.

R.f. chokes should have appreciable resistance to lower the *Q* of any resonances. Pie-wound chokes have an advantage over the solenoid types in that the resonances are broken up and more irregular. Wire-wound resistors make good r.f. chokes because they are generally wound inductively and have low-*Q* resonances. Molded-composition or metallic-film resistors are noninductive and have no resonances in the high-frequency range and consequently make good broadband impedances, although of limited value. A noninductive resistor of several hundred ohms is often more effective as a choke for power-lead filtering than a wire-wound choke.

Tank coils have multiple resonances just as do r.f. chokes. Data on three popular types as determined with the grid-dip oscillator are given in detail in Table VI.

These multiple resonances are caused by phase shifts of the magnetic flux coupling adjacent turns of the coil. Standing waves actually appear along the length of a continuous uniform coil much as they do on an antenna or resonant feedline. Short-circuiting the terminals of a coil removes the first shunt resonance. The first series-resonant frequency is the one most likely to cause abnormal

TABLE VI
Tank-Coil Resonance Frequencies

Type	*Shunt Resonances*	*Series Resonances*	*Relative Q*
B & W 20-BVL (Internal Ends Connected for Center-Tap)	49.5 175	77 203	High
B & W 20-JEL	65 230	149	High
B & W 20-JCL	51 171	95	High

harmonic output, if it should coincide with a harmonic frequency, since tank inductors are shunted by a low impedance (the tank condenser) which at harmonic frequencies acts like a short-circuit.

Suppression of Harmonics on Power-Supply Leads

The power-supply leads carrying the largest direct currents are the most likely to carry large harmonic currents. Cathode circuits are, therefore, the hardest to by-pass. Low-impedance by-pass capacitors at each and every filament lead and grounding of all available cathode leads are necessary measures to keep appreciable harmonic currents from flowing in filament and heater circuits. Low-pass filters, in addition, are usually required to obtain the necessary suppression in locations where the signal subject to harmonic interference is weak. Cathode bias is not recommended for any but the lowest-power stages using receiving tubes because of the difficulty in getting low cathode-ground impedance.

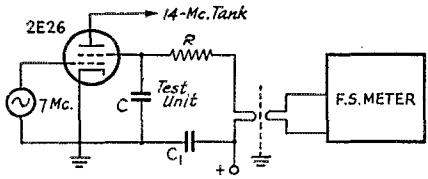


Fig. 6 — **Experimental set-up for measuring harmonic currents carried by power leads.**

Plate circuits will require at least one pi-section low-pass filter and the use of dissipative r.f. chokes is highly recommended. Where the plate current is not too high, 2-watt composition resistors of several hundred ohms often will give better performance than a conventional r.f. choke. A composition-resistor "r.f. choke" for the push-pull circuit shown in Fig. 5-B is especially recommended.

Screen-grid circuits are hard to by-pass because there is no load circuit, except the by-pass capacitor. A pi-section filter using dissipative r.f. chokes or molded-composition resistors is necessary. The effectiveness of a single r.f. suppression capacitor compared with a postage-stamp mica capacitor of equal value and a button mica capacitor of $\frac{1}{10}$ the value can be gained from the data given in Table VII. These data were taken using the measurement set-up shown in Fig. 6. The relative level at different frequencies is not accurate, but at any given frequency the data for the three by-pass units are directly comparable. The superior performance of the r.f. suppression capacitor is remarkable and its use is highly recommended for inclusion in all power leads.

The Antenna Coupling Circuit

Regardless of circuit design, some harmonic voltages will be developed across the output tank. Coupling of this output to the antenna by stray capacities between the tank coil and antenna coupling coil will take place unless adequate electrostatic shielding is applied to the antenna coupling coil. The importance of adequate shielding at this point cannot be overemphasized. Magnetic coupling, of course, cannot be avoided if there is an unbalanced harmonic current flowing in the tank coil. Double-tuned circuits or transmission-line filters are the only ways to suppress this type of output. In the case of push-pull amplifiers, the position of the antenna coupling loop for minimum harmonic output has been found to be critical for even harmonics, but not for odd harmonics because of the different paths taken by such currents in a push-pull circuit.[1]

Conclusions

The above data resulted from the author's experiences with this problem during the past nine months. While laboratory equipment was used in making the measurements reported, the above design principles for reducing harmonic output from Class C amplifiers can be applied using standard amateur grid-dip oscillators, high-frequency wavemeters and receivers to make the fundamental measurements required.

The following procedure in applying these principles is recommended:

1) The high-power stages are going to be the hardest to suppress, so use no more of them than necessary. Plan to do all the necessary frequency multiplying at as low a power level as possible.

2) Use grid and plate circuits such as those illustrated in Figs. 4-B and 5-B which have the tuning capacitors connected as directly as possible between the tube grid or plate and cathode or heater. Tuned grid and plate tanks with link coupling between stages, or unity inductive coupling attained by interwinding the grid coil with the plate coil of the previous stage tank circuit, will give superior performance.

3) Study circuit layout to ascertain the likely harmonic current paths and determine the resonance frequencies of these paths with a grid-dip oscillator. A little study will usually show how to raise the resonance frequencies of these paths by shortening leads and lowering impedances through using all available parallel paths. Do not stop until you have attained resonance frequencies of 150 Mc. and above. Work on one stage at a time, beginning with the lowest-powered stages.

4) By-pass all power leads with a full pi-network using the most effective capacitors available and low-*Q* r.f. chokes as far as possible. Use all available parallel paths for grounding of tuning

TABLE VII
Screen-Grid By-Pass Capacitor Performance; 2E26 Doubler, 7 to 14 Mc.

Freq.	*0.01 Mica with ¾-Inch Leads*	*1000-μμfd. Button Mica*	*Sprague 0.01 "Hy-Pass"*
21 Mc.	440 μv.	920 μv.	150 μv
28	780	600	140
35	950	360	24
42	1100	150	58
49	1600	46	60
56	2200	360	210
63	2500	380	85
70	2400	560	180
77	2800	700	190
84	3600	720	174
91	4000	800	170
98	5400	1040	220

capacitors and by-passing filament and screen-grid leads.

5) Install adequate interstage shielding and antenna coupling-coil shielding.

6) Explore the r.f. field about the tank circuits and power leads of each stage with a sensitive wavemeter. Check each harmonic frequency and make a record of the results and the set-up used so that your progress can be evaluated later. Energize the lowest-powered stage first and work up one stage at a time. Higher-power stages frequently feed back into the lower-power stages at harmonic frequencies, and measurements must be rechecked frequently to determine such effects.

7) Adjust operating conditions of grid drive, bias and loading to minimize harmonic output, checking a number of harmonics, not just one or two. Class B operation of high-power r.f. stages is not to be overlooked as a very practical solution in severe cases. Harmonic output from a Class B stage should be quite low because a 180-degree conduction angle produces only even harmonics. These can be substantially canceled out in the tank coil of a well-balanced push-pull amplifier.

8) Do not stop until you have so improved things that harmonic output as measured on the antenna feedline and power-supply wiring is not detectable with a sensitive wavemeter.

Appendix

The current waveform of Fig. 1 can be represented by a Fourier Series of the form:

$$i = \frac{A_o}{2} + C_1 \cos(\omega t - \phi_1) + C_2 \cos(2\omega t - \phi_2) + C_n \cos(n\omega t - \phi_n)$$

where $\frac{A_o}{2}$ = the average value, i.e. the d.c. value,

C_1 to C_n = harmonic coefficient depending on the order of harmonic and width of the current pulse, and

ϕ_1 to ϕ_n = phase angle with respect to the fundamental.

The formula for the harmonic coefficients of this Fourier Series[2] is:

$$C_n = \frac{\frac{A_o}{2} \cdot \frac{\pi\theta}{T}}{n\left[\sin\frac{\pi\theta}{T} - \frac{\pi\theta}{T}\cos\frac{\pi\theta}{T}\right]} \times \left[\frac{\sin(n-1)\frac{\pi\theta}{T}}{(n-1)\frac{\pi\theta}{T}} - \frac{\sin(n+1)\frac{\pi\theta}{T}}{(n+1)\frac{\pi\theta}{T}}\right]$$

The portion of this formula in the brackets becomes zero for certain values of the harmonic order, n, and the conduction fraction θ/T.

The grid- and plate-conduction angles θ_g and θ_p of an idealized Class C amplifier may be computed from the following formulas:[3]

$$\theta_g = 2\cos^{-1}\left[\frac{E_c}{E_s}\right]$$

$$\theta_p = 2\cos^{-1}\left[\frac{1}{1 + \frac{\mu E_{g\,max.} + E_{p\,min.}}{\mu E_c - E_b}}\right]$$

E_b = d.c. plate-supply voltage,
E_c = grid bias,
E_s = grid signal voltage (peak value),
μ = amplification factor of tube,
$E_{g\,max.}$ = maximum instantaneous value of grid voltage,
$E_{p\,min.}$ = minimum instantaneous plate voltage.

Values of $\theta = 2\cos^{-1}X$ *versus* X are given below for reference.

$\theta = 2\cos^{-1}X$	X
180 degrees	0.000
160	0.174
135	0.383
120	0.500
108	0.588
90	0.707
72	0.809
60	0.866
45	0.924
30	0.966
0	1.000

[2] See "Reference Data for Radio Engineers," published by Federal Telephone and Radio Corp., for a discussion of these formulas.

[3] F. E. Terman, "Radio Engineer's Handbook," McGraw-Hill Book Co., Sec. 5, p. 445, Par. 21, 1943.

The Military Amateur Radio System

Army and Air Force Jointly Announce Postwar Training Program; Initially Open Only to Hams in Service and Reserves

THE first step toward the postwar renewal of traditional Army-amateur coöperation in a training program was accomplished in mid-December when the office of the Secretary of Defense announced the activation of the Military Amateur Radio System, for the present open

MAJOR GENERAL SPENCER B. AKIN
Chief Signal Officer
Department of the Army

only to amateurs in the military service or its reserves. MARS will be a joint project of the Air Force and the Army under the direction of Major General Francis L. Ankenbrandt, Air Force director of communications, and Major General Spencer B. Akin, chief signal officer of the Army.

Amateurs in military service, including those in overseas commands, or in the Organized Reserve Corps, National Guard or ROTC, are invited initially to apply for MARS membership to form a nucleus of a training project which, it is hoped, will soon be expanded to include civilian amateurs along the general lines of the prewar AARS. Application for membership may be made as detailed hereinafter. Commanding officers of each base, installation or other unit will, as soon as possible, each designate an officer to act as MARS director for his command.

The purposes of the Military Amateur Radio System are "to create interest and further training in military radio communication; to promote study and experimentation in military radio communication; to coördinate practices and procedures of amateur radio operations with those of military radio communication; and to provide an additional source of trained radio communication personnel in the event of a local or national emergency."

MARS will not operate on amateur frequencies. The System has obtained the use of special military frequencies for its drills — 3497.5, 6997.5, 14,405, 20,995 and 27,995 kc. — and crystals will be supplied members. Time on these net frequencies is equally divided between the Army and the Air Force and will be further apportioned by Army areas and Air Force subdivisions, with ample time left on all frequencies for "free" net operation. Top-level net control stations are WAR for the Army and AF4AF for the Air Force, both located in the Pentagon Building in Washington, D. C.

For general amateur operation outside of drill periods, amateur stations at military posts are being assigned calls with a "K" prefix, a numeral coinciding with the FCC amateur call area, and

MAJOR GENERAL FRANCIS L. ANKENBRANDT
Director of Communications
Department of the Air Force

suffixes of FAA through FZZ for the Air Force and WAA through WZZ for the Army. These calls are, of course, obtained by making the usual application on FCC Form 602. MARS member call signs will have an "A" prefix for Army and an "AF" prefix for Air Force, with numeral and suffix the same as the amateur call. Thus station K4AF becomes AF4AF when operating on MARS frequencies; W9USA would become A9USA when entering the regular Army net.

A considerable quantity of surplus electronic equipment has been allocated to MARS, to be made available to active and reserve units through usual channels, as specified in the joint announcement (SR 105-75-1 and AFR 102-3). The military proposes to sponsor amateur training in many types of communications and expects, for examples, that certain stations will conduct facsimile experiments on MARS frequencies and that MARS members, outside drill periods in amateur status, will enter 2-meter teletype nets. Amateur support will be asked in propagation studies, solving of u.h.f. communications problems, etc. A monthly bulletin to members will carry not only general news and operating notes but an occasional technical or construction article as well as antenna and propagation data. WAR will transmit an official bulletin each Monday simultaneously on 6997.5 and 14,405 kc., at 0100 and 0400 GCT.

An advisory committee is being appointed to assist the Chief Signal Officer and the Air Force Director of Communications on matters of policy pertaining to MARS. Early appointments to this committee are expected to be Major Rawleigh Ralls, W3RO, who has been designated MARS chief for the Air Force, and Captain Edward Nielsen, W4ODI, MARS chief for the Army (Signal Corps). ARRL has nominated its communications manager, F. E. Handy, W1BDI, as one of the civilian members of the MARS advisory committee.

And now, here's how to address applications for membership, assuming, of course, that you're in military service or the reserves and wish to become a "charter" member of MARS. In certain Air Force commands (FEAF, USAFE, SAC, AMC, ATC and ATRC) applications will follow command channels, addressed to the Commanding General of the particular command to which the applicant is attached, marked to the attention of the Chief, MARS. In other Air Force units and in the Army the applicant will be governed by his geographical location, as shown below:

N. Y. *Vt.* *N. H.* *Me.* *Mass.* *Conn.* *N. J.* *Del.*	First Army Headquarters Commanding General, First Army Governor's Island New York, N. Y., Attn.: Signal Officer *or* Commanding General Headquarters, First Air Force Fort Slocum, New York, Attn.: MARS, Air Force Director
Pa. *Ind.* *Ohio* *Ky.* *W. Va.* *Md.* *Va.* *D. C.*	Second Army Headquarters Commanding General, Second Army Fort George G. Meade, Maryland, Attn.: Signal Officer *or* Commanding General, Headquarters 14th Air Force Langley Air Force Base Langley Field, Virginia, Attn.: MARS, Air Force Director
Tenn. *N. C.* *S. C.* *Miss.* *Ala.* *Ga.* *Fla.*	Third Army Headquarters Commanding General, Third Army Fort McPherson, Georgia, Attn.: Signal Officer *or* Commanding General, 9th Air Force Greenville Air Force Base Greenville, South Carolina, Attn.: MARS, Air Force Director
Okla. *Texas* *N. M.* *Ark.* *La.*	Fourth Army Headquarters Commanding General, Fourth Army San Antonio, Texas, Attn.: Signal Officer *or* Commanding General, 12th Air Force Brooks Air Force Base San Antonio, Texas, Attn.: MARS Air Force Director
Wyo. *Colo.* *Kans.* *Neb.* *Mo.* *Iowa* *N. D.* *S. D.* *Minn.* *Wis.* *Ill.*	Fifth Army Headquarters Commanding General, Fifth Army Chicago, Illinois, Attn.: Signal Officer *or* Commanding General, 10th Air Force Fort Benjamin Harrison Indianapolis, Indiana, Attn.: MARS Air Force Director
Wash. *Ore.* *Calif.* *Nev.* *Ariz.* *Idaho* *Mont.* *Utah*	Sixth Army Headquarters Commanding General, Sixth Army San Francisco, Calif., Attn.: Signal Officer *or* Commanding General, Fourth Air Force Hamilton Air Force Base Hamilton Field, Calif., Attn.: MARS Air Force Director

Upon receipt of an inquiry for enrolment in MARS, the Signal Officer of the Army area or the MARS Air Force Director will forward application blanks to the applicant. When these are processed, a MARS call sign and net allocation will be made at the proper command level and a MARS certificate will be sent to adorn the walls of the "shack" alongside the FCC ticket.

A.R.R.L. ACTIVITIES CALENDAR

Feb. 4th: CP Qualifying Run — W6OWP
Feb. 11th–14th: DX Competition (c.w.)
Feb. 15th: CP Qualifying Run
Feb. 18th–21st: DX Competition ('phone)
Mar. 5th: CP Qualifying Run — W6OWP
Mar. 11th–14th: DX Competition (c.w.)
Mar. 16th: CP Qualifying Run
Mar. 18th–21st: DX Competition ('phone)
Apr. 3rd: CP Qualifying Run — W6OWP
Apr. 18th: CP Qualifying Run
Apr. 23rd–24th: CD QSO Party
May 6th: CP Qualifying Run — W6OWP
May 20th: CP Qualifying Run
June 3rd: CP Qualifying Run — W6OWP
June 4th–5th: V.H.F. Contest
June 15th: CP Qualifying Run
June 18th–19th: ARRL Field Day

— • • • —

Jan. 1st–Dec. 31st: Most-States V.H.F. Contest

United States Naval Reserve

Navy Day QSO Party Results

THE QSO Party held on Navy Day-1948, in connection with the annual Receiving Competition, resulted in several hundred contacts between amateurs who are Naval Reserve members and those who are not. Naval Reserve participants who submitted scores made 759 contacts, and non-Reservists made 402 contacts.

High scorer among Reservists in the Navy Day QSO Party was CRM N. D. Sather, WØISH, a member of Naval Reserve Squadron VR-69, based at Wold Chamberlain Field NAS, Minneapolis, Minn.

Leader in the Naval Reserve group was Norman Sather, WØISH, Minneapolis, Minn., whose 44 contacts in 24 states yielded 3312 points. Second place was taken by George Bird, W5HGC, operating K5NAF at Pawhuska, Okla. K5NAF made 45 contacts in 22 states plus Puerto Rico, for a score of 3220. J. M. McCoy, W5OM, at W5USN, New Orleans, La., was a strong third with 2904 points from 41 contacts in 22 states. Well done, WØISH, W5HGC and W5OM!

Among the non-Reservists, it is interesting to find W9USA (Army!), Chicago, Ill., in first place, with W. F. Spanke, W9CQU, at the key. W9USA made 37 contacts in 19 states, or 2356 points. Second-high was Robert M. See, W5LTD, Garber, Okla., with 1666 points from 24 contacts in 17 states. A close third was Charles M. O'Brien, W2EQS, Westwood, N. J., with 30 contacts in 15 states and a score of 1650. Congratulations to W9CQU, W5LTD and W2EQS.

Examination of logs shows that 102 different USNR members and 353 different nonmembers were worked by those submitting scores. Nonmembers made 78% of their contacts on 7 Mc., 20% on 3.5 Mc. and 2% on 14 Mc. Reservists' contacts were distributed 67% on 7 Mc., 17% on 3.5 Mc., 10% on 14 Mc. and 2% each on 28-Mc. 'phone, 14-Mc. 'phone and 144-Mc. 'phone and m.c.w.

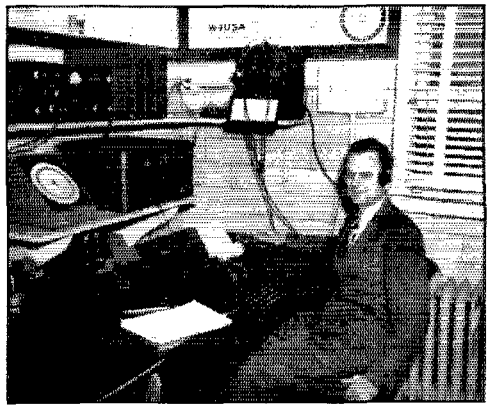
Misinterpretation of the rules as announced in October, 1948, *QST* resulted in numerous Reservists working other Reservists and in non-Reservists working other non-Reservists. The rules permitted only contacts between Reservists and non-Reservists, and some claimed scores had to be adjusted accordingly. Several participants who copied the Navy Day message* applied the 50 points *after* multiplier rather than *before* multiplier. In most cases they will find their final scores to be higher than originally calculated.

Suggestions received from operators taking part in this first Navy Davy QSO Party should result in improved rules and increased participation in future Navy Day contests.

The following tabulations of 1948 scores list number of contacts, states-plus-territories worked, and final score in each case.

Scores — USNR Members

WØISH	Minn.	44–24–3312
K5NAF (W5HGC)	Okla.	45–23–3220
W5USN (W5OM)	La.	41–22–2904
K5NRJ (W5PCL)	Okla.	37–23–2852



W. F. Spanke, W9CQU, in "Ham's Paradise," W9USA, Headquarters Fifth Army, Chicago, Ill., which he operated to win first place among non-Naval Reserve participants in the Navy Day QSO Party.

*Text on page 38.

W5NVW	Texas	27–21–2184		W2YJP	N. J.	12– 4– 96	
K1NRE (W1QJM)	Conn.	35–18–2160					
K9NR (W9AKP)	Ind.	30–18–1980					
W2KEL	N. Y.	29–17–1836		*Scores — Non-USNR Members*			
W4IA	Va.	31–16–1792		W9USA (W9CQU)	Ill.	37–19–2356	
W4MWH	Va.	27–17–1768		W5LTD	Okla.	24–17–1666	
W3ARK	Pa.	30–16–1760		W2EQS	N. J.	30–15–1650	
K8NRA (W8ZHM)	Mich.	26–17–1734		WØTKX	Minn.	23–16–1536	
W5BUK	La.	21–15–1380		WØIC	Colo.	21–13–1196	
K5NR (Hartley)	Texas	21–14–1288		W2CWK	N. J.	22–11–1034	
W6ZGG	Calif.	23–13–1248		W9DJV	Wis.	19–11– 968	
WØDJE	Kans.	18–14–1204		K9AAP	Ind.	26–16– 832	
W5AUL/4	Va.	19–12–1056		W2TUK	N. Y.	16–10– 820	
W5HKP	La.	19–12–1056		W3MCD	Del.	11–10– 720	
W2MZB	N. Y.	19–10– 880		W7JM	Ore.	13– 9– 684	
K2NRK (W2ZFK)	N. Y.	18– 9– 774		W1FTX	Conn.	11– 9– 648	
K1NR (W1IPU)	R. I.	10–10– 700		W6KJG	Calif.	11– 8– 576	
W5USN (W5JKT)	La.	12– 9– 666		W3HHS	Pa.	9– 8– 544	
K2NAF (W2BZJ)	N. J.	16– 8– 656		W7KGV	Wash.	12– 7– 518	
W5NKR (W5OGG)	Texas	10– 9– 630		W3NCJ	Pa.	10– 7– 490	
K6NAD (W6BSP & W6CDP)	Calif.	12– 8– 592		W2YPA	N. Y.	12– 6– 444	
W5USN (W5LNU)	La.	10– 8– 560		W1IIN	Conn.	9– 6– 408	
W9LOL	Ind.	8– 7– 462		W1RHU	Mass.	7– 5– 320	
W3FYK	Pa.	13– 6– 456		W4KFC	Va.	7– 5– 320	
W5NIY	Texas	7– 7– 448		W1JAH	Mass.	5– 5– 300	
W1EOB	Mass.	10– 5– 350		W6RBQ	Calif.	5– 5– 300	
K6NAA	Calif.	8– 5– 330		W3TXQ	Pa.	5– 4– 240	
K6NRR (W6WQU)	Calif.	19– 3– 264		W1LVQ	Conn.	4– 4– 232	
W3DUI	Pa.	7– 4– 256		W2HDT	N. J.	12– 8– 192	
W1GHB	Mass.	5– 4– 240		WØSGG	Colo.	6– 3– 186	
W5BCF	Texas	5– 4– 240		W2KTF	N. Y.	5– 3– 180	
K3NR (W3KWA)	Pa.	3– 3– 168		WØJJK	Nebr.	9– 8– 144	
W5ODK	Okla.	3– 3– 168		KV4AF/2	N. Y.	2– 2– 108	
W7BSE	Utah	3– 3– 168		W9LFK	Wis.	2– 2– 108	
K6NRR (W6MEU)	Calif.	12– 2– 148		W1CEG		9– 5– 90	
W6GNV	Calif.	9– 8– 144		W8BXZ	Mich.	6– 6– 72	
K6NRR (W6BSY)	Calif.	3– 2– 112		W2JBQ	N. Y.	1– 1– 52	
W4KYD	Va.	2– 2– 108		W8VDF	Ohio	1– 1– 2	

Navy Day—1948

CONDUCTED jointly by the Navy Department and ARRL, the Twentieth Navy Day Receiving Competition was held on October 27, 1948. A message from the Secretary of the Navy to all radio operators was transmitted from NSS, Washington, and NPG, San Francisco, at approximately 25 words per minute. Letters of commendation from the Secretary of the Navy were offered to all operators making perfect copy of the text transmitted from either of the Naval stations.

The special letters have been sent to 310 operators who made perfect copy of the message. Entries in the competition were received from 674 operators, 462 of whom copied NSS, 137 NPG; 75 copied the transmissions of both stations. A total of *421* participants were present or former members of the Naval service.

All entrants are included in the Honor Roll, which is divided into two sections, the crediting operators who made perfect copy, and the second listing all others who submitted entries. We extend our heartiest congratulations to the letter winners. To those who were not able to make accurate copy of the 1948 message for lack of code proficiency we offer a bit of advice: make regular use of the W1AW code practice transmissions and try your hand at the monthly Code Proficiency Qualifying Runs. By the time October 27, 1949, rolls around, you'll be much better equipped with the skill necessary to win one of the Navy Department's letters of commendation. — *J. M.*

1948 NAVY DAY HONOR ROLL

Letter Winners

First Naval District: W1ATJ, W1BGZ, W1CFG, W1ELL, W1EOB, W1GHB, W1GKM, W1ILO, W1IPU, W1JAH, W1KAG, W1KNE, W1OQP, W1QE, Arthur A. Henderson, Thomas R. Scanlan, George E. Waters. *Third Naval District:* W1BDI, W1CA, W1FTX, W1IIN, W1KAA, W1LVQ, W1MUW, W1PXS, W1QJM, W1ROV, KV4AF/2, W2ARD, W2BZJ, W2CJX, W2GFG, W2JBQ, W2LA, W2MMF, W2MRL, W2MZB, W2OWX, W2OXL, W2QFG, W2QYZ, W2SJC, W2SOU, W2TUK, W2VNJ, W2WH, W2WJL, W4BRT, Richard Adams, Walter H. Bartels, J. H. Bennett, C. Blake, D. E. Brink, Albert E. Chew, jr., W. E. Christian, P. De Angelo, M. J. Dietz, Stephen M. Fox, Joseph W. Haluska, Richard Knoff, J. F. Kocich, S. F. Korol, James Leishman, William C. Lewis, Eugene F. Merritt, jr., Paul A. Remillard, Bernard Weeks, Howard Weinstein, Robert Yolen. *Fourth Naval District;* W2HV, W3ADE, W3CUU, W3DXK, W3GJY, W3NCJ, W3OKS, W3RNH, W3UHN, John L. Bowers, James F. Campbell, Thomas T. Choate, John Bernard Combs, Beth Rosenberg, Edsel V. Sawyer, John Frank Smith, Russell S. Stocker. *Fifth Naval District:* W4CVO, W4MWH, W4NXE, W8ORD, Philip E. Day, Charles H. Hand. *Sixth Naval District:* W4ANK, W4CH, W4GMM, W4IZV, W4MHE, W4NOU, W4NVG, W4NWS,

John A. Busby, Michael John Carswell, Roy N. Greene, John W. Hiatt, Howard B. Rogers, jr., Carl H. Weaver. *Seventh Naval District:* W4AAR, W4AKV, W4BIH, W4CCC, W. A. Dennis, Major Penn King, A. F. Peele. *Eighth Naval District:* K5NAN, KL7NX/W4, W4HCP, W4NIQ, W5BUK, W5DXQ, W5FAJ, W5HBZ, W5KHH, W5LKL, W5LTX, W5NIY, W5NW, W5OM, W5PS, Mario E. Alarcon, Daniel T. Baird, George H. Bethard, Clarence R. Bradford, L. F. Breedlove, Clinton Burgess, Darwin E. Campbell, Oris N. Dill, E. J. Early, James R. Fleming, Charles R. Hammock, George F. Hartley, Jack Howell, William E. Hughes, Hugh E. Jeffery, E. L. Kelley, G. A. Lewis, R. M. Lewis, J. L. Morgan, Homer C. Powers, A. J. Rambo, C. A. Reagan, James T. Reeder, E. F. Reininger, S. D. Richard, Charles R. Schleiff, Paul Schreiber, James D. Shuman, Edward N. Smith, Phillip E. Thompson, E. S. Warren. *Ninth Naval District:* W2MPI, W8AI, W8BKE, W8BKM, W8FLA, W8SS, W8UFH, W8YCX, W8YHB, W8ZGN, W8ZHM, W9AKP, W9CXY, W9FKH, W9IFS, W9KSF, W9NGS, W9NVJ, W9UA, W9VLX, W9VUD, WØAIR, WØASJ, WØBHA/Ø, WØDJE, WØDYX, WØFTJ, WØFUL, WØKXL, WØNCS, WØNYX, WØQVA, WØTKX, Joseph L. Blakunka, Arlyn J. Welling Chradelec, Walter C. Glass, Norman C. Heinselman, Kenneth Hetue, Austin Keeler, Robert E. Luedtke, Charles A. Mesenbring, F. A. Nichols, Bernard Sanders, Carson E. Young. *Tenth Naval District:* W4NWO. *Eleventh Naval District:* W5OGY, W5ZU, W6AOA, W6AXV, W6DLR, W6DTY, W6DVE, W6LS, W6NC, W6TZD, W6VZU, W6WPI, W6YCO, W7BVZ, W7JPY, W7JU, W7KWW, W7LGS, Leo Ashmore, W. H. Baughn, Burnell B. Beckham, John L. Fairchild, Darel Gammill, H. T. Jones, Leonard J. Kulbacki, Harold Lee, Theodore C. Lindquist, John C. O'Donnell, Lenord T. Tanner, T. B. Webb. *Twelfth Naval District:* W6BYS, W6CBX, W6CQK, W6FNG, W6EY, W6OBK, W6OFK, W6ONL, W6OWP, W6QXN, W6RBQ, W6WBB, W6ZG, W7BED, W7BSE, WØIC, Alan J. Campbell, Luther A. Diaz, George H. Fischer, Ernest F. Griffith, Stewart A. De Hosnery, H. J. Morehen, Walter Frank Springer, V. F. Tara, D. C. Timmons, James H. Walker. *Thirteenth Naval District:* W7CZY, W7FIX, W7HBO, W7IIT, W7JJC, W7JM, W7KGV, W7KYY, W7MKW, W7MTY, W7MQ, W7WU, Donald G. Emmons, O. H. Gunter, E. M. Jarvis, R. F. Parslow, Donald W. Sower, E. H. Thoms. *Fifteenth Naval District:* Henry Richard Brantman. *Seventeenth Naval District:* KL7DE, KL7RT, Robert Ray Harrod, S. S. Wagoner. *Potomac River Command:* W1CDZ/8, W3AJZ, W3AKB, W3GA, W3LSX, W3NMQ, W3OFV, W4EFV, W4IA, W4IQR, W4ITA, W4KFC, W4MG, W4NPG, W4UHL, Irvin W. Baldessari, C. C. Higgins. Canada: VE5QZ, Lambert Hunneault. *Miscellaneous:* W1MBH, W9JTY/MM, W6ACH, W6CQP, Robert Edward Berni, Garold L. Brooks, Lewis Hicks, Lawrence M. Johnson, Bill Mathers, John Simsik, jr., Lawrence A. Tate, Virgil K. Witt, Wesley W. Woodnash, jr.

As Secretary of the Navy it gives me great pleasure to extend Navy Day greetings to amateur and professional radio operators participating in this Twentieth Annual Navy Day Receiving Competition. The Department of the Navy looks forward to this event as an appropriate time to extend its appreciation to you who by your continued interest and enthusiasm in the field of radio are a source of competent personnel from which in an emergency the military establishment may draw to meet its requirements. Successful Naval operations depend upon rapid accurate and reliable communications. Rapidity and accuracy to a degree beyond human ability have been accomplished by automatic equipment. However the dependability of the highly trained manual operator has never been excelled. The Navy Department cannot overemphasize the need for experienced manual radio operators. Of parallel importance is the skilled electronics technician. Naval communications is dependent upon the effectiveness of the operator technician team. A cordial invitation is extended to you on this Navy Day to visit Naval activities in your vicinity. Your activity should serve as a beacon to light the way for others whose talents in many fields are so necessary to the Navy in the fulfillment of its primary mission to help preserve the security of the United States of America.

John L. Sullivan

Text of 1948 Navy Day message.

THE SECRETARY OF THE NAVY
WASHINGTON

31 December 1948

Dear.....:

It is with pleasure that I inform you of your success in correctly receiving and reporting my Navy Day 1948 message.

The American Radio Relay League, under whose auspices the radiotelegraph receiving competition associated with my message was held, has had the responsibility of checking all copies submitted and has supplied the Department of the Navy with a list of the successful operators.

As in past years, the preponderance of those competing were amateurs. Many of these served with the Navy in World War II, some in World War I, and many are now serving in the Reserve component. The Department of the Navy has long recognized the extensive contributions to the art of radio communications and the public welfare made by the radio amateur and is pleased that the annual Navy Day message offers the Department an opportunity to call attention publicly to these contributions.

I extend my personal congratulations on your successful participation in the Navy Day radiotelegraph receiving competition and wish you every success in 1949.

Sincerely,

John L. Sullivan

Letter of commendation.

Other Participants

First Naval District: W1AAP, W1ADC, W1BIY, W1DJQ, W1HFI, W1JWG, W1KYL, W1MD, W1OPU, W1QNA, W1QX, W1RHU, W2VYO, W3MCG, Paul E. Champagne, Lawrence J. Grant, Roger A. Guillemette, Frank P. Hadley, John J. Healey, Rosario R. Houle, Donald R. Howard, R. A. Sansoucy, Richard D. Thayer, Ralph H. White, jr. *Third Naval District:* W1DAO, W1GUP, W1IKE, W1NAE, W1RGB, W2ANM, W2BAI, W2BYC, W2CWK, W2DCT, W2EQS, W2HAZ, W2HJX, W2IHE, W2JCA, W2KEL, W2KUS, W2LBI, W2LSX, W2MHW, W2NNW, W2OCW, W2OKM, W2ORZ, W2PFB, W2PFL, W2PHH, W2PPY, W2PUK, W2QB, W2QBS, W2RPH, W2SNP, W2TIM, W2TMA, W2TVX, W2VEH, W2VSU, W2YPA, W2YZO, W2ZFK, W2ZI, WØBRY, Louis A. Cantolla, Anthony R. Cataldo, H. T. Curran, Thomas C. Devita, Robert B. Dillon, Arthur T. Erickson, jr., Edward Hurley, Johnie M. Lake, G. B. Lambert, Robert Lawson, T. Meehan, Gerald G. Murphy, Robert H. Montanye, Frank H. Nissen, J. F. Peterson, G. K. Raynor, J. J. Reilly, Edward Ronner, Fred Rusin, Albert Simonetto, John J. Skura, E. J. Steimle, Harold Van Doren, Clifford Wells, Arthur C. Woods. *Fourth Naval District:* W2QDY, W2UA, W2VZM, W3AD, W3ARK, W3DUI, W3EAN, W3EU, W3FYK, W3GKT, W3GQC, W3HHS, W3JIR, W3KWA, W3MCD, W3MH, W3RWJ, W3TXQ, W3UVD, Douglas M. Bashaw, George M. Berkley, William Francis Brouillette, Alden Davis, William G. Doman, Paul Gerboc, Arthur S. Groff, Robert

(*Continued from page 106*)

"Souping Up" a War-Surplus HRO

Suggestions for Improving H.F. Receiver Performance

BY PAUL D. ROCKWELL,* W3AFM

• Here is a description of how one operator improved the high-frequency performance of his war-surplus receiver. Even if your collection of surplus doesn't include the same kind of receiver, your collection of troubles may include some of the same griefs, and this informative article may point the way to some corrective measures.

SINCE the war, a number of war-surplus HROs have hit the market at very reasonable prices. However, the one that landed at W3AFM turned out to be singularly dead. It was one of the old originals with glass tubes, and somebody must have stored it in a wet moss heap frequented by pigeons. A new crackle job, a new dial, and some work on the S-meter improved the appearance, but the performance left much to be desired on ten and twenty meters. The i.f. seemed reasonably good — the trouble was that shorting either of the r.f. grids to ground through a 0.01-μfd. mica condenser made practically no difference in noise output, indicating insufficient gain ahead of the mixer. Besides, it was difficult to distinguish between T7 and T9 c.w. signals on twenty and T6 and T9 signals on ten meters because of hum modulation in the first oscillator. The warm-up drift was over fifty kilocycles at twenty meters, and calibration could not be depended on from day to day. A jump in line voltage would "yoop" c.w. signals out of tune, and changing the r.f. gain control would cause some detuning of signals. The gain was so low that the set was being run all the time with both r.f. and a.f. controls wide open on twenty meters.

All this was after alignment and clearing up of corroded joints and other obvious troubles. Something had to be done to bring the set up to date, so the following measures were taken.

1) A preselector was built into the area beside the antenna binding posts.

2) The first r.f. stage was changed from a 6D6 to an 1851, and removed from the a.v.c. line.

3) A VR-150 was mounted under the chassis, to regulate the d.c. voltages to the first oscillator.

4) Temperature-compensation condensers were added to the first-oscillator circuit, one inside the coil can and one on the chassis. A calibration trimmer was added to facilitate setting the band edge.

5) R.f. chokes were placed in the first-oscillator heater leads, to reduce hum modulation.

Helping Out the R.F. Amplifier

About the time this program was getting under way an article appeared [1] describing a low-noise wideband amplifier that looked like a natural for topic No. 1, and a simplified version, using a 2C51 as suggested by the authors, was built and tried out, with the idea that broadbanding would save having to turn another dial. On twenty meters this was fine; but on ten meters a need was felt for help against images, there being quite a few powerful locals in this area. So a dial was added after all (visible on the side of the modified receiver in one of the photographs). The dial is taken from a surplus TU tuning unit, the brass bushing having been drilled out to take the shaft of a 100-$\mu\mu$fd. APC condenser used for preselector tuning. The large capacity was used so that coils would not have to be changed between ten and twenty meters, the gain on twenty being

*910 Overbrook Road, Baltimore 12, Md.

[1] Wallman, Macnee and Gadsden, "A Low-Noise Amplifier," *Proc. I.R.E.*, June, 1948.

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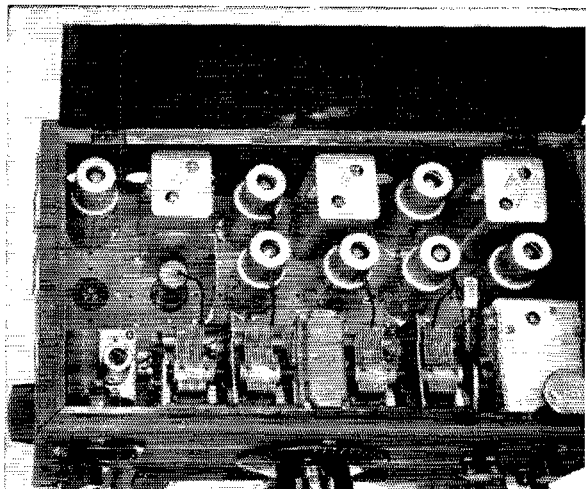


The preamplifier is mounted inside the receiver right at the antenna terminals (front left). The first r.f. amplifier tube has been replaced by an 1851. The capacity "flipper" for adjusting the oscillator frequency is visible just to the left of the rear of the crystal filter. One of the oscillator compensating condensers is mounted on a ceramic stand-off insulator between the oscillator tube and the oscillator tuning condenser. The audio amplifier tube (a 42) is removed, since all work is with headphones at W3AFM.

♦

more than sufficient anyhow. For those who still favor the broadband idea: look out for stray shunt capacity in the input-stage grid circuit, or the passband will not be as wide as you may expect. The higher the capacity, the higher will be the *Q* of the tuned circuit and the narrower the passband. If broadbanding is your object, do not use bulky (banana-plug) connectors on a metal chassis, as is done here, or all you will get will be about one-and-a-half megacycles bandwidth on the 28-Mc. band. No measurements have been made on the performance of this preselector, but it sounds good. As it stands, it works right into the low-impedance primary that formerly went to the antenna posts, except on ten meters where this winding was increased to six turns. More gain, up to the point of instability, could probably be obtained by adding turns to this winding, but with the 1851 following, and a

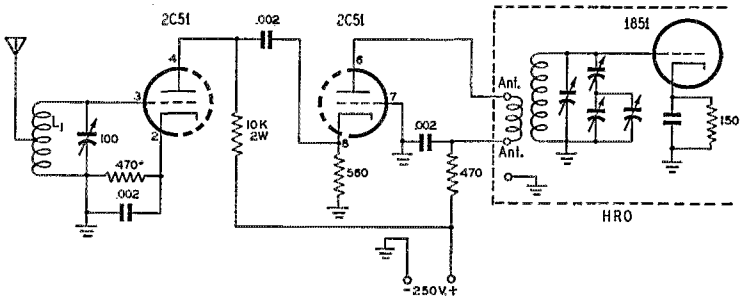


Fig. 1 — **Wiring diagram of the 10/20-meter preamplifier that was added to the HRO.**
L_1 — 6 turns No. 22 enam. on 1-inch diameter form. Tap 2 turns up from ground end.

250-volt B supply, the regeneration point is close enough as it is. The cathode-resistor values shown in Fig. 1 give a total drain of 15 ma. for both triode sections.[2]

Mechanically, the stage is built on a three-inch-square piece of 0.064 aluminum which has had ½-inch flanges turned down on two sides, making the top about two by three inches. Its position in the set may be seen in the photograph.

No great importance was placed on having an a.f. noise limiter in the space taken up by this little preselector, as such limiters have to have a certain type and amplitude of noise to be convincing in their performance. They would probably work better if used in conjunction with antishock i.f. circuits, such as are incorporated in modern military equipment to prevent charging up of the i.f. grids by radar and other spurious pulses. One way to obtain this antishock condition is to use 6AS6 i.f. amplifiers, ground the control-grid returns, and run the a.v.c. voltage to the suppressor grids. In the case of the 6AS6, the suppressor has a reasonably-good control characteristic. However, all of this looked like too much work in this case. Admittedly, the subject of a.f. peak limiters may be controversial, but those who think they are worth the trouble should be able to mount them in any old place. The r.f. wiring takes priority, and the place we picked looked like the ideal spot for a preselector, even if later-model HROs do have a limiter here.

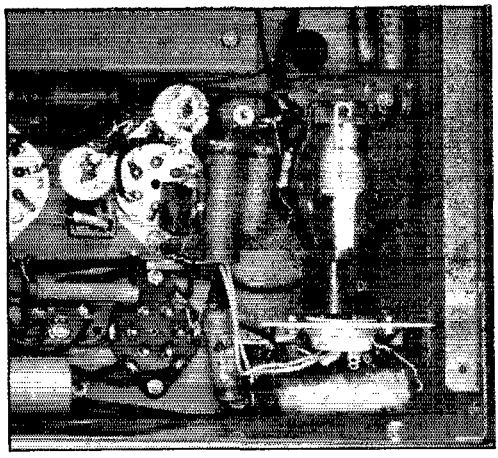
On topic No. 2, the 1851 r.f. stage — men, take it easy, and think twice before making this change. The 1851 is a 6AC7 with the grid coming out the top. It has six times the transconductance of a 6D6, and if your set is hot to begin with, this change may make it take off and give you a lot of trouble. Maybe you can do just as well by leaving this stage as it is and messing around with the turns on the primary, which used to be the antenna coil. However, too many turns here may cause the preselector to leave its moorings. If you feel you need more gain, and decide to install an 1851, you can get a clip for the grid by tearing apart a wafer socket made for one of the old-type tubes with a large filament pin. The cathode resistor is 150 ohms, one-half watt, with the same by-pass condenser that served the 6D6 before. The screen-dropper is a 47,000-ohm ½-watt resistor, giving 150 volts from a 250-volt B-plus line — it is by-passed by a mica 0.01-μfd. As the 1851 is a sharp-cut-off tube, and it was felt desirable from a signal-to-noise standpoint to let this stage run at full gain regardless of the setting of the r.f. gain control, the grid return is to ground rather than to the a.v.c. line as before. A 'phone man might not care to accept the slight impairment of a.v.c. action that results.

Oscillator Stabilization

The VR-150 was installed under the chassis. Instead of going directly to B-plus, the oscillator plate goes through a 10,000-ohm 2-watt resistor to the 250-volt B line, and the VR-150 is in parallel with an 0.01-μfd. mica condenser from oscillator plate to ground. The fact that the mixer screen is also controlled is a good thing, as considerable pulling is present.

Some temperature compensation is obtained by using two N750 p.p.m. padders: a 10-μμfd. padder located above the chassis and a 3-μμfd. padder inside the plug-in oscillator-coil can. The idea of splitting the compensation was suggested by W1RY, who reasons that a certain amount of heat comes down to the plug-in units, and that

[2] The 2C51 is a hard tube to come by, and a 12AT7 can probably be substituted with no significant difference in performance. If the 12AT7 is used, the 470- and 560-ohm cathode resistors should be made 330 and 390 ohms respectively. The base connections for the 12AT7 are different from those of the 2C51. — *Ed.*



To improve oscillator stability, heater r.f. chokes have been added, and the supply for the oscillator is stabilized by the VR-150.

there will be slow drift when coil units are interchanged unless individual compensators are used. No tests have been made here on the magnitude of this effect or what the best division of capacities should be, but with the present values the warm-up drift after five minutes is normally within ±2 kc. at 14 Mc. There is, however, a variation from day to day. This is believed to be largely a result of humidity variations. This shift usually stays within ±8 kc. at 14 Mc., and is taken care of by the capacity flipper shown in one of the photographs. This is just a ½ × 1½-inch scrap of metal bent and mounted on a ¼-inch bakelite rod that is rotated from the front panel. The dial light was removed, and a little rat-tail file work was required to locate a panel bushing for the shaft. A collar inside and the knob outside the bushing prevent axial movement of the shaft. The oscillator grid lead is dressed so that turning this flipper gives enough capacity variation to line up the band edge with an external marker crystal oscillator. Sometimes, on a very wet day (this correlation is only suspected — not proven, as no hygrometer is on hand here), the stabilization point is as much as 25 kc. off the 14-Mc. band-edge calibration. This situation may be met by pushing or pulling on the plug-in tray a sixteenth of an inch or so, or perhaps even better by using a small APC of 2 or 3 $\mu\mu$fd. instead of the lash-up shown. Does anyone have an *easy* answer to this humidity problem?

Now for the matter of the hummy c.w. signals on ten and twenty. A great many sets — not just HROs — have this trouble. Selecting tubes will get rid of it in many cases, but in this case seven 6C6s were tried before a passably clean one was found. The trouble seems to be that in the electron-coupled circuit generally used in receiver first oscillators, the cathode-to-filament capacity is across the tank. The a.c. supply imparts a mechanical modulation to the heater wires, which may be packed either tightly or loosely into the cathode sleeve, and this 120-cycle vibration of the wires causes frequency modulation of the oscillator. As the frequency of the signal goes higher, say from 4 to 14 Mc., this frequency modulation, which is some very small percentage of the oscillator frequency, becomes appreciable with respect to the audio beat in use at the second detector. The various cures are to use a d.c. heater supply, to use a circuit that permits the cathode to operate at r.f. ground or, if the cathode must be at an r.f. potential, to get the filament up to the same r.f. voltage. A d.c. heater supply, with a selenium rectifier and several thousand microfarads of electrolytic capacity, was used here for a while, but it was a nuisance and added to the already abundant supply of haywire and gadgets around the operating desk. Changing over the circuit to ground the cathode did not work in this case without a change of tube type or coil tap, which was considered too much labor. So a couple of r.f. chokes were taken out of a surplus TU unit and wired in series with the oscillator heater, as shown in the photograph. They helped a great deal; but it is still necessary to select a tube for cleanest injection. The HRO here is used only for bandspread work — on continuous coverage there could be trouble from these chokes pulling at certain frequencies. For a try, any chokes having a d.c. resistance of one ohm or less should do.

As it stands now, the receiver is much better than before. In stability, it is still a good way from the ultimate. But a little more improvement looks as if it would cost a great deal of work from this point on. To get nice, clean, stable 28-Mc. c.w. signals with rock-of-Gibraltar calibration, the best low-cost attack at the moment may be to leave the HRO, pick up a surplus h.f. receiver and use it as the tunable middle section of a home-spun double-conversion job, with a crystal-controlled first oscillator working at 18 or 20 Mc.[3] With two good, tunable r.f. stages ahead of a rig like this, image and stability worries should be a thing of the past.

For those with time and energy to refine the refinements described, two hints (which have not been exploited here as yet because of the many time-consuming jobs associated with moving down from the First District) can be offered. Examination of the diagram shows that output of the first triode is somewhat loaded by the second triode's cathode resistor. Since input impedance at the second cathode is about 200 ohms, this loading is not very serious, especially when considered in terms of sensitivity rather

(*Continued on page 108*)

[3] As, for example, "New Life for Old Receivers," *QST*, Dec., 1948.

The World Above 50 Mc.

CONDUCTED BY E. P. TILTON,* W1HDQ

EVERY year at this season we run into the same problem so far as v.h.f. activity is concerned. There are thousands of v.h.f. enthusiasts during the summer months, when sporadic-*E* skip is providing frequent opportunities for assorted kinds of DX on 50 Mc., and the working range on 144 Mc. is opening up to 400 miles or more every few evenings. V.h.f. is great stuff then, everyone agrees, and each year more stations climb on the bandwagon. Some of them even become crusaders for the cause, and they go to considerable trouble to sell v.h.f. to members of the amateur fraternity not yet within the fold.

"Look," they say, "I worked 38 states on 6 in the last couple of weeks — can you beat that on any band?" "I worked everything from Nova Scotia to North Carolina in the past week on 2 — just as good as 75, without the QRM!" So on they go, recounting the joys of working on the v.h.f. bands; selling v.h.f. on the strength of what happens at the peak of the season. And not without result, for the working of unusual distances has a basic appeal to all of us, whether those distances are statewide or worldwide.

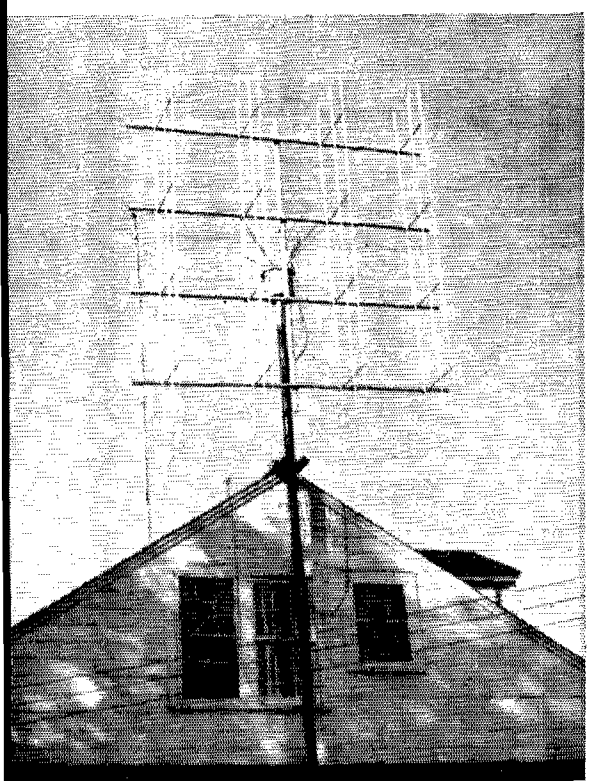
* V.H.F. Editor, *QST*.

The word gets around fast, and more and more stations appear to join the fun — and then, p-f-f-t — winter, and the horizons draw in again. The newcomer to 6 listens for days and nights on end and hears no DX bounding in from all over the country. The 2-meter neophyte scans the band in vain for signals from beyond the confines of his own call area. Almost together they decide that it's all over for another year, and they go back to 10, 20, 75 or whatever band they were working when they were first bitten by the v.h.f. bug. There they spend the rest of the year talking about the big things they're going to do on the v.h.f. bands when next spring rolls around.

Well, what's wrong with that, you say? Plenty! As any of the real v.h.f. enthusiasts will agree, DX is only a part of the picture. A legitimate part, to be sure, for making the utmost of every DX opportunity that comes along provides some of the real high spots of our radio lives. Few of us would want any less emphasis placed on the DX angle; what we would like to see is more emphasis on the other angles.

Listen on 10 any evening, after the band has gone dead, and what do you hear? In any populous area, at least, you'll hear dozens of ragchews going on over distances of less than 10 miles; and it's a safe bet that at least half of the participants are running 200 watts or more. They could work the same distances, and much more, with one-tenth of the power, on 6 or 2 — and they'd be much less likely to be running into trouble with their television-minded neighbors!

How about 75-meter 'phone, or 80 c.w.? On 75 there will be plenty of kilowatts being burned to work v.h.f. distances, and with an amount of heterodyne interference that makes the speech seem almost wholly unintelligible to the average



Just waiting to work some real 2-meter DX from Tulsa, Okla., is this 48-element array at W5DFU. It is of all-metal construction, and is pivoted at its center, permitting it to be used in either vertical or horizontal positions. It is rotatable through 360 degrees, and it may be raised or lowered, by means of the winch system shown in the "Hints and Kinks" section of this issue. The array consists of 16 half-waves in phase, fed through a "Q"-section and 300-ohm line, with reflectors spaced 0.2 wavelength and directors spaced 0.15 wavelength. Two-meter DX enthusiasts are asked to remember this array, and aim in the direction of Tulsa when the band is open.

v.h.f. man, who is accustomed to having the noise level as his only competitor! On 80 we find scores of short-haul traffic nets — a dozen stations in as many communities, for instance, using high-priority channels to handle traffic over distances which would be a cinch on 6 or 2. Even 20 and 40 are not without their local ragchews. Not a few of the occupants of these bands will be growling over the lack of frequencies available for their particular brand of hamming — and yet, just a few bands higher, there are megacycles and megacycles of useful and interesting amateur territory going begging for increased occupancy!

The bad part of the picture, so far as those of us who do stick with the v.h.f. bands the year around are concerned, is that many opportunities for interesting v.h.f. contacts are lost for lack of activity in the right places at the right times. Summer is far from having a monopoly on unusual v.h.f. propagation phenomena. Aurora, with its chances for contacts in the 200- to 400-mile range, so hard to tap by other media, comes most often in the late fall and early spring — all too often at times when there is too little activity on 50 Mc. to make its full extent realizable. The month of December offers more sporadic-*E* openings than any other outside the May–July period. The December just coming to a close as we write was highlighted by several *Es* openings which were the equal of any we experienced last summer, but they were enjoyed by only a fraction of the stations that would have been in on spring and summer sessions. Winter is not without its tropospheric openings, too. The inversions are not so frequent as in the warmer months, but when they come the signals are usually more steady, and sometimes fully as strong, as those which characterize the summer openings.

Even when no unusual propagation is in prospect there is plenty to be done on the v.h.f. bands. We can have friendly and leisurely ragchews with the fellows in neighboring towns — QRM-free contacts which do not mess up a channel for others hundreds of miles away. There are networks to be organized, procedure to be practised, emergency plans to be perfected — work which can be done best when there is no distraction in the form of DX signals. There are improvements to be made in our equipment: new antenna coupling methods, new circuits to be tried out, speech clippers and filters to be installed and adjusted, keying methods for c.w. to be installed, new preamplifiers or converters to be built and adjusted, checks for BCI and TVI to be made and scores of other projects to be carried out which will improve the performance of our stations and give us the jump on the fair-weather v.h.f. boys when the DX does begin to break through again. And, most important of all, there is occupancy to be maintained, so that our right to our v.h.f. assignments can be incontestably defended, should it be challenged at some future date.

The Annual V.H.F. Sweepstakes, from which you will just be recovering as you read this, was scheduled at what is normally the low period of the year, with exactly this thought in mind. It was hoped that a nationwide contest would encourage quite a few of the gang to give the v.h.f. bands a big play, at a time when they would normally not bother to get on. The 1949 V.H.F. SS was still in the future, as this material was being prepared, of course, but we'll bet that a lot of fellows are due for a big surprise, when they find out how many stations can be worked under winter conditions, when everybody gets in there and really tries. If you were one of these, don't let the lesson of the SS be lost — stick with the v.h.f. bands, at least a couple of nights each week, right through the year. If all of us would guarantee to do only that, life on the v.h.f. bands would be a lot more fun for everyone!

Around the World on 6 and 2

There were some really good openings for the few 6-meter enthusiasts who were on the band during December. The 12th provided a 4-hour opening, as good as any of the past summer. Its prime feature, for most of the gang, was the appearance of W4CPZ, Gaffney, South Carolina, the first 6-meter regular in his state, and South Carolina contacts were made by the dozen in what was probably the last big state-rush in 50-Mc. history. Your conductor was one of the few left out of this one, having chosen that date as a safe one for dismantling the antenna farm at the old Selden Hill location! The list reported by W2IDZ, Westfield, N. J., gives some idea of the extent of this opening. Ed worked W9ZHL,

2-Meter Standings

	States	*Call Areas*		*States*	*Call Areas*
W8UKS	14	7	W2PJA	9	4
W8WJC	14	6	W1BDF/1	9	3
W8WXV	13	—	W1HDQ	9	3
W8CYE	12	6	W1CTW	9	3
WØNFM	12	6	W1JMU	9	3
W3KUX	12	5	W1OOP	8	3
W1BCN*	12	4	WØHAQ	8	—
W2NLY	12	4	W1QXE	8	2
W4FBJ	11	5	W9NFK	7	4
W3PGV	11	5	WØWGZ	6	4
W3RUE	11	5	WØBZE	6	3
W9JMS	10	5	WØGOK	6	—
W2WLS	10	4	W8RDZ	6	4
W3GV	9	6	VE3AIB	5	4
WØIFB	9	6	W4KKG	5	—
W3BLF	9	5	W9OBW	5	2
W3HB	9	5	WØHXY	5	2
W9AB	9	—	WØJHS	4	2
W8WRN	9	5	WØKPQ	3	2

* Leading contestant for 144-Mc. Medallion Award.

Terre Haute, Ind., W9ALU, Metamora, Ill., VE1QY, Yarmouth, N. S., W4FWH and, W4MXB, Nashville, Tenn., W4DJZ, Atlanta, Ga., W4MS, Pensacola, Fla., W5JTI, Jackson, Miss., and, of course, W4CPZ. Skip signals were heard over most of the country, and down in Mexico City, XE1KE worked HC2OT for the first time since November 27th. Other good E_S openings came on December 21st and 22nd, but both sessions were characterized by light activity.

Standings as of Dec. 30th

	All-Time	1948		All-Time	1948		All-Time	1948
W9ZHB	**48**		W5AJG	43		W9DWU	46	
WØZJB	**48**		W5ML	42		W9QUV	44	
			W5VY	40		W9PK	43	
W1CLS	44		W5HLD	40	37	W9ZHL	43	
W3CIR/1	42		W5JLY	39	30	W9JMS	43	
W1LLL	40		W5FRD	38		W9ALU	42	34
W1HDQ	39	25	W5FSC	37		W9QKM	40	28
W1CGY	39		W5DXB	35		W9RQM	38	36
W1HMS	36		W5ZZF	34		WØUIA	36	27
W1JLK	35		W5GNQ	32		W9AB	26	10
W1NF	35		W5JBW	32				
W1KHL	34		W5IOP	30		**WØUSI**	**47**	
W1LSN	33		W5LIU	24	19	WØNFM	46	
W1CLH	32		W5LWG	19		WØQIN	45	
W1CJL	30					WØBJV	45	
W1AF	27		**W6UXN**	**47**		WØCJS	45	
W1EIO	24		W6OVK	40		WØKYF	44	
W1HIL	21		W6ANN	38		WØDZM	43	
			W6IWS	37	26	*WØKPQ	42	38
W2BYM	39	29	W6BPT	35		WØTQK	42	
W2IDZ	39		W6AMD	35	18	WØSV	42	
W2AMJ	38		W6FPV	31		WØINI	42	
W2QVH	37		W6BWG	18		WØHXY	41	
W2RLV	37					WØYUQ	39	
W2RGV	26		W7BQX	45	31	WØJHS	38	
			W7ERA	43		WØPKD	36	
W3OJU	38	33	W7DYD	41		WØGSW	29	29
W3OR	35		W7HEA	40				
W3RUE	34		W7FDJ	36		VE1QY	28	
W3MKL	33		W7FFD	35		VE3ANY	27	
W3MQU	25		W7KAD	35		VE1QZ	26	14
			W7JPA	34		G5BY	24	
W4GJO	46		W7QAP	32		XE1KE	23	
W4EQM	41		W7ACD	28		VE4GQ	20	19
W4QN	40		W7JRG	27		G6LK	16	
W4GIY	40		W7JPN	19		XE2C	14	
W4EID	40	26	W7OWX	15		VE2GT	14	
W4DRZ	38					XE1QE	10	
W4FBH	34		W8QYD	44				
W4GMP	34		W8NQD	31	30			
W4WMI	33		W8RFW	25				
W4FNR	33	26	W8TDJ	22				
W4HVV	29		W8LBH	21	21			
W4LNG	28							
W4MS	26	26						
W4FJ	26							

*Leading contestant for 1948 50-Mc. award.

Akron, Ohio — W8LBH announces the formation of the Potlickers 6-meter net, which meets each Monday and Friday at 7 P.M. EST, with W8CEQ, Kent, Ohio, as control station, and W8LHV as alternate. About 10 stations are participating, and the net effect is improved activity in the area around Akron, not only on the above evenings, but on other nights as well.

Garmisch, Germany — At the recent Allied Hamfest held in this Bavarian town it was decided that an organized effort aimed at the setting of European v.h.f. records would be scheduled coincidentally with the second hamfest, to be held in April. Transmitters operating on 20, 10, 5 and 2 meters will be installed at the summit of the Zugspite, highest peak of the Bavarian Alps. Receiving watches will be kept on 50 Mc. for possible crossband contacts. For further information, contact Sgt. Alvin D. Sisk, D4AHA, 1807th AACS Wing, APO 633, New York, N. Y.

South Devonshire, England — What must be near the top of the v.h.f. countries-worked list is the total of 20 posted by G5BY, as a result of his 145-Mc. contact with ON4FG, near Antwerp, more than 350 miles distant. Hilton's best DX, and the current European 2-meter record, is his contact with PAØZQ, about 390 miles.

Meudon, France — F8OL, who made the first two-way 50-Mc. contacts from France with the United States and Canada, is now doing business on 144 Mc., and has added more firsts to his record. During the phenomenal propagation which prevailed in mid-November, F8OL made the initial 2-meter contacts with England (G6DH), the Netherlands (PAØZQ), and Belgium (ON4FG), all more than 200 miles distant. He also worked G5TZ and G5DEP, Isle of Wight, 200 miles, G6WT, Torquay, Devon, 280 miles, during this period. Again, between the 22nd and 28th, conditions were good, and F8OL worked numerous other Gs, including G2IQ, Sheffield, 375 miles. F8OL uses a 30-watt rig, a 4-element horizontal array, and a crystal-controlled converter.

Maplewood, La. — That it is possible to work out on 50 Mc. with a minimum of power is amply demonstrated by the record of W5JBW. His 1948 total of 32 states on 6 was worked with 12 watts input.

Montreal, Que. — Here's one fellow who has no trouble getting Vermont contacts. VE2FO is having consistent results with W1QQ and W1BLC, Richford, W1CUN and W1PYO, Newport, and W1IT, North Troy. For more information on equipment used by the Vermont stations, watch for the 522 story by W1PYO in an early issue.

Champlin, Minn. — Activity on 2 meters in the Upper Mississippi Valley continues good, despite winter conditions. Stations include WØs HXY, SV and FSD, St. Cloud, HCY and QHC, Minneapolis, KPQ, Robbinsdale, VUZ, St. Paul,

ZQQ, Pine City, ZNE, Waite Park, and JHS, Champlin. JHS made his first South Dakota contact on December 17th, when he worked WØTI at Millbank, at 7:30 P.M. A schedule was made for the following morning, and TI was heard first at 7:10 A.M., building up to a peak at 7:27, and fading out again by 7:35. The early-morning peak is fully as pronounced in the winter as in the summer months, it should be remembered, and many good contacts could be made, particularly over week ends, if more of the gang would get on.

Oaktree, N. J. — W2NLY can vouch for the fact that nearly 2000 stations are or have been active on 144 Mc. in the east. Jim's total now is up over 1600 different stations worked, but it includes quite a bit of territory: 12 states and VE1. Most of these were worked with "the antenna that multiplies by 50" described in *QST* for September, 1947, and duplicated, with uniformly good results, in many parts of this country, and in Europe.

Hyannis, Mass. — As he was running tests with a horizontal array this past summer, W1BCN had only a coaxial dipole for a vertical antenna. Even with this, Ed rolled up a total of 11 states with the dipole in 1948, one more being added with the horizontal array. This total of 12 states and VE1 stands as the highest yet reported, as we write, for the 1948 Medallion Award for most states worked on 144 Mc. during the year. No, don't send in your total if it was higher — the deadline was January 10th.

Council Bluffs, Iowa — The 2-meter band is moderately active in the region around Council Bluffs and Omaha, according to WØCCY. He lists WØs QXR, LRD and FBK as the principal Omaha stations, all of whom are able to work WØWHZ in Red Oak, Iowa, some 55 miles southeast of Omaha. Council Bluffs is represented by WØJRY and WØCCY. WØHZE, Lincoln, Neb., and WØBIP, Elliot, Iowa, are the DX at present. Several of these fellows use crystal-controlled 522 receivers on 146 Mc., which is the calling channel. When contact is established they shift to other frequencies, leaving the calling channel open for the use of other stations.

Sacramento, Calif. — Interesting reflection effects are observed on 144 Mc. by W6KUI, Willows, and W6LYQ, Corning, according to a report from W6PIV. They are in the same flat valley as Sacramento, but roughly 80 and 100 miles to the north. They find that the signals from Sacramento may be received in any of several beam directions with about the same signal as the direct path. W6KUI formerly lost mobile stations when they went more than 12 miles north of him, but he has been able to work W6LYQ/mobile anywhere within a 30-mile radius, by aiming his beam west, toward the mountains. Both stations report that signals coming from the south have severe phase distortion, when received on nondirectional antennas, probably because of their arriving over several different paths, any one of which can be selected with a directional array.

RECORDS

Two-Way Work
50 Mc.: CE1AH — J9AAO
10,500 Miles — October 17, 1947
144 Mc.: W3GV — WØWGZ
660 Miles — September 18, 1947
235 Mc.: W1CTW — W2HWX
210 Miles — October 12, 1947
420 Mc.: W6VIX/6 — W6ZRN/6
186 Miles — July 27, 1947
1215 Mc.: W3MLN/3 — W3HFW/3
12.5 Miles — September 24, 1947
2300 Mc.: W6IFE/6 — W6ET/6
150 Miles — April 25, 1948
3300 Mc.: W6IFE/6 — W6ET/6
150 Miles — October 5, 1947
5250 Mc.: W2LGF/2 — W7FQF/2
31 Miles — December 2, 1945
10,000 Mc.: W4HPJ/3 — W6IFE/3
7.65 Miles — July 11, 1946
21,000 Mc.: W1NVL/2 — W9SAD/2
800 Feet — May 18, 1946

Wausau, Wis. — "Two-meter time in the Valley" is 9 P.M., a schedule arranged by the Wisconsin Valley Radio Association, in the hope of promoting more 2-meter activity. The club is also sponsoring a long-term contest, with scoring based on the number of contacts made, plus a bonus for the best DX worked. This information is from Wisconsin SCM, W9RQM.

Roanoke, Va. — Extension of the Eastern chain of 2-meter stations into North Carolina is the aim of the 2-meter gang in this area, according to W4CA. W4KQC, W4JXE and others heard signals from the south on December 2nd, and on the 9th W4KQC heard W4DKG, Ashboro, N. C. Though they are ringed around by mountains they feel sure that consistent effort on schedules would produce results, and they will be glad to coöperate with any interested parties, to this end. Send information to W4CA, who will see that it gets around.

Chicago, Ill. — The swing to horizontal polarization, previously reported, has not worked out well in the Chicago area, so far as consistent activity is concerned. Some of the gang have migrated to other bands as a result of their inability to make contacts since the change to horizontal was started. Quite a few of them have put their ground planes and other verticals back up again, in order to stimulate local activity. As in other areas where there is heavy concentration of population over a considerable geographical area, the vertical antenna has a definite advantage in its lack of directivity. If it is a good one, and well in the clear, it provides good coverage without the necessity of installing complex ro-

(Continued on page 108)

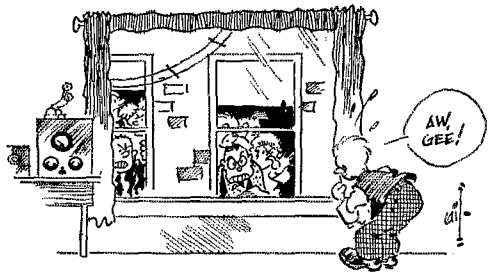
The Invisible Antenna

How To Get on the Air Unobtrusively

BY A. F. SCOTTEN,* W6ZMZ

At this station we put up what we please. But we feel deeply for those of the brotherhood who are harried and oppressed by unfeeling landlords and uncoöperative neighbors determined to see in a simple piece of wire an intolerable eyesore and a menace to aerial navigation. When you live in a three-room apartment bounded on all sides by hostility, you may expect trouble in getting out on eighty meters.

In the past there have been two general lines of attack on the difficulty. One is to cut the antenna down to a mere stump and coax it to radiate a



watt or so with more or less ingenious loading and matching systems; the other is to disguise the antenna as anything from a clothesline to a dumbwaiter hoist. Neither gives universal satisfaction.

But a third approach is possible, appropriate where space exists but is made unavailable by objections to the conventional antenna on aesthetic grounds. Just put up a good old 130-foot voltage-fed horizontal with wire so thin that it cannot be seen. We are using one here made of No. 40 enameled, approximately half the size of the hair off a small yak. It defies detection.

Of course, whenever a thing like this comes up somebody always says you can't do it, for a variety of the very best reasons. Let us examine some of them.

"The current at the center will burn it out in a flash."

Maybe a half-gallon rig would put a few curls in it, but with the low power here (twenty watts) there is no such trouble. In fact, when the full output of the transmitter is fed through a series-resonant circuit containing a specimen of the wire, it does not even get warm.

"Aha, the resistance of such wire will consume virtually all the power, leaving none to be radiated."

Well, aha yourself, and don't be so dogmatic. What makes you think the ohmic resistance must always have first crack at the power? Look at it this way: When the gismo under consideration constitutes an efficient radiator, virtually all the power will be radiated, leaving none for the resistance to dissipate. Or look at it some other way. The fact remains that stations worked report the No. 40 antenna one to two S-points *better* than the comparison antenna. The comparison antenna has for all practical purposes the same length, location, orientation, and height (some 20 feet), but is made of about No. 16.

"There's no way to account for it."

After considerable deep thought and research into the literature, a satisfactory explanation has been hit upon for the phenomenal performance of the invisible antenna. It is that *radio-frequency power abhors a fine wire.* As is well known, r.f. travels in the skin of a conductor, and when the conductor just hasn't got any skin to speak of, the r.f. is obliged to leave for distant points. It is gratifying to record that this hypothesis has been accepted by several amateurs in polite silence; one station even went off the air immediately after hearing it put forward, probably to begin remodeling the antenna.

"A half-wave of No. 40 won't support its own weight."

It will too; the break-point is six ounces, while the weight is near 0.06 ounce.

"The slightest breeze or sprinkle of rain will bring it down."

It hasn't come down yet. Anyway, one can learn from the spider and put up another. The wire costs nothing; it comes out of discarded audio equipment by the thousands of feet.

"Considering such an antenna as a single-conductor line, and substituting in the appropriate formula, we find by inspection that a wire of

* 1045 South Orange Grove Ave., Pasadena 2, Calif.

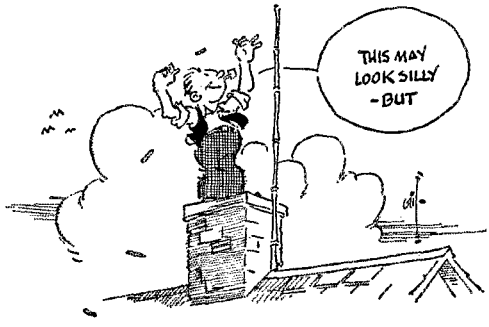
finite length but infinitesimal diameter exhibits an infinite surge impedance, so that when the line is terminated in the infinite resistance represented by an open end, it becomes nonresonant, and the development of standing waves is improbable, to say the least."

Huh?

"Birds."

Yes, birds do arouse some apprehensions. Not that they roost on the wire — like to see them try — but if they go flying along thinking about something else and not looking where they are going, they are likely to do some damage. Fortunately, the birds hereabout seem to be pretty alert.

And now if you, too, wish to be at the forefront of the march of progress in antenna construction, here are a few practical suggestions to bear in mind.



Handle the wire on a reel and avoid kinks. An empty spool with a pencil through it makes a good reel.

Don't rear back and heave as though tightening the top strand of a barbed wire fence; use the fingertips.

Forget masts and towers, rope and cable; think of slender sticks, small string and coarse thread.

Glass-headed "push-pins" will serve for knob insulators. Light rubber bands are excellent strain insulators. A theoretically superior article can be made by sticking a tiny wire loop into each end of a 1-inch length of fine glass tubing with sealing wax, but rubber bands should be used also, as jerk insurance.

To fasten the wire anywhere, bind it with a narrow sliver of Scotch Tape.

Don't try to lead fine wire into the shack, but terminate it on a tie-point outside the house and lead in with a strand of lamp cord or whatever is handy.

If you *must* see what you are doing when raising the antenna, hang a bent but not creased scrap of paper over the wire, with a long thread attached wherewith to pull it off later.

Can anyone tell us where to lay hold on some No. 60?

Strays

The effectiveness of amateur radio communication is strongly exemplified by recent accounts in the Swedish-language newspapers *Nordstjernan* and *Dagens Nhyter*. We are indebted to E. L. Page and W2EKU for translations.

On the Sunday prior to his death, the late Count Bernadotte, United Nations mediator for Palestine, talked from the Holy Land with his wife, Countess Estelle Bernadotte, and his sons, Folke and Bertil, who were at the amateur station of Lars Rudberg, SM5LR, in Arsta, Sweden. On the following Friday, first news of the Count's assassination was relayed from ZC6XY in Jerusalem to another Swedish ham station, SM5MB, operated by Per Ståhl of Helenelund. Ståhl delivered the sad news to the Crown Prince of Sweden ten minutes ahead of the regular news services. The next day, SM5LR was again instrumental in facilitating contact between the bereaved Countess and her late husband's aides, who were at ZC6UN, the United Nations station at Haifa.

HAMFEST CALENDAR

MICHIGAN — The Grand Rapids Amateur Radio Association is again staging a Mid-Winter Hamfest, this year's affair to be held on Saturday night, February 19th, at the Morton Hotel Banquet Room, Grand Rapids, Mich. Admission will be by ticket only, 50 cents per person in advance, 75 cents at the door. For those interested, dinners will be available at the Morton Cafeteria, from $1.50, and in the Main Dining Room, from $2.00. All hams and their YLs or XYLs are invited. Further information and tickets may be obtained by writing Secy. Harry R. Dinley, W8ASX, 614 Shamrock S.W., Grand Rapids, Mich., or GRARA, P.O. Box 333, Grand Rapids, Mich.

Silent Keys

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

W1BDB, ex-W5BDB, Morrill P. Mims, Waban, Mass.
W1WR, Floyd L. Vanderpoel, Litchfield, Conn.
W2VGH, Dave L. Farrell, Schenectady, N. Y.
W6KWP, ex-6AB-6TW-4GA, William L. Comyns, Atascadero, Calif.
Ex-HZ1AB-TR1P, Harold Berger, Vallejo, Calif.
W7KWF, Ernest Painter, Tucson, Ariz.
W8OUN, Maurice H. Jepson, Bethany, W. Va.
W9IUM, Howard J. Clark, Auburn, Ind.
VE3AUM, Herbert W. Adams, Ottawa
G2TI, Henry Bevan Swift
OX3GC, Donald H. Werner, American Vice-Consul, Godthaab

Annual ARRL DX Contest

C.W.: Feb. 11th–13th, March 11th–13th; 'Phone: Feb. 18th–20th, March 18th–20th

AMATEURS anywhere in the world are invited to take part in the 15th Annual ARRL DX Competition. Two week ends devoted to c.w. participation and two to 'phone are scheduled. Engraved medallions will be given to the highest-scoring c.w. and 'phone stations for each country and each continental U.S.A. and Canadian ARRL section entered in the contest. Operators outside the U. S. and Canada will attempt to work as many W (K) and VE stations as possible. Exchange of serial numbers will be required. Complete rules and details on scoring appear on page 42 of January *QST*.

The contest periods will be divided for c.w. and 'phone, as follows: The first c.w. period will begin Feb. 11th at 7:00 P.M. EST (2400 GCT) and end on Feb. 13th at 7:00 P.M. EST (2400 GCT). The second c.w. period will be scheduled during the same hours March 11th to 13th. The first 'phone period will begin 7:00 P.M. EST (2400 GCT) on Feb. 18th and end at 7:00 P.M. EST (2400 GCT) Feb. 20th. The second 'phone period will be scheduled during the same hours from March 18th to 20th.

Though not necessary for entry in the contest, ARRL will supply convenient report forms upon request. You may make up your own forms following the sample shown in last month's complete contest announcement. Alternatively, *W and VE contestants only* may use the log form shown in this announcement, supplies of which are also available from ARRL upon request. This new type of reporting form has been designed with two advantages in mind: (1) to facilitate the extensive checking necessary in compiling the final results of the DX Contest; (2) to make record keeping easier for the contestant. The outstanding feature of this form is that it shows automatically when the quota for a particular country has been filled. As shown, it is arranged for use by U. S. stations, which have a quota of three stations per country per band. Canadian participants should rule their sheets to provide for five countries per band in accordance with the larger quota allowed them under the rules. Where a certain station is worked for less than the maximum number of points allowed (as for example, the contact with G2MI shown in the sample), the additional contact to make up the points not earned in the first QSO may be indicated at the end of the form. A separate set of sheets should be used for each band. If used, this form *must* show the time of each contact in GCT. We repeat that use of this new log form is optional. The old or new form may be employed, as desired. In either case, the score recapitulation and the signed statement shown in the sample accompanying the full announcement in January *QST* must be submitted.

If you are located in mainland U. S. or Canada, here is your chance to enjoy the thrill of contacts with the far corners of the earth and to compete for the attractive medallion awards. You will be afforded the opportunity to work new countries for the DXCC and other awards. If you are located outside the U. S. and Canada, you likewise have the opportunity to compete for an award and to pick up states for WAS or Canadian provinces for a WAVE award. Wherever you are, if you want to put your antennas, transmitting and receiving gear, and operating skill to a good test, and have lots of fun in the process, be sure to get on the air for the 15th Annual ARRL DX Competition!

LOG, 15TH INTERNATIONAL DX COMPETITION

Call..... **ARRL Section**.....

Band.....**Mc.**

	Station Worked	*Date*	*Time (GCT)*	*Number Sent*	*Number Received*
Neth.	PAØGN	2/14	1800	589666	479222
	PAØRA	"	1845	569666	599123
	PAØAB	3/15	2100	569666	578333
England	G6CL	2/14	1300	589666	469122
	G2MI	"	1330		569877
	G3KP	"	1342	569666	579000
Argentina	LU7AZ	3/14	1806	589666	579345
	G2MI	3/15	1027	599666	

[Be sure to include score tally and signed certification as shown at bottom of other log form, page 43, January, 1949, *QST*.]

How's DX?

CONDUCTED BY ROD NEWKIRK,* W9BRD

How:

One thing every DX-minded amateur knows is that operating on DX bands these days is just about the most keenly competitive phase of the game, day in and day out. So competitive, indeed, that decorous operating ethics and procedures appear at times to be the exception rather than the rule. Propriety has often been overlooked, mainly by we W/VE prefix-chasers, in favor of elbowish bargain-basement techniques.

Realizing that the overseas DX stations are really the control grid of this situation, the ARRL communications department, after considerable objective study and soliciting of representative opinion from various concerned quarters, has evolved the DX Operating Code (ARRL Operating Aid Number 5) reproduced in this department this month. The text is quite self-explanatory, and we hope the points stressed therein will provide enough bias on the rare-DX grid to keep the W/VE plate current from soaring to future feverish heights.

We strongly recommend to DX stations, wherever located, adoption of these simple suggestions. A minority of rare-country stations are at present employing similar measures with gratifying results. Not only are such operators earning a wholesome respect for their clean-cut performance, but they are being paid rich dividends in maximum efficiency of communication.

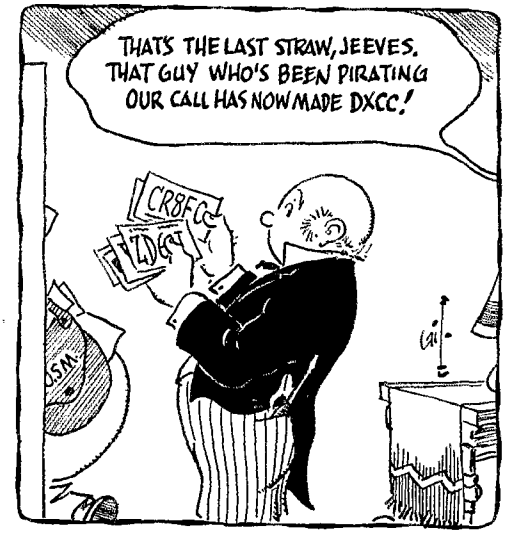
These Aids are being widely distributed via radio societies and QSL bureaus throughout the world, and are also available to individuals upon request. We believe they will exert a highly beneficial influence toward a greater enjoyment of DXing by the entire fraternity.

Hey, Jeeves, what's new? . . .

What:

Those displaying the temerity to make their WACs the hard way have been lavishly rewarded on *eighty* the past month or so. Among the early birds contacting **ZC8PM** are W1s BPX, DHD, FTX, CEG, NJM and W2QHH, the feats taking place on 3508 kc. W2QHH's 17-watt 6L6G now has 41 3.5-Mc. countries by way of **VP9U** (3530), **EI9J** (3545), **FA8BG** (3508), **W7KPA/VP2** on Antigua (3515), **LA2UA** (3562), **HH2BL** (3501), **KV4AA** (3508) and **VO2BL** (3510) . — . — . — ZC8PM gave W4BRB Gene's second WAC on the band, other additions being **VP2LA** (3577) and VP9U. Gene says that VQ8AY and VP5AO will be on before long and **CN8MI** plus **CT3AB** have been squeaking through around 3515 kc. — . — . — W2EQS did well with **HC1AW** (3521), **HC1JI** (3504), **FA8IH** (3520) and many Gs and Fs . — . — . — It's not as easily done from WØCFB's location but KP6AA, HP1BR, ZL4IE, KH6BA, KH6IJ, G6CJ and G6GM were raised . — . — . — Things are buzzing on 75 'phone, too, according to PY4ZI. Ibsen's log features G8VB, G2DQ, PAØNG, CT1AS and CT1LP. The following 'phones in South America are out after DX this season: PYs 1AGR, 1RC, 2ADH, 2AHS, 2ANF, 4DW, 4NS, 4OF and 4QE; LUs 3EL, 4DJB, 6AF; CEs 4AJ, 5BG; CX1IF; ZP3XA.

DX activity on *forty* has hit a new high, beyond a doubt. Here's W2RDK with two separate WACs within five hours! Charlie's latest are **ZC1CL** (7040), **ZC6UN** (7040), **ZC8PM** (7060), **FE8AB** (7015), **UR2KAE** (7010–50), **UA9KAA** (7025 t8), **UA9KWA** (7025 t8), **TF3C** (7033), **IS1AFM** (7025), **HC1AW** (7010), **KJ6AB** (7045), KM6AK (VFO), **CN8AN** (7060 t8) and HR1AT (VFO) plus a load of less-scarce items . — . — . — A cute number heard at W5FXN was **PO5AE** (7049 t7) claiming to be in Borneo with Shell Oil . — . — . — Just a sample of the situation at W9KFO reveals QSOs with **CT3AB** (7020), **KG6DI** (7018), **J2LIO** (7025), **FA8JO** (7040), FA9IO (VFO), **FA9RZ** (7022), **CN8MZ** (7050), **LA7Y** (7005), **OX3J** (7030), **ZS2CR** (7050), **ZS6AM** (7025), **TG8MO** (7010), **TI4MAR**



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

(6995), **KS4AS** (7015), **VK6DX** (7010) and oodles more. Gordy also hooked up with **OY3IGO** (7025), a stroke of luck on any band . — . — . — W1FTX accounts for another Middle East catch, **ZC6UNT** (7050) . — . — . — In addition to scads of VKs, Gs, etc., WØCFB snatched up OH2SR, CE4AD, CE3BM, HC1JB, KP6AA and VO6BL . — . — . — The light bill at W2EQS took a beating because of **UB5AK** (7032), **UB5BG** (7030), **UQ2AB** (7020), **ZD2T** (7021), **HK3CT** (7063), **FP8AB** (7012), **VP6TR** (7022), **FM8AD** (7027), **TI2EXO** (7005), **VP2GE** (7005), **VE8PX** (7007) and **ZS6TE** (7009) . — . — . — Between bursts of unidentified QRN, W9ABS socked EI9J, PAØPN, VE8BL and VE8CM

DX OPERATING CODE
(For W/VE Amateurs)

Some amateur DXers have caused considerable confusion and QRM in their efforts to work DX stations. The points below, if observed by all W/VE amateurs, will help make DX more enjoyable for all.

1) Call DX only after he calls CQ, QRZ? or signs SK, or 'phone equivalents thereof. Make your calls *short.*

2) Do *not* call a DX station:
   a) On the frequency of the station he is calling until you are *sure* the QSO is over (SK).
   b) Because you hear someone else calling him.
   c) When he signs KN, AR or CL.
   d) Exactly on his frequency.
   e) After he calls a directional CQ, unless of course you are in the right direction or area.

3) Keep within frequency-band limits. Some DX stations can get away with working outside, but you cannot.

4) Observe calling instructions given by DX stations. (*Example:* "15U" means "call 15 kc. *up* from my frequency." "15D" means *down,* etc.)

5) Give honest reports. Many foreign stations *depend* on W/VE reports for adjustment of station and equipment.

6) Keep your signal clean. Key clicks, ripple, feed-back or splatter give you a bad reputation and may get you a citation from FCC.

7) *Listen* and call the station you want. Calling CQ DX is not the best assurance that the *rare* DX will reply.

8) When there are several W or VE stations waiting, avoid asking DX to "listen for a friend." Also avoid engaging him in a rag-chew against his wishes.

F/Lt. Harry Pain of the RAF and his station, VS7PH, at Negombo, Ceylon. Gear in use: a 6L6-807 transmitter at 25 watts, an AR-88 receiver, and a coax-fed dipole for 14 Mc. Currently one of the most active Ceylon c.w. men, Harry has produced previous QSOs under the calls G3ATH, ZB2A and XZ2HP.

with his lil ole BC-459 while W3JAK tried D5BK, LA3UB, UA3KAA, SM3FY and SM5PW on for size . — . — . — Another BC-459 addict, W7MIC, chatted with such as **J2AFC** (7045), **UAØFL** (7025), **TI2OFR** (7005) and numerous Oceania personnel . — . — . — W2MUM isn't mum for a change and donates **UP2KBA** (7000 t8), OH3NA, HA4AE, VP3ACS, VP2LA and VP6SJ to the big 7-Mc. grab bag.

Twenty is pulling its old solar-cyclic trick of conking out after dark nowadays, at least in W latitudes. But the daylight fishing has been pretty fair and Jeeves hasn't noticed anyone tearing down his 14-Mc. array. Still purring along on 70 watts, KH6PM adamantly praises conditions out his way: CEs 3AG, 3BC, 3CB, CR7DF, **HK3CT** (14,035), **HL1AB** (14,050), **KX6BB** (14,075), **KH6QL/KB6** (14,040),**OA4CJ** (14,090), **VK9BI** (14,050), **VP7NK** (14,002), **VP8AJ** (14,075 t6), **VQ4IMS** (14,055), **VS1CX** (14,065), **VS2CH** (14,090), **ZE2JS** (14,050 t8), **ZE2KC** (14,065 t8), **ZE2KF** (14,160 t7), **ZK1AS** (14,140), **ZK2AA** (14,145), **ZS3B** (14,130 t7), **ZS4BR** (14,060), et al. Fred is stalking **FU8AA** (14,030 t8) but no luck so far.

Down Texas way, W5ACL pilfered **MD4BPC** (14,070 t7), **UF6KAB** (14,022), **UG6AB** (14,065 t8), **CR6AW** (14,000), **XZ2KM** (14,015), **VP8AK** (14,100 t8), **VP8AM** (14,105) and **MI3NC** (14,090) while W5JPC tangled with **OH2RY** (14,110), **VP5MU** (14,029), **CN8BK** (14,028), KP6AB and UA3KAH . — . — . — W3AFW mentions louzay conditions in the same breath as **ZC1CL** (14,092), **ZC6UNJ** (14,075), **J2AAA** (14,010), **J3KBE** (14,045), **J9ACX** (14,095), **J9ADE** (14,069), **PJØX** (14,027), **UA9CC** (14,-

DX OPERATING CODE
(For Foreign Amateurs)

To All Foreign Amateur Stations:

In their eagerness to work you, many W and VE amateurs resort to practices which cause confusion and QRM. Most of this is good-intentioned but ill-advised; some of it is intentional and selfish. *The key to the cessation of unethical DX operating practices is in your hands.* We believe that your adoption of certain operating habits will increase your enjoyment of amateur radio and that of amateurs on this side who are eager to work you. We recommend your adoption of the following principles:

1) Do not answer calls on your own frequency.

2) Answer calls from W/VE stations only when their signals are of good quality.

3) Refuse to answer calls from other stations when you are already in contact with someone, and do not acknowledge or act upon calls from amateurs who indicate they wish to be "next."

4) Give *everybody* a break. When many W/VE amateurs are patiently and quietly waiting to work you, avoid complying with requests to "listen for a friend."

5) Tell listeners where to call you by indicating how many kilocycles *up* (U) or *down* (D) from your frequency you are listening. *Examples:* c.w. — "CQ DX CQ DX CQ DX 15U DE AC4YN AC4YN AC4YN 15U K"; 'phone — "Answer 15 kilocycles up from my frequency."

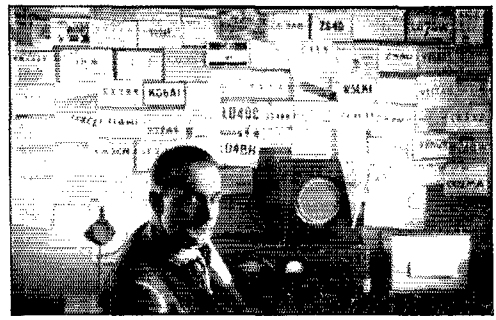
6) Use the ARRL-recommended ending signals, especially $\overline{\text{KN}}$, to indicate to impatient listeners the status of the QSO (see the ARRL *Handbook* or write for a free copy of Operating Aid No. 2).

7) Let it be known that you avoid working amateurs who are constant violators of the above principles.

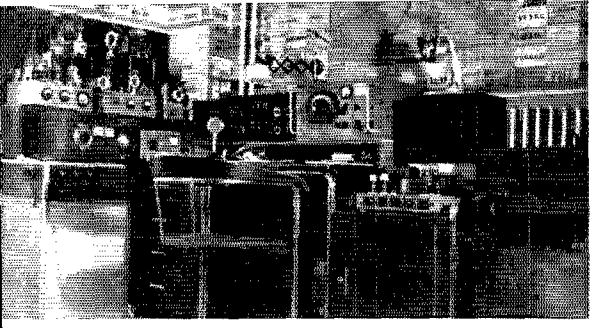
041), **UA9KOG** (14,090), **UAØSH** (14,132), **UAØLD** (14,050), **UN1AB** (14,017), **UQ2AE** (14,050), **C1OH** (14,066), **C7OO** (14,080), **VS6AE** (14,040), **KA6AC** (14,045) and, last but not the leastest, **OY3IGO** (14,034). [I think that's what *we* need, boss, some punk conditions. — *Jeeves*]

Still rankled about being taken in by AC3GG, W1KUF sought solace in **ZD9AA** (14,025), **ZD4AB** (14,120), **ZC6UN** (14,085), **TF3JS** (14,040), **ZB1Q** (14,080) and a CR6. — · — · — After eliminating W9 QRM with a new 3-element array, W4FVR reaped **W1EEC/KW6** (14,025), **W6ZNT/KW6** (14,070), **VS7NX** (14,015), **ZC6RE** (14,030), **C7AT** (14,075), **UR2KAA** (14,085), **ZC8PM** (14,010), **VU2CR** (14,045), **YN1RO** (14,040) and **KA1AP** (14,060). — · — · — An attic dipole was good enough to capture **OX3BC** (14,110 t8), **TF3AE** (14,120), **HK3FF** (14,050), **OH2NB** (14,065) and **EA1A** (14,022) for W9MDG. — · — · — W3QLW scored with OE7FR, OX3RG, LA7TA and KV4AA while W1KMY specifies TF3MB, ET3AB, EA4B, I1NU in Trieste and VQ4RF, the latter perking with a mere two watts input! — · — · — W7WEN, formerly W2WEN, is tasting West Coast conditions via **KM6AJ** (14,030), **ZS2CR** (14,050), **J2AAA** (14,010), **J6LPP** (14,020) and **OK1HI** (14,050). — · — · — Via W4QT we hear that W4LHQ has applied for his second DXCC diploma, the first one garnered as W8KKG in prewar days. Doc's more recent: ZP6AB, ZD2GHK, UO5AC, TA3FAS, IS1AHK, VQ8CB and UP2AA.

CM2SW reports increased competition since CM2CT returned to the fold after a year's abstention. Sergio is up to 161 thanks to VR2AO, EA9AA, UF6AB, PK4VD, VP2GJ, ST2JB, CR9AG and VQ4ERR. — · — · — A total of 492 DX contacts in two months netted CT3AB, CR7AF, **FO8AA** (14,010), **TA3AA** (14,020), **AR8AB** (14,080) and **MI3NC** (14,090) for W8KPL. — · — · — A welcomed 'phone synopsis from W4GDQ lists **CN8EQ** (14,380), **KL7TF** (14,298), **HP1GL** (14,388), **NY4JB** (14,322), **W9RZI/KG6** (14,252), **VP4TH** (14,165), **VP2KS** (14,358), **VP6ZI** (14,202), **4X4AD** (14,342), **ZC6UN** (14,360), VQ4SC, YV5ABT and sundry *others*. — · — · — W2DY's *A3 ramblings* resulted in HI6EC, VP9V, VP6SD, VP3MCB, CN8EM, HH2EA, HK1DZ, J9AKG and VK7GJ. — · — · — While wondering about FP8AB, **WØUOX** sewed up **ET3Y** (14,030), **ZD4AM** (14,045), **VU2MD** (14,025), **VS6BA** (14,030) and **VS6AZ** (14,020). — · — · — Thirty



Excellent results with low power is the forte of Dr. Constantine Feruglio, I1VS, of Udine, Italy. His 35-watt 28-Mc. 'phone has accounted for some 100 countries worked and 80 confirmed, employing dipole antennae, while the inhaling is done by an S20R. The OM is presently engrossed in the pursuit of an elusive WAS.



Here's the elaborate installation at PAØGN, Glimmen, Holland. An all-band exciter can be seen at the lower left with two final-amplifier stages mounted above. To the right of the NC-101X receiver is a 6-meter superhet and farther to the right stands the speech-amplifier equipment. Modulator and power supplies are not shown.

watts to a 6L6 didn't keep W5OYD away from KV4AA, HC1JW, YN1LB, VO2RF and ZS6GI, either . — . — . — A new one for almost everybody will be found in **VK9NR** (14,140 t9), operating from Norfolk Island.

Ten has been moving up fast on the rail and W2VCZ struck a 4-hour WAC with ZC6XY, **VQ4SC** (28,200f), HC1KV, VO2CO, VK2ASN and G2HK. Others worked: **FQ8SN** (28,485f), **AG2AD** (28,310f), **HA1KK** (28,205f), **UB5KAG** (28,165f) and **4X4AC** (28,175f) . — . — . — W2AEB adds ZD4AX, CP5FB, EA3HM, EA4ZH, TA3FAS and OQ5CL, all being microphonic . — . — . — Cards from W2LXF/IWO and W8SIR/KJ6 make it 100 verified on 28-Mc. 'phone for W1EKU . — . — . — Very wet juice mentioned by W4MRA's missile dwells upon ZS8A, MF2AA, ZP7FA, VP8AD, VQ2JO, ZE1JH, W3NKS/ZS3 (!), GD6IA, KJ6AB, ZB1AG, ZB2E, CR7AD, HZ1AB, VU2GB, OE7FR, ZC1AC, KX6BC, FA3GZ, VQ4RF, MT2D and 4X4AA, all 'phone exclusively. Cliff needs just ten cards to catch W1EKU . — . — . — Sticking to the brass method, W8KPL prevailed upon VP2GE, VS9AL, ST2FU, ZE1JJ, J2AAL, J2AHI, OE3CC, OX3MG, FA9IO, FE8AB, VP8AD, VQ4RF and CN8ER . — . — . — We are advised by W1IKE that **OQ5BH** is searching for Nev., Wyo., Del., Mont., S. Dak., Idaho and Colo. on 28,100-kc. 'phone. Any takers?

Where:

These addresses should do somebody some good; help yourselves. Naturally, the use of airmail is recommended to best advantage.

AR1OD	(via W3KXS)
CM7RA	Apartado 185, Ciego de Avila, Cuba
CO8OH	P.O. Box 16, Antilla, Cuba
CR6AW	Box 180, Luanda, Angola
EA3HM	J. Janer, Apartado 5041, Barcelona, Spain
EA4ZH	P.O. Box 12354, Madrid
ex-ET3AB	D. Golding, 7 Pretoria Road, Southsea, Hampshire, England
FF8FP	% PAA, P.O. Box 583, Dakar, French West Africa
HA1KK	P.O. Box 185, Budapest 4, Hungary
HA2C	Dezso Felkay, Bethlen-Utca 50, Rakospalota, Hungary
HZ1AU	(via ARRL)
J9ACX	APO 239, % PM, San Francisco, Calif.
J9ADE	APO 239, % PM, San Francisco, Calif.
J9ANZ	Navy 1175, FPO, San Francisco, Calif.
KM6AK	% CAA, Midway Island
KX6BB	Navy 824, FPO, San Francisco, Calif.
LZ1AA	Box 271, Sofia, Bulgaria
MD2BU	(via RSGB)
MI3FG	Box 513, Asmara, Eritrea
MI3LZ	APO 843, % PM, N. Y. C.
MI3NC	APO 843, % PM, N. Y. C.
PK4KS	(via W8SYC)
PO5AE	W. B. Mully, % BPM/Shell Oil Co., Tandjoeng, Bandjermasin, Borneo, N.E.I.
VE8PX	APO 692, % PM, N. Y. C.
VP2GG	R. A. Smith, St. Georges, Grenada, B. W. I.
VP3CW	C. Wiltshire, 25 Upper Norton St., Wortmanville, Georgetown, British Guiana
ex-VP4TAAE	Howard F. Stearns, W4OOP, 500 W. 7th St., Kannapolis, N. C.
VP8AJ	% Post Office, Port Stanley, Falkland Islands
VR2BF	Rod Die, Nadi Airport, Fiji Islands
VS1CX	RAF, Seletar, Singapore, Malaya
ex-VS7PH	F/Lt. H. Pain, RAF, 6 Granville St., Skipton, Yorkshire, England
W6ZNT/KW6	(to W6ZNT)
W7KPA/VP2	APO 855, % PM, Miami, Florida
YS1PB	% U. S. Embassy, San Salvador, Salvador
YU7KX	Oton S. Bernard, Box 137 P. C., Trieste
ZC6RE	E. Rosenthal, P. O. Box 972, Kibutz Shural, Tel-Aviv, Israel
ZC6UNT	(via K2UN)
ZC6XY	(via W9HXP)
ZD1AS	Royal Signals, Freetown, Sierre Leone, West Africa
ZE2KC	Box 225, Bulawayo, Southern Rhodesia

The above thanks to the generosity of W1s FH, FTX, HX, IKE, KUF, QMI; W2s AEB, CJX, EQS, MUM, OST, VCZ; W3s AFW, SNA/2; W4FVR; W5s ACL, ALA, FXN, JPC; WØFWW; KH6PM; ON4AZ.

Tidbits:

AR1OD wised up W1FH to the fact that the new Syrian prefix is to be YK1. ARs 1RJ and 1JC will become YK1AA and YK1AB respectively . — . — . — D4AFA wonders whom the W gang is kidding when they pass out T9x reports for T6 and T7 signals. A very good point. The sincerity of the rest of one's comments during a QSO is certainly open to question if one refuses to give an honest report . — . — . — Ham radio suffered a temporary curtailment recently, according to OA4B and OA4AT, but things are gradually returning to normal . — . — . — **PAØLR** is "desperately" seeking Utah and Idaho to complete his you-know-what; his frequency, 14,020 kc. . — . — . — W3ENK desires to have it known that he never operated KZ5CB on 28-Mc. 'phone, recent received QSLs notwithstanding. Possibly a reissued-call deal . — . — . — By way of W8KPL, VS9AL states that any hams finding themselves in the vicinity of Aden are cordially invited to make tracks to his shack . — . — . — To avoid confusion and whatnot, the word "China" should not appear on

mail addressed to Hong Kong . — . — . — W8CXN is seeking good words concerning TA6OBM. Can anyone oblige? . — . — . — W4DGW struggled with the call W4DGW/KJ6 for months. Upon his arrival back home he found his ticket converted to KJ6AC! Now you'll find him getting the 40-meter men excited as KJ6AC/W4. To this writing, Earl has received just 50.17% answers to QSLs sent out — fine thing.

In months of operation, VE8RB has run across just one station able to pronounce his location. No wonder — it's *Kittigazuit!!* F9EZ was the linguistic hotshot. VE8RB's stamping grounds are 300 miles north of the circle, near the mouth of the Mackenzie River. The mail QTH is correct as: RCAF Station, Kittigazuit, N. W. T., % M. P. O. 1315, Edmonton, Alberta . — . — . — ON4QF will operate his Belgian Congo station, OQ5QF, for the next three months on 7, 14 and 28 Mc. Maurice will try the DX Contest with at least a 35T and a 4-element array . — . — . — Out of 110 countries worked, YU7KX has received QSLs from a mere 41. Oton may be reached via ARRL or through the listed address . — . — . — VQ3HJP (also famous as VQ1HJP) has migrated to Kenya and should presently be heard sporting a new VQ4 label, advises G5YM . — . — . — Those who have not received their VO2AR wallpaper can obtain same by writing W1CGS, according to W8DON . — . — . — Quoting a box score in the latest *FEARL News*, we see that the DX parade lines up in this manner: J2AHI with 140 worked; J2CDJ, 94; J2AAL, 88; J3GNX and J2HYS, 81. A large shake-up in call letters can be expected, Japan-proper prefixes being changed to JA2 through JA9.

W2CJX learns that G3s DBO and DFI are ex-VU2KM and ex-VS1BX respectively . — . — . — It took some six months for VQ4ASC to jar a batch of QSLs loose from the printer — you can expect yours directly, to quote W1BEQ . — . — . — Get out your Countries List and add the following two fresh ones: Norfolk Island (VK9) and Vatican City (HV). Congrats if you have 'em, OMs. The former is really in the sticks, being about 850 miles due east of Australia and 400 miles northwest of New Zealand. It's a strategic spot in the South Seas shipping lanes. The Vatican City needs no introduction, its affirmative country-status only having awaited amateur activity there.

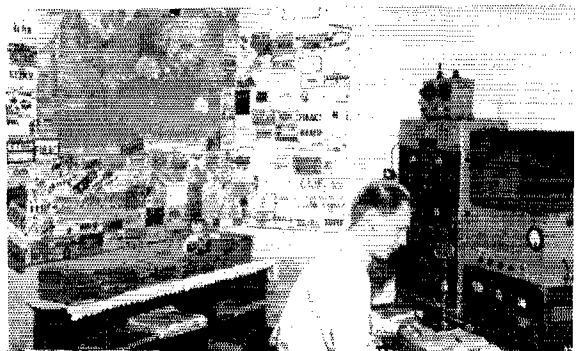
The Habana DX crew evidences a somewhat cosmopolitan matrimonial taste. CM2CT married an English girl and CM2JK is being hitched to a Mexican *senorita*. CM2SW, however, boosts the home product, anticipating a May wedding with a fortunate Cuban lady . — . — . — If any of you folks have some concrete data regarding postwar activity on St. Pierre and Miquelon, will you please bend our ears? Several fellows report working FP8AB, for instance, but the gentleman does not elucidate . — . — . — HZ1AB is fighting heavy atmospherics in Dhahran and reports reception on ham bands below 14 Mc. as washed out. Don asserts that HZ56D, supposedly operating airborne in the Arabian area, has no legitimate status so far as he knows. In fact, HZ1AB is assumed to be the only authorized amateur station presently operating in Saudi Arabia. The staff includes Don, W7KUC, Carl, WØDLK, George, WØTND, Joe, W2OHN, Smitty, W8UMQ. LAs assume the prefix LB when operating portable and prefixes LF, LI and LJ, sometimes used in the ham bands, represent Norwegian army, navy and technical-school stations . — . — . — VQ4s are now showing up with legit two-letter calls. We have it that several prominent DXers sprained eardrums trying to copy the missing members . — . — . — Far Eastern gleanings from the mail of W1IKE: VU2EV will QRT for a spell while he goes on leave and AC4YN the same. Bob Ford, now AC4RF, intends to take Reg's place on the air for awhile.

W1BIH and WØDIB offer a helping of Greenland gossip: OX3MG lost an outgoing mail boat in an ice crush last summer and suspects some of his cards have gone astray to the bottom of Denmark Strait. Awaitees who feel their veries are overdue should reapply. OX3BC is laboring over a new supply of pasteboards and should be all caught up by this time . — . — . — The gang around Seattle is doing much better since W7BE left the vicinity in favor of KH6. Bill is having great fun as W7BE/KH6, having bowled over 40 countries through the use of a 10-watt VFO and a dipole in just over two weeks of operation . — . — . — Another certificate for you DX hounds — see "IARU News," this issue.

— · · · —

Jeeves reports less TVI in the neighboring grog-shop receiver since he installed his latest-design anti-interference measures. These include r.f. chokes in the feeders plus copper spreaders. But we still don't get out worth a darn.

♦



One of the more avid Scandinavian DX-hunters is Reimar Stridh, SM5WZ, of Ulvsunda, Sweden. A four-stage 125-watt transmitter furnishes the r.f. while an SX25 does the receiving. Reimar has compiled a total of 123 countries on 7 and 14 Mc., despite ample activity as a member of the RCC. Five states are needed for WAS.

Results, Twelfth ARRL Field Day

More Than 4600 Participants Afield in Annual Test of Portables

If the number of individuals participating in an ARRL Field Day is any indication of the willingness and ability of amateur radio to prepare for service in emergency, then amateurs in the field territory of the League are doing a fine job. Dedicated to emergency preparedness, this popular annual activity has enjoyed wider participation each year since its inception. The Twelfth ARRL Field Day, held last June 12th and 13th, dwarfed previous affairs, made them seem like mere trial runs by comparison. It was the largest field testing of amateur facilities ever held and one of which we may well be proud. There were 4660 individuals in the field; 305 club portable stations, manned by 4084 participants, were active; among the nonclub groups, 576 individuals kept 144 portables on the air.

The FD was rich in experience for its participants. It provided to many a better appreciation of the problems involved in operating portable equipment afield; it showed up defects in gear and pointed the way to improvement. Some groups gained a new awareness of the importance of operator proficiency and have come to realize that this is a factor equally as important as efficient transmitters, receivers and antennas. Aside from its serious aspects, another point stands out: the FD was fun! It was filled with interesting and amusing incidents that will linger pleasantly in the memories of those who took part. If you've taken part in an FD, you'll know just what we mean; if not, you'll just have to try a Field Day some time!

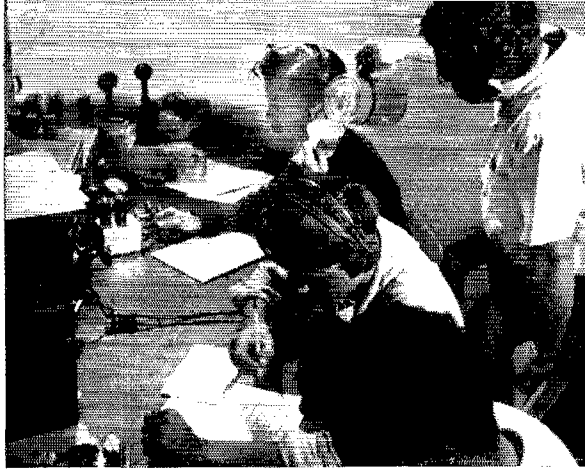
Under the rules, competition in Field Day is considered to be among stations employing similar numbers of transmitting set-ups. Score listings are arranged below according to the number of transmitters that were in simultaneous operation at each station. There always is, however, intense interest on the part of FD participants in knowing which groups, regardless of transmitter classification, had the highest scores and what combinations of gear and bands were used. Some of the top scores in the various classes will be mentioned along with brief descriptions of layouts used.

Each year has seen Field Day groups on the West Coast inching up on their competitors to the east. In the 11th FD the Society of Amateur Radio Operators managed a second-place score which augured the possibility that the banner would move to the West in 1948. SARO's apparent ambition was realized in this Field Day; by a comfortable margin their 17,017-point score earned first-place honors. Operating 7 transmitters at W6AEX/6 from a ranch location near San Carlos, Calif., 30 members assisted in making 822 contacts. Power for all rigs was supplied from batteries charged by a gas-driven generator. Each transmitter used VFO control and was operated at 30 watts or less input. Efficient antennas helped the success of SARO's operations in no small measure: radiators for 3.5 Mc. were two half-waves in phase; for 7 Mc. a "V" beam; 14-Mc. c.w., two 8JKs; 14-Mc. 'phone, three-element rotary; 28 Mc., a three-element beam and a ground-plane job; 144 Mc., sixteen-element rotary. A breakdown of the contact total by bands shows the following: 78 QSOs on 3.5-Mc. c.w., 148 on 3.85-Mc. 'phone, 223 on 7 Mc., 109

TEN HIGH SCORES

Clubs		*Others*	
W6AEX/6	17,017	W6EYH/6	6197
W2OM/2	15,615	W9ERU/9	5225
W6AMT/6	15,129	WØJIE/Ø	4968
W6GAL/6	14,378	W9EDK/9	4707
W6BYP/6	14,334	W6NIK/6	4617
W6QV/6	13,689	W9BVG/9	4167
W6VB/6	13,487	W5AA/5	4152
W6ME/6	13,150	W1ORP/1	4131
W6DK/6	12,609	W6LDJ/6	4118
W9IT/9	12,126	W2UBU/2	3929

It didn't rain everywhere during Field Day! From this sun-drenched location, Geiger Summit, in their home state, the Nevada Amateur Radio Association had four transmitters on the air. Their regular FD site on Mount Rose was covered by six to ten feet of snow! Left to right: W7BIC, W7CX and a visitor.



The Wisconsin Valley Radio Association, W9RQM/9, turned in a good FD performance; they had the third-highest score in the two-transmitter class, made the greatest number of contacts, 632, in that category. In this shot W9JBF pours coffee for W9FZC and W9CIC at one of the operating positions.

on 14-Mc. c.w., 75 on 14-Mc. 'phone, 133 on 28-Mc. 'phone, 56 on 144 Mc. Hearty congratulations on a grand FD performance, SARO!

A group with plenty of Field Day experience, the Tri-County Radio Association, reported the second highest score, 15,615 points. TCRA led the field in number of contacts with the record-breaking total of 1390. Eight transmitters, each working at 30 watts or less input, were operated simultaneously under the call W2OM/2 at Watchung, N. J., on 3.5-, 7-, 14-Mc. c.w., and 3.85-, 14-, 28-, 50- and 144-Mc. 'phone; the station was manned by 25 operators. Antennas used ranged from doublets on 3.5, 7 and 14 Mc. to a four-element Sterba curtain on 14 Mc., parasitic beams on 28 and 50 Mc., and an eighteen-element rotary on 144. Both a.c. from a portable generator and battery power were used.

The Metropolitan Radio Club of Los Angeles gave an excellent account of itself. Signing W6AMT/6 from a spot in the Santa Monica Mountains of Southern California, 25 operators rolled up 15,129 points. Their contact total, 1159, was higher than that of the SARO group, but they were outscored as a result of not gaining the advantage of the battery multiplier, all power having been obtained from a portable a.c. generating plant. Power input was kept at 30 watts or less on all except the 14-Mc. 'phone rig, which ran 85 watts. A varied assortment of antennas was employed, including doublets, parasitic and phased arrays, square-corner reflector and a ground plane. Operation was conducted on all bands from 3.5 through 144 Mc.

In the nonclub category, score listings this year were divided into two sections, those submitted by groups consisting of three or more participants that operated one or more transmitters, the other including single-transmitter scores obtained by one or two operators. The top nonclub score was made by a station in the latter classification, W6EYH/6, operated by W6EYH and W6VUC at Big Bear, Calif.; their score of 6197 points resulted from 281 contacts on 3.5-, 7- and 14-Mc. c.w. The rig, a VFO-807 job running a maximum of 28 watts, was powered by a PE-103 dynamotor; an NC-101X using storage-battery supply for filaments and dry batteries for plates provided reception. W6EYH and W6VUC deserve special congratulations for their score, which was obtained in the face of competition from groups using many more transmitters and operators.

Second-high nonclub score, 5225 points, was turned in by a Midwest group of 8 operators and 4 assistants who were set up at the Rockford, Ill., Ski Club Grounds under the call W9ERU/9. A BC-459-A was used on 7 Mc. and a VFO driving 6L6GX doublers on 3.5-, 14-Mc. c.w. and 3.85-Mc. 'phone. Receivers were NC-200s and batteries powered all gear.

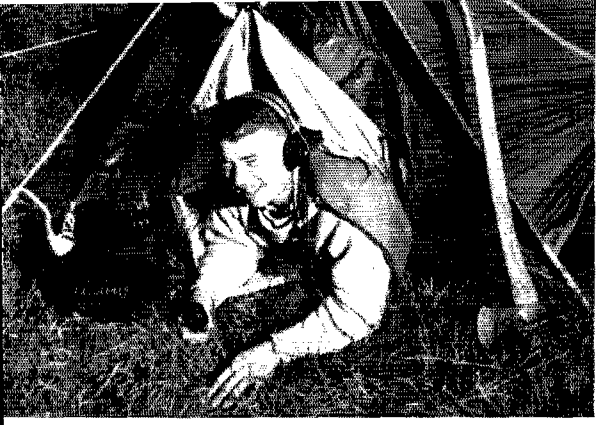
Located at the Omaha Rod and Gun Club near St. Paul, Minn., and with 5 transmitters on the air, 17 operators participated in the activities of WØJIE/Ø, third-high nonclub group. A total of 552 contacts was made for a score of 4968. Gas-driven generators powered rigs on 3.5-, 7-, 14-Mc. c.w. and 3.85-, 14- and 28-Mc. 'phone.

W3AXT/3, operated afield at Conestoga, Pa., by 5 members of the AEC of Lancaster County, was the leader among the ARRL Emergency Corps groups. Calling themselves the Conestoga Glass Arm and Elbow Bending Society for the occasion, this group operated a single battery-powered transmitter on 3.5- and 7-Mc. c.w., and chalked up 226 QSOs for a score of 3389.

V.H.F.-Only

From a favorable location in the Whittier Hills of California, four amateurs had three transmitters operating simultaneously at W6WSQ/6 to produce the outstanding v.h.f.-only score. On 50 Mc. a converted surplus MBF rig, running 8 watts input, and a half-wave dipole enabled them to work 34 stations. An SCR-522 with 25 watts input, an ARC-3 receiver and a sixteen-element beam logged 128 contacts on 144 Mc. A second 522, with a tripler as the output stage, working in conjunction with an ASB-5 receiver and a twin-4 beam added 6 420-Mc. QSOs to the contact total. All power for the set-up was furnished by a portable a.c. generating unit.

Second place, 756 points (31 contacts), in the



Not all FD stations were elaborate. From this pup tent, W8VWK/8 was operated on battery power at Rocky Gap Park, Benton Harbor, Michigan, by W8UXA, W8VWK and W8YEN. In addition to W8VWK, shown at the mike while on "75" 'phone, the tent housed a 15-watt rig, PE-103 dynamotor and a vibrapack-powered HRO.

v.h.f. class went to a 3-operator single-transmitter station, W3KRJ/3, active from a hilltop in Gambrill State Park, Md. All operation was on 144 Mc. with a PE-103 dynamotor-powered SCR-522 running 20 watts, a homebuilt superhet receiver and a five-element beam. A novel feature of the antenna system was a 20-foot rotatable mast with arrangements for changing from horizontal to vertical polarization at will by means of control ropes.

At Equinox Mountain, Vt., W1NH and W1MEP set up W1NH/1; with a 522 powered by a PE-103, they scored 297 points from 22 contacts for the third-highest reported v.h.f. entry.

Miscellany

Amateurs are resourceful people! Here's a tip on the elimination of standing waves from a 150-ohm Twin-Lead transmission line when it gets extremely wet. The Lancaster Radio Transmitting Society, W3NMR/3, experienced rainy weather Saturday and Sunday morning. Forty-meter contacts kept dropping off in the wee small hours and it was noticed that antenna current was practically nil. Hurried checks showed all to be in order except the antenna loading. After a few minutes of conference the following were rustled up around the cabin shack: 2 raincoats, 1 flashlight, 1 strong set of shoulders, 1 light ham with a long reach and, most important of all, 5 slices of bacon. You can probably guess the rest: the light ham dragging the bacon strips along the feeder while perched precariously on the strong set of shoulders! The net result was antenna current again and ten contacts during the next hour. . . . W1NXM didn't break any records for contacts. He and W1DDO, however, had an interesting time investigating the potentialities of low power. Their portable rig, a 958-A VFO driving a pair of 958-As operating either in parallel on 3.5 Mc. or as a push-push doubler on 7 Mc., ran 1.35 watts (12 ma. at 112.5 volts). The receiver was a modified BC-454-B, and the complete station power supply consisted of three standard 45-volt "B" batteries and two No. 6 dry cells. This flea-power layout netted 12 contacts in about 4½ hours of operation. . . . W6PDV operated from the "high seas." After a difficult sail from Santa Barbara, he anchored his 40-foot ketch, the *Tiburon*, a quarter of a mile off Santa Rosa Island and had an enjoyable time working the gang on 3.85-Mc. 'phone and 7-Mc. c.w. . . . The boys at W7BTV put out a potent signal on 3.85-Mc. 'phone with a 365-foot vertical antenna supported by a five-foot Air Corps balloon and worked Alaska. . . . "Without a doubt this was the best Field Day to date. Even now, bigger and better plans are being made for next year. The club in general is getting more emergency-minded. Many of our 28-Mc. contacts were made with equipment to be set aside for possible future emergency use." — *Minneapolis Radio Club, W0CRO/0.* . . . "Despite heat, insects and frequent threats of rain, we all thoroughly enjoyed the FD, and feel a definite sense of accomplishment as we almost doubled our last year's contact total." — *W4ELO/4.* . . . "We found the U. S. war-surplus transmitters ideal for FD operation, both for simple operation and quick QSY . . . used a field telephone loaned to us by the Canadian army to keep in touch with the various tents. All in all, a fine time was had by all." — *Hamilton Amateur Radio Club, VE3BNG.* . . . "The Field Day proved to be worth while in every respect. It proved how poorly we were actually prepared to meet a communication emergency, even in the light of advanced planning. Many of our mistakes have been rectified and we are waiting anxiously for next year." — *W2WFU/2.* . . . In common with the experience of numerous other groups, the Raritan Valley Radio Club, W2QW/2, had a wet FD. They suggest that in the future a multiplier based on the number of inches of rainfall be allowed! . . . "Weather: terrible, thunderstorm, high winds and antennas down, but through the height of the storm the sound of the gas generator was most reassuring. Suggest new picture on cover of June *QST* next year. No use encouraging the weather!" — *Mountaineer Amateur Radio Association, W8BIA/8.* . . . "Much fun had by all. Big excitement when pilot from near-by airfield shot down surplus balloon supporting 75-meter vertical antenna. Plans being made to make next year's event bigger and bet-

ter than ever." — *Radio Club of Tacoma, W7AEA/7.* . . . "We sure had a fine time and the experience we gained last year did us a lot of good on this Field Day." — *Electric City Radio Club, W3SM/3.* . . . "Our location was a medium-wooded area with plenty of trees for antennas, most of which were put up with bow and arrow and light string to pull up rope and antenna wire." — *Tri-County Radio Association, W2OM/2.* . . . "Movies were made on location to give favorable publicity. These were edited for later television distribution. Some showings have already been made on Eastern stations. A copy of this film is on file and available for amateur use." — *Amateur Radio Club of Hollywood, W6BYP/6.* . . . "While at our FD location we had the Mayor of Jackson representing the city, the manager of the local Western Union office, the general secretary and the disaster chairman of the local Red Cross, and officials from the local railroads visit us; a list of the local members of the AEC and a list of the Tennessee Emergency Net were given to them. Coöperation with these officials was perfect and we feel assured that we will be called upon promptly in case of an emergency." — *Amateur Radio Society of Union University, W4FA/4.* . . . "Field Day offered wonderful opportunity for operator training and leadership in organization." — *Society of Amateur Radio Operators, W6AEX/6.* . . . "We gave the slow ops and the fast ops an opportunity to take part. This naturally cut down our point total, but it also gave all the gang an opportunity to take part, and that's important to our way of thinking." — *Racine Megacycle Club Emergency Corps, W9UDU/9.* . . . "Although our score may not be much, valuable experience was gained by all who participated." — *Mississippi Amateur Radio Club, W5VJ/5.* . . . "Our set-up might prove to be of interest. We tied in with a local National Guard outfit, the Headquarters Troop of the 102nd Cavalry, Reconnaissance Group, Mechanized, of Newark, N. J. Our club furnished the radio operators, radio equipment and food. The Headquarters Troop provided living and operating quarters including tables, chairs, cots and blankets and a field kitchen complete with cooks, KPs, and all that goes with meals in the field. The success of our venture clearly indicates that the ham fraternity would do well to include their National Guard units in planning for future contests and emergencies." — *Bloomfield Radio Club, W2JC/2.*

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Operating W6ME/6 at Palos Verdes Hills, San Pedro, California, the United Radio Amateur Club placed fourth in the seven-transmitter club class. This view shows their 28-Mc. rotary, several of the tent operating positions and the trailer used as a commissary. Except for a 144-Mc. rig which ran from a 115-volt generator, all equipment was battery-powered.

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In concluding this report we wish to express our sincere thanks to club secretaries and others who sent to Headquarters the many interesting and complete reports of operations in the Twelfth ARRL Field Day.

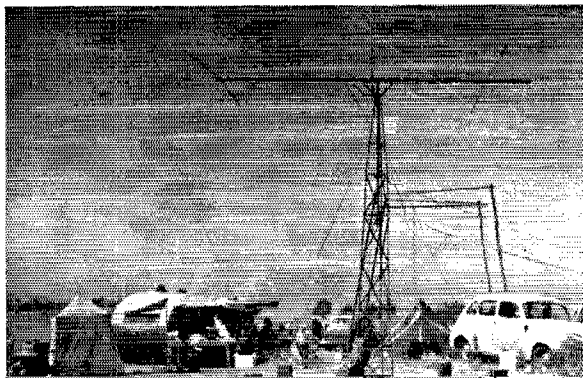
The Thirteenth FD is scheduled in the ARRL Activities Calendar for June 18th and 19th. As in preparing for service in emergencies, advance planning will help to make your operations more successful. It isn't too early now to be thinking and doing something about your participation in the '49 Field Day. See you there! — *J. M.*

CLUB GROUPS

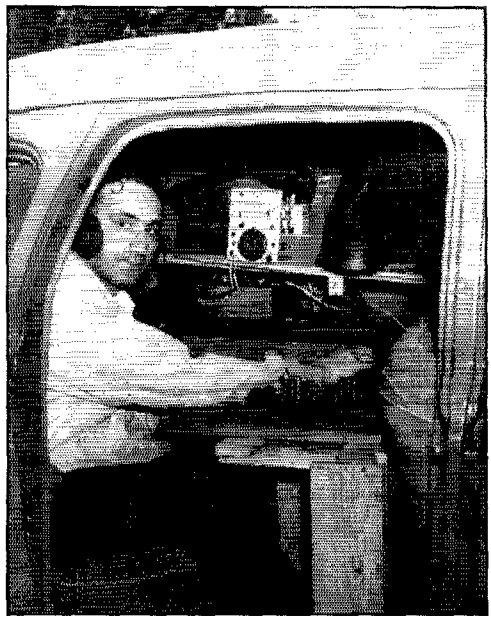
Scores are tabulated according to the number of transmitters operated simultaneously at each field station. The figures and letters following the club name indicate the number of contacts, the power or power inputs used, the number of participants at each station, and the final score. The "power classification" used in computing the score is indicated by the letters A, B or C after the number of QSOs shown. A indicates power up to and including 30 watts (multiplier of 3); B indicates power over 30, up to and including 100 watts (multiplier of 2); C indicates over 100 watts (multiplier of 1). More than one letter indicates that at different times power inputs fell within different classifications.

One Transmitter

W3BES/3	Frankford Radio Club	395-	A-3-	3942
W1EH/1	South Lyme Beer, Chowder and Propagation Society	381-	A-7-	3690
W1HLK/1	Narragansett Assn. of Amateur Radio Operators	416-	AB-15-	2661
W3USA/3	Potomac Valley Radio Club	193-	A-4-	2606
VE3BTQ	Clinton Amateur Radio Club	164-	A-3-	2417
W7LOB/7	Glacier Radio Club	80-	A-5-	2126
W4NEC/4	Alamance Radio Club	187-	A-10-	1908
W6KNZ/6	Marin Amateur Radio Club	78-	A-8-	1883
W8AIC/8	Central Ohio Radio Club	175-	A-23-	1800
VE1DN	Dartmouth Amateur Club	166-	A- 6-	1629
W8NZ/8	Calhoun Area Radio Club	172-	A- 8-	1548
WØRFT/Ø	Northeast Iowa Radio Amateurs Assn.	172-	A- -	1548
W1JP/1	Providence Radio Assn., Inc.	216-	B-15-	1446
W4NC/4	Winston-Salem Amateur Radio Club	232-	B-18-	1392
W5BPM/5	East Texas Amateur Radio Club	102-	B-15-	1377
W1AZW/1	Fitchburg Radio Club	118-	A- 9-	1287
VE2ZO/2	Lakeshore Amateur Radio Club	123-	A- 3-	1242
W7MEZ/7	Blue Mountain Radio Club	91-	A- 6-	1229
W7ASG/7	Salem Amateur Radio Club	246-	C-10-	1220
W7ED/7	Gallatin Amateur Radio Club	57-	A-10-	1154
WØZWY/Ø	Sioux Falls Amateur Radio Club	188-	B- -	1128
W7PL/7	Pendleton Amateur Radio Club	56-	A- 7-	1109
W3GAG/3	Philadelphia Wireless Assn.	107-	A- 3-	1098
W9DUK/9	Delaware Amateur Radio Assn.	170-	ABC-18-	1083
W7HZ/7	Valley Radio Club	88-	AB-13-	932
VE2ACM	Valois Amateur Radio Club	68-	A- 4-	918
W8SW8/8	Piqua Radio Club	149-	B- 4-	894
W8YOM/8	Muskingum Amateur Radio Assn.	98-	A-11-	882
W4VT/4	Mid-South Amateur Radio Assn.	145-	B-30-	870



VE5AA/5	Saskatoon Amateur Radio Club	107-	AB-13-	867
WØWML/Ø	Newton Amateur Radio Assn.	40-	AC- 3-	790
W5LUX/5	Harrison Amateur Radio Club	55-	A- 3-	743
W8UPD/8	University of Akron Radio Club	119-	B- 4-	714
W7OIF/7	Radio Club of Arizona	39-	B- 7-	576
W1KVI/1	Portland Amateur Wireless Assn.	147-	C-10-	501
W7LAB/7	Ogden Amateur Radio Operators Club	37-	A- -	500
W2UTH/2	Rochester Amateur Radio Assn.	75-	AB- 5-	465
W8TSD/8	Perry Radio Club	17-	A- 5-	459
VE3AVU	North Shore Radio Club	28-	A-13-	378
W5FGE/5	Hattiesburg Amateur Radio Club	26-	A- 7-	351
WØSEE/Ø	Council Bluffs Radio Operators Club	39-	A-11-	351
W1QMF/1	Newington Amateur Radio League	21-	B- 3-	276
KG6CJ/KG6	Guam Radio Amateur's League	32-	AC-10-	275
WØHDO/Ø	Mitchell Radio Amateur's Club	19-	A- 4-	257
W4EWY/4	Amateur Radio Club of Savannah	27-	B- 9-	162
W4MOE/4	Ashville Amateur Radio Club	25-	AC- -	159
WØRPA/Ø	Colorado Springs ERC	10-	A- 5-	135
W2TNI/2	Lake Success Radio Club	11-	B- 4-	99
VE3NI	St. Thomas Amateur Radio Club	32-	A- 4-	96
W3LTK/3	Radio Assn. of Erie	10-	A- 6-	90
WØEEE/Ø	MSM Radio Club	12-	B- 3-	72
Two Transmitters Operated Simultaneously				
W8MRM/8	Motor City Radio Club	558-	A-12-	7871
W4KFC/3	Potomac Valley Radio Club	436-	A- 9-	6405
W9RQM/9	Wisconsin Valley Radio Assn.	632-	A-24-	5859
W1OC/1	Concord Brasspounders	587-	A-17-	5517
W2JC/2	Bloomfield Radio Club	340-	A-12-	4928
W3NMR/3	Lancaster Radio Transmitting Society	347-	A- -	4685
W8CCO/8	North East Amateur Radio Club	300-	A-17-	4050
W8KS/8	Westlake Amateur Radio Assn.	251-	A-10-	3726



The Nassau Radio Club, K2AC/2, kept five transmitters on the air simultaneously, most of them set up in automobiles or trucks. Here's W2VL operating the 80-meter c.w. set-up, a BC-696 and a Super Pro.

W3ETA/3	Beacon Radio Amateurs	364-	A- 8-	3501
W8NLG/8	Detroit Amateur Radio Assn.	364-	A-10-	3501
W9RNM/9	Tri Town Radio Club	334-	A- 7-	3141
W9CRU/9	Michigan City Amateur Radio Club	291-	A- 9-	2862
W8RTR/8	Canton Amateur Radio Club	286-	A-19-	2799
W3NF/3	Delaware-Lehigh Amateur Radio Club	275-	A- 4-	2700
W6WQR/6	Stockton Amateur Radio Club	185-	A-15-	2700
W1VB/1	Candlewood Amateur Radio Assn.	266-	A-10-	2628
W6TO/6	San Joaquin Valley Radio Club	161-	A- 8-	2538
W8FT/8	Findlay Radio Club	257-	A-17-	2538
VE3GZ	Stratford Amateur Radio Club	192-	A- 7-	2431
WØRRP/Ø	Jackson County Amateur Radio Club	241-	A- 6-	2394
W1NDS/1	Norwalk Amateur Radio Assn.	248-	A-11-	2349
WØMJC/Ø	Associated Radio Operators of Denver	139-	A-10-	2214
W3UHG/3	Fort Necessity Amateur Radio Assn.	225-	A-12-	2183
VE3ASM	Kingston Amateur Radio Club	182-	A- 8-	2034
W9DQA/9	Central Wisconsin Amateur Radio Club	220-	A- 8-	1980
VE1EA	Annapolis Valley Radio Club	180-	A-15-	1845
W3CMT	Harrisburg Radio Amateur Club	197-	A- -	1773
W1ORS/1	Stratford Amateur Radio Club	169-	A-16-	1746
WØAAB/Ø	Electron Club of Denver	129-	A- 4-	1742
W9MBL/9	New Castle Amateur Radio Assn.	133-	AB- 8-	1656
W4MRT/4	Ashland Amateur Radio Club	136-	A- 6-	1449
VE3AEA	Peterborough Amateur Radio Club	103-	A-10-	1377
W3BKQ/3	Chester Radio Club	142-	A-10-	1278
W5GEM/5	New Mexico State College Radio Club	113-	AB-14-	1240
W2PJM/2	Elmira Amateur Radio Assn.	173-	B- 8-	1188
W2EFU/2	Schenectady Amateur Radio Association	126-	A- 7-	1134
W1MDE/1	Shoreline Amateur Radio Assn.	57-	A- 7-	1107
W2TZT/2	Queens Radio Amateurs	122-	A-10-	1098
W2UKQ/2	Clayton Radio Club	81-	A- 4-	1094
W2BXK/2	Brooklyn Polytechnic Radio Club	113-	A- 7-	1017
W4NCQ/4	Bluegrass Amateur Radio Club	168-	B- 6-	1008
W2RDB/2	Oneida Amateur Radio Club	72-	A- 6-	972
KP4DV/KP4	Puerto Rico Amateur Radio Club	142-	AB- 6-	921
W7CT/7	Southern Montana Amateur Radio Assn.	92-	B-28-	828
VE7ACS/VE7	University of British Columbia Radio Club	89-	AB- -	815
WØFLN/9	Saint Louis University Amateur Radio Club	89-	A- 7-	806
W8ACW/8	Genesee County Radio Club	77-	AB- 7-	624
W7DJP/7	Casper Amateur Radio Club	56-	AB-10-	536
W4BCU/4	Anniston Alabama Amateur Radio Club	100-	AC- 7-	531
W9TMD/9	Tri-Town Radio Amateur Club	58-	B- 4-	498
WØRGK/7	Western Nebraska Radio Amateur Club	83-	BC-10-	273
WØMRP/Ø	Bear Butte Amateur Radio Club	32-	B- -	192
W1RBS/1	CQ Radio Club of Torrington	1-	A- 5-	14
Three Transmitters Operated Simultaneously				
W8TQ/8	Dayton Amateur Radio Assn.	627-	A- -	8464
W2EWT/2	KBT Radio Club	841-	AB-23-	6648
W3SM/3	Electric City Radio Club	447-	A-10-	6372
W2UJR/2	Radio Association of Western New York	434-	A-22-	6197
W8BWA/8	Cleveland Brasspounders Assn.	634-	A-11-	5931
W5EST/5	Bartlesville Amateur Radio Club	281-	A-24-	5689
W3FRY/3	Frankford Radio Club	558-	A-13-	5427
W3QV/3	York Road Radio Club	539-	A-30-	5076

(*Continued on page 110*)

I.A.R.U. News

FRANCE

The R.E.F., to further celebrate the 25th anniversary of the first trans-Atlantic QSO, will award a commemorative certificate to each participant in the 15th ARRL DX contest who approaches the working conditions of those early days during the current contest. Contacts must be on 3.5-Mc. c.w., and should be between U.S.A./Canada and Europe/North Africa. Those interested in obtaining this certificate should send, prior to May 1, 1949, a suitable summary of the contacts which satisfy the above conditions to R.E.F., 6 Rue du Pont de Lodi, Paris 6e, France.

GERMANY

From a recent *Airways and Air Communications Service* bulletin we learn that licensing of German national amateurs has been approved by American and British authorities, and that the question is now in the lap of the German Economic Council. The AACS bulletin's source says that about 800 German amateurs have qualified for their new "DL" calls and, if all goes well, they should be on the air before too long.

PERU

Political events and the institution of martial law forced amateurs in Peru to close down temporarily in September. Though martial law was still in effect on November 8th, OA hams were at that time allowed to resume their activities.

BELGIUM

The following frequency allocations became effective for Belgian amateurs on the first of January: 3510–3625 kc., 7020–7280 kc., 14,050–14,350 kc., 28–30 Mc., 144–146 Mc., 420–460 Mc., 1215–1300 Mc., 2300–2400 Mc., 5650–5850 Mc. and 10,000–10,500 Mc. Above 28 Mc. certain percentage tolerances are specified to insure that the boundaries of the band edges are not violated.

DECEMBER CALENDAR

The December issue of the I.A.R.U. Calendar reviews the affairs of the Union for the year 1948, and this review shows clearly the continuing growth of amateur radio throughout the world. Five new societies were admitted to membership in the I.A.R.U. during the year: *Club de Radio Aficionados de Guatemala; Hong Kong Amateur Radio Transmitting Society; Islenzkir Radio Amatorar; Philippine Amateur Radio Association,* and *Radio Club Peruano.*

To these new sister societies the Headquarters of the I.A.R.U., on behalf of the whole membership, extends its warmest welcome and its sincere wishes for continued growth and activity.

WAC AWARDS

The number of WAC certificates issued for a calendar year reached an all-time high in 1948, with a total of 1112 awards as compared with 827 the year before. Of that number, 395 were for work solely by radiotelephony.

As has been previously reported, the only special WAC endorsement now authorized is that for work exclusively on 50 Mc., and to date no such award has been made.

I.A.R.U. MEMBERSHIP

At the close of 1948 the following 38 societies were included in the membership of the I.A.R.U.: *Associazione Radiotecnica Italiana; American Radio Relay League; A.R.R.L. (Canadian section); Burma Amateur Radio Society; Chinese*

(Continued on page 122)

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JA2KG, ex-J2AHI, needs little introduction to the world's amateur fraternity. Operated by Iris and Lloyd Colvin, this station has been prominent in DX operating and contests. Iris has the distinction of being the only licensed woman amateur in Japan, while Lloyd, in his spare (?) time, keeps an eye on the functioning of the JA QSL Bureau.

♦

Hints and Kinks For the Experimenter

BEAM ELEVATOR

SHOWN in Fig. 1 is the novel beam-elevating device used at W5DFU. All the hard work is done by a surplus winch unit that is bolted to a framework at the base of the antenna mast. The mast itself extends several feet into a hole in the ground, and is raised and lowered by causing the winch to pull up on a wire-rope cable that is fastened to the bottom of the mast. The wire rope rides on a roller bearing at the point

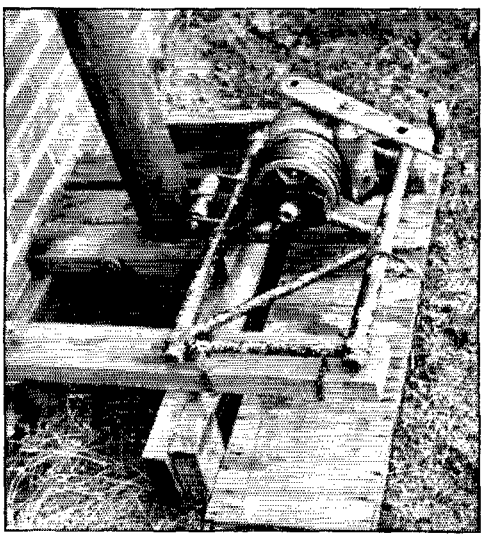

Fig. 1 — A beam-elevating system developed around a surplus bomb winch. The base of the antenna mast extends into a hole in the ground, over which the framework for the winch is mounted. When the winch pulls in the cable, which is fastened to the bottom of the mast, the entire mast is raised.

where it goes down into the hole, and this bearing and the rope support the entire weight of the mast and whatever antennas are mounted on it. The mast is of plywood tubing, also a surplus "buy," and is held in a vertical position by additional bearings, in the form of collars, one at the ground level, the other near the top. The antenna system used is a 48-element 144-Mc. array, shown in the "World Above 50 Mc." section of this issue. — *Warren J. Weldon, W5DFU.*

ANOTHER TVI KINK

HERE'S a wrinkle that may help to reduce your TVI troubles. Take an ordinary piece of tinfoil, such as might be obtained from the wrapper of a pack of cigarettes, two or three inches wide. Wrap it around the feedline used with the TV set, making a collar that fits closely, yet which does not bind.

Now, starting at the antenna terminals, slide the tinfoil along the line (arrange with a friend to operate your rig while you make the adjustments at the TV set), and watch the interference pattern as you move it slowly along. At some fraction of a wavelength away from the set, the lumped L and C of the tinfoil "tank" will make a very effective trap for the interference without serious detriment to the TV signal. — *R. F. Teseo, W2TVL.*

[EDITOR'S NOTE: While this kink may help to detune any parallel components (Paddon, "Parallel Standing Waves," *QST*, January, 1948) that may be traveling along the feedline, it is not to be assumed that this is a cure-all!]

VARIABLE INDUCTANCE FOR KEYING FILTERS

HERE'S a little stunt that may be old, but it does the job when a variable inductance is desired in your keying filter. In place of the usual iron-core choke, use the primary of a small 6.3-volt filament transformer as shown in Fig. 2. A variable resistance of about two hundred ohms is connected across the secondary. By varying the resistance across the secondary, a continuous variation of the inductance of the primary is pos-

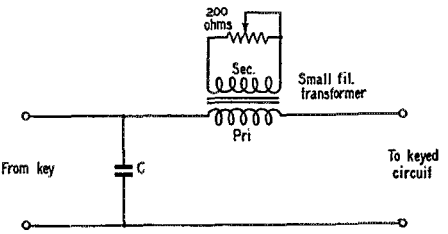

Fig. 2 — A method of obtaining a variable inductance for your key-click filter. A filament transformer is used in place of the usual choke, and the inductance is varied to suit your own taste by a resistor across the secondary.

sible. When the secondary is completely shorted, the clicks come through just as though no inductance is in the circuit. The resistance can then be increased until the keying characteristic is as soft or hard as desired. The condenser value varies, of course, depending on the amount of current being keyed, as mentioned in the *Handbook*. — *J. A. Turner, W9LI.*

Correspondence From Members-

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

DOWN TO EARTH

219 Foster Avenue, Elyria, Ohio

Editor, *QST:*

. . . At any rate, Mr. Lon Warner has a point. Single sideband has been presented in a rather advanced technical manner, and his classes in radio no doubt would be dazed at the papers thus far published. But I believe that ARRL is not to blame. The papers presented were written by competent engineers and, naturally, were replete with advanced methods of presentation. But before long, somebody will describe a poor man's single-sideband rig, and everybody will be happy . . . I hope. You at ARRL represent a "clearing house" for technical information supplied to you by members' papers. If simple stuff isn't forthcoming, I'd say it was because the junk-box and surplus-gear gang aren't contributing papers.

I do believe that single sideband has a definite place in ham radio, and I would also believe that if a junk-box rig were presented, it would give a considerable impetus to experimenters. I don't imagine low power on single sideband would be too great a drawback, if the relative freedom from QRM were taken into consideration. V.h.f.-land was pioneered with simple superregenerative receivers and transmitters built, for the most part, around receiving components. If an experiment failed, it wasn't a costly flop. Similarly, single sideband will get a big lift if a rig can be devised around similar cheap gear. The trend is in that direction. Of course, all the gear to date has been fairly expensive, and rather high-powered, but things are moving. So if the fiddle-and-tinker gang begin to present dope on a simple single-sideband rig using little bottles, we'll see everybody more contented. ARRL is doing its best to present the latest in techniques which can help you fellows lick the QRM problem. If you don't accept the ideas, and don't take the initiative in developing the gear and present dope on your findings, don't cry the blues to ARRL. How many of the 'phone men have a clipper-filter ahead of their speech equipment? That's something that can be built mostly of junk, and will certainly clean up your signals, as well as cut QRM. Or how many of the wobbly-oscillator gang have tried the Clapp VFO? That thing is also a junk-box contrivance that can help make the bands more habitable. Those things, like single sideband, were presented to you so you can make more efficient use of the frequencies we have. As long as the gang at Hq. are trying to help us better our lot, let's show some appreciation for their efforts. Could *you* keep 80,000 individualists all happy?

— *Bill Wildenhein, W8YFB*

Danna, Texas

Editor, *QST:*

As an associate member, I want to put in my 2¢ worth in the same way W5OLJ did. You guys ought to get back down to earth so we beginners can have a chance.

— *Earl L. McMullin, SWL*

T4 OR T9x?

5138 McCallum Ave., South Gate, Calif.

Editor, *QST:*

. . . *QST* has mentioned many times the importance of giving out accurate reports, regardless of whether or not it might hurt the other fellow's feelings. I would like to stress the importance of correct reports. I had trouble with ripple on my carrier when I first went on the air. I have a monitor in my station and could hear it on that. It appeared not to be bad but just noticeable, perhaps T8. I got T9x reports from nearly every amateur contacted. When asked if ripple could be detected, I always got a "yes" answer and a corrected report to T8. I finally met a hardy soul who won my respect by giving me a T5 on my tone.

I of course immediately got busy and found the trouble (a.c. on the filaments was modulating the carrier). He was too late, however, as the very next day I received an official notice from the FCC giving me a T4. The station I was working while the FCC monitored me gave me RST 599!

I mention this only because the FCC could have been saved the trouble of sending me a notice had my reports been given to me accurately, and I could have been saved the embarassment of answering an official notice.

— *D. H. Stovall, W6ECY*

MEMBERSHIP DUES

4713 Chester, Kingsessing Sta., Philadelphia, Pa.

Editor, *QST:*

I'm sorry but I have discontinued *QST* because of the price. I feel I cannot afford it just like I can't afford the present-day prices of ham gear. There are a couple of other radio magazines that still hold the same price. I realize that prices for publishing, etc., have gone up but my pay still remains the same. I think this is true of a great number of hams.

Quite a few in our club are not renewing or not going to renew when theirs run out for the same reason. When the price gets down to a reasonable one, then I'll be only too glad to join again.

— *E. M. Welch, 2nd, W8NIH*

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181 Chili Ave., Rochester 11, N. Y.

Editor, *QST:*

. . . I wish to call to your attention that all the complaints, ill-feelings, etc., relative to the increase in membership dues is uncalled for so far as I am concerned. For my part, I'm willing any day to go along with the increase. I wonder if any of these complainers appreciate the expense in getting out WAC, DXCC, WAS, etc. certificates, Official Bulletins, OO, OPS, etc. There sure is a lot of work and expense involved in this work alone and I believe it would be impossible to cover all of this expense just on a magazine publication.

— *Bruce Kelley, W2QCP-W2ICE*

PREPAREDNESS DEMONSTRATION

225 Baker Ave., Webster Groves 19, Mo.

Editor, *QST:*

Our Maplewood Chapter, Order of DeMolay, for boys, requested the Egyptian Radio Club to put on a ham radio program for them. The policy of the club has long been one of promoting good will for amateur radio with the lay public and has embarked upon an educational program for the purpose, so the invitation from the boys was welcomed.

The master control station was set up at the Masonic Temple in Maplewood, a suburb of St. Louis. It was explained that most of the equipment used had seen service before in several flood emergencies, and was always available when needed. The main transmitter was a 25-watt 'phone job set up to operate on 10 meters with a 300-ohm dipole strung up across the stage in the auditorium. At the same

(*Continued on page 122*)

Operating News

F. E. HANDY, W1BDI, Communications Mgr.
J. A. MOSKEY, W1JMY, Asst. Comm. Mgr.
ALBERT HAYES, W1IIN, Natl. Emerg. Coordinator

GEORGE HART, W1NJM, Communications Asst.
A. F. HILL, JR., W1QMI, Communications Asst.
LILLIAN M. SALTER, Communications Asst.

The ARRL "DX Operating Code." Designated as Operating Aid No. 5, the ARRL DX Operating Code is printed in full this month in "How's DX?" It consists of two parts, one for foreign amateurs and one for W/VE amateurs, and is aimed at discouraging the common ill-advised practices of amateurs interested in DX work. Operating Aid No. 5 is printed on two sides of a card of QSL size, with the W/VE code on one side and the foreign code on the other, and is available free upon request of any amateur.

The points covered in this code were arrived at after consulting a cross section of DX operating amateurs in this country and foreign societies abroad. It is aimed at doing the greatest good for the greatest number. Foreign distribution will be emphasized. It is hoped that it will be followed by both W/VE and foreign amateur stations, and that it will result in making DX more enjoyable for everybody. Post a copy at your operating position and refer to it frequently when you are working DX.

Useful New Meanings and Changes in International Q Code. As indicated in "Happenings" last month, some modifications and extensions of Q Code approved at ACy for international usage became available as of the first of this year. The new ARRL *Handbook* will show some new wording of familiar Q signals, mostly of a minor character, however. One or two much-used signals have been changed in more than a minor way. Note below two new meanings. Amateurs, of course, will continue to answer QRI? with T1–9 in RST-system definitions.

QRI How is the tone of my transmission? The tone of your transmission is. . . . [1. good; 2. variable; 3. bad].
QRX When will you call me again? I will call you again at ..... hours [on .....kc.].

Four new signals in Q Code are noted to have meanings that could be used to great advantage in ham work. Write these down or clip them out and put them to work in your QSOs and net operations:

QSN Did you hear me [or .....] on .....?
QSI I have been unable to break in on your transmission.
QTV Shall I stand guard for you on ..... kc.?
QTX Will you keep your station open for further communication with me until further notice [*or* until ..... hours]? I will keep my station open for further communication with you until further notice [*or* until ..... hours].

28-Mc. Volunteers Wanted! All amateur operators who work ten-meter 'phone or c.w. will find it of interest to consider devoting some regular time to participation in a program to assist newcomers who are working for tickets to attain that goal. A list of club and individual stations and their periods for a Code Practice Program has been mimeographed and is available to any interested person on request. If you have a good station on "ten" wouldn't you like to take part and be listed in the next such compilation for *QST*? If so, notify ARRL by card or letter. Give your call, frequency, days of transmission through March and April, and indicate the speed ranges covered. The ARRL Training Aids section will be pleased to send you helpful suggestions and information calculated to assist in running any code-practice program if this is requested in indicating your tentative schedule. A strong ham radio constantly needs new amateurs who have the usual qualifications and know-how; do your part!

Best DX . . . and Sportsmanship in ARRL's 15th DX Competition. The annual DX fray starts this month. See rules, January *QST*, and data on simplified optional reporting form in this issue. If more hams like the new method, we may standardize on that type of reporting form next year. It's up to you.

Believe it or not, *how* one operates in a sporting event such as ARRL contests is *more important* to the decent individual participant *than what the score is.* Most entrants are inherently true sportsmen. This is constantly shown in the honest requests ARRL is always receiving for advice and interpretation of rules and proposed methods of working. ARRL is delighted to write participants on points raised at any time. Of course, a few entrants have from time to time kidded themselves that outsmarting the rules or the other fellow, or stretching rules to meet personal whim, or getting careless of rules or even going off frequency for personal benefit, is "the thing." There is automatic agreement of every participant in taking part in an ARRL contest that Contest Committee decisions and rulings are final, but regardless of this a few amateurs

seem to want to be radio lawyers and beat the game. Over the years a lot of disqualifications, reclassifications and interpretations on entries have been made, as facts from the fraternity at large required. In *more* cases, and in the final analysis, *local amateur public opinion* has put those who delude themselves on the spot. In the "SS," for example, we even have by letter a report of a visit one contestant paused to make to another's West Coast station during the contest. He found a man using "bright-orange" 450THs, who boasted that he would report as a 100-watt-level station! We pause to ask, "Who is kidding whom?" Not only the visitor but a majority of active hams in the local community certainly know where such a man fits, in their estimation.

If and when a larger number of amateurs is *like* that we shall (frankly) discontinue offering certifications and awards in the fields affected. In the meantime we call upon amateurs to show any such fellows up to their faces *locally*, to write them straight and to the point, with copies to the clubs the men belong to and to ARRL for information. Even where this has *not* been done, the data we receive show that when there are local cheaters they quickly are well-known, and the word quietly spread. How "tinsel" must *any* award or certification seem, if in a man's heart he knows he didn't compete fairly and squarely for the goal! Let us assure you, however, there are really fewer such men than alibis and talk might make you believe.

Please follow the spirit and letter of the contest rules. Make your operating also in accordance with the new DX Operating Code. Watch frequency and keep in the officially-designated amateur bands. Avoid parasites, clicks, chirps and poor notes; doing so will avoid FCC trouble and OO reports that, as usual, will disqualify. In conclusion, luck and DX in the 15th International DX Competition. *Have a good time*, and let's make it a *sporting proposition* all the way.

— *F.E.H.*

FIRST STORM OF SEASON PARALYZES MIDWEST COMMUNICATIONS

Amateurs between the Mississippi and the Rockies "turned to" with a vengeance between November 18th and 21st when an unseasonably-early blizzard destroyed wire lines throughout large areas of South Dakota, Iowa, Nebraska and Kansas. Hams manned portables at many towns, among them Sheldon, Rock Valley, Ireton and Milford, all in Iowa. Members of the several traffic and emergency nets throughout the area contributed to the successful handling of Red Cross, public-utility and railroad traffic and thus materially hastened the resumption of normal conditions. The liaison between the various nets and trunk lines was notably well above what it had been in many past emergencies of this nature, and thus virtually every amateur in the affected area was able to contribute materially to this fine demonstration of the ability of amateur radio to render a public service. The staccato crackle of high-speed c.w. circuits seemed to join with the precise diction of the 'phone traffic handlers in a symphony of unselfish and uncompensated devotion to duty.

The following amateur calls, while by no means a list of all participants, are indicative of the scope of the emergency: W4FWH; W5s GG, IZM, QT; W7s GCS, GTN; W8s CTC, PVB, RHZ, WXA, ZAW; W9s DAX, DFU, EGV, FGU, FRJ, GPS, GQS, KCW, MRY, WDK; WØs AA, AEH, AFQ, AHW, AID, ANU, BJL, BQJ, CC, CQC, CUL, DCC, DCK, DDM, DHO, DK, DNX, DOP, DQW, DRB, EDN, EFI, ELH, ENV, EUZ, EZR, FEE, FKB, FLM, FON, FP, FRE, FUH, GCT, GDC, GEP, HFT, HYR, ICV, IFR, IFX, IQY, IQZ, IXR, IYB, IYR, JAP, JDV, JDX, JED, JRJ, KAA, KLC, KQX, KRV, KSS, KVD, LDW, LJF, LOU, LRY, MGV, MHC, MNN, MOM, MTS, MXC, NBC, NCV, NGM, NKD, OEV, OVS, OWP, PBX, PGX, PHI, PHR, PNN, PP, PUE, PZK, QDX, QXR, RHQ, RMK, RNF, RQK, SQF, SQQ, SRR, SWI, TGF, TNX, TQD, TTL, TXY, TYR, UDG, UFL, UFP, UGD, UHC, UID, UMD, UQM, UVJ, VUV, VWP, WLM, WLY, YPN and YQR.

BRIEF

Talking about unification of the armed forces, KA1CF (USA), W4FVI/KX6 (USAF), W3NFB/KG6 (USN) and KG6DO (USMC) recently had a four-way rag-chew and made plans to set up an "Interisland Rag-Chewers Club."

♦

Those who have copied W6OWP during ARRL Qualifying Runs can attest to the high quality of his automatic keying. Here is the equipment that does it, with Bart himself checking the copy as the tape goes through the keying head. W6OWP's keying sounds just as perfect in casual rag-chewing, at which time he uses the electronic keyer described in *QST* for October, 1948 (p. 27).

♦

WITH THE A.E.C.

When a bridge across the Wisconsin River near Spring Green, Wis., collapsed in early November, all telephone communications between Spring Green, a community of 1000 families, and the outside world were interrupted for several hours. W9s ANM, BKD, ESJ, HOW and KIZ kept the town "in touch" until normal facilities were restored. This is another example of the type of emergency which *can* hit your community. QRV?

—•••—

Last year's Midwest blizzard emergency was the setting in which Indiana amateurs contributed directly to the saving of a life. A resident of Berne, Ind., suffering a sudden siege of hemorrhages after returning to his home from a hospital in Fort Wayne, was unable to summon help, the landwires being out of service, until the town's telephone operator suggested the assistance of W9HAV, the only ham in Berne. W9HAV had fortunately equipped his station with emergency power, and, with the assistance of W9BKJ and W9CLF, medical attention was provided in time. Preparedness pays off when wires are down!

TRAFFIC TOPICS

The Oregon Traffic Net is now open for business at 7:30 P.M. PST, Monday through Friday. Connections are available with the Pioneer Net and other regional nets and trunk lines.

—•••—

Some good operating under difficulty was done during the SS Contest. VE3ATR had a rush message for Hull, Que., regarding a seriously-ill person. With the assistance of VE2BB, the message was delivered and an answer obtained and delivered within one and a half hours. The family of the addressee at Hull obtained the information in time to make the trip to be at the bedside. The messages went through speedily, even with the large amount of QRM during the contest.

—•••—

Traffic Outlet is now operating on a team basis. Each section represented has a team whose members assist by reporting into TO. The captain of each team takes the responsibility for having a station assigned to represent his section during each night of operation. It is suggested that other nets might try the team idea to insure coverage of specific localities.

28-MC. CODE-PRACTICE STATIONS

The following is a *new* list of amateur stations transmitting code practice on 28 Mc. and higher frequencies. This list supersedes all previous lists. A handy mimeographed copy is available upon request:

W1LDD, Charles T. Fernandez, 81 Warren St., Roxbury 19, Mass., 144.026 Mc., Mon., Wed., Fri., 8:00 P.M. EST, until May, 1949, 5-10-18-20-30 w.p.m.

W1NEM, Hartford County Amateur Radio Assn., Hartford, Conn., 29,000 kc., Tues. & Thurs., 7-8 P.M. EST, A-2 & A-3.

W1PFA, W. C. Loeffler, 181 Lowell, Methuen, Mass., 29.5 Mc., 8 P.M. EST, Monday.

W2NHB, A. F. Persichetty, 67 Hunton St., Dongan Hills, N. Y., 28.5 Mc., 7:30-8:30 P.M. EST, Mon., Wed.

Andrew Jackson High School Amateur Radio Club (W2VRC, W2YHB, W2YCY), 116th Ave. & Francis Lewis Blvd., St. Albans 11, N. Y., 29.5 Mc., 2:00 P.M. EST, Monday thru Friday.

Radio Assn. of Western New York (various member stations), 28,600 kc., 9:00 P.M. EST, Mon., Wed., Fri.

W7FST, Charles W. DeRemer, Route 2, Box 358, Clearfield, Utah, 29,000 kc., 3:00-4:30 P.M. MST, daily except Saturday, Sunday & holidays, progressive speeds.

W8KQE, M. L. Sliker, RFD 3, Drake Rd., Bedford, Ohio, 28,657.5 kc., Wed., Fri., 8:00-8:30 P.M. EST, 8-15 w.p.m.

WØFQB, A. R. Gaeth, 6105 N. 37th, Omaha 11, Nebr., 11-meter band, Mon., Wed., Fri., 7:30-8:00 P.M. CST.

WØMXC, Charles Bove, 1611½ E. Lake St., Minneapolis, Minn., 29,300 kc., 9-10 P.M. CST, Mon., Wed., progressive speeds.

WØOAQ, K. B. Dolsberry, 315 S. 5th St., Leavenworth, Kans., 29,084 kc., 8-9 P.M. CST, Mon., Thurs.

WØQHX, R. A. Brown, South Park, Rapid City, S. Dak., 28.9 Mc., 9 P.M. CST, Mon., Wed., Thurs.

VE3RU, A. J. Bickerton, 444 Winnett Ave., Toronto 12, Ont., 28,240 kc., 7:30 P.M. EST, Monday.

Schedules of other stations sending code practice on 28 Mc. and higher are solicited. Complete information on sending such practice is available upon request. The above list will be supplemented on these pages from time to time.

During the annual celebration in honor of the late Ezra Meeker, pioneer and writer, who did much to "open" the Pacific Northwest, members of the Valley Radio Club of Puyallup, Washington, set up an emergency-powered station to handle traffic for the many celebrants on August 6th and 7th. Illustrated at the installation are (*l. to r.*) W7MCU, W7MPH, W7IVJ, W7IYU, W7EHJ, W7KHL. Other participants in the demonstration of the amateur's ability to render public service were W7HZ, W7JJK, W7HMQ, W7LEC, W7MTX and W7CKT.

CODE PROFICIENCY PROGRAM

Effective during the month of February and continuing thereafter, W6OWP's Qualifying Run transmissions on 3590 and 7248 kc. will be sent approximately two weeks earlier each month than those of W1AW and WØTQD. The next qualifying run *from W6OWP only* will be transmitted on February 4th at 1900 PST on the above frequencies. On Saturday, March 5th, W6OWP will again transmit a qualifying run on the same frequencies and time. For additional dates, see the ARRL Activities Calendar elsewhere in this issue. These W6OWP-only runs will have different text from the runs sent by W1AW and WØTQD, but copy will be handled in exactly the same way as the transmission from W1AW and WØTQD.

The next qualifying run from W1AW/WØTQD will be made on February 15th at 2200 EST. Identical texts will be sent simultaneously by automatic transmitters. Frequencies of transmission from W1AW will be 3555, 7215, 14,100, 28,060, 52,000 and 146,000 kc., from WØTQD 3534 kc.

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 10:00 P.M. 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 December *QST:*
Feb. 2nd: *Building a Series-Tuned VFO Unit*, p. 11
Feb. 4th: *New Life for Old Receivers*, p. 16
Feb. 7th: *TVI from 21 Mc.*, p. 20
Feb. 10th: *A V.H.F. Man's VFO*, p. 23
Feb. 15th: Qualifying Run, 10:00 P.M. EST
Feb. 16th: *More on TVI Elimination*, p. 29
Feb. 18th: *The Navy and the Amateur*, p. 36
Feb. 22nd: *DX Holiday in San Marino*, p. 37
Feb. 24th: *Jungle Job — 100 Watts*, p. 39
Feb. 28th: *Mobile in Miniature*, p. 44

MEET THE SCMs

The occasion of the Midwest Division Convention provided the photo for our column this month. Shown above exchanging greetings at Wichita are, left, Alvin B. Unruh, WØAWP, retiring Kansas SCM, and Earl W. Johnston, WØICV, his successor, who took office October 29th. Both are well-known Midwest Division amateurs.

"Abie" Unruh was SCM of Kansas from 1940 until his recent retirement. For the past year he has also been an assistant director of the division. A radio amateur since 1923, he held the call 9BIO until 1925, at which time he was assigned the call 9AWP. Until late 1945 he served as an electronic test engineer at Boeing-Wichita Airplane Co. Following this he worked as c.w. operator at KGPZ, the Wichita police. In April of 1948, he returned to Boeing, where he is now employed as supervisor of the electronic test group.

WØAWP operates both 'phone and c.w. An ART-13 has been modified to serve as an exciter to drive any one of four final amplifiers running 300 to 500 watts. Ham interests center around rag-chewing, DX, and contest work. "Abie's" operating achievements include WAC, WAS, RCC, and a 35-w.p.m. Code Proficiency Award.

Also an old-timer, "Erl" Johnston, WØICV, has been a ham since 1931. A graduate of Kansas University, he has been associated with the Topeka Police Dept. for many years. He now is chief of the radio division of the department. The 'phone and c.w. transmitters in use testify to his design and construction engineering ability.

Prior to his election as SCM, Earl was EC for Kansas Zone 3. In 1947 he accepted appointment as Kansas PAM. Since then he has organized an active and enthusiastic 'phone net that is second to none. He was president of the Kaw Valley Radio Club in 1942 and is now its vice-president and treasurer.

The transmitters in use at WØICV are as follows: HT-18 exciter-807-35T-p.p. 75Ts, modulated by 811s; HT-18-804-8005, modulated by 5514s; 6L6-807 with 6N7 modulator; 6F8-6L6-807, 6N7 modulator, for 28.5 Mc. mobile. The receiver is an NC-173 with an R-9er and a 6-10 Gonsett converter. For emergency work, the two 807 rigs and the 173 are powered by dynamotors. Antennas include a 75-meter doublet, a 66-foot end-fed wire, 14-Mc. folded twin triplex, and three-element beams for 6 and 10 meters.

As minor hobbies, "Erl" enjoys fishing, hunting, football and baseball.

HIGH 1948 "SS" SCORES

Another ARRL Sweepstakes has become part of amateur contest history; added to that history by the 15th SS were operating achievements and broken records galore! Competition was the keenest ever and the bands from 3.5 through 28 Mc. abounded with stations busily engaged in making SS exchanges. Contact totals in both the c.w. and 'phone portions of the contest were broken by wide margins, indicating that participation will probably set a new all-time high.

The leading claimed score in the c.w. section was submitted by Larry LeKashman, W2IOP. Larry worked 1025 stations and all 72 League sections for a grand total of 183,690 points. W3BES placed a close second; Jerry topped W2IOP's QSO total by seven contacts, worked 71 sections to score 183,180. Third-place c.w. honors seem assured for W3DGM, who had 945 QSOs with 71 sections for 167,560 points. The performance of W4KFC deserves special mention. Vic worked 1067 stations to chalk up an all-time high SS contact record. He used high power in this SS as an experiment in order to compare the results with those he has come to expect from low power.

Top claimed score among the 'phone participants was reported by W6QEU — 83,896 points, 601 contacts, all sections worked. Also with 601 QSOs, W6QGZ worked 66 sections and scored 78,936 as runner-up. W1GKJ, with 70,005 points, reported the third-highest 'phone score.

On c.w. the only participants to claim all 72 sections worked were W2IOP and W6HZT (operated by W6HJT). Among the other high-scoring c.w. entrants, eleven claimed 71 sections. Three 'phone contestants, W6QEU, W1ATE and WØGZD, claimed all sections.

The following listings show score, stations worked, and sections worked. All figures are *claimed* by the contestants and are subject to further checking. Final results will appear in a later issue of *QST*.

C.W.

W2IOP	183,690–1025–72	W3BXE	125,063–725–69
W3BES	183,180–1032–71	W8RSP	124,862–722–70
W3DGM	167,560–945–71	W6MVQ	124,425–711–70
W6HZT	164,070–922–72	W3HUS	124,250–725–70
W9FOI	160,193–908–71	W8ROX	124,034–745–67
W9RQM	156,289–887–71	W4NNN	123,338–716–69
W4KFC	149,100–1067–70	W9LVR	122,820–713–69
W6IFW	144,662–817–71	W9CYU	122,220–860–70
W9FJB	143,288–830–69	W2PWP	122,150–698–70
W6AOA	140,875–805–70	W2FBA	122,130–708–69
W6WNI	140,613–808–70	W7GEB	121,888–700–70
W4KUX	139,400–820–68	W3FKT	121,193–735–66
W4JFE	139,060–821–68	WØJNC	121,095–702–69
W8PQK	133,480–760–71	WØYCR	121,027–737–66
W3GAU	131,921–744–71	W1JYH	120,097–717–67
W2BXA	131,794–746–71	W6KRI	119,340–702–68
W7KEV	131,655–787–67	W6EPZ	119,280–840–71
W1RY	131,338–752–70	W3JTC	119,048–722–66
W9ERU	130,113–744–70	W3CPV	118,162–685–69
W2HEH	127,978–722–71	W8OYI	117,425–671–70
W7FZA	126,469–723–71	W2GFG	117,300–680–69
W9FWS	117,250–700–67	W7QAP	107,535–647–67
W9OLU	115,913–703–66	W1DHD	107,326–800–68
W5KC	115,500–702–66	W8OZA	106,943–680–63
WØFRE	114,540–671–69	W3FQB	106,760–629–68
W3FQZ	114,195–668–69	W3EIV	106,420–627–68
W1BIH	113,575–650–70	W1EZ	106,080–624–68
W2IMU	113,100–696–65	W1MJL	105,455–667–66
W1KYK	112,710–665–68	W2OXX	105,274–630–67
WØRYJ	112,472–833–68	W3KT	105,225–610–69
W3ARK	112,058–670–67	W1TS	112,125–650–69
W9WEN	111,870–680–66	W3GJY	105,185–618–68
W2AYJ	111,690–657–68	VE3VO	104,125–613–68
W3FUF	110,160–650–68	W4IA	103,615–611–68
W9NII	109,193–633–69	W5MMT	102,343–615–67
VE3KE	109,055–645–68	W9OAT	101,227–614–66
W3EIS	108,244–628–69	W4IIY	101,065–596–68
W1EOB	107,780–616–70	W9GRV	100,800–720–70
W2PIN	107,703–643–67	W4LUE	100,732–611–66
		W2PJM	100,500–600–67

'PHONE

W6QEU	83,896–601–72	WØBIW	34,272–272–63
W6QGZ	78,936–601–66	W3DHM	34,222–241–71
W1GKJ	70,005–538–65	W4IWO	34,125–265–65
W1ATE	66,888–465–72	VE3AIU	33,741–247–69
W6TT	65,008–478–68	W4AQR	32,757–179–61
W6PWR	62,160–455–70	W7JGS	31,992–255–62
W8HUD	61,344–427–72	W4KCQ	31,746–241–66
W8TRN	58,920–491–60	W7MLJ	31,395–242–65
W6CHV	56,520–315–68	W2SKE	31,350–245–66
W9RBI	56,000–320–70	W5BDI	30,558–233–66
W4JYB	54,437–329–67	WØJYW	30,355–234–65
WØFUH	49,929–289–69	W5LMH	29,382–254–59
W6WTL	49,536–388–64	W7ENA	29,175–196–60
WØGZD	48,240–335–72	VE3RM	29,051–191–61
WØOMG	47,110–338–70	W8TAJ	28,928–235–64
W5FAG	46,356–295–66	WØBNU	27,900–187–60
WØSBE	45,126–327–69	W8NCV	27,279–219–63
W7IXL	45,061–308–59	W5EHR	27,153–216–63
W1BFB	39,065–303–65	K6NMC	26,944–211–64
W5FH	38,919–240–65	W7MAW	26,931–208–53
W5SMA	38,740–300–65	W2ROM	25,970–199–65
W7EYD	37,317–254–59	W1PKV	25,572–193–53
W1HRI	35,650–230–62	W2PVG	25,326–201–63
VE6NA	35,123–230–63	W4CYC	25,025–193–65

BRASS POUNDERS LEAGUE

(November Traffic)

Call	*Orig.*	*Del.*	*Rel.*	*Extra Del. Credit*	*Total*
W5GZU	7	26	1298	2	1333
WØHMM	15	8	1206	3	1232
W7CKT	0	15	790	12	817
W6BYS*	5	49	672	49	775
W6CXD*	638	—	6	—	644
W6FDR	18	136	330	130	614
W7CZY	27	45	529	6	607
W6REB	18	26	542	16	602
W7BED	15	23	530	17	585
W2RUF	21	27	496	17	561
W2LRW	5	22	502	18	547
W7KWC	11	8	488	6	513
W6DDE	17	133	226	130	506

The following made the BPL with over 100 "deliveries plus extra delivery credits":

W1QMI 232	W1NJM 147	W3ECP 111
W1BDI 179*	W3NHI 127	W2OEC 102
W1HN 153	KG6DI 125	

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

* October Traffic.

COUNTRIES-LIST CHANGES

Since the adoption of the ARRL Postwar Countries List, the official standard used in connection with the annual DX Competition and the DX Century Club, several changes have been reported in this department. We are pleased to announce the addition of two more countries to the list: Norfolk Island, VK9, and Vatican City, HV1. Make these changes on your list and watch the Operating News department for further changes and additions.

DX CENTURY CLUB AWARDS

DXCC certificates based on postwar contacts with 100-or-more countries have been issued to the amateurs listed below. The countries-worked totals indicated have been certified by examination of written evidence under the award rules as published in March 1947 *QST*.

HONOR ROLL

W1FH	210	W8HGW	190
W3BES	197	W4BPD	187
W6VFR	194	W1CH	184
W2BXA	191	W3GAU	184
G2PL	191	W6SAI	181

NEW MEMBERS

G3DO	139	OK1PN	104
VK5JS	126	W6YZU	103
G2AKQ	123	W8CLM	103
OZ7EU	119	W9CIA	103
G2VD	119	G6GH	102
HB9X	118	W8CEI	102
W3HOX	113	W2OMS	102
G6RC	112	W6PQT	102
W8TTS	111	HB9FE	102
W4ML	110	PK6HA	101
LU8EN	109	G3VA	101
HB9EU	108	W9MZP	100
W8BWC	107	W9TJ	100
W2PQJ	107	W3WU	100
W1GKK	107	VE3IJ	100
W4FVR	106	VE7AAD	100
MI3ZJ	105	I1LT	100
W6MVQ	105		

ENDORSEMENTS

W6EBG	180	W3OP	131
W6SN	163	W1CLX	131
W1ENE	151	W2PUD	130
W4BRB	150	W6RM	130
W9KOK	150	W1RY	127
W2ALO	150	W1LOP	124
W6AIW	142	W2RDK	121
W1BIH	141	W1FJN	120
W4DKA	140	HB9J	120
W6PB	131	G6LX	113

RADIOTELEPHONE HONOR ROLL

W1FH	171	XE1AC	136
W6DI	150	W2AFQ	135
W4CYU	148	W1HKK	131
W1JCX	143	W2BXA	130
G2PL	140	W6VFR	130

NEW MEMBERS

W8HGW	123	LU6AJ	103
G3DO	117	W4KYB	102
GM2UU	114	I1RM	102
W2ZX	106	W2RTX	101
W6MJB	108	W6MBD	101

ENDORSEMENTS

W1LMB	120	W8KML	120

ELECTION NOTICE

(To all ARRL Members residing in the Sections listed below:)

You are hereby notified that an election for Section Communications Manager is about to be held in your respective Sections. This notice supersedes previous notices.

Nominating petitions are solicited. The signatures of five or more ARRL full members of the Section concerned, in good standing, are *required* on each petition. No member shall sign more than one petition.

Each candidate for Section Communications Manager must have been a licensed amateur for at least two years and similarly a full member of the League for at least one continuous year immediately prior to his nomination.

Petitions must be in West Hartford, Conn., on or before noon on the closing dates specified. In cases where no valid nominating petitions were received in response to previous notices, the closing dates are set ahead to the dates given herewith. The complete name, address, and station call of the candidate should be included with the petition. It is advisable that eight or ten full-member signatures be obtained, since on checking names against Headquarters files, with no time to return invalid petitions for additions, a petition may be found invalid by reason of expiring memberships, individual signers uncertain or ignorant of their membership status, etc.

The following nomination form is suggested:

Communications Manager, ARRL [Place and date]
38 La Salle Road, West Hartford, Conn.

We, the undersigned full members of the.....
.....ARRL Section of the.....
Division, hereby nominate.....
as candidate for Section Communications Manager for this Section for the next two-year term of office.

Elections will take place immediately after the closing dates specified for receipt of nominating petitions. The ballots mailed from Headquarters to full members will list in alphabetical sequence the names of all eligible candidates.

You are urged to take the initiative and file nominating petitions immediately. This is your opportunity to put the man of your choice in office.

—*F. E. Handy, Communications Manager*

Section	*Closing Date*	*SCM*	*Term Ends*
Oregon	Mar. 1, 1949	Raleigh A. Munkres	Nov. 22, 1948
San Diego	Mar. 1, 1949	Irvin L. Emig	Dec. 16, 1948
Yukon	Mar. 1, 1949	W. R. Williamson	Mar. 17, 1949
Western Pennsylvania	Mar. 1, 1949	Ernest J. Hlinsky	Mar. 17, 1949
Md.-Del.-D.C.	Mar. 1, 1949	Eppa W. Darne	Mar. 21, 1949

ELECTION RESULTS

Valid petitions nominating a single candidate as Section Manager were filed in a number of Sections, as provided in our Constitution and By-Laws, electing the following officials, the term of office starting on the date given.

Alaska	Charles M. Gray, KL7IG	Sept. 15, 1948
Sacramento Valley	Ronald G. Martin, W6ZF	Nov. 1, 1948
South Carolina	Ted Ferguson, W4BQE/ANG	Dec. 2, 1948
Oklahoma	Frank E. Fisher, W5AHT/AST	Dec. 15, 1948

In the Western Massachusetts Section of the New England Division, Mr. Prentiss M. Bailey, W1AZW, and Mr. H. M. Baier, W1NY, were nominated. Mr. Bailey received 85 votes and Mr. Baier received 79 votes. Mr. Bailey's term of office began November 10, 1948.

In the Eastern New York Section of the Hudson Division, Mr. Fred Skinner, W2EQD, and Mr. Ward Alexander, W2NHY, were nominated. Mr. Skinner received 119 votes and Mr. Alexander received 111 votes. Mr. Skinner's term of office began November 30, 1948.

In the Saskatchewan Section of the Prairie Division, Mr. J. H. Goodridge, VE5DW, and Mr. Harold Horn, VE5HR, were nominated. Mr. Goodridge received 43 votes and Mr. Horn received 33 votes. Mr. Goodridge's term of office began December 15, 1948.

Section Emergency Coördinators of the ARRL Emergency Corps

The Section Emergency Coördinator is appointed by the SCM to take charge of the promotion of the ARRL Emergency Corps organization throughout the Section. He acts as the SCM's executive in the furthering of provisions for emergency amateur radio communications in every community likely to suffer in case of a communications emergency. One of the duties of the SEC is to recommend the appointment of Emergency Coördinators for the various communities in his Section. Does *your* town have an EC? If not, recommend the name of a likely prospect to the SEC. The SEC invites your questions concerning the status of the AEC in your Section.

ATLANTIC DIVISION				
Eastern Pennsylvania	W3BXE	Jack Du Bois	4105 E. Elbridge	Philadelphia 44
Maryland-Delaware-D.C.				
Southern New Jersey				
Western New York	W2SJV	Edward G. Graf	81 King St.	Tonawanda
Western Pennsylvania	W3UST	Samuel S. Turner	2700 Walnut St.	McKeesport
CENTRAL DIVISION				
Illinois	W9QLZ	George E. Keith	RFD 2, Box 22A	Utica
Indiana	W9WNM	H. E. McClellan	R.R.12, Pigeon Creek Blvd.	Evansville
Wisconsin	W9LZU	Curtis C. Schultz	3268 North 8th St.	Milwaukee 6
DAKOTA DIVISION				
North Dakota	WØSSW	John Glass	601 17th	Bismarck
South Dakota	WØHDO	Coy J. DeLapp	c/o Montgomery Ward	Mitchell
Minnesota	WØGLA	Frank Mayer	511 St. Joe St.	Rapid City
DELTA DIVISION				
Arkansas	W5EA	Leo V. Brians		Carlisle
Louisiana	W5KTE	James M. Coleman	3839 State St. Drive	New Orleans
Mississippi	W5JHS	Norman B. Feehan	Box 491	Gulfport
Tennessee	W4FCF	Milton N. McCoy	1775 Madison Ave., #28	Memphis
GREAT LAKES DIVISION				
Kentucky	W4BEW	E. G. Leachman	1314 Maryland Court	Ashland
Michigan	W8GJH	Francis E. Gary	620 Thayer St.	Flint
Ohio	W8UPB	D. E. Cartwright	2979 Observatory	Cincinnati 8
HUDSON DIVISION				
Eastern New York	W2EQD	Fred J. Skinner	500 Wolfs Lane	Pelham
N.Y.C. & Long Island	W2BGO	V. T. Kenney	3330 Fenton Ave.	Bronx 67
Northern New Jersey	W2IIN	John J. Vitale	57 Sayre St.	Elizabeth 3
MIDWEST DIVISION				
Iowa	WØFP	T. J. Innis	R.R. 1, Lincoln Rd.	Bettendorf
Kansas	WØPAH	W. G. Schrenk	1528 Pierre St.	Manhattan
Missouri	WØVRF	O. H. Huggins	3605 East 72nd St.	Kansas City
Nebraska	WØMLB	Marvin Olson	305 West 24th St.	Kearney
NEW ENGLAND DIVISION				
Connecticut				
Maine	W1LNI	Russell H. Lowd	28 Dennett St.	Portland 5
Eastern Massachusetts	W1BL	Raymond E. Boardman	53 Thurston Rd.	Newton Upper Falls 64
Western Massachusetts	W1UD	Isaiah Creaser	76 Cortland St.	Springfield 9
New Hampshire	W1APK	Basil F. Cutting		Pembroke
Rhode Island	W1MIJ	Carl M. Getter	96 Oakland Ave.	Providence 8
Vermont	W1NLO	Burtis W. Dean	P.O. Box 81	Burlington
NORTHWESTERN DIVISION				
Alaska				
Idaho				
Montana	W7EMF	William Whipple	1953 Warren Ave.	Butte
Oregon	W7HLF	Dwight J. Albright	Box 508	Medford
Washington	W7GP	Allen D. Gunston	7209 Wright Ave.	Seattle 6
PACIFIC DIVISION				
Hawaii				
Nevada	W7JU	R. T. Warner	539 Birch St.	Boulder City
Santa Clara Valley				
East Bay	W6OBJ	Omar Day	1441 81st Ave.	Oakland
San Francisco	W6DOT	Gene J. Pera	27 Gaviota Way	San Francisco
Sacramento Valley	W6KME	E. J. Schoenbackler	1622 Que St.	Sacramento
Philippines				
San Joaquin Valley	W6JPS	J. A. Ross	1910 West McKinley	Fresno
ROANOKE DIVISION				
North Carolina	W4KJS	C. E. Beard	2824 Bon Air	Winston-Salem
South Carolina	W4ANK	T. Hunter Wood	Route 6, Box 526-A	Naval Base
Virginia	W4KDV	Fred S. Howell	15 Mitchell Rd.	Cavalier Court, Hampton
West Virginia	W8FMU	Raymond L. Wardle	501 Pythian St.	Morgantown
ROCKY MOUNTAIN DIVISION				
Colorado				
Utah-Wyoming	W7UTM	Floyd L. Hinshaw	165 East 4th North	Bountiful, Utah
SOUTHEASTERN DIVISION				
Alabama	W4MAB	Edgar R. Christopher	813 12th St.	Tuscaloosa
Eastern Florida	W4DQW	Robert E. Lowery, jr.		Cortez
Western Florida	W4ACB	S. Monte Douglass	P.O. Box 3	Tallahassee
Georgia	W4BIW	Byron Lindsey	2909 N. Futon Dr., N.E.	Atlanta
West Indies (Cuba P.R.-V.I.)	KP4AM	Roger M. Wilson	P. O. Box 3067	Santurce, P.R.
Canal Zone	KZ5GD	George C. Dunlap	Box 28	Balboa Hts.
SOUTHWESTERN DIVISION				
Los Angeles	W6UXN	Roy Brady	618 E. Buckthorne	Inglewood
Arizona	W7JPV	Howard Chambers	Route 4, Box 99	Tucson
San Diego	W6DUP	Raymond Wieveg	4081 Jewel Drive	Pacific Beach
WEST GULF DIVISION				
Northern Texas	W5AAO	James A. Lee	801 Hickory St.	Abilene
Oklahoma	W5AHT/AST	F. E. Fisher		Pawhuska
Southern Texas	W5BUV	Chester A. Murgatroyd	205 Gillette Blvd. Route 12, Box 628	San Antonio
New Mexico	W5ZM/ZU	G. M. Sayre	New Mexico Military Institute	Roswell
MARITIME DIVISION				
Maritime (Nfld. & Labr. att.)	VE1FQ	L. J. Fader	125 Henry St.	Halifax, N. S.
ONTARIO DIVISION				
Ontario	VE3KM	T. W. Clemence		Bartonville, Ont.
QUEBEC DIVISION				
Quebec	VE2QQ	Rupert K. Grant	72 Hudson St.	Town of Mount Royal, P. Q.
VANALTA DIVISION				
Alberta	VE6MJ	Sydney T. Jones	Box 373	Edmonton, Alta.
British Columbia	VE7ID	R. O. Norman	8090 Main St.	Vancouver, B. C.
Yukon				
PRAIRIE DIVISION				
Manitoba				
Saskatchewan				

September V.H.F. QSO Party

V.H.F. contest enthusiasts had their third opportunity in 1948 to match skill and equipment against others in their respective ARRL sections during the V.H.F. QSO Party of September 25th and 26th. Like the January V.H.F. SS and the May QSO Party, the September affair was one in which participants competed for section certificate awards. An award is being made to the top-scoring amateur in 28 of the 29 ARRL sections from which activity was reported.

The scoring system for this contest was the same as that used in the May party, thus there is a basis for comparing scores in the two activities. Jim Thayer, W1FZ, was the outstanding operator and topped the highest score made in the May party by making 130 contacts and a multiplier of 15 for a total of 2070 points. Operations were conducted on 50, 144 and 235 Mc. from the summit of Blue Job Mountain (antenna altitude of 1400 feet above sea level) at Farmington, N. H. In order to get W1FZ/1 on the air it was necessary to pack all equipment, including a 180-pound 500-watt gasoline-driven generator unit, about one-half mile up the mountain. Gear was set up in a fire lookout tower with a two-over-six rotary-beam combination mounted through a trap door in the roof; a five-element 220-Mc. beam was mounted out one of the side windows. Input on 6 and 2 meters was about 75 watts, and 24 watts on 220 Mc. The rigs used a 2E26 final on "6," an 829 on "2," and an HY-75 oscillator provided a signal on "1¼." W1DGV and Hervey Varney of Farmington assisted in setting up the gear.

Second-highest score was made by W1CTW, top man in the May party. Cal chalked up 1690 points from 106 contacts and a multiplier of 13. Scores in excess of 300 points were made by the following: W2NSD 1690, W2IQQ 1248, W1QXE 1196, W1HDQ 986, W1MHL*[1] 666, W1AQE 444, VE3AIB 426, W1QYV 405, W1BDF 390, W1JSM 384, W9OBW 354, W1QGH/1 348.

The contact totals of the previous two contests were topped by W2NSD, who had 146 QSOs, all on 144 Mc. Next in line with 50 or more QSOs: W1FZ/1 130, W1MHL*[1] 111, W1CTW 106, W2IQQ 104, W1QXE 92, W1AQE 74, VE3AIB 71, W2QED 70, W1BDF 65, W1JSM 64, W1QGH/1 58, W1MUD W9ONO VE3ASE 55, W1HDQ 54, VE3AQG 52, W9OBW 51, W1MCR W1SS/1* W2HNN 50.

Taking advantage of the premium offered for working more than one band, the following used 50, 144 and 220 Mc. to make the high multipliers: W1HDQ 17, W1FZ/1 15, W1CTW 13. W1QXO, W1RO and W2IQQ each used 50 and 144 Mc. and had multipliers of 13, 13 and 12 respectively. W2NSD's multiplier of 10 deserves special mention as the highest accomplished through operation on one band.

We look forward to new v.h.f. score records in the Second Annual V.H.F. Sweepstakes which will have been held shortly before you receive this issue. Refer to "The World Above 50 Mc." in March *QST* for the highlights of that competition. Also, mark your calendar to reserve the week end of June 4th-5th for another v.h.f. contest.

SCORES

(Scores are grouped by divisions and sections. . . . The operator of the station first-listed in each section is winner for that section. . . . The number of contacts and the multiplier are given following the score. . . . Letters indicate band or bands used: A for 50, B for 144, C for 235, and D for 420 Mc.)

ATLANTIC DIVISION

E. Pennsylvania

W3ISE	230-	46-	5-AB
W3FXG	204-	34-	6-AB

Md.-Del.-D.C.

W3HB	36-	12-	3-B
W3AHQ	30-	15-	2-B
W3KOU	16-	16-	1-B
W3MIR	12-	6-	2-B

Southern New Jersey

W2QED	280-	70-	4-B

W. New York

W2QNA	288-	48-	6-AB
W2HNN	275-	55-	5-B
W2SXY*	115-	23-	3-B
W2YCH	104-	26-	4-B
W2UTH/2	92-	23-	4-AB
W2UXP	42-	21-	2-B
W2FFU	18-	9-	2-B
W3LWN	15-	5-	3-B
W2FMX/2*	4-	2-	2-B

W. Pennsylvania

W3RUE	234-	39-	6-B
W3PGV	210-	35-	6-B
W3KWH	176-	44-	4-B
W3MQW	32-	16-	2-B
W3CJF	22-	11-	2-B
W3MMY*	20-	10-	2-B

CENTRAL DIVISION

Illinois

W9OBW	354-	51-	6-ABC
W9ONO	220-	55-	4-B
W9KCW	156-	39-	4-B
W9JAF	132-	33-	4-B
W9WJM	116-	29-	4-B
W9RTY	51-	17-	3-B

DAKOTA DIVISION

Minnesota

WØKPO	5-	5-	1-B

GREAT LAKES DIVISION

Kentucky

W4FBJ	28-	7-	4-B
W4KKG	21-	7-	3-B

Michigan

W8TIC*	28-	7-	4-B
W8DIV	15-	5-	3-B
W8APG	14-	7-	2-A

Ohio

W8UKS	240-	48-	5-B
W8RDZ	12-	6-	2-AB
W8VOZ*	12-	6-	2-A
W8WRN	18-	9-	2-B

HUDSON DIVISION

E. New York

W2LUB	4-	4-	1-B
W2EFU	76-	19-	4-B

N.Y.C. & L.I.

W2NSD	1460-	146-	10-B
W2DZR	220-	44-	5-B
W2CET	128-	32-	4-B
W2WLS	56-	14-	4-B

N. New Jersey

W2IQQ	1248-	104-	12-AB
W2OOC	138-	23-	6-B
W2CEE	55-	11-	5-B

MIDWEST DIVISION

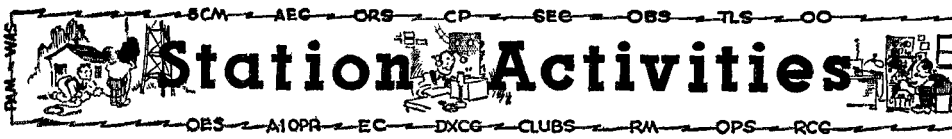
Nebraska

WØOKQ	2-	2-	1-A

* *Not entered in contest; report submitted for checking purposes only.*

[1] Waltham Amateur Radio Assn., 5 operators.

(*Continued on page 106*)



• 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 — The new North East Radio Club meets the 1st and 3rd Mondays of the month at 4740 Frankford Ave. at 8:30 P.M. The Philadelphia Wireless Association is prompting an educational program for prospective hams. The officers of the club are HLZ, pres.; Charles Antrim, vice-pres.; OTT, secy.; William Ellis, treas. This club now is affiliated with ARRL. OYP, ex-2YRY, is 15 years old and is helping to form a radio club at N.E. Catholic H.S. He will see you on 28 Mc. AQN has appointed eight Assistant ECs. ITW received his WAC and WAS the same day. QRM spoiled the FMT for CAU. The Philadelphia Hobby Show gave the traffic totals quite a lift. GAG handled 328 messages in one week. ORJ is a new-comer in Ashland, Pa. He works 3.5-Mc. with a Hammarlund 4-20. NNV receives good local reports with just an HT-18 n.f.m. attached to his beam. IRJ and MOV put up towers for 28-Mc. beams. LZP, of Collingdale, uses 100 watts to an 809 and is lacking North Dakota, Utah, and Arizona for WAS. LJ is ex-W8LJ-8AVO-9ZZN and has a pair of 4-125s. on 28-Mc. 'phone running 300 watts. The transmitter is a rack job and feeds a three-element beam. The West Philadelphia Radio Assn. boasts two YL members. Meetings have been changed to the 1st and 3rd Tuesdays in order not to conflict with the Chester Club meetings. The officers are: COZ, pres.; BXD, vice-pres.; IUD, secy.-treas. NHI makes the BPL on deliveries. BXE reports increased AEC activity. ISE took the fatal leap. Congrats, Warren. Traffic: W3VMF 328, NHI 261, DZ 177, ELI 118, QEW 100, WTS 68, AQN 36, BXE 34, CUL 27, EU 26, VR 24, ADE 23, AXA 17, CAU 7.

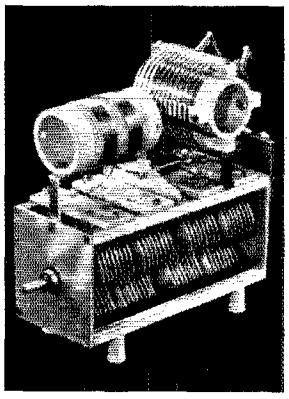
MARYLAND-DELAWARE-DISTRICT OF COLUMBIA — SCM, Eppa W. Darne, W3BWT — The Washington Mobile Radio Club's present officers are: NL, pres.; KRN, secy.-treas.; and CDL, traffic mgr. The Washington Radio Club's first November meeting featured a "Symposium of Variable Frequency Oscillators," conducted by Ed Bissell, MSK. At the second November meeting EIS, the club president, and MCG gave talks on "Conversion of Surplus Radio Gear," a timely subject which was very much enjoyed by the membership. BWT, the SCM, spoke on the Governors-President Relay and plans for same. The Baltimore Amateur Radio Communications Society has new quarters in the Red Cross Bldg. and meets the first and third Mondays of each month. The Baltimore Mobile Group has twelve mobile and four fixed control stations on 28 Mc. as an emergency net, headed by BII. In the future the BARCS will have an auction night the first meeting of each month at which time members can dispose of unused gear. The second meeting will be devoted largely to lectures and films, and discussions of technical subjects. The "MDD" Section Net has been operating nicely since mid-September on Mon., Wed., and Fri. at 7:30 P.M. using 3650 kc. Regulars on same are ECP, MJQ, QL, AKB, MYM, GZH, NT, JZY, and JHW. The regular net members have many other contacts with nets, trunk lines, and individual schedules and our "MDD" Net acts as an interchange point in a vast network of trunk lines. AKR has had to limit operating time to Sunday nights on 7 Mc. Barbie and Dick, MAX/OQF, have a new jr. operator. NT and EYX are newly-appointed ORS. GBB puts code lessons on 29 Mc. Tuesday and Wednesday at 9:00 P.M. IFW is on 28 Mc. IEM works in Swing Shift Net, 7 Mc. daily. IZ has a three-element beam on 28 Mc. BWT gets out nicely on 7- and 14-Mc. c.w. NB is building a new rig and increasing power on 14-Mc. c.w. BKZ is off the air while changing QTH. CDQ is again on 7-Mc. c.w. using 7220 kc., the YLRL frequency, mostly. Emzie has separate rigs on 7 and 14 Mc. ECP makes BPL again this month with 111 deliveries. Traffic: W3ECP 337, AKB 217, MJQ 100, JZY 73, BWT 34, NT 23, QL 16, IEM 11, EYX 6, JHW 3, MYM 2.

SOUTHERN NEW JERSEY — SCM, G. W. (Bill) Tunnell, W2OXX — The Hunterdon County Amateur Radio Association exhibited an amateur station (W2IMA) in a Flemington store window in observance of National Radio Week. A former trainee of the Merchantville Club reports that he has obtained his license, 9FKD. The South Jersey Radio Assn. will have a new group of officers by the time this goes to press. Suggestion — How about a past-presidents' club or net, etc.? All clubs could contribute their past top officers, thus permitting us to keep informed of the activities of those who have contributed so freely of their time for the progress of ham radio. SUG recaptured top traffic spot this month. BEI is rebuilding power supplies. 3NF/2 has new antenna 79 feet high. RPH is building a 500-watt final. SXK has 15 watts on 28-Mc. 'phone. BAY completed his modulator and now you can find him on 3.85-, 29-, and 50-Mc. 'phone. ORS received his Class A ticket. Prewar 3DNS now is 2ZJX. RG urgently needs traffic outlets in the general areas of Atlantic City and Wildwood. Contact him on 3700 kc. Traffic: W2SUG 183, ZI 86, RG 48, 3NF/2 32, 2ORS 30, BAY 21, QUH 20, SXK 20, BEI 12, RPH 4.

WESTERN NEW YORK — SCM, Harding A. Clark, W2PGT — SEC: SJV. RM: FCG. The New York Slow Speed Net is now operating at 9 P.M. on 3720 kc. Those interested in breaking into traffic work are invited to join. NYS is now in full swing with several new stations reporting and the volume of traffic increasing. Congrats to RUF on making BPL. Activities of several of the "netters" have been curtailed in various degrees because of the arrival of "harmonics" during the past few months. RSL keeps traffic moving on 7250 kc. QHH has worked his 39th country on 3.5 Mc. CKY, the old DX hound, is now on 3.85 Mc. renewing old acquaintances. SIB is sporting a Hooper rating given by PGT. RARA now has over 55 members and is shooting for 100. Call WFU for details on meetings. TXB received a card from VR2AB and is now DXCC. Participation in the Sweepstakes hit a new high in the section this year — especially in Rochester where the QRM was the heaviest — so they think! CLO has moved from Buffalo to Rochester. 3LLH is new-comer to Rochester. The RAWNY Hamfest was a big success with over 350 in attendance. VBH is now Class A and is on 3.85 Mc. PXA has new rig on all 'phone bands with push pull 100THs. The Syracuse University Amateur Radio Club is again active for the season. Contact SFZ or VIQ for details. Let's have the news so we can fill this column, gang. Traffic: (Oct.) W2PZC 37, QNA 6. (Nov.) W2RUF 561, PGT 197, WFU 121, RSL 74, WOE 72, QHH 47, SJV 41, AOR 30, BLO 12, USO 12, WZQ 11, VIQ 10, BLP 4, RUK 2, UZN 1.

WESTERN PENNSYLVANIA — SCM, Ernest J. Hlinsky, W3KWL — Many Western Pennsylvania stations participated in the CQ DX and the ARRL SS Contests. GJY piled up a tremendous score. TQX and KQD made it plenty hot in Altoona. LIW and LWN kept up the pace. GEG showed what can be done on 3.5 Mc. alone. The Fort Necessity Amateur Radio Assn. sent your SCM a nice photo of the new club, now complete except for commercial power source. UUZ sends information on CAV, who is undergoing a serious operation. SGA is having trouble with his beam and t.v. The ATA Club of Pittsburgh is going great guns with excellent programs scheduled by OMA. NUG, club president, and Acting Chief RM for the W. Pa. ORS Net, asks all ORS net members to note time change of net operation to 8 P.M. on 3750 kc. KSP, of the Four Ring Weather Net, is looking for a new meteorologist, since OB is blamed for wrong predictions. The Polecat Net is taking traffic from out-of-town stations at 11:30 A.M. each Sunday. BGT is doing FB with his thirteen-element parabolic 28-Mc. beam. KSR's radio-controlled plane went berserk and made a DX trip of its own. Up Altoona way MBB received his EC appointment. OJX is having trouble with the p.p. 35T rig. OFI, a new ham, is proud of his WAS contacts on 7 Mc. with only 30 watts. AEV is revamping final using p.p. 813s. VNE says violations on the ham bands are nil. RAP is on 28 Mc. after correcting beam troubles. Up Erie way NCJ keeps the traffic flowing. Erie stations are keeping Monday and Thursday schedules on 144 Mc. from 9 to 11 P.M. In Mercer County, the MCRA net frequency on 3610 kc. at 9 P.M. in conjunction with 144 Mc. is working out nicely with lots of activity on 144 Mc. VHF stations all over are noting the 9 P.M. schedules and keeping watch on these two frequencies. Code practice classes are underway five nights per week with NCD, GEG, CJF, ODB, KWL, and CJB as instructors. The MCRA is awaiting word from ARRL on club affiliation. Up in Oil City LST just missed the "Silent Key" column by overcoming an 850-volt jolt. OOF is active on 7 Mc. RBB and KXQ are heard on 3.5 Mc. Traffic: (Oct.) W3NCJ 75. (Nov.) W3KKA 123, GEG 66, NCJ 36, KWL 30, YDJ 24, LIW 22, AER 10, NUG 10.

(Continued on page 72)



MB-150

FOR MANY YEARS amateurs have been "winding their own" transmitter coils; fortunately, transmitter tank L/C ratios aren't too critical and the Handbook has carried a chart showing the proper value of tuning capacity to use on each band, so we have been able to obtain satisfactory results.

However, with the progress of the art, more and more accent is being placed on performance, safety, rapid band changing, etc. The transmitters in many amateur stations today, although home-made, have definitely commercial appearance and performance, and quite a number reflect the application of considerable thought and labor in an effort to extinguish the band-changing nuisance factor.

Until recently, the common approach to the problem of eliminating plug-in coils in a transmitter has been the use of a single tapped coil or a group of individual coils permanently mounted within the rig with selection being made by some sort of switching arrangement. Such systems afford the advantages of increased safety to the operator, no unused coils lying around the shack to trip over and less time and effort required in changing bands than when plug-in coils are used; but disadvantages also appear in the form of an additional control (the switch), increased length of R. F. paths, contact resistances, and lay-out difficulties.

The National MB-150 Multi-Band Tank provides the amateur with a new approach, for it does the job on all bands from 80 through 10 meters without plug-in coils or switches, requiring only that its dial be turned to the proper setting. The MB-150 is suitable for power inputs up to 150 watts, which is plenty for amateurs living in congested areas if BCI or TVI is to be avoided without going to a lot of trouble. For high power rigs, the MB-150 will find application in the driver plate and final grid circuits.

Many of us have employed the dodge of covering two adjacent bands with a single coil and condenser, with the lower frequency band being resonated near the tuning condenser's maximum capacity and the higher frequency band near the low capacity end of the condenser's range. This system, however, cannot be extended to cover 80 through 10 meters effectively.

The MB-150 combines two circuits that cover 80 through 40 and 20 through 10 meters, respectively, in such a way that one pair of input terminals and one pair of output terminals can be used. The effectiveness of each circuit is maintained, but as would be anticipated, the circuit is tuned to two frequencies at each setting of the dial. *The design of this unit is such that the two resonant frequencies are not harmonically related at any dial setting in the amateur bands and there are no resonances outside the 3.5 to 30 mc. range.* These design considerations assure that your transmitter will not have any spurious radiations due to resonances in the MB-150 unit. The usual problems of parasitic oscillation or oscillation due to improper neutralization may be encountered just as with a conventional coil and condenser arrangement. Now, if we can work out some method whereby the MB-150 will tune itself . . . ! * ? ! !

— RALPH S. HAWKINS

CENTRAL DIVISION

ILLINOIS — SCM, Lloyd E. Hopkins, W9EVJ — QLZ has been appointed Section Emergency Coördinator. AND is newly-elected Alternate Director for the Central Division. EVJ visited the Chicago Mobile Radio Club and Chicago Area Radio Council. The Starved Rock Radio Club officers for the coming year are: TLC, pres.; ZEN, vice-pres.; and NIU, secy. and treas. The Midwest VHF Club conducted another Hidden Transmitter Hunt, with CZR the winner. BIH reports from Korea that he is working at HL1AB as third operator and is the only ham in that country on 144 Mc. KQL is busy putting final touches on new final. EYY is gathering parts for 28-Mc. rig. JVC took second place in the latest VHF Contest. BJA is spending his time looking for the 144-Mc. band. ACJ finally got his new beam on the tower. OBB is having transmitter trouble. OLM has an antenna farm. DLO is burning up the 28-Mc. band. TAY had an appendectomy. CRW is building a home in Grand Ridge. IDA rebuilt speech amplifier. RBT is home from the hospital. PGQ put up new sky hook. YRI is operating 3.85-Mc. portable. BRY tried mobile rig. NDA finds working seven days a week leaves little time for hamming. NTV took a wife. MZW visited APK. OSP has Harvey Wells rig on 28 Mc. PBJ moved to Western Springs. HON has been on ILN many times recently. MRH is sporting new 3.85-Mc. 'phone rig. AIK has BC-610E. ZST and AJJ have new beams. The Kickapoo Radio Operators Club is proud of its 144-Mc. ace, EHX. FLH went to town in the SS Contest. AMP is switching to 'phone. ODT is building p.p. 813 final. EBX had a minor operation. HPG is working on temperature-controlled oven frequency meter. QIE, BXK, and CDO, as a team, worked 548 stations in the SS Contest. APK is putting the finishing touches on p.p. 1625 final. VE1MX now lives in Chicago. W8WVX, of Cincinnati, now is residing in Geneva. AEP completed new final for 28-Mc. rig. SXL says the XYL can tell the difference in him now that he is back on the air. WFS made WAS in 16 hours in the SS Contest. EVJ has been working on the section emergency program during the past two months and we now have active ECs in 28 counties. Chicago has seven ECs, each having separate areas. If you do not know your EC, please contact QLZ. A slow-speed ILN meets Tues., Wed., and Thurs. on 3765 kc. starting at 8 P.M. CST. Here is your chance to brush up on net operation. Traffic: W9EBX 262, KQL 243, EVJ 184, SYZ 105, RSM 94, CMC 85, CTZ 67, BUK 55, CBA 37, DUA 35, EEK 34, FRP 23, DOQ 22, QIE 20, FST 15, MRQ 13, ZPC 11, BPU 10, LIN 9, SXL 8, ASN 7, WFS 7, BRY 5, NDA 4, NIU 4, APK 2, HON 2, YTV 1.

INDIANA — SCM, Charles H. Conway, W9FSG — LPQ renewed his OPS and EC appointments. MBL, EC of New Castle, reports their emergency net now has eight stations reporting. He has 29 states on 54 Mc. and 6 states on 144 Mc. QLW rebuilt rig in a new console cabinet. UIA worked five new countries on 28-Mc. 'phone. CVN worked his first G on 7 Mc. EHU snagged a YU for his 56th country. FKE joined the Emergency Corps. FIW is the new call of ex-CWF, who is back in the game after a lapse of fifteen years. BOG got disgusted and quit the game — for a whole week. UKT has new jr. operator. PAP is a Class I OO. IU now has 193 countries confirmed. BKJ operates on Indiana 'Phone Net, QIN, QNM and TO. The Indiana 'Phone Net now has 22 stations reporting in regularly. Traffic: W9RCB 378, NH 235, TT 130, BCJ 65, BKJ 64, DKV 33, HUV 20, PAP 20, QLW 17, SNQ 17, QG 11, PMT 9, DGA 4.

WISCONSIN — SCM, Reno W. Goetsch, W9RQM — The M & M Radio Club elected: QGQ, pres.; BVU, vice-pres.; 8HND, secy.-treas. The Club conducts a beginners' code and theory class and an advanced theory class. SZL gets on for traffic when home. ESJ has the mobile rig completed. ANM uses a BC-654 and is a member of the Milwaukee Road Emergency Net. Since his Class A ticket arrived, IQW has been reporting into both the 'phone and c.w. nets. High State SS score on 'phone was made by RBI, with 309 stations in 70 sections. On c.w., RQM made 887 stations in 71 sections. DJV worked 552 stations in 63 sections on c.w. in the SS. HDJ helped CWZ put a new mast on the house. NRP works 3.5-Mc. c.w. and 'phone with a BC-696 at 50 watts. WJH has a new beam with five elements for 144 Mc. and three elements for 50 Mc. REQ is chasing DX on 28 Mc. HSL and ZGW are rebuilding. ART is program chairman of Green Bay Club. FQB, Manitowish Waters, works 7-Mc. c.w. LFK put out a map of c.w. net coverage. BCY increased power to 500 watts on 28 Mc. BQM is erecting a new tower. A 55-mile wind blew down one for his brother, CIH. HIF worked KH6 with new mobile rig. OTD has a new VFO for 28 Mc. AKB has push button to drop from 400 to 25 watts for local rag chews. VMX reports that the MRAC held a Milwaukee County 28-Mc. Contest which was won by LVR, with AYX and FDX second and third. PYM is MRAC program chairman. QJW was host at WVRA meeting. KFB, now 6DPF, is looking for the Milwaukee gang on 28-Mc. 'phone. AFT placed third in Midwest VHF Club QSO Party with 38 contacts on 144 Mc. BZU is now OES. QGQ is new EC for Marinette and vicinity. DTK is mobile. GPI is new Central Division Director. Traffic: (Oct.) W9MUM 39. (Nov.) W9LFK 150, ESJ 138, SZL 47, DND 46, ANM 41, IQW 34, CWZ 28, CBE 27, SIZ 24, DJV 21, DKH 12.

DAKOTA DIVISION

NORTH DAKOTA — SCM, Paul M. Bossoletti, WØGZD — The Grand Forks and Fargo Clubs had another of their famous joint meetings. Attending the get-together at Fargo were FCA, GHN, JNP, VAZ, UNU, RGT, GZD, TUF, IKD, HIV, HOX, NZE, OYM, BZJ, TSN, BJG, AVT, BZQ, CAQ, OTJ, RNS, JVP, SHI, ENK, KZL, FST, YIZ, AZV, NBC, and PVS. Edmore is on the map via EFJ's 28-Mc. job. B.C.I. doesn't worry AJH half as much as the hob he plays on the hearing aids around Minot! Christmas traffic really kept SSW sweating in December. WFO boasts a pair of 813s in the final. WIQ strung his 3.85-Mc. antenna between two-100 ft. elevators. YIZ and AAU are regular members of the traffic net now. CGM got his new pair of HK254s perkin'. JNP has new Collins 32V. AVT sports new rig and new house to put it in. CBM got his f.m. working FB. The Forx Club serves advance notice to plan on attending the big Hamboree this spring! Traffic: WØSSW 105, GZD 35, KZL 30, ZCM 16, LHB 13.

SOUTH DAKOTA — SCM, J. S. Foasberg, WØNGM — During the Nov. 19th and 20th blizzard emergency HDO, the SEC, called a state of emergency and the net stayed on the frequency all evening of the 19th and was back on at 8 A.M. on the 20th, checking with Minnesota, Iowa, and Nebraska nets. Traffic was handled for the C&NW and Milwaukee railroads and the net was ready to help the AP if the lines were out. About 15 stations were in the net operation. BJV and the 50- and 144-Mc. gang may be used in the northeastern corner of the State. The Sioux Falls gang, with ZIQ, is agitating a 144-Mc. net. The SFARC held an old-timers' night and out of 26 invitations sent out only one showed up. EOJ is back on 28-Mc. 'phone. RRN has his Class A ticket. It is reported that CRY has RST 591 snores as background when someone else is at the mike. Traffic: (Oct.) WØPHR 23. (Nov.) WØPHR 24, NGM 18, GCP 14, HDO 3.

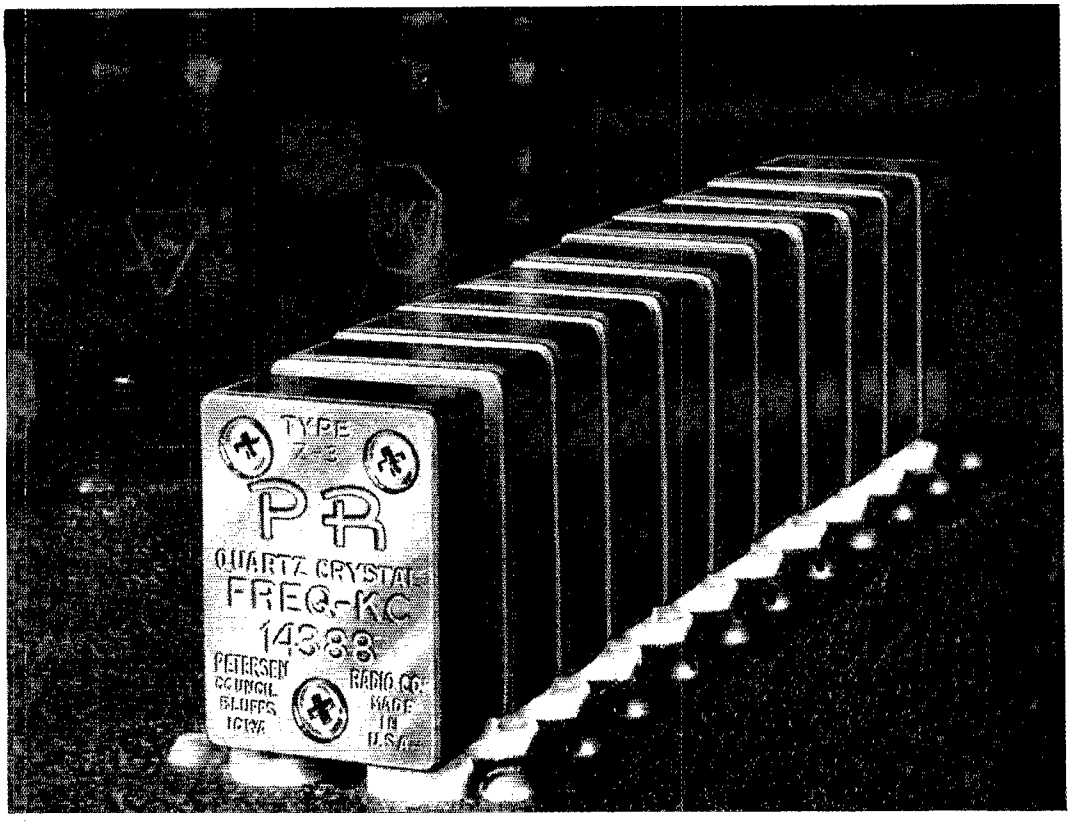
MINNESOTA — SCM, Walter G. Hasskamp, WØCWB — Biggest news for several months! BOL is our new SEC, with MXC his able assistant. All of you, please write Bob and join the Emergency Corps! HFF is quite the traffic man reporting into five nets. FID is now OBS on 3.5 and 3.85 Mc. BGY made the rounds of MSN members in Minneapolis. BBN has a rig for each band from 3.85 to 144 Mc. GKO's new 144-Mc. rig has p.p. 35TGs in the final with n.f.m. and advocates n.f.m. with two discriminators for getting rid of noise, the biggest stumbling block on h.f., he says. EJP is trying out a 24-element f.m. t.v. beam and an R9-er on 50 Mc. JVV has returned from visiting the XEs down Mexico way. GKP and NRV have organized Duluth area hams into a Red Cross emergency network on a Red Cross division system. The St. Paul Club is forming a 28-Mc. mobile emergency net with a centrally located NCS. Ten to fifteen stations have already signed up. LMQ will be back at Fergus Falls after operating KØNAH the past year. HRH is back on 3.85-Mc. 'phone for the first time postwar. 9VIL/Ø now is ØNHU. Troop 19 B.S.A. had a first-hand demonstration of ham radio at the home of JIE. CRO, ORJ, MXC, and CWB lent a helping (?) hand with the show. KØWAA is using Heising modulation on a kw. rig! CO has acquired a Collins 32V-1. YPN is building a 3.85-Mc. portable rig using a BC-696 with an 815 modulator. YBM is going to rebuild his frequency meter using a grounded grid oscillator. ORJ wants more stations on the MSN at noon. UWG had a crack at net control on MSN 'phone. BGY is now ORS and TKS is OO. GKO visited CWB. Just a few more of these reports will be written by your present SCM. Please give your new SCM all possible help and support. I urge you to write him often with a good activity or traffic report. Any letters or cards you receive from the new Section Emergency Coördinator should be answered promptly! ALL PHASES OF EMERGENCY WORK DEPENDS ON PROMPTNESS. Traffic: WØHFF 177, RJF 82, W3QP/Ø 54, WØBGY 32, CWB 25, VJH 21, RQT 14, NAH 10, BOL 9, MXC 9, FLK 8, TKX 3.

DELTA DIVISION

ARKANSAS — SCM, Marshall Riggs, W5JIC — EA has new 25-watt 807 rig on 3.5 and 3.85 Mc. OXL is new call in the State running p.p. 812s on 7 Mc. and p.p. 826 on 28 Mc. and also has Super Pro. Nice to get started that way. Hi. PCZ is new local running converted BC-457 on 3.5 Mc. with BC-459 on 7 Mc. JIC has been QRT because of bad r.f. driver. MRD has finally gotten the 810s on 'phone and is really going to town. Heard tell some of the boys mistake him for me. Sure sorry for you, Omer. He worked ZC6UN, but still doesn't believe it. Hi. Traffic: W5FMF 160, LUX 129, ICS 39, MRD 24.

LOUISIANA — SCM, W. J. Wilkinson, jr., W5VT — CEW is PAM. KTE serves as SEC. NGG is attending the University of Maine and reports a new jr. operator. MLU has a T-55 and 200 watts on 28 Mc. KRX is trying his luck with traffic. NBK has been appointed OBS. He has finally managed to get his V-70-Ds neutralized and is on 7 and 28 Mc. KYK is active on 7, 27, and 28 Mc. NNH has a new Collins 32V-1 and is working 28-Mc. DX with three-element beam. OYD is ex-W3MPI and is attending Tulane University. LQO has built himself a VFO and says he worked

(Continued on page 74)



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crosstown. MJT soon will be trying 7 Mc. again. EM was a visitor in Shreveport. KTQ says no activity lately. QH still is active on 3.85-Mc. 'phone. KC, WG, EB, MWE, USN, RX, BI, MHZ, NGN, HKU, and VT were all reported active in the SS. Others failed to report. Well, that clears the file for this month. Here's hoping to have lots of dope each month during 1949. Traffic: W5VT 5.

TENNESSEE — SCM, Ward Buhrman, W4QT — Our sympathies to the family of EP, who died Nov. 9th in Knoxville. OGG is new ORS in Memphis. LQL has new Class A ticket. FLS has moved into new shack. FLW completed six-element beam for 144 Mc. He wants contacts on 60 and 144 Mc. A new call in Memphis is IRI. The Memphis gang went out for SS in a big way. HOJ still has flash-over worries. EUT is on the air with 500 watts to a pair of 813s. DCA and GLW are interested in 450 Mc. The Tuesday and Thursday evening sessions of the 'Phone Net are very popular, with average attendance better than Sunday mornings. The C.W. Net needs a member in Nashville. DDF has the QSL situation in hand well enough to find some time for operating 14-Mc. 'phone. OEZ is a new ham in Nashville. LHQ has applied for his second DXCC Certificate; he had No. 108 prewar with the call 8KKG. His postwar claimed total is 143, with 106 verified. Some of his recent rarities are: UPAAA, UD5AC, UF6KAB, UG6AB, OE1AD, and IS1AHK. He has snagged so many UAs that they no longer are rare. He uses a "V" beam, four waves on each leg, 150 to 250 watts on 14-Mc. c.w. Traffic: W4NNJ 274, ETN 140, LNN 49, BAQ 47, DIY 27, BBT 19, CZL 19, CVM 14, HOJ 7, NXR 2.

GREAT LAKES DIVISION

KENTUCKY — SCM, W. C. Alcock, W4CDA — Kentucky's major nets, KYP (3955 kc.) and KYN (3600 kc.) need better coverage. Amateurs in the following towns, please help us out: Bardstown, Barbourville, Campbellsville, Harrodsburg, Elizabethtown, Hickman, Hopkinsville, Lawrenceburg, Lebanon, London, Madisonville, Mayfield, Maysville, Middlesboro, Murray, Paducah, Princeton, Richmond, Russellville, and Winchester. Join KYN or KYP. ALR is building 100-kc. frequency standard with 10-kc. MV. MWX is setting up slow-speed KYNet. KKG is rebuilding with a pair of 4-125As. EDV is experimenting. YPR is 72 years old and keeps up with the best of 'em on KYNet. FQQ is busy as Trunk Line Manager, but runs up nice traffic totals. JCN's new t.v. set wrecks ham activities, but one good thing — no T.V.I.! HAV is adding Q5-er to Super Pro. MKJ is experimenting with eight and sixteen-element beams on KYE Net. NBY's XYL, NOW, is secretary of new Blue Grass Amateur Radio Club, which meets 1st Wed., 7:30 P.M., Lafayette Vocational School, Lexington. FKM works KYNet during week and KYP Net Saturdays and holidays. TXC says the 'phone net is rocking along fine. MSC is an outlet for West Virginia and Ohio traffic. JVF/4, in Hollywood, Fla., was worked by CDA and says hello to KYPers. The Owensboro Amateur Radio Society will hold its second annual midwinter ham reunion Mar. 6th and 7th. For particulars contact JB. Traffic: W4FQQ 136, BAZ 115, YPR 85, ALR 41, CDA 38, JCN 25, MWX 23, TXC 17, FKM 6, MKJ 5, MSC 4, HAV 3, EDV 1.

MICHIGAN — SCM, Joseph R. Beljan, jr., W8SCW — SEC: GJH. RMs: GSJ, NOH, PVB, and UKV. GSK has been appointed RM and is net manager of the 7 P.M. QMN Net, replacing PVB. BVY is new ORS. Section Net Certificates have been issued to IHR and TNO. The Grand Rapids gang is planning a midwinter hamfest to be held some Saturday evening in February. Contact any of the Grand Rapids gang for the exact date and other particulars. Michigan was well represented in the Sweepstakes and so far RMH leads the gang with a nifty 107,467 total based on 623 contacts in 69 sections with the low power multiplier. Other high scores include: RRP, 617 contacts, 68 sections, 83,912 points; URM, 548 contacts, 60 sections, 82,200 points, GQB, 600 contacts, 66 sections, 78,936 points; GSJ, 521 contacts, 69 sections, 71,760 points; SCW, 535 contacts, 67 sections, 71,556 points; DNM, 484 contacts, 61 sections, 58,987 points; and TRN, 491 contacts, 60 sections, 58,920 points. DNM and SCW learned safety first lessons. Both tangled with the high voltage during the contest. OCC has a pair of 5514s in the final running 275 watts. DOI is QRL converting a BC-696 with full break-in for QMN. BNU has completed his WAS on 7 Mc. and is waiting for his certificate. WOV is planning on a pair of 811s for a new final running 400 watts. PZQ and VDS have new NC-173 receivers. UNK moved to California. BMW moved to Oklahoma and will look for the Michigang on 7 Mc. YLV moved to Midland. AWN has a new Premax beam. PRL has a new Hy-Lite beam for 14 and 28 Mc. IAC and ZGR are n.f.m. with HT-18s. DNM is building a modulator. TZD has a new beam and is n.f.m. on 28 Mc. ZGV is now Class A and a regular reporter into the BR Net. QHB is building an 8003 final. ZNI is building a new bandswitching exciter. WPK is back on 28 Mc. with a converted SCR-522. QZV is rebuilding and will have a pair of 100THs in the final. BHD is working out nicely with his mobile rig. UGR rebuilt his 250-watt rig in a rack and panel. Ex-JVI and 4JTZ now signs DKV and is back in Detroit. EF is ex-6UA. Congrats to YDJ, who recently middle-aisled. YDR is Michigan outlet on TLA and is NCS on the 7 P.M. QMN Net on Mondays. TRN has a nice traffic total and just misses making the BPL. Traffic: W8TRN 425, TBP 120, GSJ 116, UUS 96, WXO 72, SCW 70, IHR 69, AQA 36, BVY 29, UES 18, ZKZ 17, DNM 14, DOI 13, UKV 13, YDR 13, RJC 12, DPE 11, TNO 9, AHV 8, INF 6, EGI 5, FX 5, YFI 4, BLR 3, TZD 3.

OHIO — SCM, Dr. Harold E. Stricker, W8WZ — SEC: UPB. PAM: PUN. RM: RN. Thanks, gang, for your swell coöperation in getting your reports in on time. During the month I managed to get over to the Springfield club meeting with CNY, where we had a swell time. The Potlicker Net, on 50 Mc., meets Monday and Friday at 7 P.M. This originated in the Akron area with CEQ as NCS and LVH as ANCS. This information came from LBH, who has a new rig; 200 watts to an 813. The Buckeye Net has put out a bulletin and the net itself is very active Monday through Friday, 7:30 P.M. on 3730 kc. The Dog House Net and the Ohio River Net are going strong on 3860 kc. Through the efforts of the chief engineer at Radio Ohio, the Central Ohio Radio Club has been presented with a Collins transmitter, and with the HRO receiver that was recently purchased AIC should do well. The annual Christmas party of the Columbus Amateur Radio Assn. was held at Frecker's on Dec. 11th with many in attendance. At a recent meeting of CARA NCG showed and described some very new u.h.f. equipment. A national meeting of ECs was held in Cincinnati on Dec. 15th. From the *Q-5* we learn of the resignation of GER, our 8th district QSL Manager. Thanks, Fred, for the swell job that you have done for all of us since 1932. CDT has moved to the West Coast. BUM is after a two-letter call, as he was 9EZ in 1928. QAD has a new third harmonic; a girl. WE made 68 sections in the SS in 26 hours. BEW is using an SCR-274 Command rig. AVB and LFE have made DXCC. JFC just put up a three-element beam on 28 Mc.; he also has an eight-element Sterba for 28 Mc. PUN has a new speech clipper and splatter chokes. By now ZAU should have caught up on the sleep he lost during the SS. So should we all. BFB worked Wyoming for a new state on 50 Mc. HOX has rebuilt — a Meissner 813 at 250 watts. ROX had his receiver pass out after 12 hours of SS work but made over 124,000 points; he worked 26 hours the last half. PMJ states that between the jr. operator and the cows he is pretty busy. FNX is completely rebuilding his rig. LCY is making a bandswitching rig. TIH is working n.f.m. on 3.85 Mc. and has been getting good results. IVC states that CARA has a good 2½-kw. generator for emergency and Field Day work. EBJ recommends the monitone that was illustrated in Sept. *QST*; he says it is excellent for the traffic man. TAQ is back on low power as his kw. lit up all the lights. WXA still is testing for t.v.i. elimination. EFW has recovered from pneumonia. TZO is working on his new rig. WAB temporarily is located in Pittsburg and is working 3.5-Mc. c.w. from the hotel room using 10 watts to a BC-454. DAE says he engaged mostly in contest work in November. Through the Cleveland Area Council of Amateur Radio Clubs cards lettered by OPC were put in various ham stores, where the new-comer can receive information and/or help in becoming an amateur. JFC has done some nice work on 7 Mc.; VK2, VK3, KH6. EDX is doing some good work on 144 Mc. with a 24-element rotatable beam. WXM has been using a 522 with a dipole antenna and puts a nice signal in the north end of Columbus, according to WRN. DGG has put up a four-element 28-Mc. beam and has 400 watts to a pair of 100THs. New appointments are: ORS — VHJ. OPS — TIH. I feel sure that there are more bulletins put out than those of the CARA, CORC, Q-5, and The Cleveland Area Council. Traffic: W8EBJ 156, GZ 151, RN 112, HOX 101, TKS 84, UPB 74, PMJ 62, WE 62, OUR 49, SJF 48, WZ 31, PIH 29, EQN 27, PNY 26, ZAU 26, BZK 24, QIE 20, TIH 16, IVC 15, TAQ 14, CNY 12, PUN 12, WYH 12, LCY 10, DZO 7, LJH 7, BEW 6, JFC 4, WAB 4, BUM 3, ROX 3, AQ 2, DAE 2, YFJ 2.

HUDSON DIVISION

EASTERN NEW YORK — SCM, Fred J. Skinner, W2EQD — Report deadline was too soon after election results to permit much news this month. Please get your traffic reports and news in before the fifth of the month from now on. Last minute reports can be relayed via NYS Net on 3720 kc. for c.w. men and NIV, the old MC, on 3990 kc. for 'phone men. Slow speed section of NYS Net starting time has been changed to 9 P.M. EST, Monday through Saturday. If you can tell a dit from a dah, check in and learn traffic-handling the easy way. Appointments for Emergency Coördinators are open and urgently needed in Columbia, Dutchess, Greene, Putnam, Rockland, and Ulster Counties. Appointed ECs are SUL, Albany; PCQ, Orange; WIK Rensselaer; NHY, Schenectady; ITX Westchester. All section stations should be either full or supporting members of AEC. NVB and CFU put up 14-Mc. three-element beam and knock off DX regularly with jointly-operated station. WARA set up 15-station countywide emergency network to handle Yonkers Motorcycle Club Contest scoring traffic. Look at that traffic total for LRW. How about giving Marce some competition? Traffic: W2LRW 547, ITX 152, WIK 41, GSB 31, CLL 20, EQD 12, TYC 8, NHY 7, BSH 3.

NEW YORK CITY AND LONG ISLAND — SCM, Charles Ham, jr., W2KDC — Here's BGO's last report as

(Continued on page 76)

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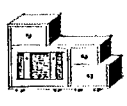

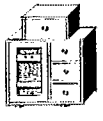

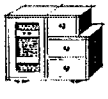

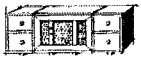

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SEC. Do we have a volunteer in the gang to replace hard-working Vin? In Brooklyn, activity on 144 Mc. shows higher efficiency in operation reported for the seven regular attendants on weekly drills. KU and HWX cross-band QSO on 144 and 420 Mc. regularly with great success. NXT is heard after a long absence. OHE built a new teleset and finds more interest in it than in 144 Mc. From Nassau, ANN is working hard to build up his 144-Mc. AEC Net, but without coöperation from those in his community finds the going difficult. All 144-Mc. stations in Southwest Nassau, please work with ANN for a good AEC Net. JXP is installing gear in his new car. FI is mobile with BTA Acting NCS on Monday once in a while. WWN, RPZ, and ZDI are welcomed to the 144-Mc. Net as new members. Five weekly drills in November showed an average attendance of 17 stations. Community ECs are requested to report regularly to FI. Suffolk: NXZ, SAH, and MZB have joined PIA, PDU, and CJZ on 3.85-Mc. mobile. BRV, Red Cross Disaster Chairman, is setting up emergency station at Huntington Red Cross Hq. TBB has joined the 3.85-Mc. 'phone. AEC Net. Get busy and work with CJZ to expand the AEC Net. Assistance is needed on 3.85-Mc. 'phone, 3.5-Mc. c.w., and 144-Mc. 'phone. 3.5-Mc. c.w.: Three groups are holding weekly drills on Mondays, Tuesdays, and Wednesdays with the regulars never missing a drill. On Sundays at 3 P.M. the ECs meet on 3600 kc. During the past month we heard from LYH, WUK, LVN, QFH, and VAF, which made the Sunday get-together more interesting. WFL, KTF, and CJZ never miss. All 3.5-Mc. c.w. stations are invited to QNI on any regular drills. Every active station in the section is invited to join the AEC for closer coördination of the job to cover the section. The NYC&LI AEC has been outstanding in the past and all operators are requested to get together with ECs to build a bigger and better AEC. A post card to KDC will bring results from your Community Coördinator, who will sign you up for AEC activity. In Manhattan, WHB is having trouble getting things going. He has plans for JXH on 28 Mc. and NKO on 144 Mc. and hopes to pull in IN and HKC. Messages have been going to Hartford regularly via the low- and high-frequency circuits. A new club has been formed in Manhattan with PRE as acting president and plans are being made for a 3.5-Mc. c.w. net. VSU has been on the E.S.N. on 7 Mc. and is seeking ORS appointment. North Shore Radio Club officers are: GX, pres., BT, treas., and JXI, secy. A T.V.I. reduction interference committee, headed by GX, is performing a useful service to all members. JVO says results and recommendations in a printed form will be available to all. JMD, in Syosset, runs tests every night from 1900 to 2000 on 430 Mc., using automatic keyer with voice break-in every 5 minutes. TUK works the NLI Net every night at 1900. He also is handling AEC activities for the Hempstead-Garden City area. Within a half hour after arriving in Florida RTZ had the sky wire up and was listening to good old NLI, especially KV4AF/2. QYZ moved the rig into new shack with all conveniences. QBS is drawing up new rig on paper. YDG is having trouble with two hams next door who knocked off 20,000 points from his SS score: PF has new Collins receiver. PRE worked 69 sections in the SS. VAF is running 600 watts. VNJ helped OUT with traffic at the booth at Chemical Convention where it was phoned to RTZ who put it on radio. Traffic: W2VNJ 204, TUK 191, VOS 191, PRE 172, RTZ 108, OBU 101, BO 99, EC 90, QYZ 74, VSU 58, KV4AF/2 45, W2QBS 44, YDG 18, VAF 9, PF 2.

NORTHERN NEW JERSEY — SCM, Thomas J. Lydon, W2ANW — The N.N.J. C.W. Net meets daily, except Sunday, at 7 P.M. on 3630 kc. The 40-Meter Net, which meets Monday, Wednesday, and Friday at 7:30 P.M., has moved to 7260 kc. to avoid QRM. Everyone is welcome to drop in on either net to move traffic. KUS is alternating with LFR on TLAP and NCS job on JN. NIY is reporting into both traffic nets regularly. YOB has new sky hook and took part in his first Sweepstakes. HXU and NKD have new jr. YL operators. LIQ was married on Thanksgiving Day. LTP has 118 countries. DWB is busy making photostats. LHJ has new receiver but is unable to get going because of landlord trouble. The *Elizabeth Journal* runs a picture of a different ham each Saturday. UCARA has rebuilt its club station, GIZ. MUP is very proud of his son, ZGG, getting his ticket. ABL reports that his son is now ZEP. VJN has 53 countries with 35 watts. OSQ is back on the air at new QTH in Shore Acres. He is new EC for Ocean County. EWZ worked 401 stations in the SS operating only on 7 Mc. PTV has cubical quad antenna on 28 Mc. and is keeping daily schedules with his brother, 5ODQ, formerly KMY. ZKN received her ticket and is working on the OM and son to get theirs. The Monmouth County Amateur Radio Assn. has elected the following officers: YLS, pres.; ABL, vice-pres.; ZEP, rec. secy.; SOY, corr. secy.; EOH, treas.; BAT, chief engineer. LOP has been experimenting with 3.85-Mc. mobile antenna. DCP has returned to the States and is back on 14-Mc. c.w. ZT operated portable while on recent New England trip. DRA is busy logging second harmonics from 3.85 and 7 Mc. New appointments include ZCL as ORS. Traffic: W2LFR 245, CGG 175, KUS 153, OEC 152, ZCL 92, CQB 54, NCY 50, OXL 48, MTV 34, VJN 31, PPH 26, CFB 23, BRC 11, CJX 6, NIY 6, K2AO 6, W2CWK 4, ZKN 2, DRA 1.

(*Continued on page 78*)

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MIDWEST DIVISION

IOWA — William G. Davis, WØPP — The North Iowa emergency Net, operating on 28.9 Mc., held its initial meeting Nov. 8th. PUE is NCS, with DLD, GCZ, LQY, QDB, RKQ, RJD, AWF, JTA, OWL, WLY, and QZP answering roll call. TJF, of Minnesota, joined up after roll call. The Des Moines Radio Club held its first emergency drill Dec. 3rd with LJF as NCS and AEH, AIX, AUL, BAL, BBE, GBB, HQA, HIB, IQS, IVP, LRY, MCK, SEJ, TIQ, UOJ, and WMM answering first roll call. They meet on 29,200 kc. The Des Moines gang elected HQA, pres.; SQF, vice-pres.; AUL, treas.; GBB, secy.; and LJF, sgt. at arms. Our Director, DEA, met with the Des Moines Radio Club Dec. 8th. FP and PP addressed the Burlington Club Nov. 28th. The Nov. 30th roll call of the Iowa 75 Net was dedicated to YKN, who had returned home from an eye operation at Iowa City. He received 96 messages of good wishes and cheer. The TLCN now has a different NCS for each night of the week; AUL, QVA, FUB, TIU, and NYX serving. QVA made a score of 84,262.5 in the SS. The northwest section of the Iowa 75 Net and TLCN got a workout as a result of the storm of Nov. 19–20. EIT is back on with a pair of 4-125As. CYY gave a demonstration of ham radio at open house at school. The Council Bluffs Club had an attendance of 52 at its last get-together. FGW is adding a pair of 813s to his VFO. The club received congrats from W.U. on its handling of emergency traffic. HMM has a new antenna. Traffic: WØHMM 1232, AUL 161, SCA 101, FP 98, SQQ 56, WMU 46, TIU 43, FKB 27, QVA 20, SRR 14, NYX 12, OSC 11, PP 10, SQV 3.

KANSAS — SCM, Earl N. Johnston, WØICV — The storm emergency in Western Kansas Nov. 18–21 was the main center of activity this month. CC, FEE, EJQ, LOU, TYR, VWP, UFP, IYR, and others in that area moved traffic to Kansas netters and neighboring states until the emergency was over. IYR reports activity in Salina is booming. Central Kansas Radio Club officers are: MVG, pres.; STC, vice-pres.; PKD, secy.-treas.; and IYR, act. mgr. The club meets the 4th Friday of each month. PKD has 39 states on 50 Mc. Salina has 5 stations on 144 Mc., 4 on 420 Mc. and 10 on 28 Mc. AHA, Independence, says the Slow Speed Trunk Line is going FB. Schedules are kept Monday through Friday nights with Harrison, Ark. and Colorado Springs. LYF, Chanute, has new 3.85-Mc. doublet. PHI, Olathe, reports a club has been formed at the Naval Air Station with PHI, pres.; BAI, vice-pres.; LCZ, secy.-treas.; and DRB, trustee, activities and traffic manager. IWS, Atchison, has new e.c.o. on 27 and 28 Mc. AEY, Beloit, is going South for the winter but hopes to QNI QKS with BC-459. Following are ARRL appointments to date: NCV as RM, HEC as PAM, PAH as SEC, with NVC as assistant on c.w. and HEC on 3.85 Mc. New ECs are: IYR, Saline; DNX, Abilene; LOU, Great Bend; TYR, Dodge City; EUZ, Hutchinson; IWS, Atchison; FRK, Garnett. ORS appointments: DYS, BQJ, DRB. Traffic: WØOUU 146, DRB 123, CC 121, IYR 103, NCV 100, FEE 96, NIY 59, OVS 57, ICV 43, UQM 35, CUL 34, IFR 32, AHA 29, JDX 28, WGM 23, PHI 22, FER 21, BNU 13, FDJ 10, IWS 6, LDW 6, AWP 4, KXL 4, JLY 3.

MISSOURI — SCM, Ben H. Wendt, WØICD — New appointments: VRF as SEC, BCD as EC, MZH as OBS, CKS as ORS. ORS renewals: DEA and GCL. The Missouri School of Mines Radio Club's new officers are: GKT, pres.; JHD, vice-pres.; and WVN, station manager. This report supersedes the report as listed in December *QST*. The HARC elected BCD, pres.; VOF, vice-pres.; EXE, treas.; BQU and TFQ, secy.; and ZWK, dir. These officials have a new constitution, modeled after the ARRL constitution. YSM is having an unlimited amount of trouble with his BC-342 receiver. So far he has found six shorted condensers. YSM hopes to be back on the air soon to resume his activities in TL "M." DEA worked 514 stations in 65 sections in the recent SS Contest. We believe this to be the high score for the section. JSR, GEP, and SKA are outlets for both TL "L" and TL "K." JSR is using an HT 18 VFO driving a single 24-G with an SX-28A receiver. SKA has 500 watts using an 813. PMI worked 7 countries on 7.15 Mc. with his BC-459. CKS reports QRM from Canadian Air Force Net is very bothersome and discouraging to the MON 3755 kc. GCL has added a room to his home in which to house the 3.5-Mc. c.w. rig. ARH has added KP6AA, J2HYS, and VQ4FCA to his list of countries which now total 74. OUD is very active on MON and has located her antenna since leaves have fallen from the trees. She is using a monitone FM and a 6H6 noise limiter which work FB. GCT was active in the recent Kansas blizzard. The tree which held one end of JRJ's 3.85-Mc. antenna was cut down by the park department. Bill is the proud father of a new baby girl. WAP has a new 7-Mc. half-wave doublet which is doing FB for him. He is proud of his new SX-43 receiver. Traffic: WØGEP 179, SKA 126, CKS 95, KIK 67, OUD 63, JSR 49, WAP 41, CCT 39, DEA 26, CGZ 22, ICD 21, GKT 16, JRJ 11, NNH 3, QMF 3.

NEBRASKA — SCM, William T. Gemmer, WØRQK — Join the Emergency Corps or the traffic nets. Inquire of MLB or RQK. FQB renewed his ORS appointment. EAO moved to new QTH with lots of antenna room. EUT, RQS, and FQB helped GTC put up 28-Mc. quad. QUA sold his

(*Continued on page 80*)

MALLORY HAM BULLETIN

The other day while talking to a fellow ham about the electrical qualifications and suitability of Mallory Capacitors, Volume Controls and Vibrators for amateur equipment, I mentioned that Mallory also made a line of replacement *soldering iron tips.*

"*Soldering iron tips?*" he exclaimed. "How on earth is the business of manufacturing Capacitors, Volume Controls and Vibrators even remotely connected with soldering iron tips?"

You know, when I stopped to think about it, his expression of amazement that Mallory was in the soldering iron tip business wasn't so unusual at that. It's a fact few people in radio realize, but a good share of the Mallory Company activity is, and has been for years, directed to the research and manufacture of metallurgical items such as electrical contacts, resistance welding electrodes and special alloys.

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This Mallory tip has been engineered especially for the service intended. It is more than just a piece of copper cut to size and shape. It is made of an alloy whose properties combine hardness with good heat conductivity and "tinability." This means a high resistance to the formation of scale and as a result less filing to maintain a bright soldering surface. In addition the shank of the Mallory tip is heavily nickel-plated to reduce the possibility of "freezing" in the barrel of the iron.

The same metallurgical know-how that made possible the Mallory soldering iron tip is applied to all other Mallory products. In fact, Mallory focuses on every product large-scale research and production facilities in electronics, electrochemistry and metallurgy.

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station to NNW. NKG is a new ham. AGS rebuilt final for HGV. AXY is revamping 454s for the ham bands. LRD has new three-element 28-Mc. beam. RQS hung up a "V" beam 275 feet per leg, added to a Sterba curtain making a total of 12 half waves on 28 Mc., and added two more elements to his three-element 28-Mc. beam. WR, an old-timer, is back on the air. The Ak-Sar-Ben Radio Club held a big auction at its November meeting. JED put up a 3.85-Mc. doublet during the blizzard. JPI has new Bud VFO21. HXH is on 7 Mc. with 600 watts to 304TLs. ZHJ is on 14-Mc. 'phone. YOD is on 144 Mc. with 522. VEC has new home-brewed 144-Mc. handie-talkie. JCB, WGB, THF, IXL, and DMY have been reporting into the C.W. Net. FHA went back to the wide open spaces with BC-459A, 348W receiver, and a Windcharger to keep his batteries charged. EYE can be worked on 3.5- and 7-Mc. c.w. HBQ has a new BC-348 receiver and a 459A transmitter running at 85 watts. EXP has new Collins 75A. JLD is boning up on new Vibroplex. DHO is rebuilding to separate finals for 3.85 and 14 Mc. coupled into doublet antennas for quick band change. Traffic: WØJED 181, HYR 102, FAM 95, THF 65, LJO 58, KJP 50, PDH 47, DHO 46, RQK 43, JLD 37, FQB 27, OZC 25, SAI 24, YMU 22, KON 14, IXL 8.

NEW ENGLAND DIVISION

CONNECTICUT — SCM, Walter L. Glover, W1VB — The Connecticut Emergency Net (CEN) is proving very popular, with many stations showing interest. It meets at 7 P.M. Sat. and Sun. with hand keys the order of the day. VW has resigned as SEC, but has accepted the appointment of PAM and hopes to line up a 'phone net or two. We regret to report the death of WR. JJR is busy rebuilding and experimenting. A net consisting of blind hams is in operation at 7 A.M. Sat., with JQD as NCS, on 7260 kc. Anyone interested is invited to join. APA has gone t.v. but still does all right on DX. AH is now DXCC with 112 confirmed, and is awaiting delivery on a Collins 310B-3. DDP and CUX are struggling with T.V.I. RDQ, a new ham in New Haven, is ex-KZ5AH. QAK is very ill in the hospital. JHN has completed his p.p. 810 rig. DBM gave a talk on T.V.I. in New Haven on Nov. 19th. AOS has rearranged his equipment for single switch control. AMQ has settled permanently in Lowell, Mass., where he bought a house with a 45-ft. pine tree in his yard. NEM, the station of HCARA, conducts code classes on 29 Mc. 7 to 8 P.M. Tues. and Thurs. IKE is building a kilowatt rig. JTD is having trouble with the big rig. NJM is manager of TO Net. 2UGX/1 is at M.I.T., and is redesigning his 50-watt rig. NYC is a member of 28-Mc. Shore Line Net. OPS is building a receiver for 50 to 250 Mc. QMI schedules 7WJ on 7 Mc. VB visited HCARA. The Meriden Club is building equipment to get on CEN. JQD, JJR, APA, AH, AW, NJM, VW, TD, LHE, and EFW renewed their appointments. FSH resigned as EC for Manchester and LMK is taking his place. Traffic: (Oct.) W1BDI 203. (Nov.) W1QMI 354, IIN 240, NJM 220, ORP 148, LKF 142, QVF 132, HYF 106, AW 82, BIH 73, DAV 71, BDI 53, EFW 51, IKE 50, ADW 32, CTI 32, KUO 32, CEG/1 18, APA 7, JTD 6, NYC 5, SJ 1.

MAINE — SCM, F. Norman Davis, W1GKJ — SEC: LNI. RM: NXX. PAM: FBJ. New ORS: NGV, QIQ, and ROM. New OBS: ROM. Renewed OPS: FBJ and MFK. Renewed ECs: CRP, DFC, and GMD. The PAWA supper was a complete success and many worthwhile prizes were taken home. EFR now has a 522 going on 144 Mc. QAR now has a Class A ticket. RSB had the tough luck to burn out his final plate transformer and modulation transformer at the same time. He has them replaced and back on the air, but now he has them fused! AMR rebuilt his exciter and has tried 14-Mc. 'phone. His comment is, what QRM! KYO is building a VFO. NGV is pleased to be back in the P.T.N. LOA is doing a lot of work on his rig to eliminate T.V.I. LOZ is experimenting on 144 Mc. LYK is back on 7 Mc. after being on the sick list a couple of months. BOC is now Class A. DBQ has deserted c.w. for 28-Mc. 'phone. LNI and MBR have radiotelephone 2nd-class tickets. CPR is on 3.5-Mc. c.w. with an 813 in the final. CPT is on 14-Mc. c.w. after having been inactive since long before the war. ExDIJ is now 6ZKL. With the traffic season now in full swing both the P.T.N. and the S.G.N. members are turning in fine traffic totals. Do not neglect to report traffic handled regardless of how little it may be. Traffic: W1LKP 76, FBJ 58, YA 57, EFR 43, NXX 42, JAS 19, NGV 19, OHY 17, AFT 15, KYO 8, JTH 5, JRS 1, ROM 1.

EASTERN MASSACHUSETTS — SCM, Frank L. Baker, jr., W1ALP — OBL is new EC for Bridgewater. The following have had their appointments endorsed: As ECs — UE, MME, MBQ, KTG, MRQ, MON. As SEC — BL. As ORS — BB, LM, MRQ, OJM, JDP, AAR. As OPS — AAR, BB, MRQ. As OBS — QQJ. RRP, a new ham in Braintree, is on 7 Mc. KPX is on 28 Mc. in Braintree. AHQ is on 28 Mc. in Malden. RLA, KME, and IZY are on 144 Mc. OGW, in Somerville, is on 3.85 Mc. PLK also is on 3.85 Mc. BSG gave a talk on his t. v. receiver and KAE talked on synchros selsyns at the Hi Q Radio Club. KNI has new NC-57 and visited ROQ and fixed his Millen final. AGR won a Collins 70E-8 oscillator at the Boston Hamfest. UE is

(*Continued on page 82*)

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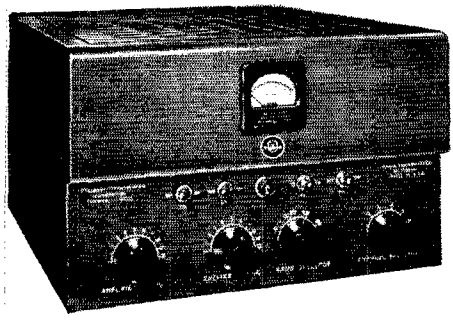

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Other features—"Press-to-Talk" operation, two-channel crystal switching, and self-contained antenna changeover relay. Designed to work with accessories available at low cost. Chassis copper-plated for electrical efficiency and finished in durable silver-grey hammertone.

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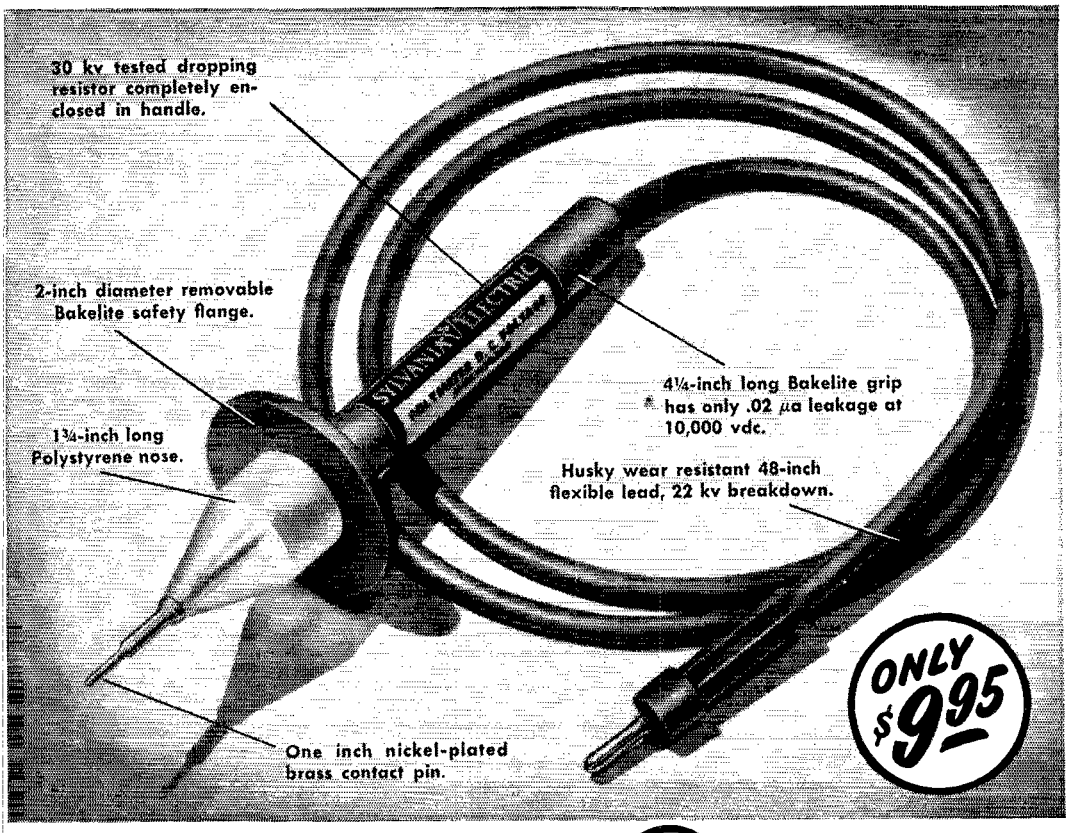
active on EMN and SSN and has a PE-103 generator run by battery and is fixing two b.c. rigs for 7 and 3.5 Mc. RCJ is new EC for Marlboro. On the test held the last Sunday of November the following ECs reported in: PLQ, FIK, SH, JSM, EK, MCR, QQL, QNJ, and DW on 144 Mc., and BVL, BL, BBL, BWH, and ALP on 3.5 Mc. OOP has a National NHU and will be on 220 Mc. with a new converter. AGR is back on 28 Mc. KVX is in new QTH. BR moved to Needham and is on 144 Mc. LMU reports the following on Newton emergency drill; BL, HLX, KVF, OMU, PAW, PX, EK, and NPA. RRH is at Harvard U. OLP gave a talk on quad antennas and QVC spoke on the functions of FCC at the South Shore Amateur Radio Club. LLY is going to Boston College and is active in the Club. The Brockton Radio Club held an auction and movies. AKY was auctioneer for Eastern Mass. Club. The T-9 Radio Club held a Christmas party at MQR's QTH. BGW is awaiting postwar DXCC Certificate; he worked a W7 with 9-watt mobile rig on 28 Mc. OMI made 33,000 points in the SS. The complete Club score was over 450,000. AYG worked 12 Europeans on 3.5-Mc. c.w. QMJ has the antenna up for 14 Mc. MCR had 8 stations report in on emergency drill. DHX will be on as OBS. BB is fixing up his windcharger so it won't shake his house. JIS is active on 144 Mc. in Rockland. ALP is building a converter for 144 Mc. and a rig using 6J6 832. It is with regret that we have to announce the death of BDB. The Framingham Radio Club holds meetings on the 2nd and 4th Thursdays at the Civic League Bldg. New officers are PAD, pres.; QQW, vice-pres.; IXJ, secy.; QFD, treas.; MOJ, act. mgr. ICO gave a talk at one meeting on emergency nets. KLE has a new arrival at his QTH. MOJ has a t.v. receiver. JUL is moving to Natick. QZO is on 14-Mc. c.w. FWS has 522 on 28 Mc. AAL renewed his ORS/OPS appointment, and is on 7220 kc. most of the time. MEV is building a new rig. JBY has his 522 receiver going now. RKD worked a ham in Spain and had to talk to him in French. Lo Nites on 144 Mc. are becoming quite popular in this section. LJT worked the following in December Lo-Nite: BL, DW, FIK, HIL, KCT, KTU, MCR, PMC, and SH. IYU is building a new rig. JNX, in Dedham, is the new QSL manager for the W1 district. Traffic: (Oct.) W1DWO 10, MCR 5, MDU 4. (Nov.) W1QMJ 151, JCK 138, TY 88, AQE 56, JJY 43, AAL 39, LM 37, BL 30, QJB 25, PYM 24, BB 20, OMI 18, DWO 12, MDU 7, DHX 6, AAR 4, RBK 4, AYG 3, MCR 3.

WESTERN MASSACHUSETTS — SCM, Prentiss M. Bailey, W1AZW — RM: BVR. SEC: UD. PAM: NY. I wish to thank all who supported me in my reelection as SCM. I shall try my best to live up to the confidence you have in me. A very fine interclub meeting was held at the Hampden County Radio Club in Springfield on Dec. 3rd. Members of the Worcester, Pittsfield, and Hartford radio clubs met with the Springfield hams for a very fine meeting. MOK is EC for Willamansett and Holyoke. RDR has a new beam with magnetic brake. UD is experimenting with TBS-50. MBT, QFB, and IGY have new three-element beams. PDF and IOZ blast the DX with full gallons on 28 Mc. Looks like EQB and JYH lead the section in the SS Contest. CCH is experimenting with square corner reflectors on 420 Mc. PVF/1 needs 5 more states for WAS. RCS, RDB, and PVF/1 are building a rig for their new club, the Crazy Kilowatt Radio Club. RDB wishes news from teen-age hams with regard to forming a teen-age net. GZ leads the section in traffic, with JE a close second. Congrats to JYH on the new jr. operator and the high SS score. MUN works plenty of DX with his ten-over-twenty beam and is up to 118 countries now. BDV has all kinds of gadgets, motor-driven VFO remotely-controlled and a remote 'phone monitor being just a few. BVR wants to know if anyone is interested in a "slow net." COI has been pushing the key on 3.5-Mc. c.w. working DX. JGY, NGE, BKG, COI, and AZW tried for high scores in the SS for PRC competition. HAZ has gone to 3.85 Mc. because of T.V.I. on 28 Mc. 8VCW was a recent visitor at PRC. LKO has new 75-A. KZS broke into 3.85 Mc. with 500 watts. PYR/1 is on 28-Mc. 'phone with 250 watts. AZW has been snagging good DX on 3.5 Mc. with ZC8, LU, and EI some of the latest. AMI visited AZW. 8DAE visited AMI. Traffic: (Oct.) W1PVF/17. (Nov.) W1GZ 152, JE 146, BVR 77, AZW 70, NY 62, BDV 14, PVF/19, JYH 7.

NEW HAMPSHIRE — SCM, Gilman K. Crowell, W1AOQ — PVF/1 reports joining the Worcester County Radio Assn. and wants to extend 73 to his New Hampshire friends. EWF now has folded dipoles on 3.5, 14, and 28 Mc. ATJ is now on 3.95-Mc. 'phone with an HT-6. ERJ is experimenting on 144 Mc. with a 522. AXL has a new speech amplifier with 809s. FZ is sporting a 32-element 144-Mc. beam on an 80-ft. tower. KEX reports 144-Mc. net functioning well with FZ, DGV, LSN, EIO, LBJ, and LB as members. PVF/1 spent Thanksgiving at home. MCS and his XYL spent their 32nd wedding anniversary in Boston. MMC was home for Thanksgiving week end. ATJ is now working on a 420-Mc. rig. GTY has a new YL harmonic, Sandra, and can be heard on 28 Mc. between baby feedings. CRW is now manager of NTL and is sporting a new Collins. Your SCM observed increased activity from New Hampshire during the SS. Traffic: W1CRW 224, QJY 69, CVK 24, MXP 22, PFU 19, ANS 17, GMM 12.

(Continued on page 84)



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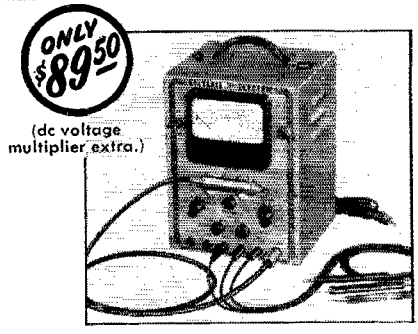

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RHODE ISLAND — SCM, Roy B. Fuller, W1CJH— The Newport Emergency Net, according to reports received here, had one of its drills recorded on wire and broadcast over Rhode Island broadcasting stations for the benefit of broadcast listeners. This Net is showing real AEC activity and your SCM hopes to be able to report on other localities in the near future. PRA held an open forum on T.V.I. at one of its November meetings. The Club also announces that code practice will be a regular feature at all future meetings. The NAARO elected the following at its annual meeting: HLK, pres.; KHZ, vice-pres.; QBZ, secy.; NES, treas. The NAARO Net is active on 28,090 kc. Mondays at 8:00 P.M. BTV still is our active relay station. LWA operated MJL during the SS. KYK was active during the SS. BFB, HLK, JRZ, KNE, QOG, QNU, NCX, KHZ, LFE, OLW, and MTA are active on 28 Mc. QBZ and OLR are keeping the NAARO on 144 Mc. HRC is our newly-elected Alternate Director. Traffic: W1BTV 47.

VERMONT — SCM, Burtis W. Dean, W1NLO — The UVM Chapter of the AIEE were hosts recently to 1500 at Open House of the Electronics & AC Lab. of the E.E. Dept. LWN has moved to Oklahoma City, Okla., and his new call is 5PBQ. IQG has moved to Newport, Del. QZK now is in California. IT, BLC, PYO, and QQ are on 144 Mc. and work VEs. FPS has moved and will be back on the air shortly. MUK has new shack in the basement. OHD is on 27- and 28-Mc. 'phone with three-element Evans Delite. MMV, OKH, and QVS have RCC Certificates. PYO and RNA have joined AEC. PTB has rebuilt final on 150B and put up new antenna to get rid of harmonics. JEN is on 29-Mc. 'phone with Heising Modulation. QNM has 813 final on 28.5-Mc. 'phone. OHD and QKQ have HF 10-20 converters. QQN has new NC-173. MET has SX-25. BOH is on 29-Mc. 'phone with n.f.m. I wish to take this opportunity to thank the fellows who are taking such an FB interest in the c.w. and 'phone nets. Traffic: W1BJP 30, AEA 14.

NORTHWESTERN DIVISION

ALASKA — SCM, Charles M. Gray, KL7IG — KL7IG, chief engineer at KINY, is our new SCM. DB is acquiring a new rig at Anchorage from AH's transmitter when the latter is not watching. GF has 450TL in Class B linear. The Juneau Radio Club is doing FB sending out QSLs. How about *your* envelope and cover charge? GV can make 813 screen modulate but cannot build high-stability oscillator that will work. BA transferred to Seattle as instructor at WVD. AE transferred to Washington in charge of Loran station. BA sold his big rig to OW, who is in charge of transmitter at WXA, and his little rig to CZ, now at Thane CAA. KP is at new CAA station, Lena Point. FQ booms into Juneau on 14 Mc. but is not so good on 3.85 Mc. AW schedules northern BC at 7:30 PST Friday on 3.85-Mc. 'phone. Moisture popped DY's transformer. Send reports for *QST* by airmail the first of each month to Box 1237. Douglas.

IDAHO — SCM Alan K. Ross, W7IWU — Pocatello: New Gem Net member is BDL, with table top VFO with Clapp oscillator and monitone keying monitor. KEA is on with p.p. 807s on 3.5 and 7 Mc. Nampa: CMD, of KFXD, has applied for AEC full membership with SCR-654 and HT-19 rigs available for emergency use. Nampa EC is ETU. Twin Falls: MMO has new jr. operator. KEK visited IEY, who has an FB windmill tower for his 29-Mc. beam. HKJ has been working out in good shape with new 29-Mc. mobile rig. ØCZK is awaiting his equipment from Nebraska. JPP has worked all over U.S.A., Canada, Mexico, and Midway with 10 watts and an SW-3 so he earned his graduation to an NC-100. IPO is rebuilding to a pair of 1625s on 29 Mc. MFC is awaiting delivery of a Collins 75A and 32VI. Boise: New Gem State Radio Club officers are: GTN, pres.; KJO, secy-treas. Write me of your activities during ARRL week. Traffic: (Sept.) W7GTN 206. (Oct.) W7GTN 70. (Nov.) W7DMZ 49, EMT 35, GTN 20, IWU 4.

MONTANA — SCM, Fred Tintinger, W7EGN — LHZ, act. mgr. of the Gallatin Amateur Radio Club, reports MXS took a BC-659 to the top of Mt. Baldy on college "M" day and maintained contact with Bozeman and Manhattan with only one watt. LHZ took the same rig up 12,000 feet in a plane and worked W8s with it. KUX and KJX QSO the "Jim Bridger" Net nightly on 28-Mc. 'phone between Manhattan and Livingston. LOD, permanently bedridden with arthritis, has Class A license and is active on 'phone and c.w. with HT-9. LHZ and IXL are teaching c.w. to beginners at college. Other active calls in Gallatin Valley are: BI, HWZ, JDZ, JID, ED, JOT, LSC, LTT, MDJ, MDW, MHQ, MKH, MSX, KVU, and 2WGW/7. New officers of Glacier Radio Club are: IWC, pres.; BLU, vice-pres.; GBL, secy.; and LOB act. mgr. CPY, our PAM and new Director, also purchased 3995-kc. crystals to develop Montana 'Phone Net. HBM, NCS of CAP Net 6, reports more stations are needed in Billings, Red Lodge, Roundup, and Laurel. CAP schedule time is the 1st and 3rd Tues. at 7 P.M. on 3620 kc. BSU runs a kw. to 304TLs and schedules CAP and MSN. The Montana State Net, MSN, is active on 3520 kc. with KGJ as NCS. Traffic: W7CT 101, KGJ 35, KIY 6, EGN 3.

OREGON — SCM, Raleigh A. Munkres, W7HAZ —

Continued on page 86

How's your amateur I.Q.*?

*Interest Quotient

Check those items of the list below in which you are interested. Allow yourself one point for each item checked:

- ☐ **Protection of amateur frequencies**
- ☐ **International DX contests**
- ☐ **Free individual technical information service**
- ☐ **Sweepstakes contests**
- ☐ **Development of new amateur techniques**
- ☐ **Receiving foreign QSLs**
- ☐ **Emergency preparedness**
- ☐ **Authoritative technical data**
- ☐ **Field Days**
- ☐ **FCC amateur regulations**
- ☐ **Operating awards (DXCC, WAS, WAC, etc.)**
- ☐ **Equipment construction data**
- ☐ **Traffic handling**
- ☐ **Representation of the amateur at world conferences**
- ☐ **Attending divisional conventions**

How to rate yourself:

If your score is zero, better take a good look at your license—it probably expired long ago!

If your score is 1, write the following sentence on the blackboard 50 times: "The only difference between a rut and a grave is in the dimensions."

If your score is 2–3, maybe there's hope for you after all. At least, there can be if you will resolve in 1949 to take advantage of more of the many services, such as those listed above, offered or provided by the American Radio Relay League.

If your score is 4–15, you're undoubtedly already a member of ARRL—you couldn't maintain such avid amateur interests without being a member of the League and using its services.

But no matter what your score—if you are not now a member, support amateur radio by joining ARRL and take an active part in League affairs.

THE AMERICAN RADIO RELAY LEAGUE **West Hartford 7, Conn.**

Astoria: MQA works Guam. COZ works Hawaii and Japan. GOO expects to be "tractor mobile" soon. *K7NRV, Astoria* Naval Reserve station, is active Tuesday evenings on 3.85-Mc. 'phone and 3.5-Mc. c.w. COZ got 1949 license plate 8873. LaGrande: MWE is new ham in town. KVG and IMM are going Collins in a big way. CHN alternates on Oregon State Net when HBO is working evenings. Medford: SEC HLF pulled a very FB AEC drill just before Thanksgiving. Messages of holiday greetings were taken for one hour. Red Cross girls typed up messages as received over the telephone and the Rogue Valley Net channeled the traffic. Redmond: The Central Oregon Radio Amateurs of Bend, Redmond, Prineville, and surrounding country, met at ANU's in November. JOP was elected as EC with KGR as assistant. Baker: IAN, of Ontario, paid a visit to the HAZ/JFM shack. He worked 3.85-Mc. mobile all the way up but is not yet satisfied with antenna. The Baker Amateur Radio Club is holding regular meetings at 7:30 the 2nd and 4th Saturdays of each month at Baker Business College. The Club also is holding code and theory classes each Tuesday evening at the same place. HBO, of LaGrande, ran his Chevvy snowplow down recently for a visit with MIR. IXT wrecked his car near Boise on a Thanksfiving trip but none of the family were injured. AOL has now recovered from the SS Contest and expects to start attending club meetings almost any time now. Traffic: W7APF 302, HVD 76, DIS 41, HBO 12, CHN 6.

WASHINGTON — SCM, Clifford Cavanaugh, W7ACF — SEC: GP. RM: CZY. PAM: CKT. FWR has received ORS appointment. EAU, GEU, and MTJ have received net certificates. CKT has moved and requests information from the gang on how to run a farm. LEC is on the air with new 500-watt rig and is looking for OBS job. KHL and JJK, of Puyallup Valley Radio Club, are stirring up things on 144 Mc. — best DX so far is four miles. EHJ is QRX building a garage. HMQ would like to join WSNET. KNV is getting his college degree on 144 Mc. BCS reports the West Seattle Radio Club had an FB blowout with the gang seeing movies of their shacks. DXF reports lots of DX with his 11-watter on 3700 kc. ZU does his sweepstaking the hard way — the first night he was on in Seattle and the second night he was on in Pittsburgh. LVB is keeping Sedro Woolley on the air via WSNET and WARTS. EAU is out of business because his antenna and poles were knocked down during the storm. DRA suggests that the gang on WSN send FIX, the editor of *Washington Section News*, a few stamps and bits of information to keep this very FB bulletin going. CZY, the RM, handles so much traffic that he has worn paddles off his bug. We hear that IOQ handled 582 messages this month. Very FB, Leo, please give us more dope so we can get you in BPL. ETO, a mail carrier, says the Christmas rush snowed him under. APS helps FIX, ZU, and CWN keep Seattle traffic going. BG is on 28-Mc. 'phone??? CWN is getting a new rig on the air. KCU applied for an RCC Certificate. She keeps several schedules a week. FB, Martha. DGN got out of the hospital after a bad time. FIX is doing an FB job as OO and is busy building new VFO. MCW is handling a nice batch of traffic both in WSN and WARTS. FWD still has the surplus bug. He has a bigger stock than surplus stores. AMZ schedules APF for Oregon traffic nightly. KWC, who is relieving CKT, has never been so busy in his life, keeping Rylics's schedules. GHI, the SEC for Seattle, is getting the gang ready for emergency drill. JC can work ZL any time on 3.5-Mc. c.w. FRU, who keeps Washington on the Pioneer Net, makes BPL again. Five 'phone stations have requested OPS this month, but no ORS. This is unusual — how come? Traffic: W7CKT 817, CZY 607, KWC 513, FRU 302, MCW 149, AMZ 80, FIX 69, LEC 64, FWD 55, ZU 53, EAU 48, ETO 44, KCU 43, FWR 39, DRA 36, LVB 30, ACF 27, DXF 14, DGN 10, CWN 6, APS 4, GHI 2, KNV 1.

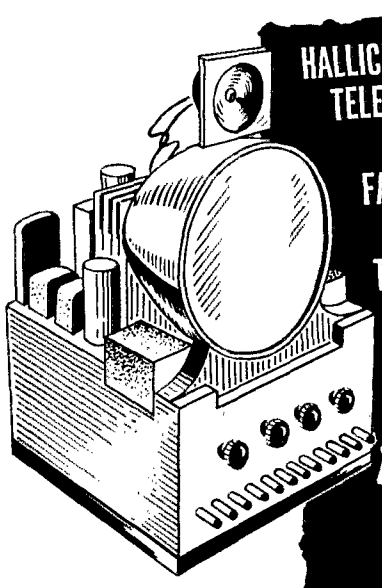
PACIFIC DIVISION

SANTA CLARA VALLEY — SCM, Roy E. Pinkham, W6BPT — Asst. SCM, Geoffrey Almy, 6TBK. RM: CIS. OO: HC. EC: JSB, TFZ. WJM worked in the last SS Contest for the first time and enjoyed it very much. RFF has new preselector and hopes to work more DX now. WNM has a 40-ft. tower for his three-element beam on 28 Mc. TAN is running 700 watts using n.f.m. and sounds very FB. EOA is installing beam on 28 Mc. AVJ increased his modulation with a new transformer rated and 500 watts of audio. VIQ has his troubles ironed out and is working out with very good reports. JSB still is holding schedules with Pacific Islands for personal QSOs. The SCCARA held its yearly election and new officers for the coming year are: RIY, pres.; LZL, vice-pres.; QBO, secy-treas.; NKP, CFK, NX, AVJ, and BPT, directors. WUI gets on 14-Mc. 'phone now and then to work DX. YRB held a nice schedule with J2RJG for personal contact with his friend in Sunnyvale. AVJ picked football scores of San Jose State and U. of Mexico from Mexico City and relayed them to KEEN for information on game. Traffic: W6WJM 121, RFF 34, VZE 23, MMG 7, SYW 6.

EAST BAY — SCM, Horace R. Greer, W6TI — Asst. SCM, C. P. Henry, 6EJA. SEC: OJU. EC: AKB, EHS, NNS, IT, IDY, QDE, WGM. Asst. EC u.h.f.: OJU. RM:

(Continued on page 90)

ANOTHER RADIO SHACK HALLICRAFTERS SCOOP!



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Hi-Low band double-folded dipole antenna with 2 reflectors	**9.71**
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Plastic 300 ohm twin lead insulators	**4c ea. (40c doz.)**

75A-1 + 32V-1 = PERFECTION

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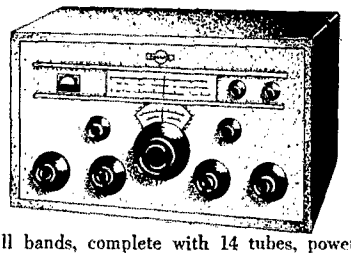
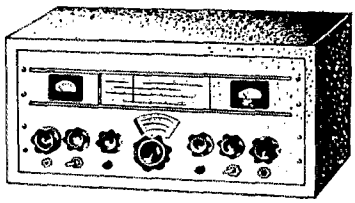


All bands, complete with 14 tubes, power supply and matching speaker.

COLLINS 32V-1 XMTR-$475



Covers 80, 40, 20, 15, 11 and 10 meters. 150 watts on CW and 120 watts on phone. ***A 20% down payment allows you to "Play while you pay".***

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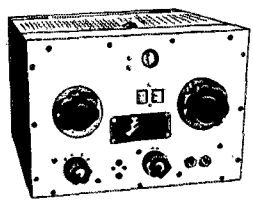

The most versatile and stable means for dodging QRM on the crowded amateur bands. Turret-mounted coils cover six bands (10, 11, 15, 20, 40, and 89 meters) with a blank for one more when needed; and the whole shielded turret is all ready to install . . . you need only pliers, screw driver and soldering iron to complete a superlative ECO that duplicates the peak performance of the factory-built model. Complete kit includes tubes and power supply.

Amateur Net Price $49.75
Only $9.95 puts it in your shack!

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(Still a few left for Early Birds)

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HT-17 ACCESSORY KIT: includes 80 and 40 (20, 15, 10) meter crystals, 100 ft. #14 antenna, CW key, 3 ft. zip cord connection, 2 antenna and 1 feed-thru insulators. **COMPLETE KIT ONLY $7.50**
(With 80 *or* 40 meter crystal, **$4.75**)

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RECEIVERS

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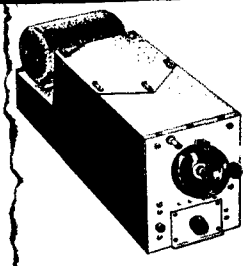

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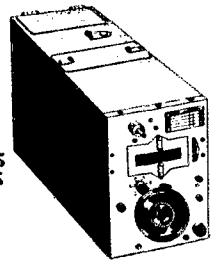
BC 454 (3-6 mc.) ....ONLY **$7.95**
BC 455 (6-9.1 mc.) ....ONLY **$7.95**
EXTRA RCVR TUBE KIT:
includes 3 — 12SK7, 1 — 12K8, 1 — 12A6, 1 — 12SR7.
KIT PRICE **$3.19**

TRANSMITTERS

complete with tubes.



BC 458 (5.3-7 mc.) ....ONLY **$7.95**
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EXTRA XMTR TUBE KIT:
includes 2—1625, 1—1626.
KIT PRICE **$1.47**

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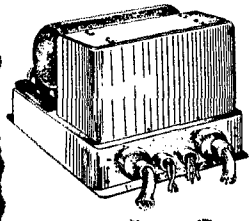

BC 456 (with tubes and dynamotor), parts alone worth over $15 .....ONLY **$3.95**
EXTRA MODULATOR TUBE KIT:
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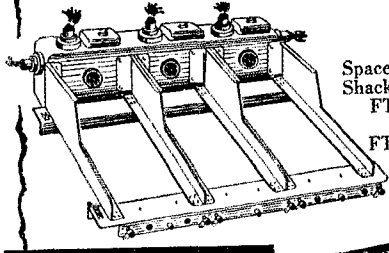
KIT PRICE **$2.03**

RACKS



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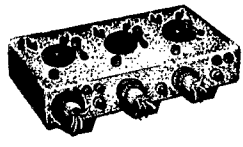

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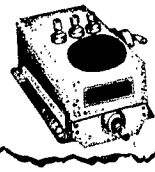
BC 451 .....ONLY **$1.50**

RELAYS



BC 442 (antenna current indicator with 50 mmfd vacuum condenser, 5000 V rating. ONLY **$1.95**

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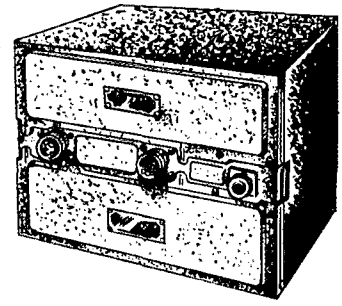

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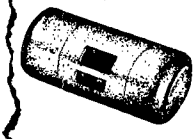

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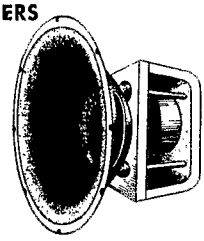

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ZM, FDR. LMZ has new 45-ft. pole for new beam. New officers of the Richmond Radio Club are: NJX, pres.; VQV, vice-pres.; EJA, secy.; ELJ, treas.; EWF, sgt. at arms; VYJ, public relations. The Napa Valley Amateur Radio Assn. has elected the following officers: LXE, pres.; ZM, vice-pres.; FJH, secy-treas. ZM reports the club has big plans for 1949. WII has too much noise to really enjoy ham radio. BF plans to get on 14- and 28-Mc. 'phone soon. KZF got his Class A license and is on 3.85-Mc. 'phone. BDG says everything is under control. YDI has a new pole up and has 14-Mc. beam under construction. OBJ has new 32V1 Collins transmitter. OT is doing a bang-up job getting Official Bulletins out. QXN is QRL traffic. ZUI reports his e.c.o. now is working. FDR states that the Pioneer Net changed time to 7 P.M. PST as of Jan 1, 1949. OJW is QRL. The North Bay Amateur Radio Assn. elected the following new officers for 1949: MLZ, pres.; KZB, vice-pres. and treas.; WXU, secy. YGL is new editor of the club paper. AIR is putting up new four-element rotary. D4AYO is the son of ELW and will be back in Oakland soon. ELW has been playing around with 7-Mc. c.w. JK has rebuilt his rig again. IKQ is planning a trip to Italy this summer and hopes to give some of the gang a new country in San Marino. Yes, Phil is a 'phone man but we understand he is practicing up on his code. We are wondering if he is going to have QSL cards printed up in advance so the boys will not have to wait. DNX is QRL 28-Mc. 'phone. CTL and KEK are chasing DX. PB is getting ready for some 7-Mc. c.w. UPV is building up his country list on 28-Mc. 'phone. MVQ, on c.w., and TT, on 'phone, took top honors in the ARRL Sweepstakes for the East Bay section. AM presented movies and still pictures of Southern California DX stations at the Northern California DX Club meeting held on Dec. 9th in Oakland. EY is thinking of going high power. If you have a radio to repair, see IDY. SQ is on a short trip to Manila. TI reports plenty of DX QSL cards awaiting envelopes at the W6 QSL Bureau. Where is the u.h.f. dope we used to get for this column? Please remember this column is for you and send in the dope. Traffic: W6FDR 614, QXN 336, OT 57, BDG 38, BF 35, ZUI 30, YDI 13, TI 10.

SAN FRANCISCO — SCM, Samuel C. Van Liew, W6NL — Phone JU 7-6457. SEC: 6DOT. CEC: 6BYS. BYS has a kilowatt rig under construction. NL is rebuilding final replacing the VT127As with 450TH. DAB has increased power to 400 watts and is operating on 28-Mc. 'phone using a four-element rotary. BCC, the HF club president, is moving to Everett, Wash. Lots of luck in the new QTH, Ken. TEL is putting up a ten over twenty beam. DIX put his signals into KL7, KX6, KH6, and KW6 with his new four-element beam. ADV has been on 7 Mc. lately. YEF is moving his QTH to KH6 Land. Here's your chance for some schedules, boys. SP is showing off his brand-new NC-183. Fred can now hear stuff he can't work. YME is now San Francisco Bay Area outlet for the Sacramento Valley Disaster Net. VEJ is QRL College of Marin. ØDSF, ex-HJP, visited in San Francisco over the holidays. The National Red Cross station here has been under construction and is now on the air under the call CXO. Station activities, policies, maintenance and operating personnel have been set up and we are ready to do a job when needed. Those of you interested in assisting in EC work should contact your SEC or CEC. The Marin Radio Amateurs Club held its Annual Christmas Party Dec. 11th at the Blue Rock Hotel, Larkspur. Gifts were exchanged and a swell time was had by all. The San Francisco NSARC Club met November 19th at 450 Gough St., San Francisco, at which time plans were made for the Christmas party, which was held on Dec. 17th. Work also progressed on the San Francisco Red Cross chapter station at that location. The usual raffle and refreshments finished off a good meeting. The November meeting of the San Francisco Radio Club was held the 26th. Mr. Mathiesen, chief engineer of KPIX, gave a fine technical talk on the new KPIX television transmitter. A new club secretary-treasurer was elected to take over the job that NNF has so ably done. Mort is unable to continue in office because of the traveling he must do in connection with his new job. Good luck, Mort, and thanks from the gang for a job well done. The new club secretary-treasurer is BIP. Mr. Allen R. Ritchter, engineer for the NARC from Washington, D. C., Headquarters, who has been here in San Francisco directing the ARC station installation, was introduced to the gang and gave them a general description of the Red Cross emergency communication set-up and the amateur station installation here. The usual raffle and refreshments concluded a pleasant evening. Thanks for the reports. Traffic: W6BYS 775, CXO 644, NL 399, JWF 65.

SACRAMENTO VALLEY — SCM, Ronald G. Martin, W6ZF — SEC: KME. EC: BVK. RM: REB. KME reports that the Sacramento Valley Emergency Net on 146.50 Mc. meets each Thurs. at 8 P.M. with KME, NCS and MYL, sub-NCS. KME has 3.5-Mc. c.w. and 146.5-Mc. 'phone equipment ready for installation at Sacramento R.C. Hq. Net members reporting regularly are KVT, FRP, AUO, BKL, BLP, BVK, CKA, EHD, MIW, PIV, QDT, QEO, QKJ, KME, MYL, KUI, LYQ, ZNL, BCI, EEX, GQZ, EXH, AJE, CUE, EYM, QER, UWY, VPV, VKD, HDE, OYF, AQG, MDQ, INP, and TJF. Southern Area: WLI is "big incher" pipe line, to Orient now. GDJ

(*Continued on page 92*)

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worked his 166th country. AUO needs help with his rotary and indicator problems. MIW is building new VFO. YV consistently works J2COM. BLP is rebuilding 522 incorporating 6J6 preselector. WTL has new wide-spaced three-element beam and worked VS1AY, VS6AM, CR9AG, and PK4DA. WRD schedules KA1USA and worked C1CH. AP enjoys 28 Mc. for local rag-chews. PIV cured B.C.L. local reception by adding Faraday screen in 6J6 preselector on his 522. MWM has new 28-Mc. rotary beam. SYN is new EC. ZF is holding down PN schedule with GF-11 hung on clothesline antenna. Central Area: Asst. SCM, Willie Van de Kamp, 6CKV. The Golden Empire Radio Club November meeting was held at RAQ's residence. KUI and LYQ, using high gain 144-Mc. beams and preselectors, report their beams pointing west to mountains 7000 feet high give stronger reception of stations in Sacramento south of them. Northern Area: Asst. SCM, Ray Jensen, 6REB. JDN handled first traffic in months. REB makes the BPL regularly. Traffic: W6REB 602, PIV 65, WTL 17, JDN 6, ZF 2.

PHILIPPINES — SCM, Stan Gier, KA1A1/W7JKJ — Oct. 31st was Field Day at Tagaytay Ridge for the purpose of testing portable rigs for emergency use. Frequencies tried and proven were 3.5, 28, and 144 Mc. The emergency call and official Philippine Amateur Radio Assn. station is KA1PAR. Effective Jan. 1st, the prefix DU will go into use here. ACF is QRT and soon will be heard from Portland, Ore., as W7HUI. RP is constructing a new ten over twenty beam. ACH, NR, ABX, CD, and AI say stateside contacts on 28 Mc. are fine. From AW, JS, AQ, NL, CT, and FT we learn that 14 Mc. still is active from out here. AQ is especially interested in some good 14-Mc. c.w. traffic. Several of the boys are experimenting with rigs and antennas on 144 Mc. Most active of these are JU, CT, FT, MC, and RP. PAR was set up to serve the Boys Town Carnival at Wallace Field, Old Luneta, Manila, from December 10th to 26th for handling of messages on 14 and 28 Mc. 'phone.

SAN JOAQUIN VALLEY — SCM, Ted R. Souza, W6FKL — Asst. SCM, James F. Wakefield, 6PSQ. SEC: JPS. ECs: KUT, PHL. Following are the new SARC officers: NDJ, pres.; HIP, vice-pres.; DIE, secy.; MHD, treas.; BHI, sgt. at arms. ERE is really working DX on 144 Mc. FYM has a new 24-element beam on 144 Mc. and a new Millen exciter. AJE is going high power. CUE is revamping his 144-Mc. rig. BCL is working 144-Mc. mobile. VKD is using phase modulation on 28 and 144 Mc. OYF entertained NOU and his XYL from Los Angeles. MDQ manages to be active in spite of overtime work. EKP is building a multiband amplifier. INP and PJF remodeled the shack and equipment. EXH is busy on 7, 28, and 144 Mc. GQZ took part in the recent YLRL Contest. ZKD can be found on 7 and 28 Mc. PHL is busy but manages to get on 3.5 and 7 Mc. VMU is thinking about a new antenna. QOS is busy with Civil Air Patrol. JPS is the new editor of the SJVRC's *Skip*. JPU has parasitics. WBZ is on 28-Mc. n.f.m. WHO has a cubical quad antenna. CPT has a new HT-18. JGR is building a new rig. PNM is building a new shack in the basement. ILH and MDQ are neighbors. BNW is on 28-Mc. mobile. DVI is trying for DXCC and WAZ. QUE is busy on Pioneer Net. VKR has a new final. HIP has new long-wire antenna. PRD has had receiver trouble. RWI is on 3.85 Mc. SRU says DX from new QTH is FB. KBP is active on 3.85 and 14 Mc. ADB has achieved a good measure of success with the new Clapp oscillator. ERE is a new call in Turlock. Traffic: W6BHI 150.

ROANOKE DIVISION

NORTH CAROLINA — SCM, W. J. Wortman, W4CYB — The Alamance Radio Club in Burlington elected the following: LXH, pres.; AEH, vice-pres.; MLT, treas.; LPN, secy.; and INL, act. mgr. The Greensboro Club has elected KYR, pres.; DTE, vice-pres.; HEH, secy.; AGD, treas.; and MR, director. The Greensboro Club now has 40 members operating a gallon on 'phone and ran up a nice score in the SS. The Elizabeth City gang has a fine set-up for emergency work, portable power and all. Many of the North Carolina gang took part in the Kingsport Christmas Party for the Holston Orphanage. The North Carolina Floating Club, which has been meeting rather irregularly, met with the Mecklenburg Amateur Radio Society Dec. 5th. The gang reports having a swell time. Who invites the gang for the next meeting? Are you registered in the Emergency Corps? Address Charlie Beard, KJS, in Winston-Salem, for information. MR worked ZC1CL for a 7-Mc. WAC. Beams are sprouting around the State like Jack's beanstalk. Incidentally, we bet Jack was a 14-Mc. DX man trying to get up a four-element job. KYI has a brand-new proboscis. GKG got a pair of 304s on. DIS has a 4-250A kicking on all bands. DLX is sporting a new sky wire. CFL has a pair of 813s working. CDQ returned to 3.85-Mc. 'phone after a long lay-off. A Prosperous New Year to the whole gang from the ol' Human Shock Absorber. Traffic: W4CFL 245, KJS 115, DLX 34, CYB 11.

SOUTH CAROLINA — SCM, Ted Ferguson, W4BQE/ANG — First I wish to apologize for not reporting for the month of October. I was out of the state at reporting time because of the passing of my father. ANK reports much

(Continued on page 94)

activity in the South Carolina 3.5-Mc. Net. MRJ has Class A. BJE has completed a new portable emergency transmitter and receiver. KEI had an amateur radio booth at the Greenwood County Fair. MRJ likes his Clapp VFO. DPN makes the following report on South Carolina 3.85-Mc. 'Phone Net: FNC, EXY, FM, CE, KMK, EZF, BPD, and DNP. The Net meets at 3:30 P.M. Sundays on 3910 kc. Our SEC, ANK, reports that the Simulated Emergency Test was a big success and the following participated: Walterboro, BJE; Chester, BR; Rock Hill, MYM; Charleston, BAT; Florence, MCY. The Charleston test was the best yet. MCY is new Florence EC. The following are out-of-state traffic stations: ANK, KEI, MRJ, and NRC. If you have traffic pass it along to them. LJJ is active in the South Carolina Net. With this report I complete my 12th year as your SCM. My contact with you boys has been very pleasant and I have enjoyed working with you. It's a pleasure to be a part of such a splendid group of men. Traffic: W4ANK 225, MRJ 43, KEI 35, CXE 23, BJE 15.

VIRGINIA — SCM, Victor C. Clark, W4KFC — Heartiest congratulations to IA and ZA on their elections as Director and Alternate Director. Virginia turned out for the SS in fine style. ABY, CC, FF, IA, JFE, KFC, KFT, JDL, JUY, KVM, LAP, LIQ, LRI, LUE, MOJ, MWA, NNN, NJV, OHF, SU, and VE are known to have scores of over 50,000 points. IWO made 33,000 points on 'phone. LIQ and KYC are moving across the Potomac. LUE moved and found himself one block from NNN and next door to RI! KVM gets out FB with low-power 14-Mc. 'phone. New ORS: JHK, ITA. New OO: LOL. New ECs: AKN, IOQ, IPC, JDB, JAR, JVU, and KAV. FV is DXing on 3.85-Mc. 'phone. NNN, SU, and KFC worked ZC8PM on 3.5 Mc., completing 3.5-Mc. WAC for the latter two. NNN is looking for a South American! BZE is alternately rebuilding and chasing 3.5-Mc. DX. JQW took Class A exam after 20 years in ham radio. MK is boring a hole in the 7-Mc. QRM with his ten-watter. BZE reports that the 28-Mc. band in Richmond is kept alive by LLU, KCM, BSM, ITK, NAD, MZM, IWW, and others. ZV, doing the work of three men, found time to fire up on 7 Mc. WT is rebuilding. KRZ will open up on 3.5 Mc. IUU, a new VN member, reports that he is getting a big kick out of working 3.5- and 7-Mc. c.w. after working 'phone exclusively since the war. EMJ reports the SS was his principal activity for the month. Rumor has it that the Potomac Valley Radio Club topped 3.5 million points in the SS. If you want to hear some snappy 'phone operating procedure tune in on VFN, the Virginia Phone Net, 3880 kc., at 7:30 some weekday evening. MWH, in Danville, has an all-band final with p.p. 813s. IWA is rebuilding to use 304TH on 3.5 and 7 Mc. and a 250TH on 14 and 28 Mc. Blow a penny on your SCM on the first of each month! Traffic: W4KYD 104, KVM 95, IA 70, KFC 54, FV 34, FF 31, LAP 25, ITA 20, IWA 20, II 18, IPC 15, IUU 8, CLD 7, BZE 4, JHK 4.

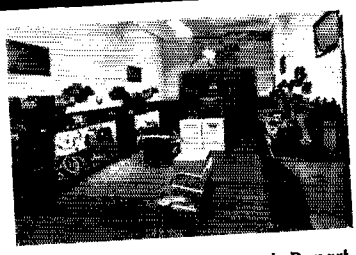
WEST VIRGINIA — SCM, Donald B. Morris, W8JM — I am pleased to announce the appointment of Ray Wardle, FMU, as your SEC. Working with your SCM, Ray will shape up the EC program. CKB, new ORS, has Collins 32-V-1 and schedules Porto Rico weekly. QHG has new rig on 3.85-Mc. 'phone and a three-element beam for 28 Mc. DFC works WVN, NTSC, and NTL Nets. PZT, VCA, and AUJ are active in Weston and PZT made a fine showing in the Frequency Measuring Test. MARA held a dinner meeting in Clarksburg. WSL, JM, EP, WVF, FMU, YGL, QG, and KWL may be found working on 29,360 kc. GBF, who is active in traffic nets, finds time to work CN, FA, G, and GW on 3.5-Mc. c.w. MOP works in the W. Va. and Dog House 'Phone Nets. JF sold out to KWI and has accepted a position in Washington, D. C. Our sympathies to GEG on the death of his mother. TDJ, EP, and JKN have regular schedules on 144 Mc. over tough terrain. Congrats to the W. Va. Nets, 'phone 3980 kc., and c.w. 3770 kc., for their excellent showings. Remember net time is 7:30 P.M. YBQ has deserted 28 Mc. for 3.85-Mc. 'phone. OFD, Grafton High School Radio Club, is on 7 Mc. running 8 watts. DHT received his ticket recently and is on 28-Mc. 'phone. Traffic: W8GBF 338, OXO 71, CSF 34, DFC 33, QG 14, QHG 7, JM 5, MOP 2.

ROCKY MOUNTAIN DIVISION

COLORADO — SCM, M. W. Mitchell, WØIQZ — RM: IC. The Denver Radio Club has "adopted" Edna Welch, an invalid who is an ardent listener to the 3.85-Mc. band. She is learning the code in order to get her license. The Club recently presented her with a receiver which was obtained through the efforts of EGY. WLA, formerly of St. Joe, now is a Denver resident. ODS is a new one on 28 Mc. DSB, BJN, and FCK are trying 420 Mc. with 645A transceiver. MKK works schedule with 2MCB, a block from his old QTH. TW has new all-band broad-tuned switching exciter. KW is building a plug in n.f.m. for his BC-610. LAQ is on 3.5-, 7-, and 14-Mc. c.w. IC wants the IUN time to be changed to 7:30 P.M. on 3540 kc. LZY schedules ECN and AHA on TLS. PGX handled special emergency during snowstorm and blizzard in Kansas. OWP assisted Nebraska 'Phone Net during the same storm. WRS moved to Albuquerque. ZIX is in Arkansas. HWH, in Greeley, is on

(*Continued on page 96*)

Sound Values! AT TERMINAL!



Our newly enlarged Sound Department enables you to conveniently see, hear and compare before you buy. We carry all best quality lines of sound equipment—in stock at lowest prices!

RECOMMENDED FOR HIGH QUALITY, ECONOMICAL CUSTOM INSTALLATION

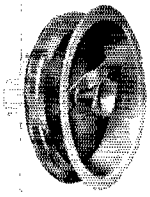
This group of equipment has been carefully selected in our laboratory for coordinated high quality LP and standard phono and FM reproduction. When installed and interconnected, this radio-phonograph equipment surpasses the quality of instruments selling for three times our price!

Terminal group TR-20A consists of: **1.** Bell model 2122 high fidelity radio-phono amplifier. 10 watts output, 15 watts peak. With bass and treble controls set for flat response, frequency range is 30 to 15,000 cps ± 1 db. Hum level is —65 db. below rated output. **2.** Howard model 482 FM tuner, compact in attractive mahogany cabinet. Covers 88-108 Mc. FM band smoothly, with excellent sensitivity and stability. **3.** V-M model 400-C duo-speed changer, 78-33⅓ r.p.m. Plays 10 and 12 inch discs intermixed; record changer and motor shuts off automatically after last record is played. Single tone arm adjustable for both type records. Up to 4 hours on LP. Dual needle reversible cartridge also adjusts for proper needle pressure. **4.** General Electric model 1201-D heavy duty high fidelity PM speaker. Frequency response is 45 to 11,000 cps, handles 25 watts. **5.** Terminal's own 12" bass reflex cabinet. Supplied unfinished, wood smoothly sanded, ready for finishing. Power requirement for items 1, 2 and 3 is 115 v., 60 cycles AC.

Your cost, complete

128.50

This equipment should be heard to be appreciated. On demonstration in our newly enlarged Sound Department.



NEW! UNIVERSITY COAXIAL TWEETER ADAPTER #4407

A new convenience for extending response range of any 12" PM speaker to 15,000 cps. Supplied with mounting ring and hardware. Net **14.70**

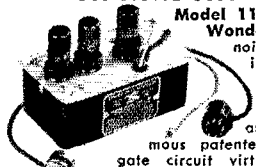
4405—Proper dividing network with variable level control for balancing 4407 tweeter with 12" PM speaker. Net **5.88**

NEW CINAXIAL SPEAKERS BY CINAUDAGRAPH

Frequency response 50 to 15,000 cps. 8 ohm input. Supplied complete with balanced bridging network. Use in same manner as a standard speaker, but enjoy the wide range performance of a dual speaker system.

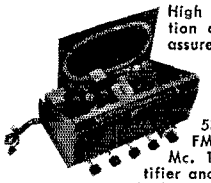
CIN-12A	12", 10 w., 3" tweeter.	**16.17**
CIN-15B	15", 15 w., 5" tweeter.	**27.93**
CIN-15C	15", 18 w., 5" tweeter.	**36.75**

SCOTT NOISE SUPPRESSOR



Model 110-A "Little Wonder" dynamic noise suppressor installs easily in most phono combinations and amplifiers. Famous patented electronic gate circuit virtually eliminates record surface noise in the range of 30-8,000 cps. Supplied with tubes, remote control, fittings, cables, adaptors and complete instructions for simple installation. Your cost **49.50**

ESPEY AM-FM TUNER CHASSIS — MODEL 511

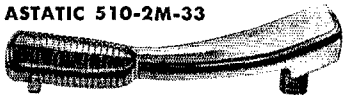


High fidelity reproduction on FM and AM is assured through well-engineered circuits and use of high quality parts. AM covers 535 to 1720 Kc., FM covers 88 to 108 Mc. 12 tubes plus rectifier and tuning eye. Supplied ready for installation with tubes, antennas, escutcheon and hardware for mounting in table cabinet or console. For 105/125 volts AC, 50/60 cycles. Net **91.14**

2% cash discount has been deducted where applicable.

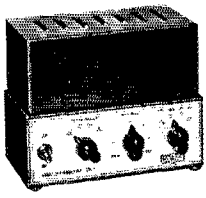
NEW LP (LONG PLAYING) PHONO EQUIPMENT

ASTATIC 510-2M-33



Equipped with variable reluctance pickup for LP records. Response to 12,000 cps. with minimum distortion. Net **5.50**

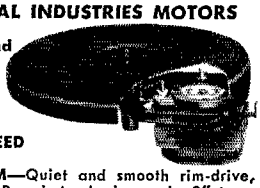
ASTATIC EA-2 EQUALIZER-PREAMPLIFIER



2-stage deluxe preamplifier for reluctance phono cartridges. Variable turnover frequency control for precise equalization. Variable bass boost, 4 position calibrated treble attenuation. Self-contained power supply. A "must" for best results with standard and LP recordings. Net **23.22**

GENERAL INDUSTRIES MOTORS

33-1/3 and 78 RPM



SMOOTH DUAL SPEED

Model DM—Quiet and smooth rim-drive, ideal for LP and standard records. 9" turntable. Net **6.75**

Model DR—Heavy duty 2-speed for more exacting requirements. 10" heavy turntable. Net **11.70**

G.E. RPX-041 — New variable reluctance cartridge specially designed for LP records. Has sapphire stylus. Net **5.82**

CLARKSTAN 201—Wide-range pickup cartridge with .001" replaceable needle for LP records. Net **15.00**

Clarkstan replacement needles (specify LP or standard). **2.40**

PICKERING D-1405 — Wide-range magnetic cartridge for LP records. Equipped with diamond stylus, outlasts sapphires by 10 times. Net **36.00**

TERMINAL RADIO CORPORATION

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28-Mc. 'phone. ECN has new mast up, a 50-footer. He also took his Class A exam. SGG is ill but has found time to build a v.f.o. f.m. 28-Mc. rig. Any hams who would like to join Colorado Air National Guard, please contact QDC. The CAP is looking for communications men. Contact QYT for details. TW is rebuilding. GAA, a new ham, has new jr. operator, new home, and new beam. SBE is thinking of bullet-proof shack for protection from irate BCLs. The Denver Radio Club (AAROD) meets the 3rd Wednesday of each month. All interested in radio are invited to attend. Traffic: WØIC 95, LZY 66, ECN 59, OWP 22, SGG 9.

UTAH-WYOMING — SCM, Alvin M. Phillips, W7NPU — SEC: UTM. RM: GBB. PAM: FST. We extend our wishes for a speedy recovery to TST, who has been in the hospital. FYR has been scanning 7 and 14 Mc. for a clue to the whereabouts of the Ogden gang. BED reports that KVS is on 28-Mc. 'phone and that TNU just arrived in St. George. UTM and BED are working hard to form the UTE Net. They guard 3700 kc. nightly at 7 P.M. MST for check ins. TPV is pumping 400 watts into a pair of 8005s. A new call at Sandy, Utah, is MWR. SP and KMR are going strong on 144 Mc. and still are listening for Ogden signals. Traffic: W7BED 585, UTM 428, TST 26, LKM 7, FYR 6.

SOUTHEASTERN DIVISION

ALABAMA — SCM, Dr. Arthur W. Woods, W4GJW — A well-organized QSO contest is underway in the recently reorganized Tri States Radio Club of Dothan. The Montgomery gang enjoyed a picnic attended by ATF, ECF, HVY, EW, AUP, DPX, LRE, MFA, MNK, and MIH. JYB and JYK have a Sterba curtain on 14 Mc. MTD's beam is only 18 feet above sea level! OVD will revert to 6OVD. FPN is back on now. ODQ sets January as the deadline for getting on the air with homebuilt rig. GBR is looking for DX 144-Mc. contacts. 8CNQ operates from Montgomery. 2ESC, formerly of University, returned to visit EBZ and AKP. 1PZG (ex-4DGS, your former SCM) is with the State Dept. OKY, OLG, and OKE are new Birmingham calls. CYL is building a rig around a pair of 304TLs. MEM has completed 28-Mc. mobile rig. OFL, OFM, and OGW are new calls in Muscle Shoals. BA has worked 80 countries on 14-Mc. 'phone since Feb. 1st. ELX is on 3.5 Mc. If lack of space keeps you off 3.5 Mc. and participation in the emergency nets, an antenna made by wrapping as many turns as possible around a long bamboo pole will be effective if fed with Zepp feeders and worked against counterpoise or ground. (Ask W4ANK.) Traffic: W4GJW 51, JYB 26, KIX 25, IMK 16, JAM 12, FZN 9, CYL 6.

EASTERN FLORIDA — SCM, John W. Hollister, jr. W4FWZ — DQW, JEP, KJ, and MGW now are OPS. MGW has been appointed EC. Help! C.w. traffic outlets are needed in Jacksonville, St. Petersburg, and West Palm Beach on 3.5 or 7 Mc. Write AYV or IKI. Listen on 7290 kc. at 7 and 3675 kc. at 7:30. This is the traffic season, get in it! Speed is not essential, dependability counts! Ft. Lauderdale: The Broward Amateur Radio Club has been formed to sponsor public service and "AEC" with MGW, AHZ, CON, and LTG as officials. MGW is back on 28 Mc. with three-element beam. Gainesville: GYO (OES) is primed for VHF with National HFS, shared with EID (OES). Jacksonville: HWA, EHU, JKI, JWX, and LZM are new officers of the JARS. Clewiston: ISR will travel for U. S. WX Bureau. Lake City: IQV is on 28 Mc. with 200 watts for northwest QSOs. Hialeah: GHP (ORS) sets the pace in 'phone traffic with telepatch. Miami: AAR (ORS-OBS) schedules official bulletins Mon., Tues., and Wed. at 8:30 on 3800 kc. BT (OO-OBS-ORS) and BYF (OO-RM-EC-ORS-OBS) are helping to clean up the bands with their consistent Official Observer service. New Port Richey: Here's the dope on KJ: four-element on 28 Mc., 250-watt all band *auxiliary* rig with 5514 final, Bud VFO, Millen exciter to p.p. 810s as the main rig. Tampa: DES is back in Palmetto Net. Let's have more reports, fellows. Net members are urged to send in reports. Reporting cards are available from the SCM. DX reports are needed. Join a net., 3675 kc. at 7:30, 7290 at 7, and 3910 Tues. at 6:15. Get c.w. information from FWZ, AYV, IKI, IQV, or MNT; 'phone information from WS, JQ, or AFO. WS and QR turned out some FB rules for the Knights of the Kilocycles. YL 2ARTZ is /4 at Palm Beach. Note to ECs: If the Florida Emergency Manual needs revision now is the time to start. Traffic: W4PEI 170, IQV 107, AAR 58, MNT 48, GHP 32, HWA 15, AYV 14, DES 12, DQW 12, KJ 6, BT 3, BXL 3.

WESTERN FLORIDA — SCM, Luther M. Holt, W4DAO. — MEN is building a new home. MUX added a pair 24Gs for more power. MS has turned football coach. EQR, QK, MOB, and CNK took Class A exams. FDL visited Pensacola. BFD bought coils for Class A bands. BGI built nice 7.5-watt mobile. DZX took the commercial exam. MTN plans 3.85-Mc. 'phone. EZT bought rig from SAA. JPA and DAO built new homes. LRC built 420-Mc. oscillator. MSX is back home from tour overseas. LRX bought new 175-watt rig. DLO wants schedules with Western Florida stations. ACB made a trip to Washington. GAA works 28-Mc. 'phone. TL is heard on 7 Mc. BKQ built quad antenna. PARC is receiving requests for membership from

(Continued on page 98)

all over the section. PARC's bulletin, *Parasitics*, is being widely circulated throughout Western Florida. JV is heard working a K4 call. Traffic: W4AXP 80, MUX 25, NGS 9.

GEORGIA — SCM, Clay Griffin, W4DXI — SEC: BIW. PAM: BOL. LNG worked HC2OT Nov. 21st on 50 Mc. Ruddy also reports that he has 25 states on this band, FBH 40, and GMP 39. The new officers of the Augusta Club are: LYG, pres.; JEF, vice-pres.; OGS, secy.; and HRR, act. mgr. CBR, Claxton, reports OAM has been drafted. Savannah: JNL, JOY, MMQ, FNY, and CJE all have emergency equipment. KGI, of Valdosta, reports the following: BVK has completed a new VFO and is on 3.5 Mc. nightly. GFF is on 28 Mc. NMS, XYL of GFF, is on 7 Mc. APS is on 14 Mc. KGI works 3.5 Mc. each night with a new longwire antenna. OMN, a new-comer, is on 7 Mc. FGH recently was married. Cochran: BOL has his new rig going on c.w. GGD still is after 3.5-Mc. DX. More reports are needed to fill this column every month. Traffic: W4BVK 42, GGD 32, MMQ 31, BOL 13, LNG 2.

WEST INDIES — SCM, Everett Mayer, KP4KD — SEC: AM, ECs: CO, DV, ES. AM reports that AM and HR are still using "Z" antenna (clothes line). Hi. BE worked CT1QA to make an even dozen countries, nine confirmed with 15 watts 28-Mc. 'phone. AM and HR walked off with Subraco transmitter at Ponce Hamfest. DJ came home from Ponce with a Harvey-Wells TBS50. EZ has beam rotator but needs transformer. Bill added WAS, WAC, WPR-50, and KZ5 Certificates, and has 63 countries with 75 KP4s. IG made his debut on 28-Mc. 'phone after the usual "bug" troubles. KD and ES keep the 3.5-Mc. c.w. and 3.85-Mc. 'phone AEC nets going but complain of poor coöperation. KD keeps regular schedule with his son, W4OLC, in Miami. The gang had a swell time at the SPRRAC Hamfest at BI's QTH. PRARC is mailing out WPR-50 Certificates. FH left for the Continent. The DX gang will miss him greatly. DR now is working for CAA. Please send in news each month. Traffic: KP4EZ 20, KD 11.

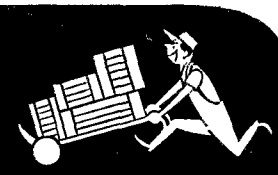
CANAL ZONE — SCM, Everett R. Kimmel, KZ5AW — SEC: GD. PAM: CG. Call assigned for special activities of CZARA is KZ5KZ, used for first time at the club's "ham shack" at Boy Scout Merit Badge Show, Balboa. Skippered by BT, the station was the center of attraction. The CZARA now meets bimonthly aboard a Sea Scout ship moored at Diablo. New officers for 1949 are: CG, pres.; RM, vice-pres.; BG, secy.; AU, treas. GD was made OO Class 1. XJ appears to be top man in the SS Contest for Zone, with AX runner up. AZ now is chasing DX near Washington, D. C., as W1MV/3. ED, arriving at March A.F. Base, Calif., fell heir to departing W6BIK's three 40-foot masts. Nineteen of the Howard A.F. Base gang have departed Stateside for new duty, seven remaining. AY is Howard A.F. Base correspondent for *CZARA Bulletin*. AX and PA for the Atlantic side. Ex-W5NEO is pounding brass as NJ. An RM is needed for the sections' traffic and Emergency Corps set-up.

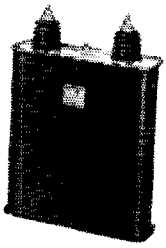
SOUTHWESTERN DIVISION

LOS ANGELES — SCM, Vincent J. Haggerty, W6IOX — AEC activities: Our SEC, UXN, reports progress in organizational work, especially in the Los Angeles area. New ECs are ESR, GVT, and KGC. EC PTR reports the following members of his AEC group had a 7½-hour workout in connection with the Topanga Canyon forest fire on Nov. 4th: QJQ, RMV, WOU, VLD, NYF, CAR, CFI, OHM, TSN, HWM, TVK, ESR, and MIO. Twice monthly this group's drill are reported directly to the SCM by radio. DDE is the section's top traffic man this month. Ed says he made the BPL on deliveries the first day of the month. CE is a new traffic man in the Santa Barbara area and submitted a fine traffic report. ZMZ sent in his traffic report by radio. MU and JBO have been working together on beams; heavy winds blew down a transmission line for MU. ZOL pounds brass on 7 and 3.5 Mc. ZQV is a member of the fast-growing Border Net. ENV talked on DX at the San Fernando Valley Radio Club. JJH has erected a 60-ft. pole with plans for a beam. ANT is working on T.V.I. problems. AM worked all but one section in the SS; he reports losing a 15-year-old 28-Mc. rotary to the wind. NAZ reports traffic somewhat slow with schedule readjustments in the offing; she also reports the November meeting of the YL of LA Club was held at the QTH of WQK with discussion of emergency needs with the Disaster Committee as the chief order of business. POD is new trustee of Paso Robles Radio Club station, ZOJ. This club has completed plans for code classes three nights per week; prizes of 274N receivers are offered to the first two students acquiring ham tickets. FYW has a 50-watt rig on the low end of 7 Mc. MSG is interested in underground antennas. One 100TH went "west" for BUK and he states a newly-sprouted t.v. antenna in his immediate vicinity brings visions of potential T.V.I. DGA got his 7-Mc. rig on the air and plans to get on 3.5 Mc., where his main interest will be traffic handling. YVJ operated flea power in the latest CD Party. His big rig is nearing completion and he plans to hit the traffic nets with it. ZUX reports the second meeting of the VHF Net on 147.5 Mc. was a successful drill. ZUX was Net Control with the following checking in: DMJ, BWY, EKK, CQJ, WHV, WWP, WHP,

(Continued on page 100)

HARVEY has it in stock





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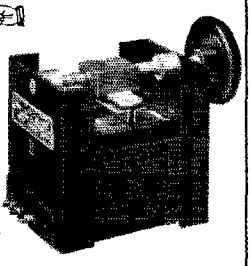

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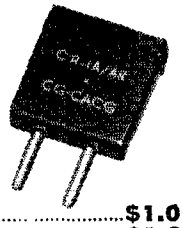
250 watts. Input 115 volts, 60 cy; commutator range 103-126 volts. Shpg. Wt. 15 lbs.....**$5.95**

1616 TUBE

Half wave, high vacuum rectifier. Filament 2.5 volts, 5 amps; peak inverse 5500 volts; peak current .8 amps; surge current 2.5 amps; average plate current .130 amps. List price $7.50, Harvey Special Price, *while they last*.....**95¢**



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20 meter xtals for a buck! Mounted in holder with ½" pin spacing. Also 40 and 80 meter and 6 and 13 mc bands at the same low price.

Specify your frequency.....**$1.00**
5 mc precision xtal, many uses.....**$1.95**
Special 8 mc xtals for 2 meter xtal control.. **1.50**
Lucite adapter for ½" xtal holders..... **.35**
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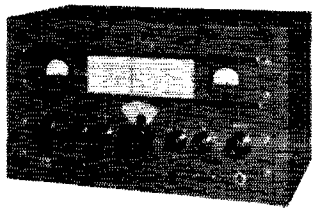
Desk xmittr, VFO controlled, band switching, gang tuned. Rated 150 watts input on CW, 120 watts on phone. Shpg. Wt. 133 lbs. Complete.....**$475.00**



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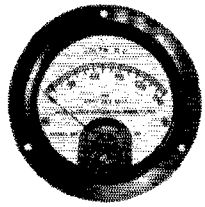

METERS

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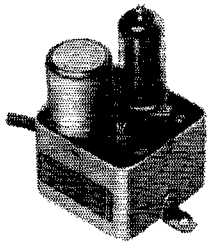

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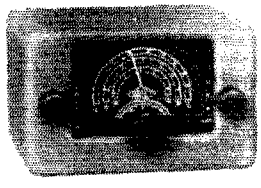
Makes your receiver an accurate frequency standard with marker signals every 100kc. Includes low drift 100kc crystal, 6AU6G tube, complete instructions. Brand New. Only a few left.....**$6.95**
Order one or more spare tubes, 6AU6G....each **65¢**

New GON-SET 3-30 Mobile Converter

Bandspread dial for all ham bands. High sensitivity, excellent for use with whip. High stability. Four working RF tubes give lots of reserve gain. Extremely compact, same size as other Gon-Sets. Low plate current drain, approx. 10 ma.....**$39.95**



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DEY, and ZRU. The Two Meter and Down Club has organized a 420-Mc. Net with meetings every Tuesday. with NTW as Net Control and drills starting at 8 P.M. PAM activities and construction work on his new rigs makes MVK a busy man. CTS and ERF are on 144 Mc. NQN is on 144 Mc. with a sixteen-element IDF beam. PXH and KUL are tackling the cubical quad. BZN gave a talk to the Metropolitan Radio Club of Los Angeles on his experiments with the cubical quad. ZRU made 51 recordings of signals heard on 144 Mc. and demonstrated the results at a recent meeting of the Two Meter and Down Club. YSJ/EAJ reports television work is cramping his amateur activity. AAE is on 3.5 Mc. Three weeks spent on location aboard the aircraft carrier, USS *Antietam*, filming Navy activities for the picture, "Task Force," kept ASW from ham radio during November. EUT got his ticket during November and is on 28.7-Mc. 'phone with a Hammarlund 4–20. Traffic: W6DDE 506, CE 208, ZMZ 106, FMG 60, MU 14, ZQV 14, AM 10, NAZ 10, ZOL 10, FYW 4, BUK 3, IOX 2.

ARIZONA — SCM, Gladden C. Elliott, W7MLL — Thanks to RJN, KAG, KQR, KAC, MEK, JGV, and MII, the Tucson, Phoenix, Mesa gangs had another enjoyable picnic. NLK is on 3.85 Mc. at Holbrook with 15 watts. MGM has a new Collins 32V rig. New officers of the Radio Club of Arizona are: JOV, pres.; JYZ, vice-pres.; MHP, secy.; and JFX, treas. KLA's electronic telescope is attracting wide attention. All Mesa hams have joined the AEC and are active with fixed or mobile rigs. Mesa Club officers are: JNA, pres.; LHM, vice-pres.; MOJ, treas.; QJL, secy. The Mesa gang put on an emergency drill for the JC and received enthusiastic commendation. Arizona SS entrants with high scores are: (C.w.) QAP 108,000; MLL, LIH, LHX, MUP, LYP, LPA, and JYZ. ('Phone) MAW, 28,000; LOJ, LAD, LVR, and KRW. KHN was heard on 28 Mc. by a J9 with only 1 watt on 28-Mc. 'phone. 5MQP/7 and ØAMB are located in Tucson. The 3515-kc. Net meets at 8 P.M. with RJN, JPY, LPA, and RU as regular members. The Low Speed C.W. Net has QSYed to 3757 kc. and meets Mon.–Fri. at 7 P.M. Members are: LVR, LFE, OZM, MDM, LOJ, LHD, LAD, LLO, MGM, and MLL. LIZ reports 3272 points in the YLRL Contest. Traffic: W7RJN 80.

SAN DIEGO — SCM, Irvin L. Emig, W6GC — Asst. SCMs, Gordon W. Brown, 6APG, and Shelley E. Trotter, 6BAM. RM: BGF. SEC: DUP. HU has been appointed ORS. The section wishes to congratulate our new Director, Johnny Griggs, KW. AD is enjoying very satisfactory 3.85-Mc. mobile operation with 11 watts output. BAM had schedules with NRM while he was portable on trip through Arizona. FMZ, a new ORS, is active with Trunk Line G, the Rebel Net, and the SBN. WXW sends in his usual fine traffic total. PG worked hard preparing for the SS and couldn't participate because of equipment breakdown. He had a good visit with FMZ and YOT, both of ex-Tsingtao fame. New schedule time for the Southern Border Net (3550 kc.) is 7 P.M. PDST, with the old time of 9 P.M. used for supplementary traffic outlet. 5NXE, of New Mexico, visited with other SBN members while in San Diego. GTM has a Collins receiver and exciter. AMO is building a kw. rig. EHV, ex-2TJF, is working lots of DX. From the sound of things EPZ made a big score in the SS. 319 contacts in 72 sections were claimed by CHV. He also mailed in his 104 'phone confirmations for DXCC. VJQ and his XYL now have a new Collins 32V1 transmitter. VUK is on 144 Mc. 1PLY now is 6VVA at Imperial Beach. BKZ is one of the mainstays in the SBN. The YLRL held a Christmas dinner. The girls are still working on the membership drive and report a generous response. CPJ is now settled in her new M.D. office and will be on 3.5-Mc. c.w. soon. ZYD is busy with club activities. BLF is working the rig while her OM is at White Sands. This will be my last report as your SCM. I have thoroughly enjoyed the association with a fine group of amateurs. May I take this opportunity to say thanks to all who have assisted in such a generous fashion. Traffic: W6BKZ 193, BGF 143, WXW 82, K6NMC 73, W6VJQ 67, FMZ 23, BAM 14, CHV 12, AD 3, FMJ 3, GTM 1.

WEST GULF DIVISION

NORTHERN TEXAS — SCM, Joe G. Buch, W5CDU — GZU rates top honors for an outstanding one-man traffic total. LSN has been appointed RM. The South Plains Radio Club of Lubbock has a membership of 33 hams and meets on the 2nd and 4th Wednesdays of the month. Officers are: EWP, pres.; NFO, vice-pres.; NIC, secy.; and NGX, public relations director. LSF is with CAA in Panama and is now KZ5CH. A very large number of section net members attended the Abilene and Caddo Lake Hamfests. Twenty members of the Lubbock Club are active in a 28-Mc. EC Net and five members are active on 50 and 144 Mc. The amateurs attending Texas Tech. have organized a radio club with OCC as president. JQD has 28-Mc. mobile rig. Extensive plans are now underway in formulating a new CAP Net in Texas. Dallas hams are gunning for the fellow who picked 27 Mc. for t.v. i.f. frequency. LGY is again on the air from Commerce. ASA has increased power. NFT will be back with NTX when he finishes punching grease holes in the Etex Field. Congrats to MC on his fine showing in the OO test with an average error of 8.2 P/M. LVR is

(*Continued on page 102*)

now with Braniff. OJ has moved to Frederick, Okla. LSN is going strong with TLAP and Rebel Nets. ONQ reports for NTAC Radio Club, operating EUY. Present operation is on 7 Mc. with new transmitters under construction. Thanks to NGX for the Lubbock Club report. Traffic: W5GZU 1333, LSN 337, CDU 168, ARK 122, ASA 41, GUD 20, ILZ 20, FMZ 18, BFA 10, SP 6, AAO 5, BTU 5, DN 2, EGJ 2, IHG 2.

OKLAHOMA — SCM, Bert Weidner, W5HXI — Asst. SCM, George Bird, 5HGC. SEC: AHT. GCM has added a pair of 807s on 30 Mc. with 600 watts on 14 Mc. EHC has a mobile rig for 3.85 Mc. PAA is completing VFO for kw. final on 3.85 Mc. AGM is now mobile on 3.85 Mc. HEV is having trouble making contacts on s.s.s.c. MBV is spreading traffic over three bands. FOM is now reporting into OLZ. FOM, from Ft. Sill, was one of the most active prewar stations. APG has joined OLZ. Ken is really an old-timer, having been assistant district manager in 1925, and has been welcomed back to OLZ. The working hours of IGO, MDV, and NMM have not permitted much net operation. AHT spoke to the Tulsa Club on emergency equipment. MIR is now Tulsa County EC with JDX as his assistant. AGM is making headway in the Oklahoma County group. KYW, Ponca City, is new to 3.85 Mc. with 200 watts. NMM is working f.m. on 30 Mc. Let's get some activity started on 50 and 144 Mc. HXI hopes to have a pair of 4-125As on 144 Mc. at once. The issues of *News* from Lawton and *Short Skip* from Oklahoma City are always read with interest. Traffic: W5AST 231, NMM 192, HXG 54, OWV 49, MBV 46, KDH 31, FRB 22, IOW 15, ADB 4, APG 2.

NEW MEXICO — SCM, Lawrence R. Walsh, W5SMA — SEC: Mert Sayre, 5ZU. PAM: FAG. RM: NXE. The LARAC organized a B.C.I. committee with NAS as chairman. So far as is known, NXE has the highest SS score on c.w. and FAG the highest on 'phone. As a result of swing shift work schedules, the 40-Meter Net now meets daily at 9:50 A.M. to 5:30 P.M. on 7266 kc. MYQ is being heard on 28-Mc. 'phone with his 522. KP4EF/5 is now W5PEJ and is active on 3.5 and 7 Mc. MYA is planning a 150-watt mobile all-band transmitter. JYW has become inactive because of an extremely high line noise. Dave Middelton, W1CA/5, is now living at 1339 So. San Mateo Dr., Albuquerque. OMR is looking for activity on 3.85 Mc. daily during the daytime. ZU spent a few days in Denver on vacation. NXE was in San Diego for several weeks. VWU and NXE have been trying to work together on 144 Mc., but have had no luck so far. UFA and UVA/5 have new Signal Shifters. Traffic: W5ZU 178, NXE 55, PEJ 19, MYA 10, NJR 7, SMA 6.

CANADA

MARITIME DIVISION

MARITIME — SCM, A. M. Crowell, VE1DQ — RM: GL. SEC: FQ. OBS: RR. Our OBS, RR, is on 3840-kc. 'phone., Mon., Wed., Thurs. at 6:45 AST. QY reports F2 openings on 50 Mc., working W and VE7s on Nov. 14 and 15th. DW is working on 3.8-Mc. n.f.m. RN is active on 14 Mc. JY is a 3.8-Mc. 'phone man. HN has new 28-Mc. beam. CU divides his time on n.f.m. between 14 and 3.8 Mc. BN has two favorite bands, 3.5- and 7-Mc. c.w. LN is rebuilding. RB has 200 watts going on 3.5 and 7 Mc. KV is active on 7, 14, and 28 Mc. HG has piled up 93 countries on 14 Mc. NC has a 19 set on 3.5 and Mc. after school hours. DT also has a 19 set. FQ has resumed schedules with Nottingham island. MZ recently appeared on the air from W9EJX for a most interesting four way with PX, QZ, DQ, and LK. EY is at CBA, Sackville. DD is on 14-Mc. c.w. Latest thing on 28-Mc. 'phone locally is the new n.f.m.-VFO-clipper-filter-exciter as demonstrated by HD and TA. DQ has been doing some cross-band work on 27 and 28 Mc. The HARC has a new Interference Committee to handle the B.C.I. problem. QG is back on 3.8 and 28 Mc. DN, Dartmouth Club station, is in Eastern Net. MK is in the Eastern and AFRS Nets. Traffic: VE1GL 204, HT 64, HJ 41, MK 38, TF 17, GB 12, ES 1.

ONTARIO DIVISION

ONTARIO — SCM, Thomas Hunter, jr., VE3CP — Asst. SCM, M. J. McMonigle, 3AWJ. SEC: KM. RMs: ATR, AWE, BUR, DU, GI, TM, WX. PAMs: DD, RG. ATR still leads in traffic. BGD and APW are new-comers to 3.8 Mc. YS, ACE, AGB, and AQB are using Q5-ers to good advantage. BUR enjoys Lo Nites. How about other LOs putting in an appearance the first Saturday of each month. AHL is operating 28-Mc. mobile. AOK conducts code classes at the Windsor YMCA. New appointments include BBM, AIL, and AZZ as ORS; BSG as OPS; BUS as EC for Sudbury. ATR still needs Ft. William for the Ontario 40-Meter Net on 7276 kc. BSW worked his first ZL. BVC is on 28-Mc. 'phone. AEJ is back on 7 Mc. BQP is heading for WAC with new beam. RU has over 68 countries. YU is back on 3.8-Mc. from new QTH in London. EAQ, Toronto, is new-comer, on 7 Mc. IZ has 144-Mc. beam 60 ft. up. BRU is on all bands, 'phone and c.w., with new rig. BBE is with T.C.A. APN has trouble with B.C.I. into the police

(Continued on page 104)

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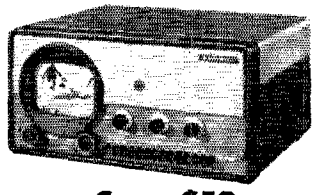

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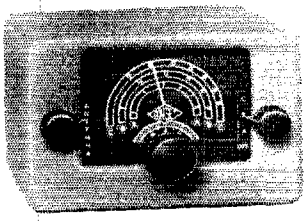

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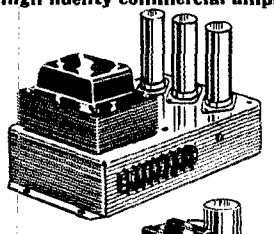

Ideal power supply for experiments, receivers, VFO's and amplifiers. Operates from 110V, 60 cycles. Delivers 250V @ 50 ma., 100V @ 15 ma., 6.3V @ 2.5 amps, and −24V bias. Hum level is 94 db below 250V, and 57 db below 100 volts. Terminal connections plainly marked on barrier strip. High grade components assure dependability and long life. Chassis size: 4¾" x 8" x 2". Uses 5Y3GT Rect. Shpg. wgt. 8 lbs.

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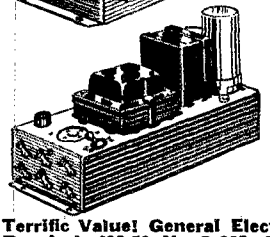

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Complete with 29 RCA Tubes, less 10BP4 Kine.

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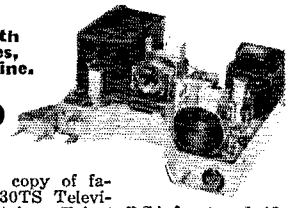

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No. A19752, Complete with 30 RCA Tubes including 10BP4 Kinescope. Shpg. wgt. 85 lbs.... **Your Cost $198.50**
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Hand Rubbed Walnut Cabinet for above. Shpg. wgt. 20 lbs.
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Swell for a medium power phone or CW Xmtr. Delivers 1345 volts AC, each side of CT at 500 ma. Heavy construction designed for continuous operation from 105 to 125 V AC. Heavy screw terminals, inverted type mtg. Size: 6"W x 9⅜"L x 8⅞"H. Shpg. Wgt. 65 lbs. A rare Value! Act Now!

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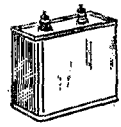

These new Newark Oil Condensers are just the thing for the power supply in your rig. Conservatively rated. Rectangular can—Glass insulators. Brand New—Not War Surplus.

No.	Cap. Mfd.	WVDC	Size	EACH
S-858	2	2000	1¾x1 x3⅞"H	$1.50
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station. AHX, HB, and ANO have new homes. ANS has given up operating temporarily. DAH, Georgetown, and XN, London, are looking for 144-Mc. contacts. KM and AND have 50-Mc. mobile in operation. BNQ added another country and zone with a VQ8. BQF worked TA3FAS for his first Asian. QE worked WAC in less than 10 hours. BHS is active on 14 Mc. BFF recently received his 'phone ticket. BPE and BTE have WAS. AQA has 6 countries on 3.8-Mc. 'phone. CP has a 120-volt 7½-kw. generator for emergency work. The Airforce Net, 3755 kc., are now members of the A.E.C. A number of clubs apparently have no emergency committee. Why not bring up the question at your next club meeting? G3FT has taken up residence near St. Thomas. May I remind all appointees to send in their certificates for endorsement. Traffic: VE3ATR 174, DU 120, BUR 118, APS 117, AWE 77, GI 72, IA 64, NI 62, RG 61, CP 33, AZZ 32, YS 25, YJ 23, DD 22, TM 22, AWJ 20, AIL 17, RU 16, WK 13, WX 12, AG 12, AEL 11.

VANALTA DIVISION

ALBERTA — SCM, Sydney T. Jones, VE6MJ — HM achieved very good accuracy in recent Frequency Measuring Test. TK reports eighteen members have signed up in the AEC in the Calgary area. JJ has good results with top loaded antenna on portable rig. PV and VJ have rig on 3.5 Mc. using VFO. LQ says his Plumber's Delight beam really works. 3AX was a visitor in Edmonton and outlined plans for AFARS. OD and LZ have built electronic keyers. They sound FB. WB hopes to have his 14-Mc. beam going very soon. QS and BN are holding down Calgary and Edmonton contacts on Alberta Net. IC is heard nightly on AFARS Net. LG is active again on 3.85 Mc. and hopes to make 14 and 28 Mc. shortly. BW claims it's too cold to work mobile during the winter months. AT is rebuilding surplus receiver. EA gave a very interesting talk on Taylor high efficiency modulation system at NARC meeting. The NARC has offered a prize to the first member to produce Code Proficiency Certificate as a result of copying ARRL code proficiency qualifying run. UH, KC, MS, and SE are new calls in the Medicine Hat area. LK has walkie-talkie on 3.85 Mc. NA is doing a bang-up job as OBS. Traffic: VE6QS 65, BN 38, NA 17, MJ 10.

BRITISH COLUMBIA — SCM, J. T. Hepburn, VE7HP — SEC: ID. RM: AEU. TG reports the Victoria gang held "Disaster Day" on Dec. 5th. Those taking part were AEC, VSWC, Red Cross, Army, and Police. The Collingwood Club had 270 guests at its "hamboree." AJP is building auto mobile rig. OJ had his beam blow down. ABP has acquired walkie-talkie from BQ. ADB worked an F9. MH still is getting QSLs from behind the Iron Curtain; his latest being Rumania. AKC has new Collins VFO. US worked J2 on 3.8 Mc. The following stations have been appointed EC for their respective areas: LK, Prince Rupert; CN, Prince George; ACW, Port Alberni; TG, Victoria; US, Penticton. Your SCM is looking for PAM, OO, and OES prospects. If you are interested, or know anyone who is, please drop us a line. We must build up a field organization in this section and your coöperation and assistance is necessary to achieve this. Traffic: VE7SW 43, AEU 40.

PRAIRIE DIVISION

MANITOBA — SCM, Art Morley, VE4AM — A new 'phone on 3.85 Mc. is that of QD in Brandon. Barney visited Winnipeg, then went back home and showed up with a nice signal. RP and YO were heard battling it out during the SS. AR is back on after blowing the final and has new BC-348. AB has new RME. JE has three-element rotary up for 28 Mc. IW is working the West Coast on 3.8-Mc. 'phone with 15 watts. EG has TBS50 on 28-Mc. 'phone and 3.5-Mc. c.w. AL is building 750-volt supply for 28-Mc. rig. Ex-SO is back in Winnipeg and will be heard soon. GY left for Edmonton. NG is using Class B modulation on 14 Mc. after a two-year try with grid modulation. DN, Shilo, is new OPS and also an AEC member. DQ, at Kanachuan Rapids, advises he visited EH at Norway House. FW, VE8, writes SS that he is enjoying the weather at SNAG. At the time of writing Frank says it was only 67 below. This is a new year, fellows, so once more how about getting behind ARRL 100 per cent? Apply for appointment and get in on League activities. It's lots of fun and I'll be glad to give you details on any appointment. Traffic: VE4AM 92, DN 10.

Strays

A grand total of 85,250 QSLs was handled by the W2 QSL Bureau in 1948. This figure tops the previous record of 70,115 in 1947, and is a far cry from the 5000 handled during the first year of the Bureau in 1932. — *W2SN*

Fellows... LET'S GET ACQUAINTED!

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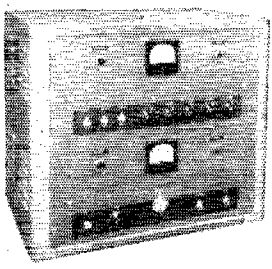

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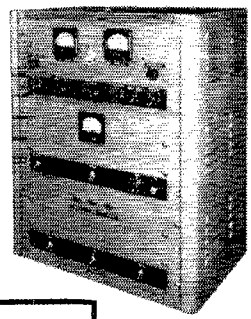
WRL is the World's Most Personalized Radio Supply House for the amateur. Getting acquainted with Leo will help you get on the air faster and for less money.

WORLD FAMOUS GLOBE KING

Unconditionally guaranteed 275 Watts phone and CW. An advanced design XMTR giving efficient performance on 10 - 11 - 15 - 20 - 40 and 80 meter bands.

Ready to go—Kit form **$379.45**

Wired **$399.45**



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- ☐ Radio Map
- ☐ New Catalog
- ☐ 40 Watt Globe Trotter Info.
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- ☐ 275 Watt Globe King Info.

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Address .....

City ..... State .....

World LABORATORIES — EVERYTHING IN RADIO — Radio INCORPORATED
COUNCIL BLUFFS, IOWA

September V.H.F. QSO Party

(Continued from page 69)

NEW ENGLAND DIVISION

Connecticut

W1BDI 8- 4- 2-AB
W1HDQ 986- 54-17-ABC

Maine

W1EIO 120- 15- 8-AB

E. Massachusetts

W1CTW 1690-106-13-ABC
W1MHL/1 *1 666-111- 6-B
W1AQE 444- 74- 6-B
W1BDF 390- 65- 6-B
W1QGH/1 348- 58- 6-B
W1SS/1* 250- 50- 5-B
W1CPB 240- 48- 5-B
W1MUD 220- 55- 4-B
W1LJI* 195- 39- 5-B
W1MCR 200- 50- 4-B
W1KCT 128- 32- 4-B
W1QOI 124- 31- 4-B
W1CTR/1 108- 36- 3-B
A1ALP 10- 10- 1-B
W1BB 12- 6- 2-B

W. Massachusetts

W1QXE 1196- 92-13-AB
W1QYV 405- 41- 9-BD
W1JSM 384- 64- 6-B
W1RO 264- 22-13-AB

New Hampshire

W1FZ/1 2070-130-15-ABC

Rhode Island

W1QBZ 42- 21- 2-B

NORTHWESTERN DIVISION

Oregon

W7DIS 14- 7- 2-B

Washington

W7AXS 5- 5- 1-B
W7JY/7* 5- 5- 1-B

PACIFIC DIVISION

Santa Clara Valley

W6ZBS 110- 22- 5-B
W6YHL 48- 16- 3-B

East Bay

W6ZHU 54- 18- 3-B
W6AFC 42- 14- 3-B

San Francisco

W6BUR 1- 1- 1-A

ROANOKE

Virginia

W4LVA 60- 15- 4-AB
W4MID 28- 14- 2-B
W4KYY 16- 8- 2-B

SOUTHEASTERN DIVISION

Western Florida

W4CNK 1- 1- 1-B

SOUTHWESTERN DIVISION

Los Angeles

W6HZ 168- 48- 3-BC

CANADA

Ontario

VE3AIB 426- 71- 6-AB
VE3ASE 295- 55- 5-ABC
VE3BQN 260- 48- 5-ABC
VE3AQG 208- 52- 4-AB
VE3AXM 188- 47- 4-AB
VE3BUO 114- 38- 3-AB
VE3KM 108- 27- 4-AB
VE3BKA* 34- 17- 2-B
VE3ANT 66- 33- 2-B
VE3TI 38- 19- 2-B
VE3PK 36- 18- 2-B
VE3IZ 220- 55- 4-AB
VE3TY* 32- 16- 2-B

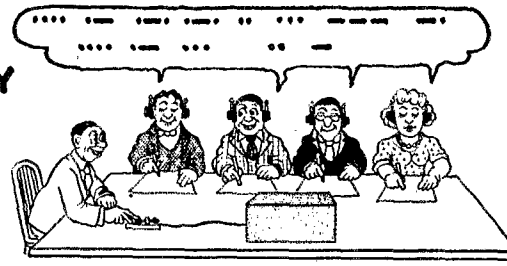
Navy Day

(Continued from page 38)

D. Jones, Philip P. Katz, Michael Kroly, John Leck, jr., Robert John Pupich, Ernest Reese, W. F. Rodgers, jr., John Sokash, Ralph Thomas, Clyde Vernon Williamson. *Fifth Naval District:* W3IJJ, W3JZY, W3NT, W4BZE, W4IJW, W4KRR, W4KYD, W4ODA, W8CLT, W8CSF, W8ORB, W8OIC, Wm. S. Hroza, Gerard L. Millman, Elmer A. Rosenberger, George E. Shoemaker, Charles Stallard, C. G. Thorpe, jr. *Sixth Naval District:* W4DAW, W4GGD, W4MYM, Charles F. Bryant, Willie F. East, George E. Hughes, James Hunnicutt, John B. Jones. *Seventh Naval District:* Walter H. Thames, jr. *Eighth Naval District:* W4CZL, W4GWX, W4LSQ, W4QT, W5AUL/4, W5BCF, W5ESL, W5EZC, W5FIV, W5HGC, W5HKP, W5JIZ, W5KMN, W5KQT, W5LQV, W5LRI, W5LTD, W5MED, W5NCN, W5NTS, W5ODK, W5OFI, W5OSY, W5ODK, David Ayoub, Ernest Biggers, James Otha Biggers, J. B. Breed, Franklin C. Burt, F. W. Byrne, Perry W. Connally, L. K. Correlle, Lyman M. Edwards, Thomas Galbreath, Gail E. Gibbs, Paul Harmon, Ralph Harrell, W. A. Koepke, jr., Allan W. Kravitz, R. D. Lines, John R. Loy, J. F. Lucas, Jimmie R. Majors, Ellis A. Oder, M. C. Iver, O. A. McKeithen, E. S. Marion, A. J. Palumbo, Tom Prickett, jr., John R. Raglund, Carl L. Raudabaugh, W. W. Rentfro, Verner C. Roach, Thomas Rogers, F. F. Sarlo, jr., Hurley O. Saxon, Marlon A. Smith, George T. Sumrall, C. E. Thames, Goerge M. Treibel, T. Q. Turner, Lafayette Vinson,

(Continued on page 108)

EVERY WEDNESDAY IS CODE PRACTICE NIGHT AT HARRISON RADIO



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HALLICRAFTERS AT LOW PRICES

Harrison offers these famous models at substantial savings!

S-40A Popular with all hams — 8 tubes plus rectifier, 540 KC to 43 MC, RF stage on all bands, built-in speaker. Was $110.00. **$99.50**

S-52 Same as above except for 115V AC-DC operation. Was $110.00. **Now $99.50**

SX-42 Hallicrafters finest communication receiver. 540 KC to 110 MC, AM and FM, high fidelity audio, 14 tubes plus rectifier. Was $295.00. **$275.00**

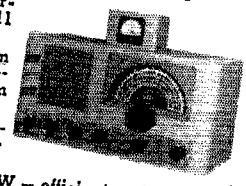
SX-62 SWL version of the SX-42. Beautiful appearance. Was $289.50. **Now $269.50**

R-42 Speaker for use with SX-42 or SX-62. Was $39.50. **Now $34.50**

Ask for complete Hallicrafters catalog.

NEW RME VHF 2-11

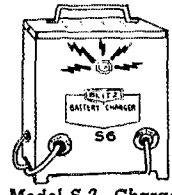
Gives super-hot performance on 2-6-10-11 meters!



- Double conversion for high image rejection and maximum selectivity!
- 11 tubes plus rectifier and voltage regulator!
- Receives AM-NFM-CW — efficient noise limiter!
- Complete — built-in speaker and power supply! Two-tone grey cabinet — 115V 60 cycle AC operation — ready to operate.
- Carrier Level S Meter for 2-11 **$146.00**

$14.00

WINTER GOT YOUR BATTERY DOWN?



Fully charged batteries last longer! Use a Blitz charger to insure easy winter starting — FB to build up the battery after a heavy mobile sked. Long life, trouble-free selenium rectifiers — for 115V AC operation.

Model S-2 Charges at 2 amps	$8.25
Model S-6 Charges at 6 amps	$10.87
Model S-12 Charges at 12 amps	$15.37

SIGNAL SHIFTER

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$49.75

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Gon-set Model "10-11" $39.95 Noise Clipper $8.25

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Ride thru the QRM and QRN! Clips tops and bottoms from frequencies which rise above a pre-set amplitude, allowing higher audio power level at 100% modulation—provides higher speech intelligibility! Very simple to connect and use with any rig!

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War-Surplus HRO

(Continued from page 41)

than gain. To recover a db. or two, an r.f. choke may be placed in series with this resistor, or the grid may be by-passed and run to a positive voltage source (i.e., 0.1 megohm to B-plus, 4700 ohms to ground), permitting a higher value of cathode resistance for rated space current. The other hint is that, in case more compensation is needed, N-1400 condensers are now available permitting larger amounts of compensation (which may be desirable downstairs in the coil trays) without exceeding total minimum-capacity requirements.

50 Mc.

(Continued from page 45)

tating devices. And not the least of its advantages is that it doesn't take an hour to find out who is on the band! Not many horizontals are being taken down (they were great stuff when the band was open) but the verticals are coming back.

W9OBW, secretary of the Midwest V.H.F. Club, only "v.h.f.-only" club in that area, writes that constant effort is being made to extend interest in v.h.f. activities. The club made a trip to Aurora, Ill., on December 2nd, for a joint meeting with the Fox River Radio League, and is planning other similar joint meetings in the near future. Clubs interested in promoting such meetings should get in touch with Melvin Mendelsohn, W9OBW, 4644 W. Adams St., Chicago.

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Henry Radio stores in Butler, Missouri and 11240 West Olympic Blvd., Los Angeles, California have complete stocks of amateur, FM, Television, Short Wave, Communications, Recording, and other radio equipment. I promise you lowest prices, complete stocks, quick delivery, easy terms, generous trade-ins. I promise that you will be satisfied on every detail. Write, wire, phone or visit either store today.

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Collins 32V	*475.00*
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Collins 310B-3	*215.00*
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National NC-57	*89.50*
National NC-173	*189.50*
National NC-183	*268.00*
National HRO-7T	*292.50*
National HRO-7C	*372.45*
National HFS	*142.00*
National NC240D	*236.25*
Hallicrafters S38	*49.95*
Hallicrafters S53	*89.50*
Hallicrafters S40A	*110.00*
Hallicrafters SX43	*189.50*
Hallicrafters SX42	*295.00*
Hallicrafters SX62	*289.50*
Hallicrafters S47	*229.50*
Hallicrafters S51	*149.50*
Hallicrafters S58	*59.50*
Hallicrafters S55	*129.50*
Hallicrafters S56	*110.00*
Hallicrafters T54	*189.50*
Hallicrafters HT18	*110.00*
Hallicrafters HT19	*359.50*
RME HF-10-20	*77.00*
RME VHF-152A	*86.60*
RME DB22A	*71.00*
Hammarlund HQ129X	*177.30*
Gon-Set 10-11 converter	*39.95*
Stancor ST-203-A	*44.70*
Hunter Cyclemaster	*169.50*

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Mail, phone, or wire your order. *Shipment at once.*

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I have the world's best time sale plan because I finance the terms myself. I save you time and money. I cooperate with you. Write for details.

LIBERAL TRADE-IN ALLOWANCE

Other jobbers say I allow too much. Tell me what you have to trade and what you want.

TEN DAY FREE TRIAL

Try any receiver ten days, return it for full refund if not satisfied.

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Field Day Results

(*Continued from page 58*)

W3KRL/3	Mon-Yough Amateur Transmitter Assn.	493-	A-	18-	4437
W2WCX/2	Utica Amateur Radio Club	422-	A-	10-	4248
W8ODJ/8	The Buckeye Shortwave Radio Assn.	395-	A-	30-	3780
W3NIF/3	Schuylkill Amateur Radio Club	378-	A-	8-	3645
W9UDU/9	Racine Megacycle Club Emergency Corps	374-	A-	15-	3609
W9IU/9	Kokomo Radio Club	395-	AB-	15-	3426
W5HTK/5	Enid Amateur Radio Club	245-	AB-	13-	3409
WØADJ/Ø	Black Hills Amateur Radio Club	349-	A-	19-	3375
W8BIQ/8	Toledo Radio Club	444-	AB-	-	3336
W7HAZ/7	Baker Amateur Radio Club	217-	A-	3-	3334
W8PR/8	Greater Cincinnati Amateur Radio Assn.	353-	AB-	10-	3285
W1QOA/1	Bridgeport Radio Amateur Club	336-	A-	13-	3249
W3DIM/3	Capitol Key and Mike Club	331-	A-	10-	3204
W3NEW/3	Capitol Surburban Radio Club	320-	A-	17-	3122
W1KAE/1	Submarine Signal Amateur Radio Club	365-	AB-	13-	2835
W4HHO/4	Charleston Amateur Radio Club	445-	B-	12-	2826
W1OSA/1	Pittsfield Radio Club	358-	AB-	18-	2757
W5IIA/5	Gentilly Section of Delta Radio Club	299-	AB-	9-	2607
W7KWC/7	Mt. Baker Radio Club	167-	A-	5-	2592
VE1FO/ VE1	Halifax Amateur Radio Club	253-	A-	7-	2538
W1NY/1	Hampden County Radio Club	257-	A-	12-	2538
WØILO/Ø	Red River Radio Amateurs	246-	A-	-	2514
W7FXD/7	Skagit Amateur Radio Club	146-	AB-	10-	2493
WØZKP/Ø	Suburban Radio Club	256-	A-	11-	2439
W8OG/8	Springfield Amateur Radio Club	213-	A-	29-	2430
W2LY/2	South Jersey Radio Assn.	215-	A-	10-	2385
W4FA/4	Amateur Radio Society of Union University	147-	A-	16-	2363
W3OAJ/8	Mercer County Radio Assn.	233-	A-	10-	2322
W1MHL/1	Waltham Amateur Radio Assn.	279-	AB-	8-	2254
W6UW/6	Santa Clara County Amateur Radio Assn.	140-	A-	8-	2106
WØEDY/Ø	Midway Amateur Radio Club	188-	A-	7-	2105
W7LRA/7	Utah Amateur Radio Club	125-	A-	10-	2025
W2TWO/2	Ridgewood Radio Club	203-	A-	6-	1986
KH6GH/ KH6	Honolulu Amateur Radio Club	197-	ABC-	13-	1834
W3QZF/3	Horseshoe Radio Club of Altoona, Pa.	271-	B-	7-	1776
WØFVT/Ø	Forx Amateur Radio Club	179-	A-	5-	1764
W6ZOJ/6	Paso Robles Radio Club	61-	A-	6-	1742
W2KTF/2	Mid-Island Radio Club	226-	A-	20-	1719
W8WMZ/8	Fort Steuben Radio Club	189-	A-	22-	1701
W7CMX/7	Olympia Radio Club	89-	A-	9-	1674
VE6—	Southern Alberta Amateur Radio Club	177-	AB-	-	1473
W8CUO/8	Scioto Valley Amateur Radio Club	148-	A-	6-	1377
W9ZJT/9	Decatur Signal Depot Radio Club	136-	A-	4-	1224
W9HPG/9	Chicago Radio Traffic Assn.	131-	A-	16-	1179
W4KEK/4	Peninsula Amateur Radio Club	118-	A-	14-	1152
W8JDJ/8	Ohio Valley Amateur Radio Assn.	124-	A-	8-	1116
W3VV/3	McKean Radio Club	127-	AB-	10-	1062
W5KXD/5	Norman Amateur Radio Club	118-	A-	13-	1062
W5NDU/5	Texarkana Radio Amateur Club	148-	B-	14-	1038
KH6RS/ KH6	Maui Amateur Radio Club	98-	B-	11-	882
W5GTS/5*	Fort Smith Amateur Radio Club	97-	A-	5-	873
W3IND/2	Philadelphia Short Wave Club	71-	A-	9-	864
W3NHZ/3	Capitol City Radio Club	80-	A-	12-	720
W3BN/3	Reading Radio Club	77-	A-	29-	711
W7KEK/7	Snake River Keys and Mikes	52-	AB-	9-	707
W8DQU/8	Southeast Amateur Radio Club	163-	B-	3-	489
W4BXG/4	Smokey Mountain Amateur Radio Club	44-	A-	17-	396
W9OQZ/9	Am-Tel Amateur Radio Society	37-	A-	6-	333
W8URD/8	Case Institute of Technology Radio Club	45-	A-	8-	213
W5GCM/5	Lawton-Ft. Sill Amateur Radio Club	11-	AB-	6-	104

(*Continued on page 112*)

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BIAS TRANSFORMER TYPE KS8779

Completely shielded, Insulator Terminals. Primary: 115 Volts 60 cycle @ 500 Ma.
Secondaries
180 V. @ 20 Ma.
300 V. @ 20 Ma.
6.3 V. @ 1.2 amps.
5.1 V. @ 7 amps. C.T.
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4 Mfd 600 Volt D.C. Sprague..... 49c
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Dual .1 Mfd 600 V. CD Type DYR each 19c, per 100, $10.00

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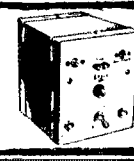
Model 129-10 Meter Model 175-75 Meter Designed for mobile or fixed operation in the 10 or 75 meter phone band. Dimensions 5"x 4"x5½". Tube compliment 6AG7—oscillator, 6AG7—power amplifier, 6AG7—modulator. Power output 8 watts. An exceptional buy (less tubes) at $23.95



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POWER P-3165—Pri. 117 V. Secs.; 350-350 V. rms. @ 200 ma. DC., 6.3 V. @ .6 amp., 6.3 V. @ 7 amp., 5 V. @ 2 amp., 5 V. @ 3 amp. $8.67

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HIGH VOLTAGE P-3170—Pri. 117 V. Secs.; 1750 V. rms. @ 2 ma. DC., 6.3 V. @ 9 amp. tapped at 2.5 V. @ 2 amp., 2.5 V. @ 2 amp. $5.14

P-3171—Pri. 117 V. Secs.; 2500 V. rms. @ 5 ma. DC., 6.3 V. @ 3 amp. tapped at 2.5 V. @ 3 amp., 2.5 V. @ 2 amp. . . . $6.76

VERTICAL OUTPUT A-3035—Turns ratio pri. to sec. 10:1, unshielded type A . . $3.09

VERTICAL BLOCKING OSC. A-3000—Turns ratio pri. to sec. 1:4.2, unshielded type A. $1.18

A-4000—Turns ratio pri. to sec. 1:4.2, shielded type J $1.62

HORIZONTAL BLOCKING OSC. A-3002—Turns ratio pri. to sec. 2:1, unshielded type A. $1.32

A-4002—Turns ratio pri. to sec. 2:1, shielded type J $1.76

FILTER CHOKE C-2991—2 henries @ 250 ma. DC. 53 ohms $1.62

C-2974—2 henries @ 200 ma. DC. 50 ohms. $2.01

PLATE TRANSFORMERS

For Small Transmitters. DC Voltage Ratings are Approx. Values Obtained at Output of a 2 section Choke input Filter. Using *Mercury Vapor Rectifier Tubes Pri. is for 115 V. 60 cy.*

Type No.	Sec. Rms. Volts	Sec. DC Volts	DC Sec. MA.	Dimensions H.	W.	D.	Price Each
P 57	660—660†	500	250	4⅝	3 1/16	4⅜	$ 6.76
	550—550	400					
P 58	1080—1080	1000*	125	4⅝	3 1/16	5	8.23
	500—500	400	150				
P 59	900—900	750	225	4⅝	3 1/16	5⅛	7.94
	800—800	600					
P 67	1450—1450	1200	300	5¾	6⅛	4	19.84
	1175—1175	1000					
P 68	2100—2100	1750	300	5¾	6⅛	4¼	24.99
	1800—1800	1500					

* For dual operation with simultaneous use of both sec. ratings.
† Has 40-volt bias tap.

ISOLATION TRANSFORMERS

All 117 Volts to 117 Volts 60 Cy.
P-96, 40 watts.. $3.60 P-98, 100 watts $9.30
P-97, 80 watts.. $5.10 P-99, 250 watts $17.70

POWERSTAT VARIABLE TRANSFORMERS

Type 20: 115 V. input, O-135 V. output @ 3.0 amps. 0.4 KVA $12.50
Type 116: mounted; 115 V. input, O-135 V. output @ 7.5 amps. 1.0 KVA $23.00
Type 116U: unmounted; 115 V. input, O-135 V. output @ 7.5 amps. 1.0 KVA $19.00
Type 1126: 115 V. input, O-135 V. output @ 15.0 amps. 2.0 KVA $46.00
Type 1226: 230 V. input, tapped at 115 V. O-270 V. output @ 9.0 amps. 2.4 KVA $46.00
Type 1156: 115 V. input, O-135 V. output @ 45.0 amps. 6.1 KVA $118.00

GREENLEE PUNCHES—

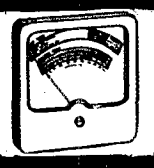
Will cut up to ⅛" thick metal.
½" $2.00
⅝" $2.00
1" $2.19
1⅛" $2.33
1-3/16" $2.33
1½" $2.98
We carry a complete line of all other sizes of punches up to 3½" diameter.

STEP DOWN TRANSFORMERS

Input 220-250 Volts 60 cy.
Output 110-125 Volts 60 cy.
Primary cord and plug, Secondary, Receptical
80 watts, P-61..... $4.80
150 watts, P-62..... $6.45
250 watts, P-63..... $8.25
500 watts, P-64..... $10.65
1000 watts, P-65..... $20.25

METERS

100 amp.—6 volt D.C., 3 inch scale, 4½" square, Grey finish, supplied with 100 amp. shunt. Brand New. Each as illustrated..... $2.95
0—100 Ma. 2" Rd. McClintock.. $1.95
0—9 amp. R.F. 2" Round..... $2.45
5—0—5 amp. ch. & dis. 2" Rd.... 69c



CHOKES

SMOOTHING TYPE	Hy	SWINGING TYPE	Hy	PRICE EACH MA	Price
C-80	10	C-87	4—16	150	$3.09
C-81	10	C-88	4—16	200	$3.82
C-82	10	C-89	4—16	250	$5.29
C-83	8	C-90	3—14	300	$5.59

All above 3000 Volts Insulation

ALUMINUM CHASSIS—

Heavy Duty
7 x 7 x 2..... 94c
7 x 9 x 2..... $1.06
5 x 10 x 3..... $1.00
7 x 11 x 2..... $1.15
7 x 13 x 2..... $1.23
10 x 17 x 3..... $1.88

ALUMINUM PANELS

⅛" Thick Black Crackle Finish
7" 93c
8¾" $1.17
10½" $1.32
12¼" $1.62
14" $1.86

STANDARD STEEL CHASSIS

Black Crackle
4 x 4 x 2 ..... 59c
6 x 14 x 3 ..... $1.06
10 x 14 x 3 ..... $1.44
10 x 17 x 3 ..... $1.44

STEEL CASES

Black Crackle
4 x 4 x 2 ..... 67c
4 x 5 x 3 ..... 79c
6 x 6 x 6 ..... $1.03
12 x 7 x 6 ..... $1.91
15 x 9 x 7 ..... $2.65

POWER TRANSFORMER

Primary
115 Volt 60 Cycles
Secondary
435-0-435 Volts
At 250 Ma. with
80 Volt Bias Tape
Dimensions
H. 3¾"xW. 4½"x
D. 4¾"

Filament Windings
5 Volts @ 3 Amps.
2.5 V.C.T. @ 10 Amps
2.5 V. @ 3 Amps.
6.3 V.C.T. @ ½ Amp.

Net Weight 11 Lbs.
Priced Right
At—Each $5.88

It not rated 25% with order, balance C.O.D. All prices F.O.B. our warehouse New York. No order under $2.00
We ship to any part of the globe.

LEEDS RADIO CO.

75 Vesey Street
COrtlandt 7-2612
Dept. QS 2
New York City 7

W4BX/4	Charlotte Amateur Radio Club	49-	ABC-	3-	102
Four Transmitters Operated Simultaneously					
W6RFR/6	Crescenta Valley Radio Club	345-	A-	15-	6986
W9JZA/9	Lake County Amateur Radio Club	665-	A-	19-	5985
W3KSP/3	Amateur Transmitters Assn. of Western Pa.	400-	AB-	25-	5126
W6ZSC/6	Reamfield Amateur Radio Club	545-	ABC-	14-	5067
W2RLY/2	Hamilton Twp. Radio Assn.	525-	A-	15-	4968
W6CUS/6	East Bay Radio Club	348-	A-	13-	4698
W5LW/5	Tulsa Amateur Radio Club	249-	A-	12-	4550
W4MB/4	Nashville Amateur Radio Club	461-	AB-	21-	4485
W9APU/9	Rock River Radio Club	349-	A-	10-	4284
W8VY/8	Kalamazoo Amateur Radio Club	357-	A-	12-	4239
W5CNG/5	Ouachita Valley Radio Amateur Club	451-	A-	-	4194
W9DXU/9	Hamfesters Radio Club	418-	A-	12-	3987
W1LTA/1	Worcester County Radio Assn.	408-	A-	25-	3951
W2QYV/2	Niagara Radio Club, Inc.	446-	AB-	15-	3924
W9CAF/9	Chicago Amateur Radio Club	370-	A-	28-	3897
W8WSX/8	Carmars Radio Club	470-	AB-	18-	3777
W9MWI/9	Joliet Amateur Radio Society	402-	A-	20-	3618
W2NVK/2	Livingston Amateur Radio Club Inc.	293-	AB-	12-	3251
WØFZO/Ø	Sioux City Amateur Radio Club	514-	B-	25-	3234
W9TCK/9	Cahokia Amateur Radio Club	458-	AB-	-	3108
W4MQN/4	Atlanta Radio Club, Inc.	497-	ABC-	-	3087
VE2CO/ VE2	Montreal Amateur Radio Club	221-	A-	11-	2984
W1KKS/1	Manchester Radio Club (Conn.)	484-	AB-	12-	2973
WØEBE/Ø	Southwest Missouri Amateur Radio Club	310-	AB-	23-	2899
W7KWW/7	Tucson Radio Clubs	291-	B-	30-	2844
W1BT/1	Manchester Radio Club (N. H.)	293-	A-	12-	2772
W7AEA/7	Radio Club of Tacoma	188-	A-	18-	2741
W8UEB/8	Kanawha Valley Amateur Radio Assn.	294-	A-	6-	2646
W7YN/7	Nevada Amateur Radio Assn.	103-	A-	9-	2612
W9JAW/9	Mancorad Club	258-	B-	13-	2457
W9OIM/9	Electron Club of Chicago	161-	A-	12-	2386
W9SW/9	Chicago Suburban Radio Assn.	258-	A-	6-	2322
VE3BXT/ VE3	Scarboro Amateur Radio Club	228-	A-	10-	2313
W8TAJ/8	Intercity Radio Club	244-	AB-	12-	2217
W7KKI/7	Amateur Radio Assn. of Bremerton	162-	A-	12-	2525
W3GJY/3	Beaver Valley Amateur Radio Assn.	211-	A-	5-	2124
W5EM/5	Delta Radio Club of New Orleans	322-	B-	14-	2106
W5WG/5	Louisiana Tech Radio Club	203-	A-	11-	2061
W5DNW/5	Meridian, Miss. Amateur Radio Club	346-	ABC-	11-	1833
W9OS/9	Elgin Amateur Radio Society	386-	AC-	-	1572
W5JCQ/5	Midwest City Radio Club	103-	A-	4-	1391
W1HOB/1	Parkway Radio Assn.	358-	A-	13-	1074
W9WQ/9	Wheaton Community Radio Amateurs	145-	AB-	18-	1080
WØSHG/Ø	Neosho Valley Amateur Radio Club	54-	AB-	14-	992
W4KJS/4	Key and Mike Club of Winston-Salem	127-	AB-	9-	984
W7KRW/7	Southside Radio Club	70-	AB-	10-	891
W5VJ/5	Mississippi Amateur Radio Club	107-	AB-	14-	870
W9EQT/9	Cenois Amateur Radio Assn.	119-	B-	-	795
W9IER/9	Effingham Radio Club	274-	ABC-	8-	618
Five Transmitters Operated Simultaneously					
W6QV/6	Los Angeles Fire Dept. Amateur Radio Club	649-	A-	15-	13,689
W9SWQ/9	Four Lakes Amateur Radio Club	763-	A-	35-	10,652
VE3JJ	West Side Radio Club of Toronto	738-	A-	22-	7992
W6NE/6	Ventura County Amateur Radio Club	313-	A-	15-	6845
W9MD/9	Illinois Ham Club	491-	A-	22-	6831
W9SO/9	Milwaukee Radio Amateurs Club	448-	A-	45-	6318
W3UUG/3	Steel City Radio Club	550-	A-	22-	5085

(Continued on page 114)

CRYSTALS!

All crystals have Army MC harmonic ratings but Sun encloses directions for deriving the correct fundamental frequency in kilocycles.

CRYSTALS WITH A MILLION USES

Fractions Omitted

kc	kc	kc	kc	kc	kc	kc	kc	kc	kc	kc
412	422	431	441	451	474	487	496	502	507	512	519
413	423	433	442	453	475	488	497	503	508	515	522
414	424	434	443	462	477	490	498	504	509	516	523
415	425	435	444	466	479	491	501	506	511	518	
416	426	436	445	468	481	492					
418	427	437	446	470	483	493					
419	429	438	447	472	484	494					
420	430	440	448	473	485	495					

49¢ each

Crystal Frequency Standards 98.356kc

Easily altered for 100kc Standard. Mounted in low loss 3 prong holder.

$3.89 each

For Crystal Controlled Signal Generators 525kc

526,388	533,333	537,500
527,777	534,722	538,888
529,166	536,111	
530,555		
531,944		

99c each

I.F. Frequency Standards

kc	kc
450	461,111
451,388	464,815
452,777	465,277

99c each

200 KC CRYSTALS

Without holders $2\frac{1}{32} \times 2\frac{3}{32}$" **each 69c**

3 for $2.00

Assorted Miscellaneous Crystals Fractions Omitted

370kc	377kc	384kc	387kc
372	379	386	388
374	380		
375	381		
376	383		

39c each

priced at a fraction of the cost of their holders alone.

For Ham and General Use

Fractions Omitted

390kc	396kc	404kc	408kc
391	397	405	409
392	398	406	411
393	401	407	
394	402		
395	403		

79c each

CRYSTALS FOR SCR 522

5910kc	7480
6370	7580
6450	7810
6610	7930
7350	

$1.29 Each

Crystals from BC 6 10

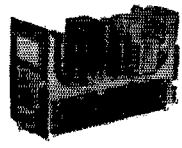
¾" Spacing—2 Banana Plugs

2045	2282	2435	3250	3570
2105	2300	2442	3322	3580
2125	2305	2532	3510	3945
2145	2320	2545	3520	3955
2155	2360	2557	3550	3995
2220	2390	3202		
2258	2415	3215		
2260	2430	3237		

$1.29 Each

- Payments must accompany order. Enclose 20c for postage and handling. Minimum order—$2.00 plus postage.
- Crystals are shipped packed in cloth bags inasmuch as they are shock mounted. All shipments guaranteed.

Hot Radio Values AT SUN RADIO

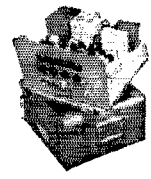


SPERRY AMPLIFIER

Brand new servo amplifier containing two beam power output tubes (1632) similar to 25L6, two twin triodes (1633 and 1634) similar to 6SC7, two mica condensers, dozens of color coded half watt resistors, two dual and four section bathtub condensers, three transformers, two wafer switches, one volume control, four octal sockets. Easily convertible.

$3.95

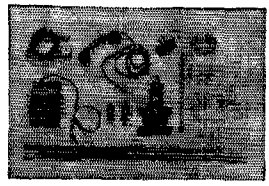
RADAR RECEIVER BC1068A



Guaranteed excellent condition. It is a "Hot" receiver for the "Ham" and short wave experimentor covering the 174 to 210 MC Television band. Has individually slug tuned antenna R.F., Detector and oscillator circuits resulting in maximum sensitivity; contains 2 R.F. and 5 I.F. stages detector and video amplifier. Complete with 110 volt AC power supply and 14 tubes..... **$39.50**

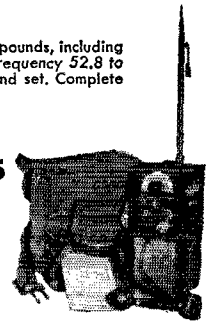
SCR-195 WALKIE-TALKIES

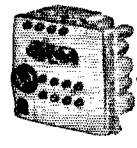
SCR 195 Walkie Talkies, brand new, weight 27½ pounds, including knapsack. Range up to 25 miles in open country. Frequency 52.8 to 65.8 MC. Transmitter and receiver with regular hand set. Complete ready to operate with spare parts.



$59.95

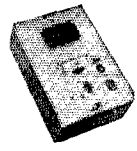
Price per set of 2 **$115**





2-6 MC PB RECEIVER

6 tubes (3–1T4, 1–1R5, 1–1S5, 1–3S4). 2–6MC in 4 bands. Easily converted to Broadcast band with instructions furnished by us. Has R.F. stage and audio output stage to drive speaker. As pictured, less case, with speaker.. **$9.95**



NAVY VHF TRANSMITTER

Battery operated (67½ V "B" and 1½ V "A") 80–105 MC. complete with 2–1G4 tubes, battery box holder and full instruction manual. Brand new.

$6.95

ANTENNAS

(A) Small four-section telescopic aerial ideal for portable receivers, transceivers or test equipment.

99c

(B) 22" tapered high frequency aerial covering 150 to 200 MC. Ideal for mobile or fixed station use.

$2.69

ATTENTION! CLOSEOUT SPECIALS

PART KITS!

KIT 1 Asstd Mica Condensers—Unmarked. 100 for.. **$1.50**
KIT 2 Asstd Resistors ½W-1 W. 100 for..... **1.00**
KIT 3 Asstd Condensers—Tubular Bypass. 25 for... **1.00**
KIT 4 Asstd Condensers—Electrolytic. 25 for..... **2.00**
KIT 5 Asstd Potentiometers—with or without switch. 10 for..... **1.00**
KIT 6 Asstd Ballast Tubes—Line Ballasts. 10 for..... **1.00**
KIT 7 Octal Sockets—Wafer. 25 for..... **1.00**
KIT 8 Octal Sockets—Plastic with Flange. 20 for... **1.00**

SPECIAL!! All 8 Kits for $8.00

MAGNETIC HEADPHONES

Brand new SC 4000 ohm Magnetic phones with 8' cord and standard phone plug. Headphones are adjustable to size A—$14.50 value..... **$2.49**

SUN RADIO

OF WASHINGTON, D. C.

938 F STREET, N. W. WASH. 4, D. C.

PANEL METERS

ALL BRAND NEW AND GUARANTEED

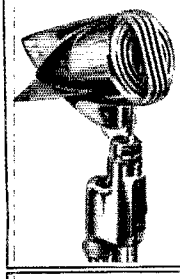
West 3" square 0–150 AC-V **$3.49**
Triplett 2" square 0–40 DC-V..... **2.97**
Simpson 2" round 0–15 DC-V..... **2.97**
Sun 2" round 0–300 DC-V..... **2.97**

TERMS All items F.O.B., Washington, D. C. All orders $30.00 or less, cash with order. Above $30.00, 25 per cent with order, balance C.O.D. Foreign orders cash with orders, plus exchange rate.

W6IK/6	Citrus Belt Amateur Radio Club	325-	A-18-	4590
W4FR/4	Amateur Radio Transmitting Society	503-	A-86-	4527
W8COE/8	Charleston Amateur Radio Club	564-	AB-32-	4395
W6CXO/6	San Francisco Naval Shipyard Radio Club	296-ABC-	9-	3915
W2AR/2	Northern New Jersey Radio Assn.	413-	AB-20-	3482
W1EMF/1	Hartford County Amateur Radio Assn.	338-	A-39-	3330
W9DUP/9	DuPage Radio Club	357-	A- -	3213
W6BXN/6	Turlock Amateur Radio Club	235-	AB-13-	3206
W6IFX/6	Richmond Amateur Radio Club	193-	A-15-	2943
W2SV	Sunrise Radio Club	265-	A-22-	2610
W8EYE/8	Columbus Amateur Radio Assn.	379-	B-26-	2424
VE1LC	Loyalist City Amateur Radio Club	271-	AB-19-	2217
K6NRA/6	Santa Barbara Amateur Radio Club	158-	A-13-	2133
K2AC/2	Nassau Radio Club	680-	A-13-	2025
W8IV/8	Grand Rapids Amateur Radio Assn.	289-	AB-23-	2007
VE6NQ	Calgary Amateur Radio Assn.	380-ABC-	10-	2007
W9NIU/9	Starved Rock Radio Club	197-	A-14-	1773
VE3HR	RCAF Club and Quinte Amateur Radio Club	182-	AB-12-	1739
W4NKM/9	Ether Benders Radio Club	413-ABC-	-	1638
WØQXR/Ø	AK-Sar-Ben Radio Club	141-	AB-11-	1277
W8AW/8	Edison Radio Amateurs' Assn.	116-	AB-11-	1158
W2KOJ/2	Watchung Valley Radio Club	165-ABC-	15-	1044
W1LBH/1	Merrimac Valley Amateur Radio Club	360-	AB-17-	759
Six Transmitters Operated Simultaneously				
W6BYP/6	Amateur Radio Club of Hollywood	715-	AB-15-	14,334
W9TO/9	North Suburban Radio Club	1072-	AB-20-	9204
W2AL/2	Central Jersey Radio Club	935-	A-25-	8640
W2AF/2	Monmouth County Amateur Radio Assn.	888-	A- -	8114
W6CG/6	Royal Order of Suds Club	657-	AB-16-	7812
WØCRO/Ø	Minneapolis Radio Club	829-	A-41-	7686
W9AIU/9	Egyptian Radio Club	784-	A-25-	7191
W2AD/2	Westchester Amateur Radio Assn.	698-	AB-23-	7103
W2QW/2	Raritan Valley Radio Club	584-	A-20-	6489
W2HXM/2	Somerset Hills Radio Club	659-	A- 9-	6066
W2VDJ/2	Lakeland Amateur Radio Assn.	630-	A-16-	5895
W2NY/2	Yonkers Amateur Radio Club	600-	AC-17-	5442
VE3CP/3	Frontier Radio Assn.	570-	A-34-	5265
W1OMI/1	El-Ray Radio Club	285-	A-10-	3861
W5DLF/5	Austin Amateur Radio Club	476-	AC-18-	3794
W2ZQ/2	Delaware Valley Radio Assn.	380-	A-12-	3645
W3HC/3	Delaware Amateur Radio Club	377-	A-30-	3393
W3BL/3	South Hills Brass Pounders & Modulators	323-	A-12-	4361
VE3RH/3	Toronto Amateur Radio Club	330-	A-15-	2970
WØPDA/Ø	Denver Radio Club	331-	AB-21-	2919
W9AKY/9	La Crosse Radio Amateur Club	296-	A- -	2664
W6DLN/6	Imperial Valley Amateur Radio Assn.	123-	A-11-	2491
W9LZW/9	Kishwaukee Radio Club	252-	AB-13-	1992
Six Transmitters Operated Simultaneously				
WØAB/Ø	Wichita Amateur Radio Club	301-	B-20-	1908
W5MPZ/5	Sandia Base Radio Club	172-	AB-15-	1778
W5MYQ/5	Los Alamos Amateur Radio Club	128-ABC-	-	1683
W4MN/4	Palmetto Amateur Radio Club	166-	AB- -	1142
W9HZB/9	Northeastern Indiana Radio Club	84-	AB-21-	629
W1LJ/1	Lowell Radio Operators Club	163-	AB- 8-	611
Seven Transmitters Operated Simultaneously				
W6AEX/6	Society of Amateur Radio Operators	822-	A-30-17,017	
W6AMT/6	Metropolitan Radio Club of Los Angeles	1159-	AB-25-15,129	
W6VB/6	Mike and Key Club of Santa Monica	648-	A-20-13,487	
W6DK/6	Pasadena Short Wave Club	878-	AB-25-12,609	
W6ME/6	United Radio Amateur Club	687-	AB-20-12,150	

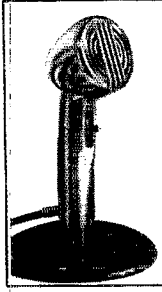
(Continued on page 116)

Now... ALL these popular Astatic microphones are available in models with CERAMIC ELEMENTS



CONNEAUT CRYSTAL OR CERAMIC MICROPHONE

• The ultimate in streamlining, bright chrome finish, shown with Type "S" Off-On Switch.



VELVET VOICE CRYSTAL, DYNAMIC OR CERAMIC MICROPHONE

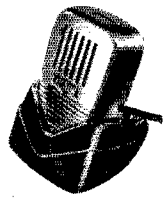
• Sparkling beauties in gold-finished case and handle, with dark brown, detachable base for convertibility to desk stand, floor stand, hand use.

■ Interest has been rapidly spreading in Astatic's first two Mikes available with the amazing new piezoelectric ceramic elements. Countless amateurs have written for complete details on these new units, which are unaffected by extreme heat, humidity, cold or dryness. Consequently, Astatic has gone all-out in making available a complete range of choice in microphones with ceramic elements. In addition to their immunity to climate and the elements, the ceramic models parallel the performance qualities of Astatic crystal types, except for slightly lower output. Write for additional information.

THE Astatic CORPORATION
ASTATIC
CONNEAUT, OHIO
Astatic Crystal Devices Manufactured under Brush Development Co patents

CARDINAL, CRYSTAL, DYNAMIC OR CERAMIC MICROPHONE

• A major new accomplishment in terms of quality performance at modest cost, has die-cast case in bright gold finish, compact to fit the hand, rests in streamlined CB case (as shown) or lies flat on felt-covered back.

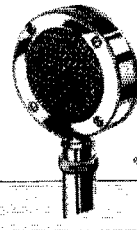


T-3 CRYSTAL OR CERAMIC MICROPHONE

• An all-time Astatic favorite, still as modern in design as ever. A sparkling beauty in bright chrome, with tilt head. Available with Type S On-Off Switch.

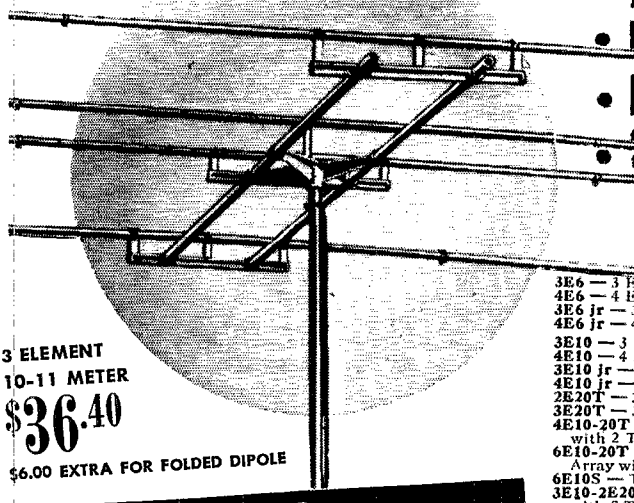
D-104 CRYSTAL OR CERAMIC MICROPHONE

• First practical crystal microphone developed, with few changes still the top favorite of amateurs.



ATTENTION · ALL HAMS AND SWL'S

- ALL-ALUMINUM
- FULLY ADJUSTABLE
- PERMANENT
- STRONG AND RIGID



3 ELEMENT
10-11 METER
$36.40
$6.00 EXTRA FOR FOLDED DIPOLE

AVAILABLE NOW!

3E6 — 3 El., 6 Meter	$27.60
4E6 — 4 El., 6 Meter	33.35
3E6 jr — 3 El., 6 Meter	23.30
4E6 jr — 4 El., 6 Meter	27.60
3E10 — 3 El., 10 Meter	36.40
4E10 — 4 El., 10 Meter	45.95
3E10 jr — 3 El., 10 Meter	28.60
4E10 jr — 4 El., 10 Meter	34.95
2E20T — 2 El., 20 Meter incl. T Match	47.95
3E20T — 3 El., 20 Meter incl. T Match	64.95
4E10-20T — 2 Element 10 and 2 Element 20 Meter Stacked with 2 T Matches	74.95
6E10-20T — 3 Element 10 and 3 Element 20 Meter Stacked Array with 2 T Matches	98.95
6E10S — Two 3 Element 10 Meter Stacked	69.95
3E10-2E20T — 3 Element 10 & 2 Element 20 Meter Stacked with 2 T Matches	84.90
Folded dipole for 6 and 10 meter beams	$6.00 extra
T Match for 6, 10, and 20 meter beams	$5.40 extra

(T & Folded Dipole must be ordered with Beam)

All above beams are close spaced (.1 Director–.15 Reflector) wide spaced beams (.15 Director–.2 Reflector) $1.50 extra. Available on 3 element 6, and 10 Meter beams only. All 3 element 20 mtr. beams come in .075 and .1 spacing.

Write to Dept. O 29 for details

HY-LITE *Antennae* INC.
Makers of Fine Antennas for AMATEUR · FM · TELEVISION
528 TIFFANY ST., BRONX 59, N.Y.

W2GSA/2	Jersey Shore Amateur Radio Assn.	787-	A-23-10,962
W6SD/6	San Fernando Valley Radio Club	469-	A-23- 9544
VE3BNG	Hamilton Amateur Radio Club	569-	A-27- 5121
W9TH/9	York Radio Club	429-	AB-15- 4062
W5MGI	El Paso Radio Club	248-	AB-25- 2282
Eight Transmitters Operated Simultaneously			
W2OM/2	Tri-County Radio Assn.	1390-	A-25-15,615
W9IT/9	Northwest Amateur Radio Club	1086-	A-35-12,126
W6CFZ	Inglewood Amateur Radio Club	643-	A-35-10,564
W6CIS/6	San Francisco Radio Club	516-	A-15- 8147
W6EUL/6	North Bay Amateur Radio Assn.	536-	A-29- 7641
W6VOP/6	San Diego Amateur Radio Club	466-	A-25- 6642
W2GIZ/2	Union County Amateur Radio Assn.	735-	AB-35- 6483
W6JN/6	Sacramento Amateur Radio Club	344-	AB-25- 4397
W2US/2	Suffolk County Radio Clubs	458-	AB-47- 3107
W9RJY/9	Fort Wayne Radio Club	350-	AB-12- 2492
Nine Transmitters Operated Simultaneously			
W8BIA/8	Mountaineer Amateur Radio Assn.	422-	A-22- 4023
Ten Tranmsitters Operated Simultaneously			
W6GAL/6	Mid Cities Amateur Radio Club	1021-	A-16-14,378
W6NWG/6	Palomar Radio Club	674-	A-38-11,563

A.R.R.L. EMERGENCY CORPS GROUPS

One Transmitter			
W3AXT/3	Conestoga Glass Arm and Elbow Bending Society	226-	A- 5- 3389
W8VYL/8	Queen City Emergency Net	202-	A-20- 2088
Two Transmitters Operated Simultaneously			
W9ESJ/9	Milwaukee County A.E.C.	205-	B- 2- 1452

NONCLUB GROUPS

The scores of nonclub groups consisting of three or more participants that operated one or more transmitters are listed below. The figures and letters following the call indicate, in the same manner as explained under "Club Groups," the number of QSOs, power or powers used, number of operators and final score.

One Transmitter			
W1BDI/1	248-	A-	7-3785
W8KVS/8	179-	A-	3-2416
W8LEV/8	143-	A-	4-2268
W1HY/1	136-	A-	6-2174
W5KSW/5	121-	A-	3-1971
W4FCU/4	184-	A-	6-1899
W7MY/7	136-	A-	7-1836
W4MOJ/4	261-	AB-	5-1815
W5CJJ	155-	AB-	4-1773
W8UDB/8	184-	A-	3-1656
W4ELO/4	142-	A-	3-1503
W2PGS/2	84-	A-	7-1472
W2WFU/2	107-	A-	4-1445
W6FFN/6	86-	A-	6-1391
W2LR/2	129-	A-	6-1161
W2YIF/2	68-	A-	3-1121
W5EGR/5	81-	B-	5- 954
W6NDF/6	44-	A-	3- 932
VE2YF/VE2	96-	B-	5- 864
W6CUE/6	68-	B-	9- 837
W4AHK	42-	A-	4- 770
K5NRB/5	132-	C-	3- 594
W1NKM/1	71-	B-	4- 576
VE1LZ/1	80-	B-	5- 570
W5FH/5	69-	B-	4- 564
WØQMF/Ø	16-	A-	3- 554
W8YNG/8	117-	AC-	4- 372
W3KYR/3	27-	A-	5- 365
W4FLW/4	33-	B-	4- 348
W4NAY/4	22-	A-	3- 198
W8VWK/8	10-	A-	3- 135
W4ACB/4	29-	C-	4- 87

(Continued on page 118)

Two Transmitters Operated Simultaneously

W9ERU/9	359-	A-12-5225
W9BVG/9	436-	A- 3-4167
W6LDJ/6	280-	A- 6-4118
WØDEP/Ø	429-	A- 6-3861
W3ISE/3	270-	A- 4-2430
W6BPJ/6	149-	A- -2248
K9AAY/9	134-	AB- 5-1239
W8ZEP/8	183-	A- 4-1647
W1ACT/1	167-	AB- -1149
W7BTV	30-	A- 3- 911
W1OBQ/1	63-	A- 7- 729
W2BMW/3	230-	A- - 690
W1OCU/1	78-	B- 5- 618
W6IT/6	22-	A- 2- 446
W5USN/5	117-	C- - 351
W7LDL/7	14-	B- 5- 126

Three Transmitters Operated Simultaneously

W2UBU/2	266-	A- 7-3929
W8GW/8	334-	A- 6-3231
W1VW/1	168-	A- 6-2592
W5NXC/5	248-	B- 7-2457,
W9FAU/9	212-	AB- 6-1806
W2FNN/2	80-	A- 4-1080
WØIAC	148-	AB-16-1056
K5NRS/5	96-	AC-21- 822
W9KQL/9	122-	AB-25- 741

Four Transmitters Operated Simultaneously

W9EDK/9	506-	A-10-4707
W5AA/5	322-	AB-37-4152
W9KMN/9	250-	A- 7-2250
W3LQM/4	368-	ABC- 7-1983
WØGHZ/Ø	124-	AB- - 861

Five Transmitters Operated Simultaneously

WØJIE/Ø	552-	A-17-4968
W6NIK/6	317-	A-10-4617
W6MNG/6	360-	ABC- 5-3815
W3EIS/4	207-	A-10-2961
W6VWF/6	162-	A- 9-2187
WØTTF/Ø	122-	AB-10- 246

Six Transmitters Operated Simultaneously

W8YFI/8	224-	B- 9-1344

Seven Transmitters Operated Simultaneously

W4KUX/4	233-	AB-12-1569

INDIVIDUALS

Grouped in this special listing are the scores of single-transmitter field day stations manned by one or two operators. Where two persons participated, the call of the assisting operator is given following that of the amateur whose call was used. Figures following the call listings indicate number of contacts, power, final score.

W6EYH/6	W6VUC	281-	A-6197
W1ORP/1	W1HFO	281-	A-4131
W2JBQ/2		216-	A-3254
W8PQK/8	W8RSP	341-	A-3204
W7RT/7		101-	A-2552
W9VSO/9	W9ODN	239-	A-2151
W9AEW/9	W9SKM	115-	A-1890
W5HCH/5		67-	A-1863
W7JU/7		35-	A-1276
W7LGS/7		31-	A-1134
W5HPG/5		38-	A-1126
VE1EK/VE1		58-	A-1121
W1CRP/1	W1LHD	58-	A-1121
W6YC/6		55-	A-1114
W9BQM/9		77-	A-1040
W2LJR/2		40-	A- 878
W2WZQ/2		59-	A- 797
W3FPQ/3		34-	A- 797
W7FJD/7		12-	A- 749
W3LMC/3	W3CYN	54-	A- 729
W2LRI/5		71-	B- 639
K1NRE/1[1]		181-	C- 618

(Continued on page 120)

[1] W1QJM and W1QAK oprs.

W7GHT/7		30-	A- 608
W7OPP/7		5-	A- 608
VE1DQ/VE1		15-	A- 594
W1DDC/1	W1QND	19-	A- 594
W4JVJ/4		44-	A- 594
WØFDP/Ø		4-	A- 587
W6PDV/6		41-	B- 554
W8YNX/8	W8YIB	41-	A- 554
W5HB/5		40-	A- 540
W7GNJ/7	W7JOP	64-	B- 480
W4MGD/4		144-	C- 432
W5ANP/5	W5DLA	32-	A- 432
W7GOF/7		21-	A- 425
W7OWZ/7	W7JHL	31-	A- 419
WØHCH/Ø		46-	A- 414
W7HDS/7	W7EUZ	20-	B- 405
WØEAR/Ø		28-	A- 378
W2BNJ/2		26-	A- 351
W7IWU/7		16-	A- 324
VE4DG/VE4	VE4EA	6-	A- 279
W9JRR/9		20-	A- 270
W1EWF/1		26-	A- 269
W4ETN/4	W4EUT	28-	A- 252
W7LNG/7		18-	A- 243
W3NMA/3		17-	A- 230
W1PVF/1		16-	A- 216
W4NRA/8		9-	A- 189
W8CBN/8		19-	A- 171
W1NXM/1	W1DDO	12-	A- 162
W3MET/3		12-	A- 162
W4BIW/4		18-	A- 138
W1EQ/1		21-	B- 126
W1EMG/1		9-	A- 122
W8MOH/8	W8TH	8-	A- 108
W8YEG/8		32-	A- 108
W6HJ/1		35-	A- 105
W1BJP/1		38-	A- 104
W7HPH		15-	B- 90
W1QGL/1		6-	A- 81
W6WJN/6		4-	A- 81
W1CA/Ø		3-	A- 61
W2PEY/2		21-	B- 42
W4GQR/4		3-	A- 41

V.H.F. - ONLY PARTICIPANTS

One Transmitter

W3KRJ/3		31-	A- 756
W1NH/1	W1MEP	22-	A- 297
W9ZJO/9	W9CQH	28-	A- 252
W6JLE/6		4-	A- 81
VE3TI/VE3		10-	A- 30
W2SHE/1		2-	A- 27

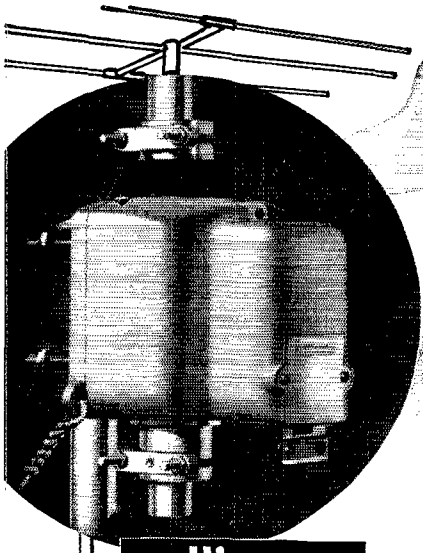
Three Transmitters Operated Simultaneously

W6WSQ/6[2]		168- A-2268

[2] Four oprs.

HOME-STATION SCORES

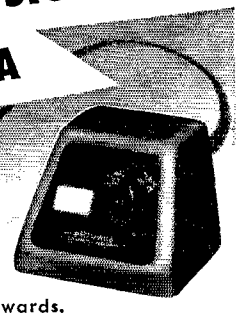
9DUA....166	W2UUV..... 22	W4AXP..... 7
W1MUW....100	W4TWI..... 21	W2VLL..... 6
VE3BBR.... 84	VE3APK..... 20	WØGMZ..... 6
W6NXY..... 80	W2PFV..... 20	W2VNJ..... 5
W8YHE..... 74	W4BYF..... 20	W4HKA..... 5
W2HDT..... 67	W5VT..... 20	W6OCH..... 7
W6MJP..... 62	W8TRN..... 20	W7IY..... 5
W6WNI..... 60	W6OLC..... 19	WØKIK..... 5
W3DZ..... 58	VE2XR..... 17	W1MMN..... 4
W3HTK..... 56	W3NRE..... 17	W6EJA..... 4
W8DAE..... 51	VE3WY..... 15	W7RAO..... 4
W1LCF..... 49	W1BDV..... 14	W9ANY..... 4
W2TYC..... 43	W2OUT..... 14	W2DCQ..... 3
W1GEY..... 39	W6BWG..... 14	W7GVH..... 3
W2NIY..... 36	W9JRR..... 13	W8YGR..... 3
VE3AWE.... 35	WØSQN..... 13	VE1CU..... 2
W3GIX..... 33	W6BGF..... 12	W1IIC..... 2
W2KEL..... 32	W1LIG..... 11	W2YOB..... 2
WØVOD..... 32	W2CGG..... 11	W3MIR..... 2
W1MD..... 30	W6OJW..... 11	W1QJX..... 1
W6ON..... 26	W8WVL..... 11	W5JYW..... 1
W9SPZ..... 26	W8VDF..... 10	W7CWN..... 1
W2WGL..... 23	W1NRZ..... 7	



AMATEURS—
Get this first mass-produced Antenna Rotator!

GETS STRONGER SIGNALS!

ROTATES TV AND FM ANTENNA



LIST PRICE $39.95

alliance
TENNA-ROTOR

Model ATR
Fits most types of antenna

Size of rotor unit 7¾"x5¼"x8"
Size of control box 5" x 5"
Approx. weight 12 lbs.
Special 4 conductor interconnecting cable available at 5½¢ per ft. list price.

Amateurs—the new Alliance Tenna-Rotor will rotate most antennas from 50 m. c. upwards. Tenna-Rotor is a "beaming" device to give you positive control of rotation—select the exact spot for "peaked" reception! Operates in *any weather*—is quick and easy to install—consists of a fully enclosed, electrically driven rotor, connected to plastic control box which plugs into any 110 volt, 60-cycle house circuit. A simple two-way selector switch rotates your antenna clockwise or counter-clockwise through 365° and stops it at any desired point on the compass! Rotor unit resists corrosion.

Ask your dealer for Tenna-Rotor!

alliance motors

ALLIANCE MANUFACTURING COMPANY • ALLIANCE, OHIO
Export Department: 401 Broadway, New York, N. Y., U. S. A.

COMPLETE RADIO TRAINING!

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.**

VALPARAISO TECHNICAL INSTITUTE
DEPT. TN Valparaiso, Ind.

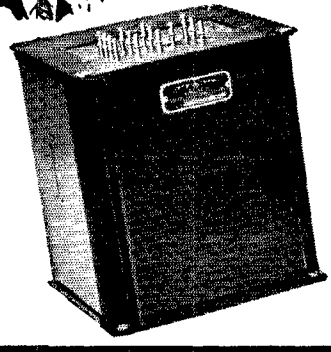
WANTED •

Teletypewriters complete, components or parts.

Any quantity and condition.

Box 138, *QST*

"It's **KENYON** *Transformers For My Rig Because They Always Put Out!"*



- Hams *everywhere* specify KENYON "T" Line Transformers! *Manufactured under rigid standards,* all KENYON transformers are constructed of the finest grades of material plus the skill and long experience of a highly trained competent operating staff.
- All KENYON transformers are checked progressively in the course of manufacture and are laboratory-tested upon completion to insure satisfaction. Yes, KENYON "T" Line Transformers meet the most exacting requirements of critical purchasers. For skillful engineering, progressive design and sound construction — *Specify* KENYON for top performance in your rig!

KENYON TRANSFORMER CO., Inc.

840 BARRY STREET
NEW YORK, U. S. A.

I.A.R.U. News

(*Continued from page 59*)

Amateur Radio League; Ceskoslovensti Amateri Vysilaci; Club de Radio Aficionados de Guatemala: Experimenterende Danske Radioamatorer; Hong Kong Amateur Radio Transmitting Society; Islenzkir Radio Amatorar; Irish Radio Transmitters Society; Liga de Amadores Brasileiros de Radio Emissao; Liga Colombiana de Radio Aficionados; Liga Mexicana de Radio Experimentadores; Newfoundland Amateur Radio Association; Nederlandsch-Indische Vereeniging voor International Radio-Amateurisme; Norsk Radio Relae Liga; New Zealand Association of Radio Transmitters; Osterreichisher Versuchssenderverband; Philippine Amateur Radio Association; Radio Club Argentino; Radio Club de Chile; Radio Club de Cuba; Radio Club Paraguay; Radio Club Peru; Radio Club Uruguayo; Radio Club Venezolano; Reseau des Emetteurs Français; Rede dos Emissores Portugueses; Reseau Luxembourgeois des Amateurs d'Ondes Courtes; Radio Society of Great Britain; South African Radio League; Suomen Radioamatoorilitto r.y.; Sveriges Sandareamatorer; Union Belge des Amateurs-Emetteurs; Union Schweiz Kurzwellen Amateurs; Vereeniging voor Experimenteel Radio Onderzoek in Nederland; Wireless Institute of Australia.

Correspondence

(*Continued from page 61*)

location a 2-meter transceiver was used. Other equipment consisted of 2-meter "handie-talkies" and two mobile units on ten meters in automobiles.

Under conditions of simulated disaster, messages were handled from the City Hall, Fire and Police Departments by 2-meter link to the Masonic Temple, from whence the mobile units were dispatched to strategic locations. These demonstrations were explained step-by-step to the audience in order to show them how life and property can be protected through amateur radio within minutes of the time that regular communications fail. All equipment was set up and functioning within a period of twenty minutes. The actual demonstration continued for an hour and was well received by those in attendance. The Egyptian Radio Club station call W9AIU was used, portable Ø. Members taking part in the demonstration were WØEKY, WØNXT, WØYRX, W9DJG, WØQDF, ex-W9NBA — *Royal E. Fisler*

The Little Slugger

(*Continued from page 17*)

connection, WAC on narrow-band f.m. had been worked through the week-end QRM. If you don't think this is a good trick try it the next time you rebuild.

In using this exciter to drive existing finals don't forget to reduce biases to Class B and take the other precautions outlined earlier in *QST*.[1] And bear in mind that after your rig is deloused so far as harmonics go it may still be necessary to trap your fundamental out of near-by TV sets.

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.

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, $1.50* up. Stamp for samples. Grifteth, W3FSW, *1042* Pine Heights Ave., Baltimore 29, Md.

AMATEUR radio licenses. Complete theory preparation for passing amateur radio examinations. Home study and resident courses. American Radio Institute, 101 West 63rd Street, New York City.

CRYSTALS: Precision low drift units. Type 100A in 80, 40, and 20 meter bands. Two units plug in one octal socket. Plus or minus 5 Kc. One dollar each. Exact frequency. $1.95 ea. Rex Bassett, Inc., Ft. Lauderdale, Fla.

10-METER Beams. $19.50. Send card for free information. Riverside Tool Co., Box 87, Riverside, Illinois.

QSLS. Samples. Albertson, W4HUD, Box 322, High Point, N. C.

SURPLUS: Deluxe crystal finishing kits containing holders, quartz blanks, abrasive, etching fluid, complete instructions. $2.00 each postpaid. *Formerly sold $8.75. Vesto Company, Parkville, Missouri.*

QSLS! Quality cards priced right. Samples. Ferris, W9UTL, 1768 Fruitdale, Indianapolis, Ind.

SUBSCRIPTIONS. Radio publications a specialty. Earl Mead, Huntley, Mont. W7LCM.

QSLS: Kromkote cards at a fair price. Dauphinee, W1KMP, Box 219, Cambridge 39, Mass.

WANTED: Teletype 1/40TH HP synchronous motor. W6ITH, Tibbetts, Moraga, Calif.

QSLS, SWLS. For distinctive cards, write to McEachron, 1408 Brentwood, Austin, Texas.

QSL'S, SWL'S. New heavy stock. Very best obtainable! Fritz, 1213 Briargate, Joliet, Illinois.

GIVE Hallicrafters receivers. Lay-away plan. Easy. Atlas Radio Jobbers. Tel. 6-3800, Nashville, Tennessee.

QSL'S? SWLS? Distinctive designs, glossy stock, one-day service. Samples. Narvestad, Granite Falls, Minn.

QSL'S, SWL'S. Finest stock. Fairest prices. Fastest service. Dossett, W9BHV QSL Factory, 857 Burlington, Frankfort, Ind.

LAPEL pins: your ham call letters engraved in white on black plastic, 1¼" by ⅜" with white border. 35¢ each, postpaid. G. Lange, W2IYQ, 34 Union Ave., Belleville 9, N. J.

PANELS, dials made to order. Gilpin, Box 638R4, Mt. Clemens, Michigan.

OUR business: Buying and selling amateur radio transmitters. Transmitter Exchange, Wakefield, Rhode Island.

BEAM control cable, new material. Two #16; six #20 rubber insulated, coded, tinned conductors. Weatherproof rubber jacket. Heavy armor shield. ½" diameter. Price 10¢ foot. F.o.b. Chicago. Trans-World Radio-Television Corporation, 6639 S. Aberdeen St., Chicago 21, Illinois.

REVOLUTIONARY copyrighted principle. "Rythmic Sound Sending". Get in tape-sending category. More QSO's, more QSL's from that other "OM". $1.00 postpaid. Richard D. Thayer, 32 Merrick St., Worcester, Mass.

FOR Sale: Prewar: 25-watt transmitter, Skybuddy receiver, many parts. Library. War surplus electronic keyer. Write for detailed list. Sold to highest bidder. Robert Butler, Box 147 Sta. A, Ames, Iowa.

TRADE SP400X Super Pro and power supply for Auto-Rolliefiex or other good camera. W1BDB.

BC-348, AC power supply, loudspeaker, other improvements, also NBFM adaptor. Best offer over $100. Leaving amateur radio. Hamilton Barhydt, 111 Canner Street, New Haven, Conn.

WANTED: RCA AR-88 receiver and ARC-3 VHF receiver. Also ART-13 dynamotor. State price and condition. WØZIS, Paul Brown, 5245 Lansdowne Ave., St. Louis 9, Mo.

ART-13, $100.00. Want QSTs prior to 1924. Quote price and condition. Montgomery, 4809 Fern, Bellaire, Texas.

SWAP: For good Graflex or Grafic camera. Complete GROSS 100 watt AM phone/cw transmitter, value $200.00. Coils and crystals Eighty through ten; Astatic crystal mike. All in excellent condition. 52 countries worked on phone. *Details* on request. W5IHN, 158 Ridgewood Drive, New Orleans 20, La.

VFO Exciter unit, 807 output, stable oscillator, VR, temperature controlled. Output 20, 40, 80, plug-in coils. Professional appearance, McElroy cabinet, 2 Weston meters, excellent parts, and excellent performance. Three separate power supplies, external tube keyer, $60 takes all. Local sale preferred. W. E. Neff, jr., M.D. W1AH, Cheshire, Conn.

FOR Sale: BC342N. No speaker. $42.00. W4MQY, USNAB, Little Creek, Va.

FOR Sale: 200 watt c.w. transmitter $100.00. Stancor 10P transmitter with 10 meter coil less crystal, $35.00. BC375E transmitter with one tuning unit and tubes like new, $27.00. Extra tuning units, $2.95. PE73C dynamotor, $12.00. BC453 and BC454 receivers, *$12.95* and *$6.95*. Sherman tank receiver and *transmitter with tubes*, new, never used, $30.00. Dynamotor 12 v. input, 275 and 500 output, $6.00. 1073A wavemeter and power supply with all tubes $25.00. All f.o.b. Duluth, Minnesota, WØJVD, 1027 East 6th.

BARGAINS: New and used transmitters, receivers, parts. 10 meter *a.c. beam rotator, $23.97; new 150-watt phone, $199.00; 60 watt* phone, $99.00; Globe Trotter, $57.50; Abbott TR-4, $29.50; HT-9, $295.00; MB-611, $59.00; Silver 701, 800, 801, 802, $29.50 ea.; NC-173, SX-28, $149.00 ea.; HQ-129X, HRO, $139.00 ea.; RME-45, SX-25, $99.50 each; RME-9D, $39.50; SX-24, $75.00; BC-348, S-40, $65.00 each; S-20R, $49.00; NC-44, S-38, $35.00 each; many others. Large stocks, trade-ins. Free trial. Terms financed by Leo, WØGFQ. Write for catalog and best deal to World Radio Labs, Council Bluffs, Iowa.

FREE QSL-SWL samples, super-gloss. Cushing, W1HJI, Box 32, Manchester, N. H.

FOR Sale: SX-25, perfect, last model, less speaker: $80.00. Null Radio, Mexico, Missouri.

QSLS? SWLS, Modernistic? Cartoon? Deluxe? Photographic? Samples 10¢. QSL printer Sakkers, W8DED, Holland, Michigan. "Made-to-order QSL Printing". VHF-152A? DB-22A?

1 KW xmitter. Sell or trade, either complete, or just high power portion. Has LM frequency meter VFO, 2 untuned stages, 6L6 and 807 multiplier stages, HK257 buffer, pair 250TH's, PP final. AM class B modulator, dynamic mike, vacuum tube keying relay, bias packs, relays and fuses, coils, 10, 20, 80 meters. Hi-lo power switch, plate and grid meters each stage, after 6L6, KV meters, keying monitor, variable link antenna, relay. Want over 200 watts VFO AM fone/cw band-switching xmitter, 10–80 meters, also 2 and 6 meter transmitting equipment. Keith C. Daulton, W6EPQ, Raymond Road, Box 11, Madera, Calif.

HRO-MX, 6 coils, speaker, power. $145.00 Levertt 1–43, Harvard, Cambridge, Mass.

WANTED: A.C. Instructograph, tapes, oscillator and instructions. First reply sells. Kew D. Johnson, 512 2nd Ave., NW, Oelwein, Iowa.

HALLICRAFTERS S-19R, Sky Buddy, in excellent condition. Best offer. A. Simon, 365 Fulton, Farmingdale, L.I., N. Y.

WANTED: Silver 701 xmitter. State condition and price. Richard Kane, W3NAG, 117 Wood Lane, Havertown, Penna.

FOR Sale: National NC100ASD. In new condition. Any reasonable offer considered. All inquiries will be answered. W9IQC, 522 Fourth St., La Salle, Illinois.

WANTED: SX-25. State price, condition, etc. McPherson, 301½ Bulkley Ave., Mansfield, Ohio.

FOR SALE: Over 300 QSTs: May, 1917 to December, 1939. Fine run. Best offer. W1KX.

KILOWATT conservatively rated, excellent condition B-W coils 80 through 10; Eimac 4-250A's P. P. final, same in modulator. Spare 4–250A. Blower cooling. B-W Butterfly final tank capacitor. Adequate relays and meters. Rugged construction. Complete in 82-inch rack cabinet. Plug in xtal, mike, connect antenna, power line, go on air. Sell for $600 cash or trade for Collins 32V1 and $200 cash. Philadelphia buyer preferred, cash and carry. W3DX, 718 Concord Ave., Drexel Hill, Penna.

WANTED: Stancor 60P, 10P, or 110 transmitter. State best price and condition. Allen Kohl, Box 491, Gunnison, Colorado.

WANTED: Wireless equipment and literature prior to 1925; List ARRL Member Stations, Pink Sheet Supplement "Ban off" Oct. 1919 QST. Franklin Wingard, Rock Island, Illinois.

FOR Sale: Stancor 110 CM xmitter, $75.00. BC375E and 7 units, $35.00. GI Recorder less amplifier, $20.00. Write to W8WSC, Box 516, Stryker, Ohio.

COLLINS 32V-1 transmitter, Collins 75A-1 receiver in original cartons. W1MKK.

ALUMINUM tubing, angles, channels and pipe. Write for list. Willard Radcliff, North Countyline Street, Fostoria, Ohio.

COLORTONE QSL'S! Snappy! Bright! Different! Beautiful colors! Samples? Colortone Press, Tupelo, Mississippi. "No junk".

QSLS: Enamel finish cards, priced reasonably. Samples sent by return mail. *The Rainbow Press, 816 Maple Ave., New Philadelphia,* Ohio.

CHANGING frequency? Fine commercial units for ARC-3's, SCR-522's, police, taxi, aircraft, marine, geophysical, and other services, except amateur. Commercial regrinding; many crystals can be economically reground to new frequencies. Inquire. Over twelve years of satisfaction and fast service! Try us first. Eidson Electronic Company, 1802 North Third St., P.O. Box 31, Temple, Texas.

SELL: ARC-5 3–4 Mc VFO NBFM unit, purchased new, converted *to 110 Ac, 6J6, 6BE6 modulator mounted on rear. Regulated power* supply. Perfect operating condition and appearance. $30.00 or best offer. W. J. Cotter, 6950 No. Wolcott Ave., Chicago, Illinois.

MONEY! That's what I need, and that's why I'm reluctantly offering my RME VHF-152 for only $60.00. W1IKE, Oakville, Conn.

COLLINS ART-13 converted for A.C. operation including DC supply. RME-45 with Cal-O-Matic dial. Best offer accepted. W9QCB, Cedar Rapids, Iowa.

1000-watt broadcast transmitter, RCA type 1-K. In excellent condition and perfect in appearance. Includes two sets of tubes, an assortment of spare parts and a separate cabinet rack for monitors. Price is reasonable. Will arrange for crating and shipping it. Write or phone Talbott, KROD, Wyoming at Walnut Sts., El Paso, Texas.

NO more wires! Learn new printed-circuit methods. Important aid in building, experimenting, repairing modern circuits. Paint working circuits over rough sketches or any non conductor. Excellent for colleges. Kits, $3.00 and $5.00, contain air-drying conducting and 30 to 2,500,000 ohm resistance paints, free manual. Manual separate, 25¢. Free literature. Microcircuits Company, Dept. 3E, New Buffalo, Michigan.

SELL Stancor 60P phone/cw transmitter, complete, in cabinet, $45.00, RME-45 with speaker, $110.00. Hickok 510X tube and set tester, $30.00; Hickok 177X signal generator, $30.00. All good condition and with manuals. Bruce Wood, Box 303, Warren, Penna.

COLLINS 75A1 and 32V1, like new, 600S Astatic microphone, push to talk mike stand, 10-meter wide-spaced beam, best cash offer takes it. W8RWZ, C. H. Buchanan, Vale Road, RFD 1, Springfield, Ohio.

SELL or trade: new deluxe steel cabinet, $10.00; Superior multimeter, $35.00; Triplett VOM, cost $99.50 and sells for $75.00; Webster Model 80 wire-recorder, like new, used as demonstrator, $99.00; Emerson disc recorder (new), $65.00; 813 (new) $5.00; new 1942–48 Ford (Zenith) radio, $50.00; Philco 1942–48 Ford radio, $75.00; G Eused self-charging portable, $50.00; Francini accordian, $200.00; 1 hp aluminum gas motor for scooter, $40.00; Briggs Stratton ¾ hp., $25.00. $500.00 takes all. All replies will be answered. Howard M. Klingbeil, WØFPW, Bottineau, North Dakota.

WANTED: ART-13 with dynamotor and plugs, unconverted. Offers from N.E. section of U.S. only, please. H. B. Barlow, 1725 New Hampshire Ave., N. W., Washington, D. C.

SELL: Transmitter, 350-watts fone, 500 c.w. push-pull 75TL in final amplifier. Push-pull 811 modulator, $580.00. C. C. Reed, jr., W8ZBK, Allen Junction, West Virginia.

SKY Ranger S-39, 1946 AC-DC and portable. Condition: good. Completely realigned in airline radio shop Dec. 1948. $50.00. Wm. Sandborgh, W7JUX, 612 3rd Ave. No., Great Falls, Mont.

OREGON only. Our radiotelegraph code practice machines, model RCM-1, now available on monthly rental basis. Tapes designed for FCC preparation, advanced, beginners. Oswego 2-5011 or write Ultradyne Electronics, Oswego, Oregon.

SSSC: Phase shift networks. Write for specifications. W5KVE, 1311 So. 21st St., Temple, Texas.

NEW York City Hams! Sell: 200-watt fone/transmitter TZ40s, final 807's, AB modulator, separate power supplies each stage, standard parts throughout, Par Metal deluxe cabinet, National 101X receiver, Turner 22X crystal mike. Call W2VG, FO 5-1326. Wm. Tannenbaum, 2296 Grand Ave., Bronx 53, N. Y.

SX-28A, in excellent condition, $145.00; SX-42 bass reflex speaker, new $25.00; Hickok 532 tube tester, like-new, $80.00. Priced to sell. Ted Walters, W8WPK, Whitehall, Michigan.

SELL: Hallicrafters SX-28 receiver just realigned, re-tubed, unused since, perfect mechanical and electrical condition, guaranteed: $125.00. Brand new BC348-P receiver, 110-volt AC operated, extra stage audio, RF and AF gain separated, crystal phasing added, with LS-3 speaker, $75.00. Brand new BC459A transmitter, $15.00; Echophone EC-1A receiver $22.50; BC453A Q5-er receiver unconverted, $12.50; Johnson condenser 200DD70, $8.00; RCA power transformer, cased, compact, 700 volts, 300 milliamps DC, $8.00. Howard O. Severeid, W9DPL, 2924 Station Street, Indianapolis, Ind.

SELL: 50 w. exciter 6L6-807; coils for 80–40–20 M. $15.00. Also BC625 (522) 2-meter xmitter, rack and panel, xtal, plate, milliammeter, filament transformer, $20.00. W2HFM, R. Bedell, Merrick, N. Y.

SELL: HQ-129X, with speaker. One year old: $135.00. W3NVD 8802 Georgetown Road, Bethesda, Md.

FOR Sale: 10-meter Gon-Set converter. W3IHF, 31 North Grant, Waynesboro, Penna.

FOR Sale: Two BC610Es for all-band operation, 75–40–20–10 at 500 watts input. Transmitters are complete ready to go, except for ten-meter coils. Better hurry up, a real buy. Set has been used only a very few hours. All inquiries answered. W2STK, Pete C. Sherman, R.F.D. 1, Belmar, Box 220, New Jersey.

SELL: Radio magazines: QST, Jan 1925 to December, 1945, $35.00; Radio News, June, 1922 to October 1943; Service, Sept. 1932 to December 1946; Radio Engineering, Sept. 1922 to June, 1932; Popular Radio, May 1922 to May 1928; Radio Broadcast, June 1922 to December 1929; Radio-Kraft, Nov. 1929 to September 1942. All complete. Radio, misc. 1923 to July 1942, 1929 and 1930 complete. Misc. others. Send for list. WØREG, Carl H. Fastje, Denison, Iowa.

DON'S QSLs. "The finest". Samples, 2106 South Sixteenth Avenue, Maywood, Illinois.

SELL: BC610 modulation transformer, $20.00; 2-inch Supreme oscilloscope, $25.00; James Buck, WØZDS, 1224 Orchard Drive, Ames, Iowa.

SELL: National FBX-A receiver plus coils for five bands, power supply and loudspeaker. QST's, 1927 through 1947 complete; 1926 complete except for month of February. Also have the following: September and October, 1919; February, March, April, May, and July, 1920; February, 1921, November 1925. H. R. Broadley, W1RE, 60 Dana Place, Needham Heights 94, Mass.

WANTED: Teletype 1/40TH HP synchronous motor. W6ITH, Moraga, Calif.

SELL: Weston model 777 tube-tester, Type 7A used, $25.00. M. Bizon, 390 Harvard Ave., Hillside, N. J.

SURPLUS: Deluxe crystal finishing kits containing holders, quartz blanks, abrasive, etching fluid, complete instructions, $2.00 each, postpaid. Formerly sold for $8.75. Vesto Company, Parkville, Mo.

QSL's, SWL's. George Beal, jr., W5OXL, Ft. Smith, Arkansas.

EX-KP4FC is now W5IXV, W. E. Bradford, KSST, Sulphur Springs, Texas. Will duplicate all unreceived QSLS.

IRE Proceedings, 1945, 1946, 1947. Make offer. N. Melancon, 140–71 Ash Avenue, Flushing, L. I., N. Y.

HIGHEST bidder takes back issues to 1935 of QST and Electronics. Write for complete list. C. L. Johnson, 1863½ So. Sycamore Ave., Los Angeles 36, California.

COLLINS 30K complete, $10.50 cash; National NC-200; Silver Micromatch, S/C Labs 3-element beam rotor mechanism selsyns, $75.00; Hallicrafters S-38, old gear Federal receiver DX Type 58; Baldwin phones, spark key, hand-mike (25 years), detector. W2TG, Brizzolari, Route No. 1, Newport, N. H.

FOR Sale: First money-order takes S-38, $37.50; like new. Garod 3-way portable, $25.00; Richard Bruce, 1171 Union St., Manchester, N. H.

SELL: National 300-watt modulator with 2032's and Multi-Match, $45.00; Thordarson speech amplifier pp 2a3's, $25.00; National CRM, 1" oscilloscope with tubes, $12.00; National N. Dial, new, $3.00; New 813, never used, with socket, $4.00; National BI and BO Class B transformers, set $4.00 or make an offer on the above. W3OXI, Wilkes, 1218 E. Rosemont Drive, Bethlehem, Penna.

BEST offer twenty days after publication: One hundred and forty issues of QST; Supreme 500 checker analyzer; 110 volt 1500 watt AC engine generator; 110 volt 1000 watt AC generator; 2000 watt 110 volt DC generator; 500 volt 500 mil DC generator; 5" 'scope; 10 battery 5 amp charger; Edison-Dick rotary mimeograph. Also must sell two 500 watt transmitters; 2 antique receivers; acetylene welding outfit; ten 110 volt AC motors, 1/20 to 1½ hp; ten 110 volt DC motors 1/20 to 2 hp. Reason: illness. WØEWN, Purdy, Mo.

FOR Sale: new code practice oscillator and monitor, cost $11.00; want $5.00. No. 385 Supreme set-tester, tests tubes, condensers, measures volts, ohms, milliamperes, capacitance. Has plug-in analyzer section, $35.00; HQ-29-X receiver with speaker, perfect, $142.00; Bandstretcher audio filter, passes 1300 cycle C.W. sig. new, $11.00; cost me $24.00. First check takes any of this equipment. W9DSV, Webster, Wisc.

SEVERAL BC-348 PH, converted AC. Hammarlund S-meter, $70.00 each. W6HCX.

MAGAZINES: Radio, Electronics, etc., bought and sold. Lipani, 157a Leverett, Boston 14, Mass.

ATTENTION all hams! Read "Practical Wireless", Britain's foremost radio monthly. Keeps you posted with British-European news and views on latest developments and ideas in radio-television fields. Exclusive articles by Britain's top radio men you cannot afford to miss! For one year's subscription (12 issues mailed directly to your address from London) send only $2.00 to George Newnes, Ltd., (PW. 30), 342 Madison Avenue, New York 17. Two years for $3.75.

BARGAINS: New and reconditioned Collins, National, Hallicrafters, Hammarlund, RME, Millen, Sonar, Meck, other receivers; transmitters, etc. Reconditioned S-38, $35.00; S-40, $59.00; S-53, $59.00; NC-46, $59.00; NC-240D, $149.00; DB20, $29.00; VHF-152A, $69.00; RME-84, $69.00; RME-45, $99.00; HQ-120X, $99.00; HQ-129X, $139.00; Meck T60, $89.00; DB22A, HF-10-20, SX-43, SX-42, SX28A, S-36, HT18, HT-9, BC610, NC173, NC183, HRO, other receivers, transmitters, VFO's, etc. Easy terms. Shipped on trial. List free. Henry Radio, Butler 1, Mo.

REWARD: 50 dollars for information leading to location of following stolen equipment: voltohmyst RCA Model 195-A, Ser. 10593 and Simpson multitester Model 260 Serial 19195. It is hoped that an innocent purchaser of these meters may afford a possible clue to other very valuable equipment also stolen in Jamaica, N. Y., on December 9, 1948. Attention all ham radio retail stores in this area: please be on lookout for any proffered meters answering these descriptions. A. L. McNealus, W2VPK, Jamaica, New York, Phone JA 3-1086.

PERSONALIZED book matches. Call letters or name and address. Samples with prices. Miss Amanda Martin, Box 1123, Rochester 3, N. Y.

SELL QSTS, starting 1926. Inquiries welcome. W9DWI.

ARMY Technical Orders Maintenance Manuals BC224, BC348, $2.50 postpaid. State model. Herman Carroll, W2NVG, Depot Place, Glen Head, N. Y.

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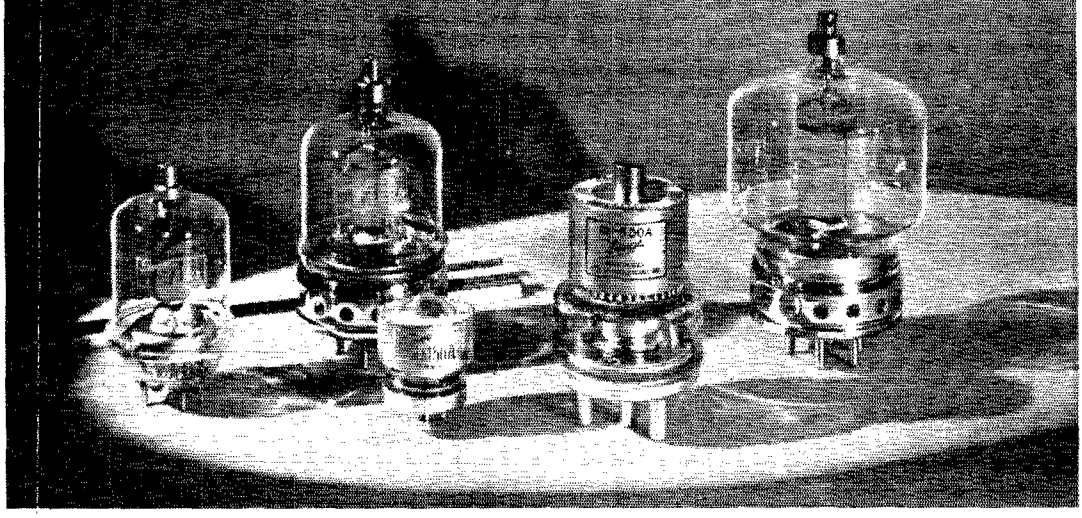
Follow the Leaders to

Eimac TUBES

The Power for R-F

THESE TUBES . . .

REVOLUTIONIZED TRANSMITTER DESIGN



THE 4-65A . . . is the smallest of the radiation cooled Eimac tetrodes. Its ability to produce relatively high-power at all frequencies up to 200-Mc. and over a wide voltage range offers considerable advantage to the end user. For instance the same tubes may be used in the final stage of an operator's mobile and fixed station. Two tubes, in the mobile unit operating on 600 plate volts will handle 150 watts input, while two other 4-65A's in the fixed station will provide a half kilowatt output on 3000 volts .

THE 4-125A . . . is the mainstay of present day communication. These highly dependable tetrodes have been proven in years of service and thousands of applications. Two tubes are capable of handling 1000 watts input (in class-C telegraphy or FM telephony) with less than 5 watts of grid driving power. In AM service two tubes high-level modulated will provide 600 watts output. For AM broadcast they carry an FCC rating of 125 watts per tube.

THE 4X150A . . . is highly versatile and extremely small (2½ inches high). It is an external anode tetrode capable of operating above 950-Mc. As much as 140 watts of useful output can be obtained at 500-Mc. Below 165-Mc. the output can be increased to 195 watts. It is ideally suited as a wide-band amplifier for television and for harmonic or conventional RF amplification.

THE 4X500A . . . is a top tube for high power at high frequencies and is especially suited to TV and FM. It is a small external anode tetrode, rated at 500 watts of plate dissipation. The low driving power requirement presents obvious advantages to the equipment designer Two tubes in a push-pull or parallel circuit provide over 1½ kw of useful output power with less than 25 watts of driving power at 108-Mc.

THE 4-250A . . . is a power tetrode with a plate dissipation rating of 250 watts and stability characteristics familiar to the 4-125A. Rugged compact construction together with low plate-grid capacitance, allows simplification of the associated circuits and the driver stage. As audio amplifiers, 2 tubes will provide 500 watts power output with zero drive.

FOR COMPLETE DATA ON ANY EIMAC TUBE TYPE WRITE TO:

EITEL-McCULLOUGH, INC.

210 San Mateo Ave., San Bruno, California

Export Agents: Frazar & Hansen, 301 Clay St., San Francisco, California

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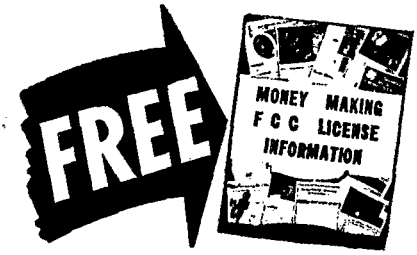

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Position	*Big Stations*	*Little Stations*
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Studio Engineer	**5000**	**3650**
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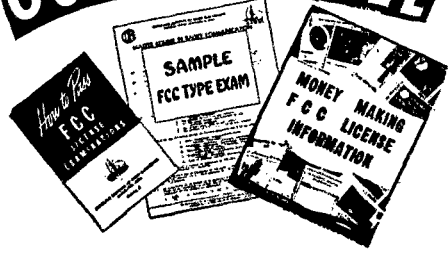

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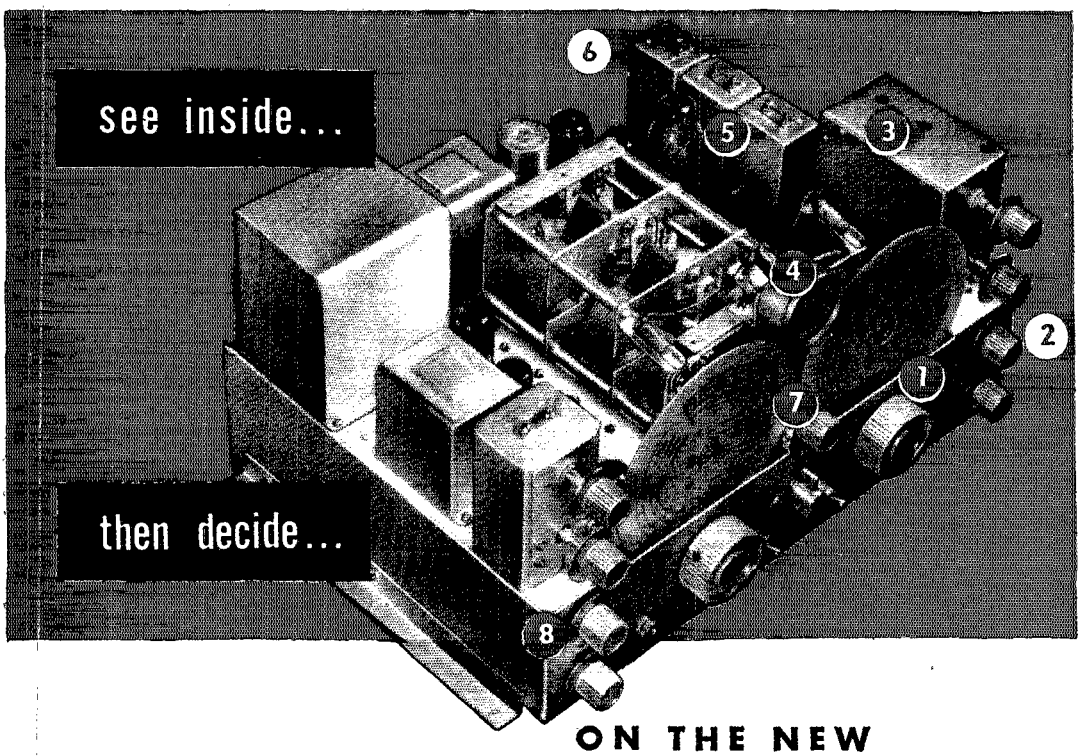
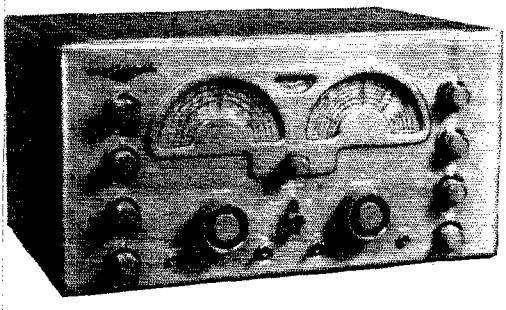


ON THE NEW

NATIONAL NC-173



- **RANGE: 540 kcs to 31 mcs plus 48-56 mcs**
- **TUBE COMPLEMENT: 13 (including rectifier and voltage regulator)**

Not just another "assembly job," the new NC-173 is constructed with rugged, dependable National-built components. That's why it outperforms, outlasts other receivers in the field under all operating conditions! Try it at your dealer's today.

$189.50

(less speaker) Also available in rack model at same price. Prices slightly higher west of the Rockies.

1. Calibrated electrical bandspread for 6 10-11, 20, 40 and 80 meter amateur bands!
2. Automatic noise limiter effective on both phone and CW, with adjustable threshold!
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4. S-meter for both phone and CW!
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7. Trimmer control permits panel adjustment of RF stage!
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NFM-73 adaptor makes the NC-173 a real NFM receiver! Instant selection of AM or NFM from front panel.

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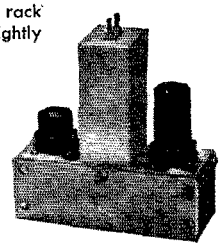

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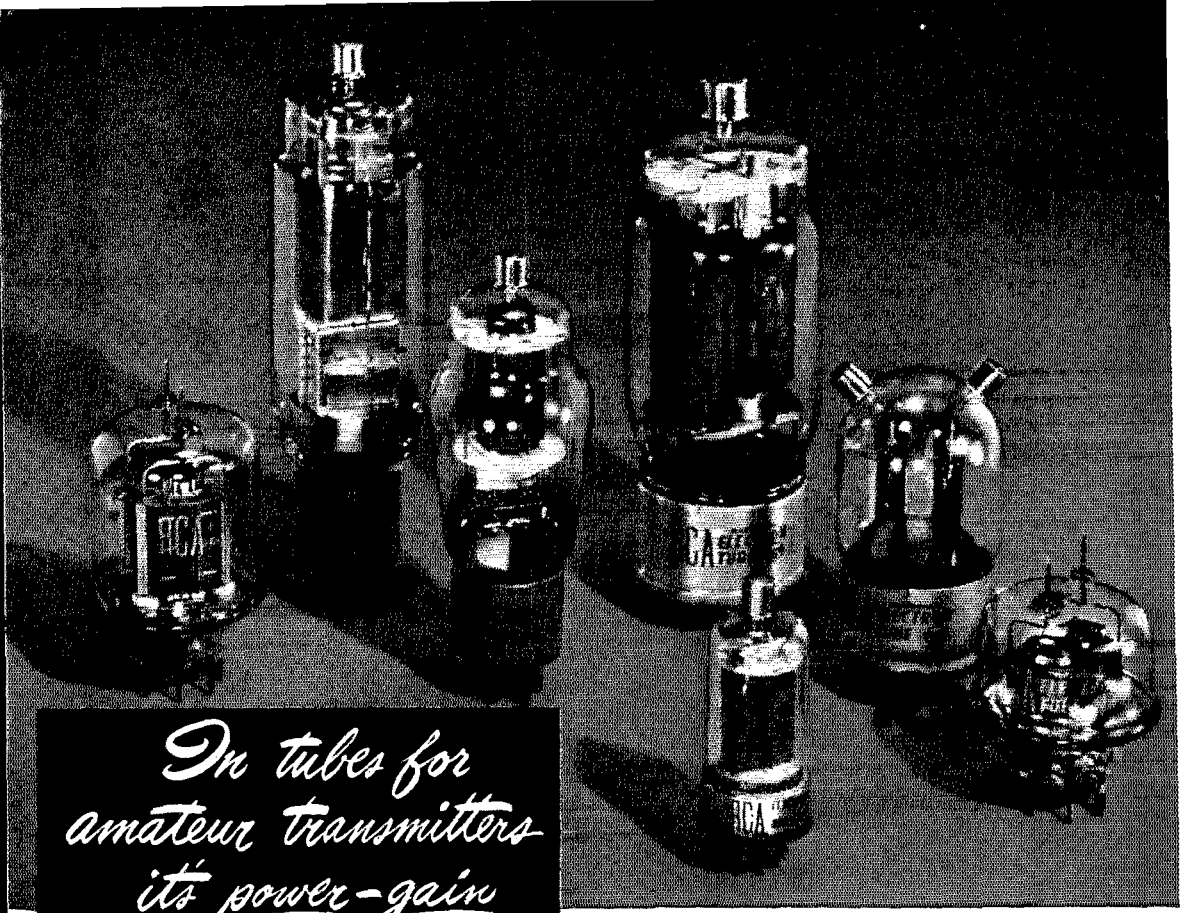

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2E26	0.2	40	600	125	$3.85
807	0.2	75	750	60	2.50
813	4	500	2250	30	16.00
815	0.2	75	500	125	6.90
828	2.2	270	1500	30	13.75
829-B	0.8	150	750	200	16.25
832-A	0.2	36	750	200	11.75
NOTE: Class C telegraphy (ICAS) ratings are shown except for 832-A which are CCS.					

● It's incredible how little excitation it takes to dr RCA beam power tubes to full plate input. Receiv tubes do it easily. In addition to power gains of 90 t or more, these transmitting huskies deliver more out at lower plate voltage than any other tubes of simi ratings.

In addition to the advantages of fewer stages a components, simplified control, and a less expens power supply, RCA beam power tubes seldom requ stabilization in well-designed "all band" circuits. Wh difficulties may arise, permanent stabilization is sim achieved by neutralization or degeneration . . . at sacrifice in efficiency.

To get all the performance and life *you* pay for . . . RCA beam power tubes. Your local RCA tube supp has them in stock.

SCOOP OF THE YEAR ON TVI . . . John L. Reinartz, W3RB, discloses simple circuit for curing TVI in Nov.-Dec. issue of "Ham Tips." Your local RCA tube supplier has a copy waiting for you.

TUBE DEPARTMENT

RADIO CORPORATION of AMERICA

HARRISON, N. J.