September 1953
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QST

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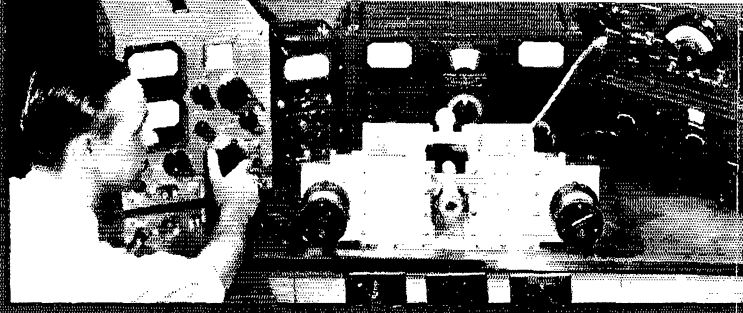
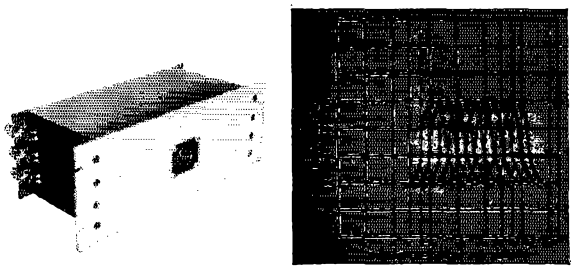
amateur radio

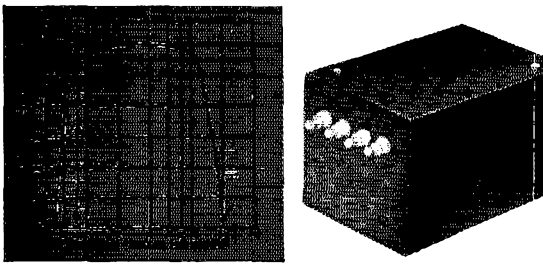
PUBLISHED BY THE AMERICAN RADIO RELAY LEAGUE



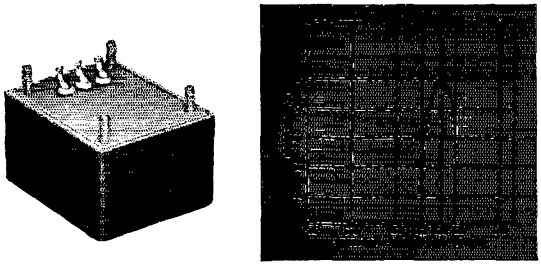
for SPECIALIZED FILTERS



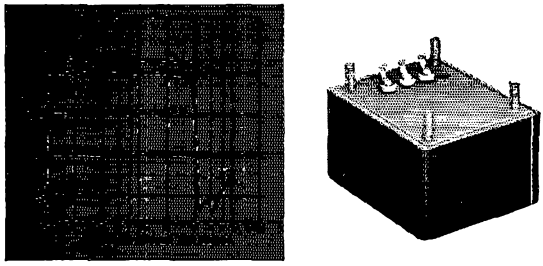
These low frequency band pass filters are held to 1 DB tolerance at the 3 DB crossover . . . 600 ohm . . . 4 filters per 7½" rack panel.



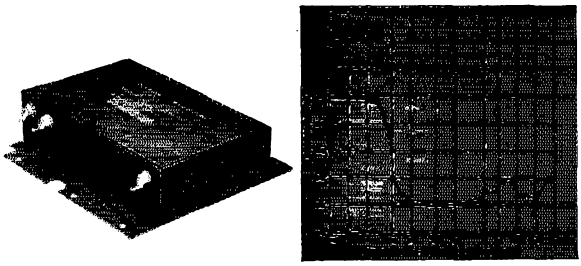
This ultra low frequency filter has a band pass range of one cycle to 10 cycles . . . 50,000 ohms . . . 700 cubic inches.



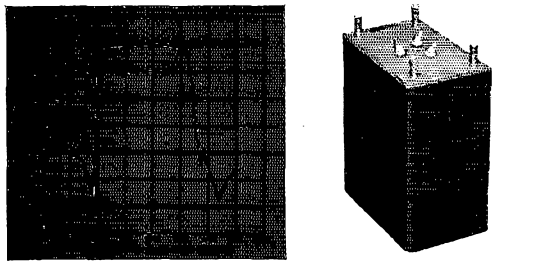
This 600 ohm miniaturized 1 KC band pass filter is housed in a case only 1" x 1¾" x 2½".



This 600 ohm miniaturized low pass filter is housed in a case only 1" x 1¾" x 2½".



This power line filter provides correct output voltages from sources of 50 to 400 cycles . . . noise attenuation is from 14 KC to 400 MC . . . 29 cubic inches.



This band pass filter is designed for sharp cut-off at both ends of the range . . . 10,000 ohms . . . case dimensions 1⅜" x 2½" x 3¼".

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Again, for 1953

THE EDISON RADIO AMATEUR AWARD

The Award Committee solicits your nominations for 1953 candidates

Here is your opportunity to spotlight the meritorious work of a radio amateur you may know who has served the public by means of his hobby. Enter his name for the Edison Award.

You will be promoting the best interests of amateur radio, and you can win for yourself an expense-paid trip to the city where the Award will be presented. Judges will consider only amateurs who are nominated by your letters.

1952 saw Don Mullican, W5PHP, receive the Edison Award as a result of his outstanding work in the March tornado disasters in Arkansas. Special citations also were given four other amateurs who performed especially notable services.

The acclaim for these five was a tribute to the important and unselfish efforts of amateurs everywhere. The 1953 Award will bring recognition to a new trophy winner—will once more dramatize amateur radio's achievements in the public interest.

Read the rules at right. Then select your candidate . . . and send your letter of nomination to *Edison Award Committee, Tube Department, General Electric Company, Schenectady 5, New York.*

RULES OF THE AWARD

WHO IS ELIGIBLE: any man or woman holding a radio amateur's license issued by the F.C.C., Washington, D. C., who in 1953 performed a meritorious public service in behalf of an individual or group. The service must have been performed while the candidate was pursuing his hobby as an amateur within the continental limits of the United States.

WINNER OF THE AWARD will receive the Edison trophy in a public ceremony in a centrally located metropolitan city. Expenses of his trip to that city will be paid. As a further token of appreciation, G.E. will present him with a precision chronographic watch to clock DX. In addition, the person responsible for the nomination of the Award-winning candidate will be invited to attend the presentation ceremony, and his expenses also will be paid.

WHO CAN NOMINATE: any individual, club, or association familiar with the service performed.

HOW TO NOMINATE. Include in a letter the candidate's name, address, call letters, and a full description of the service performed. Your letter must be postmarked not later than January 3, 1954.

BASIS FOR JUDGING. All entries will be reviewed by a group of distinguished and impartial judges. Their decisions will be based on (1) the greatest benefit to an individual or group, (2) the amount of ingenuity and sacrifice displayed in performing the service. The judges will be:

E. ROLAND HARRIMAN
President, The American Red Cross

GEORGE E. STERLING
Commissioner, Federal Communications Commission

GOODWIN L. DOSLAND
President, American Radio Relay League

GARDNER COWLES
President and Editor, "Look" Magazine

WINNER WILL BE ANNOUNCED on or before Thomas A. Edison's birthday, February 11, 1954.

Employees of the General Electric Company may nominate candidates for the Edison Radio Amateur Award, but are not permitted to receive the Award.

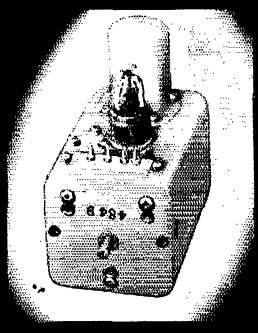
GENERAL ELECTRIC

166-189

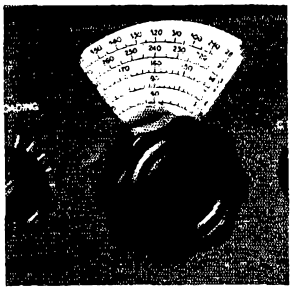
1878 75 1953
YEARS OF ELECTRICAL PROGRESS
Diamond Anniversary

A self-contained table-top transmitter —

COLLINS 32V-3



Pick your frequency with the built-in 70E-8 VFO



You can count the kilocycles on the 32V-3 dial

- With this popular transmitter you QSY from the high end of 10 to the low end of 80 in a few seconds; just pick your band and set the built-in VFO to the desired spot. The 32V-3 will stay there — its frequency is controlled by the highly stable, built-in 70E-8 VFO.
- Have you ever wondered why the 32V-3 sounds so powerful on phone? It's because the audio circuits are Collins-designed and Collins-built for peak performance at speech frequencies.
- And, of course, spurious radiation has been reduced to an absolute minimum.
- The Collins 32V-3 runs 160 watts on cw and 140 watts on phone.

See your Collins distributor today for information on this popular transmitter.

For the best in amateur equipment, it's . . .

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COLLINS RADIO COMPANY, Cedar Rapids, Iowa

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QST

SEPTEMBER 1953

VOLUME XXXVII • NUMBER 9

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

OFFICES

38 La Salle Road
West Hartford 7, Connecticut

TEL.: 3-6268 TWX: HF 88

Subscription rate in United States and Possessions, $4.00 per year, postpaid; $4.25 in the Dominion of Canada, $5.00 in all other countries. Single copies, 40 cents. Foreign remittances should be by international postal or express money order or bank draft negotiable in the U. S. and for an equivalent amount in U. S. funds.

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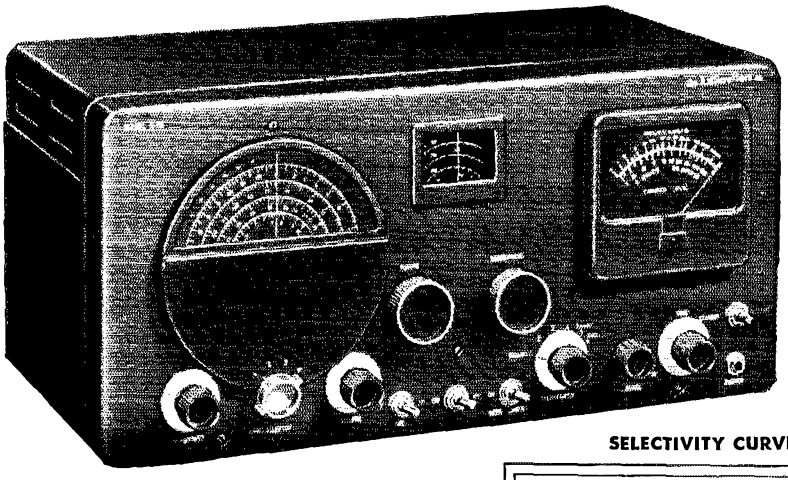
INDEXED BY
INDUSTRIAL ARTS INDEX

—CONTENTS—

Check the specs...
Check the performance...

AND YOU'LL CHOOSE

Do you know any better way, any other way, to judge SW equipment than to check the specifications and the performance? Frankly that's the only valid way we can think of to make sure you get your money's worth. Check these specs. Take a look at the selectivity curve for the S-76. It is typical of the outstanding value Hallicrafters offers in every price class.



Model S-76

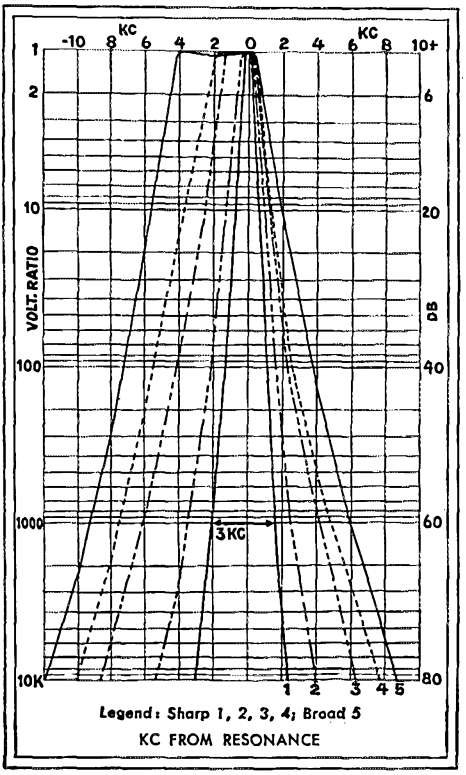
Double conversion receiver. Broadcast Band 538-1580 kc plus three short-wave bands covering 1720 kc-34 Mc.

Calibrated electrical bandspread for easy tuning. Double superhet with 50 kc second i-f and giant 4-inch "S" meter. Five position selectivity, one r-f, two conversion, two i-f stages, temperature compensated. 3.2 or 500 ohm outputs.

Satin black steel cabinet. 18½" x 8⅞" x 9½" deep. Nine tubes, plus voltage regulator and rectifier.

For 105/125V. 50/60 cycle AC
Use R-46 speaker **$199.95**

SELECTIVITY CURVES, S-76



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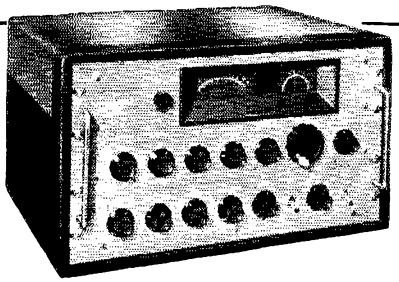


Model HT-20. T.V.I. suppressed 100 watt AM-CW transmitter with all spurious outputs above 40 Mc at least 90 db. below full rated output.

All stages metered; single meter with eight position meter switch; output tuning indication. Frequency range of 1.7 Mc to 31 Mc continuous on front panel control. Seven tubes plus five rectifiers.

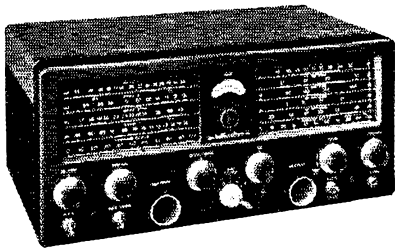
For 105/125 V. 50/60 cycle AC.....**$449.50**

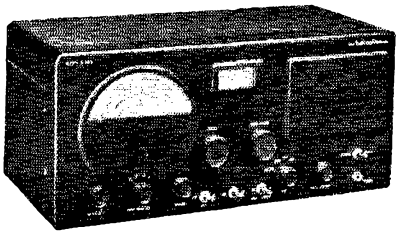
Model SX-71. Covers Broadcast Band 535-1650 kc plus four short-wave bands covering 1650 kc-34 Mc and 46-56 Mc.

Built-in Narrow Band FM one r-f, two conversion, and three i-f stages. Temperature compensated, voltage regulated. Three watt output (terminals for 500 and 3.2 ohms).

Satin black steel cabinet. 18½" x 8⅞" x 12" deep. Eleven tubes plus regulator, rectifier.

For 105/125 V. 50/60 cycle AC....**$249.95**





Models S-40B, S-77A. Covers Broadcast Band 540-1680 kc plus three short-wave bands covering 1680 kc-44 Mc.

Electrical bandspread for easy tuning. One r-f, two i-f stages to draw in stations. Switches for automatic noise limiter, code reception and three-position tone control. CW pitch control and built-in speaker. Seven tubes plus rectifier.

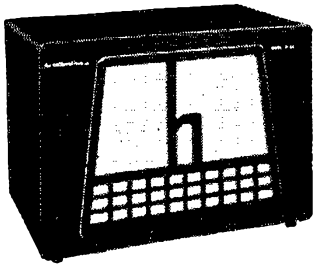
S-40B For 105/125 V. 50/60 cycle AC **$129.95**

S-77A Same, for 105/125 V. AC/DC

32 lbs. **$129.95**

Model R-46. Matching 10" PM speaker for use with Hallicrafters communications receivers SX-71, SX-76, SX-73 or SX-62. 80 to 5000 cycle range. Matching transformer with 500-ohm input. Speaker voice coil impedance, 3.2 ohms.

Satin black steel cabinet matches all Hallicrafters receivers. Cloth covered metal grille. 15" x 10⅞" x 10⅞" deep. Shipping weight 17 lbs. **$24.95**



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Section Communications Managers of the ARRL Communications Department

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

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

THE AMERICAN RADIO RELAY LEAGUE, INC.,

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

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

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

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

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

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Vice-Director:

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West Gulf Division

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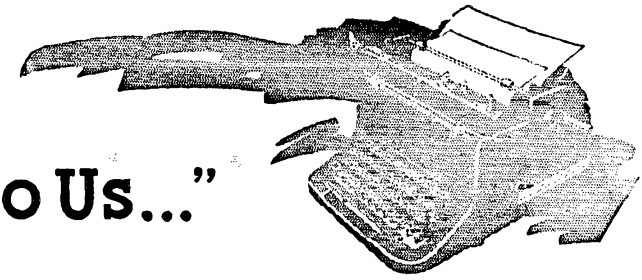


"It Seems to Us..."

OUR COMMON CAUSE

From time to time, largely through the columns of *QST*, League officials have preached the need for a common objective of *all* amateurs in presenting before the rest of the nation and the world our case for amateur radio and its continued preservation.

Organization. Unity. Trite words they have almost become on this page. They are words that you would expect repeated in a journal whose very existence depends on organization and unity — some readers might even suspect a selfish motive. But there can be no such suspicion when an independent, expert in the field of radio regulation, speaks out and warns us all of the fate that will be our lot should we not maintain and improve that unity. Amateur radio's staunch supporter, FC Commissioner George E. Sterling, W3DF, in his address which opened the 1953 ARRL National Convention program, spelled it out so clearly we would like to quote that portion of his talk. After citing some of the many problems which have beset amateur radio at international conferences, and pointing out that they are becoming more severe each time, Mr. Sterling said:

"The solution to this basic part of the amateur problem (and I believe, to most of the amateur problems) lies, to a very large degree, in promoting a full understanding in the amateur ranks of the problems of the amateur as they relate to the problems of the other radio services and to the public generally. Only by this means can the best course of action for the amateur be decided.

"In my address of last December before the New York Radio Club, I made this statement:

> To perpetuate existence through continuing provision for use of the public domain by the amateur service it seems quite clear that the amateurs must set aside small differences and petty maneuvering in favor of educating themselves to the graver problems and, like our Country, in extremis, engage the enemy on the total front of our common cause. This would mean a single altruistic purpose and completely expressive of the common will evidenced by an informed and vocal membership.

"Differences of opinion do exist, and will continue to exist, but there must be mutual respect for each other's point of view. Now is the time, in view of the serious joint fight, to solidify our ranks.

"The amateurs need a strong and vigorous League to prepare and lead them in the battles that lie ahead. The League also requires the support of the agencies of government concerned.

"I know of no better friends and staunch supporters of the amateur service than the members of the Commission and staff. The long history of the amateur service will attest to this statement.

"All of us who are familiar with past history know that the League has taken a leading part in international conferences in fighting for as well as preserving amateur frequencies. The results may not have been always what one may have desired but no one can deny that the League representatives have defended the amateurs at these conferences with all the vigor they could command.

"On the need for unity, Oliver Read stated it so clearly and emphatically in the September 1952 issue of *Radio & Television News* when he said:

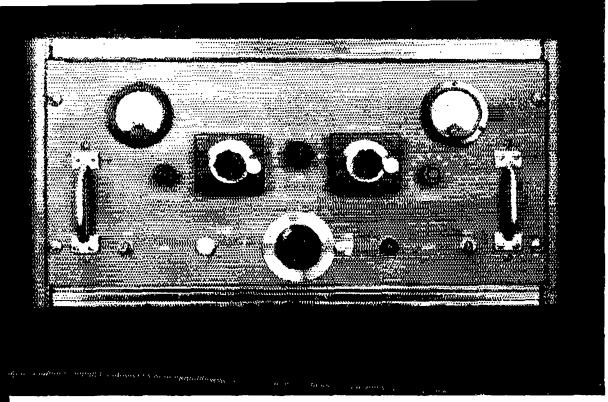
> There has never been a time in our history when it was so necessary that we amateurs "stand up and be counted." The complexity of modern life, the constant distraction of other endeavors, the not-inconsiderable effect of spreading amateur radio over a too-wide area of interest and activity have all combined to reduce the cohesive qualities of our common bond.

"Our convention Chairman, Doctor Fermaglich, W5FJF, also emphasized the need for unity when he stated in the Houston Amateur Radio Club News, 'We can only have strength in solidarity. We must stick together, we must support capable, qualified, and inspired leadership.'

"To you, Mr. Dosland, to the Directors and the membership of the League, and all amateurs of this Country, I pledge my sincere efforts to achieve these objectives."

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.



The "Little Firecracker" s.s.b. linear uses two 6146s in parallel. It operates on 80 through 10 meters without lifting the lid, and all power supplies are housed in the same cabinet as the r.f. components.

♦

The "Little Firecracker" Linear Amplifier

A Pair of 6146s and Good S.S.B. Design Practice

BY BEN RUSS,* W2QZ

AMPLIFICATION of the output of any low-powered s.s.b. exciter can be done only by using a *linear* amplifier. A linear is an amplifier so adjusted that its output voltage is proportional to its input voltage. Use can be made of Class A, AB_1, AB_2 or B — Class A is generally used for very low power levels, as in the exciter output stage.

Not only do we want to amplify our s.s.b. signal, we want to amplify it without adding new and possibly undesired signals. If the unwanted sideband is 40 db. down in the signal coming from the exciter, we expect the same (or very close to the same) ratio in the antenna after amplification. We want no intermodulation products added that will either degrade the desired sideband or appear as "crud" outside the sideband. In short, we want a really "high-fidelity" amplifier for r.f. As in audio work, you can't expect a good linear to clean up a degraded signal fed to its input. That's expecting too much.

Desirable characteristics of any linear amplifier include:

1) Good linearity up to the power-handling limit of the tubes.

2) High power sensitivity.

3) Multiband operation without opening the cabinet.

4) High-*Q LC* circuits.

5) Constant-voltage plate, screen and grid supplies.

6) Stability.

Linearity and Output

It should be recalled that the figures given for audio service in Class A, AB_1, AB_2 or B can be used for r.f. linear amplifier used with s.s.b. suppressed carrier. Two tubes can be used in parallel or push-pull — we elected to use two tubes in parallel, for circuit simplicity. In push-pull or parallel, however, it is desirable to use tubes with similar characteristics so that the tubes will share the load equally.

Table I gives the Class AB_1 and AB_2 ratings of the 6146, an excellent tube with a plate-dissipation rating of 25 watts. Slightly more output can be obtained in Class AB_2 operation, although running the tubes in Class AB_1 (no grid current) simplifies the driver problem and greatly reduces the chances for distortion on signal peaks in the grid-current region. In s.s.b. suppressed-carrier operation the maximum screen voltage (250) can be used, resulting in higher power sensitivity and slightly more peak output. The "maximum-signal d.c. plate current" is not what your meter reads on *speech*.[1]

High Power Sensitivity

The 6146 is tailor-made for this desirable feature. Like all beam tubes, the 6146 requires very little drive, and you can figuratively "blow" on the grid and get high power output. Preliminary checking of this unit on all bands was done by driving the amplifier with the output from a Millen grid dipper, with output readily indicated on all bands from 80 through 10 meters. A pair of 6146s will deliver full rated output when driven by any of the commonly-used s.s.b. exciters. The exciter will not be required to work heavily, and swamping can be used to absorb the extra power from the exciter and add to its linearity. Swamping is used in both the exciter tank circuit and the linear-amplifier grid tank at W2QZ. The amplifier operates Class AB_1, with 120 watts peak output.

Multiband Operation

Multiband operation is not essential to s.s.b. but, as in any other transmitter, it is a nice feature to have. If a shelf full of plug-in coils can be eliminated, so much the better.

In this amplifier, a revised B & W turret is used in the grid circuit, and a B & W variable inductor

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[1] Ehrlich, "How To Test and Align a Linear Amplifier," *QST*, May, 1952.

is used in the output, much along the lines of W1DF's high-powered amplifier.[2] The unit covers all amateur bands from 80 through 10 without opening the cabinet. The 160-meter band could have been included by switching in an additional inductor in the plate circuit.

High C

The subject of high Q (or high C) in tuned circuits has been stressed in many articles relating to s.s.b., as well as in the *Handbook*. High-Q circuits are used in linear amplifiers for two main reasons: for ease of coupling to other circuits, and to minimize the harmonic content. A rule-of-thumb that the s.s.b. gang follows is "Use a 10-meter coil on 20, a 20-meter coil on 40, etc."

Table 2 shows how this principle was applied to the B & W BTEL 35-watt turret used in the grid circuit (an end-link assembly with separate link windings for each of its five coils). A 250-$\mu\mu$fd. variable is used to tune the coil in use.

The Q in the plate circuit can be set with reasonable accuracy, since a variable inductor and a high-capacity variable condenser are used in a pi-network circuit. The condenser is a 190-$\mu\mu$fd.-per-section dual, and the stators are connected together by a ½-inch-wide copper strap. Connected this way, the condenser measures 40 to 400 $\mu\mu$fd. (including stray capacity to the chassis). It is a simple matter to plot the capacity *vs.* dial setting, since the condenser plates are semicircular and give straight-line-capacity tuning, and hence the tuning condenser can be set to any given capacity on any band. The circuit is then tuned to resonance by adjustments of the variable inductor, and load changes are made with the output condenser stack of S_2. The Q chart of Fig. 6-9 in the 1953 *Handbook* (page 137) was used for working out these settings — the maximum value of d.c. plate current (227 ma.) is used in the denominator.

Regulation of Power Supplies

In no other type of transmitter is the regulation of power supplies as important as in s.s.b. transmission. For a clean s.s.b. signal, the only factor governing the output signal should be the r.f. driving signal at the input. With the exception of Class A operation (used only at low power levels because of its relative inefficiency), the average plate and screen currents vary over wide ranges at a syllabic rate. If grid current is drawn during part of the operating cycle, as in AB_2 and B operation, the grid current also varies. If these variable current demands affect the voltages of the power supplies, the effect is to add some plate or screen (or grid) modulation, or a combination of them to the output. These will generate new and undesired components, or distortion products, and they will degrade the over-all signal. It is therefore important to use well-regulated power supplies with a s.s.b. linear amplifier.

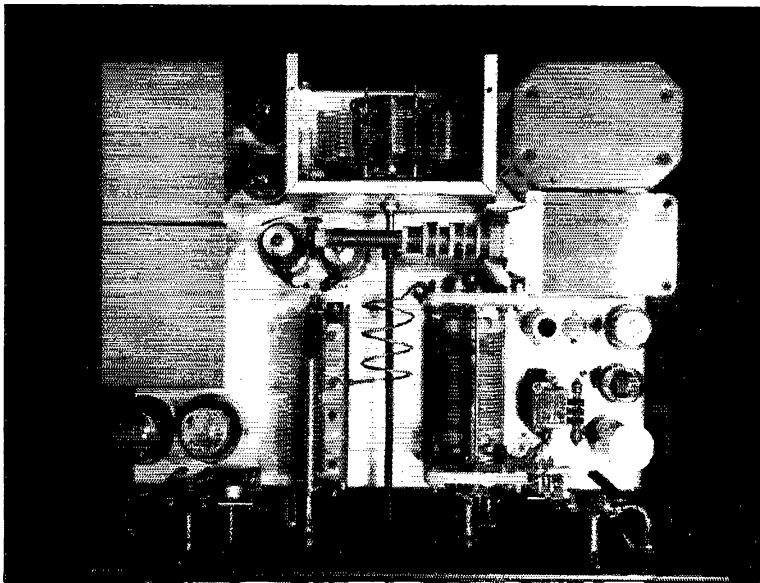
The requirement of a grid-bias supply well regulated over a wide current range is avoided by using 6146s, which draw a very low value of grid current on peaks, and by using a "stiff" bias supply. The bias voltage is adjustable and, in practice, there is no detectable voltage change, even on modulation peaks. The supply is "stiff-

TABLE I

Amplifier Ratings for the 6146 (Values Are for Two Tubes)

A.f. power amp. & mod.	AB_1
D.c. plate voltage	750
D.c. grid No. 2 screen voltage	200
D.c. grid No. 1 control grid	— 50 volts
Zero-signal d.c. plate current	57 ma.
Maximum-signal d.c. plate current	227 ma.
Zero-signal d.c. grid No. 2 current	1 ma.
Maximum-signal d.c. grid No. 2 current	27.5 ma.
Maximum-signal driving power (approx.)	0 watt
Maximum-signal power output	120 watts
A.f. power amp. & mod.	AB_2
D.c. plate voltage	750
D.c. grid No. 2 screen voltage	165
D.c. grid No. 1 (control grid) voltage	— 45
Zero-signal d.c. plate current	35 ma.
Maximum-signal d.c. plate current	240 ma.
Zero-signal d.c. grid No. 2 current	0.6 ma.
Maximum-signal d.c. grid No. 2 current	21 ma.
Maximum-signal d.c. grid No. 1 current	0.7 ma.
Maximum-signal driving power	0.07 watt
Maximum-signal power output	130 watts

[2] Grammer, "Pi-Network Tank Circuits for High Power," *QST*, Oct., 1952.



This top view of the linear amplifier shows the grid-tank shield removed. The power-supply components are on each side of the chassis — the two screen VR tubes can be seen to the left of the grid circuit.

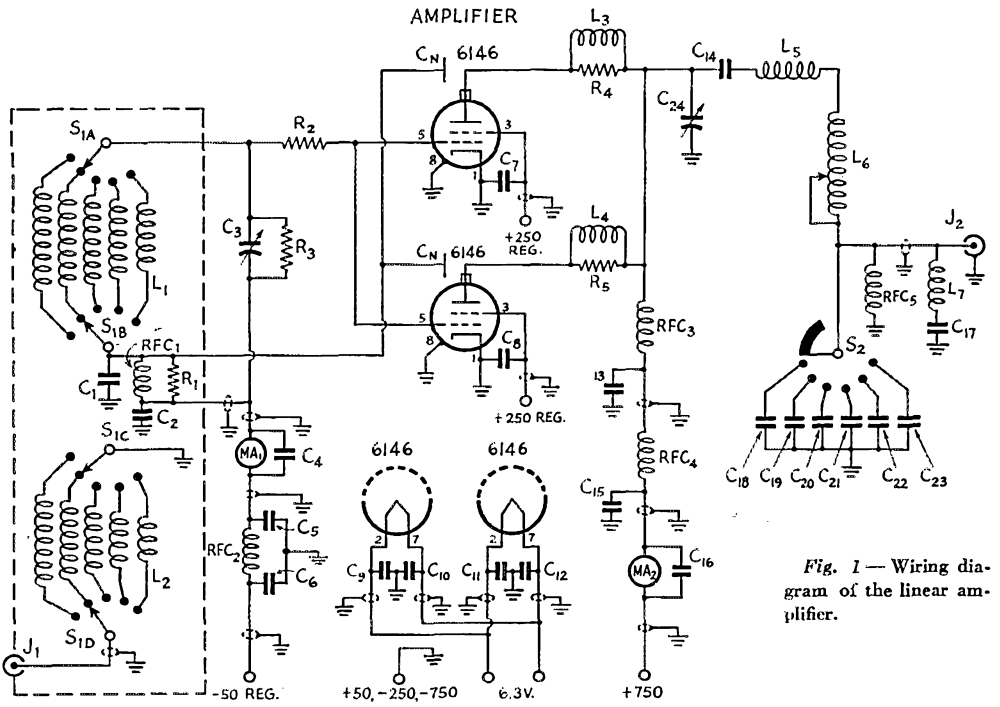


Fig. 1 — Wiring diagram of the linear amplifier.

C_1 — 250-$\mu\mu$fd. mica.
C_2, C_4 – C_{12}, C_{16} — 0.001-μfd. disk ceramic.
C_3 — 250-$\mu\mu$fd. variable (Hammarlund MC-250M).
C_{18} — 500-$\mu\mu$fd. 10,000-volt ceramic (CRL TV3-5301).
C_{14} — 0.002-μfd. 2500-volt mica.
C_{15} — 0.001-μfd. 2500-volt mica.
C_{17}, C_{18}, C_{19} — 100-$\mu\mu$fd. 2500-volt mica.
C_{20}, C_{21} — 200-$\mu\mu$fd. 2500-volt mica.
C_{22}, C_{23} — 500-$\mu\mu$fd. 2500-volt mica.
C_{24} — 380-$\mu\mu$fd. variable (Cardwell MO-180-BD, stators in parallel).
C_N — Neutralizing condenser (see text).
R_1 — 1000-ohm 2-watt carbon.
R_2, R_4, R_5 — 100-ohm 2-watt carbon.
R_3 — 10,000-ohm 10-watt noninductive (Sprague Kool-ohm NIT).
L_1, L_2 — See coil table.
L_3, L_4 — 6 turns No. 20 tightly wound around R_4 and R_5.
L_5 — 3½ turns No. 10, 2-inch diam., 3½ inches long.
L_6 — Variable inductor (B & W 3852).
L_7 — Series-resonated with C_{17} to TV channel most likely to be interfered with.
MA_1 — 0–15 milliammeter.
MA_2 — 0–500 milliammeter.
RFC_1, RFC_3 — 2.5-mh. r.f. choke.
RFC_2 — 7-μh. r.f. choke (Ohmite Z50).
RFC_3 — 225-μh. r.f. choke (National R-175).
RFC_4 — 4-μh. r.f. choke (National R60).
S_1 — 4-pole 5-position switch of L_1L_2 assembly.
S_2 — Progressive shorting switch (Centralab PIS wafer and P-121 index).

ened" by using a low-resistance voltage divider and a large electrolytic condenser across the output.

The screen supply is easy to regulate, since the maximum screen-current demand is less than the maximum current a VR tube will handle, and a VR-105 and VR-150 in series gives the necessary 255 volts. The dropping resistor to the VR tubes is adjusted so that, with no modulation, the VR tubes pass their maximum current of 40 ma.

TABLE II

L_1L_2 — B & W BTEL 35-Watt Coil Turret

All primaries left as is. Secondary turns shorted from hot end (opposite primary link).

Original Use	*Revision*	*Band Use*
10–11 meters	4 turns shorted	10–11–15 meters
15 "	3 " "	20 "
20 "	3 " "	40 "
40 "	4 " "	80 "
80 "	None	Not used

Getting the best possible regulation from the average plate power supply is no easy task. There are many components that contribute to the *IR* drops; e.g., the transformer secondary, the rectifier tube (if high-vacuum), the input and smoothing chokes, and the a.c. line. To smooth out the syllabic variations, a large amount of output capacity is recommended, and too many microfarads at this point are not within the realm of possibility. One full-wave rectifier could have been used in the rig to be described, but two were used, to reduce the *IR* drop. Mercury-vapor tubes would be even better, perhaps, in this respect. Originally, one surplus plate transformer was used. There were no current ratings on the case, but the transformer looked big enough and felt heavy enough. Later, a duplicate transformer was acquired and connected in parallel. Immediately the regulation was improved, and the *IR* drop through transformer resistance was cut in half. Don't go right out and buy two similar transformers — the

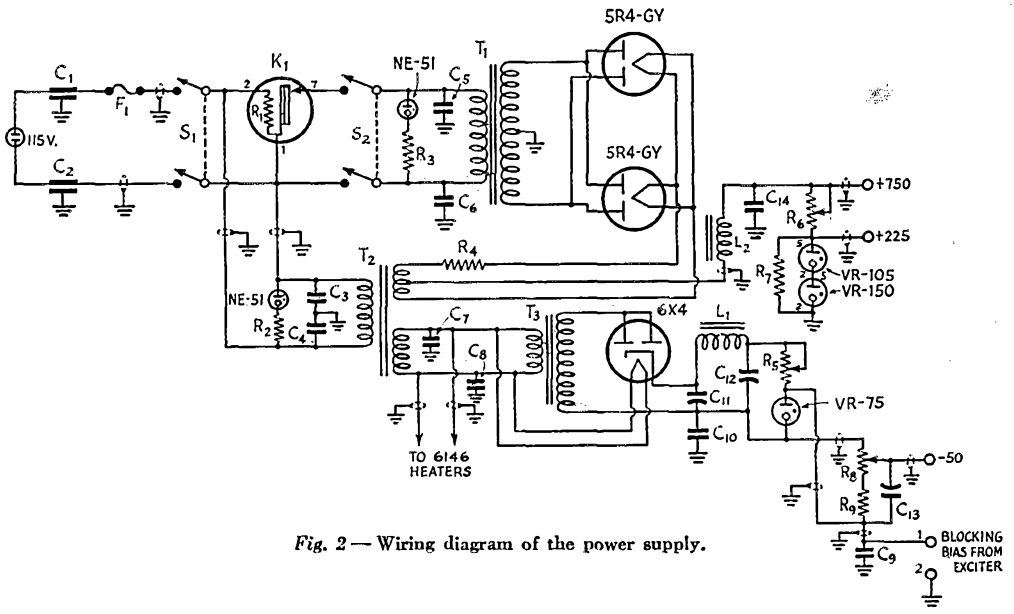


Fig. 2 — Wiring diagram of the power supply.

C_1, C_2 — 0.1-μfd. feed-through capacitor (Sprague Hypass).
C_3 – C_8 — 0.005-μfd. disk ceramic.
C_9, C_{10} — 0.001-μfd. disk ceramic.
C_{11} — 10-μfd. 450-volt electrolytic (see C_{12}).
C_{12} — 80-μfd. 450-volt electrolytic (Mallory FP-245).
C_{13} — 80-μfd. 150-volt electrolytic.
C_{14} — 24-μfd. total, 1000 volts.
R_1 — Heater built in K_1.
R_2, R_3 — 0.2 megohm, 1 watt.
R_4 — Homemade 0.35-ohm resistor. Can be omitted if T_2 has 5-volt winding.
R_5 — 1000-ohm 10-watt adjustable.
R_6 — 20,000-ohm 50-watt adjustable.
R_7 — 0.1-megohm, 2 watts.
R_8 — 2500-ohm 2-watt potentiometer (Ohmite AB CU2521).
R_9 — 2400 ohms, 2 watts.
L_1 — Small filter choke, not over 250 ohms resistance.
L_2 — 5–20 hy. 300-ma. swinging choke.
F_1 — 5-amp. fuse.
K_1 — Thermal time delay (Amperite 115NO30 wired for 6 amp.).
S_1, S_2 — D.p.s.t. toggle.
T_1 — Plate transformer, to deliver 750 v. d.c. at 300 ma., approx.
T_2 — Filament transformer, each secondary 6.3 volts at 4 amp.
T_3 — 6.3-volt 3-amp. filament transformer.

point is mentioned just to emphasize the need for conservatively-rated power-supply components when good regulation is your objective.

It was always considered desirable to have two matched filter chokes, one swinging and the other smoothing. Yes, you read it right — it says "was." In s.s.b., only one is sufficient, and using only one cuts down another source of series resistance and poor regulation. With 24 μfd. of filter condenser and the swinging choke, the regulation is improved and the ripple is only 2½ per cent.

Stability

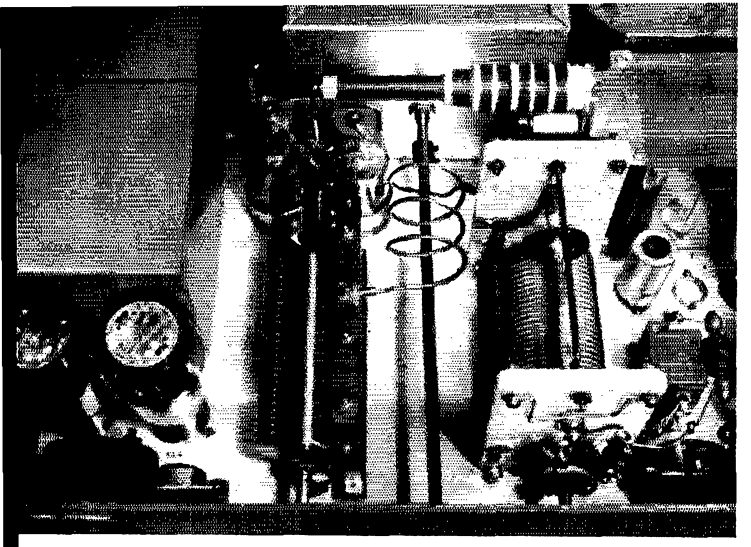
Stabilization of any r.f. amplifier is important, of course, but it sometimes becomes more important in linear-amplifier work because of the high power sensitivity of the linear. Instabilities manifest themselves as fundamental oscillations or regeneration, and l.f. and v.h.f. parasitics. As a matter of precaution, v.h.f. parasitic suppression was built into this amplifier before any testing was done. It is reasonably safe to assume that there is everything to gain and nothing to lose by exercising this precaution with multigrid r.f. tubes, especially where they are operated in a high-power-sensitivity condition.

Oscillation or regeneration at the operating frequency is evidence of plate-to-grid feed-back and the amplifier was neutralized to offset any such coupling. As originally built, no neutralization was included, although every precaution was included to minimize feed-back, such as grounding all cathode pins with heavy wire and isolating the grid and plate circuits. The amplifier was stable, but after several days of band-hopping between 75 and 20 it was noticed that maximum output did not occur at the resonance dip indicated by the plate-current meter. Adding the Bruene grid-capacitance bridge neutralization circuit [2,3] brought maximum output at the plate-current dip.

The introduction of this neutralization introduced another factor in the form of "birdies" across the band, similar to ITV. This was an unexpected l.f. oscillation that was eliminated by the addition of a 1000-ohm resistor across the grid r.f. choke. Another value of r.f. choke would probably have cured the trouble, but none was available at the time.

The amplifier circuit is shown in Fig. 1, and the power supply diagram is shown in Fig. 2. The

[3] Bruene, "How To Neutralize Your Single-Ended Tetrode Final," *CQ*, Aug., 1950.



A close-up view of the r.f. section shows the neutralizing condenser mounted close to the two 6146 plate connectors.

thermal time delay, K_1, was included to insure proper warm-up time for the 6X4 and 6146s.

Construction

The panel and chassis are aluminum, with an $8\frac{3}{4} \times 17$-inch panel and a $13 \times 17 \times 3$-inch chassis. The large chassis allows for mounting of many of the smaller components on the underside. The chassis is set back from the panel, to allow room for the mounting of parts between the panel and the front apron of the chassis. This spacing also serves to bring the rear apron, with its coax connectors and terminals, flush to the inside back of the cabinet.

All wiring was done with shielded wire where possible, with no attention being paid to its length. It is bonded and grounded to the chassis at all convenient points. Disk ceramic condensers are used liberally throughout, in keeping with present practice. The grid-tuning condenser is mounted directly under the grid-turret shield box, permitting short lead lengths.

A series of $\frac{1}{4}$-inch holes is drilled directly above R_6, the series bleeder, for better heat dissipation. A current of 40 ma. flows through this resistor when the plate switch is "on."

Condenser C_{17} is mounted as close to the output coax connector, J_2, as possible, and flush against the chassis. It is "grid-dipped" with L_7 to the frequency of the TV channel most likely to be interfered with. J_2 is shorted during the grid-dipping process.

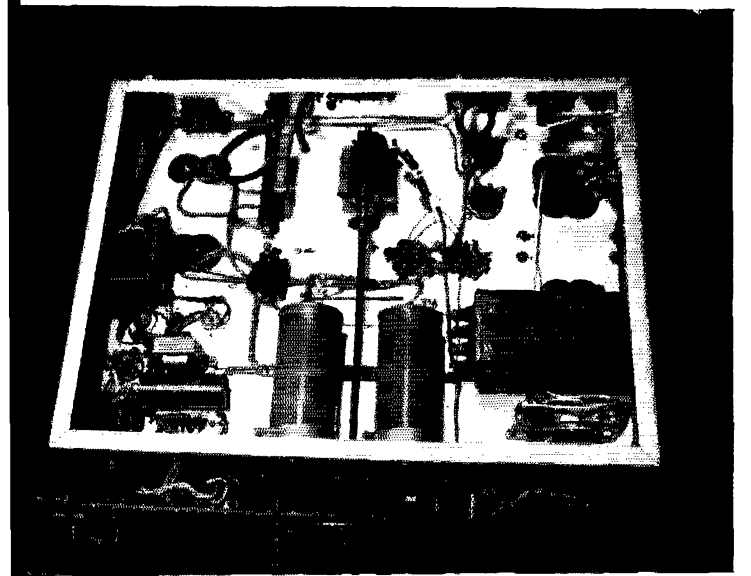
The "C" bias dual filter condenser, $C_{11}C_{12}$, is mounted on an insulating wafer because the can is negative and does not ground to chassis. A disk ceramic condenser, C_{10}, is used to by-pass the can to the chassis.

Type 4 mica condensers are used in the pi-network output stack because they lend themselves to firm mechanical mounting. Their voltage rating is higher than required for the power used, but they were on hand. The "safety choke," RFC_5, is mounted across the condenser stack.

Both sides of the plate-tuning stators are connected together with $\frac{1}{2}$-inch-wide copper strap to reduce lead inductance and make use of the condenser's maximum capacitance. The self-resonance of this condenser, C_{24}, connected this way, measures 120 Mc. — well outside any TV band.

The plate choke, RFC_3, is mounted horizon-

(Continued on page 104)



The 24 μfd. of filter condenser in the plate power supply is mounted under the chassis — it consists of the two center cylinders plus the two condensers on the right-hand side. Shielded wires and disk ceramics are liberally used throughout the unit.

The Simplest Modulator

Plugs Into Key Jack—No Plate Supply Needed

BY IRA F. GARDNER,* W6LNN

• This is about as easy a way to get on 'phone as any we've seen. The same modulator unit will serve for any transmitter power (c.w. input) up to a kilowatt, simply by using two or more tubes in parallel for the heavier plate currents. The only power supply required is a means for lighting the tube heaters.

It is possible that many c.w. operators have been looking for an easy way to modulate their rigs, especially now that the 40-meter band has been opened up for 'phone. This little modulator may be the answer.

The interesting point about it is that it can be plugged into the cathode circuit of any final amplifier and you are on 'phone. No separate plate supply or matching output transformer is needed. The plate voltage for the unit is derived from the final plate supply.

As shown in Fig. 1, the audio output voltage is impressed between the r.f. amplifier cathode and ground, giving principally grid-bias modulation of the amplifier although there is a small amount of accompanying plate and screen modulation. You can modulate triodes, tetrodes or pentodes, single-ended or push-pull. The efficiency is comparable with that of other grid- or screen-modulation systems and so, of course, cannot equal plate modulation, but good quality reports will be obtained. One feature of the system is that, with most finals at least, proper operating conditions for good modulation are attained practically automatically.

The speech amplifier uses a double-triode 6SL7GT with resistance coupling, and gives adequate gain for a crystal microphone. Plate voltage comes from the amplifier cathode, with C_1, C_3, C_6, R_3, R_7, and R_{10} providing additional filtering as well as decoupling. The voltage will vary with the power of the transmitter, but in any event the measured voltages at the 6SL7 plates are quite low. R_{11} should not be needed if the modulated amplifier is operating at such low power that the voltage at the screen of the 6Y6G does not exceed the maximum rating of 135 volts.

* 2613 No. 17th St., No. Sacramento 15, Calif.

To use the modulator, first tune up the transmitter for c.w. operation and load it to normal input. Then connect the modulator into the amplifier cathode circuit — it can be plugged in in place of the key if there is a key jack in the cathode — and the plate current should drop to about half its c.w. value. Then talk — that's all there is to it! The r.f. amplifier plate current should remain steady except possibly for a slight flicker on voice peaks. In the event that the plate current with the modulator plugged in is considerably above half the c.w. value, it can be brought into the right region by increasing the value of resistor R_9.

One word of caution, especially when using powers over 200 watts or thereabouts: Be sure the modulator filaments are ON before applying plate voltage. This will insure the proper path of the final cathode current and prevent possible burnout of the small audio filter choke in parallel with the 6Y6G circuit. This applies particularly to separate control of filament voltages.

The author's unit is built into a 6¼ × 3½ × 2-inch "channel-lock" box. This size accommodates all the parts except the small audio choke.

In estimating the number of tubes required to modulate a given transmitter, allow one 6Y6G for each 200 ma. of c.w. plate current or 100 ma.

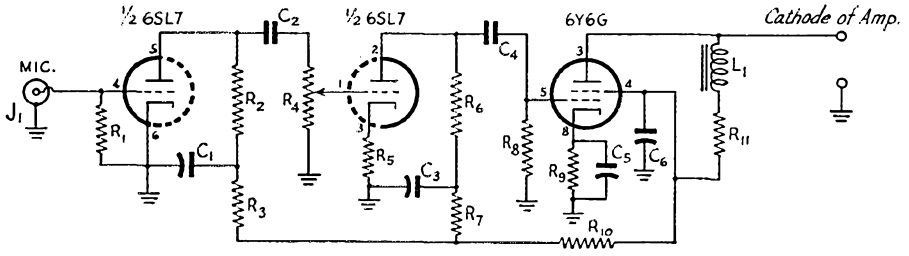
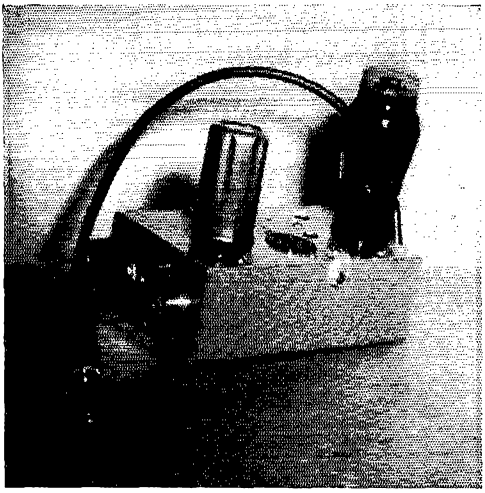


Fig. 1 — Circuit diagram of the speech amplifier and modulator.

C_1, C_3 — 0.1-μfd. paper, 400 volts.
C_2 — 0.005-μfd. paper, 400 volts.
C_4 — 0.01-μfd. paper, 400 volts.
C_5 — 50-μfd. electrolytic, 50 volts.
C_6 — 8-μfd. electrolytic, 450 volts.
R_1 — 2.2 megohms, ½ watt.
R_2 — 0.22 megohm, ½ watt.
R_3, R_7, R_{10} — 22,000 ohms, ½ watt.
R_4 — 0.5-megohm volume control.
R_5 — 2200 ohms, ½ watt.
R_6, R_8 — 0.1 megohm, ½ watt.
R_9 — 50 ohms, 2 watts (see text).
R_{11} — 2000 ohms, 2 watts (see text).
L_1 — Small filter choke, "a.c.-d.c." type satisfactory.



Practically any layout you want can be used for the modulator. The unit at W6LNN uses the circuit of Fig. 1 and has ample gain for a crystal microphone. A carbon microphone could be coupled to the modulator grid through the usual transformer, without speech amplification.

when the modulator is plugged in. One tube will modulate up to 200 ma. c.w. current, two tubes up to 400 ma., and so on, it being understood that these values should drop to one-half when the modulator is in circuit. Type 6L6 tubes can be substituted for the 6Y6G but are not as desirable because higher plate and screen voltage are required for the same cathode current. Since the voltage drop across the modulator tube or tubes subtracts from the voltage actually applied between plate and cathode of the modulated amplifier, a larger tube drop means a reduction in power input to the final amplifier stage.

In typical cases, 'scope patterns have shown that with tone input very good waveform is obtained up to about 80 per cent modulation. The positive peaks are somewhat clipped with heavier modulation, but the distortion is not particularly noticeable even at 90 per cent modulation.

The simplicity of the unit makes it readily adaptable to portable rigs. It would also be useful as a spare modulator when the regular high-powered speech system needs attention.

OUR COVER

Here's the antenna system responsible for that husky 20-meter signal from W2SAI, Riverton, New Jersey. The self-supporting seamless-tubing mast rises 100 feet above ground, tapering from ten inches in diameter at the base to two inches at the top. The whole affair is made rotatable by setting the mast ten feet in the ground in an oil-filled sleeve which, in turn, is imbedded in a 4 x 4 x 10-foot concrete block. A prop-pitch motor with chain drive serves as rotator.

If you will observe the photo background closely, you will notice that the three stacked 20-meter dipoles (at the 40-, 70- and 100-foot levels) are backed up by a "bedspring"-type plane reflector. The reflector, made of No. 18 copperweld wires spaced two feet apart, measures 42 feet by 60 feet overall.

The feed system consists of paralleled RG-8/U coax cables (totaling 104 ohms impedance) feeding into twin paralleled quarter-wave matching lines inserted in the center dipole. From here, 1:1 open-wire phasing transformers are used.

A 33-foot vertical for 7 Mc. is mounted atop the mast.

Strays

W2HH, 88 years young, filed in June for another in his long series of license renewals.

HEADQUARTERS STAFF OPENING

The ARRL Communications Department invites applications for present and prospective staff posts. A present vacancy involves contest checking and analysis work. Applications should indicate any ARRL field organization posts held, amateur operating background, any contest work, possible interest or availability for W1AW operation, etc. Preference will be given to a single man in the 20-to-30 age bracket and to field organization appointees. Experience, personality, skill, accuracy on records and ability to formulate *QST* reports, all count. Salary depends on job and experience. If interested and available, send a card or message for personnel form. All applications will be considered confidential.

An Auto-Alarm Unit for "Conelrad"

Automatic Monitoring of Key Stations for Air-Raid Alerts

BY E. B. LINDSEY,* W4BIW

• As you know, in the event of an air raid "Conelrad" provides for the alerting of all broadcast stations through designated "key" stations, at which time all b.c. stations will either go off the air or shift to one of two designated frequencies. Amateur stations are not involved in the plan at present, but we thought you would be interested in a device that can silently monitor your local key station and alert you if the "signal" is transmitted.

THE warning device to be described was designed and constructed by the WLW-A staff to carry out the automatic-monitoring functions of a "key station" in the "CONELRAD" plan[1] as set forth by FCC. In order to make possible a means of automatic electronic monitoring, FCC has set up the following "signal" to be initiated by the key station in case of an air-raid alert:

1) Cut carrier 5 seconds.
2) Restore carrier 5 seconds.
3) Cut carrier 5 seconds again.
4) Restore carrier 15 seconds with 1-kc. tone.
5) Oral message to public.

The unit here described was designed to ring a bell or sound other warning devices when the first four steps above are carried out correctly and in sequence by the key stations. It has the ability to discriminate against abnormal signals, as will be shown later. The alarm can be used with any broadcast receiver (or communications receiver covering the broadcast range), although a.c.-d.c. receivers are not recommended for this service because of the hazard involved in interconnecting chassis and ground connections in certain cases. A 3-wire cable is used from the receiver to the unit for B+, a.v.c. and ground — a B+ voltage on the order of 105 volts is required. The a.v.c. voltage from the receiver is applied through an appropriate resistance to the grid of the control tube in the warning unit.

The Circuit

Referring to the circuit diagram in Fig. 1, the 6SQ7 control tube is normally cut off by the a.v.c. signal from the receiver, and relay K_1 will be open. Assume now a bona fide alarm and the correct sequence of carrier interruptions by the key station (S_1 closed). As the key carrier disappears, K_1 will close. This action causes the stepping relay, K_2, to take half a step. Approximately 5 seconds later, when the key carrier returns, K_1 opens and the stepping relay, K_2, takes another half step and the arm locks on contact No. 1. This lights the warning light, I_3.

In about 5 seconds the key carrier disappears again, and K_2 takes another half step. The carrier returns in 5 seconds, the arm of K_2 locks on contact No. 2, and the bell rings, sounding the alarm.

There are several cases of "false" alarms that must be considered. For example, there can be a single momentary carrier interruption. This will start the process as above, but as the arm of K_2 moves to contact No. 1, the time-delay relay, K_3, is energized through T'_2. The warning light,

(Continued on page 106)

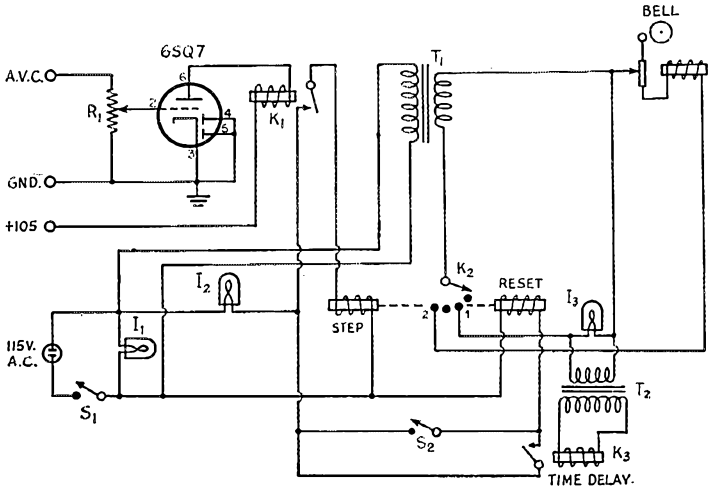


Fig. 1 — Circuit diagram of the "Conelrad" auto-alarm unit.

R_1 — 0.2-megohm.
I_1 — 115-volt 7½-watt lamp.
I_2 — 115-volt 150-watt lamp.
I_3 — 6.3-volt pilot lamp.
K_1 — S.p.s.t. sensitive relay, 1-ma. pull-in or less.
K_2 — Frame step-up relay, 30-volt coils (made by United Mfg. Co., Chicago — available secondhand through most game-machine operators in larger cities).
K_3 — Clock-driven time-delay relay (Cramer 59K48748).
S_1 — Toggle switch.
S_2 — Momentary push.
T_1, T_2 — 6.3-volt 2-amp. filament transformer. Bell is ordinary 6- to 10-volt doorbell.

* Chief Transmitter Technician WLW-A, Atlanta, Ga.
[1] *QST*, April, 1953, page 9.

The "Hot-Rod" Mobile Antenna

Adjustable Frequency with Low Losses

BY A. P. DINSMORE,* W8AUN

SEVERAL good articles have described high-Q loading coils for 75-meter mobile antennas and have given all the theory on why high Q improves the efficiency of the antenna. In spite of this, some hams seem to prefer long, low-Q coils on lossy forms and will not fuss and fool around with improvements. Perhaps one reason for this is that, even with their low-Q coils, they already know how futile it is to try to QSY more than a few kilocycles from the antenna's resonant frequency.

During the past couple of summers I have found out what kind of results you can get with extremely high Q (400–500), and why the theory says you should radiate your power in the form of radio waves instead of dissipating most of it in the form of heat. (Feel your coil after a long transmission.) But it is not the purpose of this article to try again to sell you on the virtues of high Q. Instead, here is an idea for quick, easy retuning with a range wide enough to let you operate anywhere you choose in the 75-meter band, regardless of Q. It is a simple gimmick, and it really works.

The device amounts to an adjustable hat, and as such adds to the capacitance of the top section, reduces the amount of inductance required and increases the current flowing in the antenna. A tunable hat is to a fixed-tuned mobile antenna what a VFO is to a crystal transmitter. And whether you enjoy the advantages of high Q or not, the inconvenience of stopping the car for ten seconds to retune your antenna is more than compensated for by the satisfaction that you can operate anywhere in the band. You can easily do it while the other guy is calling CQ.

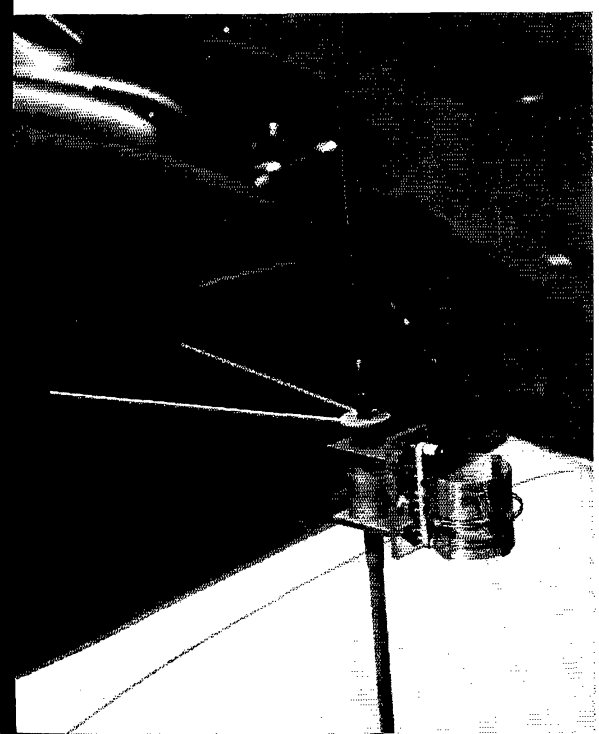
* 1123 West Hillcrest Ave., Dayton 6, Ohio.

• Quote from the author: "I call it the 'Hot-Rod' because two rods are attached to the 'hot' upper section of the antenna in such a way as to serve as an adjustable hat." Which is the story in a nutshell. It's easy to make, easy to set up, easy to use — and the low-loss construction puts more of the power into useful radiation.

How To Make It

If you have one of the common two-section center-loaded antennas, find or make two brass washers that will fit the threaded end of the upper section of your antenna. This will probably require a ⅜-inch hole in each washer. The outside diameter of the washers can be 1½ inch or so. Next, braze or silver-solder a ⅛-inch rod to the side of each washer out near the edge and extending radially. The rods should be at least 15 inches long and should preferably be of steel for durability.

Turn the smooth sides of the washers together and install them under the top section of your antenna above the coil. Set the two rods together, straight and so close to each other that the antenna will think there is only one rod there.



The "Hot-Rod" installed on W8AUN's car. The rods are kept over the car body to avoid personal damage, while the coil is kept clear of the rods and the antenna itself to reduce losses. The high-Q coil in this antenna is a standard B & W plug-in transmitting type, turns taken off as necessary to resonate; the link just goes along for the ride. This view shows the 75-meter coil in place.

Now, adjust the system to resonate at the high-frequency end of the band, or as high as you will ever want to operate. (A grid-dip meter

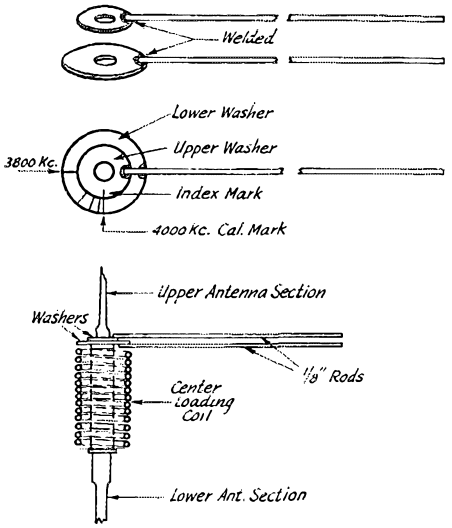


Fig. 1 — Details of rod construction. Dimensions can be varied to suit the whip diameter and the builder's convenience. Adjustment of rod lengths is described in the text.

for this job is such a big help that if you don't have one you had better stop right now and go beg, borrow or steal one.) With the transmission line connected and everything intact, you will undoubtedly find the resonant frequency too low. You have to get rid of some of that coil. Then, when you get close you have your choice: either prune the rods or prune the coil. But remember, you will probably be sorry if you trim those rods shorter than a foot or so. Don't be afraid to take those nasty, power-consuming turns off your coil. The chances are the more you take off the higher the Q will go, and believe me, that's good. When you have the antenna resonated at 4000 kc., for example, make an index mark on the edge of the top washer, and an adjacent calibration mark on the edge of the lower washer.

Now, here comes the magic. Loosen the upper antenna section and rotate the washers a little so as to separate the rods and produce an angle between them. Presto, the second dimension appears and we have a "surface" like a triangular piece of sheet metal between the rods. The resulting increased capacitance brings the resonant frequency down. The larger the angle the lower the frequency. With the aid of the grid-dip meter, calibration marks can be made on the edge of the lower washer for the 25-kc. points, for example, or for your crystal frequencies. Of course, the apparent "surface" increases very rapidly at first as the angle is increased, and then more slowly as calibration proceeds around to the minimum frequency point, which occurs with the rods at about 90 degrees to each other. Thus the calibration marks will be all "squinched" up at the high-frequency end.

If you desire, you can make the rods shorter to allow a narrow range of adjustment that is less critical. However, if you travel around the country you will find it desirable, if not necessary, to work the whole band. Electrically, it does not seem to matter very much which way you aim the rods, but if you are a high-Q man with your coil out away from the mast, you will not let the rods interfere with the field of the coil. Another consideration is that the height is just about eye-level on big guys, and so, whether you are tall or short, it may be healthier for you to turn the rods over the car body and out of the way.

I might add that I cupped the washers just a trifle so as to make the edges meet first and

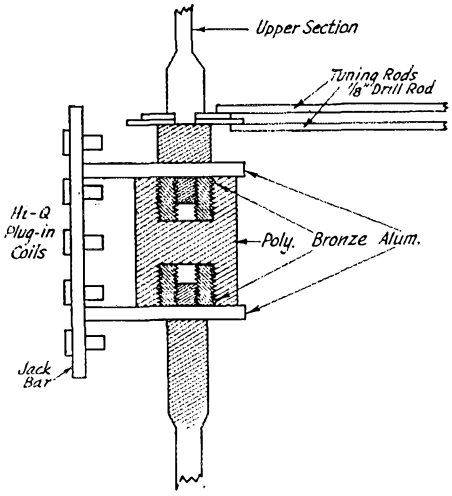


Fig. 2 — Construction details of the mounting for the rods and plug-in coil.

then clamp together with a springy action. I also had the whole works cadmium plated. Plating makes it pretty as well as protecting it from corrosion. The hardware we hang on the bumpers of our cars attracts enough attention and too much criticism even at best. If you can make it pretty and kid 'em into believing you bought it at a store, at least they'll think you're not the only one who's crazy!

QuistQuiz

Our man **A** is in a quandary. He has a commercial transmitter with a 4D32 in the final, modulated by Class AB_1 807s, but he has the urge for more power on 'phone. One way to get more power, he reasons, is to use the AB_1 807s to screen-modulate an old push-pull 4-250A rig he has. His friend **B** claims that would be a waste of time, that he should go whole-hog and plate-modulate the 4-250As with a 500-watt modulator **B** just happens to have for sale. What should **A** do?

(Please turn to page 126 for the answer)

"De Luxe" Keying Without Relays

An Improved Keyed-Amplifier Break-In System

BY T. H. PUCKETT,* W2JXM

• Here is a keying system that should enjoy widespread popularity. It permits amplifier keying (generally acknowledged to be the only truly chirp-free method) to be combined with excellent break-in operation, *without* the use of relays. If you have ever paid the slightest bit of attention to the keying characteristics of your rig, this is "must" reading for you.

THERE seems to be no question that grid-block keying allows the easiest and most effective control of a transmitter's keying characteristics. However, when it is desired to key the oscillator simultaneously, so that break-in may be used, difficulties arise. These difficulties are usually resolved by the use of a relay, as shown on page 239 of the 1953 *Handbook*.[1] The author has never found relays very satisfactory for this purpose. Noise, slow action and contact bounce are usually present in the best available relays. The following circuit was therefore developed to allow both grid-block and oscillator keying at the same time, without relays. The grid-block keying is applied to a keyer tube in the cathode circuit of an r.f. amplifier stage.

The basic method of operation is as described in the *Handbook* article. When the key is closed, the oscillator starts very quickly, and the resultant click is gone by the time the grid block keyed stages passes any appreciable signal. When the key is opened, the inverse action takes place, with the oscillator staying on until the grid-blocked stage is turned off.

The basic circuit is shown in Fig. 1. R_1, R_2, C_1 and the 6BL7 comprise a standard vacuum tube keying circuit. The oscillator is a series-tuned Colpitts, using a 6CL6, with the variation from the conventional circuit that the grid leak, R_3, is not returned directly to ground. The unusual section of the circuit is the 12AU7 control tube, which turns the oscillator on and off by changing the bias applied to the oscillator grid. This section may be described as a grounded-grid amplifier stage with a cathode-follower input, driven far into the nonlinear region. This is a case where nonlinear operation of an amplifier is absolutely necessary for correct functioning of the circuit. Also, the term "amplifier" may be misleading, as the "output" swing is considerably less than the "input" swing.

The operation of the circuit is as follows: Initially, after the key has been open for a considerable period of time, point B will be at −75 volts, cutting the 6BL7 keyer tube off. Also, only a very small current flows in the right half of the 12AU7 control tube because of the large value of cathode resistance. The bias on the left half of the 12AU7 is adjusted by R_4 so that a sufficiently large negative potential appears at point C to cut the oscillator off.

When the key is closed, point A immediately goes to ground potential, and the cathodes of the 12AU7 control tube will be pulled to about +5 volts by the cathode follower action of the right

* Electronics Research Laboratory, Columbia University Engineering Center, 632 West 125th St., New York 27, N. Y.

[1] Also, Goodman, "Improved Break-in Keying," *QST*, March, 1948.

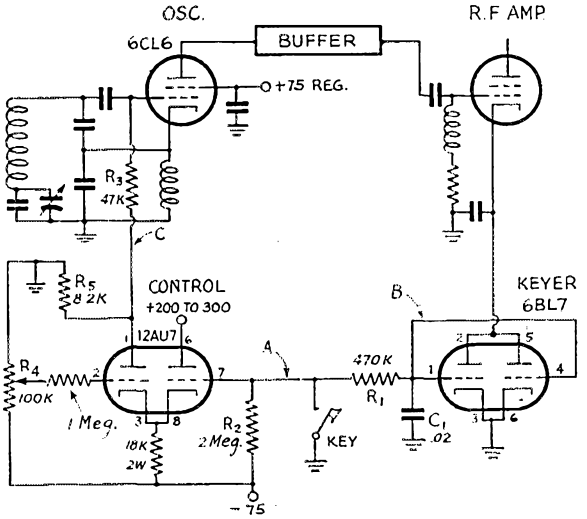


Fig. 1 — Circuit diagram of the break-in keying circuit.

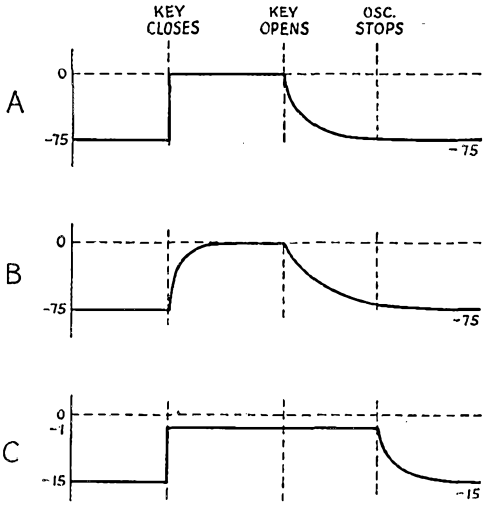


Fig. 2 — Voltage waveforms corresponding to points *A*, *B* and *C* in Fig. 1. The keyed output characteristic corresponds closely to *B*.

half. This puts the grid of the left half at a large negative potential, so the left-hand section will be cut off, and its plate potential will go to ground. This will remove the negative bias from the oscillator grid, and allow the oscillations to start. All of the above actions happen very quickly, so that the oscillator click will be over by the time the 6BL7 keyer allows much signal through the keyed stage. (Point *C* does not actually go to ground potential because the oscillator grid current flows through R_5.)

When the key is opened, points *A* and *B* will have approximately the same potential, and will start falling toward −75 volts in an exponential fashion, cutting off the 6BL7. At some time after the 6BL7 is pretty well cut off, the voltage will have fallen far enough that the left half of the 12AU7 will start conducting, biasing the oscillator grid negative and stopping the oscillations. The oscillator will have a chirp when it turns off, but it will not appear in the output of the transmitter.

The adjustment of the circuit is quite simple. The 12AU7 control tube is removed from its socket, and the grid-block keying adjusted to the desired characteristics.[2] R_4 is then placed at its negative end, and the 12AU7 replaced and allowed to warm up. R_4 is then advanced toward its positive end until the voltage at point *C* is about −15 volts. The farther that R_4 is advanced, the quicker the oscillator will turn off after the key is opened. However, if it is advanced too far, the break keying characteristic may be clipped by the oscillator's turning off too soon. The setting of R_4 should have no noticeable effect on the make keying characteristic.

For the 6BL7 keyer tube, the −75 volts bias should be adequate for amplifier plate potentials up to about 600 volts. If both halves are used in parallel as shown, it may be regarded as about a 1000-ohm cathode resistor. The tube's total current should be limited to about 100 milliamperes.

The circuit as shown gives no receiver protection or muting. These are both usually necessary if very much power is used. It is hoped to present a companion unit at a later date that will accomplish these functions.

[2] With a fixed value of C_1, the value of R_1 controls the "make" characteristic, and the value of R_2 controls the "break." Increasing resistance softens the keying.—Ed.

Strays

Copies of the 1953 *Spanish* edition of ARRL's *Radio Amateur's Handbook* have just arrived from Buenos Aires, where for many years we have had arrangements to publish an authorized edition. The supply is limited and it goes quickly. A faithful version of the English edition, its price is $4.00 per copy, postpaid.

—•••—

WN7SWW protects his mike with a cast-off plastic bag of the type now used by many grocery concerns to protect vegetables. A rubber band keeps it snug at the bottom.

—•••—

W4CKB has nothing but admiration for W5CF's efforts in collecting 103 "ditto-call" QSLs as pictured on page 55 of July *QST*. But ensconced on the W4CKB shack wall is a QSL from *W2MMM/MM*. We'll probably hear more on the subject when the calls FF8FF and HHH8HH are issued. The latter's card will also read correctly upside down.

—•••—

Leo C. Young, W3WV, and Fred C. Schnell, W9UZ, old-time amateurs and still prominently active, talk things over at the scene of Naval Research Laboratory's 30th Anniversary Celebration held in Washington during July. In 1925, Mr. Young, operating NRL's station NKF, and Mr. Schnell (then ARRL Traffic Manager), operating high-frequency experimental station NRRL aboard the Navy's training-cruise flagship *USS Seattle*, collaborated in a successful series of global tests that pioneered long-distance short-wave communication.

During the celebration a station operated under the special call "W3WV/3 at NKF" and made 45 QSOs while handling 173 messages on several amateur bands. W3s MSU OPO QAC, W4s BRC and NTZ were among amateurs on the NRL staff who participated.

A Command Set Receiver for 6 and 10

BC-454, 175-Kc. I.F., and Crystal-Controlled Converters Make a Low-Cost Receiver for 3.5, 28 and 50 Mc.

BY CHARLES L. FAULKNER,* W6FPV

HERE is an easily-constructed receiver that can serve many purposes. It is tailor-made for civil defense applications. It offers good performance in the 3-6 Mc. range and doubles as a tunable i.f. for its own built-in converters for 50 and 28 Mc. It is light in weight and thus well adapted to portable work. The low cost will appeal to operators who already have a receiver for the lower frequencies but want something for use on 21 Mc. or higher. Crystal-controlled front ends for 28 and 50 Mc. are shown, but standard converter designs for other bands could be substituted or added readily.

The receiver is built around a BC-454 Command set that covers 3 to 6 Mc. If the builder wished to tune 40 instead of 80 with the receiver proper, a BC-455 could be substituted with only minor changes. The selectivity of these units leaves quite a bit to be desired for amateur work, so a second conversion to 175 kc. is added to give the high selectivity we usually want. Separate audio output controls on the two second detectors allow selection of the desired degree of selectivity by turning up the proper control. The relatively broad response of the Command set may be useful in tuning the v.h.f. bands casually, or in spot-frequency c.d. work where stations are not lined up exactly on the net frequency. A semisquelch system is added to make life easier for operators and other personnel in a c.d. station where a net frequency must be monitored continuously. Noise limiters are included in each channel, and the a.v.c. is switched with the volume controls.

Much of the most difficult part of receiver construction is done for you by the builder of the Command set, and only minor modifications of it are required. Alignment of the complete set-up calls for no special equipment and no particular skill with receivers is necessary. Total cost is far below what you'd have to spend to buy or build anything of comparable performance in a complete receiver.

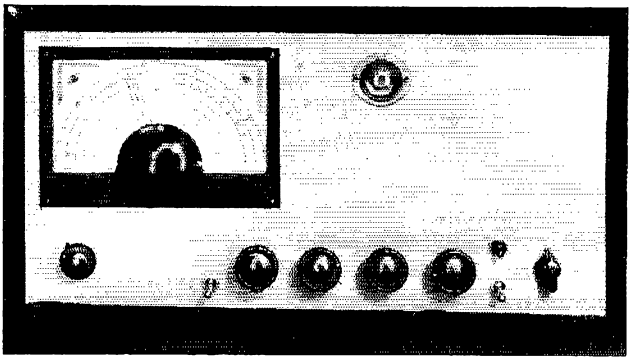
* 8804 Cedros, Van Nuys, Calif.

• Anyone who has used crystal-controlled converters at 28 Mc. and higher is unlikely to settle for less in the way of stability and performance. Few commercial receivers have enough bandspread in the region normally used as the i.f. for v.h.f. converters, however, and with prices being what they are, a good receiver is a costly i.f. system. Here W6FPV adapts the inexpensive BC-454 to serve as a tunable i.f., adding a second conversion for high selectivity where needed. Coverage of the 80-meter band, plus as many higher bands as you want to build converters for, is thus provided at low cost. The tuning rate and bandspread are ideal for the purpose.

Modifying the Command Set

The first step in the preparation of the BC-454 for its new rôle is to dismantle the shielding. Remove the antenna post on the front of the set, and the dynamotor mounting. Next, remove the control socket from the rear and replace it with an 8-pin power fitting. Enlargement of the cut-out will be necessary here. Remove the neon bulb from the input circuit. Remove the output transformer. If you wish to add the 175-kc. i.f. channel, remove the beat oscillator transformer. This will be used for the conversion oscillator tuned circuit shown at the left of the main schematic, Fig. 2.

Now we come to the actual wiring changes, to convert the BC-454 as shown in Fig. 1. The tube heater circuits are wired in series-parallel for 24-volt operation. This must be changed to straight



An effective low-cost receiver for 80, 10 and 6 is provided by a BC-454 Command receiver, a high-selectivity i.f. system, and two crystal-controlled converters. Parts can be arranged to suit one's operating preferences, but W6FPV has his arranged so that the knobs, *l. to r.*, are the bandswitch, stand-by, i.f. gain, audio gain (2 controls) and beat oscillator pitch control. The toggle switches are at the right turn on the power and b.f.o. The one at the left is for the noise squelch.

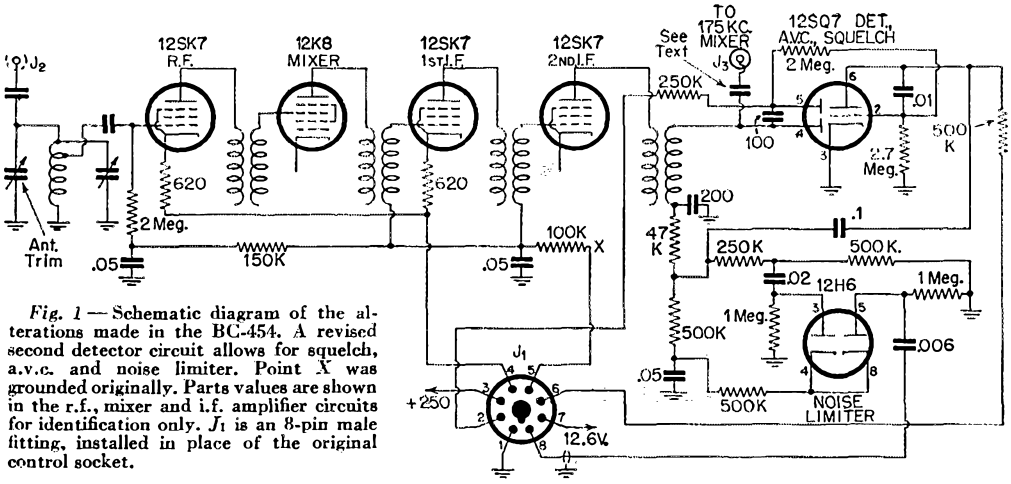


Fig. 1 — Schematic diagram of the alterations made in the BC-454. A revised second detector circuit allows for squelch, a.v.c. and noise limiter. Point *X* was grounded originally. Parts values are shown in the r.f., mixer and i.f. amplifier circuits for identification only. J_1 is an 8-pin male fitting, installed in place of the original control socket.

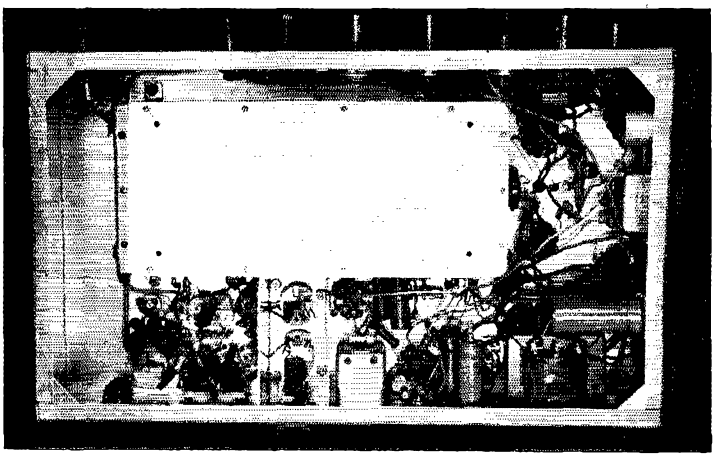
parallel hook-up for 12-volt operation. Next, the socket originally used for the 12A6 audio stage is rewired to take a 12H6 noise limiter. The second detector-a.v.c. stage, formerly using a 12SR7, is changed so that the triode section operates a semisquelch circuit, adapted from that described in February, 1952, *QST*, page 71. A 12SQ7 is substituted, the high-μ triode section being needed for the squelch circuit.

To apply a.v.c., the 0.1-megohm resistor in the upper right-hand terminal strip (point *X* in Fig. 1) is unsoldered from its ground connection, and a wire is run from it to Pin 5 on the power fitting. This will allow us to switch the a.v.c. line to whichever i.f. channel we are using. If you don't intend to build the 175-kc. stage, run the wire from Pin 5 to the 0.25-megohm resistor on the diode plate pin (also Pin 5) on the 12SQ7 socket. The audio line to Pin 8 on the power fitting should be shielded.

Driving the tuning condenser through a vernier dial results in a nice tuning rate and adequate spread for the v.h.f. bands. To use the National ACN dial the tuning condenser must be freed from the worm gear by drilling out the pin. Do not try to pound the pin out unless it is loose, as this might damage the condenser. The large gear may be left on the shaft, as it does not interfere and enough shaft protrudes so that a flexible coupling may be attached. Holes are cut in the sides of both shields opposite the condenser shaft to allow for the flexible coupling and shaft to the ACN dial.

The 11-$\mu\mu$fd. ceramic condenser from the antenna post is now mounted below the deck on the antenna trimmer condenser. The antenna socket, J_2 in Fig. 1, is a small phono-type jack mounted on the side of the BC-454 case. It is visible in the upper left portion of the open bottom view. We found it necessary to add capacitance to the input circuit to restore resonance. This was done with a small mica trimmer, also visible in the bottom view. The additional capacitance was not required in a second model, however, so this component may not be necessary.

Take-off for the 175-kc. channel is by means of a similar jack mounted on the side of the BC-454 that will be toward the rear of the main chassis. Coupling is made with hook-up wires twisted together for about an inch, as indicated on Fig. 1. It is best to twist about two inches of the wires together, and then trim off the ends a



Bottom view of the receiver, showing how the components are laid out around the BC-454. The converters are at the lower left.

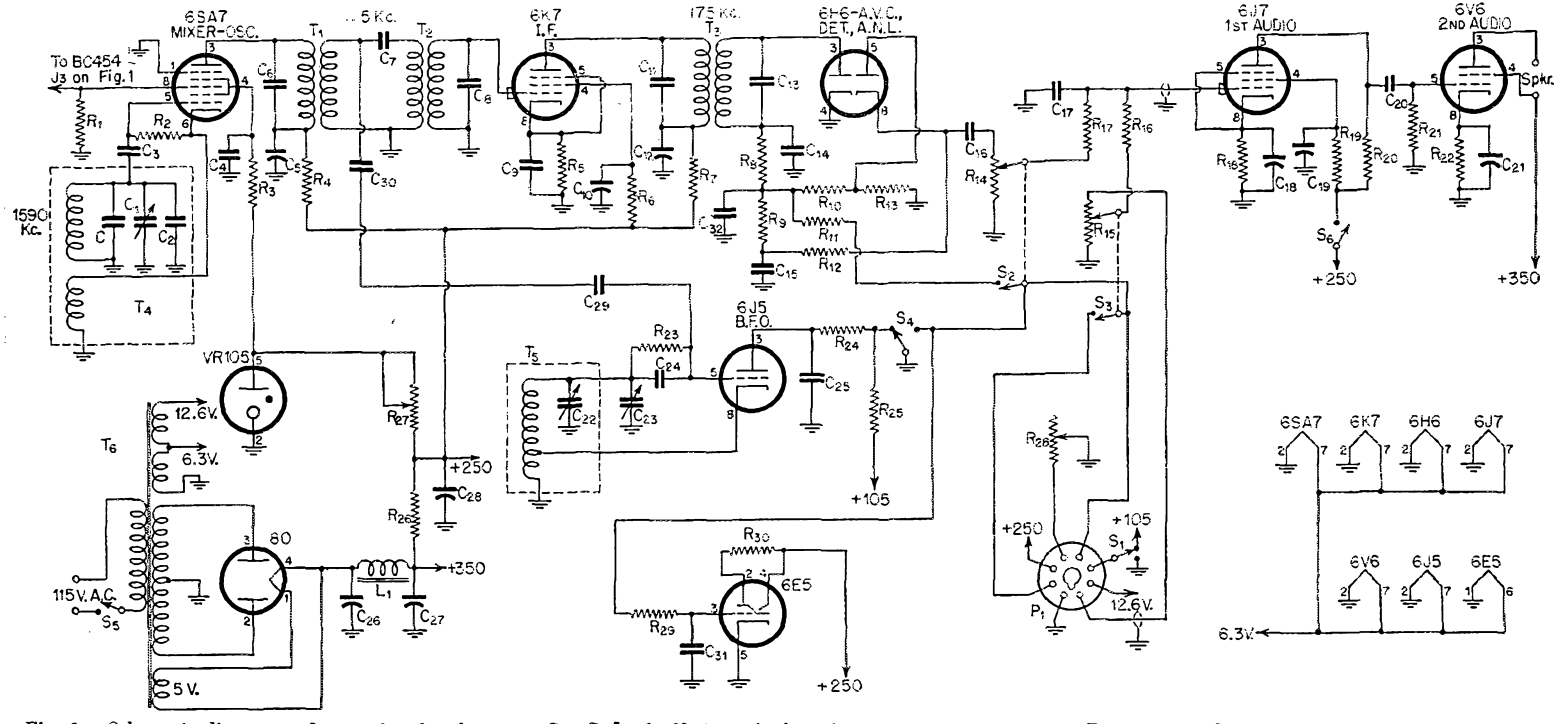


Fig. 2 — Schematic diagram and parts list for the 175-kc. i.f. channel, power supply and audio system used with the BC-454 Command set.

C, C_1 — Part of BC-454 b.f.o. unit.
C_2, C_3, C_{17}, C_{32} — 100-$\mu\mu$fd. ceramic.
C_4, C_{15}, C_{20}, C_{25}, C_{31} — 0.01-μfd. ceramic or tubular.
C_5, C_9, C_{10}, C_{12}, C_{19} — 0.1-μfd. tubular.
C_6 — Part of T_1.
C_7, C_{29} — 10-$\mu\mu$fd. ceramic.
C_8 — Part of T_2.
C_{11}, C_{13} — Part of T_3.
C_{14}, C_{24} — 250-$\mu\mu$fd. ceramic.
C_{16} — 0.001-μfd. ceramic or mica.
C_{18}, C_{21} — 10-μfd. 25-volt electrolytic.
C_{22} — Part of T_5.
C_{23} — 10-$\mu\mu$fd. shaft-type trimmer.
C_{26} — 20-μfd. 450-volt electrolytic.
C_{27}, C_{28} — 8-μfd. 450-volt electrolytic.
C_{30} — Ends of wires twisted to form capacitance.
R_1, R_{16}, R_{17}, R_{19} — 0.5 megohm.
R_2 — 22,000 ohms.
R_3, R_6, R_{20} — 0.1 megohm.
R_4, R_7 — 1000 ohms.
R_5 — 220 ohms.
R_8, R_{23} — 50,000 ohms.
R_9, R_{11}, R_{30} — 1 megohm.
R_{10}, R_{18}, R_{21}, R_{29} — 0.27 megohm.
R_{12} — 0.82 megohm.
R_{14}, R_{15} — 1-megohm potentiometer.
R_{18}, R_{22} — 470 ohms, 1 watt.
R_{24} — 5000 ohms.
R_{25} — 50,000 ohms, 2 watts.
R_{26} — 1000 ohms, 25 watts.
R_{27} — 5000-ohm 20-watt variable.
R_{28} — 10,000-ohm potentiometer.
L_1 — 10-hy. 120-ma. filter choke.
J_1 — 8-pin male chassis fitting.
J_2, J_3 — Phono-type jack.
P_1 — 8-pin socket on power cable.
S_1, S_4 — S.p.d.t toggle switch.
S_2, S_3 — Switch on audio gain control.
S_5, S_6 — S.p.s.t. toggle switch.
T_1 — 175-kc. input i.f. transformer.
T_2 — 175-kc. interstage i.f. transformer.
T_3 — 175-kc. diode i.f. transformer.
T_4 — BC-454 b.f.o. circuit altered as per text.
T_5 — 175-kc. b.f.o. unit.
T_6 — Power transformer with heater winding for 12.6 volts a.c. at 2.5 amp., or two 6.3-volt 2.5-amp. windings in series, and at least 300 volts d.c. at 120 ma.

short length at a time, until strong signals no longer block the 175-kc. channel.

The main chassis is aluminum, 3 by 10 by 17 inches in size. A hole is cut to permit submounting the BC-454 to bring the ACN dial to comfortable height. The cut-out is 1 5/16 inches from the front edge of the chassis, and 2 inches in from the left side. Save the material cut away to use for the two shields around the converter r.f. coils. Two metal angles were mounted on the sides of the BC-454 at the tuning condenser end, and two bolts were mounted through the rear shelf and through the main chassis. Spacer nuts on these bolts hold the unit in the proper position and assure a solid mounting.

We installed and tested the power supply and audio system before working on the 175-kc. channel. A power transformer already on hand had 6.3- and 2.5-volt filament windings. These were connected in series and used on the 12-volt heaters. Though the resultant voltage was more than 3 volts below the nominal value for these 12-volt tubes, it worked fine. A transformer with a 12-volt winding, or two 6-volt windings, would be preferable, but it was not necessary in this case. Another alternative, of course, would be to substitute 6-volt tubes in the BC-454. We like to have plenty of audio gain available, so we used a 6J7 first audio and a 6J5 output. For more power output, a 6V6 or similar tube could be substituted for the 6J5, as shown in the schematic.

The High-Selectivity Channel

After the power and audio equipment were installed and working we started on the 175-kc. channel. Two 175-kc. transformers were on hand, but it was necessary to purchase a new one for the input. This explains the difference in size of the i.f. units visible in the top-view photograph.

The beat oscillator transformer from the BC-454 is altered for use in the 6SA7 mixer circuit for the conversion to 175 kc. The connections are as follows: The outside wire of the large coil goes to the grid condenser; the inside wires of both coils to ground. The outside wire of the small winding goes to the 6SA7 cathode. The large coil is padded with an additional 100-$\mu\mu$fd. fixed condenser and tuned to 1240 kc. by monitoring its signal in a broadcast receiver. Note that the condensers already in the transformer are left in the circuit. If the tube fails to oscillate, reverse the small coil.

The selectivity of the 175-kc. channel is high enough to make 'phone signals sound bass, so we compensated to some extent by using a 0.001-μfd. coupling condenser out of the second detector. The 175-kc. channel is lined up easily on receiver noise, and with the aid of the tuning-eye tube. As explained earlier, both i.f. systems are left connected to the common audio stages, and either is selected by turning up the appropriate volume control. Trouble with birdies resulting from harmonics of the 6SA7 oscillator falling in the ranges covered by the converters is prevented by keeping the screen voltage on the 6SA7 low.

The Crystal-Controlled Converters

If care is used in laying out the parts, room for two converters is left at the rear of the BC-454. At least one more could be mounted alongside at the left. We already had a good 2-meter converter, so did not build one into this receiver. The converters shown cover the 28-Mc. band and the lower 3 Mc. of the 50-Mc. band. The tuning range of the BC-454 is not enough to allow complete coverage of the v.h.f. bands with a single crystal for each range, but it can be done with two crystals if we want to explore the top megacycle. The two RACES segments in each of the bands can be covered with a single crystal for each band, as in no case do these segments spread over as much as three megacycles per band.

Many crystal-controlled converter designs have been published, so the builder can take his choice. We prefer the cascode circuit for 50 Mc., but did not use it in the 28-Mc. converter as the antenna noise on that band is so great that little is to be gained through the employment of low-noise front-end technique. Band changing is simplicity itself. Both converters are left connected, and the heater voltage is applied to the desired converter

Close-up of the converter corner of the Command set receiver. Note the two r.f. input circuits of the converters mounted between the shielding partitions near the middle of the photograph. The bottom cover of the BC-454 has been removed here to show the revised input circuit, upper left.

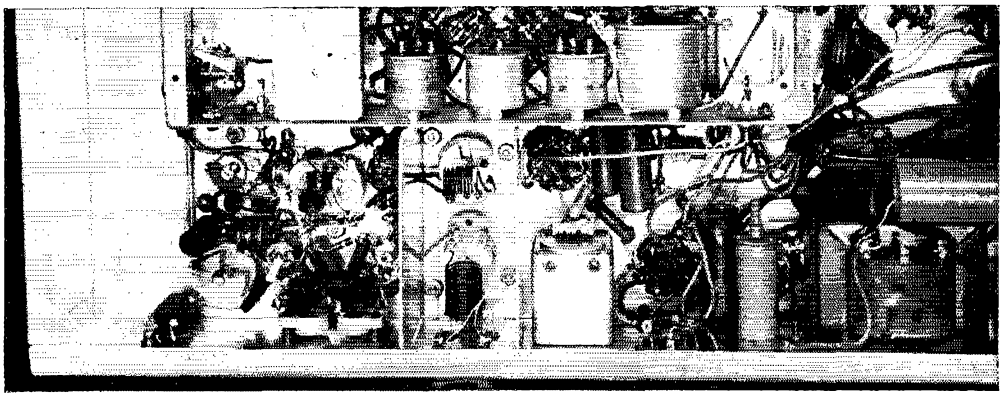


Fig. 3 — Schematic diagrams of the converters for 28 and 50 Mc. built into the Command set receiver.

Coil Data

28 Mc.:

L_1 — 10 t. No. 30 d.c.c. interwound in cold end of L_2.

L_2 — 13 t. No. 20 enam., $\frac{5}{8}$-inch diam., spaced $\frac{1}{2}$ diam. of wire.

L_3, L_4 — 19 t. No. 26 enam., $\frac{3}{8}$-inch diam., $\frac{1}{2}$ inch long.

L_5 — 22 t. No. 20 enam., $\frac{3}{8}$-inch diam., tapped at 4 turns from grid end.

50 Mc.:

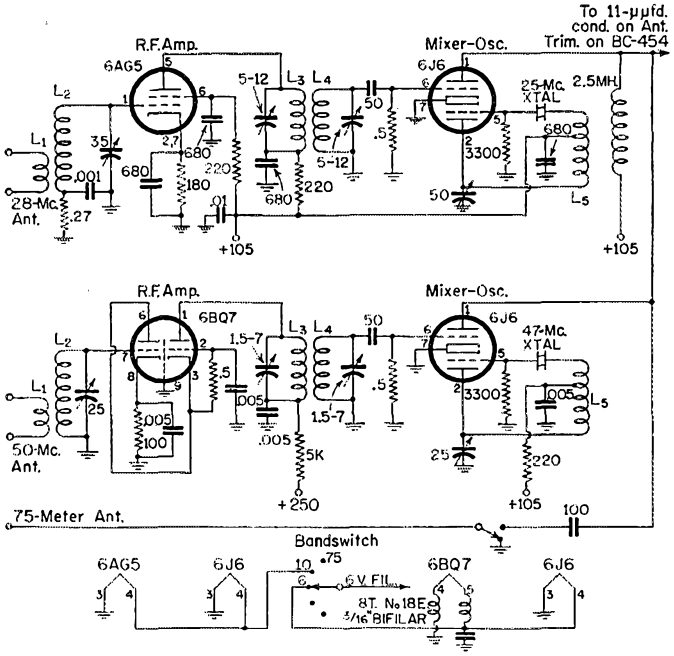
L_1 — 5 t. No. 30 d.c.c. at cold end of L_2.

L_2 — 9 t. No. 20 enam. $\frac{3}{8}$-inch diam., spaced $\frac{1}{2}$ diam. of wire.

L_3 — 10 t. No. 26 enam., $\frac{3}{8}$-inch diam.

L_4 — 8 t. No. 26 enam., $\frac{3}{8}$-inch diam.

L_5 — 9 t. No. 20 enam., tapped at 2 turns from grid end.



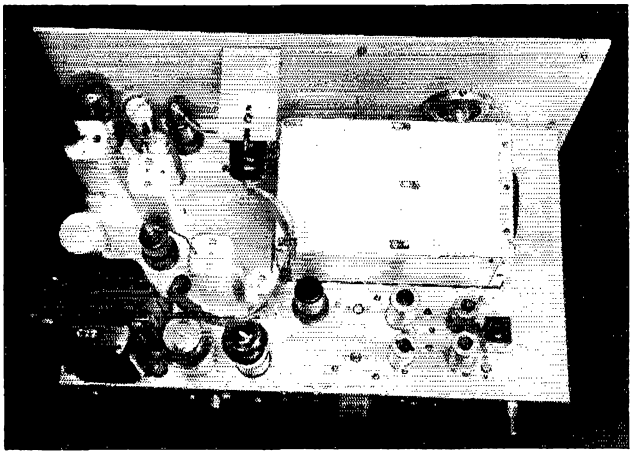
by means of a front-panel switch. If changes between bands are to be made rapidly, the builder may prefer to switch the B-plus and leave the heaters of both converters running. Note that separate antenna inputs are provided for all ranges, with a toggle switch to short the low-frequency antenna to ground to prevent pick-up of signals when the BC-454 is used as a tunable i.f. system.

The general arrangement of the converter parts is visible in the photographs, and the diagrams are shown in Fig. 3. Note that double-tuned bandpass coupling circuits are used between the r.f. and mixer stages in both converters. These help to reject signals that might otherwise come through on the intermediate frequency, and by stagger-tuning the coupling circuits fairly flat response is obtained across the bands.

The r.f. coils and their associated trimmers are mounted between two aluminum shields cut from the piece of metal removed from the main chassis. The ceramic trimmers for the coupling circuits of the 10-meter converter are mounted on the rear wall of the chassis. A dual ceramic trimmer mounted under the chassis tunes the 6-meter coupling circuits. After the bandpass coils are adjusted they are coated with coil dope. The 0.01-μfd. capacitor at the common point of the plate decoupling resistors was put in to cut out a trace of harmonic from the 1240-kc. oscillator.

The crystal in the 10-meter converter is marked 8125 kc. It works on its third overtone, about 24,375 kc. The 6-meter converter crystal is ground for 9350.6 kc. and it oscillates on its fifth overtone. Another crystal marked 28,080 kc., a third-overtone type, is made to oscillate on its

(Continued on page 106)



Top rear view of the Command set receiver. Power supply and 175-kc. i.f. components are at the left. Two crystal-controlled converters are built along the back of the chassis.

A Multiband Circuit for the Emergency-Powered Rig

VFO or Crystal — 'Phone or C.W. — 160 Through 6

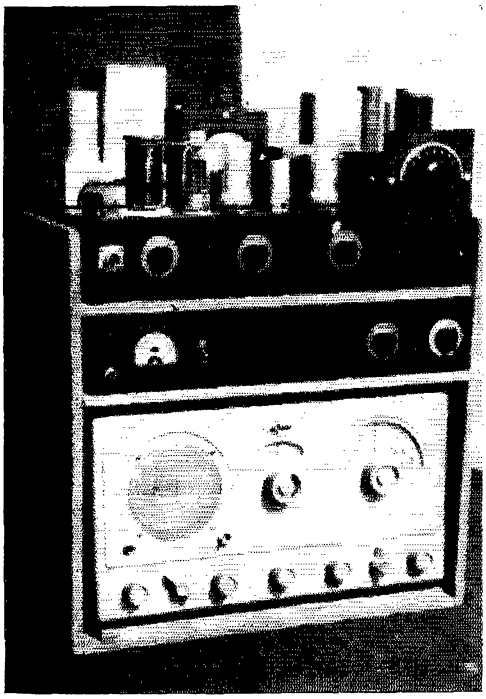
BY J. S. REDDIE,* W7FVI

• Circuits and tube line-ups that can feasibly be operated from vibrator-type emergency supply are of especial interest for civilian defense and other uses in the field away from power lines. Here is one circuit that has been given a good workout. It covers all bands from 1.8 to 50 Mc., has provision for VFO or crystal-control, 'phone or c.w. It has a carrier output of 10 watts and draws about 10 amperes from a 6-volt storage battery.

ACTIVITIES such as Field Day, civilian defense and other forms of mobile and portable work are at an all-time high. A rig that can be operated in the absence of a.c. power lines is fast becoming a regular part of auxiliary ham-station equipment. The design of a transmitter for this sort of service is considerably more of a problem than in the case of the usual installation backed up by the virtually limitless capacity of commercial power lines. Careful consideration must be given toward reducing to a minimum any power input that does not contribute directly to power output, if reasonable service is to be obtained from that most-available source of independent power — the 6-volt car storage battery. Remember, every milliampere at 300 volts becomes about 80 at 6 volts!

The circuit shown in Fig. 1 has been used in a rig that draws a total of approximately 10 amperes at 6 volts. The transmitter along with a simpler type of communications receiver is shown in the photograph. Constructional details will not be given, since the mechanical design naturally will depend upon the particular type of service in which the unit is to be used. The circuit is one that can readily be adapted to a variety of layouts.

* P.O. Box 391, Richland, Wash.



A complete station operating from emergency supply, using the transmitter circuit shown in Fig. 1. While the general construction may be varied to suit requirements, it is preferable that the oscillator be built as a unit that may be shock-mounted against mechanical vibration. In areas where TVI is a consideration, the use of shielding and power-lead filtering as described in the ARRL *Handbook* is recommended.

Both crystal control and VFO are available. When the crystal is removed and the unit composed of C_1, C_2, C_3 and L_1 plugged in, the circuit is converted from a grid-plate crystal circuit to the Clapp-type VFO circuit. By proper selection of coils for each stage, all bands from 160 to 6 can be covered.

As the coil table shows, the VFO operates at 1.8 Mc. for 1.8-Mc. output, and at 3.5 Mc. for all other bands, except 6 meters. On 1.8 and 3.5 Mc., a 2.5-mh. r.f. choke is plugged in at L_2 and, for the 1.8-Mc. band, a 44-μh. choke is used at L_3. The VFO works at 6.25 Mc. for 50-Mc. output. The screen and plate voltages for the oscillator are regulated by the 0A2.

The second stage is operated as a straight-through amplifier on 160 and 80, as a tripler to 15, and as a doubler on the remaining bands. A 2E26 is used in the output stage, operating as a doubler for output at 10 and 6 meters.

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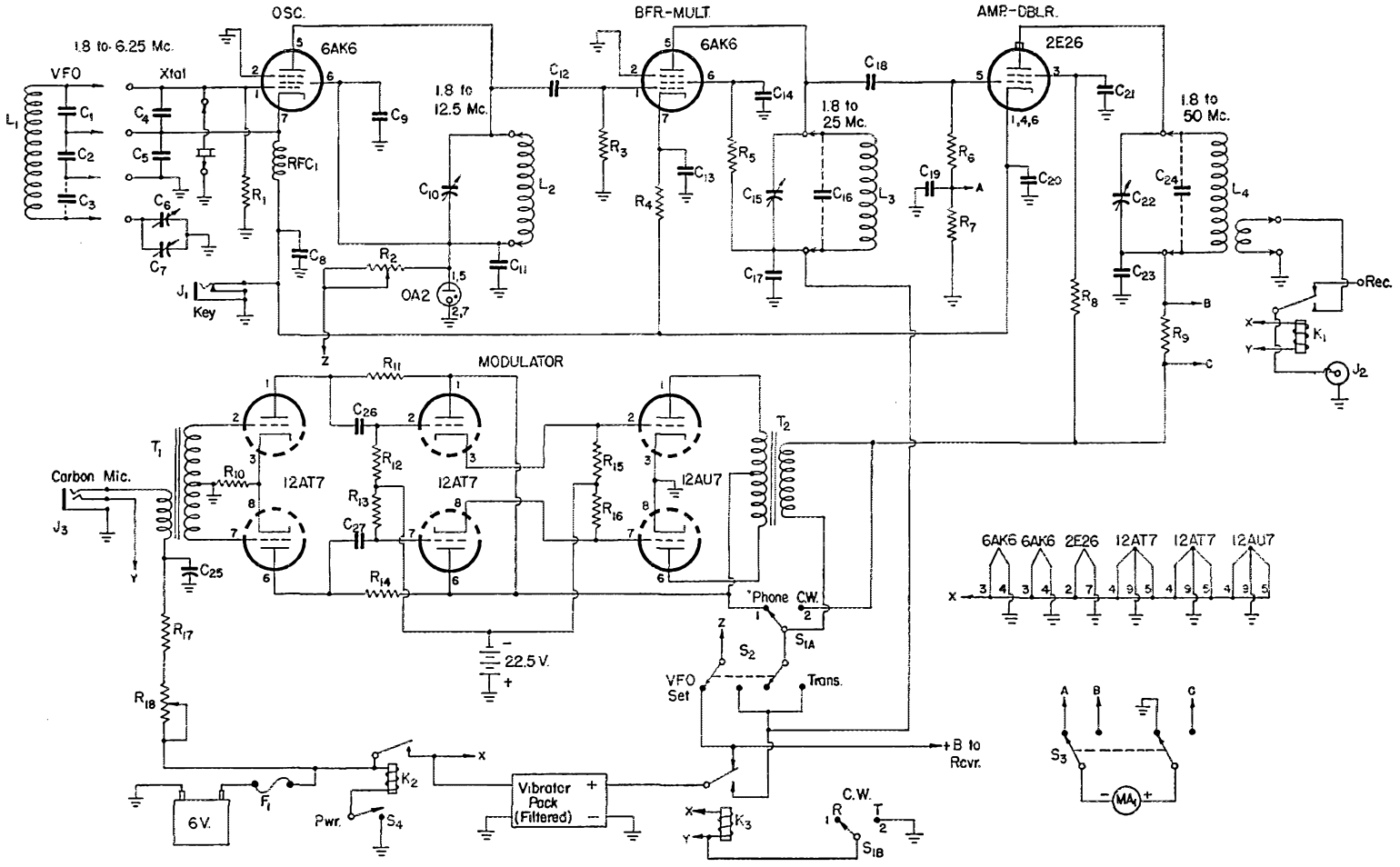


Fig. 1 — A transmitter circuit suitable for use with a vibrator-pack power supply, covering all bands from 160 to 6.

C_1, C_2 — 1.8 Mc. — 250-$\mu\mu$fd. silvered mica.
— 3.5 & 6.25 Mc. — 470-$\mu\mu$fd. silvered mica.
C_3 — 1.8 Mc. — 47-$\mu\mu$fd. silvered mica.
— 3.5 & 6.25 Mc. — None.
C_4 — 15-$\mu\mu$fd. silvered mica.
C_5 — 47-$\mu\mu$fd. silvered mica.
C_6 — 100-$\mu\mu$fd. variable (Hammarlund HF-100).
C_7 — 35-$\mu\mu$fd. variable (Hammarlund HF-35).
C_8, C_9, C_{11}, C_{13}, C_{14}, C_{17}, C_{19}, C_{20}, C_{21}, C_{23}, C_{26}, C_{27} — 0.001-μfd. disk.
C_{10}, C_{15}, C_{22} — 50-$\mu\mu$fd. midget variable.
C_{12}, C_{18} — 100-$\mu\mu$fd. mica.
C_{16} — 1.8 Mc. — 100-$\mu\mu$fd. mica; other bands none.
C_{24} — 1.8 Mc. — 75-$\mu\mu$fd. mica; other bands none.
C_{25} — 500-μfd. 15-volt electrolytic.
R_1 — 47,000 ohms, ½ watt.
R_2 — 10,000 ohms, 25 watts.
R_3 — 27,000 ohms, ½ watt.
R_4 — 1000 ohms, ½ watt.
R_5 — 15,000 ohms, 1 watt.
R_6 — 22,000 ohms, ½ watt.
R_7, R_9 — 100 ohms, ½ watt.
R_8 — 18,000 ohms, 2 watts.
R_{10} — 2200 ohms, ½ watt.
R_{11}, R_{14} — 0.1 megohm, ½ watt.
R_{12}, R_{13} — 0.47 megohm, ½ watt.
R_{15}, R_{16} — 10,000 ohms, ½ watt.
R_{17} — 47 ohms, ½ watt.
R_{18} — 250-ohm variable.
L_1, L_2, L_3, L_4 — See coil table.
F_1 — 20-amp. fuse.
J_1 — Closed-circuit key jack.
J_2 — Coax output connector.
J_3 — 3-way microphone jack.
K_1, K_3 — S.p.d.t. 6-volt relay.
K_2 — S.p.s.t. 6-volt relay, 15-amp. contacts.
MA_1 — 100-ma. d.c. milliammeter.
RFC_1 — 2.5-mh. r.f. choke.
S_1, S_2, S_3 — D.p.d.t. rotary switch.
S_4 — S.p.s.t. toggle switch.
T_1 — Single button to p.p. grids (Thordarson T-20A00).
T_2 — Modulation transformer (UTC S-18).

The plate-screen modulator and speech amplifier is push-pull in all stages. The Class B 12AU7 modulator is driven by a 12AT7 connected as a cathode follower, eliminating the need for a driver transformer. The input circuit is suitable for a single-button carbon microphone.

Control System

The control system is arranged so that a single 300-volt 100-ma. vibrator pack may be used for the receiver as well as the transmitter. A toggle switch, S_4, operates the relay, K_2, that turns on the vibrator pack and all heaters. When S_1 is thrown to the 'phone position, voltage is applied to the audio stages through S_{1A} and a push-to-talk switch at the microphone may be used to operate relays K_1 and K_3. K_3 switches the vibrator pack between the transmitter and receiver, while K_1 switches the antenna.

When S_1 is turned to the c.w. position, voltage is removed from the modulator, and the secondary of the modulation transformer is shorted through S_{1A}. The push-to-talk switch at the microphone is replaced by S_{1B} as the change-over switch. (This puts S_{1A} in the 'phone position while receiving but, since K_3 is open at this time, no voltage is applied to the modulator.)

S_2 is for setting the VFO to frequency. It applies voltage to the oscillator while the vibrator pack is connected to the receiver, but disconnects the remainder of the transmitter. Normal transmitter connections are made when S_2 is thrown to the transmitting side.

COIL DATA

1.8-Mc. Band	
L_1 — Coil No. 1 — 63 turns No. 24, 1½ inches diam., cw.[1]	(1.8 Mc.)
L_2 — Coil No. 2 — 2.5-mh. r.f. choke	(1.8 Mc.)
L_3 — Coil No. 3 — 44 μh. (Ohmite Z-14 r.f. choke)	(1.8 Mc.)
L_4 — Coil No. 4 — 58 turns No. 20, 1½ inches diam., cw.[3]	(1.8 Mc.)
3.5-Mc. Band	
L_1 — Coil No. 5 — 38 turns No. 18, 1½ inches diam., cw.[1]	(3.5 Mc.)
L_2 — Coil No. 2	(3.5 Mc.)
L_3 — Coil No. 6 — 115 turns No. 28, ½ inch diam., cw.[3]	(3.5 Mc.)
L_4 — Coil No. 7 — 40 turns No. 18, 1½ inches diam., cw.[3]	(3.5 Mc.)
7-Mc. Band	
L_1 — Coil No. 5	(3.5 Mc.)
L_2 — Coil No. 6	(3.5 Mc.)
L_3 — Coil No. 8 — 56 turns No. 24, ½ inch diam., cw.[3]	(7 Mc.)
L_4 — Coil No. 9 — 20 turns No. 18, 1½ inches diam., 1½ inches long[2]	(7 Mc.)
14-Mc. Band	
L_1 — Coil No. 5	(3.5 Mc.)
L_2 — Coil No. 8	(7 Mc.)
L_3 — Coil No. 10 — 19 turns No. 24, ½ inch diam., cw.[3]	(14 Mc.)
L_4 — Coil No. 11 — 12 turns No. 16, 1½ inches diam., 1½ inches long[2]	(14 Mc.)
21-Mc. Band	
L_1 — Coil No. 5	(3.5 Mc.)
L_2 — Coil No. 8	(7 Mc.)
L_3 — Coil No. 12 — 10 turns No. 18, ½ inch diam., cw.[3]	(21 Mc.)
L_4 — Coil No. 13 — 5 turns No. 16, 1½ inches diam., 1½ inches long[2]	(21 Mc.)
27/28-Mc. Band	
L_1 — Coil No. 5	(3.5 Mc.)
L_2 — Coil No. 8	(7 Mc.)
L_3 — Coil No. 10	(14 Mc.)
L_4 — Coil No. 13	(28 Mc.)
50-Mc. Band	
L_1 — Coil No. 14 — 19 turns No. 18, 1½ inches diam., 1½ inches long[1]	(6.25 Mc.)
L_2 — Coil No. 10	(12.5 Mc.)
L_3 — Coil No. 12	(25 Mc.)
L_4 — Coil No. 15 — 2½ turns No. 16, 1½ inches diam., 1 inch. long[2]	(50 Mc.)

Note: All close-wound (cw.) coils wound with enameled wire.
[1] Wound on National XR4 forms.
[2] Wound on ICA or Bud 1½-inch diam. forms.
[3] Wound on Millen 74002 forms.

For a period of nine months this rig was the only one in the shack. With a nominal 10 watts input to the final amplifier, considerable DX has been worked with an all-band antenna and it was found possible to dive into the middle of the QRM of the last Sweepstakes and make scores of contacts — 181 contacts in 45 sections. All reports, including 10 meters, have been T9 with both crystal and VFO. It has been a source of considerable satisfaction to be independent of the a.c. mains, knowing that all contacts in the log were made on emergency power.

Short Antennas for Mobile Operation

Loading the Whip for Low Frequencies

BY J. S. BELROSE,* VE3BLW

• Many of those who have 75-meter mobile installations do not understand that if all of the power output from a mobile transmitter could be fed to a short whip, almost 100 per cent of it would be radiated. The problem in getting power into the antenna is definitely one of eliminating losses in the system. In this article, VE3BLW discusses the various points in the antenna circuit where these losses are introduced and how they can be minimized.

SEVENTY-FIVE-METER mobile radio operation is becoming quite popular both in Canada and in the United States. Many types of antennas have been used, such as simple base-loaded whips, center-loaded whips, top-loaded whips having disks, metal balls, or spoked wheels, and folded antennas. Several articles have been published in *QST* [1, 2, 3] on low-frequency antennas for mobile use. However, the exact operation of a short vertical antenna is not too well understood by a good number of those using the antenna. I would like to try to explain clearly, on a mathematical basis, the operation and design considerations for a short antenna.

The fundamental frequency of a vertical radiator is the lowest frequency for which the reactance is zero at the customary feed point — between the lower end of the radiator and ground. At this frequency, the electrical length of the antenna is 90 degrees, or a quarter wavelength.

Vertical radiators which are short electrically have low radiation resistance and relatively high capacitive reactance. At frequencies near the operating frequency the antenna can be considered as being a lumped circuit which consists of a resistance and a capacitance in series, as shown in Fig. 1.

Here, R_a is the total antenna resistance, which includes principally the radiation resistance and

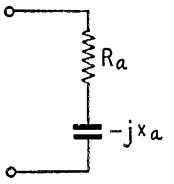


Fig. 1 — Equivalent circuit of a short vertical radiator.

the ground-loss resistance, and X_a is the capacitive reactance of the antenna at the operating frequency. It is clear that in order for this antenna to take power, the capacitive reactance of the antenna must be tuned out by a suitable inductor. The inductor introduces additional resistance, and the object in design is to obtain the highest practical ratio of radiation resistance to loss resistance.

In what follows, I propose to analyze the radiation efficiencies, bandwidths, and practical construction of base-loaded and center-loaded whip antennas. The expected range, for ground-wave propagation, is discussed, and it is shown mathematically that a better range is possible using 160 meters rather than 75 meters.

* 376 Tillbury St., Ottawa 3, Canada.

[1] Oberlies, "Installing a Practical 75-Meter Mobile Antenna," *QST*, Dec., 1949.

[2] Swafford, "Improved Coax Feed for Low-Frequency Mobile Antennas," *QST*, Dec., 1951.

[3] Wrigley, "Folded and Loaded Antennas," *QST*, April, 1953.

Definition of Radiation Efficiency

The total useful power radiated from an antenna can be considered as being that which would be dissipated in a fictitious resistance with the antenna current, at the point of reference, flowing through it. Normally, the current is measured at the base of the antenna, and therefore the radiation resistance is referred to the base of the antenna.

$$P_r = I_a^2 R_r \text{ watts,}$$

where P_r = power radiated,
I_a = antenna current,
and R_r = radiation resistance.

The radiation efficiency of an antenna is the ratio of the radiation resistance to the total resistance of the antenna system.

$$\text{Radiation efficiency} = \eta = \frac{R_r\ (100)}{R_r + R_g + R_o} \%,$$

where R_r = radiation resistance,
R_g = ground-loss resistance,
and R_o = tuning-coil-loss resistance.

Under proper conditions, insulator-loss resistance and conductor-loss resistance can be neglected. Since the loss resistances are generally greater than the radiation resistance, for short antennas, careful design must be used to engineer a usable antenna system.

Radiation Resistance

The radiation resistance of a vertical antenna less than an electrical quarter wavelength is increased by top loading and by increasing the height. For short radiators, it can be shown that [4]

$$R_r = 0.01215A^2 \text{ ohms,}$$

where A = degree-ampere plot of current distribution on the antenna.

[4] Laport, *Radio Antenna Engineering*, p. 23, McGraw-Hill (1952).

Consider the current distribution on a short vertical radiator. The current will be some value, I_0, at the base of the antenna, and zero at the top of the radiator. If the antenna is very short — less than 30 degrees — the current distribution

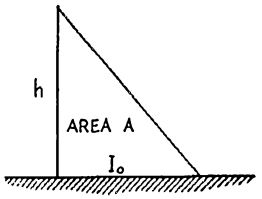


Fig. 2 — Current distribution on a short vertical antenna.

can be assumed to be linear. This is shown in Fig. 2.

For example, assume that

h = 110 inches (2.79 meters),
f = 3.81 Mc. (78.6 meters).

Then, G_v = electrical height of antenna in degrees

$$= \frac{2.79(360)}{78.6} = 12.8 \text{ degrees.}$$

So $$A = \frac{G_v}{2} \text{ degree-amperes (for } I_0 = 1)$$

= 6.4 degree-amperes,

and $R_r = 0.01215(6.4)^2 = 0.5$ ohm.

Now consider the effect of introducing a series loading coil, as shown in Fig. 3. If the inductance of the loading coil is zero, the current distribution will be curve (1), as shown in Fig. 3. This is obviously that of a simple base-loaded radiator, as shown in Fig. 2. As the inductance is increased from zero, the current distribution is modified to that of curve (2). At some value of inductance, L_0, the input impedance of the antenna as seen between the base of the antenna and ground is a pure resistance with no reactive component. For this value of inductance, L_0, we have the maximum current area on portion h_2. This is shown as curve (3) of Fig. 3. For this condition, the current flowing through L_0,

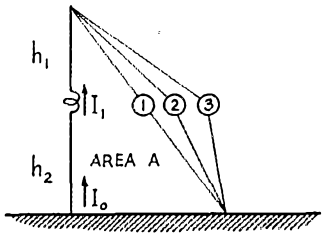


Fig. 3 — Current distribution on a sectionalized or center-loaded antenna.

$$I_1 = I_0 \cos G_2,$$

where G_2 = electrical height of h_2 in degrees (similarly G_1 = electrical height of h_1).

For example, assume that

$h_1 = h_2 = 55$ inches (1.4 meters),

and $G_1 = G_2 = 6.4$ degrees (at 3.81 Mc.).

Hence, $I_1 = I_0 \cos 6.4° = 0.995\ I_0$

$$A = \frac{G_2}{2}\left(1 + \frac{I_1}{I_0}\right) + \frac{G_1 I_1}{2 I_0}$$

$$= \frac{6.4}{2}(1 + 0.995) + \frac{6.4}{2}(0.995)$$

= 9.57 degree-amperes,

and $R_r = 0.01215(9.57)^2 = 1.11$ ohms.

It is clear that a considerable increase in the radiation resistance is obtained by placing the inductance in the center portion of the radiator.

Ground-Loss Resistance

The current flowing at the base of the antenna must be returned to the base of the antenna by currents induced in the ground beneath the radiator. These currents must be collected by the car body and through the capacitance of the car body to the ground. Since the area of the car body is considerably less than a quarter wavelength, only a portion of these currents will be collected by the car frame itself, and the rest will be collected by ground currents flowing through the capacitance of the car to the ground. Since the ground is not lossless, quite a large loss resistance, R_g, is found. The current path is shown in Fig. 4.

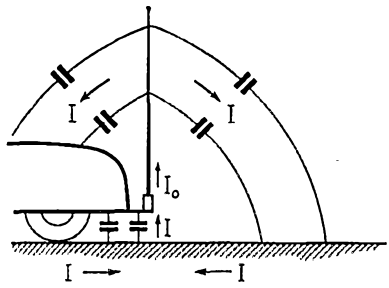


Fig. 4 — Current loop for a vertical radiator mounted on a car.

In the past, writers have neglected this loss resistance. This resistance will be a function of the positioning of the radiator, the type of car on which the antenna is mounted, and to some extent on the ground beneath the radiator. A value of 10 to 12 ohms has been measured by the author for 8- to 16-foot antennas at 3.8 Mc.

Tuning-Coil-Loss Resistance

In order that a short antenna will take power, the capacitive reactance of the antenna must be tuned out by means of a suitable tuning coil. To estimate the inductance required, we need to know the capacitive reactance of the antenna at the operating frequency. The reactance of a short vertical antenna, such as shown in Fig. 2, is

$$-jX_a = -j\frac{Z_0}{\tan G_v} \text{ ohms,}$$

where $Z_0 = 138 \log_{10} \frac{2h}{a}$ ohms,

h = average height of radiator above ground,

a = average radius of radiator,

and G_v = electrical height of radiator.

For example, let us calculate the reactance of the base-loaded antenna shown in Fig. 5.

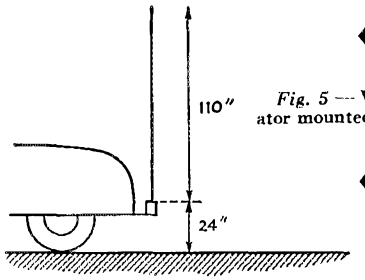


Fig. 5 — Vertical radiator mounted on a car.

Here $h = \frac{110 + 24}{2} = 67$ inches,

$a = 0.125$ inch,

$Z_0 = 138 \log_{10} \frac{2(67)}{0.125} = 418$ ohms,

and $G_v = 12.8°$ (at 3.81 Mc.)
(Add 5 per cent for spurious end effects.)

$$-jX_a = -j\frac{418}{\tan 13.4°} = -j1752 \text{ ohms.}$$

A tuning coil of 73.4 μh. is required to supply an equivalent positive reactance at 3.81 Mc.

If the coil has a Q-factor of 300, then

$$R_c = \frac{1752}{300} = 5.85 \text{ ohms.}$$

Now consider the sectionalized antenna, as shown in Fig. 3. Firstly, we calculate the reactance of the top portion. From this we subtract the lumped reactance of the loading coil, and finally the input reactance of the antenna is calculated by assuming the lower portion an opened-out transmission line, terminated in the resultant reactance of the loading coil and the top section. If the antenna is resonated so that the base reactance is zero, it can be shown that the reactance of the inductor required is

$jX_{Lc} = jZ_0$ (cotan G_1 − tan G_2) ohms,

where Z_0 = characteristic impedance of antenna (as before),

G_1 = electrical length of top portion of antenna,

and G_2 = electrical length of bottom portion of antenna.

For example, suppose we have the antenna system of Fig. 6.

Here $h = \frac{110 + 24}{2} = 67$ inches,

$a = 0.125$ inch,

$Z_0 = 418$ ohms (as before), and

$G_1 = G_2 = 6.4°$ (at 3.81 Mc.)
(Add 5 per cent for spurious end effects.)

$jX_{Lc} = j418$ (cotan 6.71° − tan 6.71°)
$= j3500$ ohms, or 146.3 μh. at 3.81 Mc.

If a coil with a Q-factor of 300 is used, the coil-loss resistance,

$$R_c = \frac{3500}{300} = 11.7 \text{ ohms.}$$

Bandwidth of Antenna System

For frequencies near resonance, the antenna may be considered as a lumped circuit with a Q-factor of

$$Q \cong \frac{X_a}{R_t},$$

where R_t = total antenna resistance.

The operating bandwidth of the antenna is therefore approximately

$$\Delta f = \frac{f_0}{Q} = \frac{f_0 R_t}{X_a} \text{ cycles.}$$

For the vertical base-loaded whip described,

$R_t = R_r + R_g + R_c = 0.5 + 10 + 5.85$
$= 16.35$ ohms.

$$\Delta f = \frac{3.81(10)^6\, 16.35}{1752} = 35.4 \text{ kc.}$$

For the center-loaded antenna described,

$R_t = 1.11 + 10 + 11.7 = 22.81$ ohms.

$$\Delta f = \frac{3.81(10)^6\, 22.81}{3500} = 24.8 \text{ kc.}$$

It must be remembered that a bandwidth of 5 kc. is required for double-sideband a.m. 'phone operation. The bandwidth of both antennas described above is adequate. However, the proximity of near-by metal objects can cause considerable detuning of the circuit. Also, very little shift in operating frequency can be allowed without retuning the antenna.

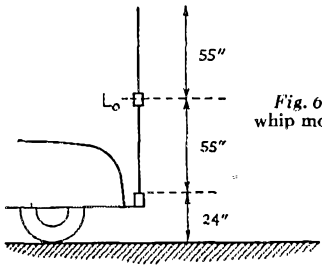


Fig. 6 — Center-loaded whip mounted on a car.

Theoretical Radiation Efficiency

The radiation efficiency of an antenna was shown to be the radiation resistance divided by the total resistance, or

$$\eta = \frac{R_r(100)}{R_r + R_g + R_c}\%$$

For the 110-inch base-loaded whip,

$$\eta = \frac{0.5(100)}{0.5 + 10 + 5.85} = 3.1\%.$$

For the 110-inch center-loaded whip,

$$= \frac{1.11}{1.11 + 10 + 11.7} = 4.86\%.$$

It is clear that a small but worthwhile improvement is obtained by center-loading the antenna. However, this is gained at the expense of reduced operating bandwidth, and increased mechanical-construction problems.

Determination of the Optimum Location of the Loading Coil

Suppose we have a 16-foot whip antenna. The antenna is bumper-mounted, the base insulator being 2 feet from the ground. The average radius of the radiator is 0.18 inch. We decide to load this antenna by introducing a loading coil in series with the antenna, and would like to know where this coil should be placed for maximum radiation efficiency. If we choose a coil Q-factor

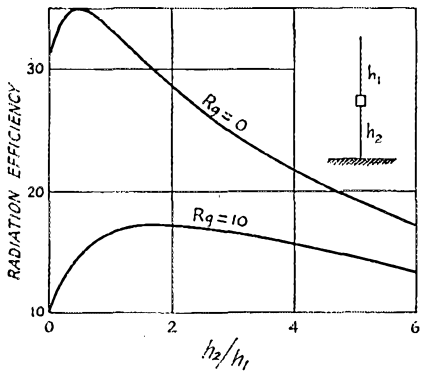


Fig. 7 — Graph showing optimum location for loading coil.

of 300, and a ground resistance of 10 ohms, the graph in Fig. 7 shows the calculated variation of radiation efficiency with the ratio h_2/h_1. The ratio $h_2/h_1 = 0$ is, of course, the case of a base-loaded antenna. It is seen that the best location for the coil is approximately in the center of the radiator (or $h_2/h_1 = 1$). The curve for no ground-loss resistance is also shown. It is noted how the optimum location of the coil is shifted toward the feed point as the ground-loss resistance is reduced.

Field Measurements of Radiation Resistance

The actual measurement of radiation resistance of an antenna at 3.81 Mc is difficult, and involves equipment not normally available to the average amateur. However, to show that measurements can be taken to prove the theory we have developed, I think a short discussion of the principles involved would be in order.

The surface-wave field intensity (that is, for grounded radiators) from a short radiator can be expressed in terms of radiated power, distance, and propagation factor for the ground between the transmitter and receiver by the following expressions:

$$P_r = \frac{F_0^2}{34.6} \text{ watts,}$$

and $$F_0 = Fkd \text{ mv./m.,}$$

where F_0 = unattenuated field strength at one mile in millivolts-per-meter,
k = propagation factor to take account of ground conductivity, dielectric constant of the ground, and diffraction due to curvature of the earth,
d = distance in miles,
F = field strength received at distance d, and
P_r = power radiated.

The first step necessary in order actually to measure the radiation resistance of the antenna is to determine how the ground influences the electric field. To determine this, we must make several measurements of the field strength at distances out to at least 10 miles from the transmitter. In this way a graph showing field strength against distance can be plotted. Comparison with a set of theoretical curves, as shown in Fig. 8, after Norton,[5] is then made. In Fig. 8, several curves are shown ranging from poor ground ($\sigma = 2 \times 10^{-14}$) to good ground ($\sigma = 15 \times 10^{-14}$). The propagation factor, k, is the ratio, at distance d, of the unattenuated or inverse-distance field strength, divided by the actual field strength

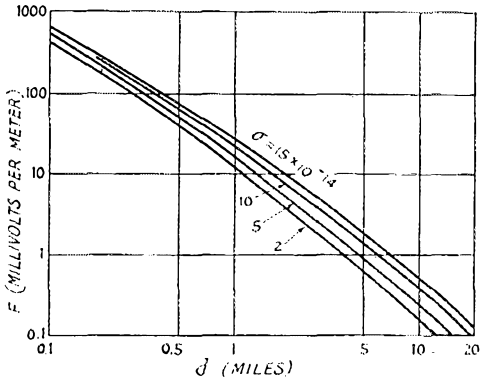


Fig. 8 — Graph showing variation of ground-wave field intensity with distance for poor to good ground. σ = ground conductivity. Frequency = 3.8 Mc. Ground dielectric constant $\xi = 15$.

predicted by the curve for a particular ground conductivity.

Once the power radiated is found, then the radiation resistance,

$$R_r = \frac{P_r}{I_a^2} \text{ ohms,}$$

where I_a = base current. This is obvious, since the actual power radiated can be considered as being the real power dissipated in a fictitious radiation resistance.

Measurements on an Actual Antenna

A sectionalized 16-foot antenna was built.

$h_1 = 6.86$ feet,
$h_2 = 9.29$ feet,
$a = 0.18$ inch, and
$f = 3.81$ Mc.

[5] Norton, "The Calculation of Ground-Wave Field Intensities Over a Finitely-Conducting Spherical Earth," *Proc. I.R.E.*, 29, 623 (1941).

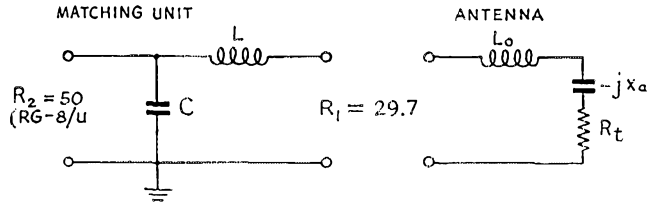


Fig. 9 — L-section match.

The antenna was bumper-mounted on a 1940 Dodge sedan, the base being 2½ feet above the ground. Suppose we design a suitable coil so that the input impedance at 3.81 Mc. is a pure resistance.

$$Z_0 = 138 \log_{10} \frac{2(9.35)(12)}{0.18} = 427 \text{ ohms.}$$

$G_1 = 9.63°$,
and $G_2 = 12.95°$.
(Add 5% for spurious end effects.)

$$jXL_0 = j427 \text{ (cotan } 10.1° - \text{tan } 13.6°)$$
$$= j2297 \text{ ohms, or}$$
$$L_0 = 96 \ \mu\text{h. at } 3.81 \text{ Mc.}$$

A coil 2 inches in diameter was wound with 66 turns of No. 14 enameled wire. The inductance was found to be 97.6 μh. with a coil Q-factor of 170. This was installed. The resonant frequency was found to be 3.81 Mc. with an input resistance of 29.7 ohms. This was measured with a General Radio r.f. bridge type 916-A, an Eddystone receiver type 750, and an A.V.O. signal generator. The equipment was battery-operated and isolated from ground.

To calculate the radiation resistance, refer to Fig. 3. Substituting in appropriate values,

$$A = \frac{12.95}{2}(1 + 0.975) + \frac{9.63}{2}(0.975)$$
$$= 17.19 \text{ degree-amperes}$$
$$R_r = 0.01215\ (17.19)^2 = 3.58 \text{ ohms.}$$

Therefore, the ground-loss resistance must be

$$R_g = 29.7 - \frac{2297}{170} - 3.58 = 12.5 \text{ ohms.}$$

To check the calculated figures, the field intensity was measured 0.284 miles from the antenna using a Stoddart field-intensity meter type NM-20-A. Preliminary measurements indicated a ground conductivity of 10×10^{-14}.

The results are as follows:

$f = 3.81$ Mc.,
$F = 3.5$ mv./m.,
$d = 0.284$ miles,
$k = 2.06$ (see Fig. 8 where $\sigma = 10 \times 10^{-14}$), and
$I_a = 0.185$ amperes.

Hence,

$$F_0 = Fkd = 3.5(2.06)(0.284) = 2.04 \text{ mv./m.,}$$
$$P_r = \frac{F_0^2}{34.6} = \frac{(2.04)^2}{34.6} = 0.121 \text{ watts, and}$$
$$R_r = \frac{P_r}{I_a^2} = \frac{0.121}{(0.185)^2} = 3.5 \text{ ohms.}$$

The agreement of measured with calculated values for radiation resistance is better than normally experimentally obtained due to the many parameters involved. It is noted that the radiated power is 0.121 watt. The power input to the antenna was supplied by a single Type 6AQ5 tube and is

$$P_{in} = (0.185)^2\ 29.7 = 1.01 \text{ watts.}$$

This corresponds to a radiation efficiency of 12%.

Tuning and Matching Center-Loaded Whips

A method of matching the antenna to the transmitter will now be considered, and a method outlined by which the antenna can be tuned using a g.d.o. and an s.w.r. detector (equipment normally owned by the average amateur).

Firstly, let us consider what matching involves. If we consider the 16-foot antenna just discussed, the input impedance at resonance was a pure resistance equal to 29.7 ohms. We must transform this low value to 50 ohms so that the antenna can be fed with standard coaxial cable (RG-8/U or RG-58/U). This can be done with an L-section matching unit as shown in Fig. 9.

Here, $$2\pi fL = \sqrt{R_1(R_2 - R_1)}$$

$$\frac{1}{2\pi fC} = R_2\sqrt{\frac{R_1}{R_2 - R_1}}$$

Substituting values,

$$2\pi fL = 24.5 \text{ ohms, and}$$
$$\frac{1}{2\pi fC} = 60.6 \text{ ohms, or } C = 690\ \mu\mu\text{f.}$$

Now the inductance, L, can be artifically obtained by adding just a small amount more inductance to L_0 the center-loading coil, than

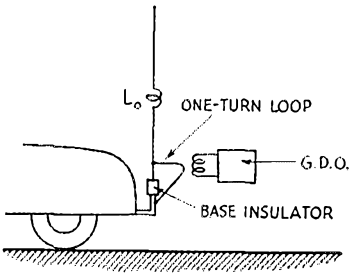
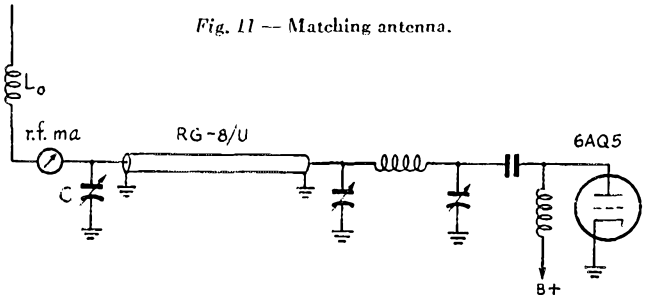


Fig. 10 — Adjusting antenna to resonance.

needed for resonance, thus making the antenna input impedance inductive. An exact match to 50 ohms can be obtained by adjusting the condenser, C, and the center-loading inductance, L_0.

First, resonate the antenna by using a g.d.o. as shown in Fig. 10. Power is coupled into the antenna from a 50-ohm transmitter. In my case the output tank circuit is a pi-tank. See Fig. 11 for set-up. Adjust the condenser, C, in small increasing steps, resonating each time by adjusting the center-loading coil for maximum current. For some value of C near 690 $\mu\mu$f. the antenna will draw maximum current and show no detuning effects at the transmitter end. An s.w.r. detector will also indicate a minimum s.w.r. for this adjustment.

Fig. 11 — Matching antenna.



(Note: L and C of Fig. 9 can be reversed. A small coil could be used instead of condenser C. The coil should have an inductance of 2.45 μh. —i.e., 60.6 ohms. The antenna must be tuned slightly capacitive. That is, resonate the antenna alone as before, and subtract turns from L_0 to resonate again after introducing the small matching coil. This method has certain advantages, and its use should be considered.)

Summary

In conclusion, I hope that I have made clear the factors involved in antenna design and also the considerations in matching the antenna to 50 or 70 ohms so that it can be fed with standard coaxial cable. It is shown that some improvement can be obtained by center loading — a gain of 1.5 in power — but this may not always be worthwhile since the mechanical problem of fixing a good high-Q coil in the center of the whip is difficult. The diameter-to-length ratio of the coil should be 2/1 if possible.

The placement of a spoked-wheel-type disk, as shown in Fig. 12, could be used to provide a substantial reduction in the size of the loading coil

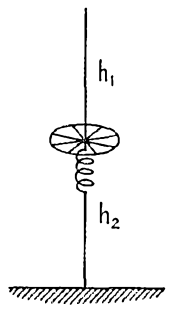


Fig. 12 — Adding more capacitance.

required. For example, a 1-foot-diameter ring of No. 12 with eight spokes has a capacitance equivalent to the length of the radiator h_1 for the experimental 16-foot antenna discussed. However, it is felt by the author that such means are not adaptable to mobile antennas, since cumbersome structures like this are rather sorry-looking sights after striking a tree branch at 50 miles per hour.

Choosing the Optimum Frequency

Let us consider whether it would be better to use 1.9 Mc. rather than 3.8 Mc. At first thought, one might say not, since the antenna efficiency will be much lower. However, the lower ground-wave propagation factor overcompensates for this. The variation of the propagation factor with frequency and distance is shown in Fig. 13 for good ground ($\sigma = 10 \times 10^{-14}$).

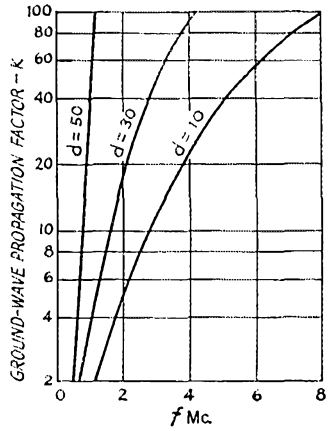


Fig. 13 — Graph showing variation of propagation factor, k, with frequency and distance for good ground (i.e., conductivity $\sigma = 10 \times 10^{-14}$, and dielectric constant $\xi = 15$). Distance d is in miles.

If we assume a transmitter power of 50 watts, an antenna as shown in Fig. 5, coil Q-factors of 300, and ground-loss resistance of 10 ohms, the

Antenna Characteristics		
Freq.	R_r	*Radiation Efficiency*
3.8	0.5	3.1%
1.9	0.142	0.67%

Transmission Characteristics		
Distance (miles)	*Freq. (Mc.)*	*Received Field Strength (μv./m.)*
10	3.8	37
	1.9	74
30	3.8	3.1
	1.9	7.3
50	3.8	0.18
	1.9	0.25

results for transmission over 10, 30, and 50 miles are shown in the accompanying tables.

(*Continued on page 108*)

Remote Tuning for the High-C VFO

A Compact Control Unit for Mobile Installations

BY N. D. LARKY,* W2GDW

THE conveniences of VFO operation, once enjoyed, are hard to do without, and when a transmitter was obtained for use as a ten-meter mobile rig, it was felt necessary to provide for this flexibility. The rig is a commercial f.m. police unit, and multiplies the crystal frequency 18 times. It was decided that the frequency control belonged up front at the operating position, and that the VFO proper should be in the trunk of the car, with the transmitter.

The idea of a remotely-controlled, motor-driven VFO tuning condenser was rejected for several reasons. The ability to set frequency closely seemed doubtful; a motor drive with a gear ratio which would allow accurate zero-beating would turn too slowly when tuning across the band, the gears would have to have a minimum of backlash, and considerable complexity would be required to include a frequency indicator at the control position.

A remotely-tuned Clapp oscillator, several embodiments of which have appeared in *QST* [1] and other publications, has the advantage of good voltage stability, but was considered undesirable for other reasons. The output of the series-tuned oscillator varies over the band and, more important, considerable care is required in order to prevent deterioration of the tank-coil *Q*. Thus a very large control box is required to house the oscillator tuning condenser and tank coil, and the box must be placed at the driving position, where space is at a premium. The much smaller unit containing the tubes is placed in the trunk, where space is relatively abundant. Also, with the low-*C* circuit, the problem of reducing the effects of mechanical vibration, especially in mobile work, is not always solved easily.

• Previous articles in *QST* have described an easy method of remotely tuning the Clapp type of VFO. Now W2GDW comes along with an even simpler arrangement for remote tuning of the high-*C* oscillator. From the viewpoint of the mobiler, one of the outstanding features is that the control-box element can be reduced to the dimensions of a single variable condenser on the dashboard!

High-C VFO

A remotely-tuned VFO featuring direct calibration, accurate and simple frequency setting, uniform output over the band, high stability, and small size at the operating position, has been developed and has proven an excellent solution to the problem of remote VFO control. The basis for this VFO is an oscillator frequency low enough that the tank capacitance may be split up and placed in several locations. In this particular transmitter the oscillator frequency is 1.6 Mc. A high-*C* Colpitts oscillator for this frequency may be built with about 2100 $\mu\mu$fd. of tank capacitance. As shown in the schematic, Fig. 1,

* 223 West Summit St., Somerville, N. J.

[1] Long, "Cutting Down VFO Drift," *QST*, Aug., 1952, p. 20.
Mix, "Simple Remote Tuning for the VFO," *QST*, Jan., 1953, p. 27.

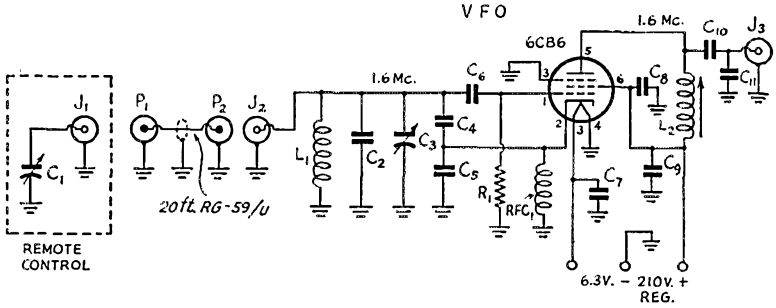


Fig. 1 — Circuit of the remotely-controlled high-C VFO.

C_1 — 140-$\mu\mu$fd. variable.
C_2 — 0.00109-μfd. silvered mica (910-$\mu\mu$fd. and 180-$\mu\mu$fd. units in parallel).
C_3 — 50-$\mu\mu$fd. variable.
C_4 — 470-$\mu\mu$fd. silvered mica.
C_5 — 910-$\mu\mu$fd. silvered mica.
C_6 — 100-$\mu\mu$fd. silvered mica.
C_7, C_8, C_9 — 0.01-μfd. disk ceramic.
C_{10} — 300-$\mu\mu$fd. mica.
C_{11} — 56 $\mu\mu$fd. (see text).
R_1 — 47,000 ohms, ½ watt.
L_1 — 20 turns No. 12, 1-inch diam., 1⅜ inches long.
L_2 — Approx. 90 μh. (CTC 1-Mc. slug-tuned coil with turns removed to resonate at approximately 1600 kc.).
J_1, J_2, J_3 — Female coax connector.
P_1, P_2 — Male coax connector.
RFC_1 — 2.5-mh. r.f. choke.

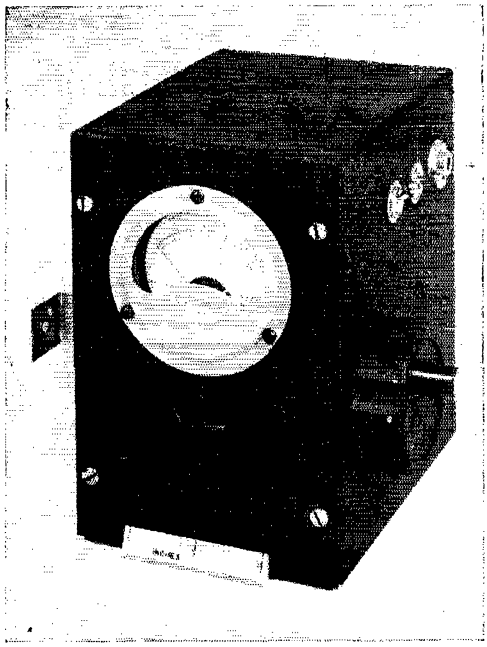
about 1425 $\mu\mu$fd. is placed directly across the tank coil, in the form of the bandset condenser (25 $\mu\mu$fd.), the padding condensers (1090 $\mu\mu$fd.), and the series combination of the Colpitts feedback condensers (equivalent to 310 $\mu\mu$fd.). Another 140 $\mu\mu$fd. is provided by the VFO tuning condenser. The remaining 500 $\mu\mu$fd. is made up by the twenty-foot length of RG-59/U cable (25 $\mu\mu$fd. per foot) which connects the VFO unit in the trunk to the VFO tuning condenser at the operating position.

The VFO unit, as indicated in Fig. 1, consists of a single 6CB6 Colpitts oscillator. The tank coil, which for a Colpitts oscillator does not require as much attention to Q as does the coil of a Clapp oscillator, is placed in the VFO unit. The remote VFO tuning unit consists *solely of the 140-$\mu\mu$fd. tuning capacitor!* The main unit, which can be placed wherever space is available, includes, in addition to the remainder of the oscillator components, a small vibrator supply, VR tubes, and switching and control circuits. The VFO control box includes the remote tuning capacitor, direct-reading calibrated dial, control switches, grid-drive meter, and the microphone jack.

Control Box

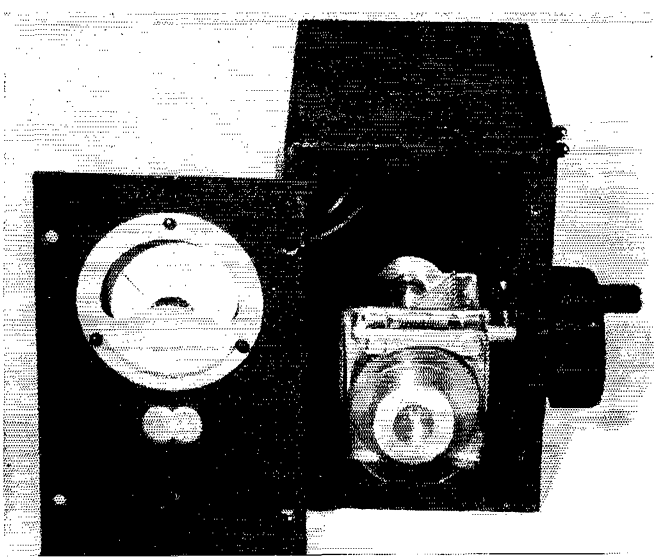
As shown in the photographs, the control box contains the VFO tuning capacitor, a microphone jack, a switch to actuate a VFO-crystal relay in the transmitter, and a switch to disable the transmitter when zero-beating. A meter is included to monitor grid drive to the 807 final stage. In addition to acting as a continuous check on the general operation of the transmitter, this meter also serves another useful purpose. Inasmuch as the transmitter is in the trunk of the car, and necessarily tuned to a particular frequency, it is important to know if the chosen operating frequency is sufficiently close to the frequency to which the transmitter is tuned. This is readily shown by the grid-drive meter. The particular transmitter used is sufficiently broad-band that the operating frequency may be swung over a 600-kc. range (half of the 10-meter band) without requiring retuning of the transmitter.

The housing is a standard $4 \times 5 \times 6$-inch metal box. This box is larger than is actually required, and if one were interested in a very small VFO control, the box could be one just large enough to contain C_1, the tuning condenser. In that event, the meter, switches, and microphone jack would be located elsewhere.



A compact dashboard unit for remote control of a VFO rig. Included in this model are also a meter for checking output-stage grid current and switches for remote power and changeover control. The jack is for microphone connection.

In this instance the tuning condenser, C_1, is one of the type used in the BC-221 frequency meter, and the knob is one of the type used on the BC-348 receiver. The gear ratio is such that the complete tuning range of the tuning capacitor is covered in 45 revolutions of the tuning knob. The entire tuning range is easily covered in about ten seconds, and yet the worm drive offers accuracy of zero beating and excellent mechanical stability under the rigors of mobile operation. A plastic disk is shown attached to the shaft on which the rotor plates are mounted; the frequency calibration is mounted on this disk, and



Interior of the remote-control box, showing the tuning-condenser dial ready for its calibrated scale.

viewed through the indicator hole in the front panel. (At the time the pictures were taken the calibration card had not been mounted.) The shape of the condenser plates is such that the calibration is linear with frequency.

A small aluminum bracket is used to mount the control box to the steering column of the car. On the rear panel of the box, not shown in the photos, is an octal connector for the control cable to the trunk, a separate "phono"-type jack for the shielded microphone cable, and a standard 83-1SP coaxial connector for the 20-foot coaxial cable which goes to the VFO unit in the trunk.

VFO Unit

Photographs show the essential details of the assembly of the VFO unit. A U-shaped aluminum chassis is used, on the top surface of which are mounted the 6CB6 oscillator tube, two OB2 regulator tubes, and a small vibrator supply. A push-to-talk relay, the band-set condenser, and VFO tank coil are mounted inside, along with the small components, while a fuse and connectors are along the sides of the U.

The 1090-$\mu\mu$fd. capacitor, made of 910-$\mu\mu$fd. and 180-$\mu\mu$fd. units in parallel, is mounted directly across the tank coil, and may be seen, in the bottom-view photograph, between the coil and the output coaxial connector. The slug-tuned coil in the plate of the 6CB6 is shown in the same illustration, below and to the left of the 6CB6 socket. In the interest of mechanical stability, No. 12 wire was used for wiring leads to the tank coil, the bandset trimmer, and the input coaxial connector.

Power Supply

Any power supply delivering 200 to 250 volts at 8 to 10 ma. may be used to operate this VFO. The author operated a breadboard model of the VFO and a crystal-controlled 10-meter converter on three 67½-volt Mini-Max B batteries for several months with no noticeable effect on the batteries. In the final model, the vibrator supply (liberated from an old Chevrolet auto radio) has been incorporated.

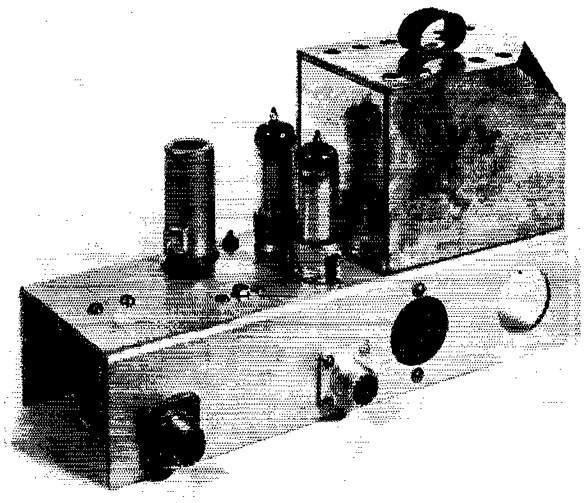
Adjustment

Adjustment of the VFO is quite simple. Set the tuning capacitor C_1 to minimum, and adjust C_3 until the oscillator signal is heard on the receiver at 29.7 Mc. That's all there is to it! If the coil and cable dimensions, and the component values in the tank circuits have been followed closely, the VFO will now tune the 10-meter band. The author's VFO actually covers from 28.548 Mc. to 29.7 Mc.; the tank coil should be just slightly lower in inductance for 100 per cent coverage of the band, but the bottom 48 kc. was not considered important enough to be worth any pruning of the coil. If a particular installation should require more or less than 20 feet of coaxial cable to link the VFO control to the main unit, the value of the padding condenser, C_2, should be decreased or increased accordingly, at the rate of about 25 $\mu\mu$fd. per foot of cable.

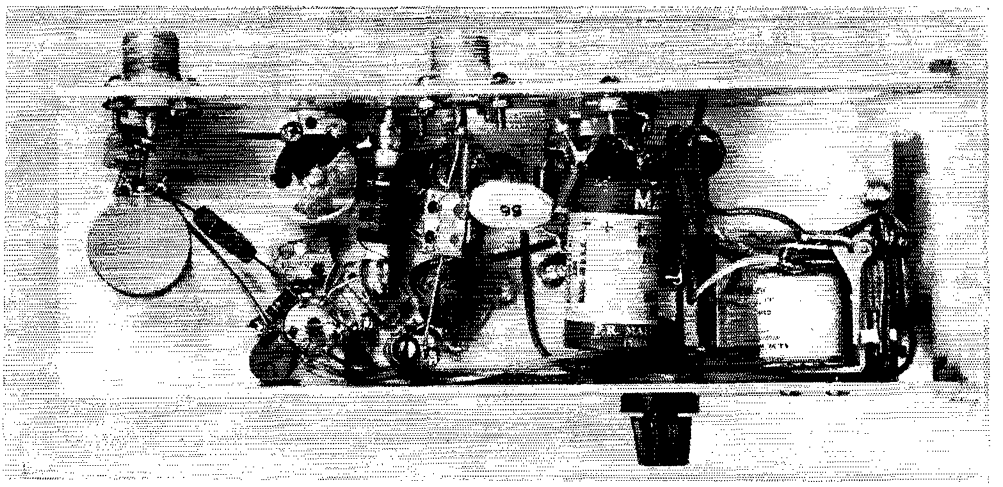
The 6CB6 plate coil, L_2, is resonated by C_{11} in parallel with approximately 2 feet of RG-59/U cable (50 $\mu\mu$fd.) and a 68-$\mu\mu$fd. capacitor from grid to ground in the crystal-oscillator stage of the transmitter which the VFO feeds. Again, if the cable from the VFO to the transmitter differs greatly from 2 feet in length, or if the capacitance shunting the input to the stage being fed is greater or less than 68 $\mu\mu$fd., the value of C_{11} or L_2 should be changed accordingly. The Q of the plate tank is sufficiently low so that the VFO output is constant over its entire range. The output is 30 volts peak-to-peak across 47,000 ohms.

Stability

Two tests of the short-term stability have been made. In a bench test following a ten-minute warm-up, the oscillator was placed in zero beat with a BC-221 frequency meter, and at the end of twenty minutes the oscillator frequency had drifted ten cycles. This represents a drift of 180 cycles at ten meters. Short-term stability has been measured while in mobile QSO with a fixed station by zero-beating the b.f.o. of the fixed-station receiver with the transmitter-



The main VFO unit may be placed in the trunk or other available space. It includes a small vibrator pack, the 6CB6 oscillator tube and a pair of voltage-regulator tubes. Coax connectors are provided for connecting to the remote tuning cable and to the input stage of the transmitter.



Bottom view of the main VFO unit. The midget variable toward the left is the handset condenser, C_3. The coil at the left is wound on polystyrene rod.

VFO signal. Variations of about 200 cycles were noted. A lock on the control knob thus appears unnecessary for purposes of in-motion stability.

The basic principle of separating the tuning capacitor from the VFO proper by a length of coaxial cable, the capacitance of which constitutes a portion of the tank capacitance, may be applied at frequencies other than the one described here. Two limitations present themselves: The length of the cable should be less than $\frac{1}{8}$ wavelength at the VFO operating frequency and, for stability, the capacitance of the cable should not constitute the major portion of the capacitance across the tank coil. In addition, if an electrically-long cable length is contemplated, there may be tendency for the end at the control box to be "hot," and adequate grounding of the control box and VFO to the car frame should be assured.

Coming ARRL Conventions

EASTERN CANADA

Montreal, Quebec, September 19th

The ARRL Eastern Canada (Quebec) Convention will be held on Saturday, September 19th, in Victoria Hall, Westmount, a suburb of Montreal. This convention will be under the auspices of the Montreal Amateur Radio Club. There will be a get-together Friday evening, September 18th, and open house at some ham shacks on Sunday, the 29th. A very full day is planned for Saturday, with a hidden transmitter hunt, code contests, games, talks, events for the YLs and XYLs, a bang-up banquet and lots of entertainment. ARRL General Manager A. L. Budlong, W1BUD, is expected to attend.

Tickets cost $4.50 if you reserve before the deadline of September 12th, and $5.00 after that date. Advance registrations may be sent to R. G. Bromwich, VE2HY, 2051 Patricia Avenue, Montreal 28. All remittances should be made payable to The Montreal Amateur Radio Club, Inc. Don't forget to add exchange on checks.

SOUTHWESTERN DIVISION

Los Angeles, Calif., October 9th–11th

The ARRL Southwestern Division Convention, sponsored by the Los Angeles Area Council of Radio Clubs, will be held on October 9th through 11th at the Ambassador Hotel, Los Angeles. The program will include displays, open forums, technical talks and demonstrations. Among the scheduled speakers will be F. E. Handy, W1BDI, ARRL Communications Manager.

The registration fee is $7.50, and preregistration closes September 15th. The Ambassador Hotel provides ample accommodations plus many extras such as tennis courts and a swimming pool. Further data may be requested from the Chairman, Walter R. Joos, W6EKM, 1315 N. Overhill Drive, Inglewood 3.

NEW HAMPSHIRE STATE

Concord, N. H., September 13th

The Concord Brasspounders will sponsor the ARRL New Hampshire State Convention and Annual Hamfest on Sunday, September 13th, at the Masonic Temple, South Main Street, Concord. Registration commences at 9:00 A.M., and the banquet with roast beef, family style, is scheduled for 2:30 P.M. Special meetings, contests, and demonstrations are planned, and the FCC will conduct ham examinations.

The sponsoring group is going all-out to keep the cost down and still supply a top-notch feed and program. Tickets will be $3.75 in advance, $4 at the door. Advance registrations and tickets may be obtained from Evans Radio in Concord, so make your remittances to that firm.

NEW YORK STATE

Buffalo, N. Y., September 19th–20th

The ARRL New York State Convention, sponsored by the Radio Association of Western New York, will be held on September 19th and 20th at the Elks Club, 207 Delaware Avenue (Route 384), Buffalo. Activities begin at 10:00 A.M. Saturday. There will be contests and displays, dinner, guest speakers, G.E. House of Magic, and dancing. Sunday will feature a mobile contest and a trip to Niagara Falls for the ladies. W2BTB has arranged other activities for the YLs and XYLs, too. George Hart, W1NJM, ARRL National Emergency Coördinator, will be on hand.

Convention special attractions will be W2ICE's Old Timers' Show featuring an illustrated display of W2ZI's famous antique collection, a review of early activities in the old 8th District, and an actual demonstration of a 1000-watt rotary-spark-gap rig.

Tickets are $5.50 per person, and advance registrations are available from J. Bruce Siff, W2GBX, 218 City Hall, Buffalo, or 81 Delwood Road, Kenmore.

Let's Keep It Simple—Adjusting the Novice Antenna

Simple Voltage-Fed Wire for the Beginner

BY NORMAN L. ROWE,* K2DFW

THIS is written for the Novice who, like myself, has become somewhat confused by too much study. Actually, I'm a very rusty old-timer from 'way back in 1921 when my ham station, 2BKK, blasted a broad channel somewhere in the vicinity of 200 meters with a half-kilowatt rotary-spark-gap transmitter. In those days, the science of radio, by today's standards, was relatively simple. After thirty-two years of complete indifference to the hobby, I am attempting gradually to crawl back through a maze of electronic theory sufficient to flunk an "Einstein."

Take antennas, for example. Occasionally in the literature one can find a casual reference to an end-fed antenna, and a guarded admission that good results can be obtained therefrom, but the experts seem to devote most of their space to the half-wave dipole, or doublet. Then, they go on to 2-wire and 3-wire folded dipoles, impedance-matching transmission lines, flat lines, tuned lines, standing waves, standing-wave ratios, line lengths, etc., etc., etc. What to do?

Of course, I do not imply that present antenna theory and practice is not right, but my shack, and possibly yours, happens to be up in the attic and there is *no* easy way to string or tie into a center-fed dipole. There certainly must be thousands of amateurs whose physical opportunities for antenna construction are more favorable for an end-fed antenna and, who not only need a little assurance that this type, under suitable circumstances, can be made just as efficient as the center-fed type, but who also might use a little help in its design and method of erection.

To begin with, it should be noted that the most efficient way to couple a transmitter to an antenna is by direct feed. In other words, move the transmitter up into the air and connect it directly to the antenna. Obviously, this is often a physical impossibility. However, if your shack is located in an attic room, or any floor high enough above the ground to be at usable antenna height, it is very easy to accomplish this desirable objective by the use of an end-fed antenna.

Secondly, despite the emphasis in the literature of the desirability of feeding an antenna at a current loop, it is not at all incorrect or inefficient to feed it at a voltage loop. So, if you place your rig close by an attic or upper-floor window, you can direct-feed a half-wave antenna at one end (which you know will be at a voltage loop) and get just as much DX as the ham next door using an equivalent center-fed dipole and transmission line. Moreover, such an antenna is a cinch to erect and can be easily adjusted to the correct length. (See ARRL *Handbook* Antenna Chapter section on direct feed.)

Antenna Length

To avoid losses and other troubles, the end-fed antenna should be equal in electrical length to one-half of the wavelength being transmitted. To permit multiband operation or the use of variable frequencies within a band, some compromise in length must be made. However, we novices should not attempt to absorb or experiment with everything all at once, and would do well to leave some of the complexities of the science for a later day. In the beginning, let's try to keep it simple. Accordingly, we might temporarily forget that there are other bands and other frequencies within a band and start out by buying an 80-meter crystal somewhere within the Novice limits, and building a transmitter and antenna around it.

So, let's say we pick up a 3.74-Mc. crystal, build a small 2-tube 30-watt transmitter, and

*85 Huron St., Bellerose, L. I., N. Y.

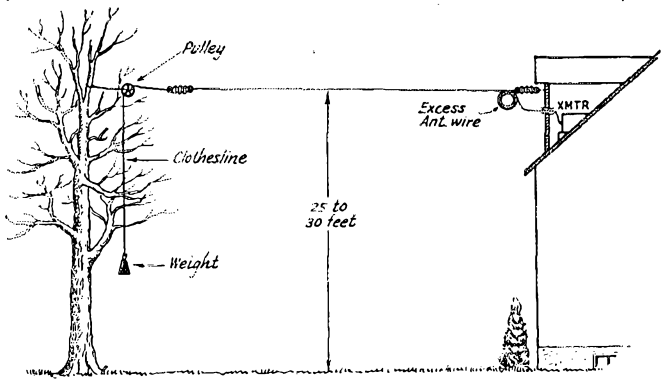


Fig. 1 — Sketch of the simple voltage-fed half-wave antenna.

now desire to erect an efficient end-fed antenna for connection thereto. The *Handbook* states that the actual physical length of a half-wave antenna may be calculated by the formula $L = \frac{468}{f}$, where L = length in feet, and f = frequency in megacycles. Hence, our antenna should be exactly 125 feet long. However, the proximity of trees, buildings and other structures, and the height above ground — to mention just a few things — have an influence on the electrical length of this antenna, and it is virtually impossible to calculate in advance for all Novice locations the exact length required for best antenna performance for a 3.74-Mc. crystal.

• For various reasons, the simple voltage-fed half-wave antenna has fallen into infrequent use. Nevertheless, as K2DFW points out, it still remains one af the easiest skywires to install and adjust. From this consideration, it is well worth considering by the Novice.

Adjustment

So, if this situation fits your case, here's what you do. Attach one end of your antenna to a distant tree, barn, house, or pole by means of an insulator, clothesline, clothesline pulley and weight, and bring the other end to a convenient point above or alongside your attic window as in Fig. 1. Start out with about 120 feet of wire between insulators and, without cutting it, lash the balance of the coil of antenna wire temporarily to the insulator outside the window. The stranded type antenna wire is preferred, since it is more flexible than solid wire and therefore easier to handle. However, other types of wire may be used, provided it is bare so that the turns of excess wire are shorted out. The lead-in should be as short and direct as possible, since this actually is an extension of the antenna. It is made by unrolling the free end of the coiled wire.

Next, tune up your transmitter without the antenna connected. Note the setting of the antenna tank-condenser dial when resonant at 3.74 Mc. The coupling between the final and antenna tanks should be loose enough so that there is only one peak in plate current as the antenna tank circuit is tuned through resonance. Then attach the antenna lead-in to one end of the antenna tank coil, press the key and note whether or not there is any difference in the reading of the milliammeter indicating amplifier plate current. If so, do not readjust the output tank condenser but retune the *antenna* tank condenser to resonate the antenna and note the dial reading when the plate current reads maximum. Then, reach out the window and pull in two or three feet of antenna wire, coil it up, lash it to the insulator and repeat the above procedure. If the dial reading of the antenna tank condenser when tuned to resonance with this shorter antenna is closer to the dial reading at resonance without the antenna connected, you are proceeding in the right direction. If it is farther away, you need to lengthen rather than shorten the antenna.

By trial and error, all very easily performed without leaving the shack, you will finally arrive at the physical length that is electrically one-half a wavelength long. This may be determined when the dial reading of the antenna tank condenser at resonance is the same whether the antenna is connected to or disconnected from the rig.

After the correct length has been found, the antenna coupling can be increased so that the amplifier will draw the desired plate current when the antenna tank circuit is tuned to resonance.

Now, brother, you're "putting out!" Since an end-fed half-wave antenna is voltage fed, it is important to insulate the lead-in well as it passes through the window, or frame, in order to avoid excessive dielectric loss at this point. No ground connection is needed, although it may be desirable for lightning protection.

After the proper length of your antenna is determined, remove the coil of excess antenna wire, and solder the joint to the short lead-in. It is well to leave the clothesline, pulley and weight at the far end, especially if attached to a tree, since this will prevent wind damage.

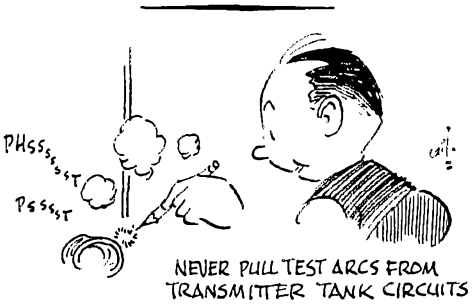
By some slight additional adjustment of length, such an antenna may be readily converted for use on 40 meters by the same trial-and-error method. In this case, it will operate as a full-wave, or second-harmonic, antenna, but will still be voltage fed.

To make it easier, later on, to shift back and forth between 80 and 40, it is better, when possible, to string a separate wire for 40 meters between your attic window and some other object not too parallel to the 80-meter wire. Start with about 60 feet of wire between insulators and follow the same length-adjustment procedure.

At some possible sacrifice in performance, the same idea can be used for operating rooms located below the level of the antenna. Under such circumstances, the length of wire between insulators is reduced to compensate for the added length of lead-in wire, the over-all length, from the far end of the antenna to the antenna tank coil, being the determining factor.

For your receiving set, a random length of wire in the attic will usually bring in anything you can reach with a Novice low-power rig.

So, up the trees, men, and let's keep it simple.



Happenings of the Month

ELECTION NOTICE

To All Full Members of the American Radio Relay League Residing in the Atlantic, Canadian, Dakota, Delta, Great Lakes, Midwest, Pacific and Southeastern Divisions.

An election is about to be held in each of the above-mentioned divisions to choose both a director and a vice-director for the 1954–1955 term. These elections constitute an important part of the machinery of self-government of ARRL. They provide the constitutional opportunity for members to put the direction of their association in the hands of representatives of their own choosing. The election procedures are specified in the By-Laws. A copy of the Charter and By-Laws will be mailed to any member upon request.

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

Executive Committee
The American Radio Relay League
West Hartford 7, Conn.

We, the undersigned Full Members of the ARRL residing in the ..... Division, hereby nominate ..... of ....., as a candidate for director; and we also nominate .... of ....., as a candidate for vice-director; from this division for the 1954–1955 term.

(Signatures and addresses)

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

All such petitions must be filed at the headquarters office of the League in West Hartford, Conn., by noon EDST of the 20th day of September, 1953. There is no limit to the number of petitions that may be filed on behalf of a given candidate but no member shall append his signature to more than one petition for the office of director and one petition for the office of vice-director. To be valid, a petition must have the signature of at least ten Full Members in good standing; that is to say, ten or more Full Members must join in executing a single document; a candidate is not nominated by one petition bearing six valid signatures and another bearing four. Petitioners are urged to have an ample number of signatures, since nominators are occasionally found not to be Full Members in good standing. It is not necessary that a petition name candidates both for director and for vice-director but members are urged to interest themselves equally in the two offices.

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

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

Present directors and vice-directors for these divisions are as follows: *Atlantic:* Clyde Heck, W3GEG, and Charles O. Badgett, W3LVF. *Canadian:* Alex Reid, VE2BE, and William W. Butchart, VE6LQ. *Dakota:* Alfred M. Gowan, WØPHR, and (no vice-director). *Delta:* James W. Watkins, W4FLS, and George S. Acton, W5BMM. *Great Lakes:* John H. Brabb, W8SPF, and Harold E. Stricker, W8WZ. *Midwest:* William J. Schmidt, WØOZN, and James E. McKim, WØMVG. *Pacific:* Kenneth E. Hughes, W6CIS, and Richard F. Czeikowitz, W6ATO. *Southeastern:* Lamar Hill, W4BOL, and Ernest W. Barr, W4GOR.

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

For the Board of Directors:

A. L. BUDLONG
Secretary

July 1, 1953

LICENSE PLATES

Senate Bill No. 530 was signed by California's Governor Earl Warren on July 6th, thereby authorizing the issuance of call letter license plates to California amateurs. This action successfully terminates months of hard work by a number of W6s. W6PIB, Chairman of the Committee which introduced the bill, was ably assisted by W6ACN and W6EUV, the Mission Trail Net and American Legion Net, and many amateurs who relayed important information on the amateur bands and kept their Senators and Assemblymen well aware of their wishes by mail.

MARITIME MOBILE

The ARRL Executive Committee, after careful and extensive examination of the proposal to open 21 Mc. for high seas amateur operation, has concluded that the long-term interests of amateur radio will best be safeguarded by not attempting at this time any extension of privileges which may have international complications. Wishing, however, to expand shipboard amateur operation to the greatest extent feasible consistent with the present international situation, the Committee has another suggestion: To permit general operation under the domestic mobile rules by amateurs on ships in the "coastwise"

FEDERAL COMMUNICATIONS COMMISSION
Washington 25, D. C.

PUBLIC NOTICE
July 9, 1953

RECEPTION OF SIGNALS OF AMATEURS OPERATING IN THE 21 MEGACYCLE BAND BY TELEVISION RECEIVERS

In 1945 the Commission allocated the 21 megacycle (Mc) band to the Amateur Radio Service. On May 1, 1952, the transfer of this band to the Amateur Service was completed and amateurs began operating their stations in the band. Some television receivers located close to radio transmitting stations are incapable of rejecting the signals of such stations even though the stations are not operating in the television channels. In some instances, interference to television broadcast reception may result from such operation. Such interference may often be due to the fact that certain post war television receivers now in use by the public use an intermediate frequency in the amateur 21 Mc band.

The Commission has carefully studied this problem and has determined that interference that may be received by television receivers which use an intermediate frequency in the amateur 21 Mc band from amateur operation in that band is due principally to characteristics in the design of the television receivers. In many cases such interference can be cured by simple and inexpensive means. The Commission expects that amateur station licensees will cooperate with the owners of television receivers in determining the actual cause of interference to television reception appearing to result from amateur operation in the 21 Me band. Moreover, amateur licensees will be required to correct any of their operations contrary to Commission Rules which may contribute to the interference. The Commission cannot, however, hold amateur licensees operating in the 21 Mc band responsible for remedying such interference if such amateurs are complying with all of the applicable rules and regulations of the Commission; this is in accordance with the policies already established with respect to other authorized services.

Attention is also called to the fact that about 300 Television Interference (TVI) Committees have already been formed in communities throughout the country to help deal with the television interference problem. These voluntary committees are composed of set owners, industry representatives and amateurs, and they have achieved encouraging results in their effort to eliminate television interference. The Commission believes that these TVI committees will also prove helpful in solving any interference problems that may develop with respect to amateur operation in the amateur 21 Mc band.

service; more specifically, ships operating between ports on the West Coast, or between ports on the East and Gulf Coasts. Such travel is certainly domestic in intent even though temporarily the ship may range a bit outside the so-called continental limits. The Committee has directed that League filings be made with FCC to present these views.

EXECUTIVE COMMITTEE MEETINGS

The following is an abstract of the minutes of the meetings of the Executive Committee of the League during the twelve months between the 1952 and 1953 Board meetings, published here for your information:

Meeting No. 219, July 9, 1952. No actions taken.
Meeting No. 220, August 19, 1952. Affiliated 9 clubs.
(*Continued on page 110*)

WHAT BANDS AVAILABLE?

Below is a summary of the U. S. amateur bands on which operation is permitted *as of August 1st.* Readers are cautioned that a number of proposals are now pending before the FCC and that action on those proposals may later change this compilation to some extent. Changes will, as usual, be announced by W1AW bulletins. Figures are megacycles. AØ means an unmodulated carrier; A1 means c.w. telegraphy; A2 is m.c.w.; A3 is a.m. 'phone; A4 is facsimile; A5 is television; F1 is Frequency-shift keying; n.f.m. designates narrow-band frequency- or phase-modulated radiotelephony; and f.m. means frequency modulation, 'phone (including n.f.m.) or telegraphy.

3.500–4.000	A1
3.500–3.800	F1
3.800–4.000	A3 and n.f.m.
7.000–7.300	A1
7.000–7.200	F1
7.200–7.300	A3 and n.f.m.
14.000–14.350	A1
14.000–14.200	F1
14.200–14.300	A3 and n.f.m.
14.300–14.350	F1
21.000–21.450	A1
21.000–21.250	F1
21.250–21.450	A3 and n.f.m.
26.960–27.230	AØ, A1, A2, A3, A4, f.m
28.000–29.700	A1
28.500–29.700	A3 and n.f.m.
29.000–29.700	f.m.
50–54	A1, A2, A3, A4, n.f.m.
52.5–54	f.m.
144–148, 220–225	AØ, A1, A2, A3, A4, f.m.
420–450[1], 1,215–1,300	AØ, A1, A2, A3, A4, A5, f.m.
2,300– 2,450, 3,300– 3,500, 5,650– 5,925, 10,000–10,500, 21,000–22,000, All above 30,000	AØ, A1, A2, A3, A4, A5, f.m., pulse

[1]Peak antenna power must not exceed 50 watts.

In addition, A1 and A3 on portions of 1.800–2.000, as follows:

Area	*Band, kc.*	*Power (watts) Day*	*Night*
Minn., Iowa, Mo., Ark., La. and east, including Puerto Rico and Virgin Ids.	1800–1825, 1875–1900	500	200
N. and S. Dak., Neb., Colo, N. Mex., and west, including Hawaiian Ids.	1900–1925, 1975–2000	500*	200*
Texas, Okla., Kansas	1800–1825, 1875–1900	200	75

* Except in State of Washington where daytime power limited to 200 watts and nighttime power to 50 watts.

Novice licensees may use the following frequencies, transmitters to be crystal-controlled and have a maximum power input of 75 watts.

3.700–3.750	A1	21.100–21.250	A1
7.175–7.200	A1	145–147	A1, A3

Technician licensees are permitted all amateur privileges in the bands 220 Mc. and above.

• On the TVI Front

TVI TELEVISION SCRIPT NOW READY

ARRL's recently announced (page 9, July *QST*) television script on TVI has been put through several dry runs in the studios of one of the local stations, and is now ready for distribution to affiliated clubs for staging on stations in areas where low-band v.h.f. TV is in existence. Timed to 15 minutes' duration, the script is of the panel- or interview-type presentation, complete with slides illustrating the various kinds of interference.

Since only a limited number of sets of slides is available, now is a good time to sound out the program manager of your local station on the possibility of presenting this show as a public service feature. Once you get tentative acceptance, let us know promptly and we will put you on the schedule for the loan of one of the slide sets at the earliest open date.

50-MC. TVI FILTER

Keeping 50-Mc. r.f. out of TV Channel 2 is not a simple matter, but it is being done, particularly in areas where the TV signal is strong. W6NLZ, Los Angeles, describes a simple parallel-resonant trap that is small and inconspicuous. John winds 10 turns of No. 24 enamel on a Centralab 50-$\mu\mu$fd. capacitor, Type D6-500, and inserts one of these traps in each side of the TV antenna lead close to the receiver input terminals.

REVISED ROSTER OF TVI COMMITTEES

According to FCC, as of June 1st of this year there were 292 TVI committees functioning in the U. S. and possessions, a total of 281 communities being served. We reproduce this up-to-date listing for the benefit of amateurs living in, or in the environs of, these cities.

Alaska: Anchorage, Fairbanks.

Alabama: Anniston, Birmingham, Mobile, Montgomery.

Arizona: Tucson.

Arkansas: Fayetteville, Ft. Smith, Little Rock.

California: Berkeley, Coronado, Downey, Fresno, Fullerton, Hollywood, Inglewood, Long Beach, Marin County, Martinez, Modesto, Monterey, North Hollywood, Oakland, Orange County, Palo Alto, Pomona, Ontario, Richmond, Sacramento, Salinas, San Bernardino, San Diego, San Francisco (5), San Jose, San Mateo, Santa Rosa, South San Francisco, Two Meter & Down Club (scattered locations), Turlock, Vallejo, Ventura, Walnut Creek, Woodlawn.

Connecticut: Bridgeport, Hartford, New London, Norwalk, Norwich, Poquonnock.

Colorado: Boulder, Colorado Springs, Denver, Grand Junction, Greeley, Pueblo.

Delaware: Wilmington.

District of Columbia: Washington.

Florida: Ft. Lauderdale, Jacksonville, Miami, Orlando, Pensacola, St. Petersburg, Tampa, West Palm Beach.

Georgia: Atlanta, Augusta, Hapeville, Macon, Savannah, Warner Robins.

Hawaii: Honolulu; Hilo; Lihue, Kauai; Wailuku, Maui.

Idaho: Kellogg, Nampa.

Illinois: Berwyn, Broadview, Chicago, Decatur, Des Plaines, Freeport, Galesburg, Hollywood, Maywood, North Riverside, Princeton, Rock Island, Villa Park, Weston Springs, Wheaton.

Indiana: Elkart, Ft. Wayne, Gary, Portland, South Bend, Vincennes.

Iowa: Davenport, Sioux City, Spencer, Waterloo.

Kansas: Leavenworth.

Kentucky: Lexington.

Louisiana: Baton Rouge, Lake Charles, Monroe, New Orleans.

Maine: Augusta.

Maryland: Annapolis, Baltimore (2), Cumberland, Hagerstown.

Massachusetts: Boston, Fitchburg, Lowell, Pittafield, Springfield, Worcester.

Michigan: Birmingham, Bloomfield Hills, Ferndale, Flint, Grand Rapids, Grosse Point, Grosse Point Park, Hazel Park, Lansing, Mt. Clemens, Mt. Pleasant, Muskegon, Pontiac, Royal Oak.

Minnesota: Fairmont, Minneapolis, Red Wood Falls, Waseca.

Mississippi: Gulfport, Hattiesburg, Jackson, Keesler Air Force Base, Pascagoula.

Missouri: St. Louis.

Montana: None.

Nebraska: North Platte, Omaha.

Nevada: None.

New Hampshire: Concord.

New Jersey: Denville, Livingston, Morristown, Parsippany.

New Mexico: Albuquerque, Sandia Base.

New York: Binghampton, Brooklyn, Corning, Elmira, Hornell, New York, Niagara Falls, Penn Yan, Rochester, Roxbury, Salamanca, Syracuse, Watertown.

North Carolina: Asheville, Charlotte, Winston-Salem.

North Dakota: None.

Ohio: Cleveland (6), Columbus, Dayton, Greenville, Middletown, Newcomerstown, Springfield, Zanesville.

Oklahoma: Clinton, Ft. Sill, Lawton, McAlester, Tulsa.

Oregon: Astoria, Eugene, Medford, Pendleton, Portland, Salem.

Pennsylvania: Altoona, Boyertown, Chalfont, Dubois, Easton, Greenburg, Kingston, Lahaska, Lebanon, Lewisburg, Lock Haven, McKeesport, Myerstown, New Brighton, Oil City, Philadelphia (2), Pittsburgh, Reading, Scranton, Selinsgrove, Sharon, Solesburg, Wilkes Barre, York.

Rhode Island: Westerly.

South Carolina: Charleston, Columbia, Florence.

South Dakota: Mitchell, Rapid City.

Tennessee: Bristol, Chattanooga, Jackson, Knoxville, Memphis, Oak Ridge.

Texas: Beaumont, Brownsville, Corpus Christi, El Paso, Galveston, Houston, Lubbock, Orange, Pasadena, Port Arthur, San Antonio, Texas City, Woodsboro.

Utah: Ogden, Provo, Salt Lake City.

Vermont: Burlington, Middlebury.

Virginia: Fredericksburg, Newport News, Petersburg, Richmond, Roanoke, Staunton, Winchester.

Washington: Bellingham, Bremerton, Everett, Kennewick, Pasco, Richland, Seattle, Spokane, Tacoma, Vancouver.

West Virginia: Dunbar, Fairmont, Huntington, Morgantown, Nitro, Parkersburg, St. Albans, Weston.

Wisconsin: Eau Claire, Green Bay, Kenosha, La Crosse, Madison, Marinette, Milwaukee, Neenah, Racine.

Wyoming: Casper, Cheyenne, Cody, Gillette, Powell.

Others: MARS NET — Eight Western States: Interference Committee: Fourth Air Force; Hamilton, California.

A Tale of Two Tornadoes

Twisters Striking Flint, Mich., and Worcester, Mass., Find Amateurs on the Job, As Usual

BY GEORGE HART,* W1NJM

WHEN a mass of cold, dry air comes in over top of a mass of hot, humid air, a whirling turmoil results as the cold air tries to follow its natural tendency to go down and the hot air tries to rise. The cold air condenses the moisture with which the hot air is laden, and the rain pours down or is blown high by the rising warm air mass to freeze and eventually fall as destructive hail. The friction of the roiling air masses generates static electricity to form lightning and thunder, and the frantic mixing of the air masses caused by nature's abhorrence of unequal atmospheric conditions causes winds of varying speeds.

If these conditions are not too severe, chances are we get only thunderstorms and rain. If they are very severe and widespread, we get first and continuously the lightning and thunder, and then whirling air currents which sometimes swoop down to the ground and reach unbelievable velocities, and finally drenching rain and/or hail to add discomfort and hardship to the fantastic destruction wrought by the wind.

Such conditions existed in Texas in mid-May, causing the tornado which laid waste to Waco,[1] and later in May at Port Huron, Mich., and Sarnia, Ont.[1] On June 8th similar conditions began to develop generally throughout northeastern United States, and twisters developed in several places. What was unusual about these twisters was not that they were more violent than many which have occurred elsewhere in isolated areas, but that they struck with almost diabolical accuracy at several population centers in the Northeast. Particularly notable for their destruction were those which struck Flint, Mich., Cleveland, Ohio, and Worcester, Mass. We have already described amateur participation in the Cleveland tornado,[1] so this article will deal exclusively with the Flint and Worcester tornadoes on the basis of information supplied by our AREC officials on the scene.

* National Emergency Coördinator, ARRL.

[1] See p. 65, Aug., 1953, *QST*.

Flint

Tornadoes in Michigan are not an everyday occurrence, but neither are they such a rarity that the population was entirely inexperienced with the effect. Our source of information on the Flint tornado comes from SEC W8GJH, who happens to reside in that city, but who tells us that the Flint Emergency Coördinator, W8EEM, ran the show, and "I did as I was told." The following information is taken from his report, sometimes paraphrased and other times in his own words.

The Flint tornado first touched ground just east of Flushing, Mich., and traveled almost due east until it reached a point a mile or so north of Flint. Here it lowered its ugly head and howled up Coldwater Road and Kurtz Avenue in a path about 200 yards wide and four miles long, leaving complete destruction from there into the next county, a distance of some 31 miles from its beginning. W8GJH notified EC W8EEM and Assistant SEC W8RTN of the existence of the emergency, and 17 minutes afterward the Genesee County Radio Club's station W8ACW was in operation. The Red Cross Director asked that AREC radio units be sent to the disaster scene north of Flint as soon as possible. Two-meter units were dispatched to the area designated by the Red Cross with instructions to locate their units and report the needs and the extent of the disaster. Seventy-five-meter mobiles were told to move in and await further instructions from W8ACW.

Officially the tornado struck at 2032 on June 8th. By 2057 W8ACW was on the air and mobile and portable units were reporting in. A few short QSTs on 3930 kc. produced such wonderful coöperation from amateurs on that frequency that it was not necessary to request FCC clear-

A dazed Flint, Mich., home owner reports the destruction of his home to Red Cross Disaster Headquarters via W8HRL/M. Operator Cal Kasson, W8HRL, had more mobile hours than any of the many mobiles participating in the Flint disaster.

ance, although the FCC regional office in Detroit was ready to act. Within ten minutes after the tornado struck, the news hit the wires and was broadcast nationwide. The immediate overload on both local and toll telephone lines made them practically useless. This was when the many long hours of practice and association of local amateurs with the Red Cross paid off. Each knew the method of operation of the other. The Red Cross field units and personnel knew that their headquarters was just as close to them as that ham radio car with its little Red Cross flag. These cars (20 of them) were stationed at the Welfare, Receiving and Food Centers, and at the State Police post. They were scheduled in relays so that the operators and units had a chance for rest without adversely affecting coverage. This coverage was maintained for 76 hours on 75, 10 and 2 meters.

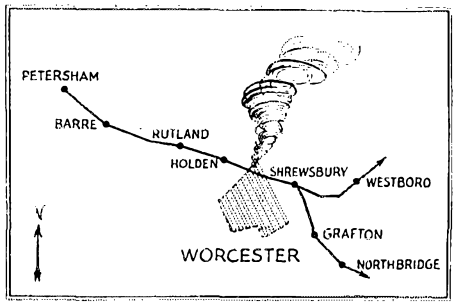
After the essentials in the way of official emergency communication were taken care of, the mobile units were given the names and addresses of people to locate in the devastated area. These investigations were most difficult in an area two blocks wide and four miles long where 291 homes had been pulverized, 66 more damaged beyond control and 93 others suffering extensive but reparable damage. The mobiles completed seventy such investigations, nevertheless. Home units on 2 meters who had telephones in operation also handled many Red Cross investigations relayed to them from W8ACW, since Red Cross telephone facilities were jammed. Some 261 Health and Welfare investigations were completed in this way. W8ACW closed down on June 14th at 5:30 P.M., after having been in operation almost continuously since June 8th.

All in all, the Flint AREC gang, composed mostly of members of the Genessee County Radio Club, kept the situation pretty well under control, mostly on 10 and 2 meters. Numerous offers of aid from other groups, although much appreciated, were declined. The Detroit AREC/civil defense gang in particular stood ready to send assistance in quantity, but on Tuesday morning, June 9th, the Assistant Communications Director of Detroit civil defense (who was in Flint) dispatched a message to W8WFA, Detroit area EC, informing him that assistance was not needed and mobilizing facilities could be released. Mr. Emery Lee, FCC Regional Manager, said in a letter to W8ACW, W8FSZ, W8QBO and W8GJH: "The Michigan amateur stations presently coöperating in the disaster effort are doing the best job of disaster communications handling that I have ever had the occasion to monitor." W8GJH says he is going to frame it, since Mr. Lee is not given to excessive praise.

Forty-six local operators participated, about 61 from the surrounding area. Fifty or more others around the state were logged assisting in whatever way they could, usually in keeping emergency frequencies clear. The Michigan Emergency Net was particularly helpful in this respect. W8GJH tells us that some 1307 man hours of time went into this operation on the part of Flint amateurs alone. The Flint AREC group is proud of the job it did in handling this unheralded emergency, as well it might be.

Worcester

In Worcester Tuesday, June 9th, dawned hot and humid, and the morning papers carried the shocking news of the Flint disaster of the previous day. The Weather Bureau said "Clearing, with little change in temperature." Later in the day, possible thunderstorms were predicted. The word "tornado" was not used, except in connection with other places, and everybody reading the morning paper was thankful that such things so rarely happened in New England — so rarely, in fact, that very few of the populace knew just what a tornado was. But late in the afternoon an



The Worcester tornado started in Petersham and roared eastward, hitting the northern section of Worcester just as everybody was hurrying home from work. Somewhere in Shrewsbury it divided without seeming to diminish in fury. It blew out at 1740 EDST after having spread havoc across the landscape for one hour and ten minutes.

ominous black cloud began to form in a quiet meadow near the little town of Petersham, and a whirling black funnel dropped to the ground to blast a crater 100 feet in diameter and six feet deep. The metamorphosis having thus been completed, this monster ran amok through the central Massachusetts towns of Barre, Rutland, Holden, the northern part of the city of Worcester, and on into suburban Shrewsbury, where it divided, one twister heading east-by-northeast into Westboro and Southboro, the other southward into Grafton and Northbridge. It started in Petersham about 1630 EDST, hit Worcester just as everybody was going home, and blew itself out at 1740. Everywhere it hit, it left fearful destruction.

Amateurs were active on three bands. On 10 meters, the Worcester Local Civil Defense 'Phone Net was activated and remained in operation almost continuously several days, with Worcester EC W1SPF at the helm. On 75, the New England Emergency Net handled thousands of welfare messages on behalf of tornado victims, with the help of the Transcontinental 'Phone Net. On 80-meter c.w., the Western Mass. Net (WMN) was active for several days, and the First Regional Net and all New England Section nets remained in action extra hours to handle tornado traffic. We are indebted to W1SPF, to county

EC W1RO (whose home in Shrewsbury was destroyed), to West Mass. RM W1BVR, to SEC W1KUE, to SCM W1JYH and to W1SS for the bulk of the information making up this narrative, which is being compiled from detailed reports submitted to headquarters by each.

EC W1SPF was alerted at 1800, June 9th, and immediately started setting up emergency communications on the regular c.d. frequency of 28,720 kc. By 1930, 8 mobiles and 8 fixed stations were in operation. By 2230, W1BIM was set up in the Red Cross building near c.d. headquarters by W1CLU, from equipment made available by W1s ONA, CLU, NTT, SPF and Harvey-Wells Electronics Co. W1MUN and W1QCQ were among those who took initial tricks. Landlines were run to c.d. headquarters and traffic began to pile up so that it was necessary to install more equipment and activate another frequency (29,560 kc.) for handling of personal traffic. Official traffic, estimated at 900 messages, was handled by W1BIM with W1s TAW/M, CS/M, JWS/M, UQL/M, QCQ/M, UQW/M, PIV/M, AAP/M, CLU/M and TBU, the latter in Shrewsbury. W1JNA and W1SAS operated into the 28,720 net all Tuesday night. JNA was also relaying traffic coming in from JWM/M in Shrewsbury and from TRC in Maynard. Some of this traffic were c.d. offers of aid from surrounding towns. By June 11th the traffic load was so heavy that W1MUN, who was helping out at W1BIM, returned to his home and cleared over 70 Red Cross messages.

FCC recognized the existence of a "voluntary" communications emergency on Thursday, June 11th, and requested amateurs to refrain from using 28.72 and 29.56 Mc. except for emergency traffic. W1AW also transmitted this request as a Special W1AW Bulletin.

On June 12th, W1MUN handled over 130 Red Cross messages with W1TBU in Shrewsbury on 29 Mc. Traffic began to taper off by June 13th, and all temporary operation ceased on June 15th. The following is a list of all those not already mentioned who assisted with the emergency communications in Worcester on 10 meters: W1s AAP HMB LFI LIB MCL NJF NMB NTT ONA/M PIE RVR SOZ SPG SPI TAW VAK VDS VDT VMF YCE and W2WCF/1.

W1SPF wishes special mention to be made of the following, who were particularly outstanding in the service they performed: W1UQW, W1TVJ, W1VHN; also Lt. Col. C. E. Harris and Sgt. John Gregal of Worcester Tech. ROTC, who made the valuable services of K1WAR available.

Communications in and out of the city were very well handled on the 75-meter band via TCPN and the New England Emergency Net on 3795 kc. W1SJO started the ball rolling with W1TOP and W1ULF. W1ULF, with the assistance of W1ULE and GHU on the 'phone, batted out the traffic continuously until 0300 June 11th. W1RLQ assisted as relief operator at ULF on June 10th until her power came on that evening. She then activated her own rig and with QQQ helping on the 'phone she began to roll up the count. These two girls (W1ULF and W1RLQ) rolled up traffic counts of 674 and 253 respectively. They did a beautiful job. W1SAS took inbound traffic and relayed to K1WAR. W1SS then activated 3965 and 3955 kc. with W1RYJ and K2CA acting as net controls and W1s LBJ MME SCS and RNA alternating as net controls. W1TBU was on from Shrewsbury, W1ULY from Westboro, and W1EKN from Holden. A local commercial radio equipment company, the Fred G. Walters Co., offered to take any message and deliver via taxi radio and taxi service free of charge so long as no other means of communication was available. In this way, it was possible to obtain answers in minutes.

The Deep Sea Dragnet and TCPN combined part of the time. This helped considerably on the 10th and 11th. The outstanding feature of this operation was the female voices — unwavering, calm, businesslike, efficient — which definitely established the rôle of the YL operator along with the OM in time of emergency.

Other 'phone traffic in and out of the area was handled on 3930 by W1MJE, W1TRD and W2NOC, who contacted W1s AQM/M RO/M KC TBU EKN and others. At times 3910 and 3955 were used and this helped relieve the load on TCPN.

On the Western Mass. c.w. net on 3560 kc. the first contact with the area was established by W1TVJ at Sterling, who was relieved by W1AMI of Worcester until 0200 Wednesday. W1LTA worked through Wed., Thurs. and Fri. nights on both WMN and 1RN, part of the time as NCS. Jim's family took in the traffic by 'phone during

(Continued on page 110)

♦

Worcester EC W1SPF was in charge of the 10-meter control station in the Red Cross Chapter House, which is located near Civil Defense Headquarters. The call W1BIM was used. Standing on the left is W1SPG. Seated at the table, left to right: W1VDS, W1AAP, W1SPF. A Red Cross messenger awaits traffic at right.

He Makes What We Hams Use

ALBERT KAHN, W8DUS
Electro-Voice, Inc.

CQ SS de W8DUS. . . . Well known to Sweepstakers since 1951 — and before that as W9KYM — Al became seriously interested in contests after 25 years of being on the air. The Boy Scouts of South Bend, Indiana, lost a good 13-year-old member when Al's troop took up radio in 1922, because rag-chewing and traffic handling with his first call 9BBI immediately took precedent over everything else in Al's life. Spark gave way to vacuum tubes and when W9KYM was issued in 1932 Al was active on all authorized c.w. and 'phone bands. The same enthusiasm that kept him pounding brass with no success during the 1922 Transatlantic Tests paid off when applied to later activities. Al has been ORS, has made BPL, was on hand as each band opened after the war, and, as W8DUS, is the possessor of WAC and DXCC Certificates. Unless there's a contest going on, looking for new countries is the chief activity, but W8DUS always welcomes a chat on either c.w. or 'phone. Author of "How Microphones Work" in *QST* for September, 1945, and codeveloper of the lip mike used by our armed forces during W. W. II, Al's great ambition is to make the highest score in the Sweepstakes in his ARRL section — on c.w.

FEED-BACK

In the description of the 420-Mc. r.f. amplifier, August *QST*, page 16, the diameter of the r.f. chokes should have been $\frac{3}{16}$ inch, not $\frac{3}{8}$ inch, as it was given under Fig. 2. Thanks to W1RFU for calling this to our attention.

HAMFEST CALENDAR

INDIANA — Sunday, September 20th, at the Rural Center, 7½ miles north of Evansville on Highway 41 North — the Tri-State Amateur Radio Society will hold its Annual Hamfest. Activities will begin at 10:00 A.M., with a family basket dinner at noon. Numerous games and activities will be provided for all members of attending families. Refreshments available on the grounds. Transmitters on 3.9 and 29.6 Mc. will be in operation during the Hamfest. Registration is $1.00 and details may be obtained from Fred Sawyer, W9FJI, 627 E. Virginia St., Evansville 11.

KANSAS — Sunday, September 6th, at Dodge City — the Tri-Cities Amateur Radio Hamfest. The program begins at 9:00 A.M. and will include many fine features such as a mobile hunt, demonstration of a new type of modulation by W2ZHH, and special activities for the XYLs and children. Luncheon will be covered-dish style. Jesse Isenagle, WØQCH, 505 E. Hazel St., Garden City, will supply further data.

KANSAS — Sunday, September 13th, at Elk's Park, Independence — the Se-Kan Radio Club will hold its Annual Picnic. A transmitter hunt will be one of the attractions. Write to R. E. Baker, WØFNS, 1014 Lincoln, Neodesha, for information.

NEW JERSEY — Sunday, September 13th, at Locust Grove Farm, Almonesson Road, near Westville, about 5 miles south of Camden — the Annual Hamfest of the South Jersey Radio Association. Program starts with registration (at $1 for entire family) at 10:00 A.M. There will be free soft drinks but picnic lunches should be brought. Facilities include a play area for small children and picnic grove. In addition, there is a screened pavilion with tables for nearly 300. Program will include a two-meter transmitter hunt. Mobiles contact K2AA on 2, 10 and 75 for driving instructions. Write Bill Bowers, W2EGP, 303 Lakeview Ave., Haddonfield, for additional information.

NEW YORK — Saturday, September 26th, at the Masonic Temple Dining Room, 230 Main St., Oneida — the Oneida Area Amateurs will sponsor the 8th Annual Hamfest & Ladies' Night. Admittance at $2.75 is by advance registration only and is limited to 150, the capacity of the dining room. Registration at 5:00 P.M. with banquet at 7:00. Make reservations with Walter L. Babcock, W2RXW, 405 Sayles St., Oneida.

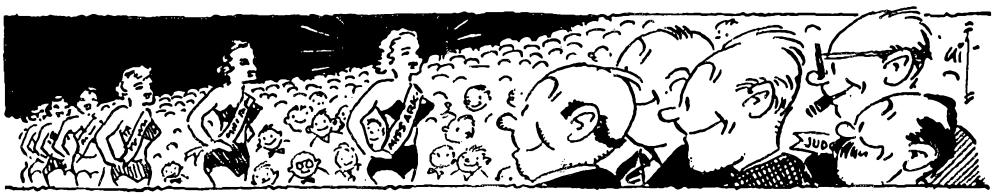
NEW YORK — Friday, October 9th, at Lost Battalion Hall 93-29 Queens Boulevard, Elmhurst — the 17th Annual Hamfest and Dance of The Federation of Long Island Radio Clubs. The program will include get-togethers for amateurs having special interests (DX, v.h.f., traffic, etc.) and entertainment and favors for the XYLs. Advance registrations are $2 for amateurs and $1.25 for XYLs. Registrations at the door will be $2.50 and $1.75, respectively. Tickets may be purchased in advance from Julian Jablin, W2QPQ, 147-14 Charter Road, Jamaica 35.

OHIO — Sunday, September 13th, at Ash Grove, Winton Road, Cincinnati — The Greater Cincinnati Amateur Radio Association's Stag Hamfest and Radio Parts Show. Refreshments, dinner and supper will be included in the share-the-cost plan, as usual. Admission is $2 at the gate. Further details may be obtained from W8IVE or W4OMW.

COMING A.R.R.L. CONVENTIONS

(*Details on page 59*)

Sept. 5th–6th — Delta Division, New Orleans, La.
Sept. 13th — New Hampshire State, Concord, N. H.
Sept. 19th–20th — New York State, Buffalo, N. Y.
Sept. 19th — Eastern Canada, Montreal, Que.
Oct. 9th–11th — Southwestern Division, Los Angeles, Calif.
Oct. 10th–11th — Midwest Division, Lincoln, Nebraska



Written in the Stars

BY ROD NEWKIRK,* WIVMW

She was a knockout, all right. In fact, nobody was very much surprised when petite and demure Susie Sopenwater walked off with the Miss America title at Atlantic City one summer. She might have left well enough alone after that, but would she? Not Susie. Not by a long shot.

It was as she was handed a sheaf of radiograms culminating from the Governors-to-Miss America Relay that the well-known Bug caught her. She cooed, "Say, what is this ham radio?" and that was her undoing. An alert newshawk caught the query, scribbled it down and the next day's papers carried the banner, "NEW MISS AMERICA INTERESTED IN AMATEUR RADIO," from coast to coast.

That was all, brother. That was *it*.

* * *

After a hectic and triumphant itinerary throughout the land — appearances on TV shows, doing the lead in "Maid in Japan" for NGN, endorsements for Bloatie Toasties and chlorophyll pizza dough, et al — Susie had no inkling of things in store for her when she wearily arrived back home in Knobaloosa, Arkansas.

She failed to notice three hams cruising her immediate neighborhood in 10-meter mobiles who spotted her approach and passed the word along to the boys on the frequency. Local nets were alerted in jig time and the rush was on.

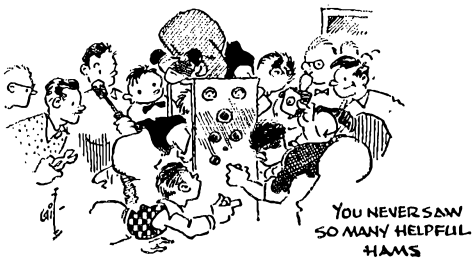
What happened afterward is rather difficult to believe, but before Sue realized it she had learned the code and was up to 7 w.p.m. — in three hours flat. Autos labeled with call signs were parked

MOM AND DAD TOOK COVER IN THE CYCLONE CELLAR

bumper to bumper for blocks around her modest domicile, the front yard was a shambles, and the Sopenwater front door was hanging on one hinge.

Perhaps the only thing that kept Susie from mastering the Novice theory exam immediately was the sudden appearance of a bunch of XYLs with rolling pins. Mom and Dad Sopenwater took cover in the cyclone cellar until the storm blew itself out, after which they came back upstairs to find their daughter thumbing through one of the 178 *License Manuals* her benefactors had left behind.

Susie did get hep to radio theory in a very short time, thanks to the bachelor contingent that arrived next day. The boys — all 76 of them — afterward escorted her over to Little Rock where she passed the Novice exam with flying colors. Indeed, attentive FCC inspectors kept correcting



each other's gradings until Miss Sopenwater had marks of 109 per cent on the code test and 117 per cent in theory — highest grades in the records of the office.

Washington haggled for a day or two over the call to be assigned. WN5WOW was unavailable so they stretched things a bit and secured for Sue a call sign equally appropriate — WN5PIP.

WN5PIP's shack was set up with considerable fanfare and contained the snappiest-engineered station in the county. Gear was volunteered by radio clubs for miles around (with little or no enthusiasm on the part of women's auxiliaries) and you never saw so many helpful hams checking one rig for TVI and parasitics that weren't there in the first place.

Susie surreptitiously attempted to have her first QSO in the peace and quiet of the wee hours of a Monday morning. However, an ambitious local with a converted Geiger counter detected the first signs of her radioactivity and the pile-up on WN5PIP's frequency after her first nervous short CQ was dozens deep on an otherwise dead band.

Like the plucky kid she was, Sue stuck with it. And when the rising sun heralded the dawn a few hours later, WN5PIP was on record with the

(Continued on page 118)

* DX Editor, *QST*.

Hints and Kinks For the Experimenter

QTH FINDER FOR CALL BOOK USE

TAKE an ordinary post card or a similar piece of material and cut a slot at each end as shown in Fig. 1. This device displays only one QTH at a time as it is moved along a column of a call book.

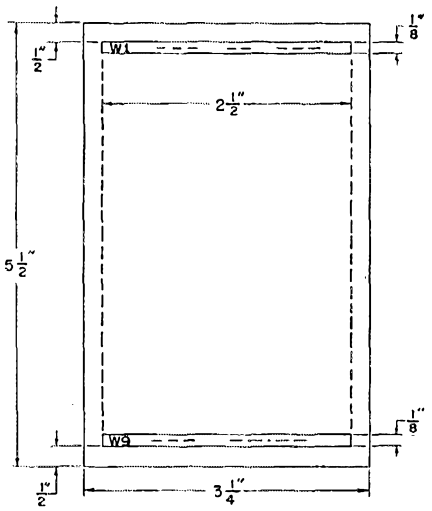


Fig. 1—Drawing of W1TXY's QTH finder.

The card should have the slots located not more than a half inch in from the bottom and the top edges so that it will facilitate QTH hunting at the bottom as well as the top of a column. — *Ralph S. Noyes, W1TXY*

ANOTHER INEXPENSIVE SOURCE OF SHIELDS

ORDINARY 5-gallon cans make ideal shielding for small transmitters, antenna couplers, etc. Most of these measure approximately 9½ by 9½ by 14 inches, are easy to work with and take solder readily. The cans can usually be obtained either for the asking or for an exceedingly small financial outlay. — *James C. Geras, W2MVR*

TIGHTENING HARD-TO-GET-AT NUTS

IN tight places, how often has one ended up by using a center punch and hammer to tighten a shaft or mounting nut? Although this system is quite acceptable, it can be improved upon by using a spring-loaded center punch as the driving tool. Just snap the punch on the periphery of the nut and the latter will drive home, tight and quickly. Of course, the use of the spring-loaded job leaves one hand free for holding the object being worked with. — *C. Deane Kent, W2JFA*

LIGHTWEIGHT "GUY WIRES"

MONOFILAMENT fishing line leader, made of Du Pont nylon, sold in 100-yard rolls for approximately $4.80, makes lightweight guy lines that are easily handled, nearly invisible and free of properties that affect antenna radiation patterns. The type having a diameter of 0.032 inch and a test strength of 40 pounds is being used here at W9FKC to guy a 33-foot vertical and has been through winds up to 60 m.p.h. during the last four months. — *Myron Hexter, W9FKC*

CENTER GUIDE FOR PAWOOD CIRCLE CUTTERS

WHEN using a Pawood circle cutter try using an ordinary panel bushing as a guide for the center drill of the cutter. If the bushing inserted in the material to be cut has a shaft hole that just clears the center drill, it will act as a bearing during the cutting operation. The cutting of large diameter holes will be much smoother and the cutting point will have less tendency to bite into the material if center-drill wobble is eliminated by this simple method. — *C. Deane Kent, W2JFA*

PROTECTION FOR RESISTORS DURING SOLDERING OPERATIONS

SMALL composition resistors frequently undergo a change in resistance during soldering, and even though the resistor is not completely damaged, it may become unusable for the application on hand. The ordinary method of protection or heat dissipation that uses pliers clamped onto the resistor lead is inconvenient because it makes a one-handed soldering job necessary.

A simple tool or heat-dissipating gadget that can be made up in a moment's time is shown in Fig. 2. The clip is bent from a small strip of copper and its size will determine the rate of heat dissipation. To be most effective, it should be

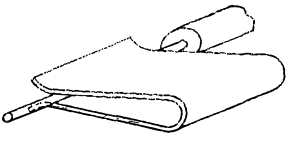


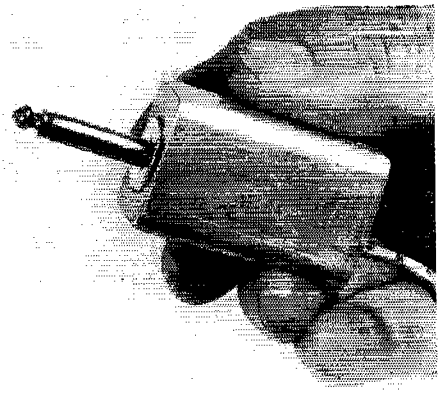
Fig. 2—A heat-dissipating clip as described in the text.

as large as space and component size permit, and should be clamped onto the lead close to the body of the component. It can be clamped in place by an alligator clip, which will tend further to increase the heat-dissipating ability of the device. The gadget will afford protection for crystal diodes, small capacitors, etc. during soldering.

(*Continued on page 120*)

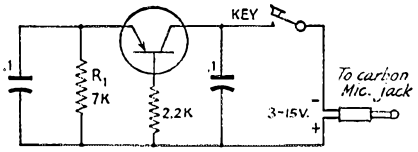
A Transistor M.C.W. Adapter

BY H. V. BRAUN,* W2RKB



THE development of the transistor has made possible some extremely simple and novel devices, particularly since the transistor requires so little energy for proper operation. It was felt that a simple transistor oscillator that could provide a keyed audio tone to a transmitter modulator would offer an excellent opportunity for expanding civil defense training or any other application where a keyed tone is required.

After some thought and some "monkeycering," the oscillator shown in the photographs was developed. It is a transistor oscillator that may be plugged into a carbon microphone jack and be keyed to produce m.c.w. (modulated c.w.). It derives its operating current (2 to 10 ma.) from the existing microphone current source and, since it requires no warm-up time, it is ready for use as soon as it is plugged into the microphone jack. The entire circuit (Fig. 1) is assembled on a Yaxley 'phone plug that has been fitted with a



All resistors ½-watt composition
All condensers 200-volt paper

Fig. 1 — Wiring diagram of the transistor oscillator.

1 7/16-inch aluminum extension. As shown in the photographs, this extension is secured to the ground terminal of the plug and serves as a miniature chassis for mounting the transistor socket and two stand-off terminals. The dimensions of the extension are shown in Fig. 2, and the method of mounting it and the rest of the parts can be seen in the photographs. After the circuit is assembled and wired it may be covered with a shield can, potted in casting resin, or just left out in the open. (Our shield can is off more than it is on, for demonstration purposes.) The unit uses a point-contact transistor and was designed specifically for use with the c.d. equipment built by the Livingston Amateur Radio Club and described in the April, 1952, *QST*. However, it will work satisfactorily when

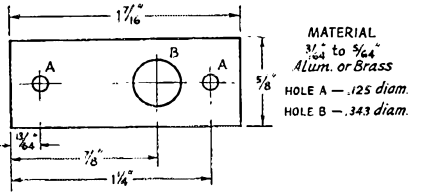


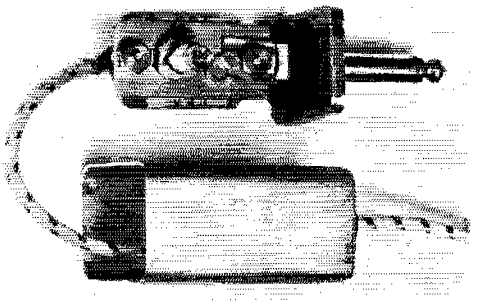
Fig. 2 — Details of the oscillator mounting plate.

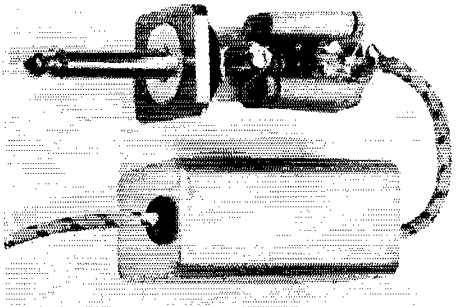
plugged into any rig that is normally equipped with a carbon microphone. R_1 may be used to control the audio frequency of the device, and some adjustment of this resistor may be necessary when other transistors are used or a different modulation frequency is desired.

Caution: Check the polarity of the supply voltage carefully, since the application of voltage of the wrong polarity will probably ruin the transistor.

* 30 West Cedar St., Livingston, N. J.

Views of the transistor oscillator, mounted on a headphone plug. The cord extending out the back contains the key leads — the oscillator is plugged into the carbon microphone jack when in use. The normal microphone power source also powers the oscillator.





YL NEWS and VIEWS

BY ELEANOR WILSON,* W1QON

W6QPI and W2JZX are two YLs who, because of their organizational efforts, were largely responsible for the success of the 1953 All-Women's Transcontinental Air Race and for the effective liaison between amateurs and contestants. The complete story of the race is given elsewhere in

Viola Grossman, W2JZX, (right) and Betty Gillies, W6QPI, leaders in organizing amateur communications liaison for the 1953 All-Women's Transcontinental Air Race. (*Lower photo by W1PFA*)

this issue, but here we take particular pride in saluting Betty and Vi and *all* of the YLs who spent many hours organizing, relaying, monitoring and assisting in every way possible.

Of the thirteen chairmen of amateur operations at each stopover city, four were YLs: W2NAI, Marge; W8ZGT, Lillian; W9GME, Grace; and W6NZP, Evelyn. Members of the Los Angeles unit of the YLRL handled Palm Springs and Long Beach operations. A list of YLs and OMs who assisted is given with the more detailed report on page 64.

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

Betty Gillies, this year's AWTAR Chairman, herself a contestant in last year's race, received her General Class amateur license (W6QPI) in April. As a result, Betty was better able to coordinate activities between the flyers and the amateurs.

Viola Grossman, W2JZX, has long been well known for her outstanding ability to organize. This year, as last, Vi set up a cross-country network of amateur stations; and it was under her experienced direction that amateur operations from East to West were so efficient.

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Responding to the confusing subject of "YL, XYL" terminology broached in the July column, an OM is the first to offer a suggestion. W4YN wonders about using "LO" for Lady Operator in lieu of the popular but misleading term "YL." If single, a girl would call herself an "SLO" — Single Lady Operator; if married, "MLO" — Married Lady Operator. The suggestion, while a good one, might be complicated by the fact that a number of OMs as well as YLs *are* LOs (League Officials)! We're QRX for additional ideas.

Keeping Up with the Girls

YLRL President W1BCU announced that VE3DEA, Denny, will be the VE District Chairman for the current term. . . . W3MSU helped to organize an amateur display at the Naval Research Laboratory's 30th Anniversary Celebration on July 2nd. Ethel later got a chance to "hitchhike" (by military aircraft) down to the ARRL National Convention in Houston. . . . W7SFR, Lorraine, reports that a number of Washington YLs have formed a new net. Girls who have checked in to date: W7s COX GXI JFB PTX PTY QYN RHM RSA SFR and SFS. They call themselves the NYLONS (Northwest YL Operators) and W7QYN is NC, with W7JFB as alternate. Net time is 8:30 A.M. PST, Wed., on 3820. . . . June 24th, W8BFQ, Everett, O., and OM W2QED, Seabrook, N. J., set a new 420-Mc. DX record. Details were in August *QST*. Margaret has now worked 24 states on 144 Mc., 4 on 220, 42 on 50, and 4 on 420. . . . W1YYM, Ellen, has been working out well from her new QTH in Hartland, Conn., on 75, 40, 20 and 15 meters. . . . New officers of the Los Angeles YLRC are W6KER, Gilda, Pres.; W6PJU, Mildred, Sec.; W6QGX, Harryette, Treas. W6WRT, Ruby, continues as Publicity Chairman. W6CEE, Vada; W6KER, Gilda; and W6UHA, Maxine, are planning the YL program for the Southwestern Division Convention to be held in Los Angeles, October 10th and 11th. . . . W2FBZ had the second highest score for the Northern New Jersey section in ARRL's June v.h.f. contest. Liane is on 144 Mc. almost every morning. She also works 50 and 220 Mc. regularly (this info from W1HDQ who worked her on three bands during the contest). . . . W6EHA, who has been portable-five in New Mexico for some time, has returned to Santa Monica. Gen's last contact from W5-land was with W6CEE, Vada, and her OM, W6HWM, who were visiting VE3DTW, Ethel, and her OM, VE3TW, at the latter's station on a lighthouse near St. Catherines, Ontario. . . . W2JZX, Vi, boosted amateur radio when she was interviewed recently on WJZ-TV in N.Y.C. . . . W3CDQ, Liz, sends greetings from W4HWR, Hilda; G3ACC, Meg; and G2YL, Nell, whom she met in London on the first leg of her European trip. . . . W4NUB of Bay Minette, Alabama, is proud of the fact that at the age of seventy, she's an active YL. Since receiving her license three years ago, Anna has started each day with a 5:30 A.M. schedule with her son, W4FNW. . . . YLs who attended the annual Deep Sea Dragnet picnic at the home of NCS W1PU, Sylvester, at Lanesville, Mass., were W1s RLQ SCS UKR ULF UQA VXC QON, W2s EEO JZX and W3MAX. W1RLQ, Chata; W1SCS, Ruthe; and W1ULF, Tweet, were each presented artistic copies, hand-done by W2JZX, of W1BTY's poem, "The Gal Be-

(*Continued on page 116*)

How's DX?

CONDUCTED BY ROD NEWKIRK,* W1VMW

How:

Handles Sigwiggle, who has the largest collection of logbook names in our club, flipped off his 'phones to answer the landline. The buzz was from our newest member, Pipeline O'Droole, who signed up with our outfit at a meeting a few nights earlier and who had earned himself quite a DX rep down Podunk way.

Pipeline tells Handles he has the kw. uncrated and fired up and asks if there's anything good on 20 or 40. Handles says sure; CRØCK is under a pile-up on 14,101 and BO1NGG is doing rush business on 7053. Pipeline says thanks and hangs up. A minute later Handles hears Pipeline's resonant filter blast into the CRØCK mess with a long call. The 'phone rings again.

"Lotsa racket here tonight, Handles," says Pipeline. "Did I raise him?"

"Yeah," answers Handles. "He gave you 389."

Pipeline hangs up with thanks and Handles hears him give CRØCK a pretty fair report and PSE QSL. Then about a minute later Handles hears him barge into the BO1NGG dogfight on 7 Mc. with another long call. The telephone clangs once more; it's O'Droole.

"Guy upstairs using a vacuum cleaner, Handles. Did he come back?"

"Sure," answers Handles. "Gave you 499x." Pipeline hangs up and Handles hears him finish with the BO1.

Handles hit the sack, thinking nothing of it beyond musing how that O'Droole can get out — man! That is, he thought nothing of it until next club meeting. There it turned out that every guy in the organization had beaten gums with O'Droole in like fashion during the preceding two weeks. A poll of the delegation established that Pipeline had worked at least 107 countries in the process — all this with QRN and QRM apparently fighting him every inch of the way.

Well, we just *had* to hold our next clambake at Pipeline's place. This was duly arranged, and after a draggy session O'Droole reluctantly let us see his shack. Since there was no sign of a receiver — just one of the fanciest kilowatts we ever saw — Pizzapie Spinosa queried him on the subject.

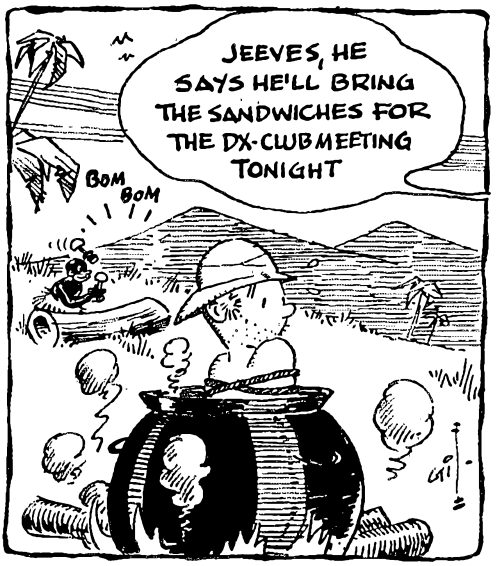
"Receivers? Never mess with the bothersome things," replied Pipeline. "QRM, QRN, ITV and stuff, you know."

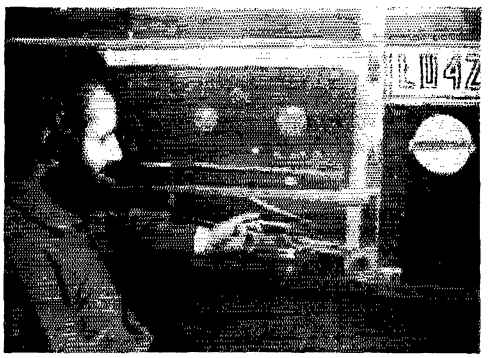
DXCC without a receiver! The boys caught on fast and we made up for lost time. Now the club has another new member, a sharp SWL out in the sticks who does all our receiving for us. Next week we install a landline switchboard out at his place to handle the terrific load anticipated when conditions get hot again, if ever they do.

* DX Editor, *QST*.

What:

On *twenty c.w.*, or almost any ham band for that matter, much of one's interest derives from the fact that one never knows just what's going to happen next. If Asiatic signals peak at 0800 on two days in succession there's still no assurance that the same situation will prevail on the third day. An outstanding case in point is The Singular Affair of the Returned Tibetan, wherein W6s FSJ and SAI abruptly found themselves chewing the fat with **AC4NC** (14,118) one recent morning. It seems that the Gs got wind of Chak's return to the air first and this was enough to vibrate the DX grapevine from here to VK6. A clipping from the Los Angeles *Times*, via W6EAY and W1WIQ/6, told the yarn in well-edited prose and constitutes one of the better examples of favorable amateur radio publicity. If AC4NC is actually back at the same old stand — W6SAI is convinced of his authenticity — clear your DX decks for action and ready yourself for five-layer pile-ups to come . . . . . "DX conditions on 20 improving," opines W8EV. Ben, ex-W4EV, put his 100 watts to work on **HE9LAA** (028), **OQ5GU** (028), **SU1CN** (075), **VR2AS** (037), **W7PLI/KG6** (052), **ZK2AA** (100) and **ZP5AY** (067) to reach the 101st rung. **KR6LX**, **OD5LX** (061 t8) and **SP1KAA** (061) slipped away. New local Cincy QRM from movers-into-town W4EPA and W8BRA will really keep Ben on his toes . . . . . CR9s AE AF, VS7MC, VU2s JK LL and **XZ2OM** (020) kept KL7PI interested, XZ2OM appearing regularly around 1430 GCT . . . . . W2ZVS was attracted to the likes of **CR5AA** (007), **EAs** 6AF ØAB (003-060), FF8AG, **FKS8AA**, **FO8AI** (020), FP8AP, **HZ1AB** (068), IS1s CXF SMB, MF2AG, MP4BBD, OE13BR, SU1SS, SVs 1SP ØWE, **VP5BF** (057), VQ4PP, **YI2AM** (060), ZB2I, ZP6CR, 3A2AY and **5A1TM** (012 t8c). Dixie keeps an ear on his first love, 28 Mc., but finds that band still in hibernation . . . . . CP1BX, GD3IBQ, HA5BD, I1BLF/Trieste and 4X4DK succumbed to W2KGN's ground-plane, while W1WPO latched onto **FU8AC** (020) with little reluctance . . . . . W2LYO finds 20-meter conditions best in New Jersey around 1600-2000 local time for catches like **GD3UB** (030), EL2P, VP7NM, **YU1AG** (015) and ZC4IP . . . . . W2CWK, as at home in traffic work as in DX doings, caught up with **CR6AI** (020-084), SVØWG of Rhodes (020), YI2AM and **ZC6OR** (040). Jim's best 14-Mc. hours are between 2100 and 2300 GCT. These got away: **ET2SM**





Landscaping and operating position at LU4ZI, Deception Island, South Shetlands. The Radio Club of Argentina asserts that there is no truth to the tale that the British "closed down" LU4ZI. "[LU4ZI operator] Mr. Vicente's return to the continental territory of Argentina was due to the normal and routine relief of the Scientific Mission on Isl. Deception done annually by the Argentine Navy," writes LU8CW, RCA Secretary. Over 2500 LU4ZI QSL cards have been distributed. Argentine Antarctic stations now in operation include LUs 1ZI, 8ZI, 1ZO, 2ZO, 3ZO, 4ZO, 5ZO and 6ZO. *(Photos via LU5CK and W2ESO)*

(060), FQ8AR, SVØWE and YN1OC (020). The W2CWK tally stands at 113/125 . . . . . W4ZAE's TCDXC cronies came up with **CT2BO** (003-032), **HB1LO** (053), **HH3L** (055), **IS1AHK** (051-070), **KA6IJ** (048-077), **OX3GG** (018), **PI1LS** (055), **SP2KAC** (078), **VP3YG** (020), **VS1FE** (078-093), **ZCs** 4AA (100), **5VS** (062), **9S4BS** (065) and many YUs. Keep an ear on those ZC5s — W6MX writes that ZC5VS may pop up in Sarawak . . . . . W3AXT was among those surprised to work **UG6KAA** (020), while W1BTQ is suspicous of one raspy HV5XX. As screwy as they may sound, it pays to pass none of them up! . . . . . **VQ5RO** (040) was W9HUZ's 200th country worked — Van has come a long way in a short time. Other recent customers at W9HUZ were **DU7SV** (082), **FK8AE** (014), **HR1UA** (100), **KR6LJ** (018), **KX6s AY** (058), **BC** (080), **SU1s CN** (050), **TQ** (020), **VKs** 1BA (014), **9RM** (030), **W5TUX/KJ6** (046), **3V8AJ** (026), a YI2 and a ZK2. An HH3DM QSL made it 176 confirmed for Van. He reported HV5XX as coming through about 40 degrees too far to the south . . . . . Hungarians are back on in force. **HA7PC** (070) answered YV5FL at 1525 GCT. Other Venezuela-style luck with freqs and times gleaned from Corny's fattening ledger: **OD5BH** (075) 2110, **SP9KAD** (080) 2100, **VU2ZW** (080) 2035, **ZB1BU** (000) 2125, **ZK1AB** (040) 0450 and **9S4AZ** (060) 2215 . . . . . W6ZZ cuts a wicked swath through the Land of the Rising Sun. JAs 1AO 1BN 1CR 2AT 3AH 3AZ 3BP 5AA 5AG and 6AD joined Miles' collection. Other W6ZZ successes include DU1FC, KAs 2JF 3AF 8SC and KG6AAL . . . . . W7OEB collected, among others, **CR9AH** (150), **KB6AY** (063), KC6AA, KM6AX and an FK8. A new 6AK5 preselector and pi-section antenna coupler allow Ev to dip into the lower layers . . . . . YU1BCD was glad to raise KV4BB and CR6CS, while W1YCG/3 settled for DL6WZ as his first DX station worked . . . . . W6KPM and the Pacifico Radio Club combined Field Day with a spell of DXing during ten days in the mountains of southern California. A 6-wavelength-per-leg Vee at 14 Mc., pointed toward Europe on the 7000-foot summit of Mt. Pacifico, netted them a fast WAC and QSOs with C3BF, CR9AF, CX5AF, DU1MB, JA3s AZ BP, **VSs** 1FT and **2CP** (046-076). Teenagers make up the majority of the club and they really had a ball! . . . . . W2HSZ took the measures of **EL2A** (045), JA2AT, KA8AB, KR6s LL LP, **VS9AS** (030) and 4X4BX through the coöperation of his new folded dipole. CR4AJ and OQ5GU keep escaping but MI3LK, VQ4NZK and ZB1BU came through with QSLs . . . . . W8JGU is still rolling along. Bill worked **CN2AS** (050), **CR4AJ** (060), **EA9AP** (020), **FA8DA** (080), HK1IQ, **HZ1HZ** (032), **KA2MH** (055), SP1KAA, **TA3AA** (011), TF5SV, **ZB1BU** (021) and **9S4AX** (010) as well as CR6, FQ8, GD3, KB6, OD5, SU1, VQ5, ZK1, ZK2 and 4X4 entries already listed . . . . . **CR1ØAB** (084), **FO8AC** (015), **FK8AB** (085 t8), **HH2G** (039), **HV1A** (091), **HZ1AB** (068), **IT1TAI** (086 t8), **KX6BG** (112), **LB5DD** (055), **MP4AJW** (118) of Qatar, **OD5AD** (017 t9c), **TF3AB** (017), **UA2KET** (078), **UQ2AE** (029), **VK9WL** (069), **VSs 1DA** (076), 1DL (048 t8), 1FR (090 t8), 2DF (050 t8), 6AE (077-093), 6CG (027 t8), 9GU (078) in Aden, **YO3RF** (050), **ZCs 2MWW** (177), 3AA (078), **4X4s BT** (060) and **FQ** (007 t8) are listed as likely candidates by the West Gulf DX Club *DX Bulletin*.

Now turning to *twenty 'phone*, this same organization recommends A3 actives or potential actives **AC4NC** (14,118), CR1ØAA, **DU1s AP** (185), **AS** (180), **FO8s AD** (148), **AI** (125), **FK8AB** (175), **HI8WF** (190), **HR1AE** (325), **KA8AB** (205), **KG6IG** (200), **KR6s GP** (205), **KS** (205), **KS6AB** (290), **M1B** (210), **MP4s ABW** and **AJW** (118) in Qatar, **OD5AD** (135), **OE13BR** (190), **OQØDZ** (165), **SU1MR** (170), **UI8AD** (190), **VK9WG** (152), **VP1BG** (191), **VQ5CY** (311), **VR4AE** (150), **VS1DS** (162), **VS2s BS** (172), **DL** (120), **DX** (120), **DY** (202), **UW** (178), **XZ2s KL** (148), **KR** (150), YA3XY, **ZB1BR** (335), **ZC2MWW** (177), **3A2AY** (080) and **5A1TC** (114) . . . . . G3HLS reported working one AC4AC via the voice route, while YU1BCD recorded QSOs with **CR5SP** (180), FQ8AR and KV4BB . . . . . W8JGU glommed onto **5A2TZ** (115) and listener L. M. Michel took time out from code practice long enough to observe the hefty morning signal of **VK1HM** (172) . . . . . YV5FL accounts for 'phones **CP5EQ** (195) at 0115 GCT, **CT3AN** (180) 0045, **FM7WD** (130) 1805, **LX1DA** (160) 2155, **OD5BA** (145) 0000, **VP2KM** (120) 1930 in the Leewards and **YU1AG** (130) . . . . . The Pacifico "DX Field Day" group captured HR1BG, KA2s CC JF YA, KG6ACS, KX6BC and YV5BY . . . . . W5WQI kept busy with CN8EJ, HH3DL, HR1UA and VP5AO, while W5KBU wrapped up a fast WAC through courtesy of CN8GY, G5TN, KA2GU, LU3DBX, ZL2QI and W5LQJ . . . . . **FL8BC** (340), **HH4MV** (087), **HR1s BG** (193), **GM** (185), **UA** (180), **HZ1AB** (200), **KA2HQ** (210), **VPs 3YG** (105), **5BF** (150), **VQs 2RG** (270), **3RWS** (210), **YI2AM** (162), **ZD1RS** (323) and **3A2AH** (175) were recent A3 prizes for the Transcontinental DX Club.

You don't have to dig very deeply for DX on *forty c.w.* Even W7s have been making hay. W7QJV did well on **JA9AC** (7018), **KW6BB** (30), **PJ2AJ** (23), **W5TUX/KJ6** (20) and an LU. Things are tough from that area but John needed only 20 watts to a 1625 to get those results . . . . . KL7PI found conditions good enough to land **LUs 3ZO** (22), **5ZO** (22) and **FK8AN** (28) . . . . . Forty watts and a folded dipole got **KG6FAA** (58) and many KL7, KH6, VK and ZL brethren for W6KHS. **DU9VR** (51) and **JA4AJ** (83) got away . . . . . YU1BCD reports QSOs with FM7WD, OY3PF and VS9AS, while W4ZAE & Co. specify **DU7SV** (13) and **PZ1WX** (06) . . . . . The WGDXC boys peppered away at **CT3AN** (15), **GD3IBQ** (08), **KX6s BD** (105), **BF** (105), **OQØDZ** (11), **UI8KAA** (01 t8c), **VS2CC** (12) and **YA3FOV** (72).

Forty 'phone provided W7QJV contacts with **KW6BI** (7204), KH6s AMA AVI GG IJ and XE2GV . . . . . **DU9BL** (040) has been squeaking through and YV5FL tried **PJ2CE** (060) with positive results . . . . . We look forward to more business on 7-Mc. 'phone as the summer noises simmer down — reports on *your* good luck will be appreciated. W1APA now has his push-pull 810s ready to pursue the A3 stuff.

Novices are game enough to tackle *fifteen c.w.* and WN1WTF has TA2EFA, YV5FL and Puerto Rican Novice WP4UN to show for his efforts . . . . CE7AA, FF8AG, KG4AF, VU2ET, ZD9AA, ZEs 2JV and 3JO used their 21-Mc. code technique on YU1BCD.

Fifteen 'phone is a little more lively. CR4AI, EAs 8AX 9AR, IS1CYZ, KB6AY, LX1SI, M1B, OD5AB, VQ3BM, VS9s AD AP, ZDs 1SW 4BK, ZS7C, ZK2AA and 4X4BL bring KZ5WZ's tally of 21-Mc. countries up to 86. Wally has two cards each from San Marino and Andorra but finds some of the so-called easy ones difficult to confirm . . . . YU1BCD found these 15-meter 'phones holding forth: CN8CS, CR6BX, EA8BF, OD5AJ, VQs 2DT 4BU 4RF, YI3WH, ZC4CX, 3V8AP, 5A2s CF and TA . . . . TG8IH was W6ZZ's 44th 21-Mc. country. Miles also added HP1PH, HR1JM, KV4BD and TI2RC . . . . KZ5WZ writes that many W/VE 'phones are not properly observing 21-Mc. band limits. Careful, gang.

Eighty, one-sixty and *ten* played their summer DX cards rather close to their tummies. We now approach the time of year when these three bands "normally" show some spunk. Perhaps there isn't much hope yet for 28 Mc. but who can be positive? W4ZAE knows of a British SWL who recently heard his first 10-meter W station in sixteen months of patient tuning!

Where:

The following DX-station addresses do not appear in the Summer number of the *Call Book*, or are at variance with some that do. The *fact* that QTHs we present here each month often do not jibe with *Call Book* listings does not necessarily mean that the latter are incorrect. For instance, DX stations often take post-office box numbers to facilitate gathering their mail, their home or station addresses remaining entirely usable.

CN8EY, J. O'Hara, VR-24, Box 301, Navy 214, FPO, New York, N. Y.
CR4AG, Jose Pedro Afonso, Box 55, S. Vicente, Cape Verde Islands
DL4EF, Capt. A. L. Hamel, AO-517569, 60th T. C. Wing, APO 57, % Postmaster, New York, N. Y.
DL4XW, Lt. N. G. Petersen (W8HBL), 328 Comm. Recon. Co., APO 108, % Postmaster, New York, N. Y.
EL2A, A. H. LeMonze, PAA, Roberts Field, Liberia
ET2SM, (QSL via ET2WW)
KA2AA, Fred B. Westervelt, ex-KA9AA, Med. Sect., AFFE, APO 343, % Postmaster, San Francisco, Calif.
KB6BA, (QSL via KB6AY)
KC6AA, Richard Hatcher, % American Trust Govt., Yap, W. Caroline Islands
KR6TG, Capt. T. G. Grossholz, 307th A&E Sqdn., APO 239, % Postmaster, San Francisco, Calif.
KR6VR, S. V. Ray, FBIS, APO 239, % Postmaster, San Francisco, Calif.
KX6AY, Box 34, Navy 824, % Postmaster, San Francisco, Calif.
KX6NA, (ex-KH6JI), Majuro, Marshall Islands
KX6UZ, (ex-KH6UZ), Majuro, Marshall Islands
SU1TQ, (QSL via RSGB)
VP1AB, Fr. Phil Pick, Corozal, Br. Honduras
VP6GT, George Taylor, Black Rock, St. Michael, Barbados
VQ5CY, P. O. Box 142, Kampala, Uganda
VQ5RO, (QSL via G2TO)
W4RGE/KL7, Col. C. E. Melcher, 5001st Med. Gp., APO 731, % Postmaster, Seattle, Wash.
W5TUX/KJ6, APO 105, % Postmaster, San Francisco, Calif.
W5ZOJ/KJ6, APO 105, % Postmaster, San Francisco, Calif.
YV1CB, P. O. Box 389, Maracaibo, Venezuela
ZB1BR, (QSL to W2ISW)
ZB2B, E. Howarth (G3IKU), 4 Cobham St., Gravesend, Gibraltar
ZK2AA, (QSL via W6MUR)
5A1TJ, Don Rowley, Box 372, Tripoli, Libya
5A2CF Gerry Curtis, Box 201, Benghazi, Cyrenaica, Libya

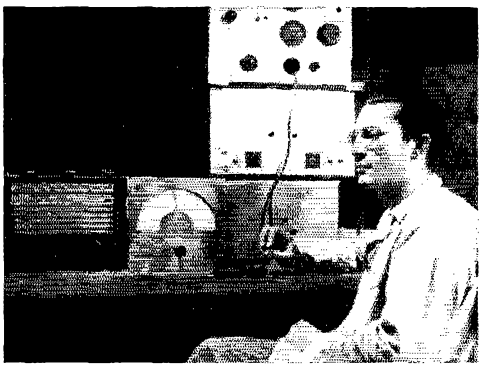
Gracias, amigos W1FWH, W2s CWK KGN, W4ZAE, W7OEB, W9s CFT HUZ, KB6AY, KL7PI, KX6UZ, YU1BCD, L. M. Michel, R. Waite and West Gulf DX Club members. We hope you'll come again.

Tidbits:

Asia — Fred Westervelt, W4VE on this side of the water, s now Chief of Medical Operations, Far East (Army) Hq., near Tokyo, and exchanged his KA9AA label for the call KA2AA. "Am set up now in new quarters and ready to go . . . do not think I'll get out quite as well but have worked a few East Coast stations on the first try and hope to be in there pitching when conditions are good. I *do* find receiving conditions much quieter, so that's encouraging. Have put up another ground-plane as I'm thoroughly convinced it takes a good beam to beat one" . . . . HS1WR is back in Bangkok after GI-style schooling in Oklahoma. He trusts it won't be long before he'll be working his W friends on 14 Mc. This will have to await lifting of FCC's ban on Thailand contacts, of course. Meanwhile, HS1WR will welcome mail to this address: Capt. Kamchai Chotikul, Anti-Aircraft Brigade, Bangsue, Bangkok, Thailand. He has push-pull 807s and a BC-348 all set to go.

Africa — The present EL2A tells W2HSZ he leaves Liberia for the States within a month or so . . . . We've been getting many inquiries that go something like this: "Does EA9DC QSL?" While there can be no blanket yes for that one, upwards of fifty EA9DC QSLs *have* gone through W1WPO's hands for Ifni DXCC credits. What does it take to get one? Ask the man who owns one . . . . Dark Continental notes courtesy the *DX Bulletin*: CN8HF reports that all his FL8MY, HZ1MY, VQ6MY, 4W1MY and 6L6MY contacts have now been QSLd. . . . The present operator of ZD9AA will head for assignment in Canada around April of next year. . . . G2RO (VQ5RD) is thinking about possible Zanzibar and VQ8 work. (Long time no VQ1s!) . . . ZD6HN returns to Nyasaland from the U.K. and will be poking around with a 150-watter.

Oceania — Continuing the *Bulletin* digest, we note that ZC2AB helps VK1s BJ and HM keep the Cocos on tap. CR1ØAA's first op became CR8AA and the CR1Ø station's remaining operator needs gear to get back on the air. . . . FK8AO (ex-FQ8AE) is doing business on several bands. . . . VK1AF, an ex-VK5, keeps Macquarie available but Heard Island is tough. . . . ZL3JA has intentions of Tokelau (ZM7) ham work in the by-and-by . . . . From New Zealand's NZART we have the lowdown on 1952 VK/ZL DX Test results. On c.w., VK2DG and ZL2FA took top honors; VK3LN and ZL2GX tallied the high 'phone scores. W7PGX, W5ADZ and W7DL had the zorchiest U.S.A. c.w. scores in that order, while VE7AIH copped an easy victory for Canada. On A3, W6DI and W6IBD did the U.S.A. one-two while VE7AIH repeated his A1 victory. This was one fracas in which our West Coast marksmen really showed 'em how . . . . An interesting KB6-eye view of Pacific-style hamming from the mill of KB6AY: "May and June proved quite fruitful DXwise for KB6AQ

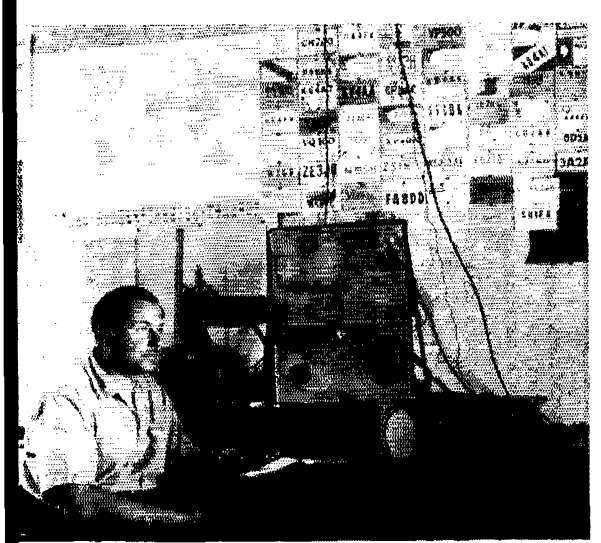


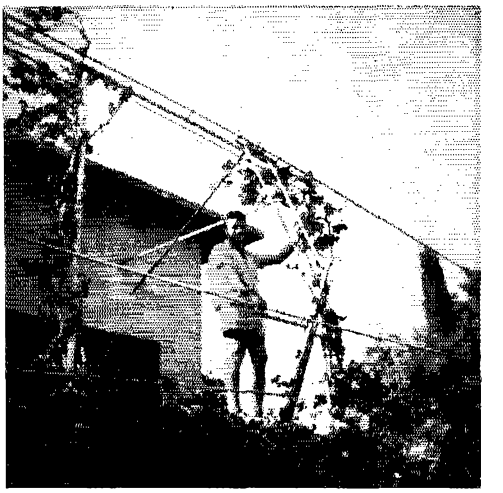
Palermo, located in Sicily's "Golden Basin," may not be the best spot in the world for DXing but IT1TAI makes out all right. Dom received his ticket late in 1952 and has since worked 91 countries and 29 United States. (*Photo via W8IV*)

and KB6AY. KB6AO was caught with his VFO down and missed out on several openings to Europe on 14 Mc. For a period of ten days or so during the first part of May (an annual occurrence) stations from northern Europe were as thick as fleas on a hound dog. The phenomenal skip ceased as suddenly as it began and openings to Europe are again few and far between. One notable exception exists, however: GI4RY appears to have a private line to KB6-land and is heard and worked frequently even though there are no other signals from that part of the world to be heard. We hope eventually to work OK1MB. . . . For the benefit of other European stations who are stalking Oceania, 14,055 kc. is the spot to pick up KB6AQ, KB6AY and ZK1AB, the

latter at Raratonga. KB6AO will be scouring the 'phone band for Europe and will be active from about 0700 to 1000 GCT. One new ham has been added to our roster since last writing — KB6BA. Howard is an ex-KL7 and hopes to be active on Canton soon. . . . KC6QY, formerly of Ponape, has pulled stakes, is now in Honolulu and may soon be heard from KH6QY. We hope that Johnny's replacement will be a ham. . . . Johnny's new QTH, incidentally, is aboard his 35-foot ketch in Honolulu yacht harbor. He and his XYL plan to sail back to San Diego some time in the not too distant future and we may hear KH6QY/MM." Fred adds that there are no British VR1s currently active on Canton and no prospects in sight. Furthermore, you may have to be patient for your KB6 QSLs because dockings at Canton average only four ships per year. . . . . KX6UZ favors us with more Pacific poop: "Calls from KX6AA to KX6MZ are assigned for Kwajalein use. . . . KX6NA, Majuro, is not on the air at present but plans to be on 20 with n.f.m. within a month. KX6UZ, Majuro, works a lot of c.w. on 20 and some 'phone on 40. QSL cards will be slow in getting to the states because of our ship schedules. . . . KC6KU is operating from the island of Kusaie [eastern Carolines] which is a bit of tropical paradise close to the equator. Jack's uncle was a trader on that island back during the days of German occupation. KC6KU uses a TCS-12 with long wires for directivity and may be heard quite frequently on 40 'phone." KX6UZ recently knocked off all W call areas on 20 c.w. within 25 minutes, then started in to duplicate the feat. Carl missed W6 and W7 on the second run, however . . . . . Midway activity is at a new low. KM6AX, the one station remaining, has only intermittent activity to report. Selection of a new KM6AX trustee, as well as necessary refiling paperwork, will suspend Midway ham operations for weeks. . . . . Cards sent to New Zealand for QSP by ZL3IC bounced back to W6KHS. Evidently the Christchurch QSL managership is changing hands.

Europe — Tima Popovic, one of YU1BCD's operators, does SWLing at the home QTH — a pastime frequently engaged in by European radio enthusiasts — and reports very puny returns percentagewise. Fifteen per cent of his W6s sent answers for the best call-area average while W9 was lowest with *no* comebacks. This confirms the fact that U.S. stations, generally speaking, are strictly on the watch for two-way confirmations and have very little interest in "heard" reports. Unless, of course, the latter arrive from Tannu Tuva or Mars. . . . . Seventeen-year-old Karl Wagner, Slotsgade 26, Aabenraa, Denmark, would correspond re radio with any young American amateur so inclined. . . . . Ex-HAF3RF-HA3B, now living in this country, is very interested in hearing from operators of stations he contacted during almost twenty years of hamming in Hungary. HA3B closed down in 1944 and wonders if amateurs who recall working him would be so kind as to send him replacement QSLs for his long-lost HA3B QSL file. Joe had one of central Europe's outstanding 'phone and c.w. signals. He hopes to become a W2 within a year or so and his address is: Joseph Boer, 6701 62nd St., Glendale, N. Y. . . . . K2CUI wonders where all the DX news from France stays hidden. Any F boys reading this stuff? If so, let's hear from you. . . . . G3HLS notes that G6LX received a pasteboard from LN4B, a station operated by Norwegian government personnel in Antarctica. G3HLS has kept busy doing QSL chores for SVØWP/SV9's Crete visit. . . . . DL1KV of DARC writes that some sixteen





Paul Tabailloux, W4VUM and ex-W2PED, makes ready to raise SVØWG's 14-Mc. rotary beam on the island of Rhodes. SVØWG was formerly SV5UN; W3CHV and KL7AIF help man this widely worked station. (*Photo via KL7AFR*)

amateurs have been licensed in the Russian-occupied zone of Germany. The prefix is DM and DARC offers to relay QSLs destined for them.

Hereabouts — VP5BH, regularly heard on DX bands with his potent 15-watter, now is WAS and has RCC and A1-Operator certificates to boot. . . . . W9s KA and NN shipped postal cards out to some 90 Midwest DXCC members as the first step in organizing a DXers' get-together to be held in Chicago. W9PGW's recent DXCC award makes the fourth such earned by present b.c.-station WGN, Chicago, personnel. . . . . W1WPO just recorded Paraguay's first postwar DXCC. It belongs to ZP5CF and was won via the A3 medium. . . . . WØJNC and W9IHN met personally at the latter's Suring, Wis., shack and found they are both hung up at 99 confirmed. . . . . W3QJM, on transmitter-installation assignment in northern Italy, ran into a large group of hams from Milan. The boys were enjoying a club field trip to the station site at the time. . . . . WN4WMY learns that the VP7 guided-missile gang keep quite active on 40 and 80 c.w., plus 20 and 75 'phone . . . . . W6UXX still hopes to put Cocos Island on the air in the near future. Clipperton, too, perhaps. Watch for some juicy calls ending in UXX!. . . . . As scheduled, K2CPR (ex-W3BXE) and W2BBK caused quite a rumpus while operating as FP8s AA and AK, respectively, during the latter part of July. They also knocked off many QSOs when using the /MM prefix on their way to and from St. Pierre.

—•••—

The Easter Island DX Contest, long postponed, broke out during the second week end of August and CEØAA (CE3AG operating) gave out with plenty of fast QSOs on 7 and 14 Mc. (This should be no news to you unless you've been *completely* out of touch with the DX grapevine!) If you got him, lucky you! VQ7UU put in an appearance from Aldabra Island at the same time — a really fierce DXplosion. Good old 20 may never be the same again.

♦

Yugoslav club station YU1BCD, with operator Tima Popovic shown ready for action, is one of the more consistent YU performers on the air. Tima's home QTH is some 10 miles distant but he manages to try his luck at YU1BCD once or twice a month on the DX bands.

♦

***QST* for**

Correspondence From Members

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

GOOD PUBLICITY

737 N. Brainard Ave.
La Grange Park, Ill.

Editor, *QST:*

Enclosed is an example of amateur-developed publicity in which you may be interested.

Prior to this time very little about civil defense had found its way into the local newspaper, and practically nothing regarding our amateur c.d. activities had been published.

But when we learned that our communications plan was the first to be received by the state, we hams in the Communications Section felt that the time had definitely come to tell about our activities in the local press.

In addition to the nice front page spread — the result of our taking the time to *write our own story* — we have gained the active interest of the local editor. In fact, he has asked for several more stories in the near future.

If you think that *QST* readers might take encouragement from this example or that it otherwise might be interesting to them, along the lines of the article "No News is Bad News" in May, 1953, *QST*, you of course are free to treat it editorially in a future issue.

— *C. W. Bailey, W9JJD*

PLAIN TEXT

124 Erie St. S.
Leamington, Ont.

Editor, *QST:*

Our *QST* arrived today and after glancing through "YL News and Views" and the Ontario news, I started at page one to see what else there was of interest to a mere YL. The first article about noise generators I passed up since we have a power line running down the lane back of our house which generates all the noise we could possibly require. The next article was called "Low-Pressure Modulation Facts" and the subtitle "Down-to-earth Talk About Radiotelephony" sounded very intriguing. I read the entire article without taking my eyes off the pages once. At last, something I could read and really understand! I can't thank you and Howard Wright enough for this article. There are so many of us who do get all snarled up in technical terms. We understand the basic principles but the terms used confuse us to the point of desperation. . . .

I'm sure I speak for many others who are intensely interested in what makes the wheels go round, but who are not fortunate enough to own a college degree in electrical engineering.

Congratulations to you and Howard Wright from a grateful reader.

— *Olive Dell Daykin, VE3AJR*

PIONEERS

311 Acme Street
Reidsville, N. C.

Editor, *QST:*

. . . I wish to thank the editors of *QST* for the method of printing the "cream of the crop" articles which have appeared in *QST* the past few years. You have published the important developments which have occurred in radio for many years and the articles in *QST* have stimulated the scientific method of investigation in many hams. After all, what was ham radio developed for? I want to urge you to continue to publish the fine articles like you have in the past on such new developments as single sideband, transistors, and v.h.f. DX (ESPECIALLY LUNAR DX).

I want to point out that the true scientist looks for truth and knowledge and doesn't worry about what good it does him or anyone else. The basic foundations come first. The house is built later.

I want to congratulate W4AO and W3GKP and say that I consider their lunar DX the most significant accomplishment ever attained by any *amateur* since the art began. They, like Columbus, Marco Polo, and Magellan, are pioneers who have ventured into the realms beyond our own and found new worlds. For this great feat W4AO and W3GKP shall never be forgotten in the history of amateur radio. *Magna cum laude!*

— *James P. Gillespie, W4LQC/4*

DEMOCRACY AT WORK

314 Chilton St.
Elizabeth, N. J.

Editor, *QST*:

. . . Since so many hams make suggestions for improving the ARRL, let me make mine. Just keep on functioning in the fine manner and impartial policies which have always been the strength of the League. John Q. Average-Ham is proud of his League and likes the way it functions.

Those who are dissatisfied or who feel that changes would be for the best, should run for League office to seek change from within the fraternity of hams and accept the results of elections by the majority. That is the democratic way.

The formation of splinter factions (often more vocal than numerically strong) has done amateur radio harm. . . . Let's hope such groups are part of the history of our post-war growing pains and not part of our future. . . .

— *John D. Schott, W2AUN*

CODE PRACTICE

14 Lisbon St.
Lewiston, Me.

Editor, *QST:*

It is my opinion that too many of those who desire to get so they can copy 13 words per minute remain too long trying to copy 5, 10 and 15 words per minute. My experience has been that they should remain only a very short time with copying 5 and even up to 15 words per minute.

I really think that very soon they should try copying 20 words per minute, and just skip those they cannot get on the tape, or better on W1AW on the evenings it sends from 15 to 35 words per minute. If they keep copying what they can grab and skip and get the next and keep doing that, they will find that in no time they will have to lose and skip less and less words. In a rather short time, not over five or six weeks at the most, they will be finding it easy to copy 20 words per minute. . . . They should also practice copying numbers often because they are hard to learn and are included in all examinations. . . .

— *Edward J. Hudon, W1LYK*

STRAY RECTIFICATION

67 George Street
Providence 6, R. I.

Editor, *QST:*

. . . Some months ago I wrote to *QST* asking advice about a strange QRM I experienced over all lower frequencies. The QRM was a mixture of two or more broadcast stations. I tried everything, cleaned contacts, explored the house for non-linear joints with a portable receiver, examined the lightning rods (with the portable receiver) on the near-by church, and finally explored the various labs at Brown. Nothing worked. Then *presto* — one night recently the main fuse in the house blew out. There was no reason, very few lights were on, and no electrical equipment was in use. After a new fuse was installed I found to my joy that the strange QRM had stopped. I have not heard it since the fuse was replaced. I pass this on for whatever it may be worth to others. . . .

— *William S. Allen, W1LU*

V.H.F. QSO Party

September 19th–20th
Certificates to Novices, Technicians

ARRL takes pleasure in announcing another of its popular V.H.F. QSO Parties, open to all amateurs able to work on 50 Mc. or higher. The contest period begins at 2:00 P.M. Local Standard Time, Saturday, September 19th, and ends at 11:00 P.M. Local Standard Time, Sunday, September 20th. New rules introduced in the June Party still apply. Plan now to devote this September week end to renewing acquaintances and working DX on the v.h.f. bands!

How to Take Part

Call "CQ contest" to get in touch with other contestants. When you contact another v.h.f. amateur, you must give him the name of your ARRL section. Exchanging signal strength and readability reports is suggested but not required.

Scoring and Reporting

Try to work as many stations on as many v.h.f. bands as you can. Count 1 point for successfully-confirmed two-way exchanges of section information on 2 or 6 meters. A one-way exchange, even though confirmed, does not count. Count 2 points for two-way exchanges on 220 or 420 Mc., and 3 points on 1215-Mc. or higher bands. The sum of station points earned is multiplied by a section multiplier. Each time a new section is worked two-way, this multiplier is increased by one. *The multiplier grows by one if you rework this same section on another band.* Scoring differs in this respect from other ARRL competitions in order to encourage everyone to make use of as many v.h.f. bands as possible. A simple tabulation with points and section list is all that is required, or a card to Headquarters will bring the simple form (as shown in the box on page 60 of June *QST*) on which to report.

Certificate Awards

You compete only with amateurs in your own ARRL section for the certificate awards. Novice and Technician licensees compete also for section awards *with others holding the same class of license.* It is possible for three awards to be made in a given section, one to the section winner, one to the top Novice, and one to the top Technician. All contestants are urged to submit their logs to Headquarters at the close of the competition, regardless of whether the score is large or small — not only to qualify for awards, but also to facilitate the cross-checking of other logs.

Rules

1) The contest starts at 2:00 P.M. Local Standard Time, Saturday, September 19th, and ends at 11:00 P.M. Local Standard Time, Sunday, September 20th. All claimed contacts must fall within this period and must be on authorized amateur frequencies above 50 Mc., using permitted modes of operation.

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

3) Fixed-, portable- or mobile-station operation *under one call*, from one location only, is permitted.

4) A "contestant" is a single operator working without the help of any other person. Results may be presented with names of all participating persons for listing, but only single-operator scores will be considered for certificates.

5) Scoring: *1 point* for completed two-way section exchanges on 50 or 144 Mc.; *2 points* for such exchanges on 220 or 420 Mc.; *3 points* for such exchanges on the higher v.h.f. bands. The sum of these points will be multiplied by the number of *different* ARRL sections worked per band; i.e., those with which at least one point has been earned. Reworking sections on additional bands for extra section credits is permitted. The band *your* transmitter is on determines whether a QSO counts 1, 2 or 3 points — cross-band-work does not count.

6) A contact *per band* may be counted for each station worked. Example: W9PK (Ill.) works W9UJM (Wis.) on 50, 144 and 220 Mc. for complete exchanges. This gives W9PK 4 points (1 + 1 + 2) and also 3 section-multiplier credits. (If W9PK contacts more Wisconsin stations on these bands they do not add to his section multiplier but they do pay off in additional contact points.)

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

8) One certificate award, endorsed as appropriate, will be made to recognize the over-all section winner, the Novice winner, and the Technician winner in each ARRL section. Awards will be limited to one per entrant per section, as earned. *It will be necessary for each Technician licensee to indicate his class of license in order to qualify for the Technician award.* Award Committee decisions will be final.

9) All reports must be postmarked no later than October 5, 1953, to be entered for awards. See the box on page 60, June *QST*, for the correct form, or a message to Headquarters will bring a lithographed blank for your contest report.

VE/W Contest

September 26th–27th

Time for the VE/W Contest again! Don't miss this chance to latch onto the QSLs you need for WAS or WAVE, and warm up the rig for the heavy schedule of fall operating activities.

A Certificate of Merit will go to the leader in each ARRL section. Tell the XYL you'll be QRL September 26th and 27th, and get set to earn one of these handsome awards now!

Rules

1) Any station located in any ARRL section as listed in *QST* (page 6) is eligible to enter.

2) All contacts must be made during the contest period 6:00 P.M. EST, September 26th, to 11:59 P.M. EST, September 27th, with a total of no more than 20 hours operating time for each entry. Times on and off the air must be clearly shown in the contest log.

3) Message preambles such as the following must be exchanged and be fully reported in the log entered: (1) number of contact; (2) your call; (3) RST report given; (4) location; (5) ARRL section; (6) time sent; (7) date sent. *Example:* NR 1 W3KMN 569 Silver Spring Md Del DC 6R02P Sept 26.

4) One point may be counted for each preamble sent and acknowledged. One point may be counted for each preamble received. No more than two contest points may be counted for contacts with any one station, regardless of frequency bands in use. VE stations will multiply the total points by the number of W ARRL sections worked. W stations will multiply the total points by the number of VE ARRL sections worked and also by 8, there being eight times as many

(Continued on page 108)

The World Above 50 Mc.

CONDUCTED BY E. P. TILTON,* W1HDQ

PROBABLY the most transitory glory in ham radio today is that enjoyed by a holder of the 420-Mc. record. As reported last month, the previous American record was surpassed twice in June, and the world record at least equaled. In July the record changed hands twice in a single day!

Morning tests conducted daily by W2QED and W8BFQ, holders of the record after June 24th, have demonstrated that just about any time this path of some 360 miles is open on 144 Mc., signals can be heard on three times the frequency, also. On Sunday morning, July 26th, 2-meter signals were unusually good, so it was no surprise to find S9-plus signals each way on 420. This looked like the morning to push the record farther, so Ken called W3BSV, Salisbury, Md., on the telephone. Cy crawled out of bed and fired up on 420, and immediately established contact with W8BFQ, with S7 reports each way. This was a distance of about 385 miles, a new record by a substantial margin.

But Margaret and Cy were not to hold the spotlight for long, for conditions were good along the Atlantic Seaboard, too, and getting better. That night it was W1RFU's turn. From his superb location on the crest of the first range of hills east of the Connecticut River, at Wilbraham, Mass., Bill has been giving ample evidence for some weeks that he would be a factor to reckon with in any Eastern onslaughts on the 420-Mc. record. His signal had been sweeping down the Atlantic Seaboard at S9-plus levels whenever conditions were at all favorable, awaiting only a shot at some of the 420-Mc. gang in Southern Virginia.

That chance came the night of the 26th, when he heard W4TLM, Yorktown, Va., working locally. The signal was running S5, and was audible even with his array around to the south to work W4VVE. Contact between W1RFU and W4TLM was established at 10 P.M., with Bill's signal running S7 at Yorktown over the 410-mile path. A contact of sorts was made with W4VVE, 20 miles farther south, in that each heard the other's signals, but no actual communication took place, so no record is claimed as yet. It is just a matter of time, however, as W4VVE has heard W1RFU on several previous occasions.

Equipment used in this work is typical of the advanced techniques now being employed almost universally in 420-Mc. work. W1RFU has a 4X-150A coaxial-line tripler patterned after the W1PRZ amplifier in May, 1951, *QST*. This feeds a 64-element array, shown in the accompanying photograph. The driven-element system of the array is laid out as four separate 16-element arrays, with phasing sections joining the upper and lower pairs. These two phasing lines are joined, in turn, and the center of the system is fed through a "Q" section. Bill's receiver uses a

Antenna systems at W1RFU, Wilbraham, Mass., northern end of the 410-mile 420-Mc. record contact with W4TLM of Yorktown, Va. The 420-Mc. array at the left has 64 elements. Horizontal and vertical twin-fives for 144 Mc. and a 4-element array for 50 Mc. are mounted above the chimney.

coaxial-line crystal mixer with 50-Mc. output and crystal-controlled injection. This works into a VHF-152A converter that is tuned from 50 to 54 Mc. to cover 432 to 436 Mc. W1RFU's frequency is 433 Mc.

W4TLM uses a 2C39 final amplifier on 435.5 Mc., working into a 72-element array that is 9 elements high and 4 elements wide. His receiver is also crystal-controlled, with a 2C40 r.f. amplifier ahead of a crystal mixer.

An interesting sidelight on this contact is that the signal of W1RFU was barely audible at the time at W2QED's location, 100 miles northeast of W4TLM, and directly in line between the two record-breakers. Worthy of note, also, is the fact that this work was done without the usual preliminary arrangements on a lower band. W4TLM does not operate on 144 Mc.

That line-of-sight paths are not needed for DX contacts on even higher frequencies has been demonstrated by G3QC and G8DD, holders of the 1215-Mc. record since 1950. On July 26th (that *same* day!) these two extended their record to 100 miles, exchanging steady S5 signals over a path that was far from line-of-sight.

They have tried many different antenna configurations, but have had by far the best results with parabolic reflectors. The optimum position

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

W0ZJB.....48	W5VY.....48	W8OJN.....39
W0BJV.....48	W5GNQ.....46	W8LPD.....37
W0CJS.....48	W5MJD.....46	
W5AJG.....48	W5ONS.....45	W9ZHB.....48
W9ZHL.....48	W5JTI.....44	W9QUV.....48
W9OCA.....48	W5ML.....44	W9HGE.....47
W6OB.....48	W5JLY.....43	W9PK.....47
W0INI.....48	W5JME.....43	W9VZP.....47
W1HDQ.....48	W5SFW.....43	W9RQM.....47
	W5VV.....42	W9ALU.....47
W1CLS.....46	W5FAL.....41	W9UIA.....45
W1CGY.....46	W5FSC.....41	W9UNS.....45
W1LLL.....46	W5HLD.....40	
W1LSN.....44	W5HEZ.....38	W0QIN.....47
W1HMS.....43	W5LIU.....37	W0DZM.....47
W1DJ.....41	W5FXN.....37	W0NFM.....47
		W0TKX.....47
W2AMJ.....46	W6WNN.....48	W0KYF.....47
W2MEU.....46	W6ANN.....45	W0HVW.....45
W2RLV.....45	W6TMI.....45	W0MVG.....44
W2IDZ.....45	W6IWS.....41	W0JOL.....44
W2FHJ.....44	W6OVK.....40	W0TJF.....44
W2GYV.....40	W6GCG.....35	W0WKB.....43
W2QVH.....38	W6BWG.....29	W0JHS.....43
W2ZUW.....35		W0PKD.....43
	W7HEA.....47	W0IPI.....41
W3OJU.....46	W7ERA.....47	
W3NKM.....41	W7BQX.....47	VE3ANY.....42
W3MQU.....39	W7FDJ.....46	VE3AET.....41
W3RUE.....37	W7DYD.....45	VE1QZ.....34
W3OTC.....36	W7JRG.....44	VE1QY.....31
W3FPH.....35	W7BOC.....42	XE1GE.....25
	W7JPA.....42	CO6WW.....21
W4FBH.....46	W7FIV.....41	
W4EQM.....44	W7CAM.....40	Calls in **boldface** are holders of special 50-Mc. WAS certificates listed in order of award numbers. Others are based on unverified reports.
W4QN.....44	W7ACD.....40	
W4FWH.....42		
W4CPZ.....42	W8NSS.....46	
W4FLW.....42	W8NQD.....45	
W4OXC.....41	W8UZ.....45	
W4MS.....40	W8CMS.....43	
W4FNR.....39	W8YLS.....41	
W4IUJ.....38	W8RFW.....41	
W4BEN.....35	W8BFQ.....42	

of these has been found to be very critical on short paths, but on the 100-mile haul precise aiming of the arrays was not required. How about some American interest in 1215 Mc. and higher?

The 2-Meter Transatlantic Tests

The transatlantic tests conducted by The International V.H.F. Society were carried through on schedule, their transmitter having been kept on the air for one week, as planned, beginning July 4th. We have received no reports of reception by an American amateur, though the beginning of the period saw many eastern 2-meter men transmitting and listening according to the schedule published in July *QST*.

At the Irish end some faint signals were heard, though in insufficient detail to permit identification. At 0014 GCT, July 7th, a signal was heard on 144.27, and at 1433, on the 8th, another was logged on 144.3. On July 11th, at 0118 GCT, another signal was heard, this time on 145.3 Mc. Rotating the receiving array, it was found that the only direction in which the signal could be heard was toward America. The signal broke off at 0121, and resumed at 0130. GI5HV made out the letters "de W4" in a burst and the signal was heard by EI2W and EI3W. Any assistance in identifying the source of these signals will be appreciated.

The tests will be repeated next year, and plans are already under way for a higher-powered transmitter and a bigger array than was used this time. The tentative location for next year's test is a 1000-foot elevation near the Irish coast.

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

Lament over the sad state of affairs on 50 Mc. last month was a bit premature. As has happened occasionally in the past, the 1953 DX season started late, but it was doing right well in July. The record is incomplete as we write, but indications are that the summer DX of 1953 will turn out to have been at least as good as last year's rather disappointing season. June, though, was the worst on record. Usually the month in which 6-meter DX breaks out all over, this year it offered only a few good openings, and almost no double hop. July, however, was much better, particularly as regards transcontinental DX.

As soon as your conductor arrived on the scene at the National Convention he began to get reports that 6 had been on a rampage, and from all indications it appears that the band was open during a considerable part of the nearly three weeks we took on our trip through 19 states of the East, South and Middle West. July 16th looks like the top date of the year, with DX being reported in all call areas for the first time in 1953. WØTJF, Bricelyn, Minn., worked them all that day, contacting W5VY, W1DJ, W2UFI, W3OTC, WØGPO, W4PCT, W8HQK, W9GYX, W7NFC and W6GCG, in that order, between 1240 and 2155. The circuit could have been completed in less than 5 hours if Dick had worked any of the numerous W5s that were coming through during the evening.

Montana, once the rarest of rare states for the gang in W1, 2 and 3, was available for an extended period during the evening of the 16th. W7JRG, Billings, Mont., worked W1s LLL DJ GJO VNH LSN ELP AEP PWW, W2MEU, W3s OTC and OJU, W8BFQ, and many others. It was the first Montana contact in nearly every case, setting off the first mass change in our 50-Mc. WAS box in many months.

W1LLL, Windsor, Conn., says that W7JPA, Yakima, and W7DYD, Bothell, Wash., were coming through when he arrived home from work about 1800, and that W7JRG was in with a strong steady signal for nearly an hour beginning about 2000. W2IDZ reports W6s heard along with the W7s, indicating that this double-hop session was considerably better than anything encountered in 1952.

Even June may not have been as bad as it was painted. W5SFW, Amarillo, Texas, found the band open at some time during 24 days in June, though Phil says that the extent and duration of the openings were below previous years. It appears that at least part of the dearth of DX should be blamed on lack of trying in many quarters. Expecting that conditions were going to be poorer this year, too many of the gang may have laid low too long. After all, if *everybody* listens —!

Despite all the material that has been published to the contrary, a high percentage of our low-frequency brethren have the idea that v.h.f. operation is still a matter of over-the-back-fence communication; that contact outside the local circle requires some special considerations such as high altitude or super-special equipment. One inhabitant of our lower bands who has been pleasantly surprised at what he found on 2 is W8GUZ, Zanesville, Ohio. Fred started listening on 144 Mc. recently, and found that he could hear more activity on 2 than on 10. With only a 5-element Yagi 16 feet above ground, fixed in a westerly direction, he heard stations in Columbus, Dayton and Cincinnati consistently. When conditions are good he has heard signals all the way from Western New York and Pittsburgh, Pa., to Memphis, Tenn. This far surpasses his best 10-meter ground-wave coverage, and the 2-meter band is much more active. One more 2-meter station coming up!

W4FLW, Dresden, Tenn., says that the contacts he and W4HFO made on 50 Mc. with their Field Day set-up opened a few eyes among the low-frequency operators. With an 80-watt rig and a portable beam only 12 feet above ground, they were able to work 50 miles back to the home station with S9 signals. The same path is not covered as well on 10 with 300 watts. They hope that they made a few converts by this demonstration.

Any prospects for 220 and 420 around Honolulu? KH6AXV, who is operating from the Ford Island Naval Air Station, has completed a rig that delivers 60 watts output on 220 on 40 watts on 420. In the hope of encouraging local holders of Technician tickets, Vic is planning to run code practice on 220 Mc., using tone modulation and tape

transmission. He has a crystal-controlled converter for 220, and will shortly be in business on 420 as well.

W3UQJ, York, Pa., writes that he and W3GZX are working on 420 and looking for more prospects around that city.

K6BGD, South Arcadia, Calif., is on 220 Mc., and would like to hear from other 220-Mc. operators in the area.

Amateur TV news from W4MS: The American Amateur TV Society now includes 53 members. They have been supplied basic camera circuits and improvements are beginning to come in. The talk by W5SVB at the National Convention was well attended, and indicated a growing interest in ham TV. Among the TV addicts there was W4HER, Burlington, N. C., who has camera equipment in operation.

Suggestions for getting on 220 from W2IHW: Gold-plated test oscillator — change grid resistor to 15,000 ohms, add filter choke for modulation, squeeze plate coil and tune cavity to desired frequency. Mark II (or B19) — squeeze coil and you are on 220 with modulated oscillator and superregen receiver. Requires 12 volts to operate relays. ARC5 (T26, T23) — convert one channel to operate on 220 Mc. First three stages triple, with 8-Mc. crystal; final runs straight through. Cardwell Oscillator — all set for use on 420, as oscillator or superregen detector. SCR 522 — can be made to work on 220 by modifying coils and installing line in final plate circuit. For receivers, several converters are now available commercially, or TV tuners can be modified. Also, National 1-10 receivers can be picked up cheap on the second-hand market. They are broad and rather insensitive by modern standards, but will do very nicely for local work.

Overtone Oscillator with Capacitive Feed-Back

If you've had trouble getting overtone oscillators to work properly, it's probably because of difficulty in controlling regeneration. This is usually done with a tap on the tuned circuit, or by adjusting the position of a separate feed-back winding. Feed-back may also be controlled by the capacitive bridge method, as shown in Fig. 1. This hint is taken from *The Mike and Key*, bulletin of the Sacramento Amateur Radio Club, edited by W6PIV. Ken tells us that the circuit should be credited to W6AJF.

From the diagram it may be seen that the crystal is connected between the triode grid and a point part way up the by-pass system in the plate circuit. The values shown are

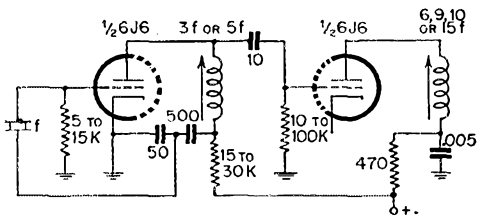


Fig. 1 — Schematic diagram of an overtone oscillator circuit supplied by W6PIV, in which the regeneration is controlled by tapping the crystal up on the plate circuit by means of a capacitive divider system.

usually OK for crystals between 6 and 9 Mc., but either of the capacitive elements can be varied to produce the desired amount of feed-back. Decreasing the larger or increasing the smaller capacitor results in more feed-back. Otherwise, the circuit is similar to overtone oscillator circuits carried in the *Handbook* for several years. When used with a dual triode, the second half of which is operated as a doubler or tripler, it provides a very simple means of obtaining up to 15 times the crystal frequency with a single tube.

Like other circuits, it will undoubtedly work well on the third overtone with practically any crystal that is capable of oscillating on its fundamental frequency. Fifth or higher odd overtones may require more careful adjustment.

Corrections on the June V.H.F. Contest Report

We hope that you like the prompt reporting that v.h.f. contests have been given in recent months. These parties are now reported in the next *QST* produced after the contest reporting deadline. This necessitates some fast work by our contest checkers, and occasionally may result in errors, but perhaps the early appearance of the results is worth this risk. The final report on the June V.H.F. Party, appearing in August *QST*, contained a few slips. W9TQ was the top man in Wisconsin, but his contest log was filed with those of another activity and it was discovered too late for inclusion in the August tabulation. We apologize to Vic, and offer our congratulations on his 51 contacts in 6 sections, for a score of 306.

West Coast mailings, just within the deadline, were de-

(*Continued on page 114*)

2-Meter Standings

	Call States	Areas	Miles		Call States	Areas	Miles
W1HDQ	18	6	850	W6PJA	3	3	1390
W1IZY	16	6	750	W6ZL	2	2	1400
W1RFU	15	7	1150	W6WSQ	2	2	1390
W1MNF	14	5	600	KG6AAV/6	2	2	275
W1BCN	14	5	580	W6NLZ	2	2	237
W1DJK	13	5	520	W6GCG	2	2	210
W1CTW	12	4	500	W6EXH	2	2	193
W1KLC	12	4	500	W6ZEM/6	1	1	415
W1MMN	8	5	520				
				W7LEE	3	2	240
W2UK	22	7	1075	W7YZU	3	2	240
W2NLY	22	7	1050	W7JU	2	2	140
W2QED	18	7	1020	W7JUO	2	2	140
W2AZL	18	7	1050	W7RAP	2	1	165
W2ORI	18	7	830				
W2PAU	16	6	740	W8BFQ	24	8	775
W2QNZ	14	5	400	W8WJC	23	7	775
W2UTH	13	7	880	W8WRN	20	8	670
W2SFK	13	6	—	W8WXV	19	8	1200
W2DFV	13	5	350	W8UKS	18	7	720
W2CET	13	5	405	W8DX	17	7	675
W2DPB	12	5	500	W8EP	17	7	—
W2FHJ	12	5	—	W8WSE	16	7	830
				W8RWW	16	7	500
W3RUE	20	7	760	W8BAX	16	7	655
W3QKI	20	7	820				
W3NKM	19	7	660	W9EHX	23	7	725
W3KWL	16	7	720	W9FVJ	22	8	850
W3LNA	16	7	720	W9EQC	21	8	820
W3FPH	16	7	—	W9BPV	20	7	1000
W3GKP	15	6	650	W9UCH	20	7	750
W3OWW	13	6	600	W9LF	19	—	—
				W9WOK	17	6	600
W4HHK	22	7	850	W9ZHL	17	6	—
W4AO	20	7	950	W9MBI	16	7	660
W4JFV	18	7	830	W9KLR	15	7	—
W4MKJ	16	7	665	W9BOV	15	6	—
W4OXC	14	7	500	W9LEE	14	6	780
W4IKZ	13	5	650	W9FAN	13	—	680
W4JFU	13	5	720	W9UIA	12	7	540
W4CLY	12	5	720	W9GTA	11	5	540
W4JHC	12	5	720	W9JBF	10	5	760
W4OLK	12	5	720	W9DSP	10	4	700
W4FJ	12	5	700				
W4UMF	12	5	600	WØEMS	23	8	1175
WN4WCB	9	4	650	WØGUD	22	7	1065
W4LRR	5	2	900	WØIHD	18	6	725
				WØONQ	17	6	1090
W5RCI	16	5	790	WØINI	14	6	830
W5JTI	14	5	670	WØZJB	12	7	1097
W5QNL	10	5	1400	WØOAC	12	5	725
W5CVW	10	5	1180	WØWGZ	11	5	760
W5MWW	9	4	570	WØJHS	9	3	—
W5AJG	9	3	1260	WØHXY	9	3	—
W5ML	9	3	700				
W5ERD	8	3	570	VE3AIB	17	7	850
W5ABN	8	2	780	VE3DIR	14	7	790
W5VX	7	4	—	VE3BQN	13	7	790
W5VY	7	3	1200	VE3BPB	12	6	715
W5FEK	7	2	580	VE3AQG	11	7	800
W5ONS	7	2	950	VE1QY	11	4	900
W5FBT	6	2	500	VE3DER	10	6	800
W5IRP	6	2	410	VE2AOK	6	2	340
W5FSC	6	2	500				
W5DFU	5	2	275				

Operating News

F. E. HANDY, W1BDI, Communications Mgr.
R. L. WHITE, W1WPO, Asst. Comm. Mgr., C.W.
PHILLIP SIMMONS, W3VES, Communications Asst.

GEORGE HART, W1NYM, Natl. Emerg. Coördinator
ELLEN WHITE, W1YMM, Asst. Comm. Mgr., 'Phone
LILLIAN M. SALTER, Administrative Aide

New Season Opening. September marks the beginning of another new operating season in amateur radio. Net activity will come up with a rush as all the gang returning from vacation resume schedules. We'll all be looking hopefully for some betterment in DX contacts these fall months, although it is too early to hope for a substantial change in the propagation conditions. The June V.H.F. Party was the biggest ever. Increased interest should make the September 19th–20th v.h.f. activity the biggest for that month yet. Elsewhere in these columns note the announcement of the fall ARRL Frequency Measuring Test for the evening of September 18th. The test is open to all United States and Canadian amateurs. If you're new at this, try your hand and in due time receive our ARRL Individual Report of your results.

For ARRL Observers it will be the third opportunity of the year to make their ratings (in frequency measuring categories). Incidentally, we can use still more fellows, who have had some years experience in amateur radio, as Observers for making (a) radiotelephone checks of modulation stability and quality or (b) radiotelegraph checks of notes, clicks, chirps, stability and also, if you have the necessary equipment of that type, for radioteletype work. Application blanks and further information on request.

RMs, PAMs and NCSs generally are requested to re-register the frequency and operating periods of all their nets for each section. This will enable us to issue the usual Net Directory. Registration helps others to avoid your net frequency in selecting suitable frequencies and times for their operation, making all operation more efficient and minimizing QRM.

We have an aging placard over the door of the Communications Department office at headquarters which reads, "Service to the Membership." This has been an aim for a long time back. It represents not only our staff efforts to give service but exemplifies the service of one member to another *through* appointments. Bulletins, traffic, observing, etc., efforts reach you through the help of those amateurs holding OBS, ORS, OO, and other appointments which your SCM (address on page 6) will be pleased to tell you about or which you will find explained in the booklet *Operating an Amateur Radio Station.* "Of, By and For the Amateur" is truly exemplified in the organized amateur services and operation with each other.

There are both voice and c.w. nets in most Sections which you can take part in for just a short time in your daily use of amateur radio. The awards and appointment certifications are not end-accomplishments in amateur radio, but recognition of your present status and progress.

Novice Note. The following comment from *Q-5*, Springfield Amateur Radio Club, is something to think about. "The issuance of a Novice license was and is to introduce the art of ham radio to the newcomer. The code test was lowered to five words per minute and the theory examination to only a basic understanding of radio to help you gain speed by c.w. operating. The time comes quickly when those temporary tickets will be void. Some of us Novices are using the 144-Mc. easy way to get on 'phone only, and mistakenly leaving the c.w. If you want 'phone use it, but *keep up the code speed on the other bands you are allowed.* 'Phone is a lot of fun. However, when you can read c.w., you will find a bang in it as well as the 'phone. Besides you don't want yours to be among the tickets that are void!

"You might argue the c.w. bands are crowded and you cannot complete your QSOs but listen on '75' and you will find it more crowded. All the more reason to get the code speed up and try for the General Class. So use the c.w. bands. . . ."

And may we add, learn to *enjoy* those c.w. contacts. Such practice is the easy door to your General Class ticket. Once practice makes you master of this new language, DX fun and traffic accuracy are yours, values you might otherwise miss.

Get in the Swim. Like everything else in the world, amateur radio can only be productive of benefits and enjoyment as it is made useful through operating. We also cordially invite all newcomers or Novices who have not received our Reference Guide with information on getting fully into amateur radio to drop a line for this and a copy of our W1AW schedule. The code practice sessions start at 9:30 P.M. EDST nightly. Keep after that ticket! The General Class license is the key to all kinds of expanded amateur privileges and makes you eligible for all the SCM appointments. (OES, however, is available to v.h.f.-interested amateurs, Novice or other.)

Stations that would like to institute code-practice periods to assist learner groups or clubs in their immediate vicinities should also let us have a copy of their schedules. These will then be included in a compilation of schedules that we send to those asking for such helps. The best fall operating weather should be just around the corner as you receive this *QST*. Your communication results come through operation; recognition

comes through *reporting* accomplishment. After receiving three consecutive monthly activity reports, SCMs will welcome your applications along stated lines of interest for which your activity shows you qualified. Make your efforts count by taking an active part in *organized* operating. Join in your Section Net and report all activities to your SCM this season.

— *F. E. H.*

PREVIEW — 1953 FIELD DAY

Listed below are high *claimed* scores for the 1953 ARRL Field Day, June 20th–21st. These are subject to checking and grouping according to the number of transmitters in simultaneous use at each station. Complete results will appear in a later issue.

CLASS A

(Listings show call used in FD, claimed score, and number of simultaneously-operated transmitters.)

W3FRY/3	24,645–10	W9JZA/9	5070– 4
W2OM/2	18,297–10	W9UC/9	5058– 5
W2GSA/2	15,743 - 9	W2WUX/2	5040– 3
W1OC/1	14,316–12	W6GER/6	4977– 7
W4FU/8	12,906– 6	W6PMK/6	4968– 4
W9AP/9	12,645– 9	W6PMI/6	4959– 4
W6UW/6	11,043– 7	W8MRM/8	4940– 4
W3VRZ/3	10,566– 4	W7DK/7	4932– 5
W2VDJ/2	10,503– 6	VE3ZM/3	4896– 4
W9PCS/9	9906– 7	W9GPS/9	4869– 3
W6ARO/6	8784– 8	W2ZQ/2	4806– 3
W2QW/2	8361– 4	W6BZE/6	4788– 4
W8BWA/8	8019– 3	W2EWT/2	4725– 2
W3RCN/3	7974– 8	W2AWF/2	4677– 7
W6HDY/6	7551– 4	W2MO/2	4662– 3
W3VU/3	7443– 6	W2QYV/2	4644– 3
K6EA/6	7443– 8	W7DA/7	4617– 4
W2BVL/2	7314– 5	W9NFT/9	4554– 6
W6MFL/6	7252– 7	W3NMR/3	4536– 2
W6OTX/6	7093– 7	W6JZ/6	4425– 5
VE3DC/3	6984– 9	W9BA/9	4422– 5
K2AA/2	6939– 4	K6FAV/6	4410– 7
W6YVJ/6	6906– 4	W1NEM/1	4401– 7
W9SW/9	6885– 6	W2GLO/2	4345– 4
W2DAY/2	6640– 4	W2UBW/2	4293– 5
W2IM/2	6624– 3	W5MPZ/5	4275– 3
W2OW/2	6609–10	W8WE/8	4266– 2
W9TCH/9	6516– 3	W8FO/8	4212– 4
VE3JJ/3	6444– 6	W3QB/3	4203– 4
W1SKT/1	6300– 2	K6BAG/6	4152– 3
VE3BRR/3	6255– 6	VE3BER/3	4098– 5
W8ACW/8	6240– 6	W1GLA/1	3960– 6
W2FUS/2	6235– 5	W1TX/1	3924– 1
W3SL/3	6192– 8	W1OSA/1	3903– 4
W4MK/4	6147– 2	W6MLI/6	3885– 9
W1AJ/1	6141– 5	W1TKA/1	3876– 5
W1QOA/1	5814– 3	W1JYH/1	3852– 3
W9AB/9	5811– 4	W8II/8	3852– 1
W9UDU/9	5751– 2	W9ERU/9	3822– 2
W8ICS/8	5715– 3	W3KX/3	3801– 3
W2CPN/2	5679– 3	W6OFT/6	3777– 6
W2DPQ/2	5658– 8	W8KQ/8	3768– 2
W3NA/3	5584– –	W2NFU/2	3747– 4
W8KGG/8	5580– 5	W9KDV/9	3618– 3
W1AA/2	5430– 5	K2CPY/2	3591– 5
W3AWS/3	5379– 4	W4TRC/4	3586– 4
WØHAM/Ø	5319– 1	VE2CK/2	3555– 2
W2AG/2	5277– 4	W1INM/1	3546– 2
VE3KP/3	5106– 8	VE1ND/1	3528– 4

CLASS B

(Listings show call used and score.)

W6RW/6	6655	W9OCC/9	1641
W3EIS/3	5873	W6INZ/6	1503
W2FBA/2	5549	W4IYR/4	1440
W1HA/1	2295	W5TGB/5	1350
W6JPM/6	2124	W7FVI/7	1337
W5OLD/5	1827	W2COU/2	1161
W5IER/5	1773	W8VWY/8	1161

CLASS C

W9RQM/9	3848	W8VK/8	1148
W6HDT/6	2148	W2ZYK/2	1148
W1WGM/1	1958	W7CO/7	1107
W6ZVD/6	1931	W7MPH/7	1035
W8AJH/8	1823	W8INO/8	986
W7KKN/7	1661	W8ZXL/8	984
W3FMG/3	1512	W3FVK/3	945
W7BA/7	1359	W3GBB/3	945
W8PM/8	1256	W7KZP/7	932
W6PIX/6	1242	W8INW/8	918
W8MWE/8	1229	W3RMN/3	905
W8AEU/8	1215	W7MSI/7	902
W8BDZ/8	1215	W7GJW/7	891
W3BII/3	1202	VE2CD/W1	870
W5DAH/5	1188	W3FDJ/3	851
W7JFO/7	1161	W7OYO/7	810
W8AGA/8	1148	W3FWZ/3	810

CLASS D

K2BCI	1161	W2RGX	21
W2SZ	246		

CLASS E

W1YYM	364	W9ESQ	147
W6GKM	363	W1WKM	132
W8NGO	277	W5YIG	120
W3DIM/3	226	W3RNY	111
W4SGH	176	W1TZA	98
W6PMQ	175	W2RGX	94
W3ISE	167	W2RHQ	93
WØBMM	160	K7NRM	92
W1AW	149	W1UGW	90

"WANE" CERTIFICATE AWARD

The Port City Amateur Radio Club of Portsmouth, N. H., is sponsoring the Worked All New England award. Rules follow: (1) All radio amateurs, regardless of location, are eligible for the WANE award. (2) To qualify, an applicant must show proof of having conducted two-way radio communication with another amateur station in each of at least 50 of the 67 counties comprising the New England states of Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island and Vermont. All six New England states must be represented in the 50 counties claimed. (3) Any or all amateur bands and 'phone, c.w., or both, may be used. (4) QSL cards or other confirmations will be accepted as evidence of this achievement. (5) Cards and applications for WANE should be sent to John W. Singleton, W1CDX, DX Manager, P.C.A.R.C., 1 Ashland St., Portsmouth, N. H. (6) Return postage for cards submitted must be furnished by the applicant. (7) The P.C.A.R.C. will not be responsible for cards lost in the mail.

A.R.R.L. ACTIVITIES CALENDAR

Sept. 6th: CP Qualifying Run — W6OWP
Sept. 17th: CP Qualifying Run — W1AW
Sept. 18th: Frequency Measuring Test
Sept. 19th–20th: V.H.F. Contest
Oct. 2nd: CP Qualifying Run — W6OWP
Oct. 3rd–4th: Simulated Emergency Test
Oct. 10th–11th: CD QSO Party (c.w.)
Oct. 16th: CP Qualifying Run — W1AW
Oct. 17th–18th: CD QSO Party ('phone)
Nov. 7th: CP Qualifying Run — W6OWP
Nov. 14th–15th, 21st–22nd: Sweepstakes
Nov. 16th: CP Qualifying Run — W1AW
Dec. 4th–6th, 11th–13th: 10-Meter WAS Party
Dec. 6th: CP Qualifying Run — W6OWP
Dec. 15th: CP Qualifying Run — W1AW
Jan. 8th: CP Qualifying Run — W6OWP
Jan. 9th–10th: V.H.F. Sweepstakes
Jan. 9th–24th: Novice Round-up
Jan. 13th: CP Qualifying Run — W1AW
Jan. 16th–17th: CD QSO Party (c.w.)
Jan. 23rd–24th: CD QSO Party ('phone)

VE/W CONTEST

The VE/W Contest is coming up September 26th and 27th. See page 58 for details on this popular activity.

ALL-WOMEN'S TRANSCONTINENTAL AIR RACE COMMUNICATIONS REPORT

Preparations for the 7th Annual All-Women's Transcontinental Air Race (AWTAR) began rolling early this year when Betty Gillies, Air Race General Chairman, contacted ARRL stating: "The service your members provided last year was of great value to us and we hope that they will want to take part in this event again this year. I was a contestant in last year's race . . . since then, I have become a ham myself (W6QPI) . . . consequently I can appreciate more than ever the value of this service to the AWTAR."

W2JZX, Vi Grossman, once again was assigned the post of Radio Chairman and by March 15th had the general plan of operation for the cross-country net set up with the following chairmen appointed to handle operations at each stopover city along the race route: Lawrence, Mass., W1PFA; Schenectady, N. Y., W2NAI; Rochester, N. Y., W2QAA; Detroit, Mich., W8ZGT; So. Bend, Ind., W9ZIB; Peoria, Ill., W9GME; Kansas City, Mo., WØZGK; Wichita, Kan., WØOZN; Amarillo, Tex., W5RRA; Albuquerque, N. Mex., W5LFT; Winslow, Ariz., W7REO; Prescott, Ariz., W7RTE; Palm Springs and Long Beach, Calif., W6NZP.

A network of communications facilities for the AWTAR was in effect from 5:30 A.M., July 4th, until the finish of the race in Long Beach on July 7th, supplying vital information to and from the 49 participating fliers. In general, portable equipment at the airport in each stopover city was manned by amateurs who kept in constant contact with a higher-powered fixed station for exchange information on plane locations and weather conditions. Nightly schedules (10 P.M. EDST, 3980 kc.) worked smoothly even though receiving conditions were poor. During the entire race period, W6LMQ at her home station in Long Beach, and W6NZP at the control tower in the Long Beach airport, received relayed information on arrival and departure times of the planes heading westward towards the finish line.

W2JZX's full report on the Transcontinental Air Race concludes: "Once again, we had a real opportunity to show what ham radio and conscientious operators can do in teamwork for public service. The fliers had sincere appreciation for the radio net that was alert in their behalf. Credit is given to each chairman, the radio clubs who took part, TCPN, MARS and the Deep Sea Dragnet for handling Air Race traffic, and the following hams who either operated, monitored or had a part in the organization of the radio net. Due to copy deadline, the following list does not mention the many amateurs in the central and western portion of the country who materially aided this communications system: W1s QON PFA QNC LBH MME BLO KNU TVD YYM AWO, W2s NAI QAA DXY GRI EFU BQU UKA UNF EEO CYK EOM NOC BTB ZOL MSE UTH VOU ZRV IJG, K2s BKU WAO ABZ BDJ, W3s DEC QPQ, W5s RRA SFW LFT RZJ UOC UEO FPB USA, K5NRX; W6s NZP QPI KSV LMQ SK TDL HCI FEA UHA KER NLM DQD PJU CEE GAU, W7s REO RTE BFA KOY JGZ PJY, W8s ZGT FWC AMH QGZ CYL, W9s ZIB AB GME USA TXC FM CC MAM TCS ZGC ZBK RE DIY DGP RWY JWC, WØs ZGK OZN HUI JTX KXL, KØWBB. . . . All enjoyed working with the aviatrixes and hope to be part of the 8th TAR in 1954."

Los Angeles YLRL (W6MWO) providing communications for the 7th Annual All-Women's Transcontinental Air Race at the terminus, Long Beach Municipal Airport. Standing, *l. to r.*: W6s PJU NZP LMQ CEE. Seated: W6s DQD KER UHA. Other operators, W6s TDL and FEA, were not present when W6GAU took this picture.

TRAFFIC TOPICS

Every year, on the first of August, we move all cards in our Net Directory card file behind a tab marked "inactive nets." This marks the beginning of the annual net re-registration. From then on, nets which register are included in the file of "active" nets and are kept in that file until the following August 1st.

This procedure is necessary because many nets, if not most nets, change something about their operating schedule from one season to the next. *We depend on you to keep us informed*, for directory purposes, of the exact, up-to-date status of your net in the particulars listed below. We cannot search SCM reports, correspondence, or depend on hearsay or what may be considered common knowledge in your particular circle or area. Net registration is a specific function and must be performed separately, preferably on a regular ARRL net registration card. *Nets are registered only on request.* Here's the usual procedure we follow in listing nets and the procedure we expect to follow again this year:

(a) Place all Net Directory cards in the "inactive" file (Aug. 1st).

(b) First call for net registration, September *QST*.

(c) First Net Directory list, nets registered as of Sept. 15th (or thereabouts) in November *QST*.

(d) Reminder and net registration card, October LO and CD Bulletins.

(e) Supplementary list of nets registered as of Nov. 15th (approx.) in January *QST*.

(f) Post-card reminder to all nets registered last year who have not re-registered. This is sent out about November 20th.

(g) Issuance of cross-indexed lithographed Net Directory (after Dec. 1st).

(h) Supplementary net lists in March and May *QST*s, of nets registered after January *QST* list was published.

HAVE YOU REGISTERED YOUR NET FOR THE FALL OPERATING SEASON?

It's not hard to do. We'll send anyone a net registration card upon request. Otherwise, here's the information we want for the directory: (1) Name of net. (2) Net designation. (3) Frequency. (4) Days of operation. (5) Time(s) of starting and ending. (6) Purpose of the net (this is a new one). (7) Direct coverage (by regular net stations). (8) Starting date of net (if new). (9) Net manager. (10) Net control stations. (11) Other nets with which liaison is maintained. (12) Name and call of person submitting information.

REGISTER YOUR NET NOW FOR NOVEMBER *QST* LISTING!

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Miscellaneous June net reports: Transcontinental Relay Net — 30 sessions, 8 stations, traffic total of 4418, an average of 145 per session. Mission Trail Net — 30 sessions, 515 traffic total, high of 35 in one session, average of 17 per session. Sound Traffic Net — 22 sessions, 357 traffic total, 75 high, 16 average.

—•••—

National Traffic System. The Transcontinental Corps of NTS is setting up shop on 7170 kc. during the summer months, from 2130 to 0130 EST. Only inter-area traffic will be handled. This is a meeting place for TCC members to exchange traffic, and every TCC member will monitor this frequency when possible during the above hours, in addition to (not instead of) his regular TCC schedules, many of which will also be held on 7170. While traffic from outside stations will be handled if reported in (provided it is inter-area stuff), all stations are encouraged to put the traffic into their area nets, from which TCC stations pick it up.

♦

QST for

Only if no TCC representative happens to be in the area net (one *should* be) should traffic be brought to 7170. Perhaps in October, the TCC net will be moved to 80 meters, or abolished altogether if we can fill up the roster.

June reports:

Net	Sessions	Traffic	High	Average	Most Consistent
1RN	22*	283	32	16.6	Me., Conn.
2RN	44	260	14	5.9	NJN
3RN	44	232	37	5.2	E. Pa.
4RN	33	261	21	8.0	Va., Fla.
RN6	46	631	40	13.7	LSN
8RN	10	39	15	3.9	Ohio
9RN	23	918	94	39.9	Ill., Wis.
TEN	44	1296	78	29.4	Ia., Minn., Mo.
TRN	22	36	8	1.6	Ontario
EAN	22	782	78	35.5	1RN,2RN,3RN
CAN	21	878	100	41.8	9RN, TEN
PAN	22**	670	74	37.2	
QIN (Ind.)	56	616	50	11.0	
LSN (Los A.)	26	692	80	26.6	
Minn. C.W.	24	67	14	2.8	
ILN (Ill.)	22	286	32	13.0	
QKS (Kans.)	13	78	17	6.0	
WSN (Wash.)	22	198	22	9.0	
Total	516	8183	100	41.8	
Record	516	8183	100	41.8	

*17 reported **18 reported

Note that every total this month is a record over other Junes — which indicates progress in any language. Also note the increasing number of section net reports. If it keeps growing, we'll either have to cut out some of the chatter to make room, or total all section reports on one line.

The 2RN early session was discontinued during July and August due to lack of traffic, but is being restored in September. W3ROU has received a 3RN certificate. W3BIP reports 3RN shows improvement over last year in all departments. Beginning June 16th 4RN met at 2000 EST for the summer months. *There's* a net that has shown some real improvement, too. Nothing heard from RN5 in several months. RN6 is just coasting during summer; W6IPW says QRN makes it tough for outlying sections to QNI. W8RO is holding 8RN together; Michigan has been falling down on QNI. VE3BUR reluctantly agrees that splitting TRN might help, but will canvass the members on their feelings. W9JUJ says that 9RN and TEN are always represented, but RN5 and EAN have been falling off. W7NH reports for PAN while we continue negotiations for a new PAN manager.

RTTY NOTES

The first reported amateur RTTY 20-meter contact with Japan was made by W4OYG (Gil Karnes, Louisville, Ky.) and KA2WW (W3MXE), June 26th, on 14,325 kc. As on the occasion of the first 10-meter RTTY contact in March, 1949, by W6ITH-W7JCU-JA3RO, several hundred words were exchanged. The contact was good from 6:45 A.M. to 9:45 A.M. CDST with relaying to W1JR. To look for RTTY traffic outlets east, W4OYG is contacting W4SHJ, W3PYW, W1BGW and W2JAV. A nightly RTTY schedule is kept with W6YDK at San Diego. W4OYG uses a single 4–400 into a pair of folded dipoles 135 degrees out of phase, also a Super Pro receiver and converter to a Model 15 printer.

CODE-PROFICIENCY PROGRAM

Twice each month special transmissions are made to enable you to qualify for the ARRL Code Proficiency Certificate. The next qualifying run from W1AW will be made on September 17th at 2130 EDST. Identical texts will be sent simultaneously by automatic transmitters on 1885, 3555, 7125, 14,100, 21,020, 52,000 and 146,000 kc. The next qualifying run *from W6OWP only* will be transmitted on September 6th at 2100 PST on 3590 and 7138 kc.

Any person may apply; neither ARRL membership nor an amateur license is required. Send copies of *all* qualifying runs to ARRL for grading, stating the call of the station you copied. If you qualify at one of the six speeds transmitted, 10 through 35 w.p.m., you will receive a certificate. If your initial qualification is for a speed below 35 w.p.m., you may try later for endorsement stickers.

Code-practice transmissions are made from W1AW each evening at 2130 EDST (September 27th and thereafter, 2130 EST). References to texts used on several of the transmissions are given below. These make it possible to check your copy. For practice purposes, the order of words in each line of *QST* text is reversed during certain of the slow-speed transmissions. 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 July *QST*
Sept. 3rd:	*Low-Pressure Modulation Facts*, p. 15
Sept. 7th:	*Noise Generators* . . . , p. 10
Sept. 11th:	*A Dot Anticipator* . . . , p. 18
Sept. 15th:	*Let's Use Neon Bulbs*, p. 22
Sept. 18th:	*QSYing the 75-Meter Mobile Antenna*, p. 26
Sept. 21st:	*Magnetostriction Devices* . . . , p. 28
Sept. 24th:	*Remote Control with a 420-Mc. Link*, p. 32
Sept. 29th:	*One Problem in Choosing Test Leads*, p. 47

BRASS POUNDERS LEAGUE

Winners of BPL Certificates for June traffic:

Call	Orig.	Recd.	Rel.	Del.	Total
W2BTB	121	4543	8849	121	13634
KG6FAA	463	4376	4159	155	9153
KA7LJ	2616	1799	1201	598	6214
W3CUL	437	2307	1586	721	5051
W6IAB	49	2486	2462	24	5021
W6KYV	124	1929	634	987	3674
W4PL	20	1308	775	489	2592
KL7AIR	128	1231	1131	100	2590
W4USA	78	1092	1211	45	2426
W4PJU	7	931	826	105	1869
W8ZGT	130	868	743	25	1766
W9JUJ	14	795	683	81	1573
WØCPI	25	756	671	85	1537
W7BA	28	683	655	25	1391
WØSCA	4	685	679	1	1369
WØHKE	14	532	535	11	1092
WØQXO	32	516	396	118	1062
W9NZZ	332	338	0	335	1005
W8GJH	354	426	109	84	973
W2ZOL	13	721	129	41	904
W4WHC	751	31	9	16	807
WØBDR	9	399	384	10	802
W9UNJ	22	354	259	95	730
W3USA	84	321	266	54	725
WØKHQ	9	353	345	6	713
K6FAL	141	279	230	18	668
K5FBB	37	322	285	21	665
W1ULF	300	175	125	50	650
W3WIQ	5	324	275	32	636
W6CMN	23	297	245	52	617
W1CRW	24	299	273	19	615
W1SJO	3	306	257	34	600
W5TFB	18	291	273	10	592
W6OFJ	47	266	266	13	592
W7PGY	14	279	273	6	572
W4FPC	5	23	470	23	521
W6YDK	57	230	134	93	514
KØFAM	160	169	125	47	501
Late Reports:					
W2BTB (May)	52	3424	3034	91	6601
WØKHQ (May)	9	559	550	3	1121
W7ONM (Mar.)	5	487	38	449	979
W8ZGT (May)	65	369	382	9	825
W7ONM (May)	8	367	363	4	742
W2NAI (May)	10	276	270	6	562
W6OFJ (May)	15	243	243	11	512

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

W3VON....338 W1RLQ.....148 W2EC.....101
W3CVE....222 W9SWM....126 Late Report:
W1LTA....205 W9RTP.....113 W8NOH(May) .114
W7APS.....152

The BPL is open to all operators who report to their SCM a message total of 500 or more, or 100 or more originations-plus-deliveries for any calendar month.

In June *QST*, this column, we started a Question-and-Answer session with ourselves, answering in print some of the most frequently asked questions we are getting from the field. Publication of these answers seemed to stop the inflow of questions — or anyway, of specific questions. Perhaps this was because amateur-c.d. organizers were reluctant to let the whole world see what dumb questions they asked (hi).

But specific questions, asked with earnest desire to get the answer, are good for both you, the asker, and for us, the answerer. It makes us both think. *You* have to think about RACES in order to come to the question, and *we* have to think and conduct research and seek interpretations to come up with the answer. Most of the questions we get are pretty general and vague, and we cannot answer them except to refer to *QST* and bulletins. Some of them are gripes saying we haven't done enough explaining about RACES, haven't spelled out in ABC language just what must be done to get started in RACES. Others are sweeping requests for "all the information on RACES." Once in a while we get a specific question, like this one:

Q. Who authorizes RACES operation in an emergency?

A. Normally, the Communications Officer, but any other responsible CD official having jurisdiction over the area served can also do so. We do not think that this can be interpreted to mean the Radio Officer alone can authorize RACES operation; he must have the acquiescence of his Communications Officer or other superior. This is covered in section 12.252 of RACES rules.

Most answers can be found in the RACES rules, or in some interpretation. Our interpretations are not official, of course, but they are fairly educated. Some of the interpretations we have seen from FCC may be official, but they aren't very clear. So let's ask more questions on troublesome points, and we'll discuss them here. If they aren't answered in the regulations, we'll give an opinion anyway; and if deemed requisite, we'll seek an official interpretation.

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The AREC of Orange, Texas, went into action under the leadership of EC W5NMV when the city of Orange was threatened with inundation from the rampaging Sabine River on May 21st–26th. Since most of the work was done on the 75-meter 'phone band, as usual, and since QRM was intolerable, also as usual, EC W5NMV appealed to FCC to clear 3855 kc., and the Engineer-in-Charge of the FCC station in Kingsville issued a "voluntary" emergency declaration. W5QLE was one of the first mobile rigs on the levee and about 10 mobiles came from Port Arthur at the invitation of W5SIC, who did a total of 96 hours of flood duty with only six hours sleep. W5SIC also built a mobile rig and installed it in his car for flood work, with the assistance of W5OMH. Contact was maintained with W5DEW who, although her house was partially inundated, was instrumental in supplying the flood zone with vital materials and services. W5DEW later came to Orange from Starks, La., through flooded roads. W5RLS set up at disaster headquarters, and 20-odd mobiles were stationed at danger spots to provide communication. Most of the Port Arthur hams who assisted were members of the Port Arthur Radio Club. Following is a list of all who were known to have participated: W5s ABX AEK AIR BUZ CCT DEW EEX FCD FJ FQI FQQ GHB IWN JNE JYM KKI KWA LHJ LQO MBI MJC NIG NIH NMV OMH OPJ OUG OYJ PKY PTJ PYU QFQ QIO QJS QLE QLD QMW RCG RLS RPW RWS RYV RYZ SDA SIC SON SQE SQI SWM TEG UIR ULX UQG URM URU UZR VCA VEG VEH VEI VHR VIY VKK VHR VOR VSK VSR VWC VWF VWH VZL WEO WHK WJI WRE WXS WZF YCA YCK YVJ ZBK ZGD, W6IZT/5 and WØBVL.

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Add to the participants in the Mt. Vernon, Ohio, fire emergency which was written up in August *QST*, this column, the following calls: W8s ABO APF DOL FYS FYW GFB GGG GIE GKN HPB IUS JHE JUM KEM KMM KVV MDX MQG MYH PHS RZG TAJ TIH VTP WXY WYH WZK YHQ and W9OKW/8.

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During the early days of June, 1953, the Sun River overflowed its banks, flooding a great deal of West Great Falls, Montana, and causing the Belt Creek at Belt, Montana, 20 miles southeast, to leave its channel and cause the worst damage ever experienced by that community.

In Great Falls, W7BOZ and W7MM contacted W7NGX/M, suggesting he go to Belt to see if he could help. He took W7DXK with him and found that there was urgent need, but their mobile rig was not of sufficient power. They therefore returned, picked up W7DXK's portable rig and were set up in Belt by 0500, June 3rd. W7DXK continued operating there until late the next evening, maintaining contact and handling traffic from the Red Cross to W7MM and W7BOZ, both of whom were on the air several days continuously. W7DXK was relieved by W7QPK, who together with W7RIL and W7TCR went to Belt the evening of June 4th to keep the rig in operation until around 1600, June 5th, at which time there was no further need. The traffic handled consisted of Red Cross requests for relief and supplies, welfare and need of evacuated persons, weather reports, road conditions and information on washed out bridges together with the usual welfare inquiries.

Good coöperation and assistance were received from everyone on the channel used for the emergency by offering their services, by standing by on the frequency, by relaying traffic to Salt Lake City and San Francisco, by clearing the channel and by relay between Belt and Great Falls when skip made things difficult. Notable among these were W7s PKX EHH HDN OOK JDZ FTV SFK and many others.

As the Belt Emergency subsided, another developed at Havre, about 110 miles to the northwest, where the Milk River left its banks and required evacuation of many at that place. W7EWR at Havre took over and maintained continuous operating schedules, handling traffic for the Red Cross as well as for others. He also established contacts with others downstream from Havre in order that all might be informed in case any danger should arise. The Red Cross had an extension to his telephone installed at his operating position to assist in handling CAP, airport, Red Cross and other traffic for the three days of this emergency.

All in all, this was a very good demonstration of service by amateur radio. I have been informed by the Red Cross that many of the reports received by them from other sources were verified via amateur radio channels.

— *W7DSS, EC Great Falls, Mont.*

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On June 9, 1953, the Lethbridge, Alta., AREC was called out to furnish communications for the city. VE6EO was alerted and advised that the Oldman River which flows through the low lying areas was rising steadily, endangering

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Last April, Denver and Colorado Springs had a mock A-bomb raid along with simulated widespread sabotage. Many amateurs took part in the communications end of the drill. This is Bob Scharping, WØANG, who set up his rig at Adams State College in Alamosa. Other amateurs who participated: WØLO (Radio Officer), WØWIR and WØTV (EC).

the lives of many people living there. VE6EO, with his mobile, ably assisted by 6TG and 6PL, patrolled the flood area during the afternoon and evening relaying messages to the city where receivers were set up at the studios of CJOC and at the main transmitter of CJOC. At these points 6OG, 6RH and 6OF were the operators. VE6PV, operating his home station, was stand-by relay station.

— VE6MJ, SCM/SEC Alberta

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Some instances of amateur radio assistance in New England forest fires have gone unrecorded in this column. One was at a fire in Elio, Maine, in early July, in which W1TTT, W1LMD and W1TWP participated. W1TTT and W1LMD went to the scene of the fire, covering two different points in the fire area, while W1TWP covered the home contact in Portsmouth, N. H. W1RZX stood by at the York Beach Fire Department to relay messages from that point.

On July 5th, W1RZX, W1ADC and W1TTT left for Mount Shaw, N. H., to assist in the forest fire then taking place in the White Mountains. W1TWP used his transmitter for the home base. They returned home about 0400.

The Portsmouth Civil Defense Department is solidly behind its amateurs and has appointed W1TTT the radio officer. The above report comes from a non-amateur c.d. official.

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On April 24, 1953, Nebraska took part in the Civilian Defense "Operation Wake Up" with more than 64 radio amateurs taking part.

A temporary control center was set up in the State House and equipment was moved in by the amateurs, whose job it was to try to furnish communications with the outlying areas of the state.

A simulated bomb drop on Omaha, incendiary bombs on Lincoln, and several other towns with sabotage were the problems. Amateurs were set up in sixteen counties and were contacted by the control center. Twenty-eight towns and areas were represented. The test was adjudged successful and the response and coöperation of amateurs was excellent. Difficulties encountered included severe QRN, poor reception due to inadequate antenna facilities and high electric noise level, and inability of control station and reporting stations to hear each other. The test points the way to remedy these and other defects noted.

— W9JDJ, SEC Nebraska

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We are still running way behind last year in SEC reports. For May, 1953, we received data from 10 SECs, representing 2466 AREC members, one (Ontario) a new section. This brings our total sections heard from for the year to 21, compared to 25 by May of last year. Last May we received *nineteen* SEC reports representing 3840 AREC members. So far this year (up to May) we have received 64 SEC reports, compared to 84 last year.

FREQUENCY-MEASURING TEST, SEPTEMBER 18TH

All amateurs are invited to try their hand at frequency measuring. W1AW will transmit signals for the purpose of frequency measurement starting at 10:30 P.M. EDST (6:30 P.M. PST), Friday, September 18th. The signals will consist of dashes interspersed with station identification. These will follow a general message sent to help listeners to locate the signals before the measurement transmission starts. The approximate frequencies used will be 3506, 7180 and 14,063 kc. About 4½ minutes will be allowed for measuring each frequency, with long dashes for measurement starting about 10:36 P.M. It is suggested that frequencies be measured *in the order listed.* Transmissions will be found within 5 or 10 kc. of the suggested frequencies.

At 1:30 A.M. EDST, September 19th (9:30 P.M. PST, September 18th), W1AW will transmit a second series of signals for the Frequency Measuring Test. Approximate frequencies used will be 3554, 7174 and 14,054 kc.

Individual reports on results will be sent to all amateurs who take part and submit entries. When the average accuracy reported shows error of less than 71.43 parts per million, or falls between 71.43 and 357.15 parts per million, participants will become eligible for appointment by SCMs as Class I or Class II OOs respectively.

This ARRL Frequency-Measuring Test will be used to aid qualification of ARRL members as Class I and Class II observers. Present observers *not* demonstrating the requisite average accuracy will be reclassified appropriately until they demonstrate the above-stated minimum required accuracy. Class I and Class II OOs must participate in at least two FMTs each year to hold appointments. SCMs (see address, page 6) invite applications for Class III and IV observer posts, good receiving equipment being the main requirement. *All* observers must make use of the coöperative notices (mail forms provided by ARRL) reporting activity monthly through SCMs, to warrant continued holding of appointment.

Any amateur may submit measurements on one or all frequencies listed above. No entry consisting of a single measurement will be eligible for *QST* listing of *top results;* at least *two* readings should be submitted to warrant *QST* mention. Listing will be based on over-all *average* accuracy, as compared with readings made by a professional lab.

FIRST 21-MC. WAS REPORTED

Miles Weeks, W6ZZ, reports that a contact with W7JU (Nevada) on July 9th completes his 21-Mc. WAS. Of additional interest, Miles already holds WAS certificate Number 1, issued January 8, 1936, when he was W1WV.

W1AW OPERATING SCHEDULE

From September 1st through September 26th W1AW will operate on the same frequencies and at the same times as indicated in the summer schedule on page 67 of July *QST*. The general contact schedule will also remain the same. The fall operating schedule will appear in October *QST*.

DX CENTURY CLUB AWARDS

HONOR ROLL

W1FH.....252	W6ENV.....243	W4BPD.....238
W8HGW....250	W3GHD.....240	W2BXA.....237
WØYXO.....246	W6AM.....239	W3KT.....237
W6VFR.....246	W6SN.....239	W2AGW....235
G2PL.....246	G6ZO.....239	W3CPV.....235
W3BES.....245	W3JTC.....238	PAØUN.....235

RADIOTELEPHONE

PY2CK.....227	W1NWO.....208	W1MCW....198
W1FH.....224	ZS6BW.....206	SM5KP.....198
VQ4ERR....220	W1JCX.....204	W2BXA.....195
XE1AC.....215	W8HGW.....204	W6DI.....195
	W9RBI.....200	

From June 15, to July 15, 1953, DXCC certificates and endorsements based on postwar contacts with 100-or-more countries have been issued by the ARRL Communications Department to the amateurs listed below.

NEW MEMBERS

ON4AU.....208	PJ2AA.....107	SM5AUP....102
W6LW.....170	W6FOZ.....106	ZE3JP.....102
W9QIY.....133	CR7AF.....105	W2FXE.....101
PAØNU.....129	W3ZQ.....104	W4BPU.....101
I1AOF.....127	W6EJA.....104	VE1CU.....101
DL3TP.....120	W3AXT.....103	4X4DF.....101
W5VSS.....110	F8DU.....102	ZE4JC.....101
F9IL.....109		WØARH....100

RADIOTELEPHONE

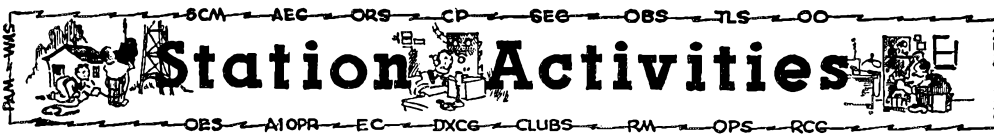
PAØNU.....123	LU4DMG....105	ZP5CF.....100
	W2LV.....102	

ENDORSEMENTS

W1ME.....232	G4ZU.....170	W1LQ.....130
ZL1HY.....230	G3DCU.....155	W1RAN....130
HB9X.....212	CE7AA.....148	F8SK.....130
LU7CD.....200	PY2AJ.....146	PY2AHS....130
W8JBI.....181	G6BS.....145	PY4UX.....129
W3PLF.....180	DL1KB.....140	VE1PQ.....126
W2GFW.....170	G3HLS.....140	CN8EJ.....121
W3CGS.....170	SM5AKM....136	W4HYW....110
W6GPB.....170	G3LP.....131	SM6DA.....110
	W1JMT.....130	

RADIOTELEPHONE

W3JNN.....181	W6MBD.....160	I1CAR.....137
	WØAIW.....141	



• 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, W. H. Wiand, W3BIP — SEC: IGW. RM: AXA. PAM: PYF. E. Pa. Nets: 3610, 3850 kc. I am very grateful for the coöperation given me by our former SCM, Jack DuBois, and wish to congratulate him on the fine work he did during his term in office. We regret his moving from E. Pa. but wish him much happiness in his new home. With the continued support and coöperation of all E. Pa. members, I will endeavor to uphold the traditions set forth by ARRL in the fulfillment of my duties as SCM. The Frankford RC held Field Day on the grounds of CTJ. Blue Mountain Summit, with an elevation of 1360 ft., was the Field Day site of the CAR-LE RC. The Lancaster RTS enjoyed Field Day at the farm of EYY. The DX Club spread out for the third year at the Ridge Fire Co. grounds near Spring City. Pottstown ARA participated in its first Field Day. SWZ is on the air from Camp Rodgers, where he is serving as counselor. UQJ and GZX are exploring the 420-Mc. region and are soliciting more v.h.f. activity in the York Area. IMV skeds Manheim, Germany, weekly to speak with his daughter. SCY attended the National Boy Scout Jamboree in Santa Ana, Calif. TER has a new antenna support in the form of a 50-ft. steel tower. OXQ is running 300 watts on 2 meters with excellent results. LUD, IXG, GZX, RAF/3, and EDO/M3, operating in coöperation with the York County Fire Police, took part in a mock disaster drill in Columbia, Pa. CUL continues her skeds while at the shore with an Eldico TRITV 300-watt 'phone and c.w. rig and an HRO-60 receiver. IGW requests that all ECs kindly make an effort to submit a progress report each month. Traffic: W3CUL 5051, BIP 110, KAG 86, NOK 79, PYF 64, RSC 60, OZV 58, MAC 50, QLZ 34, DUI 33, QOL 25, ONA 24, PVY 22, BFF 18, EAN 18, ELI 18, HIX 10, PDJ 10, UQL 9, VN 8, AD 1.

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA — SCM, Arthur W. Plummer, W3EQK — For three weeks commencing June 16th the Enock-Pratt Free Library in Baltimore displayed ham gear and literature in one of their main display windows. Donations for the display were from EQK, NNX, PRL, PSP, and QLF. AFR and EQK visited the Antietam Radio Assn. at Hagerstown, Md., June 9th. AFR spoke on RACES affairs and frequency allocation, PRL talked on TVI elimination and a TVI committee was organized, and EQK talked on League affairs and appointments. BNC spoke on how the Hagerstown gang was doing with v.h.f. RAH is pres. and CIQ, secy.-treas. ARA members using three transmitters at Foxville Fire Tower made 207 contacts on 2, 10, 20, 40, and 75 meters on Field Day. The call used was TJV and members present were RAH, CIQ, OYX, SCC, TJV, SKN, RVN, CSX, SQA, RFL, and BNC. CKJ has the first 'phone patch in the Hagerstown Area. The MEPN directors' meeting held June 24th at JQN, Rockville, Md., was attended by AWS, OYX, JQN, FWR, and FRV. At the June 15th meeting the BARC elected SKK, pres.; AFR, vice-pres.; RRQ, secy.; and QOM, treas. The Delaware Amateur Radio Club recently elected IYE, pres.; RFK, vice-pres.; UMV, secy.; and HGA, treas. AFR and EQK visited the Delaware Club and discussed League affairs, civil defense, the Delaware License Plate Bill, and RACES frequency allocations. NST is back with a Viking II and VFO which he assembled. NNX is replacing his BC-457 with an Elmac A54H. The BARC had transmitters on 10, 20, 40, and 80 meters on Field Day. The RACES plan for Baltimore has been completed and submitted to the State Director for approval. Thanks for the hard work should go to PRL, NKX, NNX, QOM, KKH, QAL, and KBF. MEPN now has 60 stations operating under the direction of RMD, who is NCM. 3GWD/3 mobiled his way into South Carolina via 75-meter 'phone. At present he is on 80-meter c.w. with 8 watts. JE reports installation of new Elmac transmitter and receiver in his car and now is mobiling on 10, 20, and 75 meters. HKS reports the DARC was very active on Field Day. CVE advises that TCRN is an emergency net as well as a traffic net and its roster includes 6BAM, 6KYV, 4SCF, 2BO, 4PL, KH6ASE, ØOMC, ØDQL, ØKA, KH6FAA, and 3CVE. CVE keeps in touch with Red Cross Headquarters in Washington, as well as the Weather Bureau, and can alert the net in any emergency. K3WBB closed down permanently June 17th. VON went to the Toledo Ohio Sesquicentennial with Signal Corps Demonstration Truck (AN-GRC-26) and set up a display for local hams and the public. VRI assisted him and the station handled 348 messages with 338 originations. VON is 2nd Lt. Elden Wayman, MARS Director, Sig. Office, Ft. Geo. G. Meade, Md. The Chesapeake Amateur Radio Club's officers are FLG, pres.; LMC, vice-pres.; DWX, treas.; URZ, secy.; AYS, sgt. at arms. PRL has been appointed as SEC for Md.-Del.-D.C. PWB is EC for D.C. and Asst. SEC, and DB is EC for Delaware and SEC. Maryland has ECs for only 8 counties as follows: Baltimore County, AFM; Worcester County, BM; Wicomico County, BSV; Cecil County, GGR; Somerset County, HL; Montgomery County, NPQ; Washington County, OYX; Hagerstown Area of Washington County, CIQ; Annapolis, Md. Area, UF; the City of Frederick, Md., in Frederick County, WN. At the July 6th meeting of the BARC eight committees were formed as follows, with the following named chairmen: ARRL information, EQK; speaker committee, AFR; membership, NNX, TVI, PRL; transmitter, JNM and KDD; QSL card, QOM; public relations, FUV; and promotion, DC. Traffic: W3USA 725, VON 348, CVE 312, K3WBB 182, W3CQS 135, JE 12, HKS 6, NNX 4.

SOUTHERN NEW JERSEY — SCM, Lloyd L. Gainey, W2UCV — We wish to offer our congratulations to the new SCM, Herb Brooks, K2BG, will take over this office on August 26th. Let's all pitch in and give Herb all the coöperation he deserves. ORA reports a 6-meter get-together on Monday nights at 8:30 P.M. for the Camden-Philadelphia Area. BAY and ADA are among some of the local stations participating. VMX took a trip West with visits to 3UVD, 8DMJ, and several other stations. WOA and his XYL just returned from a visit by air to California. RLY and DCQ are both putting fine signals out on 2 meters with the help of Gonset communicators. PAU went to Texas for the ARRL National Convention. YRW announced another jr. operator in the house. ASG apparently is laying a solid signal on 20 meters. He worked HZ1AB in Saudi Arabia twice. New Jersey MARS Nets have been reorganized under the leadership of Lt. Col. Sam Kale, W2VU/A2VU, formerly W3VE of Trenton. Traffic: K2BG 235, W2RG 111, ASG 57, ZI 5.

WESTERN NEW YORK — SCM, Edward G. Graf, W2SJV — SEC: UTH. RM: RUF. PAM: GSS. NYS meets on 3615 kc. at 7 P.M. on 3980 kc. at 6 P.M. NYSS meets on 3595 kc. at 8 P.M. NYS C.D. meets on 3509.5 kc. and 3993 kc. at 9 A.M. Sun. PBU is on 420 Mc. with ham TV. The meeting of the Southern Ontario-W.N.Y. v.h.f. group was held in Buffalo June 13th. TBD was M.C. and QED gave an interesting talk and demonstration of gear for 420 Mc. A sked arranged at this meeting resulted in the making of a new 420-Mc. DX record of 360 miles between 8BFQ and 2QED. A great many VE3s were in attendance, as well as 2UK, 3s KVN, QKI, WBM, NIX, 8s BFQ, WXV, and WJC. High scorers in the area for the ARRL V.H.F. QSO Party were VE3DIR for Ontario and W2RUI for the Niagara Frontier. KBT meetings were devoted to Monte Carlo Nite, a talk by the FCC Engineer in Charge, Mr. P. Holloway, and sound movies of the Hallicrafters-Gatti Expedition and African Adventure. RAWNY meetings were devoted to planning for the New York State Convention to be held in Buffalo Sept. 19th and 20th. EMW had a perfect attendance in NYS for the month of June. Visitors at ZHU's Field Day location were interested in 6 radio-controlled gas-powered miniature planes and balloon holding up 40-meter antenna. QQ, recuperating from an operation, took his turn at the Field Day rig on Sunday. The RARA Emergency Truck is the main center of activity in tests, being tied in with both the city and county radio facilities. JEY worked FRQ on 80-meter c.w., who was running 2 watts on Field Day. YRH and COU spent Field Day at the summer camp of WXQ. Rochester mobiles were very active with c.d. drills, a transmitter hunt involving 2 transmitters and a call to proceed to Mt. Read Airport with reports to the NCS from various check points en route. RUF is back on the air after a severe illness. QLI spent 5 weeks in Canada, secured a Dept. of Transport certificate, and worked 75-meter mobile. The Corning Radio Club played a big part in the Red Cross

(*Continued on page 70*)

ANOTHER fine National ARRL Convention is over. This one was held in Houston, Texas, at the fabulous Shamrock Hotel. The writer was fortunate to be able to attend, primarily to spread propaganda as to why everyone should operate on the 220 mc. band, but also to enjoy one of the finest conventions of them all. Congratulations and thanks to those who put in the tremendous amount of work necessary to stage such a fine affair.

Some people wondered why a convention should be staged in Texas in the middle of Summer. Wouldn't the weather be hot? It was hot — outside. The Shamrock Hotel where the event was staged is beautifully air-conditioned and actually we were more comfortable than we would have been if we had stayed home here in Boston. And there was no need to worry about outside affairs luring away part of your attendance. It was too darned hot anywhere else; that is, except for the superb swimming pool just outside the hotel.

Although the convention lasted for three days, it was necessary to run group gatherings of special types of amateur activities simultaneously. This has been done at IRE Conventions for some time and merely is a sign of the growth of amateur radio and the increase in the diversity of interests of our hobby. The writer attended the VHF group meeting which was held Saturday morning, followed by a VHF luncheon at noon. Such subjects as W5AYU trying to blow up fluorescent lamps on 420 mc., Ed Tilton's noise generators, tape recordings of the 2 meter signals reflected from the moon and the New Mexico balloon tests were very interesting.

Of course, the National Co., Inc. had a booth displaying our line of receivers. The NC-88 was displayed for the first time at any amateur gathering. This receiver is the newest of our comprehensive line, and I think you will find it to be a real buy. It is the first receiver in its price class to have a *calibrated* band-spread dial separate from the General Coverage dial, calibrated for the 10/11-15-20-40 and 80 meter ranges: General Coverage and Bandspread calibrations are shown on two slide rule dials with figures large enough to be read with your glasses on backwards. Printing is on the same side of the lucite dial as the pointer, reducing parallax to a minimum. The H.F. Oscillator tube is separate from the first mixer tube in the extremely stable self-compensating circuit formerly used in the popular NC-2-40 receivers. A separate antenna trimmer is included. And by the time you read this, these receivers will be on the market, as shipment is scheduled to start during the month of August.

Look it over. It's a honey!

CAL HADLOCK, W1CTW

drill in May using 10-meter mobiles. K2AHH has Viking II, VFO, and Lettine 240, and SX-71 receiver. 3KVN now is located at Niagara Falls. The RARA DX Association's DX-Fest was held at the cottage of BZN on Canadaigua Lake. Net certificates were issued to K8s CQA, AHH, AQY, 2s NAI, VDW, CLX, MSE, SD, KLF, KKZ, LXE, ATC, DVE, and HKA. Appointments: FXU as OO and ORS. Traffic: (June) W2BTB 13,634, ZOL 904, RUF 326, OE 110, ZRC 87, HKA 62, EMW 34, SJV 31, DVE 26, HXG 25, FEB 18, K2DG 16, W2OZR 12, FGL 8, ZHU 6, RQF 5, FXU 2, COU1,QLI 1. (May) W2BTB 6601, NAI 562, ZOL 222, HXG 26. (Apr.) W2FXU 2.

WESTERN PENNSYLVANIA — SCM, R. M. Heck, W3NCD — RMs: NUG and GEG. PAM: AER. The V.H.F. QSO Contest and Field Day (June to the uninitiated) has been taken in the usual or even better than usual stride by the gang, if the reports beginning to filter into this office are an omen. Apparently the usual difficulties were met with and overcome in the conventional ham style. Many newcomers were on hand and initiated into one of our most enjoyable and best attended amateur activities, Field Day. The Radio Association of Erie was at its usual location with emergency trailer and additional gear and reports the group had the best amateur Field Day turnout in years. It's reported that 10 was good and 2 added considerably to the scoring. Plans for lunar reflection experimentation are said to be shaping up with a gigantic antenna growing in the backyard of QKI. Erie amateurs were alerted by the Red Cross during June when tornadoes were expected, with ODF directing activities from Net Control assisted by LKJ, OIH, and QN. MED operated mobile in the expected trouble zone and TMK at the Red Cross to keep them posted. The Mercer County Radio Association set up at Reynolds for Field Day and early reports seem to show the site to be a good one with all attending enjoying the activity. The Steel City Amateur Radio Club publication, *Kilowatt Harmonics*, arrives on schedule. Its editorial staff, NRQ, MPO, RSL, VBL, MTP, and WN3UUH, are doing a fine job. Among those attending the Uniontown Hamfest were OKU, UHM, SDU, and OMY. OMY is back on 2 meters sporting a good signal. RUE worked 8BFQ in Everett, Ohio, on 420 Mc. Congratulations, Ted. The 2-Meter Weather Net still is going great but it could use more observers. See KWH Wednesday nights 2000 EDST 144.3 Mc. UHM is a new alternate operator on the KWH Weather Net. The WPA traffic net still is running at 7:00 P.M. EST Mon. through Fri. so let's join in and give them a hand. Traffic: (June) W3WIQ 636, NRE 151, UHN 75, SIJ 21, AER 14, AEV 3. (May) W3LXE 19.

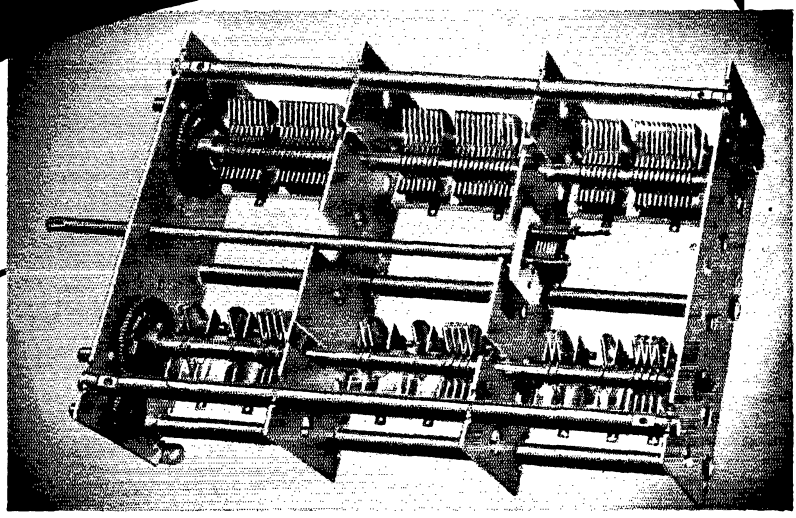
CENTRAL DIVISION

ILLINOIS — SCM, H. F. Lund, W9KQL — Section Nets: ILN 3515 kc. (c.w.); IEN 3940 kc. ('phone). SEC: HOA. RM: BUK. PAM UQT. Despite almost unanimous approval in the House of Representatives, the Call-Letter License-Plate Bill was defeated in Senate Committee; principal objections originating in the office of the Secretary of State caused the Committee to kill the measure. Let's try again in '55. Field Day activity reports by radiogram showed the largest turnout in years. Messages were received from the following stations: BA, GET, IAW, IT, MAE, MKS, PCS, OWD, WFJ, and WWO, all /9. VPD worked 35 miles with 0.9 watts on 1.8 Mc., air-borne mobile. PRV and CFV take honors as square-dance champs of the CIRC. TLC is running a new Elmac on 4.0 Mc. AEX jr. demonstrated his ability to put out an s.s.s.c. signal without the benefit of a single one of the necessary electronic gadgets. RNM may be heard under the call YCS when vacationing in Southern Illinois. Our thanks to the Illinois Central Railroad and KXN for making 2-KVA generators available to several clubs in time for Field Day. FSK demonstrated his ability as a mechanic on the one purchased by the Springfield Club. The Elgin Club station is licensed under the call YYJ, while new Novices in Elgin are YOA and YPZ. OKI, OKQ, and OIJ won the Illinois Academy of Science Award at Arlington Heights; they went on to win the Downstate portion of the contest at Macomb. Visitors at UZP were 9s CIA and HOD. Traffic: (June) W9CSW 337, KMO 179, W6CIW/9 108, W9OKI 75, PHE 42, KJ 28, NN 7, KRI 5. (May) W9DOR 18, KJ 14.

INDIANA — SCM, Clifford C. McGuyer, W9DGA — VNV has reduced car noise in his mobile. UKT has Elmac on 75 meters. KLR schedules 8WXV (240 miles) every night on 2 meters. ARH is going mobile. FYC is building a walkie-talkie. OFW demonstrated amateur radio to the Boy Scouts. WN9YIW is a regular on 2 meters and soon will be on 80-meter c.w. MEA has started a 145.7-Mc. net at 8 P.M. each Wed. TLR has his Gen. Cl. license. VGD rebuilt his 2-meter rig. DHJ has new 5-over-5 2-meter beam. CNY has moved to 2 meters. RBX is Assistant Manager of the Midwest Teen-agers Net and reports all teen-agers are invited to report in. The frequency is 3510 kc. at 1630. IEZ is on 147.3-Mc. f.m. ZIB installed mobile gear in his new car to cover all bands. PWB is building the TV transmitter of WKLO-TV. SWM keeps schedules with YLs on 40 meters. VAY reports the Chesterton Club is seeking 100 per cent ARRL membership. The Indianapolis Club provided communications for the championship boat races. UDD is president of

(*Continued on page 72*)

HQ-140's Sectionalized Tuning Capacitors Always Provide Proper L/C Ratio!



Heavy Brass, Soldered Plates Give Finest Performance

The carefully engineered tuning capacitor assembly of the HQ-140-X receiver eliminates the usual difficulties encountered in a receiver covering both the short wave and broadcast bands.

The nine individual sections of the bandspread capacitor, and the six sections that make up the main tuning capacitor, at all times maintain the proper L/C ratio regardless of what part of the receiver's range (540 Kc to 31 Mc) you use.

These two multi-sectional capacitors are built into a large sturdy frame that will always maintain its shape and provides receiver stability even under the most adverse conditions. Plates are of heavy brass, soldered to their shafts. They never loosen like ordinary aluminum staked plates. The rotor units are suspended on two ball bearings—front and rear—to assure smooth operation at all times.

The Hammarlund tuning capacitor assembly is further evidence that the HQ-140-X is engineered for amateurs who appreciate professional standards.

For detailed information about this receiver write to The Hammarlund Manufacturing Co., Inc., Box AU1, 460 West 34th St., New York 1, New York.

HAMMARLUND

the Indiana Chapter of the APCO. UQW, QYS, MIB, and WUH have new Vikings. YPG is the call of Butler University. POK is trustee of the Broad Ripple RC. For the latest in QSL cards, QSO TG. The Indianapolis Club has purchased a typewriter for its secretary. KIE and RIV won the TARS transmitter hunt. Officers of the Chesterton ARC are VAY, pres.; KFW, secy.-treas.; and WN9YNS, act. mgr. KLR now has 14 states on 2 meters. RZS again attended the National Jamboree of Boy Scouts. HIW is very busy with his Electric Co. UTZ is in Iceland. NXU works 7 and 144 Mc. FYM has his 1st-class radiotelephone ticket and was top scorer from Indiana in the Vermont QSO Party. NZZ says the 800-cycle mechanical filter in the 75A-3 receiver is the answer to the c.w. man's prayers. DPT is building a new shack. QOR has p.p. T-40s in his new final. JBQ reports RFN traffic as 58. YQA is a new Novice. QYQ has been appointed EC for Orange County. The Indianapolis Club has started a building fund with $1000. HQF has DXCC sticker for 120 countries. DGA has new 20-meter ground-plane antenna. Traffic: (June) W9JUJ 1573, NZZ 1005, TT 384, SWM 177, YWE 243, PPS 101, NTA 94, RBX 91, DHJ 74, QLW 74, ERB 70, DGA 60, CMT 57, DOK 57, VNV 55, OLX 38, LQE 36, JBQ 33, RZS 29, KDV 25, IFR 23, WUH 21, UMS 19, UQP 12, EUC 11, ZIB 9, BDP 8, SKP 7, KLR 6, FYM 4, PWB 4. (May) W9LZI 343.

WISCONSIN — SCM, Reno W. Goetsch, W9RQM — SEC: OVO. PAM: ESJ. RM: IQW. Nets: (BEN) 3950 kc. 6 P.M., (WIN) 3625 kc. 7 P.M. State Mobile and c.d. frequency, 29,620 kc. UNJ got his second BPL in a row with his FB total of 730. RTP makes BPL via originations plus deliveries this month. About 100 were in attendance at the BEN picnic sponsored by the Marshfield Club, with 3950 kc. a beehive of mobile activity. Net certificates (BEN) were issued to LEE, KWJ, UDX, OTA, OTL, QFX, and SAA. UCR has a new Sonar VFO. LSK now is scooter-mobile. SDK is QRL building an addition to his house. NLH replaces GJK as EC for Door County. WN9ZCX is new in Sturgeon Bay. ONV has 60-watt mobile on 28 Mc. Maj. Gen. R. J. Olson, State Director of Civil Defense, has appointed a committee to act in regard to amateur participation in the c.d. program, which includes Mr. N. H. Blume, Special Asst. to the Director, RQM, OVO, RUF, and TPS. TPS has been appointed Wisconsin OCD Radio Officer. All ECs will be kept advised as the program develops. Sign up *now* with your local EC. If your county has no EC appointed at present, recommend a qualified candidate to OVO, the SEC. AFT's XYL received her call, WN9ZAP. JLR is active on all bands from Park Falls. On 144 Mc. LEE now has 14 states in 6 call areas and GFL has 6 states and 3 call areas. GJK is on with sixteen-element beam. RKP now has 104 countries worked. WN9VCH is on 3.5 and 7 Mc. from Milwaukee. LEE is mobile on 4 Mc. KJM is leaving for W6-Land. 1JR (9ARE) attended the BEN picnic while on vacation in Wisconsin. ARRL appointments renewed: ESJ as OPS and PAM, AFT as OPS and OES, RUF as EC. New appointments: SHZ. JXY, SAA, GMY, LAG, and NLH as ECs. PBB operated portable at Rhinelander during the summer. Traffic: W9UNJ 730, RTP 389, ESJ 233, SAA 76, UCR 54, LSK 37, GMY 27, UCR 23, OVO 11, SDK 10, RQM 6, NLH 5, ONV 4, MUM 2, OOF 2, VHA 2, VLL 2, IFS 1.

DAKOTA DIVISION

SOUTH DAKOTA — SCM, J. W. Sikorski, WØRRN — Asst. SCMs: Earl Shirley, ØYQR, and Martha Shirley, ØZWL. SEC: GCP. RM: OLB. PAM: UVL. Rapid City, Aberdeen, Vermillion, and Sioux Falls Clubs are known to have participated in Field Day. PRL has a new jr. operator. Ex-5SNJ, Rapid City, now is ØOJQ. 5WVO has been assigned to Rapid City AFB. New calls at Rapid City are OVE and ORR. At Sioux Falls new Novices are Bill Wood, OOZ; Roger Dalziel, OOL; David Harms, ONN. 7MXK and ØOPP have been transferred to CAA at Sioux Falls. GCP announced the appointments as EC of EUJ, Turner County; IEI, Brown County, and GDE, Clay County. GDE also is a newly-appointed OO. GWL, Mitchell, received General Glass ticket. 7RBU (ex-ØHDO of Mitchell) spent a vacation with ØEYB and visited the Sioux Falls and Mitchell gangs. LBS reports working 14 DX countries and SMV worked 8 during the month. WNØLXN, whose courting activities interfered with transmitter-building for months, was married recently and expects to finish the rig soon. RRN visited Pierre and Rapid City Clubs. Traffic: KØFCR 121, WØOJQ 48, PHR 20, SMV 5, LBS 3, MPQ 3

MINNESOTA — SCM, Charles M. Bove, WØMXC — Asst. SCM: Vince Smythe, ØGGQ. SEC: ZDU. RMs: DQL, RPT. PAM: JIE. The Excelsior Radio Club now has a station on the air with the call CYE. IMC has moved to his new location near Canby and has plans for an antenna farm. The MSN noon 'phone net had an all-time high reporting into the net with 57 stations reported in during roll call. HFY has his new exciter in operation now. HKF has moved to his new QTH and claims to have the highest antenna in St. Paul, a ground plane on 10 meters on top of a 40-foot windmill tower. Bob says it is 1035 feet above sea level. BRA is building a fancy plywood operating console for his operating position. He is going to concentrate on 10 and 20 meters. The MSN C.W. Net dinner was a big success. CGK and BDR, of the Tall Corn Net of Iowa, attended. OMC was appointed as the new MSN Manager. One of the big problems discussed was the increasing of net attendance from Southern Minn. We have very few outlets in this area and wish to encourage the gang in Southern Minnesota to report into the MSN on 3795 kc. at 1900 CST. It is everyone's duty to join the Emergency Corps. Join up now! Traffic: WØDQL 240, OMC 209, UCV 178, SWB 65, DYD 41, GGQ 25, GTX 22, MXC 20, OPA 19, CID 18, QYZ 16, EMH 14, HMV 10, LIG 10, TJA 10, FFU 7, BUO 6, IRJ 6, CQY 5, JNC 3.

DELTA DIVISION

ARKANSAS — SCM, Fred E. Ward, W5LUX — Field Day this year was one of the best in a long time with most of the clubs taking part in a big way. Reports on the activities were rather slim but the Fort Smith Club came through as usual and reported 10 operators and 5 rigs. BJH had a BC-375 in fine shape for portable work and did a good job. WBA made BPL on Armed Forces Day. TID is using new Viking II rig. WUB has a new 120-watt rig and is on 20 meters mostly now. VVP is a new call in Danville. He is jr. operator at MRD and is ten years old. That may be a record for Arkansas, at least we have not heard of any younger. Congratulations to Todd and Omer. Traffic: W5WBA 252, TID 5, EA 4.

LOUISIANA — SCM, Robert E. Barr, W5GHF — This issue will appear just a few days prior to the first Delta Division Convention to be held since the affair in Biloxi in 1948. The New Orleans gang has put the big pot in the little one in preparing for the biggest affair ever to be held in the section. The Convention will be held at the Jung Hotel Sat. and Sun., Sept. 5th and 6th, allowing many hams to take advantage of the long week-end holidays caused by Labor Day on the 7th. Reports are that the prizes are to be the best yet, with a well-rounded program for the ham, his XYL, and the jr. operators. NG continues as the traffic hound with a nice total of 330 in June. YSN is on from Baton Rouge with a Viking on all bands, and a Super Pro receiver. The Naval Reserve crowd from New Orleans did a nice job on Field Day from Henderson Point, Miss. TRQ vacationed in Oregon and other points in the Northwest. USN maintained amateur teletype service in the National Convention at Houston via K5NRH/5 in the lobby of the Shamrock Hotel. YCB puts out a nice 75-meter signal in New Orleans. HHT is getting back on 75 meters at times now after a long sojourn to the upper frequencies. Messages to the SCM were received during Field Day from 1GQ/5, K5NRS, and USN/5. Traffic: W5NG 330, TRQ 2.

MISSISSIPPI — SCM, Dr. A. R. Cortese, W5OTD — Well, OMs, the pickings are slim this month; must be the hot weather. K5FBB made BLP again. YBH is on 75 meters now. JHS is checking into the c.w. nets again. OTD is portable at his office. QYZ is busy observing, as you fellows have found out. The Jackson Club's dues have been increased to three bucks. Your SCM would like more club reports and more station reports. PNM and SWQ had a fine time at the Convention in Houston. Traffic: K5FBB 665, W5JHS 115, W5YBH 16.

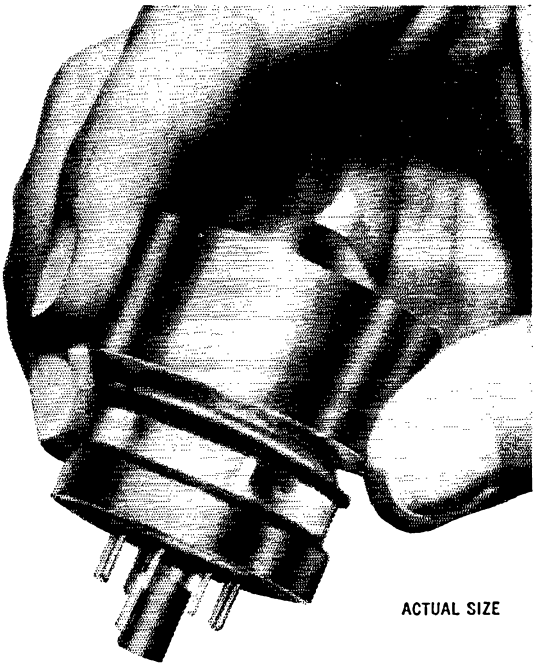
TENNESSEE — SCM, Mark M. Bowelle, W4CXY/WLG — SEC: NJE. RM: AGC. PAM: PFP. Vacations, fishing, and the hot weather have not bothered some of the old reliables such as PL, who holds well up in the nation in BPL. The c.w. net will be back on 3635 kc. at 0700 CST daily except Sun. starting Labor Day. The 'phone net, 3980 kc., has continued operation both evening and morning throughout the summer although hounded by QRN and a multitude of tuner-uppers on the frequency with no modulation. Helen, at IWV, tried to go mobile with her lawn mower but some flying debris cut her foot and blood poison put her out of circulation for a while. WQW is rebuilding again and says he will not be content until he equals AKJ (1 kw. plus or minus). VKE also has been doing some building — a 100-watt rig for 6 meters. SGI is sporting a new 32V-3 to go with his 75-A. FLW set up a 6-meter rig Field Day and was rewarded by a band opening which made the low frequency boys sit up and take notice. The fact that both 'phone and c.w. have a place in traffic work was brought out when CXY and WAX, two normal c.w. operators, had to take to voice to move some emergency traffic with the aid of IWV when the c.w. frequency was blanked out with a level roar of QRN. Traffic: W4PL 2592, YIP 258, IWV 202, OGG 110, VKE 90, VUA 63, VJX 48, CXY 44, LNF 41, RHO 36, OEZ 29, UIO 12, ZJA 9, WQW 6, DTI 4, RMJ 4, FLW 2.

GREAT LAKES DIVISION

KENTUCKY — SCM, Ivan C. Kelly, W4TUT — The scourge of the summer season has hit the SCM right in the face in that so very few of the boys turned in activity reports. There were reports of Field Day activity in Lexington, Louisville, the Covington Area, and Paducah, but all the transmitters must have blown up as no reports of such activities were forthcoming. UWA is running a TR75TV and is trying to show his future XYL the workings of a transmitter and receiver. WN4ZLK took the Tech. Class exam and has a full 75-watter. WHC is going mobile with TBS-50. NIZ, with multiple operators, uses broadcast tower for radiator. JUI still is chasing split frequencies building a

(Continued on page 74)

EIMAC 4X150A
and AIR-SYSTEM SOCKET for efficiency and power thru the 420 mc band



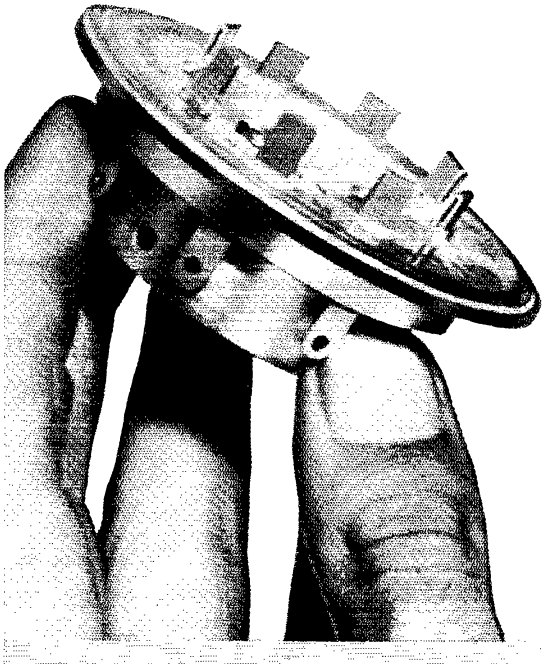
ACTUAL SIZE

TYPICAL OPERATION

Radio Frequency Power Amplifier or Oscillator Class-C Telegraphy or FM Telephony

D-C Plate Voltage	1000 volts
D-C Plate Current	200 ma.
D-C Screen Voltage	250 volts
D-C Screen Current	30 ma.
D-C Grid Current	10 ma.
Driving Power (approx.)	1 watt*
Power Input	200 watts
Power Output	150 watts*
Heater Voltage	6 volts

*At 165 mc.
(Power output at 500 mc. 120 watts)



COMPACT, RUGGED, POWERFUL — the Eimac 4X150A is a dependable performer for those who want higher power at higher frequencies. Excellent power gain and stability with plate voltages less than 1000 volts are among the many features establishing the 4X150A as an outstanding tube in VHF and UHF service. Small, compact, rugged design and ability to operate in a simplified transmitter with low driving power make it ideal for mobile thru the 420 mc band.

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new super-duper u.h.f. standard. WN5ZIV/4 has returned to Kentucky. K2CYI/4 is back handling traffic at Ft. Knox and installing a mobile rig. TZT loads up with OPS, ORS, and OO appointments. The Kentucky Ham Reunion held at Mammoth Cave June 21st was "swellelegant" and 88 turned up for visiting and ragchewing. No speeches, nothing but eat and talk. CMP, NGZ, TFK, and KBY have spark-plugged all eight of them. TFK plans to attend 80 more. All voted to hold the reunion next year on the 1st Sun. in June. OMW's *Ether Waves* brings information from northern Kentucky. OYG handled 86 messages, all by teletype, including Japan traffic direct. Traffic: W4WHC 807, OYG 172, SBI 98, SMU 33, UWA 33, NIZ 25, K2CYI/4 10, W4JUI 4, WN5ZIV/4 1.

MICHIGAN — SCM, Fabian T. McAllister, W8HKT — Asst. SCMs: Bob Cooper, 8AQA; Joe Beljan, 8SCW; Mickey Wills, 8CPB. SEC: GJH. New appointments: OPS to 1QJ. Between the storms and the ideal summer vacation weather the attendance on our traffic nets is taking a beating. Everyone reports the best Field Day we ever had. ILP is all torn up because of house remodeling. WVL added another Secretary of Defense certificate to his big collection by copying the annual Armed Forces Day message. He did it the hard way, too; got home just in time to catch the midnight broadcast from NPG. FGB has joined the boys on 2 meters and reports 100-mile DX. NUL had his long perfect-attendance record on QMN disrupted on June 30th when power lines failed. NOH came out second best when lightning struck the house and shack. CPB still works KF3AA at the Pole, and says the boys up there are having nice summer weather! MGQ finished his Elmac mobile installation in the car and has joined the mobile gang. We still need more of your reports, fellows, and we want more applications for AREC. Traffic: (June) W8ZGT 1766, GJH 973, URM 227, TBP 118, NUL 93, SPF 89, JYJ 83, QIX 67, ZLK 60, NOH 24, FX 23, QGZ 19, CPB 18, FSZ 17, AQA 12, SCW 12, MGQ 4, SJF 4, DLZ 3, MAI 2. (May) W8ZGT 825, NOH 190, RTN 82, SPF 29.

OHIO — SCM, John E. Siringer, W8AJW — Asst. SCMs: C. D. Hall, 8PUN, and J. C. Erickson, 8DAE. SEC: UPB. PAM: PUN. RMs: DAE and PMJ. Hot weather and Field-Day activities apparently detracted from the normal interest in traffic-handling. About 45 Field Day messages were received by the SCM. The tornadoes in Northern Ohio on June 8th certainly brought many of the amateurs to life. Exceptionally fine work was done in the Cleveland Area. Our jovial SEC requested the following to appear in this column. "In case of REAL need for amateur radio communications help in an emergency, notify W8UPB by radiogram and/or long-distance telephone. Reverse charges! Business telephone: VAlley 0701; home telephone: EAst 6518. He can assist in getting circuits set up." All Ohio 'phone nets are moving to 3820 kc. to escape(?) the QRM formerly found on 3860 kc. Some optimism! The Teen-agers Net meets on 3510 kc. at 1630 and 2100 EST. FYO is working on an 813 final. The Cleveland Brasspounders, with but four operators, made 860 contacts during Field Day with three transmitters! Quite a performance! LMB, TCPN chairman, says the Ohioans are doing a swell job on TCPN and the Early Bird Nets. IFX bemoans the fact that such unimportant courses as calculus, physics, vector algebra, etc., are raising havoc with his traffic-handling. HNP, Lucas County EC, had 18 mobiles out to check radio-activated sirens on June 20th. He states that 75 turned out for Field Day. The Westpark gang had more than 200 people visit their Field Day set-up. The socializing obviously reflected on the operation. AQ is starting his 31st year as ORS. Judging by Ev's appearance, he must have gotten his ticket before he turned ten. AVT, BWZ, DAD, JFG, KAL, LRU, and SVK were among the June graduates at Case Tech. The OVARA *Ether Waves* tells of the Club making a mere 1400 contacts with six transmitters during Field Day. The GCARA *Mike and Key* asks the gang to start talking up their Stag Hamfest, which will be held at Ash Grove on Sept. 13. This is one affair, gentle reader, that you can't afford to miss. Columbus's *Carascope* mentions that 30 mobiles went to Mt. Vernon to assist in the communications emergency; the recent transmitter hunt was won by KHO, with QQ and DWP next in line; and that Field Day was better than ever. DNJ, a well-known old-timer, will conduct on-the-air code classes on 28 Mc. starting in September. The Dayton *RF Carrier* informs us that AUN won the latest transmitter hunt and that VOS has been named as Dean of Science at the Univ. of Dayton and HB has been made an Associate Professor. From Toledo's *Shack Gossip* we learn that HXF and family vacationed in Canada, JKR is on 75-meter mobile, MBE is putting a rig on 160-meter mobile, and MBI has a new Viking II. NCK is the newly-assigned call of the SVARC, which meets in Fremont. Traffic: (June) W8JAR 387, KNX 356, FYO 350, UPB 258, RO 111, SRF 101, DAE 84, AL 80, AJH 67, CTZ 66, AJW 53, LMB 50, IFX 49, ILC 39, HUX 34, NYY 22, PUN 17, HNP 9, YGR 9, ET 7, AQ 5, BLS 4, EQN 4, MGC 4, HFR 2, TLW 1. (May) W8BEW 14, MGC 6.

HUDSON DIVISION

EASTERN NEW YORK — SCM, Stephen J. Neason, W2ILI — SEC: RTE. RMs: TYC, KBT. PAMs: IJG, JQI, K2CA. K2BSD received General Class license and gives credit to BSH, who conducts classes in the Schenectady Area. The MHT Net has closed down for July and August. CFU is on vacation in New Hampshire. MRQ worked 47 states on Field Day using 35 watts input; all bands were used. Once again the E.N.Y. gang furnished communications for the Women's Transcontinental Air Races. Those taking part were DXY, NOC, EFU, GRI, NAI, K2BKU, and K2BQU. HZZ claims his new 144-Mc. Quadrapole is working FB. KN2ASD has a Gonset Communicator and a twin-six beam installed at the Middletown Hospital and is doing very well with the set-up. Notice: All interested v.h.f. stations in E.N.Y. are invited to take an active part in our Hudson River 144-Mc. Net. Activity on this Net will give you an excellent opportunity to experiment with your gear and antennas For information, please contact PCQ, RTE, or VP. Why not investigate now? Clubs reporting activity on Field Day were AARA, IBM, SARA, and RVWARS. GDD, ZBS, and NRY were awarded Section Net certificates for activity on NYSEPN. VP is doing a fine job with his AREC-c.d. group in Ulster. In a recent parade in Saugerties, five mobile 10-meter stations assisted the Town and State Police in handling the traffic on Route 9 W and keeping in touch with the chief. PGE did an excellent job as NCS. Appointments: QKK, JEA, and K2ASQ as EC. Endorsements: WQL, GTC, NOY, SNN, IRT, QGH, SUL and AAR as EC. LEL is doing fine with a twin-five Yagi on 144 Mc. Please don't forget to check your endorsement date and avoid cancellation. Traffic: (June) W2EFU 73, LRW 65, ILI 48, MRQ 38, CFU 28, HEI 12, AAO 7, K2BSD 7, W2BUI 6. (May) W2LRW 91, EFU 83, KBT 23, K2BSD 15.

NEW YORK CITY AND LONG ISLAND — SCM, George V. Cooke, jr., W2OBU — Asst. SCM: Harry Dannals, 2TUK. SEC: ZAI. RM: VNJ. PAM: YBT. Field Day reports indicate a high attendance and scoring over and above all previous years. In 10 clubs reporting, 166 operators participated, with 20 AREC members among them. The Tu-Boro Club set up at Shohola, Pa., and the Sunrise group at Coram, N. Y. Thanks go to the Tu-Boro, Huntington, Lake Success, Mid-Island, Nassau, Sunrise, Levittown, Kings County, Queens Radio Amateurs, and North Nassau Clubs for Field Day messages. Traffic, both 'phone and c.w., nets, and AREC groups slowed down for the summer and full resumption is expected about mid-September. In Queens, Section Net certificates have been issued to FKR, FVS, KWU, and AVI, while in Nassau certificates went out to BFN, BPV, BTA, DQN, DUS, GLU, GQP, IBQ, KAE, KEB, LBJ, LLI, LTR, ONG, PDH, VUW, ZAI, ZYK, CAC, CNN/2, GBF, GLO, HAK/2, IDJ/2, KTF/2, K2ALH, BCI, CFJ, W2FI, KFV, QBR, and TUK. The list includes all AREC/c.d. participation, including operation in Borough and County C.D. Control. The Teen-agers Net, sparked by JOA, has expanded into W1-Land and shows wonderful opportunities for tie-in with NTS and local nets in the East: League registration has been completed. JOA urges all teeners to contact him for fall activity and bulletins. The net meets on 3630 kc. daily at 1730 EDST. YFA, TMA, DUP, and KN2COS furnished communications for the annual New York AC Regatta at Orchard Beach using 10-meter mobiles and piping results into a p.a. system for the benefit of the spectators. An excellent job was turned in. VNJ reports that the NLI Traffic Net, operating on 3630 kc. at 1930 daily, will resume full season schedule effective September 14th. The Nassau Radio Club elected the following officers for the '53–'54 season: PC, pres.; KAC, vice-pres.; GLU, treas.; and KDP, secy. PF has returned from a trip to Korea, Japan, and Hawaii, during which he visited KA2ZZ and other stations in Japan. K2FAA is doing a fine job as NCS on TCPN. BQM worked ZD1SW, Sierra Leone, for a new country on 20 meters. K2ANH is doing a swell job conducting the Lake Success Club code classes. GG and TUK have a third member of the family to join the ham fraternity: brother Frank, now at Keesler AFB, Biloxi, Miss., received the call W5ZRA and operates K5FBB. LGK tells us of the FLIRC Hamfest coming up on Oct. 9th at the Lost Battalion Hall. RHN is back on 80 meters with a Collins station. OBE has a new s.s.b. rig. YBT now is running a gallon, 80 through 40 meters. LJF is back from a honeymoon. BAE has moved to W6-Land permanently. UWG is operating s.s.b. on 40 meters and looking for contacts. The Ninety-Niners Women's Powder-Puff Air Derby from Lawrence, Mass., to Long Beach, Calif., was a complete success with communications being handled on this eastern end by JZX and EEO. ABT, VOU, and K2ABZ rendered invaluable assistance by helping monitor and clear frequencies for the most successful operation. JZX and EEO spent about 30 hours over the week end and handled upwards of 15 messages between the fliers and their families. MUM now is AREC, MARS, RSGB, and WBE with a Viking II on all c.w. bands. Traffic: (June) W2JZX 228, JOA 191, EC 179, AEE 128, VNJ 75, GXC 65, KJG 64, DIC 54, PF 37, LGK 30, ONG 29, AZS 26, LEO 19, KFV 18, IN 17, BQM 16, MUM 9, IAG 6. (May) W2LPJ 331, JOA 163, GXC 153, KFV 14.

NORTHERN NEW JERSEY — SCM, Lloyd H. Manamon, W2VQR — SEC: NKD. PAM: CCS. RMs: NKD, WCL, CGG. YKX reports promising DX conditions on 10

(Continued on page 76)

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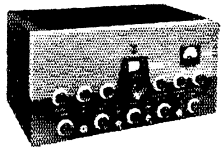

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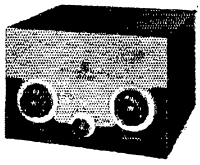

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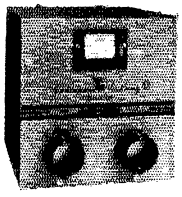

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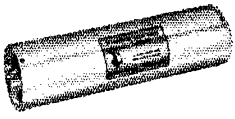

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TOWER AND BEAM PHOTO—COURTESY OF WØEDX
During the 19th annual ARRL Sweepstakes, WØEDX rolled up 108,972 points with 505 exchanges in all 72—to win top 'phone honors and the distinction of being the only entrant to tally a six-digit score. Johnson equipment in use by WØEDX: Viking II, Viking VFO, "Matchbox", Low Pass Filter, SWR Bridge, Rotomatic Rotator, and Automatic Dual Beam Antenna.

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meters, his first contact in June being CT1SX. CVF, Area 1 RACES Officer, recently completed the fourth in a series of c.d. monthly drills. This operation was conducted in coordination with police personnel in Bergen and Passaic Counties. Thirty headquarters stations answered roll call, with official c.d. police personnel present at 24 of the 30 stations. Further operations of this nature will be held in September. YLS has the record this month for the longest 'phone patch, Marmaduke, Ark., to New Jersey on wire and on to VO6-Land by amateur radio. Dave handled this traffic for a G.I. in Labrador, who was delayed in departing on an emergency furlough home to visit his seriously-ill daughter. CGG is back in the traffic listings again after a brief layoff. K2BWP, a new ham in Clifton, has been on the air for only four weeks and sends in a traffic total of 124. Congratulations and good luck to you, OM. NIY received certificate for high score for New Jersey in the Vermont QSO Party. OOG furnished communications for the Annual Boy Scout Camp-O-Ree near Holmdel, N. J., on June 5, 6, and 7. Operations were on 75-meter 'phone, 2 meters, and on 80-meter RTTY. NQA has a new addition to his family, another boy. HUZ is heard mobile on 2 meters. CUI has moved his trailer home and station to Atlantic Highlands for the summer months. FYS managed to get enough time off from Navy duty to take part in RVRC Field Day. AJB is enjoying the vacation from college by designing and building gear and antennas, both h.f. and v.h.f. HJD added a Viking to his station. LTI is back on 75 meters and is on MARS. The Bloomfield Radio Club-Irvington Radio Club Field Day rivalry reached an all-time high when each discovered the other's camp was only a mile away. All ended well as the refreshments were pooled. WR and K2BC share the same birthday date in July. KN2CZD was elected president of the Dunellen Junior Fire Department. BVS agrees to forward late issued copies of the *Call Book* to hams overseas who cannot purchase same. Send him your less-than-a-year-old call books; Fred has a long list of DX foreigners wanting same. CCS is lending a hand to a group of 6 Novices in converting BC-454 transmitters. Henry says he will have them all on the air soon. OO activity reports were received from NIY and TPJ; it takes more than the hot weather to slow those boys down. K2DHE is the new call assigned to W8JWK/2. Your SCM enjoyed a visit with the Morris Radio Club on July 1st. The GSARA building program on c.d. emergency equipment is going very well, reports ENM. K2DQO is the new call for the second station of W2ENM, located at his place of business in Bradley Beach. Traffic: K2BWP 124, W2CGG 117, CCS 115, DYW 86, EAS 84, CUI 80, K2BX 70, W2CGH 70, JMH 50, VQR 42, DME 36, ATA 14, HIA 13, K2BXL 12, W2YLS 1, K2BCK 1.

MIDWEST DIVISION

IOWA — SCM, William G. Davis, WØPP — I received a swell report from the scribe of the Iowa Great Lakes Amateur Radio Club and have misplaced same, much to my regret. He reports the Club has great plans, especially in the line of instruction, and a great record for the number of new hams made since the club was organized. SCA and BDR made BPL again. The Central Iowa Amateur Radio Club furnished auxiliary communications for the Marshalltown Police Dept. during the Centennial Celebration July 2 3-4. Operation was very successful and won the praise of the Police Department. Those participating were SCA, BDZ, HWW, EIZ, PRF, THU, PTL, SRQ, UJC, ISV, and EFL, with BDR as NCS. BDR attended the Rocky Mountain Division Convention. LCX got his application in for ORS appointment. QVA reports for TLCN that BDR attended the Minnesota Net party at Minneapolis. BBZ is working at WOW/TV during the summer vacation from medical school. BVE lost his antenna and some condensers in his Viking when hit by lightning. EEG had a picnic for the 160-meter gang at his cabin on the Cedar River. NYX became a "pop" on Father's Day. A new ham in Burlington is 8ICB, who works at the new Sylvania tube plant. GSH is recovering OK from a broken hip received while clearing broken limbs from the ICRR Company wires. The Iowa clubs were very active during Field Day, I hear from the grape vine. Traffic: WØSCA 1369, BDR 802, LCX 299, PZO 228, BVE 102, QVA 98, ERP 59, BBZ 38, NYX 13, GSH 12, FSX 4, BLH 3.

KANSAS — SCM, Earl N. Johnston, WØICV — SEC: PAH. RM: KXL. PAM: FNS. Hats off to VTT, new Net Control for Thurs. night, who is doing a very fine job. The Kansas Net members, both 'phone and c.w. who are keeping the traffic r lling these hot days, deserve commendation for their perseverance. The Central Kansas Radio Club had a very fine picnic June 14th with over 200 registered. Amateurs from Colorado, Oklahoma, Nebraska, and Missouri were in attendance. TLG reports the Pawnee Amateur Radio Club held its April meeting at St. John with Bill English as host. BVQ, of Wichita, gave an s.s.b. demonstration. The July meeting was held in Great Bend where police-amateur radio communication system in connection with c.d. was planned. The PARC holds its meetings and picnics the first Sunday in each month. The Kansas City communications for Transcon All Women's Air Race were successful, with 8ONM operating 10-meter mobile at the Kansas City Airport. YCT is on 2 meters and ZGK is on 75 meters. FEO has completed his 120-watt modulator and now is active on both Kansas nets. YZB, of Wichita, is working DX on 20 meters with a kw. and ground-plane vertical and reports an opening to Europe June 28th. WGM has a new Viking II and has stopped worrying about TVI. HAW is planning to attend Upland College in California this fall. The Kansas-Nebraska Radio Club held its annual hamfest picnic at Lincoln Park in Superior, Nebr., Aug. 16th. Traffic: WØNIY 229, BLI 179, IFR 66, FEO 51, WMQ 46, UPU 32, HFP 26, FUF 25, WGM 24, ICV 11, GHR 8, LIX 4, YZB 4.

MISSOURI — SCM, Clarence L. Arundale, WØGBJ — SEC: VRF. PAMs: AZL and BVL. RMs: OUD and QXO. The Southwest Missouri Amateur Radio Club, the Rolla Amateur Radio Club, the Band Hoppers, and the Mo.-Arc Clubs reported having participated in Field Day activities this year. FIR has a Viking II with companion VFO. BVG has a new Johnson mobile unit in operation. OUD is getting better signal reports with the folded dipole. MCM has a new RME-55 on order. IWZ is busy with 40-meter traffic work. EST is mobile on 10 meters and IBZ is mobile on 20 meters. DUD is making some 10-meter mobile antenna experiments. EAN is with the Collins Radio Company and will have the 813 final in operation at the new QTH. The Missouri 'Phone Net held its annual picnic, near Eldon, on June 14th. A 15-minute recording made at the picnic later was broadcast by the Eldon b.c. station. TGG, BVL, JXJ, and AZL participated in the recording. The Greater St. Louis Hamfest was held May 30th, with a large crowd in attendance. CFL has returned from his two-week Naval Reserve Cruise. KIK received his 2500 Traffikers Club certificate. CPI and QXO made BPL again. MIZ has worked all states and is waiting for some confirmations to qualify for his WAS. LCU is building rig with a 2E26 final. JDG is operating on 40 meters. The St. Louis University Amateur Radio Club operated 2 transmitters in Field Day operations. Traffic: (June) WØCPI 1537, QXO 1062, GAR 238, GBJ 170, CKQ 79, IJS 79, HUI 61, CFL 48, EBE 37, OUD 32, CXE 20, KIK 18, BUL 13, BVL 8, BZK 8, QMF 8, TSZ 6, IVH 5. (May) WØCFL 266, ZLN 27. (Apr.) WØIJS 184.

NEBRASKA — SCM, Floyd B. Campbell, WØCBH — Asst. SCM, NCS: Thomas S. Boydston, ØVYX. SEC: JDJ. PAM: EUT. JDJ, SEC and Nebraska Radio Officer (c.d.) reports that Director Schmidt has OKed the Midwest Convention for Lincoln, Nebr. Oct. 10-11. VYX is general chairman for the convention, with RYG and BUR as his able assistants. RYG is new EC for Lincoln. LRK is new EC for North Platte Area. RACES communications plans had to be modified slightly with assurance they would be accepted. The AK-SAR-BEN Club is the proud possessor of two gas generators. There is plenty of mobile DX in Lincoln with 2ZWS/Ø in town for several months. The control center for Nebraska c.d. will be in the State House building. There will be two Viking Is on loan from the 5th Army. "Pee Wee" Hunt, musician and ham, 8HBC, operates all bands, 'phone and c.w. with 160 watts to a pair of 807s. He says he sometimes puts out an occasional CQ from the bandstand on his horn. RQS has a new HT-20 on the air. GFQ won an all-expense trip to Bermuda for himself and his XYL but is too busy to take it. JRY has a new KW-1 on 15 and 10 meters. WNØKGA has been notified by FCC to drop the "N" from his call. The Hastings Radio Club reports Field Day activity with contacts on 80 and 40 meters. LJO, NPZ, EGG, AQE, and WNØOMH did the operating. Traffic: WØBUR 60, VYX 38, QHG 34, CBH 18, MJK 17, TIP 15, EGQ 14, MAO 14, KØWBF 14, WØHQQ 8, ZJF 8, HQN 6, HTA 6, DDP 5, HXH 4, IAY 4, ORW 4, BEA 3, ISV 3, FSE 1, LEF 1.

NEW ENGLAND DIVISION

CONNECTICUT — SCM, Roger C. Amundsen, W1HYF — SEC: LKF. PAM: FOB. RM: KYQ. CN-3640 kc. CPN-3880 kc. CEN-29,580 kc. WN1YQR, in Stratford, and WN1YON, in Ridgefield, are new ones this month. RMZ visited MJE/KON in Massachusetts, then he and FMU motorscooted to RYL in the same State. URM made ORS. Renewals: FRL, ABZ, and FOB as EC; CUH and LHE as ORS; FOB both PAM and OPS. There are lots of appointments that are years in arrears and two weeks after this appears in QST I propose to clean house. So if you have an ARRL appointment you want to keep, check your endorsement date pronto! NJM is going to be a better boy and report. OGQ moved to Waterbury. RFJ is replacing him as EC for Stratford and BRL Comm. Off. Red Cross. BVB has new 813 rig on. CUH is busy farming. LV/2 is on from Auburn, N. Y. SZI gave a talk on his trip to Europe to the CARA. ZL is up to 201 countries. MEF received telephone 1st-class license. UNG is busy as NCS in CN. BDI was active on Field Day, then went to Texas, then on vacation. Field Day reports received here include those from TX, BDI, EH, and HA. WN1YHO and WN1YND are after AREC membership. Ex-JLN now is on in Lynn, Mass., APA reports. Gil qualifies as tinsmith after de-TVI work on the rig. EOB, the foremost contest winner and ex-SCM of Western Massachusetts, has moved to Danielson. An FB bulletin was received from WM section. KH6AQT has moved to Bridgeport. RRE reports on c.d. exercise. WDM, SAQ, IWY, STM, MHF, TSI, OND, RMZ, FMU, VNI, and RPQ were among others in Willimantic on June 28th. HYF hamfested

(*Continued on page 78*)

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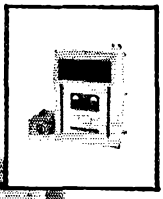

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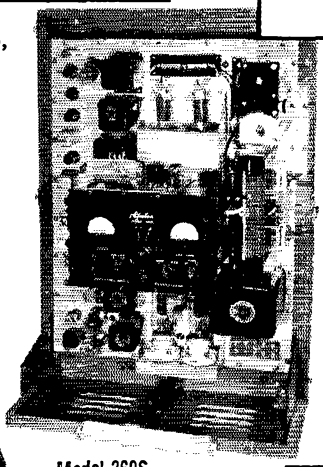

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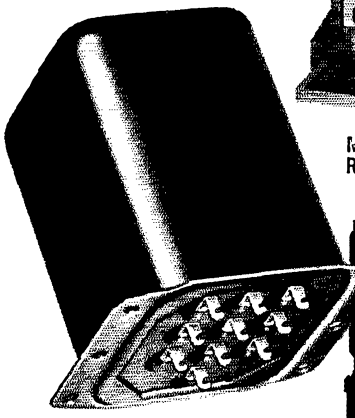
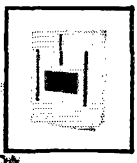
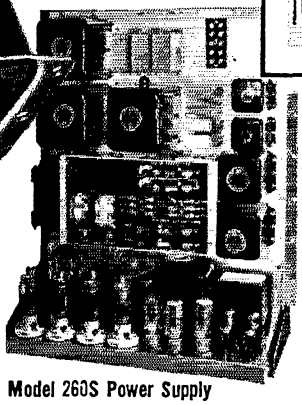
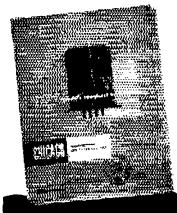






Model 260S Power Supply



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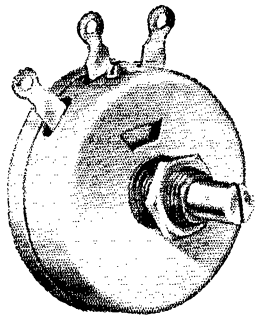
in Auburn, Maine, during vacation. Traffic: (June) W1SJO 600, AW 224, KYQ 209, AYC 189, NJM 185, CUH 92, FOB 78, LIG 73, UNG 47, RRE 40, KV 36, W3VES/1 34, W1VOV 32, BDI 28, HYF 23, BVB 10, NEK 10, QJM 6. (May) W1VOV 22.

MAINE — SCM, Bernard Seamon, W1AFT — SEC: BYK. PAM: BTY. RM: LKP. You will note that we now have a new PAM. Our good friend, Red, now becomes the Major Domo of the Sea Gull Net, which will meet on 3960 kc. the Monday following the ending of Daylight Saving Time. The exact time of meeting will be made known later. Red will need several Alternate NCs to assist him, so please volunteer if you'd like to take it one night a week. Our SEC, BYK, tells me that the Androscoggin Radio Club plans to build a complete station in a mobile trailer. C.d. and county officials are interested and actively coöperating. They also are going to set up a C.D. Communication Center at the Maine State Fair in Lewiston for handling all outgoing traffic. Listen for them on 3960 kc. about the first of September. Your SCM stood by during Field Day, but was able to make only two contacts with stations in Augusta and Lewiston. The Maine gang is to be commended for remaining silent during the recent tornado disaster in the Worcester (Mass.) Area. Large amounts of traffic were handled by the Mass. Emergency Net using 3975 kc. as a net frequency with much activity on 3960 kc. as well. Many messages were quickly handled by the Maine gang. That is the way to do it; lots of listening with transmissions only when you are needed. Traffic: W1LKP 108, OHT 83, TWR 55, BTY 24, AFT 18, BX 17, BYK 16, VV 13, PTL 11, BQG 9, BOC 6, RSC 2.

EASTERN MASSACHUSETTS — SCM, Frank L. Baker, jr., W1ALP — BL is our Section EC. AWA is PAM for 6 meters. JCK is RM for 80-meter c.w. AQE is RM for 40-meter c.w. Region 5 committee is made up as follows: DFS Sector 2 chairman, KTG Sector 3 secretary, DOF Sector 1, ALP Sector 5, TQP Sector 6, RM Sector 4, and BL WB. ZK is EC for Region 6. MAN is EC for Region 4. Our Eastern Mass. Net is on 3660 kc. at 7 P.M. Mon. through Fri. New appointments: MON Stoughton, NHN Needham, SUV Reading as ECs. Appointments endorsed: As ECs — IAP Lexington, DW Westwood, LJH Plymouth, BBL Manchester. As OES — CTW. As OOs — PXH, NF. WFU is on 40 and 75 meters. HEW is on 75 meters. AJA and WJJ moved to Stoughton. Heard on 10 meters: WPG, RVK mobile, DA, HXK mobile, TTS, and VBB. Heard on 2 meters: LVR, PRX, and WOY. MNK is working in Washington, D. C. Wm. G. MacKay, age 72, in Quincy, has a license. RTW and OGJ are home from Japan. WN1YQI, Marblehead, has a TBS-50 and a rig on 2 meters. TWK has a new transmitter on 2 meters. TWN has TBS-50D Gonset Commander, and Eldico on 2 meters. ECO and JLI were in New Hampshire on Field Day. Active on Field Day were the Arlington Radio Club, VPT; the El Ray Radio Club, AJ/1; WLU/1; the Waltham Amateur Radio Assn., MHL/1; the Yankee Radio Club, LQQ/1; and the Framingham Radio Club, GLA/1. TQS/1 is in Provincetown for the summer. MFZ and 3OTC/1 furnished communication on 53.4 Mc. for the Sports Car Hill Climb at Mt. Equinox, Vt. The Arlington C.D. Net had a 6-meter mobile gypsy ride. VCZ is mobile on 6 meters. NF celebrated his 50th year as a ham Apr. 1st; he is on 2 meters. WN1YQF, Middleton, is on 40- and 80-meter c.w. TVZ/1 will be in Hillsboro, N. H., for the summer. The Wellesley Amateur Radio Assn. elected CMT, pres.; FFO, vice-pres.; OQP, treas.; VVA, secy.; UVN, VCJ, and HRY, directors. WSS is working at b.c. station WKNY, Kingston, N. Y. The Windy Net officers are TYR, pres.; SMC, vice-pres.; ONV, secy.-treas.; WJJ, asst. secy.; GOU, prime minister. The Net meets on 28,700 kc. Sat. at 9 P.M. The South Shore Radio Club, through the efforts of OTZ, secured a National receiver from Lafayette Co. in Boston for a crippled boy, Sonny Hayes, of Quincy. The Framingham Radio Club went into action in the Westboro Area the evening of the tornado, June 9th. The Club's generator was set up at the home of SQY and mobiles owned by MEG and MQU were set up at the Westboro Fire Station. Messages from the Fire Dept., Police Dept., and National Guard were relayed by MEG and MQU to SQY, who fed them into the Framingham Radio Club Emergency Net on 28,700 kc. Net Control was RCJ. Among those helping were RXH, SNJ, SLH, SBW, MHC, RVA, TRC, QQW, SRG, Mickey Norton, MJO, YFA, IXJ, LOS, JNA, QFD, and the Boston Emergency Nets. Other clubs that were activated were the Braintree Radio Club, TYN, and the Hingham Radio Club, VPR. The Everett Amateur Radio Assn., TNI, was on and ready to help with BHD, PJ, KNA, and RLF. WN1s YNF, YIC, and YID are new members. Some of the calls heard here on 75 meters were MME, MKX, BPH, ULF, LBJ, MKW, MJE, BB, SS, GOU, RYJ, and RLQ. GOU and IPA are on 10 meters. MKW has a new 20-meter beam. BB is making a new antenna for 160 meters. WN1YLL is a new ham in Fall River on 80-meter c.w. The South Eastern Mass. Amateur Radio Assn., using the call WKM on Field Day, was at the C.D. Communication Headquarters with 2 TBS-50s on most of the bands. UID, FXB, AVY, CTZ, PWL, WGN, LAZ, KHV, 3MAQ/1, and Jerry Mullen took

(Continued on page 80)

MALLORY HAM BULLETIN



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For your information and possible help the next time you require a wire-wound control, a few of those available in the latest Mallory catalog are listed and described below.

"C" TYPE 2 WATT WIRE-WOUND—This control is one of the smallest capable of dissipating a full 2 watts. It measures only 1⅛" in diameter, and as a result it is a handy control for many bias, "S" meter, and other low voltage applications where physical size is a factor. It features a grounded rotor arm, screw driver slotted shaft, and a full 266° of electrical rotation. Resistance values from 6 to 15,000 ohms are available.

"R" TYPE 2 WATT WIRE-WOUND—The "R" control has many amateur applications. Its 1500 volt AC insulation between shaft and resistance element, and its dust proof phenolic case, make this control safe for amateur circuits where high potentials may be encountered. The shaft is a thumb knurled and screw driver slotted stub ¼" in diameter to which a special 3" extension shaft may be added when desired. The "R" control is made in resistances from 20 to 5000 ohms.

"M" TYPE 4 WATT WIRE-WOUND—This control is the old stand-by used by more amateurs than any other made. Wherever variable resistors of 4 watts or less are required, the "M" control should be the logical choice. With resistance values of 0.5 to 70,000 ohms available it is universally acceptable for voltage division, bias control and test instrument circuits of all kinds.

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part. WKM and SSS have new TBS-50 e.c.o. attachments. AVY calls attention to one priority message from the Worcester Red Cross to Fall River Red Cross which took less than 6 minutes to receive and transmit a return answer. CFQ and ARC are on 2 meters. AJZ is on all bands. MKW wants the gang to drop in and see him in Dennisport. Traffic: (June) W1TY 162, AVY 65, UXL 43, MKW 30, BB 12, WU 10, BY 9, JCK 7, WAG 5, CTR 3, TQS 12. (May) W1KCJ 11.

WESTERN MASSACHUSETTS — SCM, Roger E. Corey, W1JYH — SEC: KUE. RM: BVR. PAM: RDR. WMN meets at 7 P.M. Mon. through Fri. on 3560 kc. At this writing the biggest news of section activity is that of the amateurs' part in the tornado disaster which hit Worcester County. More than 100 Western Massachusetts amateurs participated. The Hoosac Valley, Pittsfield, and Hampden County Clubs took part in Field Day. COI visited Electronics Park in Syracuse. New officers of the PRC are UIS, pres.; HRC, vice-pres.; UUJ, secy.; TDS, treas. HRC plans to dispose of his phasing type s.s.b. rig in favor of a crystal lattice type. RLQ and TVJ are new OO appointees. WKF has a new VFO and antenna using balun coils. RHU is moving to New Jersey. LTA, RLQ, and ULF made BPL handling tornado traffic. OBQ and VBG have moved into new homes. LRA, SRB, UAT, UVI, VBG, and VMN took part in a Westfield c.d. practice alert. UVI has a new Heathkit AT-1 transmitter. RO lost his home in the tornado and says his tower stood up longer than the house. RVW is teaching at a microwave school. RRX is new ORS and OPS. NY is vacationing on Cape Cod and checks into WMN from there. ULE is a new Class I OO. The HCRC visited WWLP-TV as a program for its summer meeting. CJK has a new 75A-2 and is currently having good results with an off-center-fed antenna. BVR, JYH, KUE, KUL, and UKR were guests at a recent WCRA meeting. If you would like to have an ARRL appointment, a postcard will bring you information and application blanks. My address is on page 6 of this issue. If you already hold an appointment, better check now to see if it is due for endorsement. Traffic: W1ULF 650, TVJ 288, RLQ 253, LTA 250, KC 126, BVR 69, HRV 57, MNG 47, JYH 39, TAY 30, TZA 27, UKR 19, WKF 17, MVF 16, RRX 11, HRC 10, AGM 6 JAH 6, LJQ 4, RHU 4, OBQ 1, UVI 1.

NEW HAMPSHIRE — SCM, Carroll A. Currier, W1GMH — SEC: BXU. RM: CRW. PAM: UNV. A lot of good work was done by many New Hampshire hams during the Worcester disaster. VGX has a new HQ-129X and is doing a good job as NCS for the Teen-age Net. WN1WUU now is WUU. The Concord Brasspounders is sponsoring the New Hampshire State Convention to be held in Concord Sept. 13th. Hope to see you there. The Club also is running a New Hampshire QSO Party Sept. 26/27 from 6 P.M. to 6 P.M. QWH has a new beam on 10 meters and is having fun. UNV has a mobile rig on 10 meters. The Nashua Mike and

(Continued on page 82)

FIFTH NEW HAMPSHIRE QSO PARTY

The Concord (N. H.) Brasspounders announce their sponsorship of the Fifth New Hampshire QSO Party, and cordially invite all interested radio amateurs to participate. Here are the details:

(1) Contest period: Saturday, September 26th, 6 P.M. EST, to Sunday, September 27th, 6 P.M. EST.

(2) No time limit and no power restrictions.

(3) Contact information required: QSO number, report and location. Assign a serial number to your QSOs starting at number 1, like the Sweepstakes. The same station may be worked for additional credit on more than one band ('phone and c.w. are considered separate bands).

(4) Suggested frequencies to congregate near are as follows: 1810, 3550, 3685, 3725, 3850, 7050, 7185, 7250 14,100, 14,250, 21,100, 21,350, 27,200, 28,100, 28,600; 51, 145, 221 Mc. (Suggested time schedule for the above frequencies will be mailed upon request.)

(5) General call: "CQ NH" on c.w.; "CQ NH QSO Party" on 'phone.

(6) Engraved certificates will be issued to all participants reporting, with special endorsements for the highest scoring operators, both in N. H. and outside, in the following categories: 'phone only, c.w. only, combined 'phone and c.w., Novice.

(7) Logs and scores must be postmarked not later than October 15, 1953, and should be mailed to Concord Brasspounders, Box 312, Concord, N. H.

(8) The WNH (Worked New Hampshire) certificate will be awarded to stations working all ten counties during this QSO Party, participating logs confirming.

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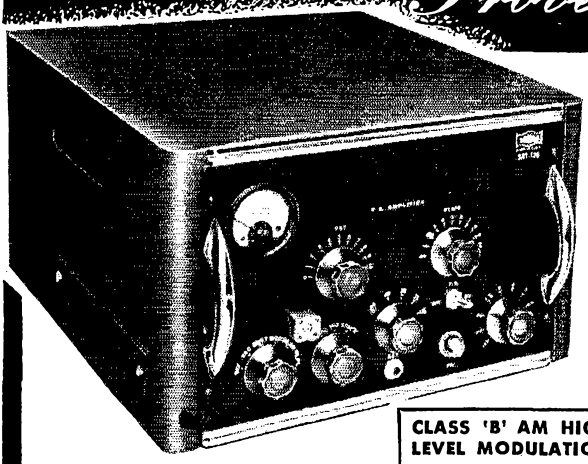

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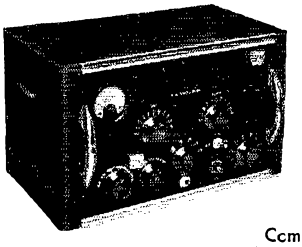

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MOBILE OR FIXED

Complete less pwr. sup. Choice of Mobile or Fixed Cabinet (specify)

Complete **KIT** **$159.50**

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Key Club had six mobiles and two fixed stations assisting the Police Dept. and handling traffic during the Centennial Parade. MKD has moved to North Adams, Mass. The Manchester Radio Club now has the call of its first president, the late J. Brodie Smith, W1HPM. WUG has a Viking II and a new mobile rig. EXZ has moved to Needham, Mass. CDX is doing FB in recruiting members for the Rockingham County Emergency Net. The New Hampshire Emergency Net is on 3850 kc. Sun. at 0900 hours. Traffic: W1CRW 615, CDX 58, GMH 56, UNV 36, POK 25, VGX 23, QGU 18, QJX 8, JWJ 7.

RHODE ISLAND — SCM, Merrill D. Randall, W1JBB — SEC: MIJ. RM: BTV. RIN meets Mon., Wed., and Fri. at 7 P.M. EDST on 3540 kc. R.I. C.D. meets every Sun. at 10 A.M. EDST on 3993 kc., R.I. 'Phone Net every Sun. at 11 A.M. EDST on 1890 kc., TRX as NCS. NCRC's destinies will be guided for the next six months by 6TWT/1, prexy, and TRX, vice-prexy. We welcome 4CVO/1 into our section; with that BC-610 in his car he will be a very important addition to our emergency plans. Our busiest YL, VRX, did a fine job with the Worcester Net during the recent tornado. Congratulations, June. TRX and 6TWT/1 handled communications for Newport's Soap-Box Derby. A copy of issue No. 1 of PRA's new monthly publication, *Zero Beat*, was received. An excellent idea, and thanks to VXC for sending it! KKR has a new QTH at which he installed and operated on 2 meters before moving in the furniture! VMB has left for duty with the Armed Forces. The last two items were from *Zero Beat*. Thanks. This section's reports of Field Day participation indicate one of the finest ever held. Traffic: W1BVI 43, OIK 34, TGD 22, TRX 18.

VERMONT — SCM, Raymond N. Flood, W1FPS — SEC: NLO. PAM: AXN. RM: OAK. Asst. RM: TAN. VTP and VZE are doing an FB job as NCS on Vt. C.W. Net. The 2nd International Field Day and Family Picnic was attended by 150 persons. RPR/M won the 10-meter treasure hunt. Mobiles taking part were VE2XZ, EY, AGF, AHY, W1BRG, TBG, QQN, TLI, VDX, and PWB. AEA broke his ankle. (Sending with the left foot?) VZE is building a modulator, JLZ is using BC-457 on 75 meters with 30 watts. WN1WPN is active on 80 meters with Elmac and NC-183. WN1YEL has HRO-60 and Viking II. CGW is building a 6-meter rig for c.d. WN1WTO passed General Class exams. WN1YRH is a new ham in Brattleboro. NLO is using long-wire antenna. MMV is mobile on 75 meters. Traffic: W1OAK 182, RNA 152, JLZ 71, AVP 32, VZE 17, BJP 13, VJJ 1.

NORTHWESTERN DIVISION

ALASKA — SCM, Glen Jefferson, KL7NT — Summer work in all sections reduced activity to near-zero level. The only news item is that KL7PDG has picked up his 75A-3 and relocated at Kotzebue. The Anchorage gang is working with city officials to reduce the high noise level, a slow process and expensive for the city. A few offending neon signs have been turned off and await debugging. Traffic: KL7AIR 2590.

IDAHO — SCM, Alan K. Ross, W7IWU — Twin Falls: NH has been appointed manager of the Pacific Area Net of the ARRL National Traffic System by 1NJM, National Emergency Coördinator. Boise: TCI lists 90 per cent of his time handling traffic on RN7 — 3575, PAN — 3670, and TCC — 3560 kc. Hamming has slumped to a new low this summer. Two TV stations are on, KFXD on 6 and KIDO on 7. Reports from the field are slim. IWU keeps Sunday schedules with 4ZJG (ex-7KIL) on 20-meter c.w. Traffic: W7TCI 369.

MONTANA — SCM, Edward G. Brown, W7KGJ — Our SEC, KUH, was laid up in the hospital in Great Falls during the emergency there but was able to monitor the activities with an S-38 receiver. Walt's mobile was manned by FDH. QPK has gotten rid of his 812s and has gone to 813s and is thinking about getting a new Signal Shifter. NGX is contemplating putting his 10-meter rig on 75 meters and going high power with a 4-65A Class B mobile. QQL finally has gotten a rig together and probably will be the only active YL in Great Falls. RLL is having trouble with his 807 rig. TLA is on 40 meters with his TBS-50 and is having good luck. Mike Maloney, who is blind, has received word that he has passed his Conditional Class license. RIL is working out very well with his 350 watts to his ground plane. Both Great Falls Radio Clubs held a meeting together and appointed a committee to look into getting amateur license plates. SSF, TRU, and KVU were the only stations operating Field Day who sent their messages to the SCM. The Billings Club, OQI, operated on Field Day with four operators. Traffic: W7MM 53, TGU 35, SFK 24, CT 18, OPM 12.

OREGON — SCM, John M. Carroll, W7BUS — Field Day activity is getting larger each year on 2 and 6 meters. 10 meters opens just often enough to get a few interested and then closes down. EDU reports TIC, TIG, TON, TOO, TOP, TOQ, and TOR are all new calls as a result of the radio class held at Wy East High School and taught by RKA. QTS reports the Sourdough Net is active at 11 P.M. PST on 3892 kc. ESJ is Asst. SCM for the Portland Area. WJ resigned as RM because of illness and advises that

(*Continued on page 84*)

36 *Engineered* BEAMS BY GOTHAM

All beams use any standard transmission line. Full data supplied with each beam. All GOTHAM beams assemble quickly, are adjustable over the entire band, and can easily be stacked on a single mast. **Every beam complete with all hardware, fittings and castings.**

6–10 M. BEAMS

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S63T • Std. 6m 3-El. T match, $14.95. 1 — 8′ Boom, ¾″ Alum. Tubing; 3 — 6′ Center Elements, ¾″ Alum. Tubing; 6 — 2′ End Inserts, ⅜″ Alum. Tubing; 1 — T Match (4′), Polystyrene Tubing; 1 — Beam Mount.

D63N • DeLuxe 6m 3-El. (No T), $21.95. 1 — 8′ Boom, 1″ Alum. Tubing; 3 — 6′ Center Elements, 1″ Alum. Tubing; 6 — 2′ End Inserts, ⅝″ Alum. Tubing; 1 — Beam Mount.

D63T • DeLuxe 6m 3-El. T-match, $24.95. 1 — 8′ Boom, 1″ Alum. Tubing; 3 — 6′ Center Elements, 1″ Alum. Tubing; 6 — 2′ End Inserts, ⅞″ Alum. Tubing; 1 — T Match (4′), Polystyrene Tubing; 1 — Beam Mount.

S64N • Std. 6m 4-El. (No T), $16.95. 1 — 12′ Boom, 1″ Alum. Tubing; 4 — 6′ Center Elements, ¾″ Alum. Tubing; 8 — 2′ End Inserts, ⅜″ Alum. Tubing; 1 — Beam Mount.

S64T • Std. 6m 4-El. T match, $19.95. 1 — 12′ Boom, 1″ Alum. Tubing; 4 — 6′ Center Elements, ¾″ Alum. Tubing; 8 — 2′ End Inserts, ⅜″ Alum. Tubing; 1 — T Match (4′), Polystyrene Tubing; 1 — Beam Mount.

D64N • DeLuxe 6m 4-El. (No T), $25.95. 1 — 12′ Boom, 1″ Alum. Tubing; 4 — 6′ Center Elements, 1″ Alum. Tubing; 8 — 2′ End Inserts, ⅞″ Alum. Tubing; 1 — Beam Mount.

D64T • DeLuxe 6m 4-El. T match, $28.95. 1 — 12′ Boom, 1″ Alum. Tubing; 4 — 6′ Center Elements, 1″ Alum. Tubing; 8 — 2′ End Inserts, ⅞″ Alum. Tubing; 1 — T Match (4′), Polystyrene Tubing; 1 — Beam Mount.

S102N • Std. 10m 2-El. (No T), $11.95. 1 — 5′ Boom, ¾″ Alum. Tubing; 2 — 6′ Center Elements, ¾″ Alum. Tubing; 4 — 6′ End Inserts, ⅝″ Alum. Tubing; 1 — Beam Mount.

S102T • Std. 10m 2-El. T match, $14.95. — 5′ Boom, ¾″ Alum. Tubing; 2 — 6′ Center Elements, ¾″ Alum. Tubing; 4 — 6′ End Inserts, ⅜″ Alum. Tubing; 1 — T Match (4′), Polystyrene Tubing; 1 — Beam Mount.

D102N • DeLuxe 10m 2-El. (No T), $18.95. 1 — 5′ Boom, 1″ Alum. Tubing; 2 — 6′ Center Elements, 1″ Alum. Tubing; 4 — 6′ End Inserts, ⅞″ Alum. Tubing; 1 — Beam Mount.

D102T • DeLuxe 10m 2-El. T match, $21.95. 1 — 5′ Boom, 1″ Alum. Tubing; 2 — 6′ Center Elements, 1″ Alum. Tubing; 4 — 6′ End Inserts, ⅞″ Alum. Tubing; 1 — T Match (4′), Polystyrene Tubing; 1 — Beam Mount.

S103N • Std. 10m 3-El. (No T), $16.95. 1 — 8′ Boom, ¾″ Alum. Tubing; 3 — 6′ Center Elements, ¾″ Alum. Tubing; 6 — 6′ End Inserts, ⅝″ Alum. Tubing; 1 — Beam Mount.

S103T • Std. 10m 3-El. T match, $18.95. 1 — 8′ Boom, ¾″ Alum. Tubing; 3 — 6′ Center Elements, ⅝″ Alum. Tubing; 6 — 6′ End Inserts, ⅝″ Alum. Tubing; 1 — T Match (4′), Polystyrene Tubing; 1 — Beam Mount.

D103N • DeLuxe 10m 3-El. (No T), $22.95. 1 — 8′ Boom, 1″ Alum. Tubing; 3 — 6′ Center Elements, 1″ Alum. Tubing; — 6′ End Inserts, ⅞″ Alum. Tubing; 1 — Beam Mount.

D103T • DeLuxe 10m 3-El. T match, $25.95. 1 — 8′ Boom, 1″ Alum. Tubing; 3 — 6′ Center Elements, 1″ Alum. Tubing; 6 — 6′ End Inserts, ⅞″ Alum. Tubing; 1 — T Match (4′), Polystyrene Tubing; 1 — Beam Mount.

S104N • Std. 10m 4-El. (No T), $21.95. 1 — 12′ Boom, 1″ Alum. Tubing; 4 — 6′ Center Elements, ¾″ Alum. Tubing; 8 — 6′ End Inserts, ⅝″ Alum. Tubing; 1 — Beam Mount.

S104T • Std. 10m 4-El. T match, $24.95. 1 — 12′ Boom, 1″ Alum. Tubing; 4 — 6′ Center Elements, ¾″ Alum. Tubing; 8 — 6′ End Inserts, ⅝″ Alum. Tubing; 1 — T Match (4′), Polystyrene Tubing; 1 — Beam Mount.

D104N • DeLuxe 10m 4-El. (No T), $27.95. 1 — 12′ Boom, 1″ Alum. Tubing; 4 — 6′ Center Elements, 1″ Alum. Tubing; 8 — 6′ End Inserts, ⅞″ Alum. Tubing; 1 — Beam Mount.

D104T • DeLuxe 10m 4-El. T match, $30.95. 1 — 12′ Boom, 1″ Alum. Tubing; 4 — 6′ Center Elements, 1″ Alum. Tubing; 8 — 6′ End Inserts, ⅞″ Alum. Tubing; 1 — T Match (4′), Polystyrene Tubing; 1 — Beam Mount.

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15 M. BEAMS

S152N • Std. 15m 2-El. (No T), $19.95. 1 — 12′ Boom, 1″ Alum. Tubing; 2 — 12′ Center Elements, ¾″ Alum. Tubing; 2 — 5′ End Inserts, ⅝″ Alum. Tubing; 2 — 7′ End Inserts, ⅝″ Alum. Tubing; 1 — Beam Mount.

S152T • Std. 15m 2-El. T match, $22.95. 1 — 12′ Boom, 1″ Alum. Tubing; 2 — 12′ Center Elements, ¾″ Alum. Tubing; 2 — 5′ End Inserts, ⅝″ Alum. Tubing; 2 — 7′ End Inserts, ⅝″ Alum. Tubing; 1 — T Match (6′), Polystyrene Tubing; 1 — Beam Mount.

D152N • DeLuxe 15m 2-El. (No T), $29.95. 1 — 12′ Boom, 1″ Alum. Tubing; 2 — 12′ Center Elements, 1″ Alum. Tubing; 2 — 5′ End Inserts, ⅞″ Alum. Tubing; 2 — 7′ End Inserts, ⅞″ Alum. Tubing; 1 — Beam Mount.

D152T • DeLuxe 15m 2-El. T match, $32.95. 1 — 12′ Boom, 1″ Alum. Tubing; 2 — 12′ Center Elements, 1″ Alum. Tubing; 2 — 5′ End Inserts, ⅞″ Alum. Tubing; 2 — 7′ End Inserts, ⅞″ Alum. Tubing; 1 — T Match (6′), Polystyrene Tubing; 1 — Beam Mount.

S153N • Std. 15m 3-El. (No T), $26.95. 1 — 12′ Boom, 1″ Alum. Tubing; 3 — 12′ Center Elements, ¾″ Alum. Tubing; 2 — 5′ End Inserts, ⅝″ Alum. Tubing; 2 — 6′ End Inserts, ⅝″ Alum. Tubing; 2 — 7′ End Inserts, ⅝″ Alum. Tubing; 1 — Beam Mount.

S153T • Std. 15m 3-El. T match, $29.95. 1 — 12′ Boom, 1″ Alum. Tubing; 3 — 12′ Center Elements, ¾″ Alum. Tubing; 2 — 5′ End Inserts, ⅝″ Alum. Tubing; 2 — 6′ End Inserts, ⅝″ Alum. Tubing; 2 — 7′ End Inserts, ⅝″ Alum. Tubing; 1 — T Match (6′), Polystyrene Tubing; 1 — Beam Mount.

D153N • DeLuxe 15m 3-El. (No T), $36.95. 1 — 12′ Boom, 1″ Alum. Tubing; 3 — 12′ Center Elements, 1″ Alum. Tubing; 2 — 5′ End Inserts, ⅞″ Alum. Tubing; 2 — 6′ End Inserts, ⅞″ Alum. Tubing; 2 — 7′ End Inserts, ⅞″ Alum. Tubing; 1 — Beam Mount.

D153T • DeLuxe 15m 3-El. T match, $39.95. 1 — 12′ Boom, 1″ Alum. Tubing; 3 — 12′ Center Elements, 1″ Alum. Tubing; 2 — 5′ End Inserts, ⅞″ Alum. Tubing; 2 — 6′ End Inserts, ⅞″ Alum. Tubing; 2 — 7′ End Inserts, ⅞″ Alum. Tubing; 1 — T Match (6′), Polystyrene Tubing; 1 — Beam Mount.

20 M. BEAMS

S202N • Std. 20m 2-El. (No T), $21.95. 1 — 12′ Boom, 1″ Alum. Tubing; 2 — 12′ Center Elements, 1″ Alum. Tubing; 4 — 12′ End Inserts, ⅞″ Alum. Tubing; 1 — Beam Mount.

S202T • Std. 20m 2-El. T match, $24.95. 1 — 12′ Boom, 1″ Alum. Tubing; 2 — 12′ Center Elements, 1″ Alum. Tubing; 4 — 12′ End Inserts, ⅞″ Alum. Tubing; 1 — T Match (8′), Polystyrene Tubing; 1 — Beam Mount.

D202N • DeLuxe 20m 2-El. (No T), $31.95. 2 — 12′ Booms, 1″ Alum. Tubing; 2 — 12′ Center Elements, 1″ Alum. Tubing; 4 — 12′ End Inserts, ⅞″ Alum. Tubing; 1 — Beam Crosspiece, 1″ Alum. Tubing; 1 — Beam Mount.

D202T • DeLuxe 20m 2-El. T match, $34.95. 2 — 12′ Booms, 1″ Alum. Tubing; 2 — 12′ Center Elements, 1″ Alum. Tubing; 4 — 12′ End Inserts, ⅞″ Alum. Tubing; 1 — T Match (8′), Polystyrene Tubing; 1 — Beam Crosspiece, 1″ Alum. Tubing; 1 — Beam Mount.

S203N • Std. 20m 3-El. (No T), $34.95. 1 — 12′ Boom, 1″ Alum. Tubing; 3 — 12′ Center Elements, 1″ Alum. Tubing; 6 — 12′ End Inserts, ⅞″ Alum. Tubing; 1 — Beam Mount.

S203T • Std. 20m 3-El. T match, $37.95. 1 — 12′ Boom, 1″ Alum. Tubing; 3 — 12′ Center Elements, 1″ Alum. Tubing 6 — 12′ End Inserts, ⅞″ Alum. Tubing; 1 — T Match (8′), Polystyrene Tubing; 1 — Beam Mount.

D203N • DeLuxe 20m 3-El. (No T), $46.95. 2 — 12′ Booms, 1″ Alum. Tubing; 3 — 12′ Center Elements, 1″ Alum. Tubing; 6 — 12′ End Inserts, ⅞″ Alum. Tubing; 1 — Beam Crosspiece, 1″ Alum. Tubing; 1 — Beam Mount.

D203T • DeLuxe 20m 3-El. T match, $49.95. 2 — 12′ Booms, 1″ Alum. Tubing; 3 — 12′ Center Elements, 1″ Alum. Tubing; 6 — 12′ End Inserts, ⅞″ Alum. Tubing; 1 — T Match (8′), Polystyrene Tubing; 1 — Beam Crosspiece, 1″ Alum. Tubing; 1 — Beam Mount.

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TMY/7 and KL7AJR are the same, his son. RLG signed up with AREC. AJN is doing an FB job as OBS with the slow net. Traffic: (June) W7QPS 84, PKN 73, AJN 60, EDU 7. (May) W7ONM 742, QPS 186, PPG 72, KTG 50 BKN 16. (Apr.) W7ONM 434. (Mar.) W7ONM 979.

WASHINGTON — SCM, Laurence M. Sebring, W7CZY — SEC: BTV. RM: FIX. PAMs: EHH, PGY. EHH has 30-watt mobile and 90-watt portable rigs. EVW does most of his operating on 10-meter mobile. CWN works DX on 20-meter c.w. LVB is building another VFO. BG, FWR, and FWD spent Field Day visiting different Field Day sites. RXH works traffic on WSN and RN7. OE reports that his signals vary with the amount of leaves on the trees near his antenna. KT is giving traffic a try after years of DX. NWP runs 150 watts to a pair of 4-125A tubes. FIX received his first TVI report from an ex-ham. FRU still is in the traffic business. VI has new AR-88 receiver. PGY has new 400-watt final. The North Seattle Club had a successful Field Day at the home of MSI. The jr. operator at CO used a bass plug and casting rod to install the antennas in 100-foot fir trees. SOX is "sweating" sixteen more months in Germany before being reassigned to the Pacific Northwest. QKD is new OES and is looking for contacts on 420 Mc. RT spent Field Day at home location. SARC held Field Day on Guemes Island. HDT is new OPS at Clarkston. JNP handled traffic and helped keep channels clear during the Montana flood. OOF is back home in Spokane after a tour of duty with the Air Force. NXN has low-powered mobile using three 6AQ5 tubes. JGV is building a fixed station. EEN and ETY are mobile on 10 meters. Spokane Club members have renovated the radio shack at the club house. PWI/M, KGQ/M, and 6VJR/ visited Spokane. The Spokane Club held Field Day at the top of Mt. Spokane. Operators present were FGQ, JGV, JIK, NDZ, NVR, OPR, OWS, PCV, PKJ, PXA, RFP, GBU, JNP, NXN, OHI, OOF, OWJ, and PUL. HMQ is working in the Pierce County c.d. program. LEC works 40-meter c.w. after TV hours. SMB has a 6AG7-829B mobile rig. PHP is at Thule AFB, Greenland, and heard OEB/7. PFZ is home from Chanute AFB. MCU is on Saipan. MPH operated MM on Lake Washington Field Day. JJK is new EC for Puyallup Valley. TGO does nicely on 80-meter c.w. NZM moved to Milton. PXY uses low-power rig on 75-meter 'phone. OEB, with 525-foot long wire, worked CR9, 3A2XQ, and OK1 on 20-meter c.w. OGP is back in Puyallup. Traffic: W7BA 1391, PGY 572, CZX 327, RTQ 227, KT 189, APS 180, BAQ 162, AMC 147, FRU 132, TH 112, OE 110, NWP 81, BLX 76, FIX 71, RXH 45, EHH 40, BG 31, SKT 20, LVB 19, AIB 13, PFE 13, QOU 12, GAT 9, EVW 6, CWN 4.

PACIFIC DIVISION

NEVADA — SCM, Ray T. Warner, W7JU — SEC: HJ. ECs: KOA, LGS, NWU, OXX, TJY, VO, and ZT. OPS: JUO. ORS: MVP. Newly-elected officers of the reorganized Reno Amateur Radio Club are as follows: JLV, prexy; MJB, vice-prexy; OYQ, secy.-treas. The Club must have received a strong shot in the arm as there was a turnout of twenty members operating Field Day on Gieger Summit. TVI committees are being set up for the Reno and Sparks Areas in preparation for TV, which is expected in September. MVP is a new ORS appointee in Reno. RN-6 will be looking for you, Ray. NTW/6, ex-Nevadan, now is in Riverside, Calif., after a tour of duty in Japan. OXX is building another kw., possibly for RSY. The Las Vegas Police regulation forbidding any receiver in a car capable of receiving 1500 kc. or higher is due to get a working-over after action by Southern Nevada hams.

SANTA CLARA VALLEY — SCM, Roy I. Couzin, W6LZL — Field Day was the main point of interest in June. All clubs commented that they had a better turnout this year and scores were higher. At the June club meetings without exception Field Day was the chief topic, next in line was the pending Bill on the Governor's desk giving us our license plates. The CCRC meeting was held in Palo Alto in June and all clubs commented on their pending activities for Field Day. The Council offers a plaque to the member club which has the highest score on Field Day. HC is doing nicely as Net Control on RN6. BAN, and PAN. AIT sends in his small but welcome report. NTQ isn't doing so well after the big windstorm a few weeks ago which took down his 30-foot tower with 28- and 144-Mc. beams. MMG still is managing a few messages and taking it easy after Field Day. CAZ is having fun on 7-Mc. 'phone and mentioned that the Mountain View Radio Club meets on the last Fri. of each month not the 4th Fri. WMM reports he has the 144-Mc. receiver going but mobile power supply still is NG. OFJ is busy as a beaver with LSN and TCC. New appointments are HC as Route Manager, WGO and UTV as ORS, and OFJ as OBS. The San Mateo County Amateur Radio Club held its Sixth Annual Hamfest at Coyote Point and all had a good time even though the date conflicted with the Mission Trail Roundup. Mobileers had a picnic at Alum Rock Park. Traffic: (June) W6OFJ 592, HC 11, AIT 7, NTQ 4, MMG 2. (May) W6OFJ 512.

EAST BAY — SCM, Ray H. Cornell, W6JZ — Field Day was made an outstanding success for almost all of the Bay Area clubs by the finest weather which we have had the fortune to enjoy on any recent Field Day. There were

(*Continued on page 86*)

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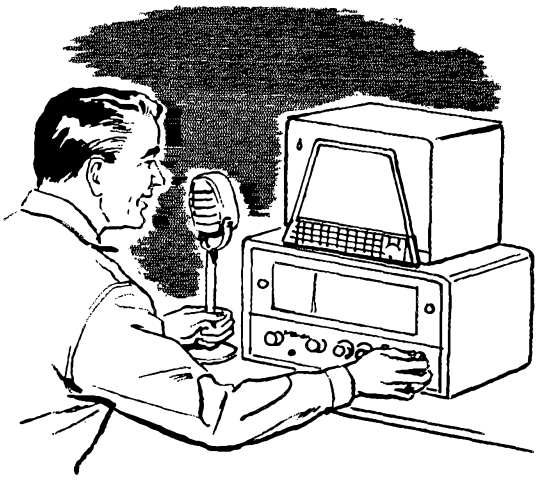

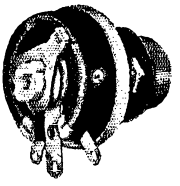

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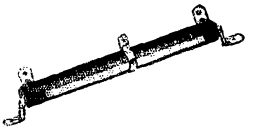

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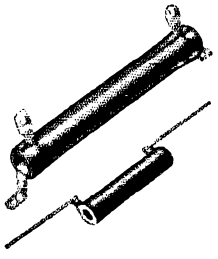

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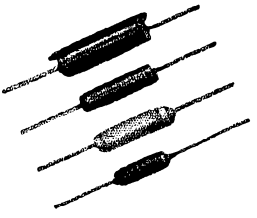

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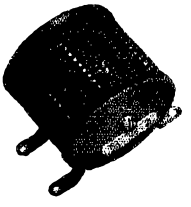

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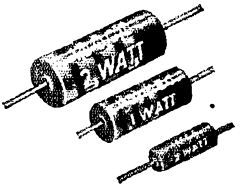

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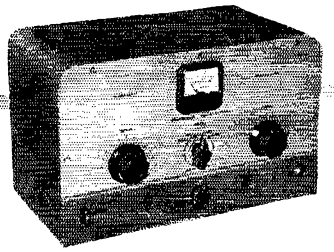
the usual incidents: The NBARA, for example, came up with a new twist on the c.w. versus 'phone argument when the c.w. gang tried to chase one mama and eight small skunks into the 'phone operators' tent. It was necessary to QRT at that QTH temporarily. The June 6th. V.H.F. Party also was a big success with many of the gang going out into the field (Coast Range and Sierras). Plans already are being made for additional trips in September. The Richmond Radio Club provided a base station and four mobiles to cover communications for the Yacht Races on June 6th. This, too, was a successful operation which received very favorable publicity in the local press. Other events during June in which many of the East Bay gang participated were the Mission Trail Round-up at Mt. Shasta on June 27–28, which your SCM really enjoyed, the hamfest at Coyote Point on June 28th, and the Western Area C.D. Drill. The Bill authorizing license plates for California hams owes its successful passage mainly to the efforts of the CCRC, and especially to ACN, whose intimate knowledge of the proper way to further such projects assured the success of this project. New officers of the CCRC are RLB, pres.; HC, vice-pres.; CTH, secy. BPS is rebuilding. He now holds a new OPS certificate. YDI is moving to Alhambra Valley. NQJ is healthy again. YEQ reports the following stations active on 420 Mc. in the Bay Area besides himself: AJF, JHV, QT, EMD, CGA, UOV, VQV, DXJ, VSV, VW, JDI, and BCL in Ripon. BS is working hard at Murphy's on the Russian River. JGF will be at home during the coming school year. The SARO enjoyed an interesting talk on industrial uses of radioactive materials from Vic Sloman, of Tracerlab. Reports say the SARO 2-meter project is getting hotter. DNX takes his gear with him on vacation every year. Likewise, RLB takes his Communicator to bed with him every night. On a recent visit to the Southern Alameda c.d. organization, BNB demonstrated to Section Officers that a skillfully organized c.d. drill can be a lot of fun. JOH reports the Bay Area Net is suffering from midsummer blues. IPW has his high-power rig about ready. Traffic: K6FAL 668, W6JZ 179, IPW 135, BPC 98, JOH 91, EJA 8.

SAN FRANCISCO — SCM, R. F. Czeikowitz, W6ATO — SEC: NL. Phone: PL 5-6457. Governor Warren of California on July 6th signed the Johnson Bill, authorizing the issuance of call-letter license plates to amateurs in this State upon the application therefor, and the payment of an additional fee not to exceed three dollars. Details as to the first date of issue, method of application, etc., are not as yet available. It is likely, but not certain, that these special plates will not be available until the regular automobile license renewal period in 1954. Clubs known to have been active in Field Day include the Tamalpais Radio Club, the San Francisco Naval Shipyard Radio Club, the Highfrequency Amateur Mobile Society, and the San Francisco Radio Club. Congratulations to BIP and his XYL on the birth of a son, Larry. BIP was chairman of the SFRC Field Day committee, and did his usual excellent job. The meeting nights of the various clubs of the section are as follows: The Humboldt Amateur Radio Club meets the 2nd and 4th Fri., Civic Auditorium, Eureka. The Sonoma County Radio Amateurs meets the 1st Wed., County Court House, Santa Rose. The Marin Amateur Radio Club meets the 2nd Fri., American Leg. Hall, Larkspur. The Tamalpais Radio Club meets the 3rd Fri., 7 Loma Ave., Tiburon. The San Francisco Radio Club meets the 4th Fri., 51 Lakeshore Plaza, San Francisco. The Highfrequency Ama. Mob. Society meets the 2nd Fri., 1625 Van Ness Ave., San Francisco. The Cathay Radio Club meets the 2nd Fri., San Francisco. The S.F. Naval Shipyard Radio Club meets the 1st Fri., San Francisco. The SFNSYRC meets on odd months at the Naval Shipyard, and therefore no visitors are permitted. On even months at the Nat. Red Cross Bldg., 1550 Sutter St., visitors are cordially invited. It's always the 1st Fri., however. Traffic: W6SWP 317, GB 74, ATO 11, BIP 5, GQA 3.

SACRAMENTO VALLEY — SCM, Harold L. Lucero, W6JDN — EOU, with the Armed Forces in Germany, writes that he would like to talk to the home folks. He is on 14,302 kc. s.s.b. His address is 7774 Sig BN, APO 430, c/o P.M., New York, N. Y. AVZ is doing a wonderful job with the E.C. ZF is getting the old rig ready to go again. YIO is active on 40 meters. DSM moved to new QTH on top of a hill. LZM is active on MARS frequency. ASI and VBI teamed up for Field Day on 75-meter 'phone with the MARS gang of McClellan. FYK reports c.d. emergency breakfast, 2-meter airborn mobile temporary organized from Placerville to Chico, from Nevada City to Yuba City, Willows to Paradise to Oroville to Forbestown. SUP reports that GHP has a new S-76. OUB is on 75 meters. OXG is on 75-meter 'phone with 1 watt input. UNT is working DX on 75 meters with 100 watts. øUP reports that LRW has one of the best signals on 40-meter 'phone. WFW has an 80-foot tower. MUN has 5 watts on 75 meters. The Tehama County Amateur Radio Club reports: OEY and LJ are new locals from Ukiah. SYY now is General Class. PYE has 400-watt rig and is knocking off DX. SIA divides time between u.f.m. and DX. TMP and SIA are very close to DXCC. SBH is on 40-meter 'phone. TMP is winner of the 1953 SS Contest. Dunsmuir Radio Club is reorganizing. CMY is out of the Navy. From the Redding gang: PTX has bought new

(Continued on page 88)



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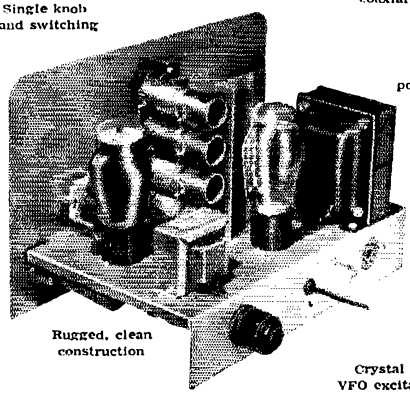

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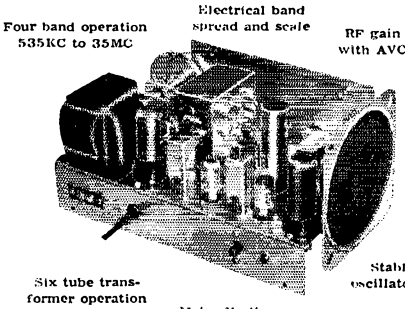

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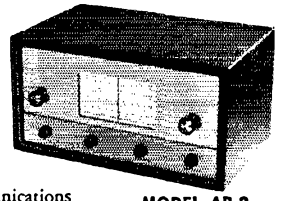

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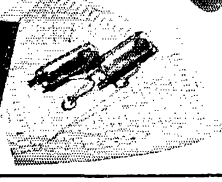
SHIP. WT. 4 LBS.



Two additional plug-in coils are available and provide continuous extension of low frequency coverage down to 355KC. Dial correlation curves included. Shipping Wt. 1 lb. Kit 341. **$3.00**

HEATH COMPANY
BENTON HARBOR 9, MICHIGAN

antenna farm and is doing well with off-center-fed doublets. AKF has been busy with 10-meter mobile. ETT will be at his QTH in the mountains using his other call, HRJ. HVB is located in Central Valley. Redding is now the hub for civil defense area No. 2 with KTF as Net Control on 160 meters. KUP attended the Roundup in Mt. Shasta. BJO has the boys on a doodle bug hunt for him near Crescent City. The Shasta County Radio Club put up a 60-foot antenna. PVI has erected 60-foot tower for v.h.f. PIV, KVT, ILZ, MCR, OTN, QAC, LSB, HLM, PEI, and UM are active on 144 Mc. ONT installed 144-Mc. rig in his car. KME has 144-, 28-, 7-, and 3.8-Mc mobile. AUO is active on 2 meters. The Sacramento Club has a weekly 10-meter mobile hunt near Grass Valley. The Mission Trail Net held its Annual Roundup at Mt. Shasta, Calif., June 27-28. The Mt. Shasta Radio Club was host with K6BJ as speaker. QAC, QCZ, and TZG now have General Class tickets. NRZ operated at New Castle during Field Day while GDO/6 operated at Folsom. The AEC in the northern part of California meets with the Tall Pine Net. The Cascade Net has suspended operations until October. FXI, SDP, HRF, NQA, FNU, JDN, YNM, IEO, and Herb Stutts aided in making the Mission Trail Net Roundup a success. TYC and GGC recently visited JDN. 7SCF now is located in Chico. The Golden Empire Radio Club spent Field Day at Lake Francis, Yuba County. KN6ASX and KN6AWR are quite active. FKI has new mobile. ARR was transferred to Filmore, Calif. Traffic: W6TMP 20, K6NAK 13, W6JDN 12, OMR 10, FYK 6.

SAN JOAQUIN VALLEY — Acting SCM, Edward L. Bewley, W6GIW — SEC: KRO. RM: EXH. Field Day was the main activity in June. Clubs in the section that were heard were TO/6, Fresno Club; UJ/6, Taft; OHB/6 Merced; BXN/6 Turlock; KU/6, Modesto; SF/6, Stockton. SQR, who was in charge of 75-meter 'phone, brought a house trailer which contained the station, a double bed, ice box, stove, fan, etc. Who could ask for more? ERE has a 70-foot TV telescoping mast that cranks up from the ground. Cliff says it is FB for testing new beam antennas and for checking performance at various heights from ground. BCL is heard often these days at 144 Mc. with a strong signal. Roy also is building 420 gear and soon will be looking for some skeds. GIW has a new Elmac PMR-6A in the car. While on vacation in the Bridgeport Area, the best daytime signals heard were PJF and REA in QSO on 75 meters, but I was too busy catching trout to do much listening. Your SCM met 6HCF/6 while at Lundy Lake and had a nice personal QSO with Bill. QNP is teaching a class of 24 hams-to-be at Fresno High Summer School. The Trowel Radio Club is starting a net on 3940 kc. under the direction of TRP. New officers of TARC are DIY, pres.; SKH, vice pres.; ADB, secy. TFD is installing aircraft radar for Boeing at Seattle. IAZ is sporting a new "pie pan" antenna. NQC is back in Stockton. Keep the reports coming, gang. Traffic: W6EXH 160, VPV 139, TSO 80, OBA 36, OPU 27, SJJ 19, GIW 13.

ROANOKE DIVISION

NORTH CAROLINA — SCM, J. C. Geasler, W4DLX — Your SCM received four messages from groups during Field Day. The following clubs reported activity: NC/4, Winston Salem; MOE/4, Asheville; UBT/4, Sand Hills Radio Club; and IYR/4, at Jarvisburg, working single-handed. Both Charlotte clubs, BX/4 and BFB/4, had good attendance and plenty of fun. NC has gained a good c.w. man, an old traffic buddy of your SCM, ex-8OXO, who now is at Wallace. REZ reports from Hickory that ENQ has a new 75A-3 and a single-side-winder rig. ENH is reduced to 60 watts while de-TVIing BC-610. PEQ reports from Dunn that the gang there has a new club, the Harnett Amateur Radio Club. Officers are JCP, pres.; and PEQ, secy.-treas. The Club has classes in code practice, lectures on construction, TVI committee, and c.d. activities. TYR and VHH stirred up some interest at the Charlotte Hamfest with their 160-meter bike-mobiles. AKC has a new 20-meter beam up and is taking a summer break from NCN. DXG, at Black Mountain, is the new NCS of the Tar Heel Net. UEG and OQQ, Charlotte, are on 6 meters and looking for some North Carolina stations. SWB, Mooresville, has a new 75-2-meter mobile going. How about some of you new c.w. boys checking in on the North Carolina C.W. Net this September and qualifying for ORS appointment? The RM would sure welcome you. Traffic: (June) W4AKC 189, RRH 120, WXZ 21, CVQ 12, HUW 10, SPV 10, YPZ 6, VHH 4, BBZ 2. (May) W4AKC 350, RRH 86, BBZ 9, WXZ 9, VHH 8. (Apr.) W4AKC 352.

SOUTH CAROLINA — SCM, T. Hunter Wood, W4ANK — FM was active with portable rig until stopped by a defective filter. ANK's portable also went out after a short period. MN, operated by the Columbia Club, and NTD, by the Rock Hill Club, were active on Field Day. Ex-2PFJ now is 4ZVY at Aiken; ex-8BDF now is 4ZRH at Mt. Pleasant; ex-ØAMM now is 4ZWF at Sumter. OLZ is new on 75-meter mobile in Columbia. TWW made 137 contacts on his mobile while on vacation. WN4YLX is new in Seneca. TTG has rebuilt the rig, has new antenna and a 40-watt emergency portable rig for 40- and 75-meter

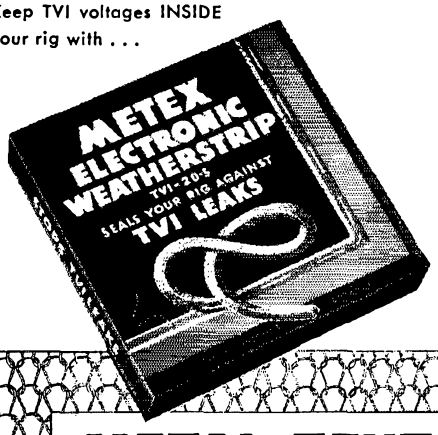
(Continued on page 90)

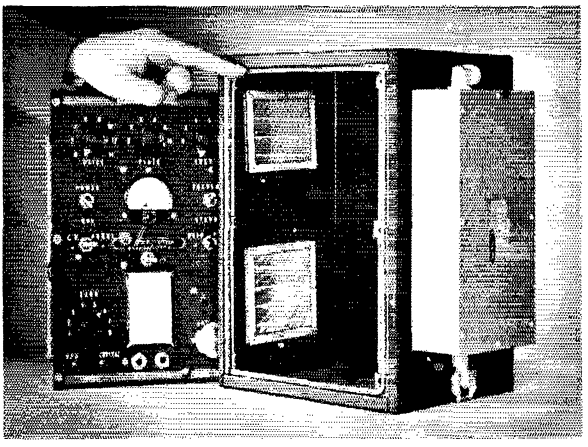
Tired of being the TVI villain?

IF YOU'RE tired of causing TVI in your neighborhood, take a leaf from the book of engineers designing Air Force electronic equipment and find out about METEX ELECTRONIC WEATHERSTRIPPING. The same material they count on to suppress RF leakage in the electronic equipment of combat planes . . . where all equipment must be crowded into minimum space and a leakage of 5uV/M would be critical . . . is now "at your service." Made of resilient, compressible *knitted* wire mesh, METEX TVI-20-S seals rig openings to RF leakage just as regular weatherstripping seals doors and windows. Users report amazing results. One man operated a TVI-20-S shielded rig* on 10 meters on the same table with TV set tuned to Channel 2—with no noticeable TVI.

Yes, if you're still trying to whip TVI—wrestling with innumerable latches, screws, bolts and other clumsy closure methods—*and still not getting satisfactory results,* INVESTIGATE METEX TVI-20-S TODAY! If your supplier doesn't have it, write us direct.

Keep TVI voltages INSIDE your rig with . . .





*TVI-20-S installed on the Harvey-Wells TBS-50D described in paragraph 1. METEX's resiliency insures continuing positive contact, despite routine opening and closing.

METAL TEXTILE CORPORATION

KNITTERS OF WIRE MESH FOR MORE THAN A QUARTER CENTURY

METEX

Roselle, New Jersey

'phone and c.w. It is suggested that South Carolina mobiles operate 3930 kc. primary with 3920 kc. as secondary frequency. More reports from members are needed to make this column complete. Traffic: W4ANK 105, TTG 20, ZWF 12, FM 7.

VIRGINIA — SCM, H. Edgar Lindauer, W4FF — Ambassadors from Virginia to the National Convention at Houston were KFC, EMJ, CC, ESK, and GF. 8NBK is throwing bouquets in the direction of Virginia on the last CD Party. I quote from a recent soapbox, "My hat is off to the Virginia section gang as 31 of my QSOs were with them." EMJ is preparing to change his QTH to Kerrville, Tex., retiring as a Major General, USAF. SHJ has been transferred to ship operations. Hoppy promised to QNI on VN every time he hits port. It will be tough to find a replacement who will put in the hours that Hoppy devoted to Virginia *Esprit de Corps*. ZFV is new ORS. LW has taken over duties as editor of *VN Bulletin* and will send out ARRL Official Bulletins as soon as he has the rig at new QTH on 3860 kc. each Fri. at 2000 hours using tape transmitter and a BC-610. VQZ is mobile at Rehobeth, Del. QLL and ZCA participated in the RTTY broadcast on Armed Services Day. Volunteer operators at NSS included 1NK/4, RPI, UCN, and LW. 5PLQ/4, whose new QTH is Arlington, is pushing the ether with 800 watts. LW is new OBS. NRO keeps PYN on the air during summer activities. Net certificate has been earned by UWS. Field Day activity was exceptionally heavy with most clubs experiencing smoother operation and less power failures than usual. NPT, OWV, KSV, and KX reported Field Day activity. Four rigs were operated at Signal Mountain near Winchester. QDC, using a 350-watt generator and a Harvey-Wells, knocked off 120 stations using 5 operators. With FV reporting 448 messages handled last mouth, but received too late to reach the printer in time for credit in the same month, the actual traffic for that period was boosted to 4013, and the highest for Virginia at any time. Traffic: (June) W4SHJ 294, FV 242, KX 94, UWS 83, JAU 69, NV 67, RCM 66, GR 52, LNX 51, JAQ 49, CFV 14, UHG 14, KFC 13, LW 11, TYC 11, FF 10, LJE 8, WAB 8, VQZ 6, IYI 5, PYN 5, LK 4, OWV 4, ZFV 1. (May) W4FV 448.

ROCKY MOUNTAIN DIVISION

COLORADO — SCM, Karl Brueggeman, WØCDX — EC: AEE. The Grand Valley Radio Club provided communications for the Annual Colorado River Motoboat Races on June 11th. Mobile units were spaced every two miles from Fruita to Grand Junction so the boats were never out of sight of a mobile. GDC, PXZ, UVY, GMB, ZJO, FKY, DGA, GIT, FYV, INT, LCE, and AGY took part. LCE handled a search for an airplane lost in the desert of Northern Arizona. APK has a new monotone using a 6BN6. KHQ makes BPL month after month. Congratulations to CDP on his appointment as OO. DDM is back at Hillside for the summer. NUU, YMP, and OMN are mobiling on 75 meters. OWP reports an informal hamfest held in Brush in April. The Rocky Mountain Division Convention was a success, thanks to all who donated their time to it. WLN headed the convention committee. WRO was treasurer and handled the registration. TW, IC, LO and XYL, WIR, and XYL, GQY, BYE, OTR, OBP, GCQ, CDX, OGH, SNH, MTD, IOD, LQD, BON, CYT, and SYA all worked on the various committees. DEE won the transmitter hunt. Net problems, traffic, and the RACES were discussed at the SCM's meeting. CBH, SCM of Nebraska, outlined activities in that State. President Dosland gave a fine talk on League activities. HKE is operating the MARS station at Ent Air Force Base, Colorado Springs. KØFAM is monitoring 20 meters continously for traffic. EWH, NWL, and OEB have a portable rig and are traveling with the Koshare Indian Dancers. Traffic: (June) WØHKE 1092, KHQ 713, KØFAM 501, WØCDP 29. (May) WØKHQ 1121, APK 54, OWP 30.

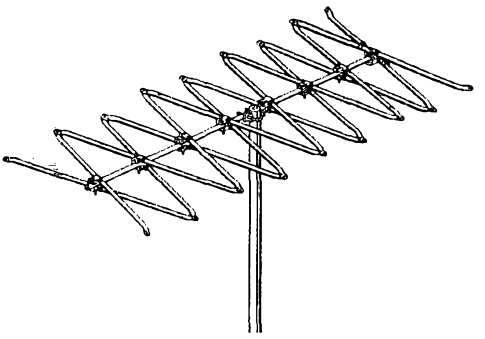
UTAH — SCM, Floyd L. Hinshaw, W7UTM — GPN, EC for Ogden, held 5 test runs in June and reports unusual 2-meter results with high interest being shown by the City Officials. Carl hopes to have "sold" them on backing for c.d. gear. SP and the Salt Lake gang had a very full week end with c.d. test and Field Day activities; almost *too* much activity to have both events take place on the same week end. Results have not been evaluated by c.d. officials but should be published in another month. BED has reapplied and is new ORS in St. George Area. John expects to be more active now with his rebuilt equipment. The Ogden Radio Club held Field Day outing at Willows Campground, with 13 operators enjoying the Cool Canyon breezes. This Club's SCM message was the only Field Day message received here.

SOUTHEASTERN DIVISION

EASTERN FLORIDA — SCM, John W. Hollister, jr., W4FWZ — Field Day has come and gone with huge success and now is the time to get set for the S.E.T. Thanks to SGH, DU, and 3AKE/4 for QSP Field Day reports from KOH, QLC, DU, ALP, TFP, YKY, GAC, AB, TJU, and others. EYI sent in the best news reports on Field

(Continued on page 92)

How High Gain TRIO ZIG-ZAG TV Antennas Operate



Popular TRIO ZIG-ZAG ANTENNAS, designed by G. N. Carmichael, W9LIY (Ex W4GCA) represent a new antenna design that should be of interest to amateurs since these antennas permit *multi-channel TV operation*, with pattern and gain comparable to an efficient Yagi antenna.

To understand the new antenna principle let's first look at the Model ZZ12L (illustrated above) which is designed for very high gain operation on channels 2 thru 6. (Other models are available for channels 7 thru 13, still others are designed for channel 2 thru 13 operation.)

DISSIPATIVE FEED-LINE

In the ZIG-ZAG antennas, the feed-line is spread out, or broken up into series of resonant elements or zig-zags, so that it resembles a rhombic dissipative feed-line antenna. The elements are end-connected but insulated from the boom and each other,

Let us suppose you built such an antenna, or a feed-line with suitable elements connected across it. If one of those elements was resonant on channel 5, let us say, and if you used a 300 ohm feed-line, and the antenna presented a 300 ohm impedance at the feed point — then that resonant element would deliver most of its energy to the feed-line. It would be properly "matched". If you had another element on your antenna that was resonant on channel 2, but which did *not* present a 300 ohm impedance to the feed-line on channel 5, and normally it would not — you would have a "mismatch" between that element and the feed-line. This "mismatched" element would consequently re-radiate most of the energy it was picking up. If you can get the current-voltage phase and the length and spacing correct, this "mismatched" element would become an efficient parasitic element — either a director or reflector. If you constructed an antenna where you had a whole series of elements connected to the feed-line, that had resonant elements for the various channels, and with *all of* the non-resonant elements, because of their length, spacing, etc., re-radiating their energy as efficient parasitic elements — then you would have the TRIO ZIG-ZAG. The foregoing becomes clear, when you bear in mind that an element that is resonant on one TV channel also serves as a director or reflector on the other TV channels.

COMPARISON TESTS

Experimental verification and comparison with other antennas established the fact that TRIO ZIG-ZAG antennas have multi-channel pattern and gain comparable to the best single channel Yagi antennas employing a like number of elements — thus making the ZIG-ZAG one of the most versatile, efficient and popular TV antennas in America today!

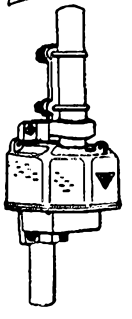
This new antenna principle, because of its broadband characteristics, presents many possibilities for amateur communications.

EIGHT MODELS

TRIO ZIG-ZAG ANTENNAS are made in 8 different models ranging from primary to ultra-fringe area types. Excellent forward gain, front to back ratio and line match are maintained thruout all channels covered. Quality construction assures rugged strength and long life.

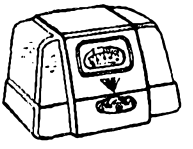
Write G. N. Carmichael, W9LIY, Chief Engineer, for Catalog and full details.

TRIO ROTATOR



Two Motors, one for each direction of rotation. *Guaranteed For Two Years. Cut Steel* gears for long trouble-free life. *Die Cast Housings* for rigid, warp proof alignment. *All Shafts* mounted in Oilite or ball bearings.

Positive Electrical Stops prevent over-rotation. *New Brake* — no coasting, no drifting. *Extremely Rugged Powerful.* Widely used by hams for supporting and rotating 2, 6 and light 10 meter antennas. Special mast bearing available for heavy arrays. *Attractive Control Unit.* Easy to read; easy to use.



TRIO MANUFACTURING CO.
GRIGGSVILLE, ILLINOIS

Day. Support the Tropical 'Phone Net; TJU reports the traffic total for June was 284! Wanted: NCS for 3675-kc. Traffic Net. Contact FWZ. (How about a traffic net on 40-meter c.w. also?) Check your 'phone procedures, fellows. Some of it is pretty bad, especially on nets. The good ones can help the others along (in a real friendly way). Clewiston: PJU is off on his annual visiting vacation after making another BPL. Daytona: RWM reports FXH in residence at Daytona. Jacksonville: DSC now is OPS and OO Class III, and Horace is running a local club code class. UZB is using a Globe Trotter. Lakeland: VIE visited PZT, SJK, JQ, and PJU, probably talking AREC? Miami: FWZ talked on AREC before the Dade Club on a visit from Jacksonville. We are sorry to hear that DRD lost his mother. IYT, MVR, and IM, among others, are working hard to put over hatu circuits for the 5th Annual Gold Coast Boat Marathon from Miami to West Palm Beach. New Port Rickey: KJ now is a member of the Old Timers Club. St. Petersburg: Congrats to FPC and TLX on working with the Convention Bureau on Philippine traffic. FPC made BPL again. K. of Kc. Net: UMJ, of New Port Rickey, is new MO and RWM, of Daytona, is SA. Congrats to both and posies to DDW for a swell job as MO the first six months. SSB: Please send me your activity reports. 144-Mc. stations: Please send me activity reports. Traffic: W4PJU 1869, FPC 521, DRD 174, W6PWZ/4 and W6PXC/4 160, W4PZT 156, RWM 69, QBR 68, ZIR 62, LMT 38, KJ 26, SVB 26, FWZ 25, IM 13, TFP 13, 1YT 4, VIE 2.

WESTERN FLORIDA — SCM, Edward J. Collins, W4MS/RE — SEC: PLE. SRX had three transmitters on all bands on Field Day. ZWG/4 was operated by ZWG, VAQ, UXW, and ØKVX on all bands with two transmitters. PQW and HJA attended the ARRL National Convention in Houston. MS visited Atlanta, where more ham TV ground work was laid. RZV keeps the Dagwood Net perking. TTM keeps the home rig going while the OM, PTK, does mobile work. NOX/NYZ keep their FB G.I. traffic work going. KG6ADX is home with his dad, WN4ZPN, and is keeping the Viking II hot. PAA is passing the word on TVI elimination. FHQ still is interested in v.h.f. ART and UUF are heard on 144 Mc. YNA is getting his 144-Mc. gear going in Tally and the long-awaited Western Florida 144-Mc. Net may become a reality. DAO has moved permanently to 75 meters. ZDG/4 keeps the kw. hot at Saufley. PJP is on 7-Mc. 'phone. SZH keeps 75 meters busy. WN4YRF is going after General Class license. WN4YFF, W4YFG, and W4YFH keep the bands busy. AXF tries her hand at DX. UYC is looking at 75 meters. MS caught a 6-meter opening. SSP is working on s.s.b. gear. KWM has the 14-Mc. 'phone going.

GEORGIA — SCM, James P. Born, jr., W4ZD — The Atlanta Radio Club's Annual Hamfest will be held Aug. 30th at Robinson's Tropical Garden on Pacesferry Road on the banks of the Chattahoochee River. A Viking II will be given to some lucky attendant. VSW has moved to Atlanta from Columbia, S. C., and is active on 3.85-Mc. 'phone with new p.p. 814 transmitter. LNG has returned to Atlanta and is active on 50 Mc. and 144 Mc., 'phone and c.w. IMQ is recovering from a broken leg. Good luck, Jim, on a speedy recovery. URB is moving to New York. YPN has a new 25-watt rig on 28-Mc. 'phone. EYQ, POI, MOS, TTZ, JOP, BVU, and PYI have moved to Fort Worth, Tex. JDR has enlisted in the Army and is stationed at Fort Breckenridge, Ky. K4WAR has a new 72-foot tower and is rebuilding his beams and other antennas before winter. GVU has a new kw. rig. GMP is in Jugoslavia and hopes to be on the air soon with a Viking II and HQ-129X. KL is rebuilding his 14-Mc. beam. Plans are being made for reactivation of a club in the Rome Area. MZO is on s.s.b. and is enjoying it. Traffic: (June) W4USA 2426, KL7ASP/4 223, W4EJC 115, ZD 61, MTS 20, MA 7, IMQ 4. (May) W4MA 22.

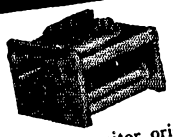
WEST INDIES — SCM, William Werner, KP4DJ — SEC: HZ. RC, new EC for San Juan District, now has 500 watts on 80- and 20-meter c.w. KV4BD, new EC for Virgin Islands, met the gang here and received WPR-25. KP4OM now is Army medical officer stationed in Texas. His 14-year-old brother is WP4US. Field Day at Borinquen Park had DV, AK, and RC operating most of the time. RK now has an HQ-129X. MV was appointed treasurer of the PRARC after BV's resignation. A WPR-N certificate will be issued to any station that works 10 Novices on the Island. VP2AJ is operating MM on 40 meters on the way to Bermuda. W4PGS and W4IL, from Miami, met the gang at KP4ID and later heard operating from HH3DL with an FB signal on 20-meter 'phone. KP4TZ and CX4AB received WPR-25. KP4VA is the call of the Agricultural College Amateur Club station. VC, from Ponce, is new on 3925 kc. TO is back in his shack after a vacation in W-Land. ES has a new 32V3. DL and KE are back on the air. Traffic: KP4RC 6, RK 5.

CANAL ZONE — SCM, Nelson W. Magner, KZ5NM/W4QBS — DE is new RM, Atlantic-Side. IA is new EC, Atlantic-Side. SS is MARS Director, USARCARIB, Panama Area. AL has a new Collins 75A-2. PH has a new "V" beam. BC is doing FB on 14-Mc. c.w., working DL, EI, F, G, HB, KH6, KL7, OA, OH, SM, and YUs. AA, works the Armed Forces Net daily at 1400 EST on 14,294

(*Continued on page 94*)

NEWARK'S Page of Values!

VARIABLE CAPACITOR BUY!



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63 Mmf

High quality variable capacitor originally designed for use in the master oscillator section of the famous BC-375. Extremely rugged construction and fan tail tracking adjustment make this unit ideal for VFO use. 3500 volt flashover. Stator plates fastened to end sections by 4 point, screw type suspension. Micrometer adjustment. Wt., 2 lbs.

54G583. Special Price..... 1.35

AEROVOX CAPACITORS

At a Fraction of Their Original Cost. Highest quality round can oil-filled capacitors. Porcelain insulators. Av. shpg. wt., 1 lb.

No.	Mfd.	VDC	Each	10 for
54G024	1	1000	.98	7.50
54G028	2	1500	1.39	...
54G032	1	2500	1.39	7.50
54G009	0.5	600	...	

In Stock At Newark

Nationally famous brands of Transmitters and Communications Receivers—In stock—for immediate delivery.

97F300. Collins 75A2 Receiver. **NET**.....420.00
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97F301. Speaker for Collins Receiver. **NET**..... 20.00
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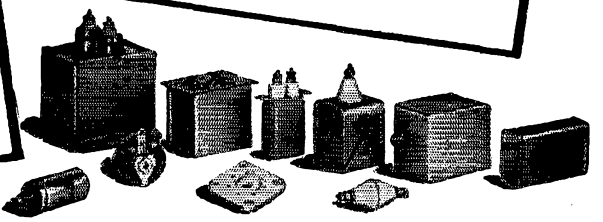
98F323. National HRO-60 Receiver. **NET**.....483.50
98F307. Speaker for HRO-60. **NET**..... 16.00
98F300. National NC125 Receiver. **NET**.....179.95
98F301. Speaker for NC125. **NET**..... 11.00
97F455. Johnson Viking II, kit. **NET**.....279.50
97F460. Johnson Viking II, wired. **NET**.....337.00
97F410. Hammarlund HQ140X Receiver. **NET**..264.50
97F404. Speaker for HQ140X. **NET**..... 14.50
98F001. Hallicrafters S76 Receiver. **NET**.....199.95
98F003. Hallicrafters S40B Receiver. **NET**.....129.95
98F005. Hallicrafters S38C Receiver. **NET**..... 59.95
98F008. Hallicrafters SX71 Receiver. **NET**.....249.95



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.01 Mfd. 8000 VDC Test. Rect. oil-filled. Single porcelain insulator. 1 lb.
54G585. 10 for 7.50. EACH.....98c

2 Mfd. 600 VDC. General Electric Pyranol-filled capacitor. Flange type mounting. Ceramic pillar terminals, 10/32" studs. Size, 2x2¼x1". Wt., 1 lb.
54G006. 10 for 3.00.....Each 39c

5 Mfd. 1000 VDC. Type BAR. Oil filled. Solder terminals. Size, 3⅜x3¾x 1¾". Wt., 1 lb.
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.2 Mfd. 5000 VDC. Sprague oil-filled unit. Ceramic terminals, 10/32" Stud. Size, 3⅜x3¾x1¾". Wt., 2 lbs.
54G586. 10 for 10.00.....Each, 1.29

.1 Mfd. 3000 VDC. Round can capacitor. Upright mounting. 2¼x1 5/16" dia. Shpg. wt., 1 lb.
54G008. 10 for 1.25.....Each 20c

1 Mfd. 5000 VDC. General Electric Pyranol-filled filter capacitor. Large ceramic terminals. With mtg. clamps. Size, 4½x3¾x4⅛". Wt., 3 lbs.
54G004. Special Price.....4.95

WAR SURPLUS TUBE SPECIALS

3C24/24G	.89
805	4.50
838	4.50
100TH	11.95

SPECIAL PARTS VALUES!

35 ohm, 50-watt Pot. Ohmite Type "J" wire-wound pot. Heavy ceramic form. ¼" shaft for ⅜" mtg hole. 1 lb.
54G587. 10 for 5.50..... Each 69c

Feed-thru Insulator. Double cone high glaze ceramic insulator. 1¼" diameter. Mounts with 1" above chassis. Complete with 10/32" threaded rod, washers, and nuts. Wt., ½ lb.
54G580. Special Price... 10 for 1.00

Low-loss Steatite Socket. For 829B/-3E29 or 832 tube. Center has large cooling hole. Less shield Base. Mfd. by Johnson. 2" mtg centers. Wt., ½ lb.
54G588. 10 for 5.00..... Each 56c

Mallory Type NF-1-2 Noise Filter. For filtering generator hash. Will handle either 6 or 12 VDC at 50 amps. Formerly used on 32 volt aircraft systems. Easily mounted on car generator. Wt., ½ lb.
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SAVE ON TRANSFORMERS!

Thordarson T-45166 Output Transformer. Single 6L6 to 2-4-8-500 ohms voice coil. Case size 2½x2½x3" high. Shpg. wt., 5 lbs.
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Driver Transformer. P.P. 2A3's to grids. Case size, 3¼x2½x3" high. Shpg. wt., 5 lbs.
54G111. 10 for 15.00..... Each 1.95

NEW SHIPMENT! STANDARD BRAND CAPACITORS

Special bargain offering of High Quality Standard Brand Capacitors. All oil-filled, rectangular cased. Have porcelain insulators. Less mounting brackets. Av. shpg. wt., 2 lbs.

Stock No.	Capacity and WVDC	Net Each
54G201	2x2 mfd. 600 volts	.89
54G202	.5 mfd. 600 volts	.49
54G203	2 mfd. 2000 volts	1.75
54G204	1 mfd. 1500 volts	1.25
54G205	.5 mfd. 2000 volts	.89
54G206	2 mfd. 2500 volts	2.10
54G207	1 mfd. 3000 volts	3.50
54G208	2 mfd. 4000 volts	6.95
54G209	.5 mfd. 3000 volts	1.25
54G210	1 mfd. 6000 volts	8.95

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kc. FG is building a new 813 final. KZ5PA/KZ5 was the Atlantic-Side Field Day station. CARC is conducting code and theory classes. DG, GD, KA, RM, RV, and WA are vacationing in U. S. AC, GQ, JQ, PC, RL, RT, TP, TT, and WK have returned to the U. S. and BO, NN, TB, TW, and WT are leaving shortly. Traffic: KZ5ML 66, FL 30, NM 12, HG 9, BY 5, HO 4.

SOUTHWESTERN DIVISION

LOS ANGELES — SCM, Howard C. Bellman, W6YVJ — Howard F. Shepherd, jr., QJW, is our brand-new SEC. Taking the place of FMG as RM for LSN, is BHG, with NTN as Asst. RM of LSN. RM-at-large is GJP, while the new Manager of PAN is RM CMN. KWQ is our Asst. SCM. PIB remains the "hams' politician" and his political tree has really borne fruit this time. Smitty and hundreds like him have given the California hams auto license plates. Governor Warren signed the Bill July 6th. NCA likes NCS duties Saturday but reports the teen-ager round table is "going to the dogs." The table meets 1030 on 7150 kc. Beverly Hills ARC, 12 members, with KCM as pres.; QHS as vice-pres.; and TJL as secy.-treas.; is a new high school club. OXB is back on after 6 years with Viking 11 and 33-foot vertical. He and VUP are getting a club going at KTTV, where 30 of 68 engineers are hams. RNN is communications chief for E.L.A. District and has 2-meter net going in Bell Gardens and Bell Areas. NJU has a new Viking VFO. ZWS, mobile, worked operator GSA at PMJ and did on-the-spot emergency work at a wreck. GYH got award No. 1 GMTHC-BRAT from 7FIX of *PAN News*. KYV didn't count 308 "book messages" so totaled only 3674 this month. This is his 30th consecutive BPL for long-haul traffic. New LSN members are KNA and OXJ. BHG reports 324 station check-ins. UGA needs an Asiatic card for WAC on 75-meter 'phone. QJW says first reports from the big L. A. fire shows ham radio working between the Air Force Base and its men at the fire. QVN is M.C. of the Golden State Net. OI, on 2, and ESR on 10 meters were NCSs for Centinella Valley. Net during Helm's Marathon Race. KOS has a new mobile antenna in High Sierras. Twelve members of the Fish Net helped encampment in the Sierras. LYG says the Teen-age Cactus Net meets on 7270-kc. 'phone at 10 A.M. weekdays, with HJK and QJV as NCS. EBK reports CWD is on 10 meters, AEA is on 2 meters, ON has ground place on 75 meters, KSN is on 40-meter c.w., and EBJ is building a home in Apple Valley. BLY has been very ill. GEB, U.C.L.A., got straight "A" for the semester. Region 9 plan has been OKed by FCC and FCDA and the RACES call is W6PMJ9. The U.C.L.A. Club officers are ERN, pres.; KWG, vice-pres.; RBW, secy.; 1WY, treas. PZN is a new OBS appointee. The *Downey Champion* has a lengthy description of hams in action during the June Disaster Drill when Rancho Los Amigos was "blasted" and thousands of "refugees" were taken care of. QJW, the new SEC, has appointed UQL and FUA as ECs for Temple City and Lakewood, respectively. Traffic: (June) W6KYV 3674, CMN 617, GYH 459, BHG 324, CAK 275, LYG 248, UGA 110, WRT 70, NCA 48, GJP 28, HIF 15, PZN 13, BLY 7, CBO 4, GEB 3, YVJ 1. (May) W6NLM 304, JQB 36, NJU 1.

ARIZONA — SCM, Albert Steinbrecher, W7LVR — Undoubtedly the outstanding event during June was "Operation Beware," the "bombing" of six western states by "Enemy Migs." It was well organized and attended, and all communications within the State were quickly dispatched by the following: AIA, BFA, DRQ, EAW, FAG, FAL, GV, GYK, HUV, IRX, JQP, JUY, JVK, JYH, KOY, LAD, LBE, LSK, LVR, MAS, MDM, MES, NFZ, OIF, OQB, OQF, OQS, PEF, PKM, PLM, PLX, PNJ, PVD, PZ, QHE, QJS, QNC, QZH, REO, RFE, RNB, RTG, RU, RVI, SIC, SQN, SUL, SX, TCQ, and USX. Field Day found many active groups around the State. The Saquaro Radio Club had 10 operators at Powell Springs Park. The Radio Club of Arizona had 12 operators on Mingus Mountain. The Kilowatt Club had 6 operators in Tucson, and PZ and 4 operators in South Tucson; LVR and HUV were on Mount Lemmon. A hidden transmitter hunt, "Operation Red Flag," followed by a picnic in Phoenix, was well attended and controlled by JYH, IRX, and RBA. First prize went to KFS, who spotted the transmitter in little over an hour. Other winners were JUY, JWH, KOY, LND, LQB, MAE, NZO, QZH, RAB, SWY, and USX. *NOTICE*: The Arizona Novice Emergency Net has been established and will be on 3704 kc. Tue. and Thurs. at 6 P.M., with SUI at Net Control. ARRL Bulletins will be transmitted at 5:45 P.M. on 3704 kc. at 5 and 13 w.p.m., and 'Phone Bulletins will be ready by IRX and SUI on 3865 kc. at 6:45 P.M. the same nights. Traffic: W7KOY 74, LVR 32, LAD 24.

SAN DIEGO — SCM, Edgar M. Cameron, jr., W6FJH — Asst. SCMs: Thomas H. Wells, 6EWU; Shelley E. Trotter, 6BAM; Richard E. Huddleston, 6DLN. SEC: SK. Asst. SECs: FOP, WYA. ECs: DEY, ZLV, HRI, QJH. RM: MUE. PAM: JPM. Excellent reports rolled in from all parts of the section on Field Day operation. It made yours truly very proud of the obviously very keen interest prevalent in these parts. Congrats go to the Imperial

(*Continued on page 98*)

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IMMEDIATE DELIVERY

Single Sideband Exciter SS-75

Check these specifications and you'll see why the SS-75 is now the one piece of equipment that places all the advantages of single sideband at your finger tips:

- ★ **Built-in stable VFO, with voltage regulation.**
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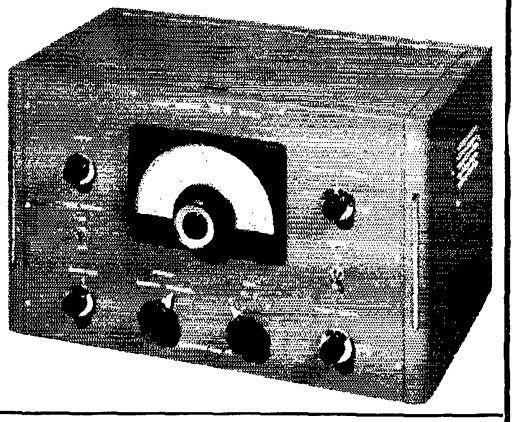
- ★ **Built-in voice control and receiver disabling circuit. Also provides for break-in CW operation.**
- ★ **Specially designed crystal filter network for maximum stability and reliability.**
- ★ **Carrier injection to transmitter available for working single sideband WITH CARRIER, for tune-up adjustments, or CW.**
- ★ **10 watts output, with additional 807 socket for up to 100 watt operation with external power supply.**
- ★ **Handsome grey crackle cabinet, chrome trimmed, 20" x 12" x 12". Complete with 12 tubes, including one 807, operating manual.....$245.00**

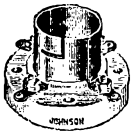
Frequency conversion mixer for 40–20 meters, rack mtg. 3½" x 19" less power supply..... 75.00



WRIGHT T-R SWITCH

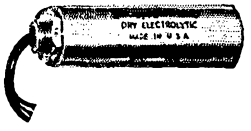
For break-in operation on CW, AM, or SSSC. Use one antenna for transmitting and receiving. It's instantaneous! No moving parts, no power needed to operate. Coax fitting for connections to feeder and receiver. Will handle 1 Kw. With 75 meter plug-in coil.. **$9.95**

Extra coils **$1.75** per band



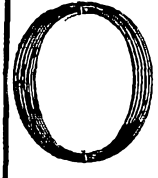
TUBE SOCKETS

For 4-prong tubes 866, 809, 811, 100th etc. Heavy phosphor bronze side wiping contacts, metal shell, white porcelain base. Regular list $1.50, while they last..... **45¢**



Triple 8 mfd. 450 V. electrolytic upright can condenser, separate negatives, all leads insulated from can. Nationally known mfr. Reg. dealer net $2.58.....ONLY **59¢**

10 for **$5.00**



PHOSPHOR BRONZE AERIAL

125 ft. of the finest aerial wire obtainable. 42-strand phosphor-bronze with linen center. Will not stretch, very high tensile strength, diameter approximately same as No. 14 copper, very flexible. Excellent for transmitting or receiving antenna, control cable, guy wire. Regular list $4.95..... **90¢**

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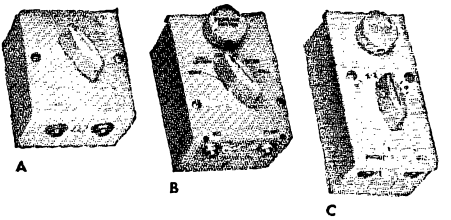


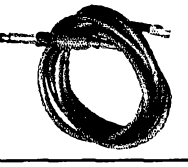
A B C

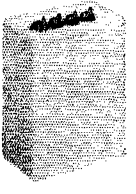
(A) BC-345. 3½" x 3½" x 1⅞" aluminum, 2 standard open-circuit jacks, 3-position switch, 6-contact banana plugs and jacks.
(B) BC-1366. 4¼" x 3" x 2¼" aluminum, 1 standard open-circuit jack, 1 3-circuit mike jack, 150,000 ohm volume control, 5-positions switch, 11-contact banana plugs and jacks.
(C) BC-213. 5¼" x 2¾" x 2⅛" aluminum, 1 standard open-circuit jack, 1 3-circuit mike jack, 150,000 ohm volume control, 4-position switch, 8-contact banana plugs and jacks.

YOUR CHOICE 30¢

PL-55 PLUG AND CORD

Standard plug with 6 ft. rubber, 2-wire cord with spade lugs.... **85¢**





8/8/8 MFD. 500 V. D.C.

Triple 8 mfd. 500 working volt D.C. oil-filled condenser, common negative, solder terminals, hermetically sealed. 5" x 3⅜" x 2¼"..... **$1.95**

MINIMUM ORDER $2.00. Send 20% deposit with COD orders. Please include sufficient postage or instruct us to ship by Express Collect. Overpayment will be refunded by check.

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73, Jule Burnett W8WHE

Club gang down El Centro way, to NIL/6 and his boys at Huntington Beach, to the Palomar Radio Club bunch, and to the Camp Pendleton boys (IAB), who really pitched in there with their own USMC radio truck and trailer-generator. GER reports the Soledad Club did OK with 7 transmitters on Mt. Soledad, the Helix Club held down the Field Day fort at Kearney Mesa, JPM had fun on Red Mountain, Camp Callan was the site of the San Diego Club using the club call GGK. Field Day did not find the members of Orange County Radio Club remiss either — 4 operators and 2 transmitters held forth on Santiago Peak. Thanks lots, fellows, for joining in this great coöperative effort in the field! UFE and mother go mobiling to Minnesota while OM TZO stands watch at the home QTH. Flowers to QJH for working so hard on the amateur radio exhibit (HRK) at the County Fair at Del Mar, and let's not forget the gracious gesture of BOS in lending all that "crazy" gear for the operation. Thanks, Art! From Betty, OQY, prexy of the Coronado Club we learn that ICM is now in Guam and UNU is home from KH6-Land and is now mobile. Traffic: (June) W6IAB 5021, YDK 514, IZG 337, FCT 9. (May) W6ELQ 224. (Apr.) W6ELQ 234.

SANTA BARBARA — SCM, Vincent J. Haggerty, W6IOX — IHD divided his operating time between the Tri-Co Net and ragchewing. ORW reports the 2-meter net reactivated in Paso Robles. DLR is active with OBS skeds, the Tri-Co Net, and compacting a mobile installation in his new car. FYW reports his best 2-meter mobile DX from Paso Robles was KN6ALL, also mobile, on Mt. Abel. LB, prexy of the San Luis Obispo Club, reports a very successful Field Day from Oceano County Park; NJP supervised at the barbecue pit and kept the operating members well fed. QIW reports SBN is underway on 3600 kc. Mon. through Fri. at 7:30 P.M. Prospective members are invited to listen in and check in when Net Control requests. Operating speed will be confined to the ability of new members. YCF topped the section in traffic: Traffic: W6YCF 58, ORI 13, LB 8, DLR 7, FYW 7, JML 2.

WEST GULF DIVISION

NORTHERN TEXAS — SCM, William J. Gentry, W5GF — Asst. SCM: Thomas B. Craig, 5JQD. SEC: QHI. RM: Open. PAM: IQW. WHE has a new mast. UBY is having transmitter trouble. Hope you get it working soon, OM. TVY is learning TV servicing. WHE also is one of our new Official Observers. SRQ is being transferred to Europe. Good luck, Cecil. ONQ has been building a new 50-watt rig, and has a new light pole. TFB needs net outlets in Dallas, Fort Worth, Amarillo, Lubbock, and San Antonio. How about it, men? Give him a hand. AWT is going to put up a new 75-meter antenna. Pressing business makes it necessary for your SCM to resign effective immediately. Asst. SCM T. Bruce Craig is Acting SCM. I have enjoyed working with all of you and sincerely regret that I must give more time to business matters. The office of SCM requires considerable time to be properly handled. Thanks again, men, for your fine coöperation. Traffic: W5TFB 592, KPB 43, WHE 35, TVY 33, SRQ 6.

OKLAHOMA — SCM, Jesse M. Langford, W5GVV — SEC: AGM. RM: MQI. PAMs: SVR and ROZ. MQI's son has received the call WN8MZR. Oklahoma has a new net operating at noon on 75-meter 'phone called the SOONER-NOONER. KY is working on walkie-talkie for 6 meters. TFP has been visiting the gang in Oklahoma while making his territory. The Pioneer Radio Club has made arrangements for a TVI program in July with the R.I. from Dallas putting on the demonstration. MFX still is working on water well. OYW, WEH, and UNR have new 75A-2s. EHC is back on 75-meter mobile. TKC is carrying a paper route this summer. 8UFN/5 now is using squelch on his mobile receiver. RDI is trying a T2FD antenna. VHP and TKI drove to the Convention at Houston. The Canton Radio Club now has a license for its club station, BAA. The call was received as a memorial to Bob Gettys. The station will be located 1½ miles west of Canton. VBH reports in this month with traffic for the first time. UEG has been operating in the NTO Net and is doing a swell job. RST is working on a new VFO for his mobile rig. SCX is working 2 meters with considerable success and is interested in schedules with anyone on 2 meters. The Phil Rand demonstration of TVI and its elimination, sponsored by the AREC, Caravan Club of Oklahoma City, and the Oklahoma City TV dealers, was held July 8th. Traffic: W5UGO 243, GZK 139, MQI 116, SWJ 58, SVR 52, PML 43, KY 38, TFP 29, VBH 27, MFX 19, GVV 18, OFG 17, RST 14, ITF 12, VHP 8, EHC 5.

SOUTHERN TEXAS — Dr. Charles Fermaglich, W5FJF — As chairman of the ARRL National Convention held in Houston, I would like to say that we had a whale of a good time and I sure did enjoy meeting and talking to everyone. We tried to show everyone a good time and there were a lot of social and informative gatherings. Now that the Convention has come to a successful conclusion it is time for us to get down to work and make the Southern Texas section the best one in the U. S. This takes lots of work and one or a dozen can't do the job. It will take every one of us to do a first-class job. We have the makings,

(Continued on page 98)

WEBSTER
(WEB-WIP)

Band-spanner

75 40 20 15 11 10

MOBILE ANTENNA

Now . . . . . mobile operation on 75-40-20-15-11-10 meter bands with one streamlined antenna! No external taps or projections . . . . no plug-in coils!!!

Band change is simple. The top whip is merely raised or lowered to a pre-calibrated setting corresponding to the particular band selected.

The Webster "Band-spanner" is essentially an effective, Center-loaded Antenna with the loading inductor wound directly on the upper portion of the fiber glass support column. This inductor has sufficient turns to permit resonance at the lowest frequency band, (75 meters) with the particular top whip used. A unique Webster design allows a portion of each coil turn to be *internally* exposed. A top whip of fixed length is arranged to push down or pull up from the inside of the loading section. This whip has a circular contactor affixed to its lower end and this contact establishes positive electrical connection between the bottom end of the whip and the internally-exposed loading coil turns. The whip may, by merely raising or lowering it plunger-fashion, be "Tapped" on any desired portion of the loading inductor. This type of continuous adjustment of the loading inductor permits exact antenna resonance to be achieved anywhere within a given band, minimizes loading problems, assures most efficient operation. The contact arrangement is self-cleaning . . . tends to firmly hold the whip into any pre-set position. The overall effect is neat, streamlined, mechanically sound and sturdy.

Flexible, fiber glass covered top whip

Factory calibrated mid-band markings

Weather-proof packing gland

Plastic covered loading section

Fiber glass support column

Lightweight: Total weight less than 2 pounds.

Six band operation.

Streamlined and weather proof.

All parts individually replaceable.

Top whip pushes completely in for storage or low door clearance.

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Put a Band-spanner on your car

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so let's show the boys how we can organize down here. I have appointed ULN and FEK as assistants to our Section Emergency Coördinator, GLS. ULN will coördinate all low-frequency operation, 160 through 10 meters, and FEK will handle 2 meters and higher. All appointments will be reviewed and ECs will be reconfirmed or new ones will be appointed. There will be two ECs for each area, one for high frequency and one for low frequency. They will work together but will report to either ULN or FEK. FED and ULN need to bring their records up to date, so all ECs, Net Controls, Alternate Net Controls, net members, Emergency Corps members, mobiles, in fact all those interested in emergency or net work, are asked to drop one of these men a line. If your area has no EC or an inactive one, by all means suggest one for v.h.f. and l.f. This is not just a passing fancy — this is a campaign that we will pursue until it is organized and then we will work to preserve it. I will send a letter to each and every ARRL member in Southern Texas explaining the program in detail and also explaining the ARRL appointments that are available. MN has the distinction of consistently being the best traffic man in Southern Texas.

NEW MEXICO — SCM, G. Merton Sayre, W5ZU — SEC: MYI. PAM: BIW. RM: NKG. Field Day found New Mexico well represented in the field. The Sandia Base RC reports 537 contacts using 3 transmitters, 2 under 30 watts, 1 under 100. The Pecos Valley ARC had 104 contacts for a total of 864 points, same category as above. The Mesilla Valley ARC made about 600 points; Los Alamos ARC was very active in the 5-transmitter class; Tularosa Valley ARC had 10 operators on 4 bands; White Sands Proving Grounds ARC had 16 operators. Individuals reporting: DAH, CTG, and IGO. PLK can now handle out-of-State as well as A.P.O. and F.P.O. traffic. JZT reported a fire in the Santa Fe National Forest to FVY and MOX on the MARS Net, each relayed to the appropriate Forest Service office. Among those heard on the New Mexico Breakfast Club on 3838 kc. between 0700 and 0830 MST are: BIH, BIW, DRA, HAF, LAJ, LLG, MEW, NRX, NUN, PGJ, PUW, QD, QDD, RFJ, RFK, RMK, RWH, STQ, TBA, TGU, TOU, UAR, VES, WLL, WPA, WSP, YAS, YFN, YIB, TWG, ZFN, and ZU. FVY got emergency C.A.P. traffic through to Iowa. RWH reports an FB trip to Yellowstone and the West Coast. Traffic: W5JZT 187, K5WSP 127, W5NKG 68, ZU 24, PLK 23, IGO 21, QKJ 14, FRP 2.

CANADIAN DIVISION

MARITIME — SCM, A.M. Crowell, VE1DQ — SEC: FQ. RM: OM. EC: EK. Sorry to report two well-known OMs on the sick list this month — ET and TA. A recent visitor to Halifax was W2AWH, with very nice all-band mobile in his car. AAW, who has been assisting DW as Acting Net Control of the Maritime Net, has piled up a nice total this month. OC has been active in the Maritime Net. FQ has been handling last-minute traffic for the North as the boys prepare to change crews and leave for home. Notes from the FRAC: BM and CM are busy building new homes. RF is doing some mobile operating. ABT got her 'phone ticket. The following news on the VO1 boys in NRC came via VO2B: Officers of NRC are VO1RG, pres.; VO1J, vice-pres.; VO1D, secy.; W1QDM/VO1, treas. Regular meetings are held on the 1st Fri. of each month. VO2B is acting secy. during the summer months while VO1D is traveling with Government survey. VO1Y has a new 813 final. The following are mobile: 1T, 1I, 1AB, W1QDM/VO1, W4YCM/VO2, and VO2B. VO1A has been recommended as VO QSL Manager. Two groups from the NRC were active on Field Day and VO1RG is awarding a trophy to the station or group making the best showing. Traffic: VE1AAW 165, VO6U 164, VE1FQ 158, VE1DW 80, VO6N 77, VO6B 47, VE1ZM 42, VE1ABZ 17, VE1OC 17, VE1UT 15.

ONTARIO — SCM, G. Eric Farquhar, VE31A — June, the month of brides, vacations, hamfests, picnics, and fish stories, found many still using the ham bands despite very adverse conditions. Traffic-handling took its usual summer slump but there were some very nice totals in this section, with ATR heading the list. AVS now is Class A. DGJ, a newcomer in Hamilton, is going great guns. We welcome VE1SP to this section. BIU, IA, and W4FPC patiently await QSL from VS6AA. JU finds conditions tough at the Soo. The North Bay Hamfest, well attended, was favored with good weather and everyone enjoying northern hospitality to the full. Newly-elected executives of the Sudbury District Radio Club are BHJ, pres.; BHG secy.; DOF, treas. Glad to hear that ARRL has been of great assistance to this Club's TVI Committee. From many quarters reports show that this year's Field Day was the best yet. EAB has completed power supply for new rig. DU vacationed up Northbay way. BUR went to Connecticut by way of Bermuda. DFE sticks to steady program of Official Bulletin transmissions. BSW attended his first Field Day in five years. WT enjoys fishing and mobiles to some very choice spots. DRX will be at Pagwa by October and plans to originate some traffic on 7 Mc. To BPE we extend our sympathy in the loss of his mother.

(Continued on page 100)

Bob Henry says

"Some things call for a specialist!"

When it comes to amateur radio apparatus deal with the man who knows . . .
BOB HENRY

Bob's a radio ham himself—and he's built his hobby into a nationwide business. All his experience and "know how" are at your service. He sees to it that you get speedy delivery—complete selection—a time-payment plan tailored to your needs—and a really liberal trade-in allowance. Yes, Bob knows the wants of the radio ham or hobbyist and he delivers! Write, wire, phone or visit either store today.

SOME ITEMS IN STOCK ARE:

Collins 75A3 (speaker $20.00)	$ 530.00
Collins 32V3 $775.00; 35C2	$ 40.00
Collins 70E-8A	$ 97.50
Collins KW1 xmitter	$3850.00
Hallicrafter S53A $89.95; S38C	$ 49.50
Hallicrafter S72L $119.95; S72	$ 109.95
Hallicrafter S76 $179.50; S40B	$ 119.95
Hallicrafter SX62 $299.50; SX71	$ 224.50
Hallicrafter HT-20 xmitter	$ 449.50
Hallicrafter TW1000 portable	$ 149.50
National NC88 $119.95; SW54	$ 49.95
National NC183D $369.50; NC125	$ 179.95
National HR060	$ 483.50
Hammarlund HQ140X	$264.50
Johnson Viking II (wired $40.00)	$279.50
Johnson VFO kit (wired $17.00)	$ 42.75
Johnson mobile xmitter kit	$ 99.50
Gonset Commander $124.50; VFO	$ 29.95
Gonset Communicator $199.50; Super-6	$ 52.50
Morrow 5BR $74.95; 3BR	$ 64.95
Elmac A54H $149.00; A54	$139.00
Elmac PMR6A receiver	$134.50
Harvey-Wells TBS50D $137.50; TBS50C	$111.50
Harvey-Wells VFO $47.50; APS50	$ 39.50
Lysco 600S $189.95; Lysco 600	$143.95
Babcock MT5A	$ 99.50

Prices subject to change. Some prices higher on west coast.

Johnson, Gonset, Elmac, Babcock, Morrow, Eldico, Lysco, Hallicrafters, National RME, Millen, Master Mount, B&W, RCA, HYlite, Bud, Vibroplex, Eimac, all others.

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"LARGEST DISTRIBUTORS OF SHORT WAVE RECEIVERS"

TWO STORES: Butler, Missouri & 11240 West Olympic Blvd., Los Angeles 64, Calif.

News is somewhat scarce, no doubt because so many of the gang are away. Please let's hear what hamming you may have done, fellows, so that this column may continue. Traffic: VE3ATR 237, BUR 159, IA 109, IL 107, NG 95, AJR 58, NO 50, EAM 40, KM 24, DFE 7, BSU 2.

QUEBEC — SCM, Gordon A. Lynn, VE2GL — BK has renewed ORS appointment, has new Gonset Super Six in the car, and visited League Headquarters while traveling. AIS took part in Field Day and handled some Field Day messages. Other participants in Field Day included TA, CK, AFO, CD, CQ, and AKH, each assisted by goodly turnouts of willing helpers. AJ is changing QTH to Shawinigan South, where he hopes to improve his operating activities. EC reports for the St. Maurice Valley gang, including AEM, ACS, AOB, and APE, who maintain daily skeds at 9 A.M. and 1 P.M. AGP is very proud of a 100 per cent QSO with W1AW and of the QSL card received. CA reports conditions and traffic both picked up during the month and that Phyl is much better and is able to stay with the rig for a couple of hours at a time now. QN reports for the Quebec City gang, which holds AREC Quebec Emergency Nets each Sun. morning and Thurs. night. Also every two months the gang holds a drill test to promote c.d. preparedness. Our QSL Manager reports that he has cards for 407 different VE2s for which he has not received envelopes. If you have not sent him one, do so now, and put return postage on it. We'll be looking for you at Eastern Canada ARRL Convention, in Victoria Hall, Westmount, Montreal on Sept. 19th. Traffic: VE2CA 69, EC 15, QN 8, AIS 4.

ALBERTA — SCM, Sydney T. Jones VE6MJ — HG, formerly of Winnipeg, has taken up residence in Edmonton and expects to be active real soon. WR and FB and gang did real well in the Field Day activities. SC has taken off for greener pastures in British Columbia. Dave expects to be back in town for the hamfest. EH has mobile gear in his new car. RU is active again on 14 Mc. 'phone. The Alberta civil defense authorities wish to express their thanks to all who took part in the recent exercise "Beware." The Lethbridge gang is to be congratulated on the real fine showing during the flood June 9th. The following are known to have assisted: OG, RH, OF, PV, EO, TG, and PL. WC is holding up the Alberta end of the Maple Leaf Net. ZR has a new antenna on 14 Mc. and also a new job with CPA. IJ reports from Lacombe and is interested in AREC work. EA and his XYL enjoyed a nice trip to San Francisco and took in the get-together at Lethbridge on May 30th. IE now has his 'phone ticket. Don't forget the Alberta Hamfest in Edmonton Sept. 5th and 6th. Bring the XYL, the mobile, and the kids. Let's have fun! Traffic: VE6HM 202, OD 69, WC 11, MJ 9.

BRITISH COLUMBIA — SCM, Peter McIntyre, VE 7JT — Field Day reports were received from ZV/7 of the VARC, ND/7 of the Totem ARC, AQL/7 of the BCEARC.; and AO/7 Congrats to YR, who has worked 115 countries with an 807 in the final with 91 confirmed. See, you can do things with low power. Condolences to BQ and LK on their recent bereavements. The Vancouver amateurs and AREC members took part in the local c.d. "Operation Beware," under the EC, AOB, and his assistants. C.d. officials were very well satisfied with the way in which the amateurs carried their share of the exercise, which included supplying all the operators for v.h.f. equipment and all the mobiles. DH, of Nanaimo, reports that US and BF still are mobiling, DH's mobile now is working, APL is dragging in the DX on 20-meter c.w., ALL is whizzing along mobiling, and ALY is back on the air. We would like to receive reports from any and all VE7 hams so we can get a picture of what is going on throughout the Province. Hope you are all enjoying the summer vacations and the weather suits your tastes of holiday weather. Traffic: (June) VE7TF 206, QC 133, DH 8. (May) VE7DH 41.

MANITOBA — SCM, Leonard E. Cuff, VE4LC — WØSSG and WØEXE, from Kansas City, Kans. and Mo., respectively, with their XYLs were visitors to Winnipeg in June and a few of us spent a very enjoyable evening with them. JD has returned from his trip South, where he had his Collins rig completely TVIed. SR attended the hamfest at North Bay and came away with two of the best prizes. WS and ML are additions to the steadily growing ranks of mobile operators. HL has moved to a new QTH at Portage la Prairie. We are sorry to see you go, Johnny, but we wish you the very best at your new location. 7APH was a visitor to Winnipeg in June. If any of you have not yet returned your civil defense cards and do intend to take part in the worthwhile effort, will you please fill out and return same as quickly as possible. Also, if anyone has not received a card and desires to join, please contact Mel Watson, VE4JY, 249 Lanark St., Winnipeg. A vote of thanks to Frank, VE4CX-TV, who put on such a fine show with his television station at the Red River Exhibition in Winnipeg and to those who helped and gave their time at the ham station booth. Traffic: (June) VE4JM 32. (May) VE4JM 8.

SASKATCHEWAN — SCM, Harold R. Horn, VE5HR — One of the best hamfests yet was held at Lake Waskesiu, with about 125 registered. Mr. Moxham, of the Civil Defense for Saskatchewan, gave a very good address to the

(*Continued on page 102*)

HARVEY HAS THE MOST COMPLETE STOCK OF MOBILE GEAR

25th ANNIVERSARY YEAR

ELDICO TR-75-TV TRANSMITTER KIT

This is an ideal unit for the novice. Very simple to assemble. New, revised circuit to aid in the elimination of TVI. Uses 6L6 oscillator — 807 amplifier combination PI-network output. Husky power supply delivers 600 volts to the 807. Complete . . . including a punched chassis and shielded cabinet. Unbelievably low priced at . . . **$64.95**

MD-40 modulator kit for above... **49.95**

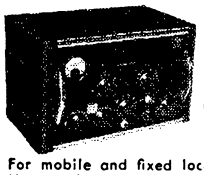
MD-40P as above but with power supply..... **59.95**

SUPERIOR POWERSTATS

Smooth, efficient voltage control, 0-135 volts output from 115 volt AC line. Models also for 230 volt input. Write for free literature. Models for table and panel mounting.

Type 10, 1,25 amps	$ 8.50
20, 3 amps	12.50
116, 7.5 amps, table mtg.	23.00
116U, 7.5 amps, panel mtg.	18.00
1126, 15 amps	46.00
1156, 45 amps	118.00

Complete Stock Always On Hand For Immediate Delivery



SONAR Model SRT-120 Transmitter

For mobile and fixed location operation. Has band-switch for 80, 75, 40, 20, 15, and 10 or 11 meters, plus spare position for any future band. Has provision for two crystals or external VFO head. Final amplifier employs the new Amperex 9903/5894A tube. Power input is 120 watts on CW, and 100 watts on phone. All circuits metered. Power requirements: 600 volts dc at 350 ma, and 6.3 volts at 6 A.

Complete with Tubes..... $198.50

External VFO Head..... 19.50

SRT-120P same as SRT-120 but with built in push-to-talk relay and self-contained power supply for use with 110-125 v. 50-60 cycle line..... $279.50

Also available in Kit Form:

120 Kit—$158.50 120P Kit—$198.50

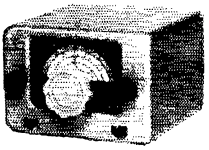
HARVEY carries a complete line of all makes and types of

FIXED and MOBILE ANTENNAS

NOTE: In view of the rapidly changing market conditions, all prices shown are subject to change without notice and are Net, F. O. B., New York City.

GONSET "SUPER 6"

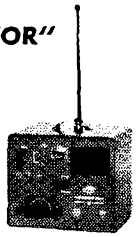
Six Band Amateur Converter



A compact converter covering 10, 11, 15, 20, 40, and 75 meter phone bands. Also covers 6 mc. (49 meter) and 15 mc. (19 meter) short wave broadcast bands. Uses 6CB6 low noise rf stage, with panel controlled antenna trimmer, 6AT6 triode mixer, 6C4 modified Clapp oscillator, and 6BH6 IF stage.

Complete with Tubes..... $52.50

GONSET "COMMUNICATOR"



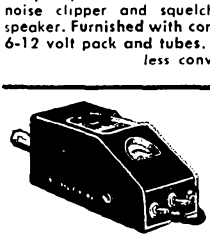
A complete two-way station for 2 meter band operation. Suitable for mobile or fixed location use. Receiver is a sensitive superheterodyne with built-in noise clipper circuit and 6BQ7 Cascode rf stage. Transmitter uses 2E26 in final 15 watts input. Employs 8 mc. crystals for stability, and has a range of over 100 miles. Operates on either 110 volts AC or 6 volts DC. Weight approx. 16 pounds.

Complete with Tubes (less crystal and microphone) .. $209.50

New Mobile Receiver GONSET SUPER-CEIVER

Uses any converter as a tuning head. Employs crystal-controlled first IF and dual conversion to 265 kc. Adjustable-pitch BFO; AF, RF and AVC controls; built-in noise clipper and squelch; built-in PM speaker. Furnished with convertible (dual) 6-12 volt pack and tubes.

less converter $119.50



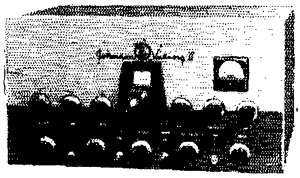
MILLEN GRID DIP METER

No. 90651

Covers 1.7 to 300 mc on seven direct-reading bands. Self-contained, compact. Plug it in to use with its own built-in transformer-type AC power supply. Or connect batteries to the handy internal terminal board $61.50

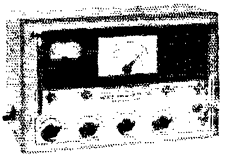
New Deluxe Transmitter Kit JOHNSON VIKING II

100 WATTS ON PHONE
130 WATTS ON CW



Every desirable feature has been included in this outstanding transmitter: BAND-SWITCHING to all amateur bands, from 160 through 10 meters... TVI suppression ...100% AM modulation... PARALLEL OUTPUT 6146 tubes . . . PUSH-PULL 807 MODULATORS. Supplied complete with *pre-punched chassis, copper-plated steel* cabinet, tubes, hardware, assembly instructions, and all necessary parts and components. $279.50

Viking II complete with tubes, wired and air tested	324.50
Viking VFO Kit, worthy companion to the Viking II	42.75
VFO Kit—wired and tested (with tubes)	62.75
Viking Mobile Kit, up to 60 Watts input for that rig-on-wheels	99.50
Viking Low Pass Filter, 4 section, 75 DB Att., handles a KW	16.50
Viking TVI Kit, everything to TVI-proof the Viking I	24.75



ELMAC A54

Under-dash Mobile Xmtr.

Measures: 7½" x 7½" x 12"

Weighs: 14½ lbs.

Covers 10, 20, 40 and 75 meter bands.

For Carbon Mike Input	$143.00
For Dynamic or Crystal Mike,	153.00
Power Supply, 110 volts AC,	39.50

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By Central Electronics, Eldico, Millen and others.

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gathering. BV won the Gus Cox C. W. Memorial Trophy. MQ retained the fur-lined button holes in the liars' event. The C.K.B.I. Trophy on radio knowledge was won by YJ on the second round when a tie with JC developed. MO located the hidden transmitter, VE5VB/portable, in record time, followed by FY/YF. Fifteen mobiles were in attendance, with 3DLL/DLM winning this event. UQ, RD, and JK were next in order for points in the mobile judging. The Saskatoon Club was out in full force for Field Day. DR was in charge of operations. The Moose Jaw Club also took part and did well after some transmitter troubles. JO is the proud father of a jr YL operator. Congratulations to the XYL of GU, who got her amateur ticket. DA, a new call in Saskatoon, is heard on 80-meter c.w. running 20 watts. HR is looking for Africa for 14-Mc. WAC on 'phone. CO made WØ, W9, and VE7 contacts on 50 Mc. 5TE now is 4TE. OM now has a T2FD in use. TK has a new rig. OM and OP have been in ham radio for 20 years. IL, TD, and JS are now mobile at Moose Jaw. AT and IB were the oldest and youngest hams in age at the hamfest. Traffic: VE5GI 11, RE 10, DR 4, EQ 4, PJ 4, GO 2.

A.R.R.L. QSL BUREAU

The function of the ARRL QSL Bureau system is to facilitate delivery to amateurs in the United States, its possessions, and Canada of those QSL cards which arrive from amateur stations in other parts of the world. Its operation is made possible by volunteer managers in each W, K, and VE call area. All *you* have to do is send your QSL manager (see list below) a stamped self-addressed envelope about 4¼ by 9½ inches in size, with your name and address in the usual place on the front of the envelope and your call printed in capital letters in the upper left-hand corner. For a list of overseas bureaus see p. 59, June, 1953, *QST*.

W1, K1 — J. R. Baker, jr., W1JOJ, Box 232, Ipswich, Mass.
W2, K2 — H. W. Yahnel, W2SN, Lake Ave., Helmetta, N. J.
W3, K3 — Jesse Bieberman, W3KT, Box 34, Philadelphia 5, Penna.
W4, K4 — Thomas M. Moss, W4HYW, Box 644, Municipal Airport Branch, Atlanta, Ga.
W5, K5 — Oren B. Gambill, W5WI, 2514 N. Garrison, Tulsa 6, Okla.
W6, K6 — Horace R. Greer, W6TI, 414 Fairmount St., Oakland, Calif.
W7, K7 — Mary Ann Tatro, W7FWR, 513 N. Central, Olympia, Wash.
W8, K8 — Norman W. Aiken, W8LJS, 701 East 240th St., Euclid 23, 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, Man.
VE5 — Fred Ward, VE5OP, 899 Connaught Ave., Moose Jaw, Sask.
VE6 — W. R. Savage, VE6EO, 329 15th St., North Lethbridge, Alta.
VE7 — H. R. Hough, VE7HR, 1330 Mitchell St., Victoria, B. C.
VE8 — W. L. Geary, VE8AW, Box 534, Whitehorse, Y. T.
VO — Ernest Ash, VO1A, P.O. Box 8, St. John's, Newfoundland.
KP4 — E. W. Mayer, KP4KD, Box 1061, San Juan, P. R.
KZ5 — P. C. Combs, KZ5PC, Box 407, Balboa, C.Z.
KH6 — Andy H. Fuchikami, KH6BA, 2543 Namauu Dr., Honolulu, T. H.
KL7 — Box 73, Douglas, Alaska.

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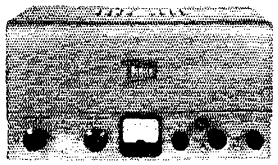
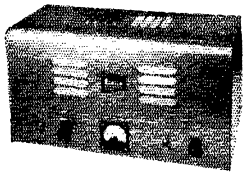


TR-75 TV Transmitter Kit

Popular 60-watt CW transmitter. Includes anti-TVI features. Covers 80, 40, 20, 15, 11 and 10 meters. Clean, smooth keying. Built-in antenna tuner permits easy loading of any single-wire antenna. Single meter with switching circuit for metering at all stages. Uses 6AG7 crystal osc. and 1625 final amp.; husky power supply delivers 550 volts. Includes cabinet, all parts, tubes, coil forms and coil wire for any one band, instructions (less key and ½"-spaced crystal). 10 x 17 x 9". For 110-120v., 50-60 cycle AC. Shpg. wt., 42 lbs.

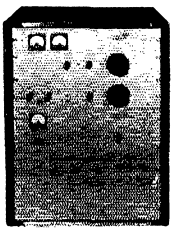
97 SX 953. Net..... **$64.95**



AM-40 Modulator Kit

New 40-watt modulator for TR-75TV, TR-75 and transmitters of similar input power. 6-tube circuit uses 6L6's in push-pull. Built-in power supply. Plate current meter on front panel. Housed in cabinet to match TR-75TV transmitter. 10 x 17 x 9". Includes tubes, all parts, cabinet, instructions. For 115 v., 50-60 cycle AC. Shpg. wt., 42 lbs.

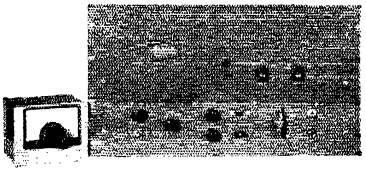
99 SX 052. Net..... **$59.95**



TR-1TV Transmitter Kit

New 80-10 meter 300 watt phone or CW transmitter. 3-chassis rack cabinet construction. Built-in line and low-pass filters plus shielding and by-passing provide 60 db harmonic attenuation. Bandswitching in all stages. 4E27A final, 2-811's mod. With tubes, all parts, 28" cabinet, instructions (less mike). 115 v., 50-60 cycle AC. Shpg. wt., 175 lbs.

97 SX 959. Net..... **$379.95**



SSB-50 Single Sideband Xmitter Kit

50 watt input to type 6146 power amp. Covers 160, 80, 40, 20, 15 and 11/10 meters. Stable VFO for variable frequency control on 80 and 40 meters. Crystal operation on all bands. Pi-network output. Built-in power supply, receiver silencing, antenna changeover, voice control operation. 10½ x 19" panel fits any standard cabinet. 10½ x 19 x 10". Includes all parts, tubes, instructions. For 115 v., 50-60 cycle AC. Shpg. wt., 40 lbs.

98 SX 013. Net..... **$199.95**

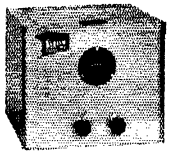
98 SX 014. As above, but wired... **$279.50**

Electronic Bug Kit

Insures perfect sending by producing self-completing dots and dashes automatically. Continuously variable speed from 8 to 50 wpm. Controls for weight of characters and ratio of dots to dashes. Built-in power supply for 105-125 volts AC. Easy to build. Complete with all parts and instructions. Shpg. wt., 5½ lbs.

97 S 779. Net..... **$29.95**

97 S 788. As above but wired. Net.. **$39.95**



Antenna Tuner Kit

New 300-watt universal tuner. Couples any conventional antenna (regardless of impedance) to any tank circuit. Kit includes split stator capacitor, swinging link, shielded case, 2" meter, coax connector from xmitter. Uses B & W TVL coils (not supplied). Shpg. wt., 9 lbs.

98 S 040. Net..... **$26.95**

Eldico Code Records

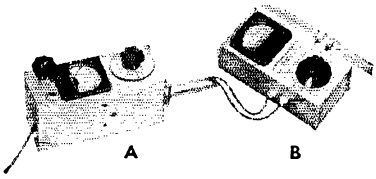
12" vinyl, 3-speed microgroove records. Code speeds shown are at 33⅓, 45 and 78 rpm. ½ hour playing time per record at 33⅓. Wt. 1 lb.

77 P 630. 6, 9 and 14 wpm
77 P 631. 8, 13 and 21 wpm
77 P 632. 10, 15 and 23 wpm
77 P 633. 11, 16 and 26 wpm
77 P 634. 13, 17 and 30 wpm

Net Each..... **$3.95**

Complete Novice Course. Five 12" vinyl 33⅓ rpm records —complete home study course for Novice license.

77 P 615. Net..... **$25.00**



A. GDO Grid Dip Oscillator Kit

Here's a big help for TVI elimination. Locates and measures resonant circuits without applying power to rig or receiver. Measures har. rad.; helps build traps and filters. 6 steps, 3-250 mc. With 9002 tube, all parts, built-in power supply. 5½ x 2⅜ x 3". 105-125 v., 50-60 c. AC.

84 S 964. Net..... **$34.95**

B. Antennascope Kit

Great for tuning and adjusting antennas for maximum radiation. With grid dip osc. or RF signal generator, will determine standing wave ratio, transmission line imp., antenna radiation resistance, receiver input imp., antenna res. freq. Imp., 10-500 ohms; freq., to 200 mc. 6 x 2¾ x 2⅜". With all parts.

97 S 770. Net..... **$29.95**

97 S 769. As above, but wired. **$34.95**

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"Little Firecracker"

(Continued from page 14)

tally, to bring the "hot end" directly centered over the plate caps of the 6146s. Here, too, ½-inch copper strap is used to connect the end of the choke to the plate blocking condenser, C_{14}, resulting in short leads and low inductance. This choke works as well on the 15-meter band as it does on 10, when we used the grid-dipper as the source of excitation for preliminary tests. This may be due to the proximity of the adjacent components adding sufficient capacitance to move the expected "hole" out of the 15-meter band.

Parts R_1, RFC_1, and C_1 are mounted just inside the input turret shield can, and directly in back of the 6146s. A lead is brought through close to the bottom of the vertical side of the shield can, by means of a feed-through insulator. This lead connects to the vertical part of the neutralizing condenser, C_N. The neutralizing condenser is made of a thin aluminum sheet cut in the shape of the letter "T", with the horizontal part of the T 1 inch high and 4 inches wide. It is mounted on a ceramic post so that it can be bent away from the plates of the 6146s.

Tuning and Loading

Tuning is straightforward as with any amplifier of similar design. However, careful attention should be paid to loading.

Light loading cannot be tolerated because (a) the screen dissipation may be exceeded. (An indication of this can be seen by the screen VR tubes being extinguished. When the amplifier is properly loaded, these VR tubes should not "go out" during any part of the modulation cycle). (b) "Flattening" of the peaks will occur before rated output is reached, assuming proper drive requirements are met. If reduced power output is wanted, just turning down the speech level control will do the trick. There is a point of loading where maximum rated output occurs without flattening, and loading beyond this point serves only to reduce the efficiency and output.

Details of loading and testing are beyond the scope of this article. Readers are referred to the excellent text, "How To Test and Align a Linear Amplifier," May, 1952, *QST*.

A word about tuning. As with any r.f. device that covers a wide band of frequencies, caution must be exercised to be sure that only the desired output frequency is amplified. This is especially advisable when using beam or tetrode tubes, because of their high power sensitivity.

With the grid circuit tuned to resonance at the fundamental, the plate circuit should be tuned starting with the *maximum* number of turns in the variable inductor. The first resonant point is the desired frequency.

Results

This linear has been on the air regularly on 20 and 75 meters up to the time of this writing. It has been dummy-load tested on the other bands.

(Continued on page 106)

TAKE FIVE!

"There's one thing we must put down as fundamental. *QST* is not a magazine published on the same basis as 'other radio magazines.' It is the official journal of ARRL. It is only one of the things you buy with your membership dues. . . .

"Remember, your ARRL is a noncommercial, nonprofit organization, whose only purpose is to promote and advance the welfare of amateur radio . . . The members of the ARRL are its owners . . . The dividends you receive from the operations of the ARRL are in the form of a multitude of services and an unceasing effort to improve the status of amateur radio in all its many aspects." (*QST* editorial, April 1949)

That's why we tell you to TAKE FIVE! — five dollars worth of membership services and benefits to you *over and above your dues,* which are $4 per year in the U. S. — *QST*, the complete magazine on amateur radio, included.

Dues in Canada, $4.25, $5 elsewhere

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Stable as the Rock of Gibraltar, all reports indicate that it transmits a high-quality signal with excellent sideband suppression, and a minimum of distortion products. This result was the hoped-for goal when the unit was in the design stage. That it is so is due to the application of good design practices for s.s.b. transmission.

It is affectionately called "Little Firecracker"; for its small size, it sure gives a loud report.

A word about TVI — this is the first transmitter in use at this station to prove itself completely TVI-proof. With this unit operating, the family, watching any one of the seven local TV stations, was completely unaware of its being in use. Furthermore, at the time, the linear was out of its cabinet and no low-pass filter was used.

For his patient efforts photographing the "Little Firecracker," special thanks to Henry Marcus, W2AJX.

Auto-Alarm

(*Continued from page 17*)

I_3, is on, but if nothing else happens within 20 seconds, the time-delay relay will close, energizing the "reset" coil of K_2 and returning the entire unit to its normal monitoring condition.

If there are several momentary carrier interruptions, each lasting a second or so, the step relay, K_2, will go to contact No. 1 on the first signal from K_1. However, K_2 cannot be stepped past this point because the heated lamp, I_2, will not pass enough current to operate K_2. The time-delay relay, K_3, will reset the unit to normal after 20 seconds.

If, for some reason, the key station simply leaves the air and does not return, K_2 will take a half step, I_2 will burn at full brilliancy, and K_2 will give out an audible warning buzz.

In operation, the potentiometer, R_1, is set to adjust the input signal to a level that works best. In some cases, where only a weak signal is available and there is considerable noise present, it may be necessary to make a few adjustments on the spring tension of K_1. Some receivers may require a slight revision of the a.v.c. circuit, although this was not true of the NC-57 with which this unit is used.

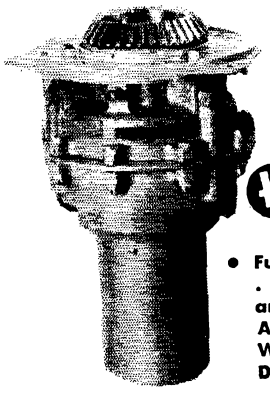
Receiver for 6 and 10

(*Continued from page 26*)

fifth overtone, about 46.8 Mc. This crystal is easier to get going, as it was ground for overtone operation originally.

It will be seen that the 6BQ7 in the 50-Mc. converter is not neutralized. There was no tendency to oscillation, and no difference in reception was discernible when neutralization was tried. This was probably due to the already lower-than-necessary noise figure of the 6BQ7 front end at 50 Mc. External noise was high enough so that the further lowering of the noise figure afforded by neutralization was of no practical advantage.

(*Continued on page 108*)



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New...Small PROP PITCH MOTORS

• Lightweight Type • Limited Quantity

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• Fully Converted . . . Tested . . . and ready to use. ALL THE HARD WORK HAS BEEN DONE FOR YOU.

These rugged, dependable motors are brand new "spares" that have never been used or installed. Small, lightweight type (ony 42 lbs. and 15½" high), powerful enough to easily turn the largest dual beam and tough enough to support the heaviest array! Continuous rotation in either direction at 1 RPM. Instantly reversible with SPDT switch. 9000 to 1 gear reduction gives tremendous power and eliminates free swing even in highest winds. Brake and rotation stop removed, leads pulled and drainage hole filled. Filter condensers also installed for quieter operation. Merely apply 24 to 30 volts to plainly marked leads and the motor is ready to go!

CONVERTED PROP PITCH MOTOR RO-10...SPECIAL $29.95
Same motor as above, but less filter condensers.....$24.95

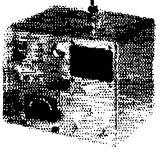
Accessory for Prop Pitch Motor

STEP DOWN TRANSFORMER

Specially designed to meet the power requirements of small prop pitch motors. Delivers 30 volts AC from 115 volts, 60 cycle AC. TF-30. **$7.95**

GONSET NEW!

COMMUNICATOR II



with Built-in Adjustable Squelch and Ear-Phone Jack

$229.50

New, improved model of popular Communicator 2-meter station. Cabinet modified to include ventilating screens. Ideal for CD work because of squelch and automatic speaker muting when phones are plugged in. Has receiver dial light on-off switch and built-in speaker, noise limiter and 19" whip. Takes crystal or carbon mike. Crystal control. With tubes, less crystal and mike.

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Novice—5 double-faced, 78 RPM records in album with instruction book. Alphabet thru 8 WPM. Records include exams similar to FCC types. Has charts to check receiving accuracy. **$7.95**

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Theory Course—Covers Novice Technician, General and Conditional classes. Information to pass FCC exams. Easy to understand. 14 lessons cover basic electricity thru radio transmission and reception. Sample exams and questions for all classes. Study guides. **$6.95**

Harrison Has Self-Supporting

Heavy Gauge STEEL TOWERS

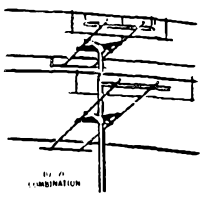
• Brand New • Easy to Erect • 20-30-40 Ft. Heights

These sturdy, heavy gauge towers, are precision manufactured by Missouri Rolling Mills, and designed to withstand winds of 70 miles an hour on the tower and a thrust of 800 lbs. at the top. They are self-supporting – no expensive foundation or unsightly guy wires necessary. Only three holes filled with broken rock and concrete are required. Anyone can make the installation.

Height Ft.	Weight lbs.	SPECIAL PRICE
20	264	$ 49.50
30	404	69.50
40	567	99.50

Prices are net, FOB warehouse St. Louis, Mo. Send full payment with order. Shipment will be made by cheapest rate — Motor or Rail Freight.

All towers supplied complete with anchor posts, section bolts and lock washers, plus set of instructions for installation.



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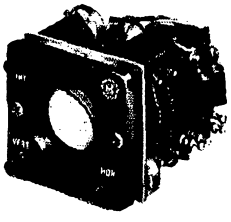
Combined arrays – all equipped with T match

2 element – 20 meters 2E20T $47.95
3 element – 20 meters 3E20T $64.95
2 element 10 & 2 element 20.....4E10-20T $74.95
3 element 10 & 3 element 20.....6E10-20T $98.95
3 element 10 & 2 element 20....3E10-2E20T $84.90

NEW! MILLEN MINIATURE SCOPE

Only 2-3/4" square by 4-5/8" L! Excellent for modulation monitoring, FSK, plus a wide variety of monitoring applications in place of usual panel instruments. Uses new 1CP1 CRT. Equipped with instensity and centering controls, but has no amplifier, sweep or power supply. Horizontal and deflection sources, and heater and acceleration voltages taken from equipment monitored.

Millen Model 90901. With scope tube..... **$33.90**
Same as above, less scope tube.....**$21.00**



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A post card request puts your name on our mailing list to receive future copies of this popular catalog.

The panel need not be metal unless the builder wishes. We used an 8½ by 18-inch piece of tempered Masonite sprayed with two coats of grey enamel. Most parts placements are not particularly critical. This receiver was built largely of junk box parts, and they were arranged accordingly. Decoupling resistors can be any value from 100 to 1000 ohms.

The squelch circuit is effective only when the broad i.f. is used, as it was felt that this would be the bandwidth most often employed in monitoring work. The squelch could be duplicated for the 175-kc. channel, if desired.

Availability of the two i.f. bandwidths has been found to be both useful and convenient. The selectivity of the 1415-kc. channel is about right for easy tuning of the ranges where converters are used, and the sharper response of the 175-kc. channel is helpful when QRM is rough on the lower bands. It also provides a better signal-to-noise ratio in reception of weak signals in the v.h.f. range. The receiver has been in use at W6FPV for about a year now, with excellent all-around results.

Short Antennas for Mobile

(Continued from page 35)

It is seen that at all distances the received field strength is better at 1.9 Mc. than at 3.8 Mc. It is also interesting to note that the atmospheric noise level goes through a broad minimum near 2 Mc., which is another factor in favor of using 1.9 Mc. The field strength required to communicate varies with the time of day, season, frequency, and location. For frequencies near 1.9 Mc., approximately 0.5 μv./m. is required at noon for radiotelephone communication in Ontario. Many times that is required at night — 30 μv./m. at 8 P.M. in the summer, and 100 μv./m. at the same time in the winter. These estimates were taken from graphs given in Laport.[6]

It would be interesting if a few amateurs decided that 75-meter 'phone is too crowded and moved down to 160 meters. I will bet a lot more would soon move down after comparing cross-channel transmissions at distances up to 50 miles. This, of course, is so only if there is no sky wave, such as a summer day. Normally low-power mobile operators on the low-frequency amateur bands communicate by ground wave.

[6] Laport, *Loc. cit.*, p. 542–555.

VE/W Contest

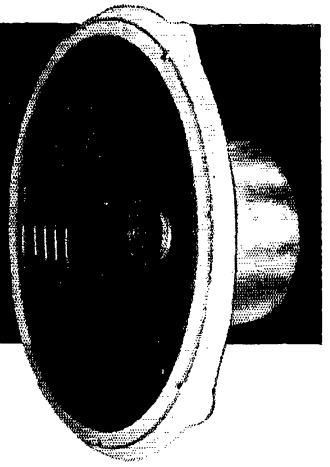
(Continued from page 58)

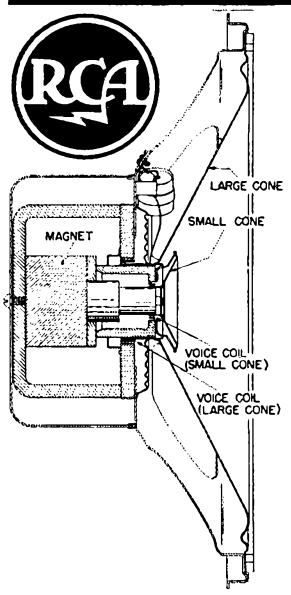
W sections as VE. Stations using a power input of less than 30 watts will receive an additional multiplier of 2, and stations using a power of less than 100 watts will receive one of 1.5. The final score consists of "total points" multiplied by "sections" (times 8 in case of W stations) multiplied by the "power multiplier."

5) Each entry must be accompanied by the following certification: "I hereby state that in this contest I have not operated my transmitter outside the frequency bands as specified by governmental regulation, and also that the log submitted is correct and true."

6) All entries shall be sent to the Montreal Amateur Radio Club, P.O. Box 7, Station H, Montreal, Canada, and must be postmarked before midnight October 17, 1953

FABULOUS SPECIAL BUY!
RCA $82.50—LIST HI-FI 15" DUO-CONE SPEAKER —YOURS "FOR A SONG"!





$20.00 SAVINGS OVER THE REG. DEALER NET!

Notice: this is the biggest bargain in a 15" speaker we've seen in all our 31 years. Quantities are good NOW, but we suggest you place your order without delay because—frankly—there will NOT be enough to go around.

$29.50

ORDER RQ-5108

DUO-CONE STRUCTURE DESIGNED BY DR. H. F. OLSON

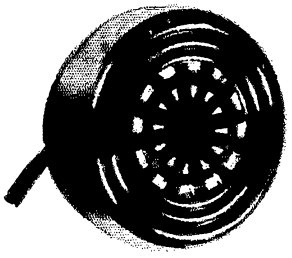
For high-fidelity music systems, broadcast monitors and other low-distortion systems! Features TWO voice coils, each driving one of the duo-cones. Very smooth 40-12,000 cycle response, uniform 60-degree directivity pattern! High sensitivity at power levels up to 25 watts! 16 ohms. 2-pound Alnico-V magnet. Resonance in baffle 40-55 cps. L-f voice coil 2" dia.; h-f voice coil ¾" dia. Net wt. 15 lbs., ship. wt. 16 lbs.

CABINET KIT FOR ABOVE: 23" W x 33" H x 16" D. Includes everything — even finishing instructions. Ship. wt. 25 lbs. Order No. 31-283Q, Net $19.50.

SPECIAL-VALUE CRYSTAL MIKE!

$3.25

3 FOR $9.45



Smooth 100-6000 cps response. 4½ ft. shielded cable. Brown molded case 2⅛" dia. x ⅞". No shock hazard. Compact hand-hold, suspended, or flat-rest design. Boxed under our label because famous-maker won't let us use his name. Feathery 5 oz. actual weight. Ship. wt. ½ lb. Element is same one used in much costlier microphones!

ORDER NO. 20-205Q

DIAMOND NEEDLES — USUALLY $12.95

Exclusive special purchase of one of the country's most famous diamond needle makers! For ALL single needle phono cartridges having front thumbscrew or set-screw construction! UNIVERSAL TIP . . . plays all records, all speeds. A real professional stylus made from South African whole diamonds, not fragile chips or splints. Precision polished to .0021" within .0003" accuracy! Lowest price we've ever seen!

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Happenings of the Month

(*Continued from page 43*)

Approved admission to IARU of societies in Southern Rhodesia, Mozambique and Yugoslavia. Extensively examined FCC Docket 10237, and decided to strenuously oppose the calling-and-answering channel proposal for amateurs. Found the emergency procedure proposed regulations unrealistic and drafted alternative language to offer FCC as a substitute. Gave interim examination to draft of rules for the Communications Department.

Meeting No. 221, September 29, 1952. Examined nominations in regular autumn elections; determined eligibility of candidates; in cases where there was only one eligible candidate, declared him elected without ballot; ordered ballots sent on others. Appointed a committee of tellers to count ballots in November. Affiliated 7 clubs.

Meeting No. 222, November 21, 1952. Authorized John E. Cann to sign checks for the General Manager. Directed the Communications Manager to continue policy of requiring ARRL membership for field appointments, pending formal adoption of new rules. Affiliated 8 clubs. Discussed civil defense and MARS matters.

Meeting No. 223, January 23, 1953. Decided that referral to General Counsel of *QST*'s "advertising guarantee" was for advice on legal aspects only. Declined to instruct General Manager to print verbatim in *QST* proposed motions of directors, and continued policy of editorial reporting. Adopted new Rules and Regulations of the Communications Department. Referred to Board of Directors a suggestion for National Amateur Radio Week. Accepted contract proposal of Houston Amateur Radio Club to hold 1953 ARRL National Convention. Affiliated 10 clubs. After extensive discussion, decided no basis for successful appeal to FCC on the unfavorable ruling in Docket 10173.

Meeting No. 224, March 5, 1953. Designated Hartford, Conn., as location of 1953 special Board meeting. Affiliated 13 clubs.

Meeting No. 225, May 7, 1953. Approved, with several minor recommendations, 1953 ARRL National Convention program. Rendered an informal opinion that a part-time consultant to a radio manufacturing concern would be ineligible as a director candidate, the same as a full-time employee. Gave formal approval to the holding of two state and two division conventions. Affiliated 18 clubs and ratified affiliation of 8 others.

Tornadoes

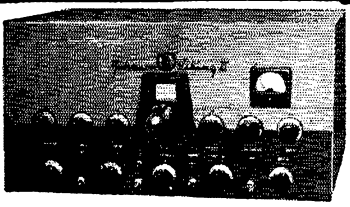
(*Continued from page 47*)

the day and LTA cleared the hook at night. He rolled up a total of 251. The Western Mass. c.w. net operated on June 9th to move traffic out of the disaster area. The First Regional Net and all section nets tying into 1RN operated on a continuous schedule to move traffic into the National Traffic System. NCS of West Mass. Net was passed among W1s BVR HRV DVW JYH and AMI, the latter in Worcester. NCS of 1RN was handled by W1s BVR CRW and LTA, the latter in Worcester.

In Shrewsbury the only activity the night of the tornado was by W1JWM/M, who put through some traffic to W1BIM via W1JNA on ten. On Wednesday morning W1AQM, W1RO and W1TZI set up equipment at the Red Cross Center and started to handle traffic on emergency power. W1AQM/M, with the help of Boy Scout runners, handled traffic on 75 and 10 meters. W1RO/M and W1JWM/M handled traffic Wednesday and Thursday with W1BIM, W1JNA and W1TRC, the latter of the Framingham net. W1TBU, stationed at Sampson Air Force Base when he heard about his home town being blown

(*Continued on page 112*)

Lafayette for High Voltage BARGAINS!



NEW! JOHNSON VIKING II

The Johnson Viking II transmitter kit incorporates all the desirable features of its predecessor plus those required for effective TVI suppression. 100 watts output on phone and 130 watts on CW on all bands 160 thru 10 meters. New final amplifier uses parallel 6146 tubes. All parts supplied, including copper plated steel cabinet, chassis, wiring harness, all hardware and tubes. Complete construction test and operation manual also supplied. Viking II Transmitter Kit.....**279.50**

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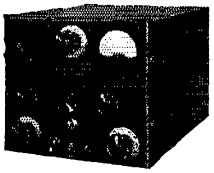

New Johnson mobile transmitter kit, a band-switching 4 band rig, 60 watts input, 100% modulated (30 watts on 300 volt supply) 807 final, microphone input—dynamic, crystal or carbon. Crystal or VFO control. Viking Mobile Transmitter Kit (less tubes) **99.50**

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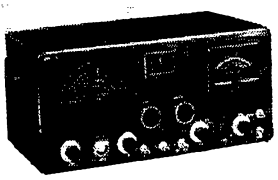

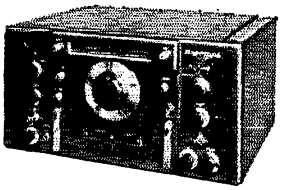

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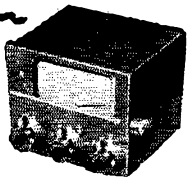
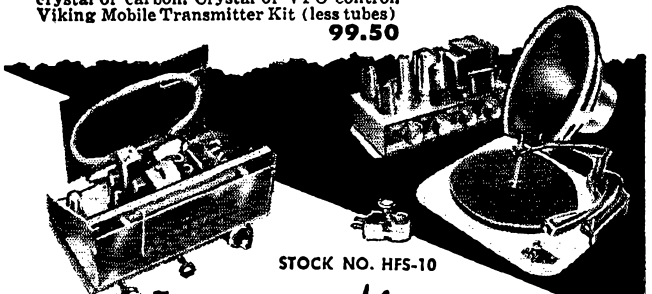
S-40B	119.95	NC 125T	179.95
S-53A	89.95	NC 183D	369.50
SX-62	299.50	HRO 60	483.50
SX-71	224.50	**HAMMERLUND**	
SX-73	975.00	HQ-140	264.00
S-76	179.50		

RME MC-55 5-BAND MOBILE CONVERTER



MC-55 Net $69.50
MC-53, for 2, 6 and 10-11 Meters..... 66.60
MC-57, for 10, 20 and 75 Meters..... 64.50



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$59.50 *for Tuner alone!* Reg. $82.50

The famous Espey 512 AM-FM tuner. Guaranteed 100% by Espey and Lafayette. The 512 is a self-powered tuner with built-in preamp, 2 high gain I.F. stages and an R.F. stage for both FM and AM circuits. Equipped with loop antenna for standard broadcast and folded dipole for FM. External phono input — 2 audio output channels — all controlled by the tuner volume control. Tubes: (2) 6BA6, (2) 6BE6, 6SH7, 6SG7, 6AL5, 6C4, 6SQ7, 6U5, 5Y3GT rect. 13½" W x 8½" H x 9" D. Wt. 18 lbs.
ESPEY 512 AM-FM TUNER NET 59.50

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HERE IS WHAT YOU GET!

Espey 512C FM-AM Tuner
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New! Compact TAPE RECORDER *that has Everything!*

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... at a price that's almost nothing!

Equal in quality and reproduction to the larger and MORE expensive recorders — but MUCH smaller, lighter. Dual track recording. Fast forward and rewind — full 7" reel rewinds in 80 seconds. Frequency response essentially flat from 70 to 8500 c.p.s. at 7½ IPS and from 90 to 6000 c.p.s. at 3¾ IPS. Wow and flutter less than ½ of 1%. Handles up to 7" reels. Two hours recording time on one 7" reel at 3¾ IPS using standard tape. 3 watt amplifier. Inputs — mike and radio-phono. Outputs — 3.2 ohm for speaker plus high impedance for external amplifier. Controls — one operating control for record and play and one control each for tone and volume. Size — 8⅝" x 10¾" x 11½". Wt. only 20 lbs., complete. 110-120 volts, 60 cycles AC. Complete with microphone, reel of tape and extra reel. Choice of 2 models: Model 903 — 3¾ IPS; Model 907 — 7½ IPS. Aqua and beige leatherette case.

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apart, came home on pass and with W1TZI set up at the Red Cross Center on Thursday. W1TBU operated on a 24-hour basis, handling traffic with W1BIM and W1MUN of Worcester and W1ULY of Westboro. Other assisting operators were W1s USG KIB VMH and RO. Mobile work around Shrewsbury was taken care of by W1s AQM/M CS/M JWM/M RO/M and SIX/M; the latter came down from Haverhill to help out. On June 11th, W1RO procured additional equipment and set it up on five frequencies in the 75-meter band. W1KIB also handled traffic with emergency power and Boy Scout runners on both Wednesday and Thursday and had an outlet through W1JR for overseas traffic.

In Holden, W1EKN started handling emergency traffic on 75 Tuesday night and kept it up every evening until Friday. Jim used what telephone facilities were available to round up answers to his traffic. On Thursday noon W1CLU/M went to Holden Hospital to handle very essential Red Cross traffic and stuck with the job continuously until 0100 Saturday, handling 99 messages during this time into the W1BIM net on 28,720. W1CLU/M provided the most important link into Holden during the emergency. The Region 9 six-meter gang, organized by W1BNO and including W1GUY and W1EHH, pitched in to help out by setting up and maintaining a radio link between Holden and Leominster. This net was set up June 9th and operated until June 14th. There were two or three mobiles in the disaster area at all times, plus relay stations. The whole operation was considered very successful.

W1RO/M and W1QFD/M both contacted W1RCJ in Marlboro about one hour after the tornado struck Fayville, with W1RO continuing to Shrewsbury to view the remains of his home while W1QFD went back to Marlboro to help relay for W1RCJ with the Framingham AREC Sector 5 net. Tuesday night W1MEG/M, W1MQU/M and W1RXH all went to Westboro to help W1SQY and W1SNJ get SQY on the air. SQY operated on 28,700 kc. into the Framingham net all that night and Wednesday, clearing essential c.d. and Red Cross traffic from Westboro officials into the net. W1RCJ and later W1RXH then passed this traffic on to the various Boston and suburban nets as well as routing some traffic on a hit-or-miss basis into the Worcester net through W1RO/M, W1JWM/M and W1JNA. W1TRC also passed some traffic direct to Worcester through W1TBU while W1SLH/M and W1SBW/M furnished additional mobile units in Westboro. Other stations in the Framingham net who were active handling traffic were W1s MHC TRC RVA QQW SRG MJO LXI LOS YFA IXJ HPB NIL YGS TVZ and PRC; the latter three helped out at W1RCJ with NCS duties. W1ULY handled traffic on 75 and had a direct ten-meter hook-up with the Worcester Red Cross through W1TBU in Shrewsbury. He also handled quite a few messages from the towns immediately surrounding Westboro.

(Continued on page 114)

GRAND OPENING!

HUDSON RADIO & TV CORP.
OPENS SALESROOMS IN
NEWARK, N. J.
at 35 WILLIAM STREET

Now offering to N. J. Amateurs the same Huge Stocks and fast service that have made our two NYC stores the "Happy Hunting Grounds for Hams"! Drop in, get acquainted, look over our Vast Facilities. You'll find Complete Stocks of all Standard Brands, thousands of Special Buys at our Big Bargain Counters—and a corps of friendly salesmen—hams themselves—to serve you fast and well! **Free souvenirs to NJ Hams—Come in Today!**

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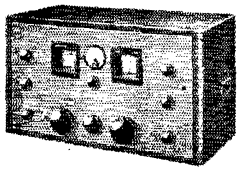

"Professional"
HQ-140 X
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New circuits, new "professional" characteristics. 540 KC to 31 MC continuous. Direct calibrated bandspread. NOW IN STOCK for IMMEDIATE DELIVERY!
HQ-140-X Amateur Net Price $264.50
Matching Speaker ..... $ 14.50
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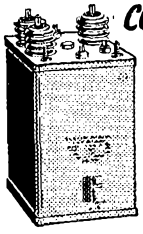

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Famous Make. Ideal for 'Scope, Industrial, ham use. Circ. diagram on case.
PRIMARY: 115 V. 60 cycles.
SEC.: 6100 Volts @ .006 Amps.
2.5 Volts @ 3 Amps.
Overall 9x4½x4¼". Wt. 10 lbs.

No. S-5070
Low, LOW priced at $8.95
Please include postage

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BRAND NEW . . . GUARANTEED
Precision made, for amateur and novice.
Singly, each $1.49
$1.29 each Lots of 3
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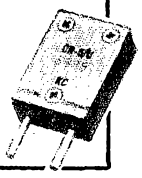
At this impossibly low price, they're going fast! Get yours NOW, while you can! They're all precision-ground, mounted in standard holders (½" spacing). Accurate to .002% of marked freq. We'll deliver within 10KC of your specified freq. Save more—get 'em in sets!

40 METERS (incl. harmonics to 20, 15, 11, 10, 6 and 2 meter bands.)
6200 to 6807.5 KC (for 6 and 11 meters)
7000 to 7425 KC (for 20, 15 and 10 meters)
8000 to 8222 KC (for 2 meter band)
80 METERS (includes Novice 3700-3750 KC Band)
3500 to 4000 KC
160 METERS 1800 KC to 2000 KC.



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DUO-VUE PROJECTION TV

SENSATIONAL PRICE SLASH!

BRAND NEW Norelco PA2A projection TV Adapters at a price far below wholesale cost! Provides CHOICE of direct view picture on your present set OR Projects Giant 3'x4' Home Movie Size TV from almost any 10", 12" or 16" set.* Ideal for clubs, taverns, schools, churches. EASILY INSTALLED! Supplied complete, ready to set up, with 3NP4 Proj. Tube, 25KV power supply, all tubes, and all accessories, plus detailed instructions. Nothing Else to Buy! In mahogany cabinet 23x26x20" Deep. 87 lbs. **OURTERRIFIC LOW PRICE . . .**

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37"x50" Aluminized Screen ... $17.25
*Specify your make and model TV set when ordering.

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Other amateurs participating in the Worcester disaster not mentioned above: W1s AGM AJK AW BDU BKG CR EG GED GUI HAZ HNE HRC IMY IPA JTL JWT KFV KUL LC LN LPF LV MNG NJM NNT NTF NVF NVJ NY OAK ODW OOY PFR PRS PU PYR RBF RCC RRX RYR SAL TAZ TZA VIS UKD UKR UNG USS UTH VBG VBS VBT VFI VOT WCF WEF WKF; K1s FAP and FCC.

* * * *

No emergency operation goes off without a hitch. This one was no exception. In a group so large and heterogeneous as the amateur fraternity, opposing factions are bound to spring up, especially in large metropolitan areas. The group that is most successful is not so much the one which eliminates friction, for this is all but impossible, but rather the one which minimizes it to the greatest extent. Amateurs in both Flint and Worcester received high praise from public officialdom, as indeed they deserved. In both places, however, many lessons were learned — lessons which will be valuable not only if we have another natural disaster, but also in the event of enemy attack with all its modern weapons, particularly the atom bomb. In such an eventuality all the chaos, the confusion, the requirements, the deaths, destruction, human misery and suffering would be increased a thousandfold. For as terror-inspiring and devastating as these tornadoes were, they were as nothing compared to what we would suffer if an atom bomb were dropped in our midst.

Our measure of how we could handle a civil defense emergency is the extent of our success in handling these just past.

World Above 50 Mc.

(Continued from page 61)

layed in reaching West Hartford, so we omitted W6HZ, Los Angeles, with 71 in 4, for 284 points, and W6BAZ, San Francisco, with 41 in 5, for 205 points. The log of W8WRN was misplaced, so his 49 contacts in 8 sections, for 432 points, didn't show.

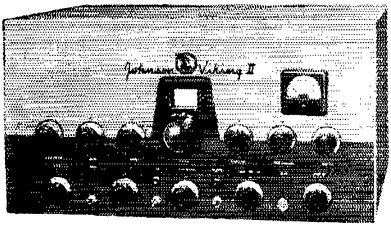
Logs were received at times indicating late mailing from VE3BMB, W2s ZOC OQI/2 ZPG JTV YIK, W3CIQ/3, W4NQR and W9SSI.

In listing outstanding single-band scores we inadvertently missed the top 2-meter total of W2GMT, N.Y.C.-L.I., who ran up 1474 points on 144 Mc. by working 134 stations in 11 sections, for the country's best one-band score.

Then, in the caption under the photograph of the W1MHL/1, the fellow doing the heavy work should have been W1QMN, not W1QMB. Our apologies, gang — and good luck in the September Party.

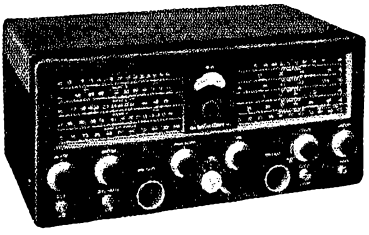
If our reporting this month seems on the skimpy side, charge it up to an absence of nearly three weeks from the Headquarters office, during which time we attended the ARRL National Convention at Houston, took part in meetings in Shreveport, La., Little Rock, Ark., and Peoria, Ill., as well as attending the famous Turkey Run V.H.F. Picnic near Terre Haute, Ind. With this schedule, and visiting numerous ham shacks en route (W5SVB, W5VX, W5DFZ, W5DVI, W4HHK, W9ZHB, W9ZHL, W8WJC-BFQ and W2QED) on a 5040-mile trip, we've been a little busy. But the opportunity this trip afforded to meet v.h.f. enthusiasts from all over the country, to renew old acquaintances and make new ones, and to see first-hand how v.h.f. is working over at least the eastern half of the country, was a chance not to be passed up. We had a wonderful time the whole way, and we take this way of thanking all those whose hospitality and coöperation made our travels so pleasant.

LOOKING FOR A NEW MODEL?



JOHNSON VIKING II Transmitter Kit.
Shpg. wt. 85 lbs. Net $279.50
JOHNSON VIKING II. Wired and Tested
Net $337.50

If you're ready now for that new receiver or transmitter—or simply "window shopping" at present—you'll do yourself a big, money-saving favor by obtaining Walter's "SURPRISE" Trade-In offer on your used communication equipment. Allowances were never more generous! Stocks of all the big-name brands are complete. Deliveries are prompt. Wire, write, phone or use the handy coupon today.



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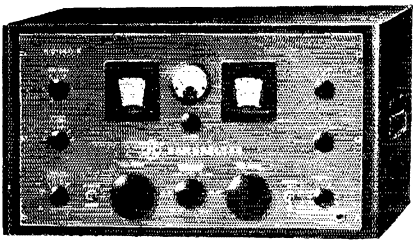
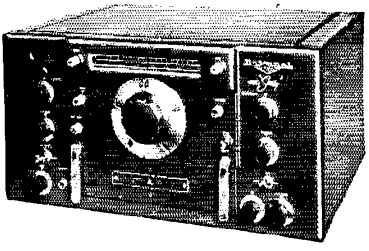
SX-71. Less Spkr.
Shpg. wt. 51 lbs.
Net $224.50

HAMMARLUND
HQ-140X. Less Spkr.
Shpg. wt. 60 lbs.
Net $264.50





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HRO-60-T. Less
Spkr. Shpg. wt. 90
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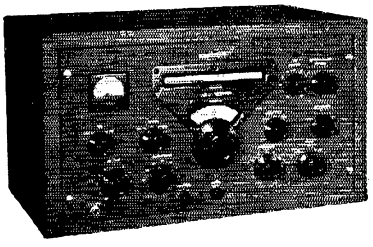
COLLINS 75A-3 with
3 KC Mechanical
Filter. Less Spkr.
Net $530.00



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YL News & Views

(Continued from page 52)

hind the Mike," as a tribute to the unselfish service which they rendered during the Worcester tornado emergency. Here it is:

The Gal Behind the Mike

When your eyes have started burning
And your head begins to ache,
And your ears are dully ringing
With the challenge — break, break, break,

When the telephone keeps calling
With frantic, helpless pleas,
And countless hours of operation
Have you trembling at the knees,

And you're plagued by sideband splatter
From the thoughtless (and the heels),
And Don Ducks' monkey chatter
Blends with heterodynes and squeals,

Still your voice is calm and steady,
Clear and crisp and undismayed,
As you move disaster traffic
Unrewarded and unpaid,

And your patience is amazing
Be the going rough or smooth,
And your businesslike procedure
Is strictly in the groove,

Thus we who saw their operation
When tornado made its strike —
Bow low in admiration,
To the gal behind the mike!

— *W1BTY*

—···—

IS1EHM, Maria Marras, of Sardinia, is the only YL in her country. Currently studying for her doctor's degree in chemistry at the University of Cagliari, Maria has worked 99 countries with her 100-watt rig on 20 'phone. Her brother is IS1EH.

Strays

W2JB arranged an emergency day-in-advance medical appointment in New York for KP4JE after their recent contact on 20 c.w. KP4JE then hopped a plane for W2 where, happily, his condition was diagnosed as not serious.

—···—

The possibility of a "WAUSC" award — Worked All United States Counties — is suggested by W8NAF. He points out that our Government Printing Office, Washington 25, D. C., has large maps available with all U. S. counties named and outlined. The map is referred to as publication 3.62/2 Un 3/9 and the price is thirty cents. It would be interesting to know just how many U. S. counties boast amateur radio activity and are thus possible to work. No, ARRL does *not* contemplate the issuance of an all-county award. For one thing, when they started to come in, there would be over 3000 QSLs to check per application!

Uncle Dave's Radio Shack

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24 HOUR SERVICE ON ALL STOCK ITEMS

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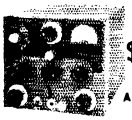
Get in touch with Uncle Dave, W2APF

HE CAN HELP YOU PICK THE RIGHT GEAR AT THE RIGHT PRICE. On the air for over a quarter century is your guarantee that Uncle Dave knows the Ham and his needs from a practical standpoint.

VIKING MOBILE TRANSMITTER KIT



$99.50 Amateur Net

In Stock for Immediate Delivery

JOHNSON VIKING II

$279.50

(In Stock)

Kit, complete with tubes—less crystal, key and mike.

Wired and Tested, $334.50

ELDICO TR-75-TV TRANSMITTER KIT

The ideal novice transmitter. New TVI circuit. Uses 6L6 as oscillator and 807 amplifier to PI Network output. $64.95

MOBILE TRANSMITTER KIT

STANCOR

ST203A

$31.75

WIRED AND TESTED $43.00

72 Ohm KW Transmission Line, 9c per ft.; $5 per 100 ft.

USED EQUIPMENT — Send for Demonstrator and Used List

Collins 32V-3 Transmitter

$775

VFO Controlled, Bandswitching, Gangtuned. Covers 80, 40, 20, 15, 11 and 10 meters; 150 watts CW; 120 watts phone; entire RF section enclosed in metal shield. (In Stock)

COLLINS 75A-3 RECEIVER With Mechanical Filter and Speaker — $550

HAMMARLUND HQ 140X

$264.50

Matching Speaker $14.50

Tunes .54-31 mc. in six bands; calibrated band spread; 9 tubes in RF and AF; full wave rectifier and voltage regulator; calibrated S meter; crystal filter; antenna compensation; AVC; new series-type noise limiter; furnished in two-tone gray.

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TUBES — standard brands
6AK5 ..... 69c ea. — 6 for $2.50
6C4 ..... 39c ea. — 6 for 2.00
6AQ5 ..... 39c ea. — 6 for 2.00
12AT7 ..... 39c ea. — 6 for 2.00

MINIATURE VARIABLE CONDENSERS Screw driver adjustment.
25 mmfd....25c ea.—5 for $1.00
140 mmfd....75c ea.—4 for 2.50

FEED THRU INSULATOR, ceramic.
For 1" hole, 41c ea.—10 for $3.25
For 1½" hole, 45c ea.—10 for 3.50

INSULATOR, cone type
1¼" high, 18c ea. — 10 for $1.50
3" high, 43c ea. — 10 for 3.25

STANDOFF INSULATORS, low loss steatite, nickel plated base and top.
Dia. ½" x 1⅛" high — 13c ea. 10 for $1.00
Dia. ½" x 2⅞" high — 17c ea. 10 for $1.45
Dia. ¾" x 4⅞" high — 43c ea. 10 for $3.20
Dia. ¾" x 6⅞" high — 59c ea. 10 for $4.75

SOCKET, 7 pin min., mica filled, shield base .....10 for $1.00

SWITCH, phenolic section, 2 deck, 3 pole, 3 pos., NS., 29c ea. 4 for $1.00

USED EQUIPMENT

RME DB22A		$ 45.00
National NC240	With Speaker and Select-a-Ject	200.00
National NC100	With Speaker	95.00
Hallicrafter SX43	With Speaker (2 Only)	150.00
Hallicrafter HT9 Transmitter	Grey, with Complete Coils	200.00
Meissner 150B Transmitter	Complete	250.00
Eldico TR75TV	Wired and Tested	70.00
Sonar VFX 680		60.00
Meisner Exciter Units		25.00
Lysco 175T		19.50
National HRO5TA1	With Speaker and Coils	115.00
Hallicrafter SX25	With Speaker	115.00
National HFS	With Power Supply (Like New)	135.00
Automatic Key	(Metalloid)	5.00
Harvey Wells DPS50 Power Supply	(Regular $89.50)	45.00
Sonar MR3 Receiver		50.00
Gonset 2 Meter Converter		30.00
Sonar FM Exciter	With 40 and 20-Meter Coils	100.00
Sonar 10 Meter MB611		50.00
Aircraft Transceiver		25.00

Trade-ins TOP ALLOWANCE

DISPLAY MODELS — DEMONSTRATORS
NEW GUARANTEE

Sonar SR9 Two-Meter Receiver	$ 57.50
Sonar MB-26 Two-Meter Transmitter	57.50
Harvey Wells TBS50D	119.95
Hallicrafter S-76 Receiver	149.95
Harvey Wells APS50 Power Supply	34.50
Hallicrafter S-77 (AC-DC Version of S-40B)	99.00
Hallicrafter S-40B	109.00
Gonset Marine Converter	33.95

FOREIGN TRADE SOLICITED

Extra Special
DYNAMOTOR CN45B
6V in, 400 V 160 MA out. Complete with conversion diagram and brushes. Will go Parcel Post. $24.95

SPECIAL

Electric "HAM" Clock 24-Hour with GMT Indicator $11.95

Regular $15 — Just a few left at this price

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Written in the Stars

(Continued from page 49)

fastest Novice WAS on the books. This on *one* CQ!

We could continue *ad infinitum* to tell you of Susie's subsequent amateur radio accomplishments — WAC/WAS roundtables, DXCC in a matter of days, etc. — but you've no doubt already caught the pattern. One most unusual aspect of these triumphs was that she actually used no antenna. A dummy load had accidentally been left connected to WN5P!P's final all this time — proof beyond question that "getting out" is at at least 90 per cent operator.

Yessirree, for months and months Sue set a killing pace for the best operators in the land, and with so *little* apparent effort. Also, in addition to being awarded the title of Miss Hamerica

at that year's ARRL National Convention, Susie received an engraved plaque from DX Clubs Amalgamated as "The Operator We Would Most Like To Be in a Pile-Up With."

But in the due course of human events, tempus inexorably fidgets. And Susie Sopenwater was no exception. After a year or so of such concentrated amateur activities the doll grew a little restless.

There just weren't any more certificate awards around to hold her interest and the parents Sopenwater were rapidly becoming allergic to r.f. burns. Sue had built everything in the *Handbook*, too, and had a few patents of her own to boot. Small wonder, then, that she began to get interested in men.

Not the ham variety, that is, but men in general. After a huddle with herself one day when conditions were poor, she made her decision. Rather than risk dire consequences by hitching up with some eccentric radio bug, Susie elected to marry some more normal mortal, this with the purpose in mind of enjoying the benefits of truly tranquil family life. And, having made up her mind, she did just that.

Yes, she put away her resistor-condenser box and soldering iron and married up with an extremely respectable banker feller who didn't know a strain insulator from a hardboiled egg.

* * *

Here the story should end, we suppose, with the guy and gal living happily and mushily forever after. Ah, would that it were so. So simple.

(Continued on page 120)

You Are Invited to Visit Our NEW HOME!

This modern new building is the recently completed home of World Radio Laboratories, located at 3415-27 West Broadway, Council Bluffs, Iowa. The new plant covers 30,000 square feet of floor space, all on one level, and houses all departments of WRL. A special feature of the new building is a modern Hi-Fi Sound Room and a special amateur display room with transmitting facilities available.

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The NEW MODEL 40A

Complete Band Switching

GLOBE SCOUT

(50 Watts CW—40 Watts Phone)

Leo I. Meyerson, WØGFQ
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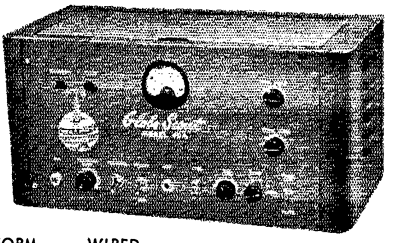
WRL—the world's most personalized radio supply house.



KIT FORM $89.95 WIRED $99.95

New TVI suppressed XMTR. Cabinet screened and completely enclosed.

GLOBE SCOUT ACCESSORIES

Crystals 160, 80, or 40M (40M used on 10-20) each ..... $ 2.95
Quality crystal microphone and stand..... $10.17
Signal R-50 Key ..... $ 1.43

WRL 165 WATT GLOBE CHAMPION TRANSMITTER

(Less Accessories)

KIT FORM $329.50 WIRED $349.50

NEW TVI MODEL 400C GLOBE KING XMTR

TVI SCREENED CABINET NOW STANDARD EQUIPMENT

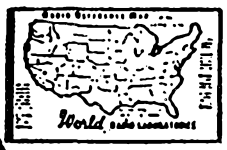
KIT FORM $495.00 WIRED $515.00

LATEST TRIUMPH OF THE WRL ENGINEERING STAFF

A beautiful, compact XMTR, completely self-contained, including power supply. Contains new 6146 tube in final; covers 160M thru 10M. Metering provided for final grid and final plate circuits. Complete kit includes all parts, chassis, panel, power supply, cabinet, tubes, meter, with band switching coil assembly. Can be used for mobile work with suitable power supply. (Auxiliary socket provided.) Ideal XMTR for the novice or experienced ham.

Combination pi-network antenna tuner assembly will work into any antenna impedance from 52 ohm to 2,000 ohm. Antenna requirements may be doublet, folded dipole, or any random length long wire (preferably ¼ wave at lowest frequency). Coax output provided for antenna. All main operating controls are on the front panel. Three stage modulator allows complete modulation of the final. Any hi impedance microphone may be used.

RADIO REFERENCE MAP



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we mean. For Susie, as so many women occasionally manage to do, really outsmarted herself with a capital "Oh!"

You see, it came to pass, before the honeymoon was even half over, that Sue's delightfully ideal new hubby ran across an old *QST* up in the attic and caught the Bug himself. But *good*. And now Susie sits alone in the kitchen with the kids every night while the OM does a very sad job of battling the QRM on 40.

Poor kid — she's married to a first-class lid.

Hints & Kinks

(Continued from page 50)

USING WWV MODULATION AS AUDIO TEST SIGNAL

ALTHOUGH the idea has not been tried here at W2MVR, it seems practical to suggest that transmissions from WWV be used as a source of pure sine-wave voltage for testing audio equipment. To employ the system, the receiver should be tuned to the WWV frequency coming in strongest at the time and the output taken from across the secondary of the output transformer (remove the 'speaker if possible). If a high-impedance output is required, it may be obtained by connecting the secondary of an output transformer to the secondary of the 'speaker transformer and then using the primary of the new transformer as the signal source.

The frequency of the audio signal so obtained will change from 440 to 600 cycles at regular intervals. Complete data on the WWV schedule appear in the measurements chapter of the 1953 edition of *The Radio Amateur's Handbook*. — *James C. Geras, W2MVR*

[EDITOR'S NOTE: Selective fading — a common occurrence — causes severe distortion of the received signal and, as a result, it can not be assumed that the receiver will always deliver a pure sine wave even when tuned to WWV. W2MVR's idea should prove to be quite helpful in many instances, however.]

REFLECTIVE-TYPE CALL SIGNS

FOR the ham who likes to let other mobile hams know his call letters both night and day, try making your call letters out of 'Scotchlite" Reflective Sheeting, manufactured by the Minnesota Mining and Manufacturing Company, Saint Paul 6, Minnesota.

At K6DK, I made my call letters out of the No. 2272 (red) 1-inch-wide sheeting. The adhesive backing makes it simple to apply on the rear bumper or other surfaces. The results are really startling. At night, the call letters can be seen clearly for a great distance when the light from approaching headlamps strikes the material.

The wide-angle Scotchlite No. 2272 comes in 50-yard rolls at a cost of approximately $11.00. Clubs could purchase a roll for sale to individual members. The same material also comes in silver (2270), gold (2273), yellow (2271) and grey-blue (2276). — *T. A. Sprink, K6DK, ex-W2CH*

Under His Foot, the Live Grenade

Technical Sergeant
Robert S. Kennemore, USMC
Medal of Honor

THE MACHINE GUN belonged to E Company, Second Battalion, Seventh Marines. It was under the command of Technical Sergeant Robert Sidney Kennemore.

It was busy. For on this November night fanatical Red masses were swamping Marine defense positions north of Yudam-ni.

Fifteen yards in front of the gun, a Red soldier raised his body briefly and sent a grenade into the air. It landed squarely among the crew. In a split second, Sergeant Kennemore had covered it with his foot.

There was a violent, muffled explosion, but not a man was hurt. Not a man except Sergeant Kennemore. He had given both his legs to save his comrades' lives.

"When I was on active duty," says Sergeant Kennemore, "I sometimes wondered if people back home cared as much about stopping Reds as we did. Now that I'm a civilian, I know they do. And one proof is that so many of my neighbors are investing in E Bonds for our country's defense. Believe me, I know how important that defense is. So I'm investing, too, just as I hope that you are!"

Now E Bonds pay 3%! Now, improved Series E Bonds start paying interest after 6 months. And average 3% interest, compounded semiannually when held to maturity. Also, all *maturing* E Bonds automatically *go on* earning—at the new rate—for 10 *more* years. Today, start investing in U. S. Series E Defense Bonds through the Payroll Savings Plan; you can sign up to save as little as $2.00 a payday if you wish.

Peace is for the strong!
For peace and prosperity save with
U.S. Defense Bonds!

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September 1928

. . . The importance of adequate self-monitoring for maintenance of signal quality and frequency stability is emphasized in this month's editorial.

. . . In "Washington Developments," ARRL Secretary K. B. Warner reports that on October 1st new international prefixes become effective — U. S. hams become "Ws."

. . . Secretary Warner explains why "We Ought to Talk Frequency," pointing up shortcomings of the wavelength terminology now most commonly used.

. . . A practical study of the suitability of "The Oscillator-Amplifier Transmitter" for 1929 operation is given by *QST* Associate Technical Editor Ross A. Hull.

. . . Considerations to be taken into account when "Adapting Medium- and High-Powered Self-Excited Transmitters for 1929 Service" are also discussed by Mr. Hull.

. . . Technical Editor Harold P. Westman furnishes information on the new UX-860, a screen-grid T-type power tube of wide potential amateur application.

. . . In "Remodeling the Traffic Tuner for 1929," Mr. Westman polishes off several rough spots inherent in the conventional amateur-band regenerative receiver.

. . . James J. Lamb, 1CEI, of ARRL's Technical Information Section, provides facts and figures for designing a Hertz antenna with two-wire voltage feed — "The Zepp."

. . . Articles on "Mica Condensers for High Frequency" and picture reception "Synchronism" are offered by Arthur M. Trogner and C. Francis Jenkins, respectively.

. . . "Radiovision," by Thornton P. Dewhirst, outlines problems involved in reception of 24- and 48-line pictures as transmitted by experimental station WGY.

. . . "The Fifth Age," by W. A. Adams, 6ANN, recounts the life, loves and frustrations of a hero who very well might be "the ham next door."

. . . Among DX reported in "IARU News" as currently available: ep3MK, Azores; skVPC, Falkland Islands; VPG, Gold Coast; and ac8ZW, Shanghai.

Silent Keys

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

W1GAW, Frederick J. Higgins, Waltham, Mass.
W1LVZ, Alfred T. Heyworth, Beverly, Mass.
W2ADF, Rogers J. Silva, Pearl River, N. Y.
W2ANH, John E. Evans, sr., Princeton, N. J.
W2AZQ, Alfred H. Irmler, Yonkers, N. Y.
W2JLR, Henry W. Weiler, New Brighton, S. I., N. Y.
W2YEN, John T. Fisher, Camden, N. J.
W3VQF, Charles H. Karel, Pittsburgh, Penna.
W6JNF, Vernon C. Castle, Van Nuys, Calif.
W6MLG, Dr. J. Lynn Ironmonger, Beverly Hills, Calif.
W6NNF, Mortimer M. Kuhn, San Francisco, Calif.
W7PXQ, Thomas G. Jones, Walla Walla, Wash.
ex-W9GQU, Maurice J. Chesebro, Chicago, Ill.
W9WVK, Elmore Fenstermaker, Mentone, Ind.
WØGFA, Peter B. Jensen, Rochester, Minn.
WØMXW, Dr. Charles K. Maytum, Rochester, Minn.
WØOUI, Leo A. Anderson, Denver, Colo.
VK2IN, J. K. Kebblewhite, Wahroonga, New South Wales

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☐ Bookkeeping	☐ Mechanical Engineering
☐ Building Contractor	☐ Mechanical Drafting
☐ Business Administration	☐ Practical Accounting
☐ Certified Public Accounting	☐ Practical Electrician
☐ Chemical Engineering	☐ Reading Shop Blueprints
☐ Civil Engineering	☐ Reading Structural Blueprints
☐ Cotton Manufacturing	☐ Radio Servicing
☐ Diesel Engines	☐ Railroad
☐ Diesel Locomotive	☐ Railway Postal Service
☐ Drafting	☐ Creative Salesmanship
☐ Electrical Engineering	☐ Stenographic-Secretarial
☐ Electrical Maintenance	☐ Structural Engineering
☐ Electronics	☐ Textiles
☐ Foremanship	☐ Toolmaking
☐ Television	☐ Tool Design
☐ General Radio	☐ Traffic Management
☐ High School	

Other.....

Name.....Age.....

Home Address.....

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

Occupation.....

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---

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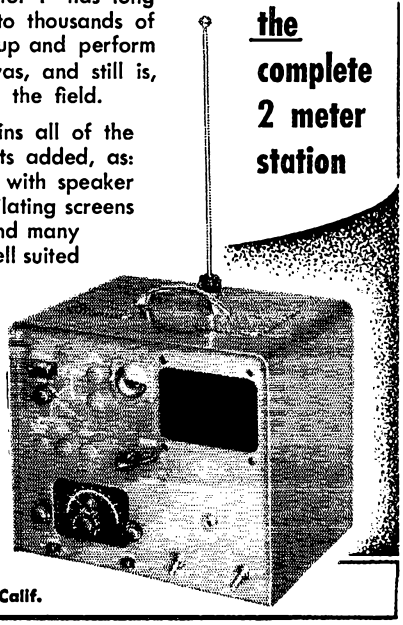
GONSET "Communicator"

The original "Communicator I" has long since proven, to thousands of users, its ability to stand up and perform under service conditions. It was, and still is, the outstanding two meter unit in the field.

A second model, "Communicator II", retains all of the original features, has numerous refinements added, as: built-in adjustable squelch, earphone jack with speaker disconnect, on-off switch on dial light, ventilating screens on top to reduce inner-cabinet heating. These and many other features make this new model extremely well suited for C-D, amateur and similar services.

the complete 2 meter station



A special Industrial Model Communicator is also available which incorporates the basic 2 meter Communicator assembly. This unit may be set for any fixed frequency in the 152-172 mc range. Both transmitter and receiver, (AM) are crystal controlled.

HIGHLIGHTS, all models: 10 tube superhet receiver with Cascode RF. Three stages of I. F. Crystal controlled transmitter with 2E26 final amp. Power output, 5-7 watts. Self contained power supply for both 110 AC and 6 volt DC. 6V6 output audio which may also be used for PA using panel speaker.

COMMUNICATOR II, (with squelch etc.)—Less mic. and xtl.....229.50
COMMUNICATOR I, (less squelch etc.)—Less mic. and xtl.....209.50
INDUSTRIAL COMMUNICATOR. (With xtls for trans. and rec.).....299.50

GONSET CO. 801 South Main Street . Burbank, Calif.

U. S. N. R.

Louisiana Flood

During the recent flood in the Lake Charles, La., area, the Naval Reserve furnished emergency communications to the stricken community. The Naval Reserve Training Center, Lake Charles, (K5NBQ) was the center of operations. This station was operated on 3550 kc. by W. E. Hughes, RMC, USNR (W5PYU) and W. Murphy, ET2, USNR (W5LQO). Messages were handled to and from the disaster area. The Naval Reserve Training Centers at Beaumont, Texas, (K5NBW); Lafayette, La., (K5NRQ); and Shreveport, La., (K5NRS) assisted in the operation. The latter was operated by L. C. Bennett, ETC, USNR (W5NEL). The District Reserve Master Control Station, New Orleans, La., (W5USN) also assisted. Two Beaumont Reservists, Lt. (jg) J. C. Shepherd, USNR (W5RYV) and T. R. Lewis, EMPC, USNR (W5WJI) assisted with their own mobile rig.

Message Service

On Armed Forces Day, the Naval Reserve Training Center, Shreveport, La., (K5NRS) operating portable from Court House Square in downtown Shreveport, furnished message service for local citizens via amateur radio. Operators were: R. J. Goff, ETR3, USNR (W5NAL); L. H. Bennett, ETC, USNR (W5NEL); L. R. Sapp, RM2, USNR (W5QCZ); and E. B. Varnell, ETR3, USNR (W5SEJ).

Amateur Activity

The Naval and Marine Corps Reserve Training Center, Indianapolis, Indiana, (K9NR) worked 45 stations in 21 states on the 7-Mc. band during Armed Forces Week. P. R. Kennedy, RMC, USNR (W9AKP) was the operator.

ARRL Convention

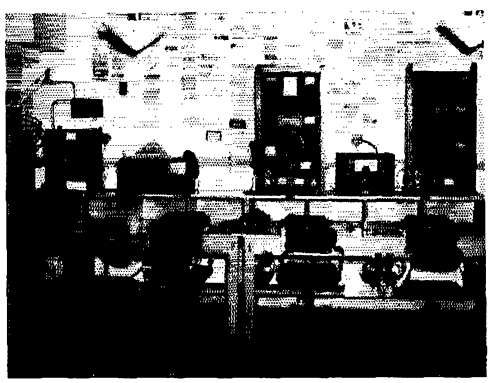
Cmdr. R. E. Thomlinson (W7LY) represented the Commandant, Thirteenth Naval District, at the Oregon State Convention of the ARRL in Salem, Oregon, on May 23–24, 1953. He spoke about the many contributions of radio amateurs to the Navy's Electronics Program.

B. R. Larson, SN, USNR (W7LNG) of Naval Reserve Electronics Division 13–5, Medford, Oregon, won the code receiving contest at a solid 55 w.p.m. — all with a stick!

The Naval Reserve Training Center, Salem, Oregon, furnished films and a display of electronics training aids.

Alert Operation

During a recent statewide civil defense mock air attack, the Naval Reserve Electronics Facility, Aberdeen, South Dakota, (KØNAI) operated a portable transmitter-receiver to handle alerts via amateur radio. Lt. Cmdr. Merton Hasse, USNR (WØDKJ), Commanding Officer, Electronics Division 9–17, was in charge during the alert.



Amateur radio station K7NRT, Naval Reserve Electronics Facility, Port Angeles, Washington.

M. A. R. S.

Colonel Crosher to Head MARS Advisory Committee

Colonel Kenneth R. Crosher, USAF, (W4TSJ) Deputy Special Assistant to the Chief of Staff for Reserve Forces, has been elected chairman of the Military Affiliate Radio System (MARS) Advisory Committee for a one-year term. Colonel Crosher succeeds Colonel William D. Hamlin, Signal Corps, Chief of the Army Communications Service Division, who remains a member of the committee.

Elected to serve with Colonel Crosher, as vice-chairman, was Lieutenant Colonel Frank Chilton, Signal Corps (W5NWZ-DL4QR). Colonel Chilton is Chief of the Methods and Procedures

Col. Kenneth R. Crosher (left) and Lt. Col. Frank Chilton, elected to head MARS Advisory Committee.

Branch, Army Communications Service Division. Both of the newly elected officers are active in the MARS program.

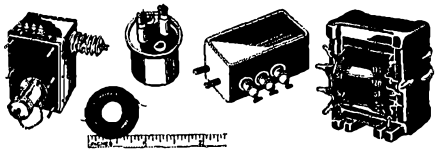
The MARS Advisory Committee is composed of military and civilian members representing the Armed Forces, the Federal Civil Defense Administration, the American Radio Relay League, Federal Communications Commission, the American National Red Cross and others. The committee meets quarterly at the Pentagon to advise the Chief Signal Officer, Department of the Army, and the Director of Communications, Department of the Air Force, on MARS operations and to recommend policy pertaining to coördination of civilian and military amateur radio activities.

Answer to **QUIST QUIZ** *on page 19*

It depends a lot on how much **A** wants to increase his power. For maximum power, up to the legal input limit of one kilowatt, **A** will be better off to take **B**'s advice (and his modulator), since plate modulation will give the higher output (carrier of approximately 750 watts). On the other hand, with screen modulation the carrier from the pair of 4-250As will run only around 250 watts. Since the carrier with the 4D32 runs around 100 watts, **A** has to make up his mind if a 2.5-times increase (4 db.) is worthwhile.

FREED

TRANSFORMERS



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Discriminators	Band Elimination Filters
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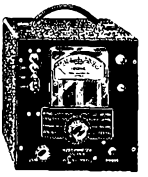
INSTRUMENTS



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Self-contained and A.C. operated. . For rapid and accurate test of Resistors, Condensers and Inductors.

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NO. 1210 Null Detector and Vacuum Tube Voltmeter
NO. 1140 Null Detector Amplifier
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NO. 1410 Harmonic Distortion Meter and . . . Decade Inductors

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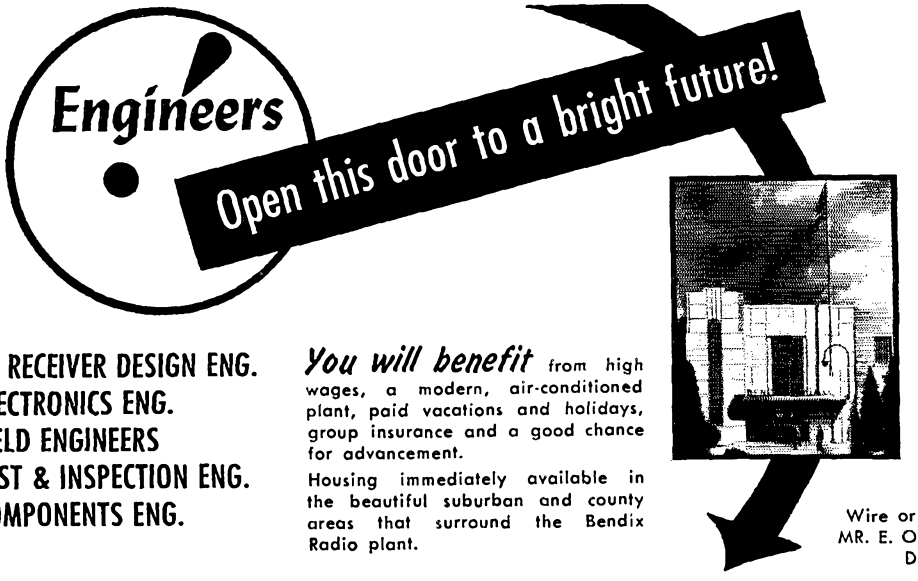

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NEW BOOKS

Radiotron Designer's Handbook. Fourth edition, edited by F. Langford-Smith. Printed in U.S.A. (1953) by Radio Corporation of America, Harrison, N. J. 1522 pages, 8¾ by 5½ inches. Illustrations, index, references. Price, $7.00.

The preface to this book says, in part: "This book has been written as a comprehensive, self-explanatory reference handbook for the benefit of all who have an interest in the design and application of radio receivers or audio amplifiers. Everything outside this field — television, radio transmission, radar, industrial electronics, test equipment, and so on — has been excluded to limit the book to a reasonable size."

And that sums it up very nicely. The book is a gold mine of information for the amateur interested in receivers and audio amplifiers (including disk reproduction and speakers and enclosures). For any specific problem there is a 50-page index for quickly finding the section of the book you need. Likely as not, the section will give you further references on the subject, since there are about 2500 bibliographies and references (including *QST*) throughout the book. Subjects that require it are treated mathematically, but there is a very generous distribution of graphs and tables for the nonmathematical reader, and no one should ignore the book because it contains equations and formulae. You will find circuits galore among the 1000 illustrations, ranging all the way from noise-limiting circuits to tone controls and hi-fi amplifiers and preamps, with practical values given in most cases. There isn't as much information on v.h.f. front ends as some of the v.h.f. men would probably like to see, but this is compensated to a great extent by the thorough treatment of i.f. and communication frequencies.

It's hard to see how a receiver or audio engineer could pass up the book, but the volume should also find a place on the shelf of any amateur who builds his own receiving and audio gear or accessories, or just works over his store-bought gear to his own liking. It's a handbook that will serve you a long time, but it's 10 to 1 that you will spend the first five or ten evenings just browsing through it. Much of the reference material is British or Australian (the editor is Australian), so the book offers an opportunity to learn some of the British philosophies of receiver and audio design, if you don't see the foreign periodicals regularly. — *B. G.*

—•••—

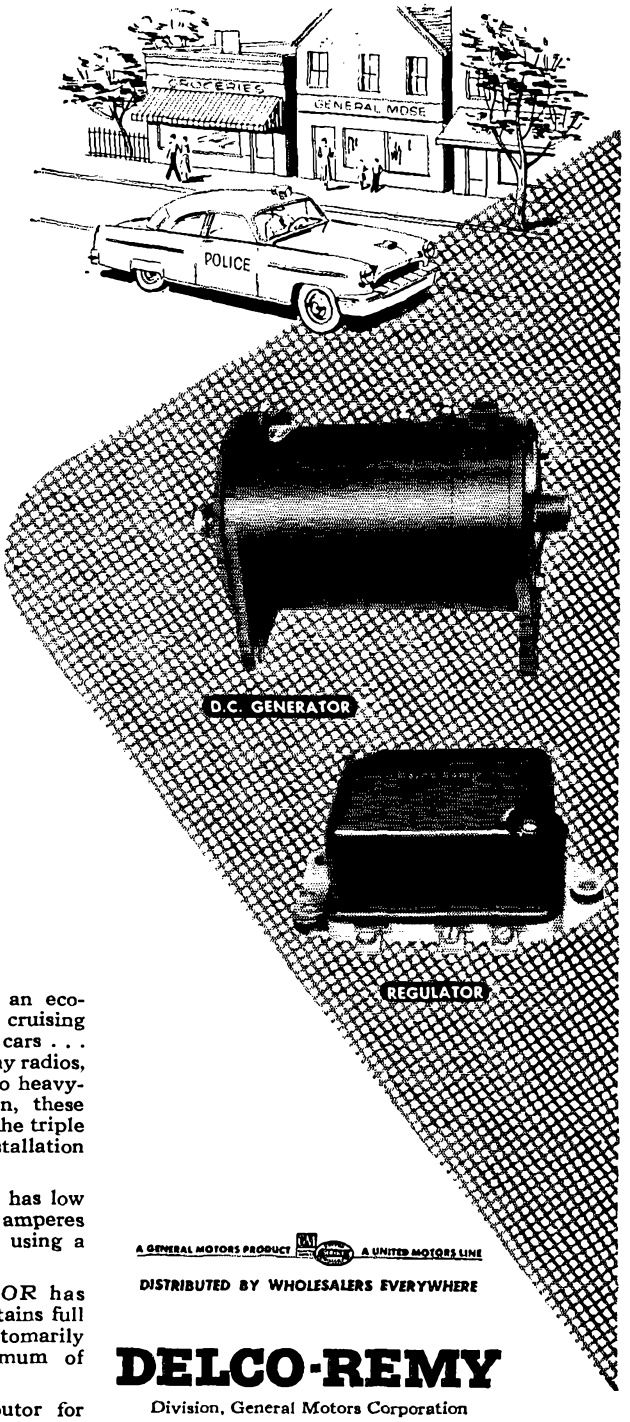
The Conductance Curve Design Book, by Keats A. Pullen; published by Kann-Ellert Electronics, 9 So. Howard St., Baltimore 1, Md. 17 charts and 4 pages of design information; 8½ by 11, paper cover. Price, $1.00 postpaid.

Over the past few years the author has published a number of papers in the technical press on the advantages and practical application of conductance curves for amplifier design, as contrasted with the more familiar types of characteristic curves ordinarily furnished by the tube manufacturer. Lack of actual tube data in the proper form probably has prevented wider use of the technique, and *The Conductance Curve Design Book* is a beginning at filling this gap. Characteristic curves are included for seventeen of the more widely used varieties of receiving tubes, including currently-popular miniatures and receiving power tubes.

The triode charts include curves of constant transconductance and constant plate conductance plotted on the conventional plate family. The pentode curves show plate current as a function of screen voltage for various values of grid bias, with transconductance curves superimposed. It is expected that data on additional tube types will be made available from time to time.

Those who have been interested in the conductance-curve method of design but have been unable to apply it without constructing their own sets of curves from existing data should find this set of charts a useful accessory. — *G.G.*

Right for the Job!



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(Medium Duty—40 and 50 Amperes)

Delco-Remy extra-output generators are an economical answer to the electrical needs of cruising taxicabs, suburban police cars, rural mail cars . . . other vehicles with additional lights, two-way radios, special electrical equipment in moderate to heavy-duty service. For this type of operation, these Delco-Remy extra-output generators offer the triple advantages of low initial cost, simple installation and economical maintenance.

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(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 noncommercial 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 take 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.

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MOTOROLA used communication equipment bought and sold. W5BCO, Ralph Hicks, 204 E. Fairview, Tulsa, Okla.

SUBSCRIPTIONS. Radio publications. Latest Call Books, $3.00. Earl Mead, Huntley, Montana. W7LCM.

QSL's-SWL's Meade WØKXL, 1507 Central Avenue, Kansas City, Kans.

QSLS, SWLS. Samples, 10¢. C. Fritz. 1213 Briargate, Joliet, Ill.

WANTED: Cash or trade, fixed frequency receivers 28–42 Mc. W9YIY, Troy, Ill.

QSLS, SWLS. High quality. Reasonable prices. Free samples. Write to Bob Teachout, W1FSV, Box Q124, Rutland, Vermont.

WANTED: Marconi multiple tuner, coherer, spark coil, magnetic detector, etc.; DeForest responder, coherer and other early equipment; Marconigraphs, Modern Electrics; Electrical Experimenter and early Call Books and text books of wireless. Franklin Wingard, Rock Island, Illinois.

WANTED: All types of aircraft radios, receivers and transmitters. Absolutely top prices. Dames, W2KUW, 308 Hickory St., Arlington, N. J.

WANTED: AN/ARC-1 or AN/ARC-3 or components. Write to J. Durrant, 5526 Parkland Court, Apt. 202, Washington, D. C.

QSL samples. Dime, refunded. Roy Gale, W1BD, Waterford, Conn.

QSLS-SWLS, as low as $1.50 per color. Samples dime. Stronberg, P.O. Box 151, Highland Station, Springfield, Mass.

QSLS "Brownie," W3CJI, 3110 Lehigh, Allentown, Penna. Samples 10¢; with catalogue, 25¢.

RTTY. An amateur teletype monthly bulletin, $1.80 per year, available from Southern California Radio Teletype Society, 3769 East Green Street, Pasadena 10, Calif.

I NEED transmitters and receivers. Trade your old gear on a new Hallicrafters SX-88, or HT-20, Hammarlund HQ-140X, Barker & Williamson 5100, Elmac, Gonset, National, RME, Sonar, etc. Highest trade-in allowance. Convenient terms. Fast four hour shipping service. Dossett, 855 Burlington, Frankfort, Ind.

TOP prices or better your best offer for RT18ARC1, ARC3, ART13 gear, also any other air or ground equipment. Air Ground Electronics, Box 226, Kearny, N. J.

QSLS: 24 hour service. 2 colors, $2.00; 3 colors, $3.00. Samples, 25¢, refundable with order or order direct. Satisfaction is guaranteed. Constantine Printing Service, Bladensburg, Md.

TELETYPE at your station? Easy! Get the entertaining Amateur Radio Teletype Society Bulletin and keep up with the latest activities, circuits, and news. Mammoth Bulletin 24 (while they last) sent immediately, free with every subscription. Send $3.00 to Section 9, 1379 E. 15th, Brooklyn 30, N. Y.

FOR Sale: Globe Champion rig with 80, 40, 20, 10 coil sets. HRO-50T-1 receiver with crystal calibrator and speaker. Both are 18 months old, and in perfect condition. These are in Dade City, Florida. Will accept reasonable offer for either or both. Arthur Davenport, W4KIN, 102-28 62nd Road, Forest Hills, L. I. 74, N. Y.

WANTED: BC-348 radio receiver. Advise price and condition. Write to C. Porter, 2520 Forest Glen Road, Silver Spring, Md.

QSL's, SWL's. Fair prices for excellent quality cards. Eleven styles for you to choose from. Samples, 10¢. Almar Printing Service, 602 Barker Bldg., Omaha, Nebraska.

FOUR complete TV sets, 7", $35.00; 10", $45.00; 12½", $55.00; 14", $65.00; Millen SSB selector, $45.00. Will trade. W4API, Spitz, 1420 South Randolph, Arlington, Va.

QSLS? SWLS? Get America's finest and largest variety super-gloss QSL samples 25¢. Sakkers, W8DED, Ham Print Shop, 53 East 7th St., Holland, Michigan.

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PRECISION-made, custom built antennas for all bands. Literature available. Antenna, Incorporated, Wakefield, R. I.

WANT *QST*s older than 1920. Have 200 copies from 1932 to 1953 at 25¢ each. WØMCX Jablonsky, 1022 No. Rock Hill Road, Rock Hill 19, Mo.

SELL: like new, 32V3, $700; 75A2 xtal calib., FM, speaker, $400 or both, $1,025.00 F.o.b. Petersburg, Va. Hylite 10, 20 meter beam, $65.00; Millen Grid Dip, $45.00; Triplett Mod. #650 Vac-VOM, $50.00; 5–304 TL, $5.00 each; all parts ¾ kw pwr supply, $70.00; complete mobile station TBS 50, deluxe Triband Gonset antenna WE 375 Ma. dynamotor, all $140.00, misc. mikes, bridges, power supplies, modulation transformers and tubes. Price on inquiry. W4IWA, George Cottrell, 115 Shore St., Petersburg, Va.

LETTINE 240 xmitter with 10, 20, 40, 80 coils, $70.00; NC125 rcvr, $120.00; Eldico antenna tuner with 10, 20, 40, 80 coils, $20; 3-el. beam, 10 meters, $15.00. All two years old and unmodified. TVI got me. W3RWN, 2405, Colston Drive, Silver Spring, Md.

DELUXE QSLS. Petty, W2HAZ, 17 Southard, Trenton, N. J. Samples 10¢.

WANTED: Amateur who builds up rigs (no triflers). I have a good 2-meter schematic diagram of R.F. mod. and pwr. supply, can be on two chasses, also TVI-proof, wired and tested, less tubes, in exchange for a good tape-recorder, complete, and the difference. Locals contact ST2-2176. Outsiders write to W3TEC, 2227 Germantown Ave., Philadelphia 33, Penna.

FOR Sale: Super Pro 400 X, $175.00 or best offer; 30 ft. tower, $30.00, other items. E. A. Trezise, 801 Barrett Rd., Falls Church, Va. Phone JE 4-1418.

QSLS. Quality printing as low as $1.07 per hundred. Maps, cartoons, fluorescent, special Novice deal, fast delivery. 12 samples rushed, 10¢. H. Robinson, W9AVH, 12811 Sacramento, Blue Island, Ill.

FOR Sale: W2ZWQ's dual 10–20 3-element array, with rotator and remote control. Boom 35 feet long. Price $450.00. Come and see it. Mrs. Cecil T. Spriggs, 60 Drake St., Malvern, L. I., N. Y.

COLLINS 310C-2 exciter, $95.00; National NC-173 receiver, $125.00; NC-183, $185.00. W6ITH, Morago, Calif.

WANT McElroy perforator and 100-kc. GT-cut vacuum-mounted crystal. Paul Rockwell, 5 Alabama Ct., Towson, Baltimore 4, Md.

WANTED: AN/APR-4, APR-5A, ARC-1, ARC-3, ART-13, etc.; TS-146 and other "Ts", particularly microwave equipment, even salvage; VHF frequency meters and signal generators; quantities of 723A/B, 3C22, etc., tubes; any Laboratory equipment. Top cash or swap. Rush! Engineering Associates, 434 Patterson Road, Dayton 9, Ohio.

RAYTHEON regulating transformer, 500 watt, 110 volt, $20.00; BC652A receiver 2–6 Mc., $20.00; PE101C dynamotor, $4.00; B & W low pass filter, $14.00; vacuum tubes, $2.00 each and 4 — 24G, 7–211. All items in new condition. F. J. Merry, W2DSU, East Greenbush, N. Y.

COLLINS 32V2 used 75 hours, in excellent condition with special antenna coupler, spare 4D32, manual, $550.00. Also HRO-7 complete, $285.00. W1KC, 240 Moreland St., Worcester, Mass.

HQ129X, Hy-lite 20 meter, SCR 10 meter beams, relays, all $135.00. Dr. Raynold Arcuri, 8 Linden Ave., Pelham, N. Y.

SELL: BC342N receiver, 1.5–18 Mc. 110 VAC, in good condition, best offer takes it. Fred Kurz, 2711 W. 29th, Zion, Ill.

SELL: National NC183 receiver, excellent condition, $200.00; Viking II with ECO, excellent, $250.00. Both for $425.00 F.o.b. W4AIS.

WANTED: Q5er and BC459 preferably both with 110V A.C. power supplies. D. W. McKay, Box 668, London, Ont., Canada.

SALE: Collins 75A-1. Equal to new condition, $245.00. Two BC-221 with xtals and books. $60.00 each. New 304TL's, $2.00 each. Will box and ship. J. Leonard, W4FPS, Box 2366, Roanoke, Va.

CLEANING House: Stancor C-1710, C-2309, C-1002, P-6160, P-3064, P-6134, P-5014; UTC A11, CUP1, all new; three 4D32's, four 3D22's; two .005μ 3 kv micas, three .5μ 2kv, two 2μ 1 kv oil, all new but shelf-worn; Vibroplex bug, like new, NR1 radio and TV servicing course; Radio and TV News, June 1951 to July 1953; Radio Electronics July 1951 to April 1953. Make an offer. 100% QSL. W3UDM, 1319 W. Loudon St., Philadelphia 41, Penna.

FOR Sale: Hammarlund Super Pro SP 400X, complete. In perfect condition. Not many hours operation. Best offer over $200.00. R. Minichiello, 510 W. Parker Road, Las Cruces, N. M.

FOR Sale: Trans 2000 or 2500 V at 500 Ma, $45.00; 450V at 150 Ma, $5.00; 980V at 350 Ma, $10.00; matched power supply 750 or 600 V at 200 Ma, $25.00; Mod. trans. 125 watt polypedance, $8.25; condensers, Cardwell variable XF240KD, $6.25; 3μfd-600V, 2μfd-1000V; 1μfd-5000V; shielded link B&W 3582; 3" 0–250Ma meter; 810's and trans; 3" and 5" CRO tubes; 110VAC DPDT relays and many other items. Ed Kingsley, 128 Grove, West Hartford or call Hartford 32-2625.

ELECTRONIC Technicians. For permanent positions with Sandia Corporation. Armed Forces acquired radar or electronic experience desirable; trade school certificate with minimum five years experience. Versatility, capability and willingness to work most essential. Sandia Corporation, a subsidiary of the Western Electric Company, operates the Laboratory under contract with the Atomic Energy Commission in Albuquerque, New Mexico. Excellent working conditions and liberal employee benefits, including paid vacations, sickness benefits, group life insurance and a contributory retirement plan. No housing shortage in the Albuquerque area. For further information write to Section (2), General Employment Division, Sandia Corporation, Sandia Base, Albuquerque, New Mexico.

PROGRESSIVE eastern manufacturing engineers seeking Project Engineer, Electronics, BSEE or equivalent, minimum 7 years experience HF, VHF antennas. Background in microwaves and general circuitry very desirable. Many valuable benefits plus very liberal compensation to right man. Future unlimited. Please send complete information. Write to Telrex, Inc., Asbury Park, N. J.

SWAP: 4 x 5 Busch Pressman camera, f/4.7 lens, Kalart synchronized range-finder, Heiland flash gun, two reflectors, filters, extra Telek lens, film holders, Graflex Handicase, many extras, all in really good condition. Want: 100-watt rig for any band(s) or any mobile gear you have. Write for details: W2NED, 663 Mt. Pleasant Ave., West Orange, N. J.

SELL 32V2 shielded cabinet, filtered leads, lo-pass filter, crystal mike, spare 4D32, perfect condition, $525.00. Also 75A2 nearly new, $365.00. Cash and carry only. W2AEB.

FOR Sale: Pierce wire-recorder, commercial type with foot-switch mike, mike stand, cable. Fine for office dictation and recording conference later to be transcribed. Built-in, mod. monitor speaker, etc., for playback, regular $400 value; one Harvey-Wells TBS-50 and 1 Kw RCA modulation transformer. Will trade for commercial med. power transmitter. All clean equipment. R. Spitzer, W9DBD, Gregg Addition, Decatur, Ill.

FOR Sale: Complete sets of coils for HT-9 for 10 and 20 meters, $20.00. Gaines C. Batson, #3 Spanish Fort Boulevard, New Orleans, La.

SELL Millen 90811 HF final with new RCA 829B, $39.00; Drake TV-52-40 LPF, $5.00; new Electro-Voice #300 C dynamic microphone, $9.00; 6L6Gs, $1.00; 6N7s, 75¢; 6J4s, $4.00; converted SCR522 with power supply, $35.00; complete 500 w. rack and panel transmitter all bands and Sonar VFO with built-in NBFM and 813 final. Sell complete or in parts, $125.00. Dick Kreeb, W9RUW, 108 Clifton St., Peoria 5, Ill.

FOR Sale: HRO50T1, ABCD coils. In excellent condition, less speaker, $300.00 F.o.b. Baltimore. R. E. Ridenour, 839 Wildwood Parkway, Baltimore, Maryland.

FOR Sale: Collins 32V2, perfect, with spare 4D32, other spare tubes, $500.00. W7AOD, Ogg, 17406 4th Ave., S. W., Seattle 66, Wash.

FOR Sale: (1) Johnson Viking II, 3 months old, $275.00; (1) SX25 postwar receiver, $60.00; (1) Stancor transmitter ST-203A, 6 months old, $30.00; (1) PE-103 dynamotor, $15.00; (1) Gonset 10-meter converter and noise clipper, $25.00. Buyer can inquire from Frank H. Tomanek, 267 Lear Road, Avon Lake, Ohio.

SELL or trade: BC221 converted AC operation, excellent, $75.00; BC453, $15.00; BC454, BC455, BC456, $6.00 each; BC1206 Q5'er, $10; Gonset Triband, $25.00; VT127A, $2.50 each; 203Z, $3.00 each; 24G, $1.00 each; ART-13 speech amplifier, $10.00; Select-O-Ject SOJ-1, $15.00; Millen 89er, $15.00; Millen #90800 exciter with coils, $35.00; steel cased power transformers, 110/220 volt primary 2500 VCT 350 Ma, $15.00 each; Thordarson transformers: #T21M64, 300 watt MultiMatch, $30.00; #T6F53 866 filament, new, in sealed boxes, $4.00 each; #T19P68, 2500 volt 500 Ma. DC with swinging choke, $50.00, all F.o.b. Want 310B1 or 310B3. W9AMU, John Huey, 390 Hill Ave., Elmhurst, Ill.

FOR Sale: two (2) 220 ft. self-supported radio towers, complete with lighting equipment. Contact Iowa Police Radio, Fairgrounds, Des Moines, Iowa.

SACRIFICE: Shielded de-TVI'd Viking I. Four 829s. Two 807s, B&W filter, 10-meter beam, 20 meter dipole, mike, bug; 100 ft. RG8-U and 72KW twinlead. Super Pro covers 10. Complete set new tubes, power, speaker, $350.00. Morty Hans, 1032 Lexington Ave., New York 21, N. Y.

FOR Sale: Good Hammarlund HQ129X, speaker, $75.00. Ex-W3UAP, 3977 Durango Drive, Dallas, Texas. Telephone EL-4289.

WANTED: Pair of BC611s in good condition and in working order. Quote price. J. Gould, 1233 High St., Auburn, Calif.

TRANSMITTER for sale, WRL Globe Scout, in excellent condition; coils, and tubes. Best offer, express collect. W3VAG, R. Schnick, Riderwood, Md.

SELL: Hammarlund PRO400X, complete, like new; Weston VOM $35.00; new Electro-Voice mike, 210S, PTT SW cable, coiled, $16.50. Richard Long, 184 L St., South Boston, Mass.

SALE: 75-90 watt phone xmitter with VFO; band-switching 80 through 10 except final plug-in coils; 829B final, 807s modulator with hi-level clipping. Enclosed cabinet. Best offer takes it. W3KUC, Carlsten, 507 Margaret Dr., Silver Spring, Md.

TRADE: New Leica III-F with F-2 Summitar lens, case, Leica gun, sunshade, cable release and Sportsfinder, cost $434.00; for receiver or receiver and transmitter of same price range. WN1WQN, Bil Mueller, 53 Westminster St., Pittsfield, Mass.

FOR Sale: 32V1 and 75A1. Can't be told from new. Perfect. $700 with dyn. mike. Paul Schneider, W6JXW, 592 Corsicana Dr., Oxnard, Calif.

FOR Sale: Johnson Viking 1 with TVI suppression and grip-to-talk 'phone operation. In excellent condition. Best offer over $225.00. Extra 4D32 final and Johnson low pass filter also available. W9QZA, 867 Bluff St., Glencoe, Ill. Glencoe 2570/2184.

VIKING II, VFO, latest models, perfect, both $325.00. Collins 75A1, speaker, modified per W6SAI, like new, and very hot, $285.00. No trades. All inquiries answered. W2GIM, 455 Oakridge Dr., Rochester 17, N. Y.

FOR Sale: 3-3 to 4 meg. 274N units, ea. $20.00; 348 receiver, converted to AC, extra audio stage added, $65.00; 1 KW modulation transformer RCA, with screen windings, $35.00; 1 Stancor 2000 Volt DC at 300 mil power transformer, $25.00; 1 RCA 750 mil 1475 VDC power transformer, $30.00; W8THJ. K. L. Deal, 104 E. Greene St., Piqua, Ohio.

FOR Sale: S76 with NC 8 in. Spr. New condition, $130.00. SOJ #3, $18.00; BC221 AH with power supply, $50.00; Heath portable tube tester, $42.00; V6-VTVM, $32; Eico batt. eliminator, $30.00; BC453 85 Kc IF, new, $1.50 each; PE101C modified, $5.95, plus shipping. M. J. Marshall, 455 Washington Ave., Dumont, N. J.

SELL: All new or like-new condition: heavy duty converted prop pitch motor. Heavy duty power supply on steel chassis, 350V. DC @ 200 mils; 5V. 3A; 6V. 5A; 24V. 3A; complete with pair 866, VFO 7MC output with calibrated dial. Two element 20 meter beam Telrex plumbers delight. What am I offered separately or for lot? C.o.d. F.o.b. Jenkintown, Penna. T. Lightfoot, W3KB, 214 Runnymede Ave.

FOR Sale: National NC 183D, used 7 months, perfect condition both physically and electrically, includes speaker, $250.00. W9MPV, D. McKilligan, 108 E. Allegheney, Austin, Minn.

BC459A, complete with regulated power supply in amplifier chassis, Harmoniker, de-TVI'd for fringe area, very clean. Pick up for $35.00. Ship at cost. Want: NC100. J. Phipps, W2CPQ, Box 1004, Sparta, New Jersey. Lake Mohawk 4472.

ROLLEIFLEX Automatic, Zeiss Tessar 3.5 lens. Wish to swap for Viking II, less VFO. W7QNN, Capt. Cowan, Box 615, Mississippi City, Miss.

COLLINS 32V2 for sale, hardly used, $450.00. Pick up. W2ALH, Tighe, 20-64-20 St., Apt. 2B, Astoria, L. I., N. Y.

SELL: Elmac A-54, $100.00, Morrow 3-BR, $50.00, both for $145.00. John Freiling, WØJVF, 1727 Harrison Hill, Hannibal, Mo.

WANTED: Collins 32V2 or 32V3, state condition and lowest cash price. Sell: Nearly 30 years of QSTs, in good condition. Make total offer. W5AMK, Temple, Texas.

SELL two 7" TV sets, $30.00 each first check. Have couple larger will sell or trade for ham gear. W4API, Spitz, 1420 So. Randolph, Arlington, Va.

SSBC crystals. Excellent layaway buys. New (surplus) crystals in guaranteed correctly matched sets for all published SSB circuits using 4, 6, or 8 crystals. 4 crystals $3.00, 6 for $4.00, 8 for $5.00, postpaid. Orco Products, Box 51, Downey, Calif.

QSLS! Interesting samples, 10¢. Tooker Press, P.O. Box T, Lakehurst, N. J.

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CODE Slow? Just the help you need in psychological aids booklet. One dollar postpaid. Inquiries invited. Donald H. Rogers, 41 Fourth St., Fanwood, N. J.

SELL: BC-610-E, BC-614-E, tuning units, tubes, coils, $395. Teletype #21A printer, $49.00; #12 page typing unit, $65.00. Want: ART-13, DY-17 and parts, ARC-3, ARC-1, APN-9 test equipment, manuals, radar. Cash or trade. Tom Howard, W1AFN, 46 Mt. Vernon St., Boston 8, Mass. Tel. Richmond 2-0916.

FOR Sale: Hallicrafters Sky Buddy, communications receiver, variable-pitch BFO, AVC, bandspread, reconditioned, $25.00; Alliance ATR Antenna Rotator, never outdoors, $20.00; Consumers Research triode amplifier, built-in mike preamplifier, fine as speech amplifier, 6J5, 6SC7, 2-6SN7, 2-6B4G, 5U4G. $55.00; General Industries R9OI 2-speed disc recorder, magnetic cutter, $25.00; Garrard RC-60 record-changer, GE pickup, $25.00; Rider Chanalyst 162C. $85.00; VOM from Sprayberry kit; $10; Brush PL-20 transcription pickup, $20; Neon sign transformer, $10; Corona silent deluxe portable typewriter, $50; all excellent, priced f.o.b. V. R. Hein, 418 Gregory, Rockford, Illinois.

TRADE: Linhof Super Technika 4 x 5 camera with Schneider 90 mm f 6.8, 127 mm. 4, 7, 360 mm f 5.5, multifocus rangefinder, flash gun, tripod, GE Pr 1 lightmeter film holders, filters, sunshades, also Omega DII with color head and complete dark room equipment. Need darkroom for radio shack. Want 32V3 or 32V2. Will consider factory wired Viking II and cash. John Barr, W4WDC, Box 9156, Oteen, N. C.

FOR Sale locally Super Pro SP110LX with Jensen 12" speaker and spare tubes, $60.00. BC221AH with power supply, $55.00. Bob Drury, W1JFB, 62 Whitney St., Hartford, Conn.

SSBC crystals. Excellent layaway buys. New (surplus) crystals in guaranteed correctly matched sets for all published SSB circuits using 4, 6, or 8 xtals. 4 xtals, $3.00; 6, $4.00; 8, $5.00; postpaid. Orco Products, Box 51, Downey, Calif.

SEND for free literature about Wraplock kits. Rigidly clamps together objects of any size or shape with steel strap, using ratchet wrench supplied each kit. Up to 100 clamps from kit. Fast — strong — versatile and most inexpensive, 1001 uses around your shack for masts, cable clamps, mobile gear mounting, special equipment, etc. Stainless steel — galvanized. You'll be glad you inquired. Dombert Distributing Co., Box 23-Q, Gedney Station, White Plains, N. Y.

WANT: ARC-3, APN-9, ART-13, DY-17, TCS, BC348R, 32V2, any surplus equipment, manuals. Cash or trade new ham equipment. Alltronics, Box 19, Boston 1, Mass., Richmond 2-0916.

SELL NC200 receiver, good condition, ninety-five dollars. W3IHF, 31 North Grant St., Waynesboro, Penna.

I.R.E. Proceedings. Almost complete run 1941 to present. Will swap for communications receiver. W2IRU, 211 Frankhauser Rd., RFD #3, Williamsville 21, N. Y.

FOR Sale, $150.00, brand new NC-125, with speaker, original cartons. Need cash. W1SBC, 330 Fairfax Drive, Warwick 5, R. I.

WANTED for cash: HRO5TA1. Please give details on: condition, coil sets, wiring changes, and price. All replies will be answered. E. Fry, K2CW, 69 Ashland Road, Summit, N. J.

SELL: RCA 7DP4, new, $8.00; Jennings VC 250 vacuum cond., 250μμfd., 20 Kv, used, $18.00; BC645, unconv., $20.00; 20 2μfd. 600v sq. bathtub cond., 50¢ ea.; 4 Westinghouse 1μfd 7500 v. cond., $6.75 ea.; BC412-B 5 in. 'scope, unconv., as is, $22.50; Triplett 1175A multimeter and battery oper. Sig. gen., $12.50; BC 314-D rec., $50-1500 kc., conv. for 110v. AC, $34.00; 7 in. Motorola TV rec., works, but needs repairs, $12.00; coil kit, 630 TV rec., $6.75; spkr 630 rec., $2.25; 1 set (10 vol.) Hawkins Electrical Guide 1917 edt., best offer. Prefer to sell all items locally but will be willing to pack and ship at buyers expense. Wilczek, W2CXK, P.O. Box 305, Port Washington, L. I., N. Y.

SELL: HRO5TA1 complete, best offer over $100.00. Many transformer, choke, meter bargains. Sample: UTC S-60, $7.00; S-36, $7.00; S-43, $10.00; Thordarson 1000/1250 VDC half amp., $15.00. All plus shipping. W6BZU, 1830 Clayton Way, Concord, Calif.

TRANSMITTER, 350-watt, NBFM, three power supplies, XE-10 exciter, SX-25 receiver, $175.00; F.o.b. St. Louis, takes all. Card for details. WØKID, 714 Interdrive, University City 5, Mo.

FOR Sale: SX-62. Just aligned. Universal output transformer, $185.00. Dr. C. B. Armstrong, 1618 Cedar, Cincinnati 24 Ohio.

WRL Globe Champion, latest model laboratory modified TVI-proof and press-talk. Low-pass filter and D 104 included, $275.00. Also Millen R'9er with coils 10 & 20, $15.00, new. EX signal shifter, $50.00. Millen Grid dipper, #90651, $45.00. W2TLG, Stoody, 619 Chelsea Road Oceanside, N. Y.

BROADCAST station operators write W2SVC % WHAM Rochester, N. Y. for information about broadcast operators cw net.

SPECIAL: Used S.W. diathermies. Cost over $500 new. 500–900 watts input. Tubes, meter, transformers, condensers, etc. worth more than we are asking. Portables, $25.00. Consoles, $35.00. F.o.b. Chicago. Medical Arts Supply Co., 500 S. Wolcott Ave., Chicago 12, Ill.

ATTENTION Bargain hunters! Dozens of real trade-in values including Collins, Vikings, Nationals, Hallicrafters, Elmac, Gonset, RME, Morrow, Harvey-Wells. Write for free bargain bulletin. Complete stocks, all leading brands. We trade and sell on time. Burghardt Radio Supply, Watertown, South Dakota.

WANTED: Hammond organ spinet or larger. Cash or wide variety of parts and equipment to trade. Rich, W1JR, Mockingbird Hill, Gardner, Mass.

QSLS, SWLS. Ham specialty printing. Keelings, Valley City, No. Dakota.

FOR Sale: One Collins 75A1 receiver, like brand new, $275.00. One Viking I completely shielded and filtered, $235.00; one Viking VFO with neatly built-in NBFM, $45.00. C. W. Amundson, WØLCM, 1013 Seventh Ave., Worthington, Minn.

BARGAINS: New and reconditioned Collins, Hallicrafters, National, Hammarlund, Johnson, Elmac, Harvey-Wells, Gonset, Morrow, Babcock, RME, Millen, Lysco, others. Reconditioned S38 $29.00; S40A, $69.00; SX24, $69.00; S27 $99.00; SX42, $179.00; SW54, $35.00; NC173, $149.00; NC183, $199.00; NC125, $129.00; HF-10-20, $49.00; VHF152, $49.00; VHF152A, $59.00; HQ129X, S53, SX43, SX71, SX16, NC183D, HRO50T1, HRO5TA1, HRO60, Collins 75A1, 75A2, 32V1, 32V2, HT9, Viking I, Viking II, Viking VFO, $49.00; Meissner bandswitching VFO, $49.00, many others. Shipped on approval. Terms. Write for free list. Henry Radio, Butler, Mo.

ART-13: For sale T47A/ART-13 complete with instruction manual, spare antenna relay, modulation xformer, variometer, one Autotune head, and final tank coil assembly. Unmodified. Less power supply, and in excellent condx. $300 takes it all. W4WOH, 1003 Vanderbilt Drive, Huntsville, Ala.

SELL: MC55 RME mobile converter, $60.00. Used very little. Need cash. Express collect. W3VPP, Brook Lane Farm, Route 5, Hagerstown, Maryland.

WANTED: RAX 7–27 Mcs. or any good communications receiver. Bob Rowan, W2TLJ, 315 Henry, Hasbrouck Heights, N. J.

QSLS. We have printed a million. Samples 10¢. VVS Print, 1704 Hale Ave., Ft. Wayne 6, Inc.

SELLING the Collins, National, Globe King and other equipment from my station. WØUFD, John Leeder, 1123 So. 50th St., Omaha, Nebraska.

HARVEY-WELLS TBS-50D deluxe with APS-50 power supply for sale. In A-1 condx, the same transmitter pictured on p. 50 July "CQ" also mentioned in May "QST". Have worked 12 countries, 13 zones so far, as a Novice. Will sell both for $125.00, or for higher offer. Dave Smith, K2CHS, 54 Butler Road, Scarsdale, N. Y.

HAM receivers and transmitters bought and sold. Olson, WØMLB, Box 4, Kearney, Nebraska.

DON'T have time or tools? Let us build that rig for you. Any unit from QST or the Handbook or your own design. Quotations gladly furnished. True commercial quality. De-TVI'ing a specialty. Jaclyn Products, 619 Chelsea Road, Oceanside, N. Y.

HQ129X $129.00; Thordarson Hi Fi Triode amplifier 10 watts, $45.00; 15" Cinaudagraph speaker, $10.00; Gonset 2-meter Communicator, used once, $185.00; Gonset 152–162 Mc. VHF tuner, $40.00. W6UVF, 839 N. June St., Hollywood, Calif.

ANTENNA Wire: No. 18 high strength Copperweld, 2500 foot spools, $7.50 F.o.b. Bricelyn, Minn. P.O. Box 9, Dick Buchan, WØTJF.

TO Settle estate of W5OKM, will sacrifice Collins 30-K transmitter in perfect condition, looks like new, spare 4–125A, $695.00 f.o.b. Waco, Texas. Also, two new 4–125A tubes, $22.50 each, both for $40.00. Leo Kennedy, W5BIN, 3515 Mitchell Road, Waco, Texas.

L. A. Hams especially: Sell cheap enuff, 4/250A final, 4/125A's mod., SP-400-X, other quality stuff, all like new. Write: Burt Hansen, 4435 W. Slauson, L. A. 43, Calif.

SELL or swap National School Radio or I.C.S. servicing course, $20.00 each; new Rider's XVII, $12.00; Eico 320 Sig. Generator, $17.00. W9QXE, 308 MacArthur Ave., Eau Claire, Wis.

COMPLETE rig, Harvey-Wells TBS-50C with homemade power supply and NC-57 transmitter; has no power changes and power supply has correct voltages and uses Harvey circuit. Xmitter excellent condition and receiver good, except for few scratches. Ready to operate: $125.00 or best offer. W5VLR, 2209 Ward Parkway, Ft. Worth, Texas.

32V2, 50 hrs., low pass filter, a.c. filter, D-104 mike, ant. tuning box, spare 4D32, all for $475.00; 75A2 25 hrs. with FM adapter and reflex speaker, $360.00; BC-946, new, $25.00; BC-314D, $40.00. WØNEN, 6001 Cottage Drive, Des Moines 11, Iowa.

SKY BUDDY, clean, untouched, $18.50; Q5'er, converted to 110 AC, in Bud cabinet with spkr, $35.00. WØJEF, Marvin Shores, Fillmore, Mo.

BARGAINS: Extra special: Motorola P-69-12, mobile receivers $19.20; 32V1, $395.00; Globe King, $299.00; HT-9, $199.00; Supreme AF100 or Temco 75GA, $225.00; HRO-50, $275.00; 75A1, $250.00; SX-71, $169.00; S-76, $139.00; SX-42, $189.00; SX-45, $129.00; HRO-Senior, $99.00; RME-2-11, $99.50; RME-45, $99.00; EX Shifter, $69.00; S-40A or SX-16, $69.50; VHF-152, $49.00; HF 10-20, $59.00; Globe Trotter, $69.50; MB611 mobile transmitters, $14.95; 90800 exciter, $22.50; DM-36-10 meter converter, $19.50; XE-10 $14.95; Gonset 10-11 converter, $14.95; and many others. We need used receivers: We give highest allowances for S20R, S-40A, B; NC-57; NC-100; NC-125; SX-24; SX-25; HQ-129X; and similar receivers. Free trial. Terms financed by Leo, WØGFQ. Write for catalog and best deal to World Radio Laboratories, Council Bluffs, Iowa.

NATIONAL HFS with 5886 power supply. Like new condition, $125.00 F.o.b. Columbus, Ohio. R. L. Grimes, 656 So. Eureka Ave., Columbus 4, Ohio.

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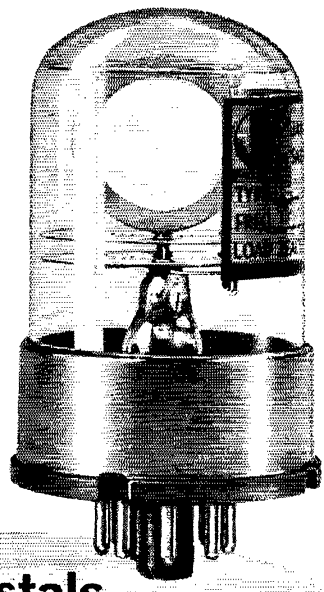

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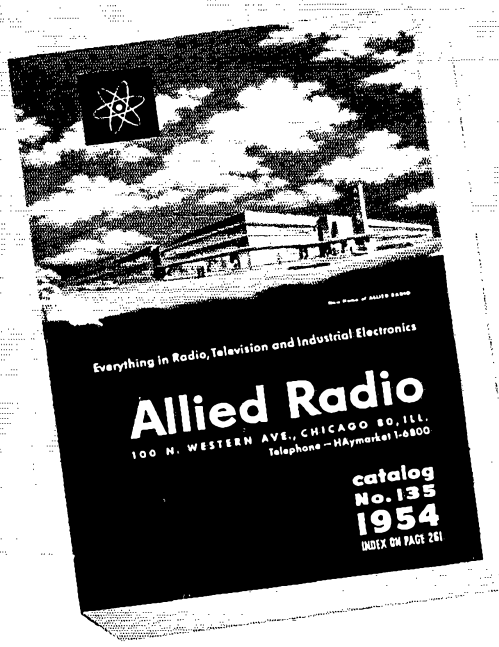

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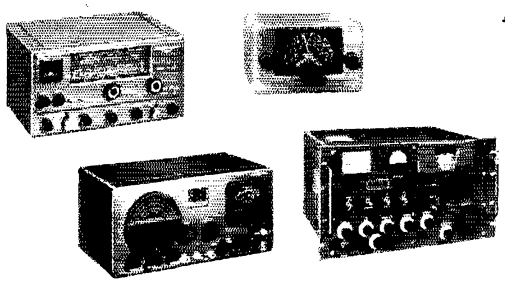

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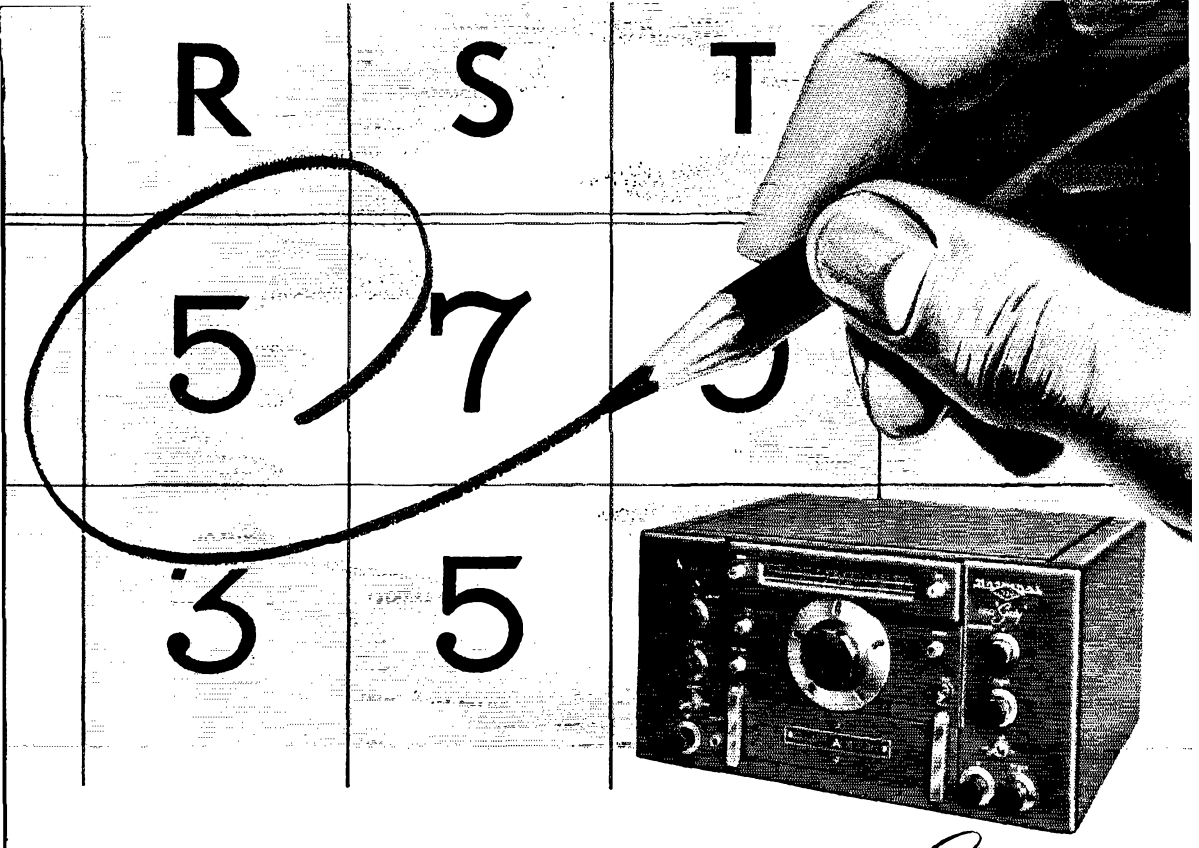
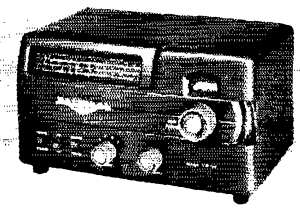


the difference is often an HRO *Sixty*

Try a side by side comparison between the HRO-Sixty and the best receiver of any other make. Tune both to a hard-to-read signal. You'll discover that an HRO-Sixty often means the difference between an R5 and an R3! For sensitivity and low noise level, the HRO-Sixty stands alone!

COVERAGE: 50-430 kc., 480 kc.—35 mc. And 50-54 mc. Voice, CW, NFM (with adaptor).

FEATURES: Edge-lighted, direct frequency-reading scale with one range in view at a time. 3 I.F stages at 456 kcs. employing 12 permeability-tuned circuits on all bands plus one I.F. stage at 2010 kcs. on all frequencies above 7 mcs. Switching is done automatically when coil set is plugged in. Built-in, isolated heavy-duty power supply. Sensitivity of 1 uv or better at 6 db. sig./noise. Selectivity variable from 3 kc. overall to app. 100 cps. at 6 db. Current-regulated high frequency oscillator and first converter heaters. Voltage-regulated high frequency oscillator and S-meter amplifier. Negligible drift after warmup. Micrometer dial for logging. Provision for built-in crystal calibrator unit. Variable ant. trimmer. Accurate S-meter. Min. tubes in front end and high freq. osc. Osc. circuits do not drift during standby. High-fidelity push-pull audio (± 2 db. 50-15,000 cps.) with phono jack. BFO switch separated from BFO freq. control. Illumination dimmer control.
Accessory socket for Select-O-Ject.



TOP VALUE
in a Standby Receiver

THE *Mighty Midget* SW-54

540 kc. to 30 mc. in 4 bands. Sensitive and selective superhet circuit, using new miniature tubes. Bandspread dial is adjustable to assure logging accuracy. Built-in speaker and power supply. Volume, Receive-Standby, Bandswitch, AM-CW, Speaker, Phones.

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"Ether buster" ...penny pincher

500 watts input*

...4 watts drive!

HERE's a real champion when it comes to circuit simplicity, operating convenience, high power, and economy. For high-power work . . . for full input up to 30 Mc with a 6L6 driver, RCA 813 delivers *more watts per dollar than any other amateur beam power type in its class.*

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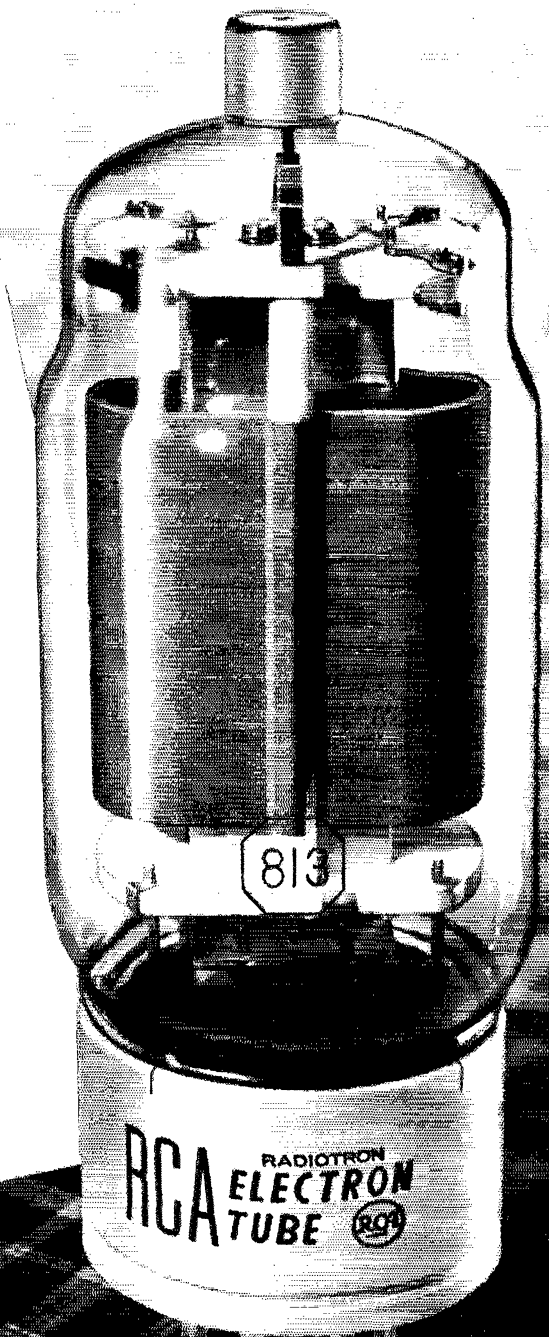
Get an RCA 813 for your new high-power final. Your RCA Distributor carries them in stock.

It's a "power house" 500 watts input for $18.00

Suggested user price

*CW rating, ICAS



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