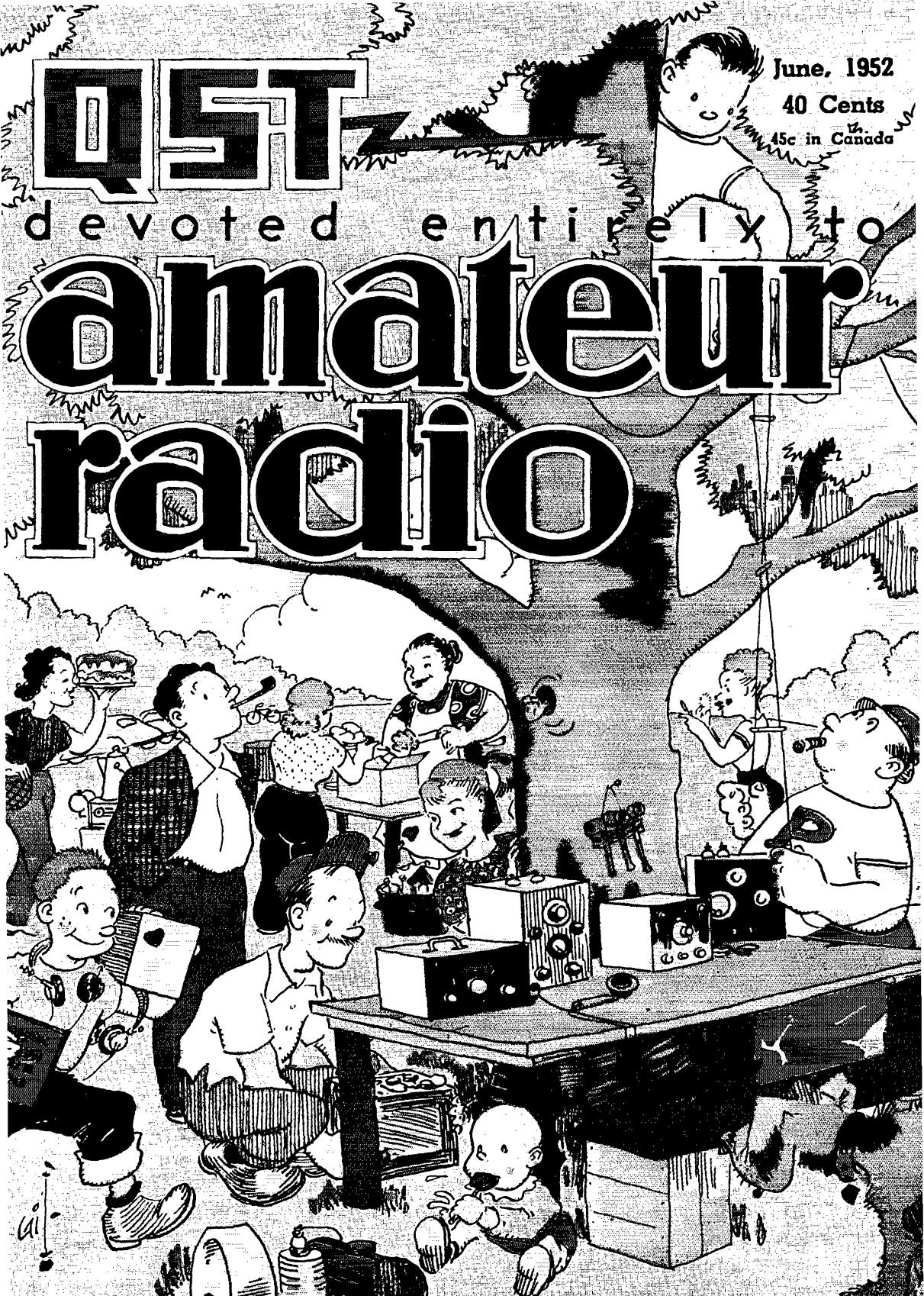
June, 1952
40 Cents
45c in Canada

QST

devoted entirely to

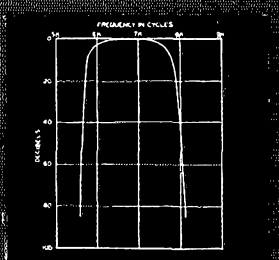
amateur radio

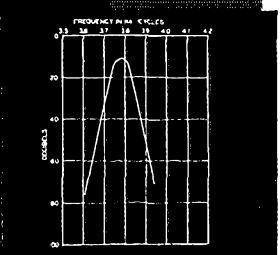


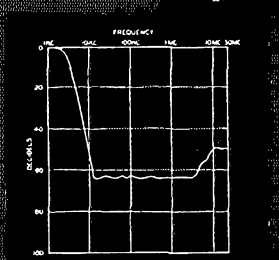
FILTER SPECIALISTS

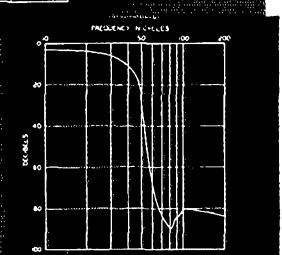
PRODUCERS OF PERMALLOY TAPE WOUND TOROID COILS AND FILTERS FOR OVER A DECADE

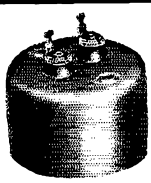
FOR FILTERS





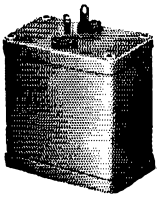






HQA, C, D TOROID COILS

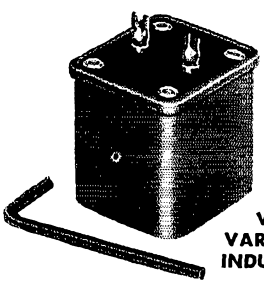
$1\frac{11}{16}$" Dia. x $1\frac{3}{16}$" High.



HQB TOROID COIL

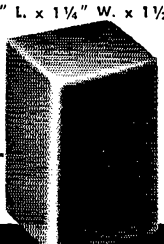
2⅝" L. x 1⅝" W. x 2½" H.

UNCASED TOROIDS

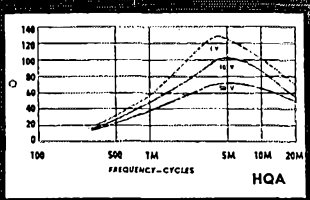


VIC VARIABLE INDUCTOR

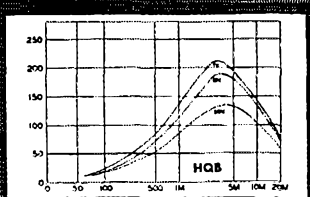
1⅜" L. x 1¼" W. x 1½" H.

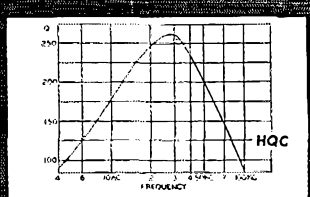


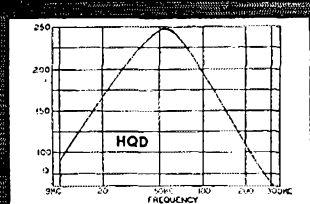
FOR HIGH Q COILS

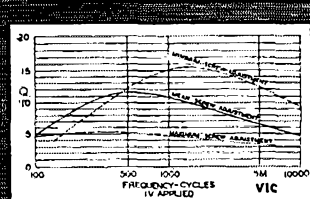


HQA









VIC

SUB-OUNCER TOROID FILTERS

Filters employing SUB-OUNCER toroids and special condensers represent the optimum in miniaturized filter performance. The band pass filter shown *weighs 6 ounces.*

Write for our latest catalog.

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CHANGES in your mobile rig's high voltages can mean annoying signal fluctuations to the man at the receiving end. If you're working at the limit of your range, your signal may fade out completely.

BIGGEST CAUSE? Variations in car-generator output, caused by engine idling at red lights, followed by racing in first and second to get ahead on green.

REMEDY? G-E glow tubes! Use one or two of these V-R types in your high-voltage circuit. They're economical to buy—cost the same as an average receiving tube.

CAPACITY? Glow tubes have plenty for mobile work, which involves relatively low powers. Types available? G.E. offers you a wide range (see listing).

YOUR G-E TUBE DISTRIBUTOR will be glad to quote you actual low prices. See him today! *Tube Department, General Electric Company, Schenectady 5, New York.*

TYPICAL OUTPUT	
*GL-OA2	151 v
GL-OA3	75 v
*GL-OB2	108 v
GL-OB3	90 v
GL-OC3	108 v
GL-OD3	153 v
GL-874	90 v

*7-pin miniature type.

G-E MILESTONE: GLOW TUBES for voltage regulation!

● In 1925, recognizing the need for an economical means to regulate voltage, General Electric developed the first glow-discharge regulator tubes. New in principle, the glow tube—a cold-cathode diode—leveled off the peaks and valleys of voltage by means of a cathode glow, or discharge, which gave a tube drop largely independent of power-source variations. Today, scores of thousands of glow tubes in use prove the importance of this pioneering. G-E tube "firsts" form a foundation of experience that makes the G-E tubes you buy better . . . more dependable . . . longer-lived!

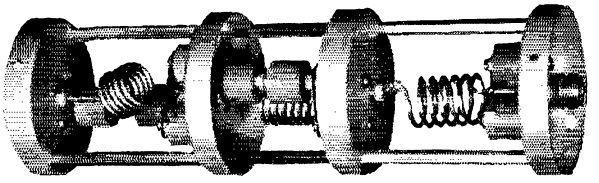
ELECTRONIC TUBES OF ALL TYPES FOR THE RADIO AMATEUR

GENERAL ELECTRIC

166-186

Reduce harmonic radiation...

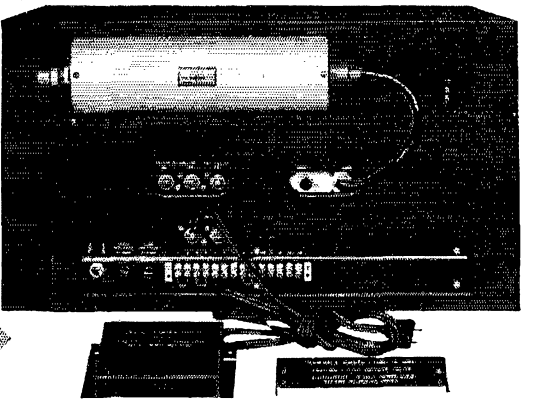
with a Collins 35C-2 filter!



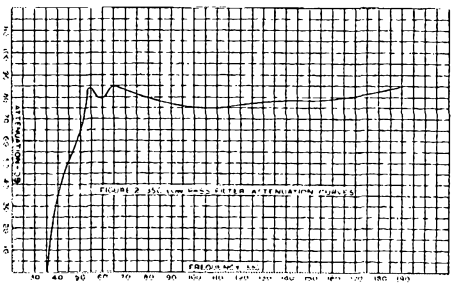
Collins 35C-2 Low-Pass Filter

If television antennae have sprouted in your vicinity, chances are your ham rig is subjected constantly to the suspicious glances of your televiewing friends and neighbors. Put their minds at rest by mounting a Collins 35C-2 low-pass filter on your transmitter.

Although specially designed for use with the Collins 32V-3 transmitter, the 35C-2 is adaptable to any 52-ohm-output transmitter . . . providing about 75 db attenuation at television frequencies with an insertion loss of only .18db. The filter's three sections are individually shielded, and the use of low-loss capacitors insures excellent performance.



35C-2 Filter mounted on 32V-3 Transmitter



35C-2 attenuation curve

The 35C-2 is furnished with coaxial fittings to make installation easy. If used with a Collins 32V-3 transmitter, the filter is fastened to the rear of the cabinet by two readily accessible mounting screws. The coaxial fitting on the cabinet's back permits the use of a well shielded transmission line. The unbalanced output permits grounding the outer conductor of the line and the filter case.

35C-2 Net Domestic Price $40.00

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JUNE 1952

VOLUME XXXVI • NUMBER 6

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"A Gibraltar of Stability"

It is the ultimate in all-wave receivers . . . this jewel of precision craftsmanship! Refined in even the smallest detail, the SX-73 meets the tough military communications specifications. Hallicrafters is proud to place its name on the SX-73.

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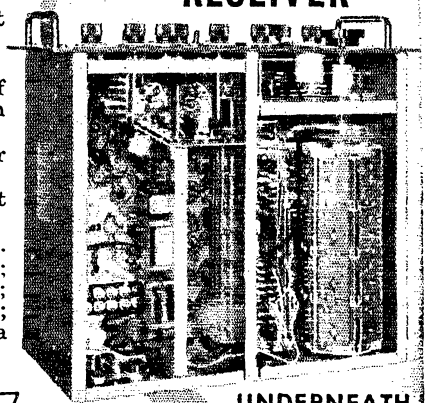
HALLICRAFTERS • WORLD'S LEADING MANUFACTURER

and Dependability

THE SX-73 COMMUNICATIONS RECEIVER



UNDERNEATH VIEW, SX-73

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540 kc to 54 Mc in six turret-selected bands.

20 tubes, including rectifier, voltage regulation and ballast tubes.

Dual conversion, 455 kc and 6 Mc crystal controlled.

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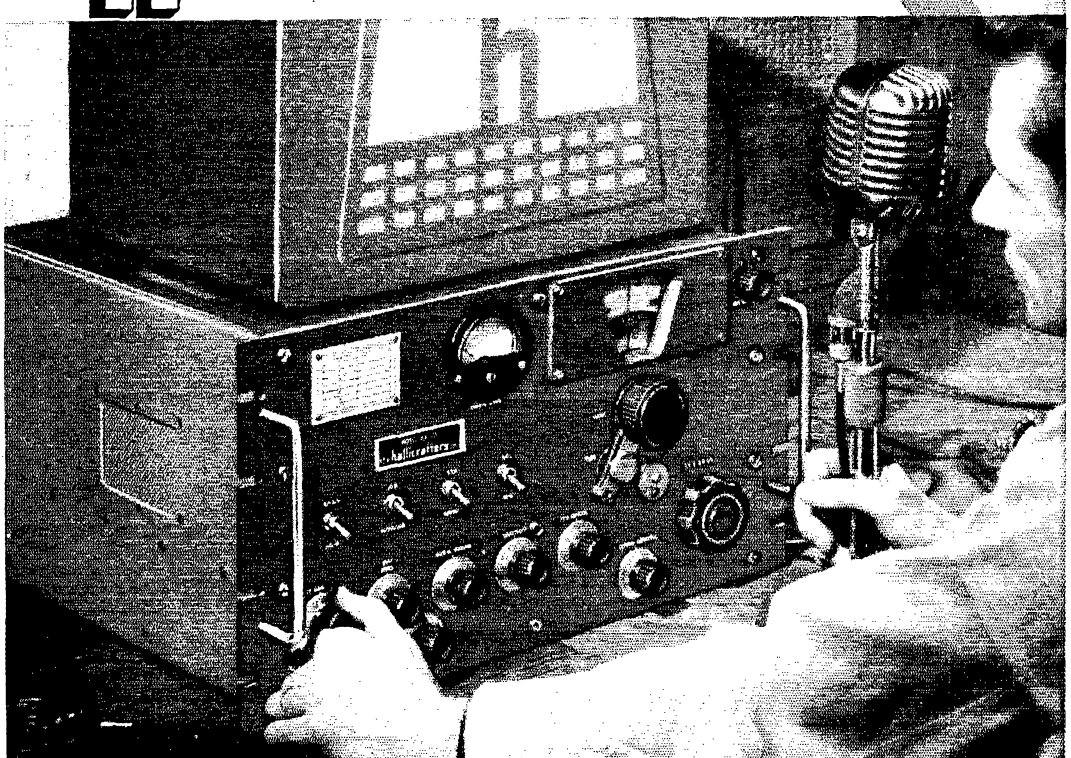

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Reports Invited. All amateurs, especially League members, are invited to report station activities on the first of each month (for preceding month) direct to the SCM, the administrative ARRL official elected by members in each Section. Radio Club reports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

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

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

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

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243 Colon Ave., San Francisco 12, Calif.

Roanoke Division

WILLIAM H. JACOBS W4CVQ
Route 6, Raleigh, N. C.
Vice-Director: Gus M. Browning W4BPD
135 Broughton St., S. E., Orangeburg, S. C.

Rocky Mountain Division

FRANKLIN K. MATEJKA . . . . . WØDD
P. O Box 212, Estes Park, Colo.
Vice-Director: Ramon S. Walker . . . . . WØOWP
P. O. Box X, Brush, Colo.

Southeastern Division

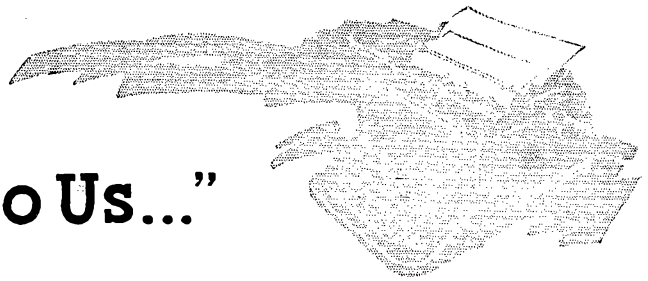
LAMAR HILL W4BOL
104 Myrtle, Cochran, Ga.
Vice-Director: Ernest W. Barr W4GOR
911 Rosemary Ave., SW, Atlanta, Ga.

Southwestern Division

JOHN R. GRIGGS W6KW
10412 Don Pico Rd., RFD 2, Spring Valley, Calif.
Vice-Director: Walter R. Joos W6EKM
1315 N. Overhill Drive, Inglewood 3, Calif.

West Gulf Division

A. DAVID MIDDELTON W5CA
9 Kay Road, Tijeras, N. M.
Vice-Director: Frank E. Fisher W5AHT/AST
104 E. 11th, Pawhuska, Okla.



"It Seems to Us..."

F.C.C. PROPOSALS

The Board of Directors of ARRL usually finds a well-stocked agenda outlining the business to be handled at its annual meetings, but this year may outdo all the others. The reason is that with FCC's major headache, the TV freeze, finally out of the way, the Commission has been turning out, with what seems like feverish activity, rule-making proposals concerning the amateur service. There are four major Dockets which were newly released or modified during the last two weeks of April. The texts appear in "Happenings" for this issue. It is unfortunate that the announcements were too late for May *QST*, which otherwise would have permitted more general dissemination among amateurs before the Board meeting; however, directors and their assistants have been informed promptly in each instance, and W1AW has carried immediate bulletins to members with follow-ups to Official Bulletin Stations and some 700 affiliated clubs.

In Docket 10073, first announced last November (see page 38, December *QST*) as a series of questions on f.s.k. teletype and 7-Mc. 'phone, FCC now makes some specific proposals which in essence would:

a) open 7200–7300 kc. to voice operation, A-3 or n.f.m.;
b) open 7175–7200 kc. to Novice operation, c.w. only;
c) open the non-voice portions of 80, 40 and 20 meters to f.s.k. radioteletype;
d) set up technical standards for teleprinters — limiting use to the five-unit (start-stop) code, specifying 60 w.p.m. as the standard speed, and providing 850 cycles as the frequency shift;
e) tighten up identification procedure by requiring signing of amateur calls every half-minute or less during CQs or tests (i.e., when not in communication); and requiring teletype, facsimile or television amateur transmissions to be identified not only with the mode in use but also in voice or code, depending on the frequency in use.

FCC nominally turns down ARRL's request for an extension of time to June 2nd, but actually goes the League one month better in setting a comment deadline of July 1st for the above matters.

In Docket 10173, the Commission deals with a problem brought to its attention by ARRL — the fact that with the discontinuance of the Advanced Class license after the end of this year new aspirants for 75- and 20-meter voice privileges will have to take the Amateur Extra Class exam, with many questions at a level equal to or exceeding that of the higher-class commercial tickets. That, the League thought, would be a little rough on hams, and as you know proposed retention of the Advanced Class. FCC agrees the problem is a real one, but proposes an alternative solution — opening the 75- and 20-meter voice bands to all amateurs (except of course Novices and Technicians). Again, July 1st is the final date for comment.

In Docket 10188 (are the final two digits of these docket numbers more than coincidence?), FCC sets forth its ideas on how the new 21-Mc. band should be whacked up, and solicits comments before August 1st. Briefly, it proposes 100 kc. for 'phone at each end, and the remaining 250 kc. for f.s.k. — except that the center 150 kc. of this is to be available to Novices, whereupon the 11-meter band would be withdrawn from their use. In detail:

a) 21,000–21,450 kc. — A-1;
b) 21,100–21,350 kc. — F-1 (f.s.k., teleprinter);
c) 21,000–21,100 and 21,350–21,450 kc. — A-3 and n.f.m.;
d) 21,150–21,300 kc. — Novices.

This arrangement is difficult to visualize from figures; the best thing to do is draw yourself a diagram. As to just where you put the Canadian and foreign 'phones, at this point we can't suggest a solution.

In Docket 10021, FCC now proposes some further amendments concerning 1800–2000 kc. which among other things would permit nighttime operation in the Gulf States. This is a project which ARRL has been promoting for some time through liaison with the United States Coast Guard, which has the responsibility for loran operations. Briefly, the new arrangement would shift Minnesota, Iowa, Missouri, Arkansas and Louisiana to the "East Coast" frequencies 1800–1825 and 1875–1900 kc., 500 watts day, 200 watts night; move Texas, Oklahoma and Kansas amateurs to those same frequencies with 200 watts daytime, 75 watts night; and put Puerto Rico and Virgin Islands also on the East Coast segments, with 500 watts day, 200 watts night. The comment deadline is July 1st.

The Board of Directors at its meeting, at this writing only a few days away, will formulate an ARRL position in these various matters. We are holding a page in this issue of *QST* until the very last minute to report highlights of the meeting.

HAMFEST CALENDAR

ALBERTA — Saturday and Sunday, July 5th and 6th, at the Harris Sky Rooms in Calgary — the Annual Alberta Hamfest, sponsored by the Calgary Amateur Radio Association and the Alberta Provincial Amateur Radio Association. Preregistration until June 16th is $4.00. $5.00 after that date. Registrations from O. E. Wilson, P. O. Box 196, Calgary. Accommodations may be obtained from the same address.

CALIFORNIA — Sunday, June 1st, at Coyote Point Picnic Grounds, San Mateo — the Annual Hamfest of the San Mateo County Amateur Radio Club. For further information contact Robert L. Shand, W6TBG, P. O. Box 751, San Mateo.

GEORGIA — Sunday, June 8th, at Robinson's Tropical Gardens, near Atlanta — the Annual Hamfest of the Atlanta Radio Club. Transmitter hunt on 10 meters, good food and free drinks. Fun for all, rain or shine. Adults $3.00, children $1.75. Send reservations to J. Herb Axsom, 202 North Semmes Street, East Point.

ILLINOIS — Sunday, June 8th, at Scout Camp Ki-Shau-Wau — the Annual Hamfest and Picnic of the Starved Rock Radio Club. Ki-Shau-Wau can be reached by driving south from the junction of Illinois routes 178 and 71 near Starved Rock State Park, or by driving east on blacktop road from Route 51 at Tonica. Follow the "hamfest" signs. Plenty of doings for the whole family, with free coffee and donuts at 10 A.M. Advance registrations (mailed prior to May 25th) $1.00, while registration at the gate is $1.50. Get registrations from G. E. Keith, W9QLZ, Utica.

KANSAS — Sunday, June 1st, in Kenwood Park, Salina — the Annual Hamfest of the Central Kansas Radio Club. The usual fine program is planned. Further information available from Joe W. Addison, WØPKD, 908 South 11th St., Salina.

MAINE — Saturday, May 31st, at the Odd Fellows Hall in Auburn — the Auburn Hamfest. There will be a pie-baking contest for the ladies, a dance, and plenty of activities for the OMs and kiddies. Registration is $1.50 for adults and 75¢ for children under 14. For further information write the SCM.

MISSOURI — Sunday, June 15th, at Kaiser State Park near Eldon — the Fourth Annual Missouri Emergency Net picnic. Fish fry at noon. Advance registration $1.50, at the gate $2.00. Tickets from WØAZL, Granett Bryan, Sedalia, Mo. Cabin reservations from WØTGG, Eldon, Mo.

NORTH DAKOTA — Sunday, June 8th, at Mayville — the state Ham Picnic. Registration is $1.00, with free coffee and ice cream. Festivities start at 10 A.M. For further information write the SCM.

ONTARIO — Saturday, Sunday, Monday, June 28th–30th — the Fifth Northern Ontario Hamfest sponsored jointly by the Radio Clubs of Sudbury, Kirkland Lake and North Bay, being held again this year at Camp Friendship, 2 miles south of North Bay. Plans include a Saturday night party and dance, and a mobile treasure hunt, games and an evening banquet on Sunday. Fifty-mile boat cruise to French River on Monday. Information on accommodations and reservations can be obtained from Jack Barnaby, VE3TX, % Radio Station CFCH, North Bay, Ontario.

PENNSYLVANIA — Saturday, June 7th, at the W3PIE club grounds — the 1952 Gab-Fest of the Fort Necessity Amateur Radio Association. Refreshments, games, movies, and an auction. Bring your old gear. W3PIE is located 2 miles north of Uniontown off Route 51, and signs will be posted.

SASKATCHEWAN — Monday, June 30th, and Tuesday, July 1st, at Regina — the Annual Saskatchewan Hamfest. ARRL, SARL and AFARS meetings. Special program for the ladies. Banquet and dance on Monday evening. CKBI trophy, transmitter hunt, sports and games. Registration $3.00 per person. For reservations and information contact VE5TO, 211 York Apartments, Regina.

● See page 52 of this *QST* for detailed announcements of coming ARRL conventions.

Strays

Having troubles with your VFO? W9ICF says he changed his Hartley oscillator to a "Taft-Hartley" so it will no longer quit cold on him.

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W9KXG checked at random 100 QSL cards in his file dating back to 1931 to see if the operators still retain their calls. The *Call Book* revealed 48 clinging to their 20-year-old-plus call signs.

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What's in a name. . . ?

C. W. Hoffman, W2APU, is high on the DXCC 'phone roster. — *W2EEJ*

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Amateurs whose forte is light, compact portable equipment will be interested in transistor-technique progress reported by the Army Signal Corps. A "transistorized" radioteletype converter unit has been built which uses one-hundredth the current drain and weighs one-tenth as much as comparable vacuum-tube equipment now in service. Estimated life of the type of transistor used in the new converter is seven years for 24-hour-per-day use.

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A spokesman for General Electric points out a growing trend toward ceramic-and-metal vacuum tube envelopes for transmitting types in lieu of glass. Resistance to higher ambient temperatures, better resistance to shock and vibration, lower electrical losses and superior vacuums through use of higher possible exhaust-process temperatures are advantages claimed for the ceramic-and-metal construction.

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Articles published in *QST* invariably bring the authors considerable mail from readers desiring clarification or amplification on certain points. While such interest is always welcomed, authors are often hard put to handle such correspondence in volume. To expedite replies readers should:

1) enclose stamped self-addressed envelopes;

2) when using club stationery include the secretary's address;

3) sign their correspondence with full names and mailing addresses in addition to call signs;

4) stress legibility when handwriting.

Quist Quiz

A receives an **OO** report advising that his rig shows bad key clicks. **A** writes back to the Official Observer and accuses him of inaccurate observations — **A** has an r.f. filter across the key that took out every single click in the b.c. receiver in the next room, so he knows there are no clicks. Should the **OO** stick to measuring frequency?

(Please turn to page 52 for the answer)

A Beat-Frequency Exciter for Better C.W. Signals

Simplified Break-In with Good Keying Characteristics

BY F. A. BARTLETT,* W6OWP

• From time to time, the idea of the so-called "conversion" exciter is proposed as a solution to clean break-in keying without receiver interference. While the system appears to be almost ideal on paper and several highly-successful units have been built and operated on the air by experimentally-minded hams, for one reason or another it has never received the popular acceptance it deserves. In this article, W6OWP describes circuits which overcome the difficulties sometimes experienced with earlier designs.

IN c.w. work, the self-excited oscillator as a prime frequency source exhibits two major obstacles to good signal quality:

1) It is subject in varying degree to reflected load or feed-back from succeeding transmitter stages. This gives rise to chirp and other characteristics traceable to a change in frequency.

2) It cannot be keyed with sufficient shaping to assure freedom from clicks without chirping.

Much work has gone into development of means to overcome these inherent disadvantages. But, at best, these schemes are circumventive, calling for specialized keying systems and a high degree of oscillator isolation.

There is another approach to variable-frequency control that has as its basis the beat between two stable oscillators. This is the familiar heterodyne principle so widely used in receiver design. Applied to transmitter control, the heterodyne system permits the frequency-establishing circuits to function independently of the multiplier and power-amplifier stages of the transmitter. Output of the beat-frequency source is many kilocycles removed from, and bears no harmonic or incompatible phase relationship to, either of the two fundamental oscillator frequencies. Consequently, it is subject to far less loading reaction than the VFO of more conventional design.

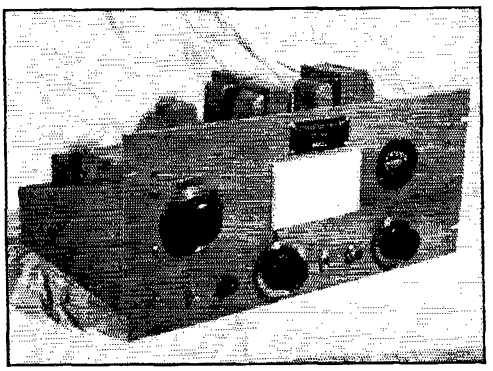
The absence of the reactive problem simplifies keying since the desired amount of shaping can be introduced without developing chirp. In addition, converter tubes of modern design make possible keying of the mixer stage with consequent freedom from key-up signal, although both oscillators run continuously.

* 2210 Cipriani Blvd., Belmont, Calif.

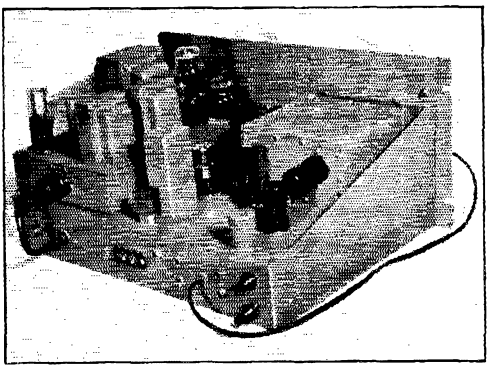
Circuit Development

Whenever two frequencies are combined in a nonlinear mixer circuit, two new frequencies or beats are produced. These are the mathematical sum and difference of the original two. If the oscillator supplying one initial frequency is fixed and the other made variable, both of the resulting beats will vary directly with changes in the variable-oscillator tuning. At this point, four frequencies are present — the two oscillator fundamentals plus the two beats. Suitable means must be employed to select the desired beat with rejection of the other frequencies. The basic components of a beat-frequency source are thus seen to comprise a fixed oscillator, a variable oscillator, a mixer and a frequency-selection system.

Early amateur development of the beat-frequency exciter was aimed primarily at a simple means of arriving at over-all stability through



The clean, professional-looking beat-frequency exciter built by Richard Hoeck W6RZL. This unit also includes a reactance tube for n.f.m., as well as provision for frequency-shift telegraph or teletype keying.



Rear view of W6RZL's exciter. The shielded compartment encloses the variable oscillator. The power supply is a detachable shock-mounted assembly. Octal, instead of miniature tubes, were used in this particular unit.

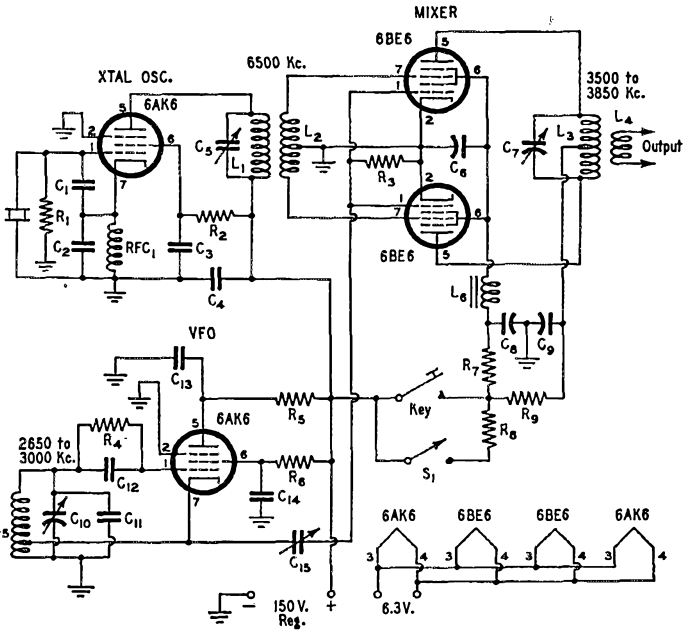


Fig. 1 — Circuit diagram of the basic beat-frequency source. Output from this unit will be low and an amplifier is recommended unless adequate buffer-doubler stages are already available.

C_1, C_2 — 57-$\mu\mu$fd. mica.
C_3, C_4, C_{12}, C_{13} — 0.01-μfd. disk ceramic.
C_5, C_{15} — 30-$\mu\mu$fd. trimmer.
C_6, C_8, C_9 — 0.1-μfd. 600-volt paper.
C_7 — 100-$\mu\mu$fd. variable.
C_{10} — 140-$\mu\mu$fd. variable.
C_{11} — 240-$\mu\mu$fd. silvered mica.
C_{14} — 100-$\mu\mu$fd. mica.
R_1 — 47,000 ohms, ½ watt.
R_2, R_3, R_5 — 10,000 ohms, 1 watt.
R_4 — 47,000 ohms, 1 watt.
R_5, R_9 — 470 ohms, ½ watt.
R_7 — 10,000 ohms, 10 watts.
R_8 — 3.9 megohms, 1 watt.
L_1 — 26 turns No. 24 d.c.c., ⅛-inch diam., close wound.
L_2 — 15 turns No. 24 d.c.c., center-tapped, wound over L_1.
L_3 — 32 turns No. 24 d.c.c., 1½-inch diam., close wound, center-tapped.
L_4 — 3 turns No. 18 hook-up wire wound over center of L_3.
L_5 — 19 turns No. 20 enam., 1¼-inch diam., 1 inch long, tapped 5 turns from bottom.
L_6 — Primary of 50L6 output transformer.
RFC_1 — 2.5-mh. r.f. choke.

use of a low-frequency variable oscillator beating with a much-higher-frequency crystal oscillator. The idea was that a low-frequency oscillator of high stability was much easier to build than the higher-frequency VFO of conventional exciters. There can be no argument with this premise. However, oscillator harmonics must be reckoned with. Where these are present, numerous direct or combination frequencies in addition to the desired beat may appear as unwanted "birdies" in the mixer output. The lower the frequency of the oscillator, the greater the number of harmonics which potentially may cause trouble. This factor probably accounts for the failure of earlier heterodyne exciters to gain much favor. Use of bandpass principles could be resorted to as a means of coping with the harmonic problem. But since keying and reaction difficulties are at a minimum, the building of a stable oscillator of a sufficiently high frequency range to avoid harmonic involvement is quite practical.

Space will not permit an analysis of the considerations involved in choosing workable combinations of variable-oscillator and crystal frequencies. But, in essence, the requirement is that no direct harmonic, or product of the mixing process involving harmonics, fall within the output range of the mixer. To cover the 80-meter c.w. band, a combination that fulfills this requisite is a variable oscillator tuning from 2650 to 3000 kc. in conjunction with a 6500-kc. crystal oscillator. The difference beat is utilized. Subtracting the variable-oscillator range from 6500 gives the resultant beat — 3850 to 3500 kc.

The principal frequencies which must be rejected in the mixer are those of the 2650- to 3000-kc. variable oscillator, the 6500-kc. crystal signal and the sum beat between the two oscillators occurring between 9150 and 9500 kc. In addition, there will be a number of harmonics and beats of lesser amplitude. With one exception, these frequencies fall remote from the mixer tuning range and may be disregarded. The exception is the 2650- to 3000-kc. variable-oscillator fundamental, which is close enough to the output frequency to be a possible source of spurious radiation. Suppression of this frequency in the mixer output is necessary.

A straightforward circuit that accomplishes this without recourse to bandpass filters or trap circuits is the so-called balanced-modulator type of mixer. In this particular adaptation, a pair of receiver-type pentagrid converter tubes (6BE6s) are connected with their plates in push-pull working into a 3.5- to 3.85-Mc. tank. Variable-oscillator drive is fed in parallel to the Number 1 (oscillator) pair of grids. The Number 2 (signal) grids are supplied push-pull drive from the crystal oscillator. In the push-pull output circuit, the variable-oscillator fundamental and harmonics are 180 degrees out of phase and are cancelled to negligible amplitude. The only signal present in the output range is desired difference beat. The tank tuning is set to this frequency.

This application of the balanced-modulator circuit stems from an earlier heterodyne exciter described by W1FMZ and W1BKO.[1] A typical

[1] Bliss and Bailey, "Heterodyne Exciter," *QST*, July, 1940.

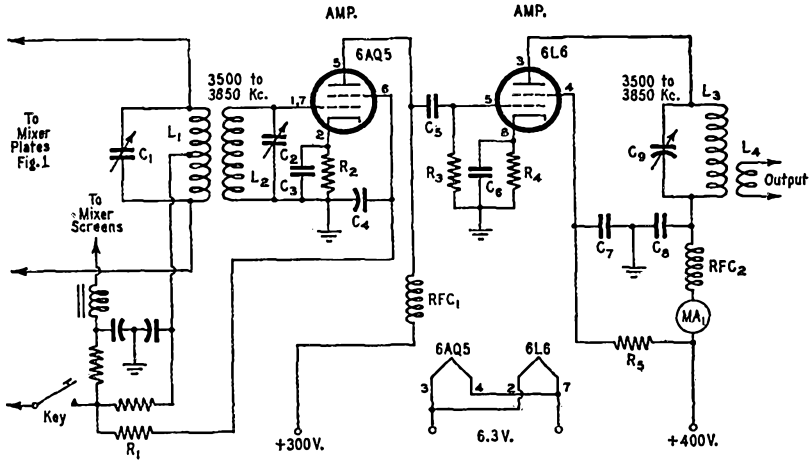


Fig. 2 — A stable output section giving sufficient boost in drive to handle a high-power beam final on the fundamental frequency. Note the bandpass coupler substituted for the mixer output circuit shown in Fig. 1. Use of the 6AQ5 untuned buffer is discussed in the text.

C_1, C_2 — 100-$\mu\mu$fd. trimmer.
C_3 — 100-$\mu\mu$fd. variable.
C_4 — 100-$\mu\mu$fd. mica.
C_5 — 0.1-μfd. 600-volt paper.
C_6, C_7, C_8, C_9 — 0.01-μfd. disk ceramic.
R_1 — 470 ohms, ½ watt.
R_2 — 470 ohms, 1 watt.
R_3 — 22,000 ohms, 1 watt.
R_4 — 600 ohms, 2 watts.
R_5 — 22,000 ohms, 2 watts.
L_1 — 32 turns No. 30 enam., in two equal sections 1½ inches apart on 1½-inch-diam. form.
L_2 — 26 turns No. 30 enam. wound in area between sections of L_1.
L_3 — 28 turns No. 14 enam., on 1¾-inch-diam. ceramic form.
L_4 — 3 turns No. 18 hook-up wire, wound at cold end of L_4.
MA_1 — 100-ma. milliammeter.
RFC_1 — 2.5-mh. r.f. choke.
RFC_2 — 1.5 mh. r.f. choke.

circuit is shown in Fig. 1. This represents one basic design for developing beat-frequency driving voltage. It should be emphasized that the output is rather low, and unless an adequate buffer-doubler section is already available, the addition of an amplifier will be necessary.

In Fig. 2 is shown a stable output section sufficient to drive a beam final to rated input on the fundamental frequency. As an added feature, a bandpass coupler [2] is incorporated in the mixer, thus making readjustment of this stage unnecessary over the range of operating frequencies. The 6AQ5 untuned buffer, although not strictly essential, provides a small amount of gain and eliminates need for neutralizing in the output stage, even when a poorly-shielded tube, such as the 6L6, is used. Nine times out of ten, substitution of an 807, or similar tube, for the 6L6, in Fig. 2 with the idea of eliminating the untuned buffer or avoiding neutralizing problems results in self-oscillation troubles. Unless the builder is one of those lucky few to whom the 807 bows in meek docility, the little buffer stage is highly recommended.

Construction Hints

Mechanical stability of the variable oscillator, its drift characteristics and freedom from a.c. ripple are just as much problems with the beat-frequency unit as they are in a conventional VFO. Attention paid to good design renders dividends in trouble-free performance. While the old reliable electron-coupled oscillator is diagrammed, this is purely a matter of individual preference. A vast amount of reference data on stable-oscillator construction can be found in a file of *QST*.

The crystal oscillator permits smooth variation of drive to the mixer by simply detuning the plate tank. In the circuit shown, the plate is not a functional part of the oscillator. A conventional tuned-plate oscillator could be substituted, but some difficulty in adjusting drive might be encountered. In either case, a center-tapped coupling coil furnishes push-pull input to the mixer.

It is suggested that the first step in construction be the building of the variable oscillator, followed by the crystal circuit, then the mixer and amplifier sections in that order. The proper functioning of each stage can be checked as construction progresses.

Individual shielding of the variable-oscillator and mixer coils is recommended. Where an amplifier section is incorporated, its output tank should be shielded from the preceding stages by a partition.

Keying

While the beat-frequency unit may be used exclusively as a source of variable-frequency drive, with keying done in a succeeding transmitter stage, the advantages of zero key-up signal without need for auxiliary switching should not be overlooked. This is, of course, a prime

(*Continued on page 108*)

[2] Chambers, "A Two-Control VFO Rig with Bandpass Exciter," *QST*, August, 1950.

A 432-Mc. Converter from the Gold-Plated Test Oscillator

Stable Weak-Signal Reception at Moderate Cost

THE war-surplus unit that forms the basis for this converter has been one of those things that many hams bought simply because they couldn't resist such a beautiful gadget at so low a cost. What to do with it was something else again. So many inquiries have come in to ARRL Headquarters saying, in effect, "What can I do with this thing?", that when we heard that Carl Pierce, W1HDF, had built a 432-Mc. converter from one of them we went right after him for the details.

This is not a surplus-conversion article. Rather, it is a description of a smooth-working u.h.f. converter that only incidentally makes use of the box and some of the components of the TS-1/ARRI portable test oscillator, commonly called the "gold-plated special" in the surplus trade. Anyone interested in better 420-Mc. reception will find useful ideas in it, even if he does not follow W1HDF through on all the details.

For some time it has been obvious that it is well-nigh impossible to cover the entire thirty megacycles of the 420-Mc. band with a single tuning mechanism when a selective i.f. system is used. The kilocycles go by too fast to make tuning this much range a practical matter with communications receiver selectivity, yet such selectivity is necessary if we are to attain the maximum signal-to-noise ratio. Thus, by mutual agreement among 420-Mc. enthusiasts, use of crystal-controlled transmitters and selective receivers is largely confined to that portion of the band between 432 and 436 Mc.

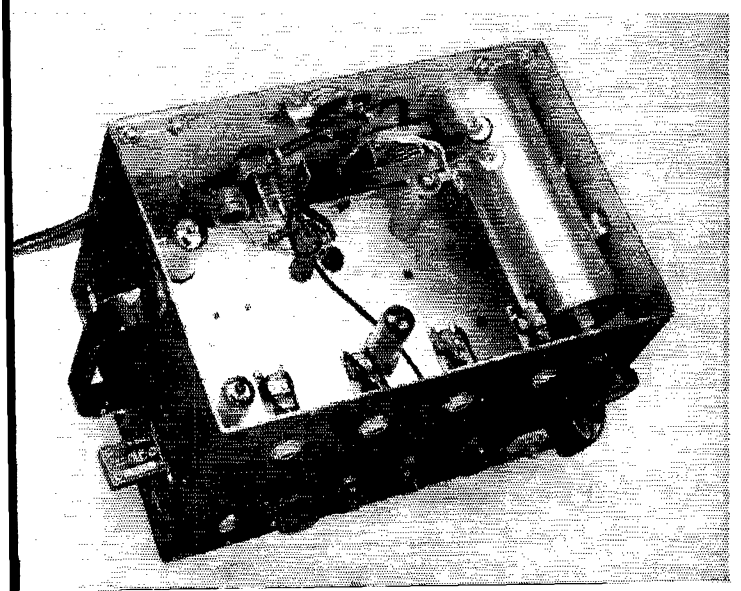
This makes possible the employment of a crystal-controlled injection source in the 432-Mc. converter. Only four megacycles need be tuned by the i.f. system, which can very well be another converter for any of the ham bands from 28 to 220 Mc. With the converter described, W1HDF uses a 50-Mc. converter [1] which is, in turn, also crystal-controlled. The tunable i.f. system is a communications receiver tuning from 7 to 11 Mc. With this combination, a crystal-controlled signal on 432 to 436 Mc. tunes in exactly the same as one on 7 Mc. If you have spent a few years struggling with tunable oscillators on the v.h.f. and u.h.f. bands, this is quite an experience!

Circuit Details

The complete converter will not be described in minute how-to-build-it detail, as it is assumed that anyone willing to tackle such a project will be sufficiently well-informed in receiver matters to make use of ideas, briefly outlined. Basically, the converter consists of a push-pull grounded-grid r.f. stage, a crystal mixer with a coaxial tank circuit, an overtone oscillator and frequency multiplier chain, and an i.f. amplifier stage on 50 Mc.

The case of the surplus bargain is used, as is the beautifully-made coaxial-line assembly. An aluminum shelf that is part of the original case serves admirably for a chassis, so that only a couple of simple aluminum shield plates need be made. Looking into the top, the mixer tank circuit is seen at the right. In the upper left corner is the 12AT7 r.f. amplifier, with the two 6J6s that supply the injection voltage at the lower left and center. The i.f. amplifier circuits and a crystal-current jack are on the back wall of the case. Across the front wall are four jacks for metering the plate current in the oscillator and multiplier stages, and the controls for these stages and the r.f. amplifier. In the bottom view,

[1] Tilton and Chambers, "Crystal-Controlled Converters for V.H.F. Use," Sept., 1950, *QST*, p. 11. Also, 28th and 29th editions, *The Radio Amateur's Handbook*, Chapter 16.



Top view of the W1HDF 432-Mc. converter, with cover removed. The coaxial line mixer tank is at the far right. The tube in the upper left corner is the 12AT7 r.f. amplifier. The two 6J6s, lower left and center, comprise the injection chain.

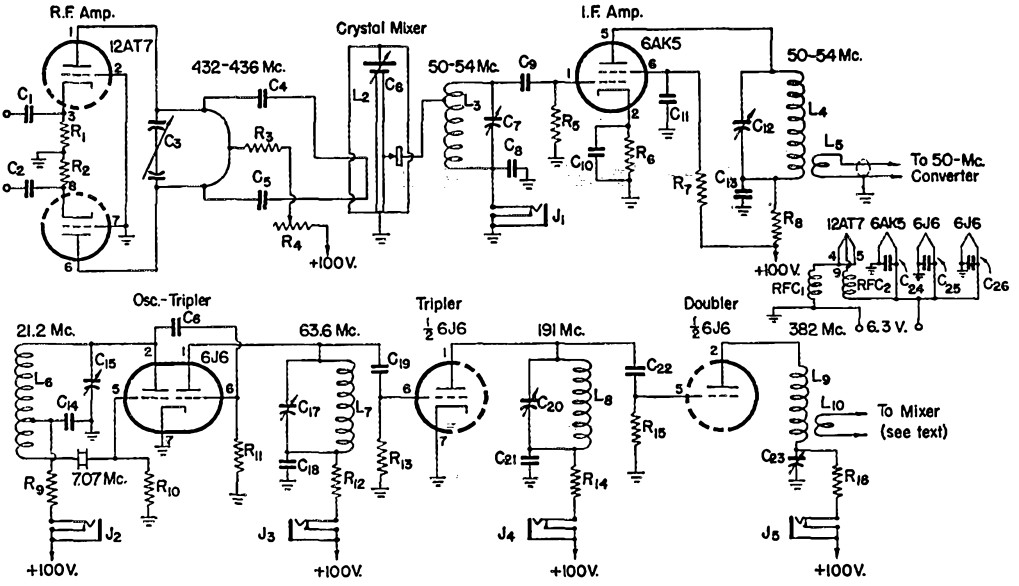


Fig. 1 — Schematic diagram of the 432-Mc. converter built by W1HDF.

C_1, C_2 — 50-$\mu\mu$fd. ceramic. May be omitted if antenna is not grounded.
C_3 — Remodeled miniature split-stator variable. See text.
C_4, C_5 — 30-$\mu\mu$fd. ceramic.
C_6 — Part of coaxial line assembly. See text.
C_7, C_{12} — 15-$\mu\mu$fd. trimmer.
C_8, C_{10}, C_{11}, C_{13}, C_{14}, C_{18}, C_{21} — 0.005-μfd. disk ceramic.
C_9 — 0.001-μfd. disk ceramic.
C_{15} — 100-$\mu\mu$fd. trimmer.
C_{16}, C_{19}, C_{22} — 20-$\mu\mu$fd. ceramic.
C_{17} — 15-$\mu\mu$fd. miniature variable (Johnson 15M11).
C_{20} — 5-$\mu\mu$fd. miniature variable (Johnson 5M11).
C_{23} — 20-$\mu\mu$fd. miniature variable (Johnson 20M11).
R_1, R_2 — 100 ohms, ½ watt.
R_3, R_7, R_8, R_{12}, R_{14} — 470 ohms, ½ watt.
R_4 — 50,000-ohm potentiometer.
R_5, R_{13}, R_{15} — 82,000 ohms, ½ watt.
R_6 — 220 ohms, ½ watt.
R_9, R_{10}, R_{11}, R_{16} — 10,000 ohms, ½ watt.
L_1 — U-shaped brass strip, 5/8 inch wide, sides 1 7/8 inches long and 3/8 inch apart. Replaces stator plates of C_3 — see text. C_4 and C_5 connected 3/8 inch from closed end of U.
L_2 — Coaxial-line assembly. Outer conductor cut down to 5½ inches long — Inner 4¾ inches.
L_3 — 5 turns No. 20, 5/8-inch diam., spaced wire diam. (B & W Miniductor No. 3007). Tapped 1 turn from top.
L_4 — 7 turns No. 3007.
L_5 — 2 turns No. 22 d.s.c. at cold end of L_4.
L_6 — 9 turns No. 3007, tapped at third turn from crystal end.
L_7 — 5 turns No. 20, ½-inch diam., spaced wire diam. (B & W Miniductor No. 3003).
L_8 — 2 turns No. 18, 3/8-inch diam., spaced wire diam.
L_9 — 3 turns No. 16, ¼-inch diam., turns spaced ⅛-inch.
L_{10} — 1 turn insulated wire cemented between turns of L_9. Leads twisted to form link which is wrapped around coupling loop in L_2.
J_1–J_5 — Closed-circuit jack.
RFC_1, RFC_2 — Bifilar-wound r.f. chokes made from two pieces of No. 22 d.s.c. twisted together and wound into one unit of 10 turns, 5/16-inch diam.

the oscillator components are in the upper left compartment and the multiplier circuits are across the top of the picture. The r.f. amplifier is at the lower left. The shielded tube near the lower center is the 6AK5 i.f. amplifier.

The injection source consists of a pair of 6J6s. The first is an oscillator-multiplier, using the third overtone of a 7-Mc. crystal, tripling in the other half of the dual triode. The second 6J6 triples and doubles to 382 Mc., the last circuit being series-tuned. This 54 times multiplication of the crystal frequency in two tubes may seem like quite a feat, but actually the small amount of r.f. required by the crystal mixer is easily developed, and the stages run very lightly at 100 volts on their plates. L_{10} is a loop in the end of a twisted pair, cemented between the turns of L_9. The leads are wrapped around the Twin-Lead link between the r.f. and mixer stages, with no electrical connection. Only 0.5 ma. of crystal current is required for full mixer output.

The mixer tank circuit requires some mechanical work. The outer conductor is cut down to 5½ inches and the inner conductor to 4¾ inches. The cutting is done at the bottom end, leaving the tuning mechanism at the top end for future use. The disk on the end of the inner conductor is cut down to about 1 inch in diameter to reduce the minimum capacitance. The crystal taps into the inner conductor 1½ inches up from the bottom. If radar-type crystals (1N21, etc.) are used, the small end contacts the inner conductor. An insulating sleeve is provided around the large end to keep it from touching the outer conductor. Spring tension to hold the crystal in place is provided by a small piece of spring bronze, which is mounted on an insulating pillar alongside the tank circuit. Coupling into the tank circuit is done with a loop of insulated wire about one inch wide, brought out through two feed-through bushings about one and two inches up from the bottom of the line.

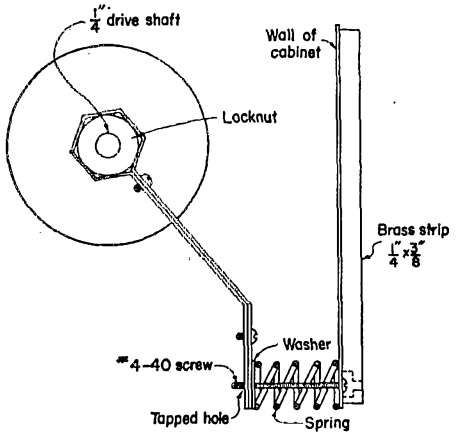


Fig. 2 — Details of the tension adjustment for the lock nut on the crystal-mixer tuning assembly.

Unlike equipment involving tunable oscillators, no particular attention need be paid to prevention of vibration. There's nothing in this converter that can cause fluttery signals. A neat bit of gadgetry is used to set up the lock nut on the coax-line tuning adjustment, however. The mixer tank circuit requires some retuning across the four megacycles tuning range, and this is done, of course, with the built-in capacitor in the end of the assembly. The adjusting screw was fitted with a quarter-inch drive shaft so that it could be turned with a knob from the front of the converter. It was then desirable to provide some sort of tension adjustment, as the lock nut could not be set in a position that would provide tight contact, and still permit rotation of the adjusting screw.

The way this problem was solved is shown in Fig. 2. A strip of brass was bent to fit around the lock nut. Its two sides were screwed together and bent in the shape shown, to provide a lever for turning the lock nut a small amount. A captive-head screw made by drilling out a strip of brass, as shown in the drawing, was fitted with a spring and washer to provide tension. Turning the screw moves the lock nut enough to set it up tight or loosen it to permit easy turning, if the initial position of the nut is set carefully.

Adjustment and Operation

To put the converter in service, first get the oscillator and multiplier stages working properly. Adjustment of overtone oscillators has been covered many times in *QST* [2] and the *Handbook*,[3] so it will not be repeated here in detail, except to say that in this instance the plate voltage and plate current will be lower than in transmitting applications. Each stage in the injection line-up will draw not more than 4 or 5 ma. Adjust C_{15} to the point where the oscillator will start each time plate voltage is applied, and tune the succeeding two stages for minimum plate current. There will be little or no dip in the 382-Mc. stage, so C_{23} should be tuned for maximum crystal current initially.

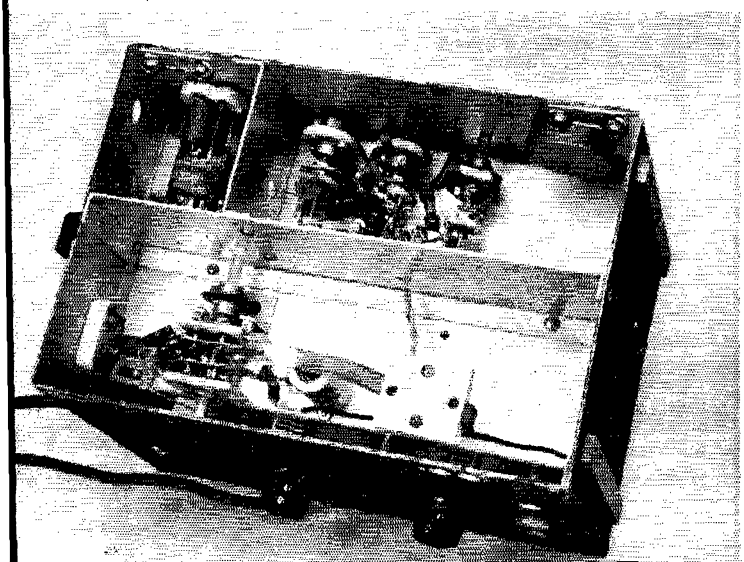
From here on, some sort of signal is almost a necessity. This can be provided by the harmonic of a transmitter on some lower frequency, though it is easy to land on the wrong frequency by this method. A low-powered 432-Mc. oscillator set up to run continuously at a distance that will provide a suitably-weak signal is very helpful, if no amateur signals in the 432–436 Mc. range are available. The mixer tank circuit should be adjusted by putting an antenna on the input loop and tuning for maximum signal, or the injection can be removed and the mixer tuned for maximum crystal current from a near-by 432-Mc. transmitter.

Next check the operation of the r.f. stage. It will be noted that a potentiometer is provided for adjusting the plate voltage on the 12AT7. This is required to prevent oscillation that is almost certain to show up with this sort of r.f. amplifier when it is operated at full plate voltage. The setting should be the highest voltage at which the amplifier operates stably, which may be not more than 40 or 50 volts. Even at this low voltage there is a marked improvement in sensitivity when the r.f. amplifier is used, compared to that obtainable with the mixer alone.

(Continued on page 112)

[2] Tilton, "Overtone Crystal Oscillator Circuits," April, 1951, *QST*, p. 56.

[3] *The Radio Amateur's Handbook*, 28th and 29th editions, Chapter 17.



Looking into the bottom of the 432-Mc. converter, we see the r.f. amplifier components in the large compartment. The shielded tube is the 6AK5 i.f. amplifier. Oscillator and multiplier circuits occupy the two upper sections.

A Three-Band 40-Watt Mobile Transmitter

Featuring Quick Band Change and Crystal Switching

BY BERT N. HAYHURST,* W8IZQ

THE three-band pretuned automatic band-change mobile transmitter to be described is the product of two years' concentration on the subject by Toledo hams. Much credit is due W8HSW, W8QUO, W8TKS and W8UEL for their coöperation in arriving at the final design.

At first, VFO operation was considered, but it was finally decided that crystal control was better for fixed-frequency net operation and all-around reliability of communication. The principle of using common tubes and switching tuned circuits was discarded in favor of separate transmitters for each band, with a common speech amplifier and modulator. This insures optimum r.f. performance on each band and also simplifies the switching problem, since to change bands it is only necessary to turn on the filaments of the desired r.f. section. Although this band change is not instantaneous, the 15 seconds of warm-up time is used up in changing over the receiving converter.

The complete diagram of a 10-, 20- and 75-meter mobile transmitter is shown in Fig. 1. Although clamp-tube modulation is shown in this version, plate modulation by Class B amplifiers has been used in two of the units built locally. Plate modulation increases the power-supply demand, of course, along with the increase in power output. As can be seen from the diagram, each r.f. section uses a 7C5 or 6AG7 crystal oscillator to drive an 807 output stage. Fundamental crystals are used in the 75-meter band, and 7-Mc. crystals are used in the other sections, doubling or quadrupling in the oscillator stage as required. A 3-section Ledex rotary-solenoid switch, S_1, controlled from the dashboard, selects any of four crystals as desired, and another Ledex rotary switch, S_2, selects the heater circuits for the desired r.f. section. This second rotary switch is therefore the "band-change" switch, and in turning on the proper heater circuit it also switches the antenna to the desired r.f. unit. In the 20- and 10-meter positions, a Mallard Hi-Q base-loading coal is shorted out by Ry_2. On any band, the receiver is connected to the antenna through a tap on the output coil.

The transmitters are pretuned and not reset when the crystals are switched. This has not been found to be any particular disadvantage, and permits a frequency change of about 40 kc. at 75 meters, 80 kc. at 20, and 200 kc. at 10. The circuits are peaked for the midfrequency in each band.

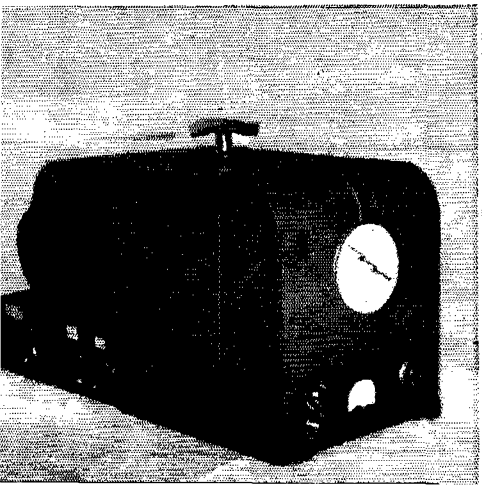
The transmitter, with audio equipment and Eicor Dynamotor power supply, is built on an 8 × 17 × 3-inch chassis. Plenty of room is available for the dynamotor, relays, solenoids, meters, jacks, eight tubes, three tank sections and twelve crystals involved, although this chassis is only 3 inches longer than that used formerly to accommodate a converted one-band police transmitter. The oscillator slug-tuned coils (five in all) are mounted underneath the chassis and tuned from above. The output tank coils and condensers are mounted on the top of the chassis, as is the crystal-socket strip. Both rotary solenoid switches are mounted underneath the chassis, one under the crystal-socket strip and the other underneath the output tank circuits. Power- and control-cable sockets are mounted on one side of the chassis, together with an auxiliary-power socket for operating the rig from another "B" supply when the transmitter is not in the car. A metal cover shields the rig and protects it from physical damage in the luggage compartment.

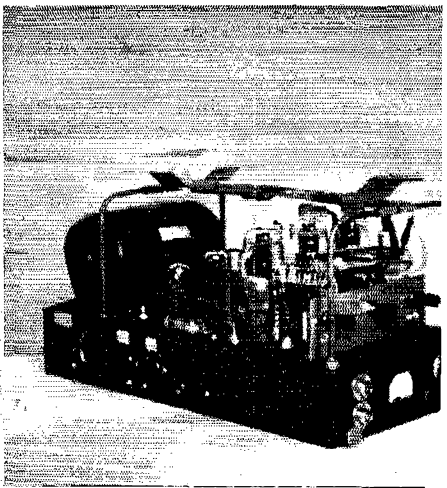
Tune-up and Loading

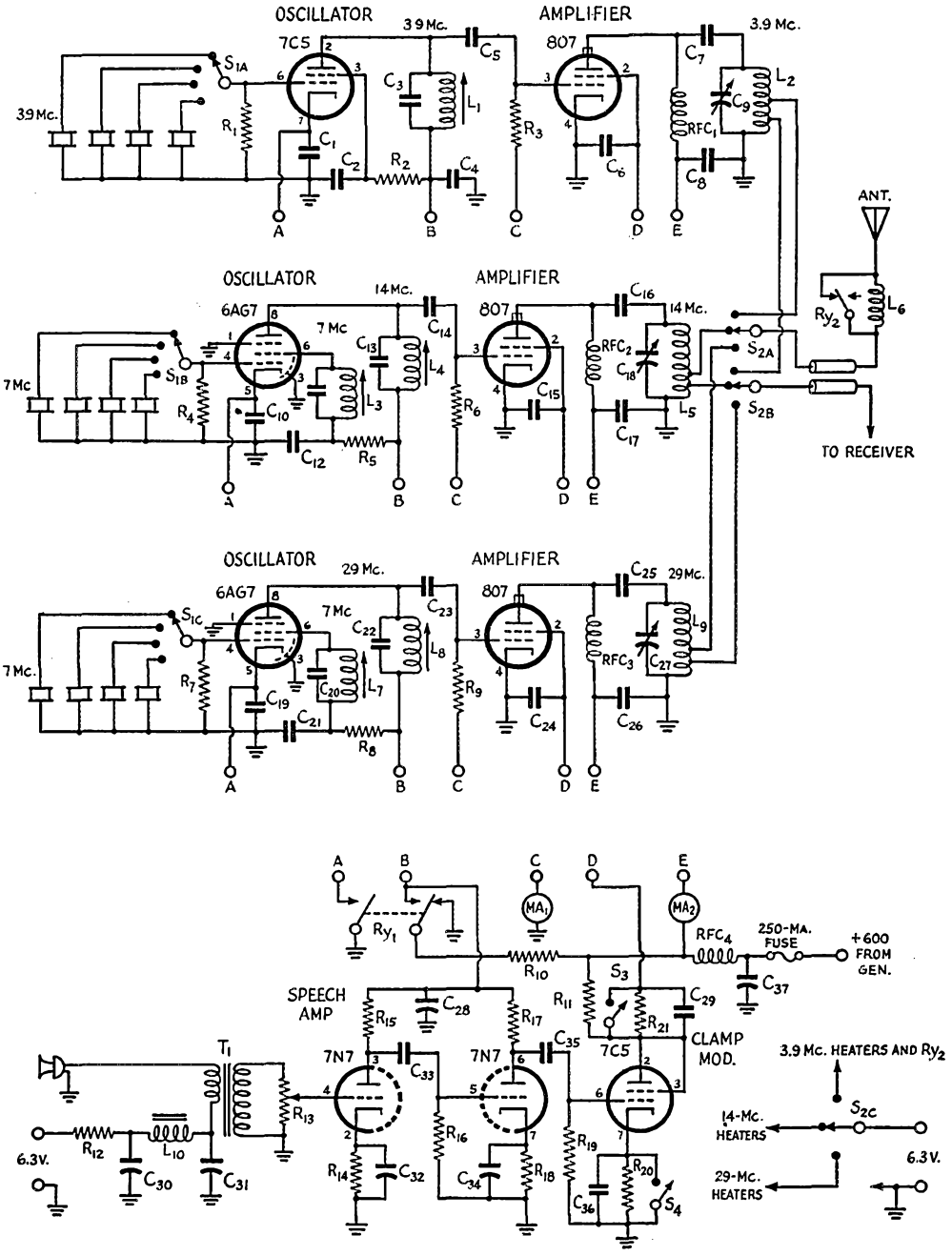
Using the values shown in Fig. 1, the grid current in the 807 output stage runs about 3 ma.

* 1873 Atwood Road, Toledo 7, Ohio.

Views of the three-band mobile transmitter. The design is unusual in using a separate r.f. section for each band, with a common modulator and power supply. A solenoid-actuated band-change switch connects the antenna and the heater supply to the proper r.f. section. Another solenoid-actuated switch selects any one of four crystals.







when the oscillator circuits are tuned properly. When properly loaded, the output-stage plate current runs about 80 ma. on 10 and 20 meters and 60 ma. on 75 meters, depending somewhat upon the clamp-tube bias setting.

The switches, S_3 and S_4, are closed during the preliminary tune-up, which consists of getting the proper drive to the 807 grid and loading the plate circuit as heavily as possible without losing output. The switches are then opened and R_{20} adjusted to give a plate current of half of the previous value. The gain control, R_{13}, is then set where voice peaks will just begin to kick the plate current. Modulation checks with an oscilloscope indicate modulation percentages of over 80 per cent, and this value was considered to be satisfactory.[1]

Several methods were tried for using the 86-

[1] See "Clamp-Tube Modulation," *QST*, March, 1950, page 46. — *Ed.*

Fig. 1 — Wiring diagram of the three-band mobile transmitter.

C_1, C_2, C_{10}, C_{19}, C_{33}, C_{35} — 0.01-μfd. paper.
C_3 — 75-μμfd. ceramic.
C_4, C_{12}, C_{21} — 0.002-μfd. ceramic.
C_5 — 100-μμfd. ceramic.
C_6, C_{11}, C_{13}, C_{14}, C_{15}, C_{20}, C_{22}, C_{23}, C_{24} — 47-μμfd. ceramic.
C_7, C_{16}, C_{25} — 0.001-μfd. mica, 1000 volts.
C_8, C_{17}, C_{26} — 0.002-μfd. mica, 1000 volts.
C_9 — 100-μμfd. variable.
C_{18}, C_{27} — 50-μμfd. variable.
C_{28} — 30-μfd. electrolytic, 450 volts.
C_{29} — 1-μfd. paper.
C_{30}, C_{31} — 100-μμfd. 25-volt electrolytic.
C_{32}, C_{34} — 10-μfd. 50-volt electrolytic.
C_{36} — 0.1-μfd. paper.
C_{37} — 2 μfd., 100 volts.
R_1, R_2 — 82,000 ohms.
R_3, R_6, R_9 — 27,000 ohms, 2 watts.
R_4, R_7 — 47,000 ohms.
R_5, R_{21} — 22,000 ohms.
R_8, R_{14}, R_{18} — 1500 ohms.
R_{10} — 6000 ohms, 20 watts.
R_{11} — 40,000 ohms, 25 watts.
R_{12} — 100 ohms.
R_{13} — 0.1-megohm volume control.
R_{15}, R_{17} — 0.1 megohm.
R_{16}, R_{19} — 0.47 megohm.
R_{20} — 3500-ohm 10-watt adjustable.
All resistors 1-watt unless specified otherwise.
L_1 — 45 t. No. 28 enam. on National XR-50 form.
L_2 — 45 t. No. 18, space-wound, 1-inch diam.
L_3, L_7 — 30 t. No. 24 enam. on National XR-50 form.
L_4 — 13 t. No. 18 space-wound on XR-50 form.
L_5 — 14 t. No. 16, space-wound, 1-inch diam.
L_6 — 75-meter base-loading antenna coil (Mallard Hi-Q75).
L_8 — 6 t. No. 18, space-wound on XR-50 form.
L_9 — 7 t. No. 16 space-wound, 1-inch diam.
L_{10} — 3.5-henry 200-ohm choke.
RFC_1, RFC_2, RFC_3 — 2.5-mh. r.f. choke.
RFC_4 — 20 turns No. 16 enam., ¼-inch diam.
S_1, S_2 — Solenoid-operated rotary switch (Ledex).
S_3, S_4 — S.p.s.t. toggle.
Ry_1 — D.p.d.t. relay, 6.3-volt winding.
Ry_2 — S.p.s.t. relay, 6.3-volt winding.

inch whip antenna on the three bands before arriving at the one shown in Fig. 1. However, base loading with the Mallard coil on 75 and feeding straight through on 10 and 20 seems to be a simple and happy compromise. Stopping the car and retuning the antenna through clip-on leads or the insertion of another loading coil is time-consuming and perhaps not worth the time or effort for mobile QSOs.

The relay in the oscillator cathode circuit permits quick break-in and is used for emergency c.w. keying via the microphone push-to-talk button, with speech and modulation removed. Separate contacts on the same control relay ground the 600-volt line through R_{10}, thus quickly bleeding the dynamotor during its coasting period.

The receiver at W8IZQ/8 consists of a Gonset Tri-Band converter into the Philco radio of a 1947 Studebaker. Optimum hamband reception is obtained by pretuning the converter antenna through the transmitter tank coils as shown. The tap point is selected by experimentation. A d.p.d.t. relay disconnects the receiver antenna lead and opens the converter B+ during transmission periods.

There are now four of these mobile transmitters in operation in this area, two with Class B modulators and two with clamp-tube modulation.

New Propagation Forecasts from WWV

Beginning July 1st, the National Bureau of Standards will broadcast new short-wave radio-disturbance forecasts via the NBS standard-frequency broadcasting station WWV — on standard frequencies 2.5, 5, 10, 15, 20 and 25 Mc. — to replace the radio-disturbance warning notices that have been transmitted by WWV since 1946. The broadcasts will tell users of radio transmission paths over the North Atlantic the condition of the ionosphere at the time of the announcement and also how good or bad communication conditions are expected to be for the next 12 hours.

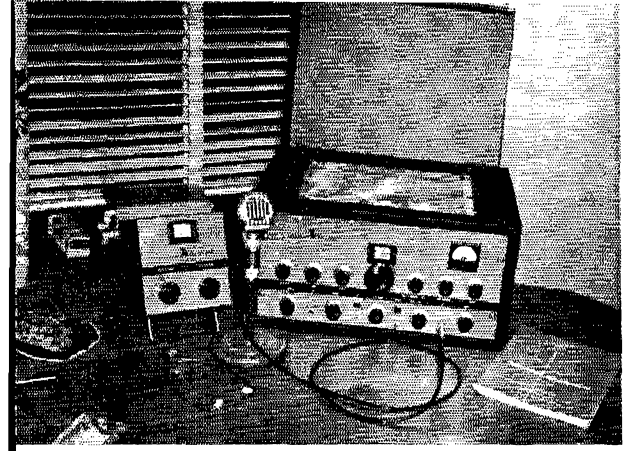
Prepared four times daily — at 0500, 1130, 1700 and 2300 GCT — these forecasts will be transmitted in code at 19½ and 49½ minutes past the hour. Each forecast statement will be broadcast by WWV for a period of about six hours until the next forecast is made. Thus the forecast prepared at 1700 will be first broadcast at 1719½ and then at half-hourly intervals through 2249½. The broadcast at 2319½ will then carry the next disturbance forecast issued at 2300.

As in the past, the notices will include a letter indicating present radio reception conditions. However, the new notices will also contain a digit indicating the expected quality of *future* reception. As before, the letters used will be N, U and W, signifying that radio propagation conditions are normal, unsettled, or disturbed, respectively. The added digit will be the forecast of expected quality of communications conditions on the NBS-CRPL scale of 1 (impossible) through 9 (excellent). The complete scale follows:

Digit (Forecast)	*Propagation Condition*	*Letter (Current)*
1	Impossible	W
2	Very Poor	W
3	Poor	W
4	Fair to Poor	W
5	Fair	U
6	Fair to Good	N
7	Good	N
8	Very Good	N
9	Excellent	N

If, for example, propagation conditions at the time the forecast is made are normal but are expected to be only "fair to poor" within the next 12 hours, the forecast statement would be broadcast as "N4" in code, repeated five times. As another example, a forecast statement of "W5" issued at 0500 means that at 0500 the conditions across the North Atlantic path were disturbed but that in the period 0600–1800 the average of conditions is expected to improve to "fair."

The new NBS radio disturbance forecasts refer only to North Atlantic paths, such as Washington to London or New York to Berlin. One purpose of broadcasting both a current description and a forecast is to show more clearly whether propagation conditions are expected to deteriorate or improve within the next 12-hour period concerned. See Jan., 1952, *QST*, p. 116, for WWV-WWVH schedules and announcement procedure.



After thorough shielding and filtering, the original appearance of the transmitter is preserved. No attempt was made to use the existing case as a shield; instead, a complete new shield made from copper screen is installed as part of the panel-chassis assembly. The low-pass filter is mounted on the back of the cabinet.

TVI-proofing the Viking I

Shielding and Filtering for Harmonic Reduction

BY PHILIP S. RAND,* W1DBM

THIS project was undertaken to answer a large number of requests for specific information on TVI-proofing the popular Johnson Viking I Transmitter, as well as to prove once again that harmonic-type TVI can be 100 per cent eliminated even in a bandswitching transmitter covering from 10 through 160 meters.

For those who still maintain voluntary quiet hours in preference to cleaning up their transmitters because it is supposed to be such a time-consuming job, let me point out that it took exactly one Sunday morning to do the necessary filtering and by-passing and another Sunday morning to install the additional shielding. (The entire project lasted for several months because some 500 tabulations were made of picture quality and harmonic field strengths on 12 TV channels from six different amateur bands before TVI-proofing, after filtering and after shielding, on two different types of transmitting antennas, both with and without low-pass filters. But the actual work on the transmitter only took a total of about 8 hours.)

The only tools required for the complete job, which was done right in the living room, are as follows: screwdriver, hammer, long-nose pliers, diagonal side cutters, hand drill, small soldering iron, heavy-duty soldering iron, and an old pair of scissors (or tin shears).

In addition to the list of parts shown in Fig. 2, the material required includes a piece of 16-ounce copper flashing, 14 inches wide and 6 feet long, a few square feet of bronze window screening, a box of No. 6 self-tapping sheet-metal screws, and a roll of rosin-core solder.

Sounds easy? Well, it was! It was fun, too; and think of the satisfaction of having no TVI even on your own TV set. Operate on any band at any time the spirit moves you — with no gripes from the XYL or junior operator.

*C/o Laboratory of Advanced Research, Remington Rand Inc., South Norwalk, Conn.

Procedure in a Nutshell

Those who expect to find a new secret method of harmonic elimination in this article are doomed to disappointment, because the TVI-elimination procedure used is that explained in my booklet, *Television Interference:*[1]

1) The TV receiver was protected by both an a.c. line filter and a high-pass filter, as shown in Fig. 1 (pages 37 and 38).[2]

2) The remaining TVI was compared with the chart on page 42 and the photo on page 49. This established the fact, by the absence of interference on channels not in harmonic relationship to the transmitter frequency, that the remainder was entirely harmonic.

3) A resonance at 84 Mc. (Channel 6) was discovered and corrected (page 16).

4) Harmonic-carrying wires or leads in the Viking were filtered and the by-passing improved (page 21).

5) The shielding was improved (page 29).

6) A low-pass filter was installed (page 19) in a *flat* (s.w.r. 1 to 1) 52-ohm coax line.

Result: No TVI on any channel from any band.

Preliminary Checks

The Viking was delivered completely wired in accordance with the kit instructions, and a couple of weeks of operation on all bands indicated that it was remarkably free from TVI in its original condition without even a line filter. Only one complaint was received, from a neighbor with a Philco, and this proved to be fundamental overload. Of course, the transmitter did put harmonic cross-hatching in my own TV set, a 1951 17-inch RCA, as indicated in Table I.

In general, the Viking held its own on every

[1] If there are any active hams who still do not have a copy, information on how to get one is given on page 116, February, 1952, *QST*. — *Ed.*

[2] Page numbers refer to the booklet *Television Interference.*

TABLE I

Viking I Transmitter Before TVI Treatment

TV Channel	28.5 Mc.				14.25 Mc.				7.125 Mc.		3.562 Mc.				1.805 Mc.			
	COAX		LW		COAX		LW		LW		COAX		LW		COAX		LW	
	E	F	E	F	E	F	E	F	E	F	E	F	E	F	E	F	E	F
2	M	H	M	N	M	M	M	H	VL	M	C	L	C	VL	C	C	C	C
4	C	C	C	C	C	L	C	MH	C	M	C	M	C	L	C	C	C	C
5	VL	VL	VL	M	M	MH	M	H	L	M	C	L	C	L	C	C	C	C
6	N	NP	N	NP	N	NP	N	NP	N	NP	C	L	L	N	C	C	C	C
7	C	C	C	C	VL	VL	M	MH	VL	VL	C	C	C	C	C	C	C	C
9	C	C	C	C	C	C	C	VL	C	C	C	C	C	C	C	C	C	C
11	M	H	L	N	C	L	C	H	C	L	C	C	C	VL	C	C	C	C
13	N	NP	N	NP	M	NP	M	NP	C	L	C	L	C	C	C	C	C	C

VL — Very Light Cross-hatching
L — Light Cross-hatching
M — Medium Cross-hatching
MH — Medium Heavy Cross-hatching
E — Exciter Only
F — Final Amp. on
H — Heavy Cross-hatching
N — Negative Picture
NP — No Picture
C — Clear of TVI
LW — Long-Wire Antenna

Notes: TVI worse with c.w./'phone switch in c.w. position, no key in jack.
TVI worse with meter switch in final plate position.

band with transmitters in the same general power class. The only complaints were not quite enough grid current for the final when on 10 and 11 meters and the fact that the buffer tuning dial and shaft were hot with r.f. on the same bands. Just touching the dial skirt would change the grid current several milliamperes. Both of these defects automatically cleared up during the TVI-proofing.

A study of Table I reveals two interesting points that need emphasizing:

1) Antennas fed with 52- or 75-ohm coax cable were a great deal better on every band, so far as TVI and BCI were concerned, than a random-length long-wire antenna fed with the pi network of the Viking.

2) TVI was consistently worse on Channel 6 regardless of the band in use.

TVI Considerations

The general measures employed in TVI-proofing the Viking are the same as repeated over and over in my TVI book and in practically every article ever written on the subject. They not only apply to the Viking but to every transmitter, electronic heater, diathermy apparatus and even to oscillator radiation from receivers.

They are:

1) Reduce the generation of harmonics as much as possible by eliminating undesirable secondary resonances in the tuned circuits, and by choosing operating conditions that minimize the generation of harmonics.

2) Use proper by-passing and filtering of wires that might carry harmonics all over the chassis in an effort to confine them to their source.

3) Filter every single wire that leaves the chassis right at the point it leaves, to prevent conducting harmonics out into the open where they can be radiated.

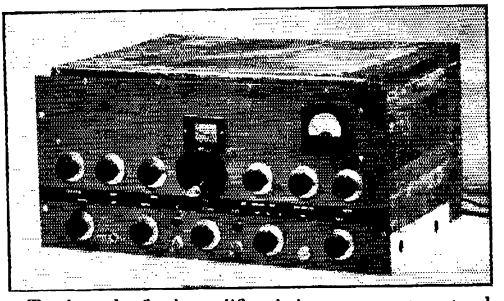
4) Use complete shielding so that all r.f., including harmonics, is confined to the inside surface of the shielded enclosure.

5) Use a low-pass filter in a flat coax line to feed the antenna, either directly or through an antenna coupler.

Up till this year, protecting the TV receiver has been one of our major problems. Fortunately, all the major TV manufacturers now will install high-pass filters when the TVI is caused by the transmitter's fundamental. In stubborn cases it is sometimes also necessary to build in an a.c. line filter and to provide a bottom pan on the chassis.

The first thing to do, of course, is to protect your own TV set with a high-pass filter and an a.c. line filter. Suitable filters are shown in Fig. 1. You are then ready to tabulate your harmonic-type TVI as shown in Table I. This will not only give the over-all picture before TVI-proofing, but will also point out any particular channel that gets hit with an unusually strong harmonic.

In our case Channel 6, 82–88 Mc., was the bad actor, so we went exploring with the grid-



To clear the final amplifier, it is necessary to extend the shielding beyond the top of the panel. The corners are made from flashing copper, held to the chassis and panel with sheet-metal screws. Copper screening is soldered to the copper corners.

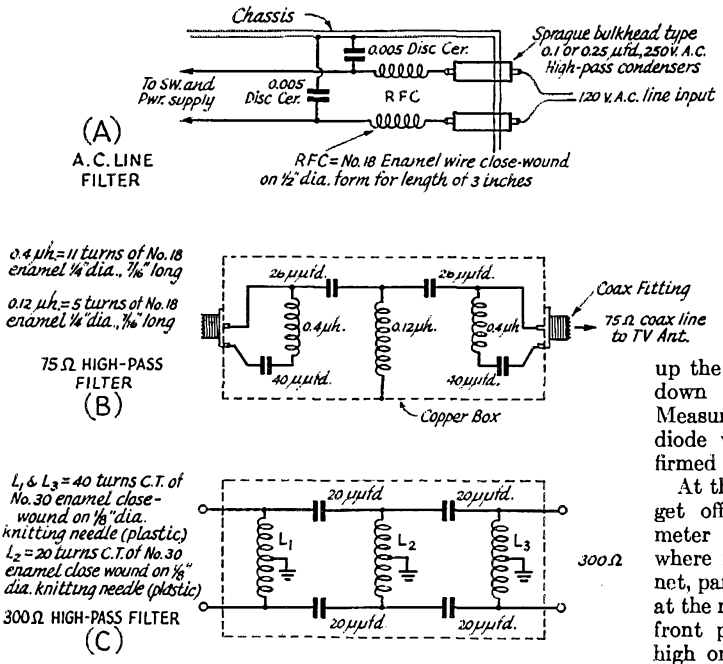


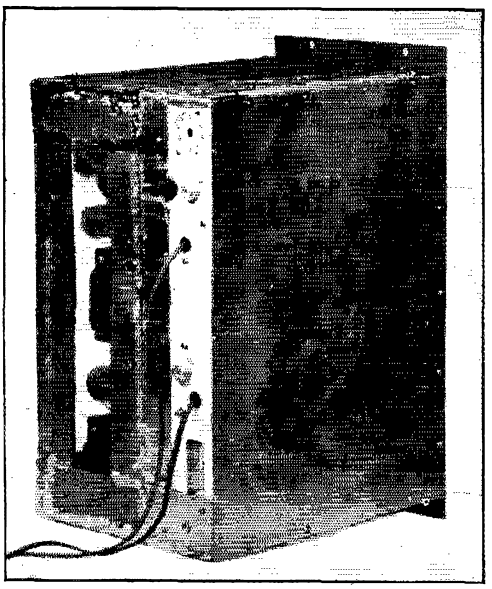
Fig. 1 — **High-pass and power-line filters used in the TV receiver. The same constants were used in modifying the Simpson field-strength meter as described in the text.**

♦

dipper and found a beautiful resonance in the plate-lead circuit of the 6AQ5 buffer stage at 84 Mc. This resonance remained regardless of the band or the setting of the tuning condenser and was the reason for the bad harmonic on Channel 6.[3] Not being able to shorten the plate lead, we lengthened it by inserting a coil of 4 turns of No. 18 wire, ½ inch long, wound on a 3/16-inch diameter rod, in series with the plate lead. This broke up the 84-Mc. resonance and cut down the excessive harmonic. Measurements with the crystal-diode wavemeter (page 4)[2] confirmed this.

At this stage, it was possible to get off-scale readings with this meter at TV frequencies anywhere near the chassis and cabinet, particularly near the openings at the rear and near the top of the front panel. Readings were also high on the a.c. line and on the outside of the coax line to the antenna. However, the harmonic in Channel 6 was now no stronger than the one on Channel 2.

[3] It is possible that the exact frequency of this resonance will vary with different transmitters, so in some cases the excessive harmonic may show up in a different channel.



The bottom of the chassis is covered with a piece of flashing copper, as shown in this view of the set turned on end.

Measuring the Harmonics

From past experience we knew that before we would be completely free of TVI on our own TV set the wavemeter would be useless because of lack of sensitivity, so we looked for a better method of measurement. That method turned out to be a slightly modified Simpson TV Field Strength Meter. This meter has been highly satisfactory in use and is recommended to TVI Committees and others seriously interested in TVI reduction.[4]

This instrument was modified as shown in the photographs by installing a high-pass filter with a coax fitting for either a probe or an antenna. An a.c. line filter also was installed, and a hole was drilled in the front panel (between the labels for Channels 3 and 4) for adjustment of the oscillator coil so that it could be tuned to the harmonic. The filters are the same as those installed in the TV receiver and described in detail in Fig. 1 at *A* and *B*.

In use, the meter is connected to the regular TV antenna and tuned to the picture carrier of the channel in question. This carrier can be identified, by listening with a headset, by its strong 60-cycle modulation. The relative input to the TV receiver can then be read on the meter. This is not an accurate reading of field strength in microvolts per meter, but what we are interested in is the relative value of the signal deliv-

[4] The Simpson uses a Standard Coil turret-type tuner whose coil strips can be modified for the ham bands as described by Tilton in July, 1951, *QST*, page 33, and by employing the channel strips not in use locally can be used both as a field-strength meter and emergency receiver.

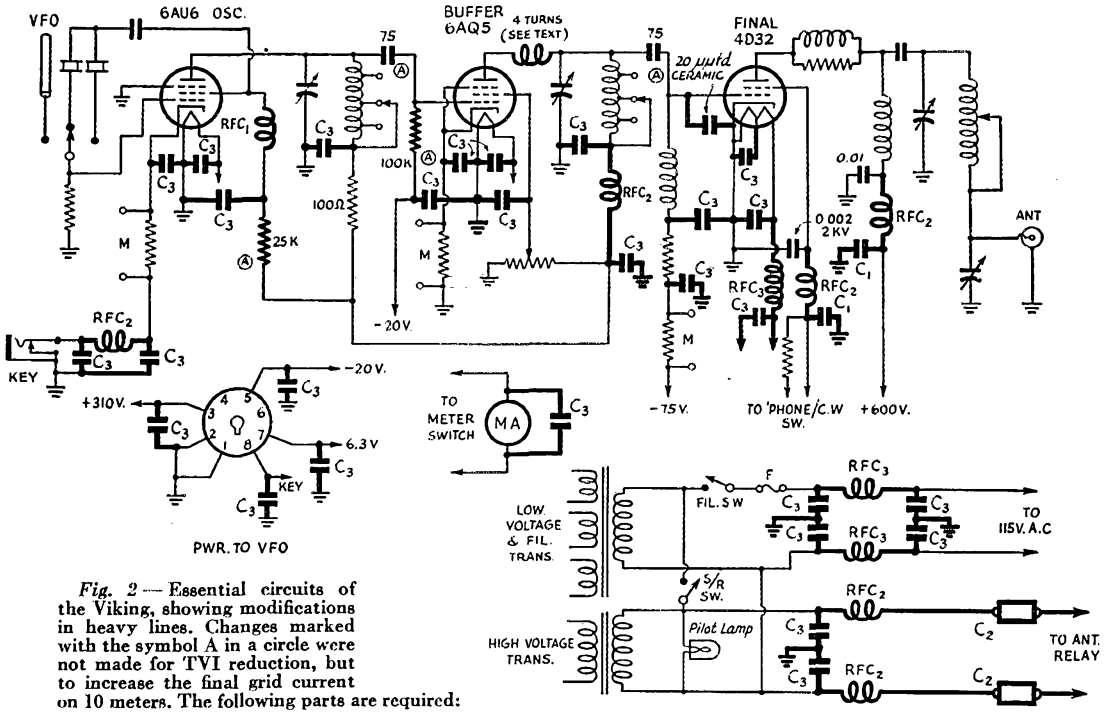


Fig. 2 — Essential circuits of the Viking, showing modifications in heavy lines. Changes marked with the symbol A in a circle were not made for TVI reduction, but to increase the final grid current on 10 meters. The following parts are required:
C_1 — 0.003-μfd. mica, 2000 volts (2).
C_2 — 0.1- or 0.25-μfd. Sprague Hypass, 120 volts (2).
C_3 — 0.005-μfd. Erie Type 811 disc ceramic (28).
RFC_1 — Johnson Type 102–750, 0.8 mh. (1).
RFC_2 — Johnson Type 101–760, 6.8 μh. (6).
RFC_3 — 3-inch winding No. 18 enam., ½-inch form (3).

ered to the TV receiver compared with the amplitude of the interfering harmonic. Next, a short length of coax cable with a fitting on one end and with the braid removed for about six inches on the other end is plugged into the Simpson. This is used as a probe to take harmonic readings on the a.c. line, to find r.f. leaks in the transmitter shielding, etc.

By-Passing

Observation of the TV picture quality and the Simpson field-strength readings while operating the c.w./'phone switch and the meter switch indicated that the wiring in the Viking was loaded with harmonics, because every time these switches were thrown, the TVI pattern changed in intensity. It was also observed that there was

♦

The modifications in the r.f. circuits consist principally in substituting 0.005-μfd. disc ceramic by-passes, with very short leads, for the mica condensers originally in the set, plus a few r.f. chokes at strategic points. Note also the small coil in the buffer plate lead (upper left) to detune a self-resonance in Channel 6, and the tubular ceramic (20 μμfd.) from grid to cathode on the 4D32 amplifier socket. The actual changes are shown in Fig. 2.

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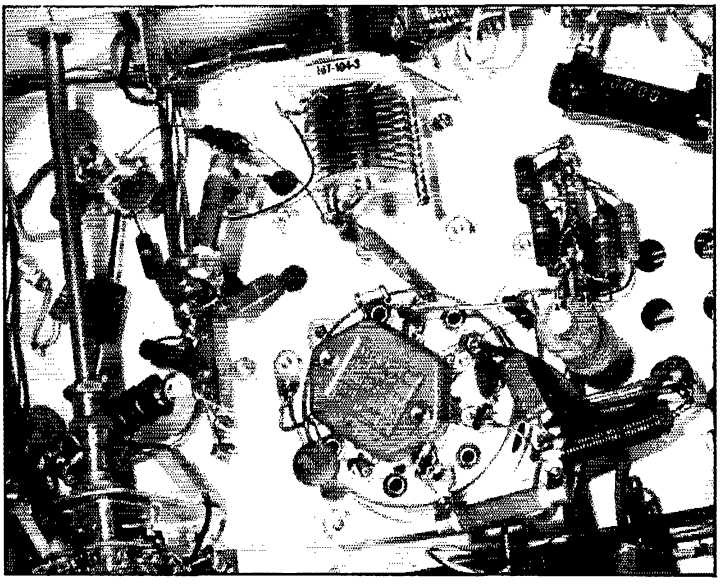


TABLE II

Viking I Transmitter After Filtering but Before Shielding

TV Channel	*10 METERS COAX*		*20 METERS COAX*		*40 METERS COAX*		*80 METERS COAX*		*160 METERS COAX*	
	E	F	E	F	E	F	E	F	E	F
2	C	VL	C	VL	C	C	C	C	C	C
4	C	C	C	C	C	C	C	C	C	C
5	C	C	C	M	C	C	C	C	C	C
6	C	N	C	H	C	M	C	C	C	C
7	C	C	C	C	C	C	C	C	C	C
9	C	C	C	C	C	C	C	C	C	C
11	C	C	C	C	C	C	C	C	C	C
13	C	C	C	C	C	C	C	C	C	C

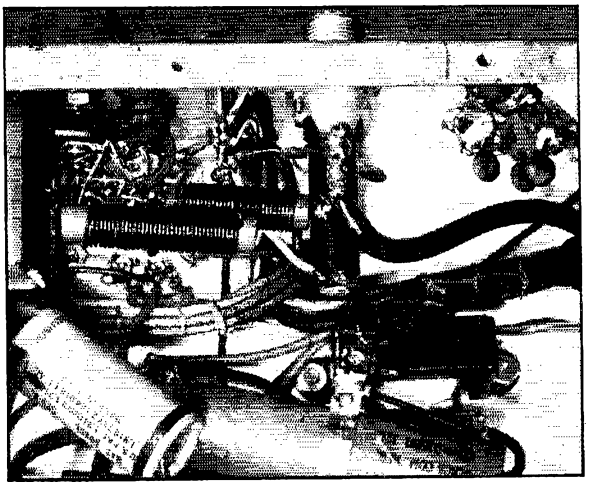
Notes: See Table I for list of symbols.
No change in TVI with position of c.w./'phone and meter switches.
Cabinet cover may be opened with no change in TVI.
Low-pass makes no difference in TVI.

a great deal of TVI with the final turned off and with only the exciter running. After a study of the underside of the chassis, it was felt that, if the by-passing could be improved along with a little filtering of leads, the harmonics could be kept out of the wiring harness and hence confined to their source.

The by-passes used in the Viking, 0.005-μfd. mica condensers with one-inch pigtails grounded to most any convenient ground lug, were all snipped out with diagonal cutters and replaced with 0.005-μfd. Erie disc ceramics, Type 811, with $\frac{1}{8}$-inch leads soldered directly from the tube socket pin to the cathode pin or ground.[5] This was done on the 6AU6 oscillator and 6AQ5 buffer stages, and effected a marked reduction of harmonics in the cabinet and wiring harness, and also definitely stepped up the final grid current. The next step in cooling off the interior was to install Johnson 101-760 6.8-μh. r.f. chokes in place of the 100-ohm resistor in the "B"-plus lead to the 6AQ5, in series with the plate choke of the final, and in the screen-grid lead of the final. These are shown in the photographs. Mica condensers of 2000-volt rating, 0.003-μfd., were used to by-pass the plate and screen chokes, using very short leads. When adding the choke in the 6AQ5 "B"-plus lead, the ground for the plate return by-pass condenser was changed from the rotor of the tuning condenser to a ground lug near the 6AQ5, and a ground wire was run from the tuning condenser to the same point. This further stepped up the 10-meter final grid current and removed all r.f. from the buffer tuning dial.

Checks with the crystal-diode wavemeter now showed the harmonics to be mainly due to grid current in the final. Therefore, a 20-$\mu\mu$fd. Erie ceramic was tied directly from grid pin to cathode pin on the 4D32 socket. This required spacing the turns on both the 10- and 20-meter coils to enable tuning the buffer to resonance, but it further reduced the harmonics.

[5] Grammer, "By-passing for Harmonic Reduction," *QST*, April, 1951.



Line filter for incoming power. This view also shows the by-passing on the VFO socket.

Readings on the wavemeter now showed the harmonic field strength on the outside of the cabinet to be greatly reduced, but still indicated a sizable amount of r.f. in the a.c. line. The next step was to install two a.c. line filters as shown in Fig. 1, the first in the power line and the second in the line feeding the antenna relay. These filters were installed just before the a.c. lines leave the chassis.

Preliminary Results

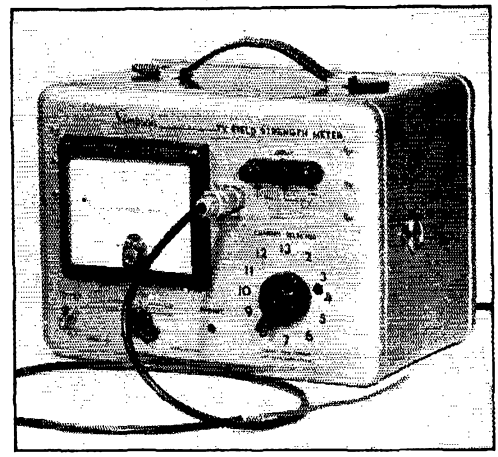
Table II shows the marked improvement after four hours of actual modifications. Note especially that now there is no TVI with only the buffer and oscillator stages running, and also how much the TVI is reduced on all bands. Take Channel 2 on ten meters, for example: Before filtering, the negative picture with the long-wire antenna changed to heavy cross-hatching with

52-ohm coax feed; after filtering, very light cross-hatching.

One would think that as a final touch all that need be done would be to slap in a low-pass filter. We knew better from past experience, but tried it anyway. As expected, there was no discernible change in the TVI pattern. However, by measurement with the field-strength meter we were able to determine that the harmonic was cut in half, a 6-db. reduction with a filter capable of 60 to 80 db. attenuation. The filter was a Barker & Williamson 75-ohm low-pass, an excellent filter with good shielding between sections and completely soldered up in a copper box with a coax fitting on each end. Our 52- and 75-ohm coax feed lines were flat and everything was in order except for one thing — we were not backing up the filter with a good job of shielding. In other words, one half of the harmonic was being stopped by the filter and the other half was escaping on the outside of the coax and the outside of the filter box.

Shielding

Commercial cabinets of the type used by Johnson for the Viking, by Collins for the 32V2, or any of the Par-Metal or Bud cabinets or relay racks are *not* shielded enclosures. They are merely dust covers for appearance or for keeping inquisitive fingers from getting burned. If you need more attenuation of harmonics than has been achieved at this point, or if you plan to spend some hard-earned dough on a good low-pass filter, then you had better look to your shielding.



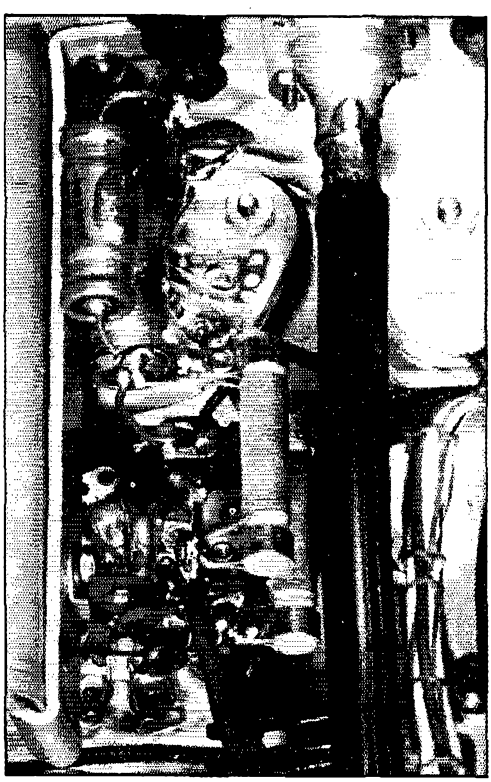
The modified TV field strength meter used for checking harmonic radiation. A coax fitting is installed for use with RG-59/U and a hole is drilled in the panel to permit retuning the oscillator beyond the fine-tuning range provided.

There are many fancy ways of getting a good job of shielding as well as a good-looking job. For one, you can modify your existing commercial cabinet. Cover all the holes with screening, cover the cracks around the panel, solder up the joints, remove paint, get good bonding. You might try some of the knitted metal gasket material manufactured by the Metal Textile Co. of Roselle, New Jersey, for plugging the leaks around the panel and top cover. With the particular construction of the Viking cabinet, these all looked like too much work for the average ham.

The way that looked the easiest has been used many times by the author and really works. It consists of shielding the chassis top and bottom with copper screening and then replacing the unit in its "dust cover." We could have used sheet aluminum or perforated metal and really made a swell-looking job, but after all it is all hidden in the cabinet; furthermore, the services of a sheet metal shop would have been required.[6]

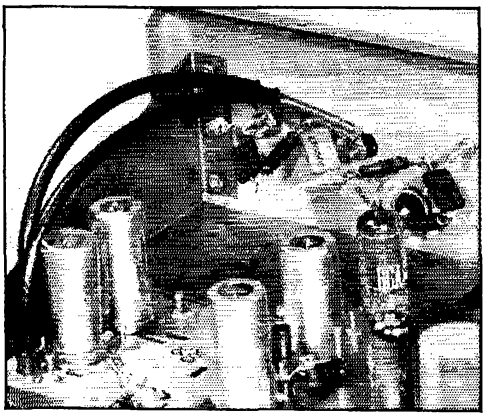
First, four corner angle posts were constructed along with the top and bottom framework shown in the photographs. These, together with the bottom pan, were cut out of 16-ounce copper flashing with an old pair of scissors. Tin shears would be better, if available. Don't use the XYL's pinking shears — it may look pretty, but she will probably kill you. The angle posts were formed by bending the sheet copper strips over the edge of a short piece of 2 × 4 by hand and then tapping them into shape with a hammer.

The framework was assembled in place on the



Line filter for the antenna relay cord.

[6] Since the construction of the shielding represents the hardest part of the TVI-proofing, it was suggested to the manufacturer that suitable shielding be fabricated and made available to Viking owners. It is understood that this is being done and that it will be obtainable in the near future.



High-pass filter installed in TV field-strength meter. The circuit is the coaxial one shown in Fig. 1. In addition, the a.c. line filter was installed at the point where the line cord leaves the unit.

chassis with No. 6 sheet-metal screws, allowing at least one inch overlap, and then all the copper parts were soldered together with a heavy-duty soldering iron. Next, panels of copper screening were cut out to cover the holes on the framework and then soldered in place. The framework was also fastened to the front panel at the sides and top with sheet-metal screws. A 13 × 17-inch copper bottom pan was screwed on the bottom of the chassis. That's all there was to it — period. Time: 4 hours. Place: living-room.

P.S.: Cover the Oriental rugs with newspapers, as the solder shaken off the iron is hard to get off!

When constructing the shield be sure to make it about ½ to ¾ inch higher than the front panel to give adequate clearance above the final tank circuit. This will mean removing the top "U"-shaped bar that ties the front of the cabinet together. If you can manage to saw the ends of this off so that it is 19 inches long, and also either saw off or bend down the bottom of the "U," it can be replaced after the Viking is replaced in its cabinet. If desired, it can be discarded and a ¾-inch piece of chromium trim can be attached to the shielding just above the top of the panel. Even a piece of ¾-inch half-round wood molding could be used if it were painted to match the cabinet, as it is only to cover the copper for the sake of appearance.

Final Results

After filtering, shielding and installing the B & W low-pass filter, all TV channels were free of even the slightest bit of cross-hatching on every ham band to which the Viking would tune, so it would be rather silly to show a table of picture quality after TVI-proofing.

A Johnson No. 101-760 5-meter r.f. choke had been installed at the key jack, each end by-passed with 0.005-μfd. Erie disc ceramic condensers. This was what eliminated the remaining TVI when the key was plugged in. Also, as a general preventive measure, each terminal on the VFO power socket was by-passed to ground with the same Erie disc condensers.

In extreme cases it may be necessary to cover the final amplifier tuning dial opening with a small piece of copper screening because the 0-100 degree dial behind this window is hot with harmonic r.f. It may also be necessary in extreme cases to use an insulated shaft on the final amplifier tuning knob. The present metal shaft seems to conduct a small amount of harmonic r.f. out through the shaft bearing in the front panel. It might be possible to reduce this if a positive r.f. ground could be devised for the shaft at the point where it passes through the panel.

There is also a small amount of harmonic leakage through the face of the meter which, in our case, does not cause any observable TVI. However, shielding the meter might be required in very weak signal areas. By-passing the meter terminals proved sufficient here.

Conclusion

The Viking I was tested on c.w. on all bands and after TVI-proofing, it produced no TVI, not even any from key clicks. On 'phone, it produced neither modulation bars nor cross-hatching on any channel.

As a final "super fringe area" test, the Simpson coax probe was substituted for the stacked Workshop TV beam. With this 6-inch TV antenna right in the room, 6 feet behind the transmitter, there was no TVI even though the TV signals were barely visible through the snow. The TV signals were so weak that the sync on the receiver would hardly hold. Channel 2, which read 4600 on the TV beam, read only 35 on the probe.

The Viking does put out some weak low-frequency harmonics which, if desired, can be reduced through the use of an antenna coupler. These will not be stopped by the low-pass filter because they are below the cut-off frequency. For example, I can be heard weakly across town on ten meters when working 20 meters.

In closing, let me suggest that everyone using a low-pass filter in a coax line build a resistance-bridge s.w.r. indicator "a la" the *Handbook* to be sure the s.w.r. is low so the filter will work correctly.

Silent Keys

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

W1BHJ, Otto A. Halquist, Nashua, N. H.
W1DRL, Austen H. Wood, Hingham, Mass.
W2ZDS, George G. Weinert, Ridgefield, N. J.
W4RFD, David E. Arnold, Miami, Fla.
W5BVK, Carl W. Cooper, Duncan, Okla.
W7QGI, W. Stanley Lott, Walla Walla, Wash.
W8WG, John R. Isatala, Lansing, Mich.
W9BXR, Hans J. Mueller, Hillsboro, Ill.
WØBRS, Carl Molander, Portal, N. Dak.
WØZEA, Vernon E. Andrews, Denver, Colo.
CO7VP, Victor H. Porter, Camaguey, Cuba
VE3WN, Harold W. Northover, Toronto, Ont.

The "Black Box" Antenna-Mystery Solver

BY C. G. BACON,* W4SZU

SINCE saying good-by to 160-meter 'phone just previous to World War II, I have never — until lately — been able to get a high-frequency antenna to work satisfactorily. This has been due chiefly to the simple fact that I never seemed to have either the space or the height to erect the "proper" wire or the "proper" feeders.

Finally settling in a small place with a smaller backyard — it being rented property at that — it seemed that there was less than no chance of doing the right job on the skywire needed for 40-meter operation.

Upon consulting the minor oracles who were versed in antenna lore as to WHAT-TO-DO, I got the following suggestions:

1) Go to 6 meters.
2) Go to very high power (*something* will get out).
3) Go to 1.25 cm.
4) Go to h---.
5) Get a new hobby (the wife agrees).

So, here we were, with a 300-watt rig designed for 40-meter c.w. and no antenna in sight. Deciding that I ought to do something about something, I started studying mathematics, geometry, the classics, history and science. I tried stamp collecting, bird watching, Spanish, German and Italian. No help. Everytime I came downstairs, there was my rig — 300 beautiful watts of it — staring me in the face with a sad expression in the depths of its meter eyes.

One evening late at night, after struggling with a mammoth German verb (one of those that march across the page in endless bulk — which you can neither crawl over, under, around or break into smaller pieces that might be subject to sensible attack) I snapped the book shut and leaned back in my chair. My sagging eyes were just about closed when suddenly they rested on a piece of wire hanging down the side of the wall. Wire . . . wire . . . huh? Terrific German verbs. Massive and unresisting capacitive effects. THAT'S IT, BOYS! *Let's try it!*

Quickly tracing the wire, I discovered that it was a telephone extension lead to the bedroom upstairs. The 'phone had been ripped out some 20 years ago but the wire had never been removed. Whipping out a piece of No. 18 wire, I coupled it to the final and warmed up the filaments.

Hitting the key, I watched the final plate current climb with a rush and then suddenly settle back to a new low. This was followed quickly by the patter of little feet on the stairs, as the family cat came charging down, accompanied by a wildly-lashing tail and the distinct odor of burning fur. *There's the answer* — that cat added enough capacity to load up the wire!

From the disgruntled appearance of Tabby, it was obvious that she wanted no more to do with experiments of this kind, and I thought I saw in her eyes a plea for me to get a black box to do my dirty work.

The Black Box

Black boxes have been the solution to many an engineering problem, and it just so happened that I had a black box that was just the right size to put something in. It also just so happened that I had the parts of a surplus Army rig on hand, and it just so happened that the final tank condenser and coil fitted neatly within that black box.

Whipping out the trusty soldering iron, I soon had the works assembled as a parallel-tuned circuit, and the grid-dip meter revealed the amazing fact that the thing hit 40 meters right on the nose with the condenser nearly all the way in. Grounding the rotor side of this tank circuit assured me that I would not be the second to try Tabby's experiment. I connected the telephone extension to the "hot" side of the tank, and link coupled the whole works to the transmitter with about 10 feet of lamp cord.

Hitting the key gave a remarkably-low plate current, but after some tuning of tank circuits, there was about 300 watts going into the final stage of the transmitter, and everything indicated that the rig was loading!

I called a CQ and, just as a joke, turned the receiver on. Lo! A WØ was calling me. "Gosh,

(*Continued on page 112*)

* 244 Warwick Road, Hilton Village, Va.

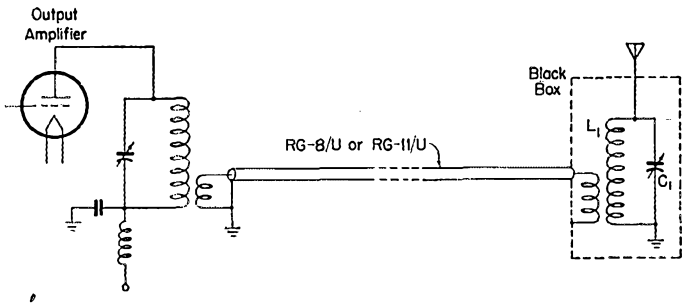


Fig. 1 **— The "black box" antenna tuner is coupled to the output amplifier through a length of coaxial line. L_1 and C_1 should resonate to the operating frequency — when the antenna is connected it will require retuning unless the antenna is a quarter or half wavelength long. As described by W4SZU, the black box is very useful in feeding random lengths of wire.**

BOARD MEETING HIGHLIGHTS

The Board of Directors of the American Radio Relay League, Inc., at its 1952 meeting in Hartford, Connecticut, May 9th and 10th, elected as its new president Dakota Division Director Goodwin L. Dosland, WØTSN, of Moorhead, Minn. New By-Laws proposed by the Constitution Revision Committee were adopted, completing, together with the Amended Articles of Association put into effect last year, the revision of the League's corporate structure to bring it up to date. New England Division Director Percy C. Noble, W1BVR, was designated an additional member of the Executive Committee. Rules and regulations governing conventions and affiliated clubs were approved, with regulations governing the operation of the Communications Department to be completed later.

In operating and allocations matters the Board, after extensive examination and discussion, instructed the General Manager to make the following requests of the Federal Communications Commission, all but one by unanimous vote (except the Canadian director, who abstained):

1) Open 7200–7300 kc. to voice operation, A-3 and n.f.m.

2) Open 21,250–21,450 kc. to voice operation, A-3 and n.f.m. (this coincides with the band-planning recommendations of the International Amateur Radio Union).

3) Extend the 10-meter 'phone band down to 28,250 kc.

4) Open 3775–3800 kc. for mobile voice operation, A-3 and n.f.m.

5) Continue the present requirements of Advanced Class or higher license for voice operation on 75 and 20 meters.

6) Continue issuance of new Advanced Class licenses after December 31, 1952.

7) In addition to present Novice privileges, permit Novice c.w. operation in 7150–7200 kc.

8) For a temporary period of one year, permit Novice c.w. or voice operation in 51–53 Mc.

9) Open 7150–7200 kc. to f.s.k. radioteletype.

10) Permit A-Ø operation (duplex) in 51–54 Mc.

The Board commended the work of SCMs, SECs and QSL Managers and continued its policy of providing funds for their travel, with expanded coverage of certain divisional meeting and civil defense travel expenses. The work of the Hq. in TVI matters and in membership solicitation activities was approved and ordered continued; the Membership & Publications Committee was retained for an additional year. Special bouquets were tossed to Phil Rand, W1DBM, for his outstanding accomplishments in TVI reduction; to the Technical Editor for the high quality of *QST* articles; to John Cann, W1RWS, for his handling of DXCC matters; and to Treasurer David H. Houghton for his completion of 30 years' ARRL service. The Board expressed its appreciation to General Counsel Paul M. Segal for successes in litigation of municipal ordinance matters affecting amateurs. FCC's Field Engineering and Monitoring Bureau was warmly thanked for its long and continued record of cooperation with amateur affairs in the field. The Board expressed its sorrow at the passing of Hq. staff member Ralph T. Beaudin, W1BAW.

Approval was granted for the holding of a National Convention in Houston, Texas, sometime during 1953.

ARRL's Planning Committee was asked to examine the possibility of establishing a technical scholarship. Hq. was requested to study the problem of maritime-mobile suballocations, and the possible desirability of setting up a new section field appointment to coordinate interference matters, especially in TVI.

The Board re-elected First Vice-President Wayland M. Groves, W5NW; Vice-President Francis E. Handy, W1BDI; Secretary Arthur L. Budlong, W1BUD; and Treasurer David H. Houghton. For the information of Dakota Division members, with the election of Mr. Dosland as President of ARRL, Vice-Director Alfred M. Gowan, WØPHR, becomes the new Director.

A standing vote of applause was tendered retiring President George W. Bailey, W2KH, for his long and meritorious service to the League and amateur radio.

Minutes of the meeting will appear in July *QST*.

Happenings of the Month

WE GET 21 MC.

FCC on April 29th released notice of its action in making final a proposal to open for amateur use effective May 1st the frequencies 21,000-21,450 kc., c.w. only. As earlier reported, only A-1 (c.w. telegraphy) emission will be permitted as a starter; it is anticipated further proposals will be forthcoming shortly to authorize additional modes of emission.

CUBAN THIRD-PARTY TRAFFIC

An agreement between the United States and the Republic of Cuba has been concluded which provides for the exchange of third-party message traffic by amateur stations of each country. Like earlier such agreements with Liberia and Ecuador, it provides that traffic must be of the type which would not normally go by established means of communications; however, in event of emergency amateurs may handle any type of message. It applies to territories and possessions of the U. S. and to our U. S. licensed personnel overseas such as in occupied Germany and Japan.

Negotiations for the agreement were initiated by the Department of State at the request of ARRL.

RENEWALS AND MODIFICATIONS

With some additional people working on FCC's backlog of amateur applications, the license-issuance situation has now got fairly well back to normal. New licenses are going out in about a month after receipt of the papers in Washington, which is about the normal time required for processing. Handling of modifications and renewals has also improved considerably.

The Commission finds quite a number of amateurs asking for modification or renewal of their licenses by ordinary correspondence rather than on prescribed forms. This not only delays handling of the individual application but takes time which might better be spent on other matters. Please keep these fundamentals in mind:

1) If you are applying for a renewal of your amateur license, with no additional aspects such as change of operator privileges or change of address involved, use the new "short-form renewal" Form 405-A. This is the one which you fill out in detail, and carefully, since parts of it become FCC's file record; one section in the form of a postcard, which you address to yourself, is validated by FCC and returned to you, and it must be kept with your original license as evidence of renewal. You don't have to send your current license with a 405-A renewal application.

2) If you are applying for a modification of your amateur license to show a *permanent* change of address, use the usual FCC Form 610; fill it out and send it to FCC in Washington with your current license. While your license is away you may operate at the new location under the "portable" rules, which include sending a monthly notice to the Engineer-in-Charge of your district.

3) If you are moving your amateur station to a *temporary* location or a series of temporary locations (Examples: moving to another city to accept employment known to be of only several months' duration, with intention to return to the licensed address eventually; or amateur in military service irregularly transferred from one post to another) no application for modification is required. Your license should be issued for a permanent home address. Such moving about as you may do, similar to examples shown above, can include amateur operation providing you sign the portable designator, and providing you notify by letter both FCC in Washington and the Engineer-in-Charge of the district in which you will be operating; additional monthly notices to the Engineer only are required for continued temporary operation, and a single notice to each is required when you move back home. These notifications must include "the station call sign and licensee, shall indicate both the permanent and the temporary station locations, shall indicate the address at which the licensee can be readily reached during such temporary operation, and shall show the reason why operation at that location is considered temporary rather than a change of permanent location."

F.C.C. PROPOSALS

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

In the Matter of Amendment of Part 12, "Rules Governing Amateur Radio Service" } DOCKET NO. 10073

FURTHER NOTICE OF PROPOSED RULE MAKING

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

2. The Commission heretofore on November 6, 1951 (16 F.R. 11281) published a notice of rule making in which issues raised by three petitions for amendment of Section 12.111 of Part 12, "Rules Governing Amateur Radio Service" were set forth and all interested amateurs invited to submit comments or suggestions as to what rules would be appropriate and suitable to provide the relief sought by the petitions and at the same time resolve the apparent conflict in the rules as proposed by the petition. The petitions, in general, requested that portions of the amateur frequency band 7000-7300 kc be made available for both A3 and F-1 emission in addition to A1 emission now authorized and that frequency shift keying (F-1 emission) be authorized in all amateur frequency bands below 27 megacycles for radio printer and for similar operation. Comments and suggestions, submitted either individually or by amateurs in groups or clubs, were received from a considerable number of amateurs. From these comments the Commission has now prepared specific proposed amend-

• In late April the American Radio Relay League addressed the presidents of principal television receiver manufacturing companies warning of the potential interference problem with the opening of the amateur 21-megacycle band and soliciting their coöperation in providing solutions for cases found to be a result of receiver i.f. pick-up. The letter follows:

Dear Sir:

On May 1st the frequency band 21,000–21,450 kilocycles is to be made available for the use of amateur radio stations in the United States and Possessions. This bodes an interference problem of considerable magnitude for the millions of existing television receivers which were built with an intermediate frequency for the sound channel in the lower part of the "standard" range 21.25–21.9 megacycles.

This standard was set up by the industry in 1945. It was done despite our protests, which were on the basis that the U. S. Government had already then announced its intention to allocate a 21-Mc. band to amateurs, so that it would be highly undesirable to choose as a standard i.f. a channel likely to be in extensive use by radio transmitters in residential areas, as is of course the case in the amateur service.

When the industry announced its decision and began producing TV receivers with an intermediate frequency in the 21-megacycle range, the American Radio Relay League, anticipating eventual trouble, conducted a series of tests of potential interference from 21-Mc. amateur transmitters. A special experimental license was secured from FCC. Exhaustive tests showed conclusively that a transmitter operating on 21.25 megacycles, for example, even with low power, completely disrupted reception on nearby receivers using that i.f. Other receivers employing slightly higher sound channels such as 21.5 megacycles were disturbed only slightly. Further tests showed that realigning the intermediate-frequency amplifiers of affected receivers to place the sound channel at 21.7 or preferably 21.9 megacycles eliminated the interference completely in practically all cases.

When an amateur station operating in the new 21-megacycle band causes interference to television receivers of older design because of pick-up in the intermediate-frequency channel, there is nothing which can be done at the transmitter to eliminate or reduce the interference. Remedies can only be applied at the receiver. Primarily this means realignment to place the sound i.f. at 21.7 megacycles or above. In some instances it may also mean the installation of a high-pass filter. It is the responsibility of the industry to apply these remedies to eliminate such interference as may arise.

Several companies have indicated that it is already their policy to make, or authorize, such adjustments to existing receivers when interference is identifiable as i.f. pick-up. We earnestly hope this will also be the policy of your company.

Sincerely yours,

A. L. BUDLONG, *General Manager*
THE AMERICAN RADIO RELAY LEAGUE

ments of Part 12, designed to provide more frequency space for frequency shift keying (F-1 emission), permit some radiotelephone communication in the frequency band 7000–7300 kc, provide more frequency space for Novice amateur operators, provide readily identifiable announcement of call signs, and to prescribe standards to be observed in radio teleprinter operation. The substance of the amendments proposed is contained in the appendix hereto attached.

3. The proposed amendments are issued under authority contained in Sections 303(a), (b), (c), (e), and (r) of the Communications Act of 1934, as amended.

4. Any interested person who is of the opinion that the proposed amendments should not be adopted, or should not be adopted in the form set forth, may file with the Commission on or before July 1, 1952, a written statement or brief setting forth his comments. At the same time any person who favors the amendments as set forth may file a statement in support thereof. Comments or briefs in reply to the original comments or briefs may be filed within fifteen days from the last day for filing the said original comments or briefs. The Commission will consider all such comments, briefs, and statements before taking final action. If any comments are received which appear to warrant the Commission in holding an oral argument before final action is taken, notice of the time and place of such oral argument will be given such interested parties.

5. All comments and briefs should be addressed to the Secretary, Federal Communications Commission, Washington 25, D. C., and should be submitted in quadruplicate.

FEDERAL COMMUNICATIONS COMMISSION
T. J. SLOWIE
Secretary

Released: April 18, 1952

APPENDIX

PART 12, RULES GOVERNING AMATEUR RADIO SERVICE, IS PROPOSED TO BE AMENDED IN THE FOLLOWING PARTICULARS:

1. AMEND SECTION 12.23(e) (2) TO READ AS FOLLOWS:

(2) Only the following frequency bands and types of emission may be used, and the emissions of the transmitter must be crystal-controlled:

(i) 3700 to 3750 kc, radiotelegraphy using only type A-1 emission in accordance with the geographical restrictions set forth in Section 12.111 of this Part.

(ii) 7175 to 7200 kc, radiotelegraphy using only type A-1 emission.

(iii) 26.960 to 27.230 Mc, radiotelegraphy using only type A-1 emission.

(iv) 145 to 147 Mc, radiotelegraphy or radiotelephony using any type of emission except pulsed emission and type B emission.

2. AMEND SECTION 12.82(a) TO READ AS FOLLOWS:

(a) All transmissions of an amateur station shall be identified by the transmission, by the properly authorized operator thereof, of the call sign assigned that station and the call sign(s) of the station(s), if any, with which communication is in progress or is being attempted, in accordance with the following minimum specifications:

(1) Each station which is actually engaged in an exchange of signals or other communications with some other station or stations shall transmit the required identification, as follows:

(i) At the beginning and at the conclusion of the series of transmissions constituting that exchange except that, if the entire duration of such exchange is less than three minutes, the identification need not be repeated at the conclusion of the exchange.

(ii) At the conclusion of any single transmission which exceeds three minutes' duration during such exchange, unless the identification has already been given during that transmission.

(iii) At intervals not exceeding ten minutes during the series of transmissions constituting that exchange except that, if the station is not transmitting when such identification becomes due, the identification shall be transmitted at the beginning of the first succeeding transmission by that station.

(2) Each station which is not actually engaged in an exchange of signals or other communications with any other station or stations shall transmit the required identification during its other transmissions in accordance with the following schedule:

(i) At intervals not exceeding one-half minute during all transmissions which are for the purpose of establishing communication with any other station or stations, or for the purpose of testing, adjusting or calibrating transmitting, receiving or other equipment, including transmissions for the purpose of determining signal strength, operating frequency, or other characteristics of the transmitted or received signal.

(ii) At the beginning, at the conclusion, and at intervals not exceeding ten minutes during the transmission of other authorized one-way signals or communications; including but not limited to signals for the control by radio of remote objects or equipment, general messages containing amateur information bulletins or code practice transmissions, etc.

(3) The required identification shall be transmitted on the frequency or frequencies being employed at the time and shall be either by telegraphy, using the International Morse Code, or by telephony, whichever may be authorized for use on such frequency or frequencies and appropriate to the type of emission being employed for the other transmissions. When a method of communication other than telephony, or telegraphy using the International Morse Code, is being used or attempted, the prescribed identification shall also be transmitted by that other method.

3. ADD NEW SECTION 12.107 AS FOLLOWS:

§ 12.107 *Special provisions regarding radio teleprinter transmissions.* The following special conditions shall be observed during the transmission of radio teleprinter signals on authorized frequencies by amateur stations:

(a) A single channel five-unit (start-stop) teleprinter code shall be used which shall correspond to the International Telegraphic Alphabet No. 2 with respect to all letters and numerals (including the slant sign or fraction bar) but special signals may be employed for the remote control of receiving printers, or for other purposes, in "figures" positions not utilized for numerals. In general, this code shall conform as nearly as possible to the teleprinter code or codes in common commercial usage in the United States.

(b) The nominal transmitting speed of the radio teleprinter signal keying equipment shall be adjusted as nearly as possible to the standard speed of 60 words per minute and, in any event, within the range 55 to 65 words per minute.

(c) When frequency-shift keying (type F-1 emission) is utilized, the deviation in frequency from the mark signal to the space signal, or from the space signal to the mark signal, shall be adjusted as nearly as possible to 850 cycles and, in any event, within the range 800 to 900 cycles per second.

(d) When audio-frequency-shift keying (type A-2 or type F-2 emission) is utilized, the highest fundamental modulation audio frequency shall not exceed 3000 cycles per second, and the difference between the modulating audio frequency for the mark signal and that for the space signal shall be adjusted as nearly as possible to 850 cycles and, in any event, within the range 800 to 900 cycles per second.

4. AMEND SECTION 12.111(a)(2)(i) TO READ AS FOLLOWS:

(i) 3500 to 4000 kc, using type A-1 emission and, on frequencies 3500 to 3800 kc, using type F-1 emission, to those stations located within the continental limits of the United States, the Territories of Alaska and Hawaii, Puerto Rico, the Virgin Islands and all United States possessions lying west of the Territory of Hawaii to 170° west longitude.

5. AMEND SECTION 12.111(a)(3) TO READ AS FOLLOWS:

(3) 7000 to 7300 kc, using type A-1 emission and, on frequencies 7000 to 7200 kc, using type F-1 emission and, on frequencies 7200 to 7300 kc, using type A-3 emission or narrow band frequency or phase modulation for radiotelephony.

6. Amend Section 12.111(a)(4) by the addition of the authorization for the use of type F-1 emission on frequencies 14000 to 14200 kc and 14300 to 14350 kc.

FEDERAL COMMUNICATIONS COMMISSION
Washington 25, D. C.

In the Matter of Amendment of Part 12 with respect to Special radiotelephone operating privileges presently granted only to holders of the Extra Class and Advanced Class amateur operator licenses.	DOCKET NO. 10173

NOTICE OF PROPOSED RULE MAKING

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

2. It is proposed to amend Part 12, "Rules Governing Amateur Radio Service", by deletion of the present limitation on the operating privileges of the holders of Genera and Conditional Class licenses, insofar as they apply to the use of radiotelephony on the frequency bands 3800 to 4000 kilocycles and 14200 to 14300 kilocycles, and grant to the holders of General Class, Conditional Class and Advanced Class operator licenses, uniformly, all authorized amateur privileges.

3. The proposed amendments are designed to preclude the necessity for new applicants after December 31, 1952, who desire the special radiotelephone operating privileges now reserved to the holders of Extra Class and Advanced Class licenses, to qualify for the Extra Class license as the only means by which to obtain those privileges. They are also designed to remove an existing restriction on the operation of amateur stations licensed to holders of General or Conditional Class licenses which appears no longer necessary, in view of the present state of the radio art and the general technical regulations which govern the operation of all classes of amateur stations.

4. The proposed amendments are contained in the Appendix attached hereto and are issued under the authority of Sections 4(i) and 303(b), (1), and (r) of the Communications Act of 1934, as amended.

5. Any interested person who is of the opinion that the proposed amendments should not be adopted, or should not be adopted in the form set forth, may file with the Commission on or before July 1, 1952, a written statement or brief setting forth his comments. At the same time any person who favors the amendments as set forth may file a statement in support thereof. Comments or briefs in reply to the original comments or briefs may be filed within fifteen days from the last day for filing such original comments or briefs. The Commission will consider all such comments, briefs, and statements before taking final action. If any comments are received which appear to warrant the Commission in holding an oral argument before final action is taken, notice of the time and place of such oral argument will be given such interested parties.

6. In accordance with the provisions of Section 1.764 of the Commission's Rules, an original and three copies of all statements, briefs, or comments shall be furnished the Commission.

FEDERAL COMMUNICATIONS COMMISSION
T. J. SLOWIE
Secretary

Released: April 18, 1952

APPENDIX

PART 12, RULES GOVERNING AMATEUR RADIO SERVICE, IS PROPOSED TO BE AMENDED IN THE FOLLOWING PARTICULARS:

1. AMEND SECTION 12.23(c) TO READ AS FOLLOWS:

(c) *General and Conditional Classes.* All authorized amateur privileges.

2. AMEND SECTION 12.111(a)(2)(ii) TO READ AS FOLLOWS:

(ii) 3800 to 4000 kc, using type A-3 emission and narrow band frequency or phase modulation for radiotelephony, to those stations located within the continental limits of the United States, the Territories of Alaska and Hawaii, Puerto Rico, the Virgin Islands and all United States possessions lying west of the Territory of Hawaii to 170° west longitude.

3. AMEND SECTION 12.111(a)(4) BY THE DELETION OF THE FOLLOWING CLAUSE:

. . . subject to the restriction that type A-3 emission, or narrow band frequency or phase modulation for radiotelephony, may be used only by an amateur station which is licensed to an amateur operator holding an

OFFICERS' REPORTS AVAILABLE TO MEMBERS

Each year the officers of the League make comprehensive written reports to the directors. The Board has made these reports available to interested members. The cost price is 75 cents per copy, postpaid. Address the General Manager at West Hartford.

Amateur Extra Class or Advanced Class license and then only when operated and controlled by an amateur operator holding an Amateur Extra Class or Advanced Class license.

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

In the Matter of Amendment of Sections 2.104 (a) of Part 2 and Section 12.111 of Part 12 of the Rules and Regulations of the Federal Communications Commission	DOCKET NO. 10021

FURTHER NOTICE OF PROPOSED RULE MAKING

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

2. On July 26, 1951, the Commission published a Notice of Proposed Rule Making which proposed re-distribution of frequencies in the band 1800–2000 kc. for use by amateurs on a shared basis with Loran to the extent that amateurs in the State of Minnesota were concerned. It was proposed that instead of being split into two frequency areas, Minnesota be included in the group of states then designated as "West of the Mississippi River." An appropriate amendment of footnote 2 of Section 2.104(a) of Part 2 was included in that Notice. During the pendency of the described rule-making proceedings, the Commission has received further information with respect to amateur interference to Loran and the possibility of making additional changes in the geographical areas, frequency distribution and operating limitations previously in effect which would make possible greater utilization of the frequency band 1800–2000 kc. by the amateur service, while continuing to maintain necessary protection to the Loran service. It is therefore proposed to enlarge the proceedings in Docket No. 10021 to cover re-designation of geographical areas with respect to use of frequencies in the band 1800–2000 kc. by amateurs, to re-allocate frequencies in that band to such areas, and to re-specify the operating limitations applicable in each such area, not only with respect to the State of Minnesota but with respect to other parts of the United States, its territories, and possessions as well. The amendments proposed are set forth in the attached appendix.

3. The proposed amendments are issued under the authority of Sections 4(i) and 303(c) and (r) of the Communications Act of 1934, as amended.

4. Any interested person who is of the opinion that the proposed amendments should not be adopted, or should not be adopted in the form set forth, may file with the Commission on or before July 1, 1952, a written statement or brief setting forth his comments. At the same time any person who favors the amendments as set forth may file a statement in support thereof. Comments or briefs in reply to the original comments or briefs may be filed within fifteen days from the last day for filing the said original comments or briefs. The Commission will consider all such comments, briefs, and statements before taking final action. If any comments are received which appear to warrant the Commission in holding an oral argument before final action is taken, notice of the time and place of such oral argument will be given such interested parties.

5. In accordance with the provisions of Section 1.764 of the Commission's Rules, an original and fourteen copies of all statements, briefs, or comments shall be furnished the Commission.

FEDERAL COMMUNICATIONS COMMISSION
T. J. SLOWIE
Secretary

Released: April 18, 1952.

APPENDIX

I. Section 2.104(a), "Table of frequency allocations", of Part 2, "Rules Governing Frequency Allocation and Treaty Matters", is proposed to be amended in the following particulars: [not reproduced here because it duplicates what follows. — *Ed.*]

II. Section 12.111(a)(1)(i), "1800 to 2000 kc", of Part 12, "Rules Governing Amateur Radio Service", is proposed to be amended to read as follows:

(i) 1800 to 2000 kc. Use of this band is on a shared basis with the Loran system of radionavigation. The amateur service may use, in any area, whichever bands, 1800–1825, 1875–1900, 1900–1925 or 1975–2000 kc, are not required for Loran in that area, in accordance with the following conditions:

(*a*) The use of these frequencies by the amateur service shall not be a bar to the expansion of the radionavigation (Loran) service.

(*b*) The use of these frequencies by stations in the amateur service shall not cause harmful interference to the Loran system of radionavigation. If an amateur station causes such interference, the station licensee shall, as directed by the Commission, immediately cease operation on the frequencies involved.

(*c*) Only type A1 or A3 emission shall be employed.

(*d*) Amateur operation shall be limited to the following areas, to the indicated frequency bands within each such area, and to the indicated maximum plate power input to the tube or tubes supplying energy to the antenna during day and night hours, respectively, on such frequencies:

Area	*Authorized Bands, kc.*	*DC Plate Input Power in Watts* *Day*	*Night*
Minnesota, Iowa, Missouri, Arkansas, Louisiana and states to the east of these states, including District of Columbia	1800–1825 1875–1900	500	200
North Dakota, South Dakota, Nebraska, Colorado, New Mexico and states to the west of these states except the State of Washington	1900–1925 1975–2000	500	200
State of Washington	1900–1925 1975–2000	200	50
Texas, Oklahoma and Kansas	1800–1825 1875–1900	200	75
Hawaiian Islands	1900–1925 1975–2000	500	200
Puerto Rico and Virgin Islands	1800–1825 1875–1900	500	200
Alaska, Guam and other territories and possessions of the United States not listed above.	None	No operation	No operation

(*e*) The provisions of this subparagraph shall be considered as temporary in the sense that they shall remain subject to cancellation or to revision, in whole or in part, by order of the Commission without hearing whenever the Commission shall deem such cancellation or revision to be necessary or desirable in the light of the priority within this band of the Loran system of radionavigation.

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

In the Matter of Amendment of Section 12.111 of Part 12, "Rules Governing Amateur Radio Service" to specify emissions and other particulars of operation in the amateur frequency band 21,000–21,450 kc., and for other reasons	DOCKET NO. 10188

NOTICE OF PROPOSED RULE MAKING

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

2. It is proposed to amend Section 12.111 of the Commission's Rules and Regulations to specify emissions and other particulars of operation in the frequency band 21.00–21.45 Mc to be available for use of amateurs on or about May 1, 1952 (Docket No. 10158). In order to conform with existing limitations on the use of those frequency bands as expressed in existing rules and in the Atlantic City (1947) Table of Frequency Allocations as ratified by the United

(*Continued on page 122*)

An Efficient Sling-Pack Portable for Civil Defense

Lightweight Battery Station for Emergency Work

BY R. G. FINKBEINER,* W8AQK

CIVIL defense preparations in the Detroit area (which includes Ann Arbor) have reached a high stage of development according to a recent article [1] by W8GJH, the Michigan SEC. Ten meters was chosen for the network because a majority of the amateur stations involved were equipped to operate most effectively on this band.

Although the network is made up of fixed and mobile stations, a great deal of interest has been shown recently in the possibilities of portable units. But at the present time the circuit of a portable battery-powered station suitable for civil defense work on ten meters cannot be found, and so the design of such a unit was undertaken. The circuit diagram of the complete station is shown in Fig. 1.

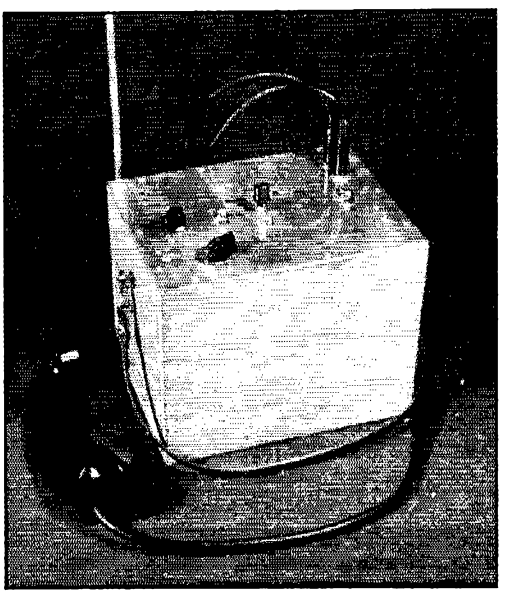
The transmitter portion consists of a triode-connected 1T4 in a tuned-plate crystal-oscillator circuit operating on 20 meters, followed by a Heising-modulated doubler-final. More than enough drive is available for the 3V4 doubler/final. Several "straight-through" final amplifier circuits were tried, with no worthwhile increase in efficiency or output. This doubler circuit requires a minimum of tuned circuits and eliminates the need for neutralization, otherwise necessary when using a 3V4 on 10 meters. Two bias sources are used; the grid leak bias provided by R_{13} and C_{19}, and 6 volts of protective bias provided by B_3.

The receiver is a straightforward superhet, with a 1T4 tuned r.f. stage. Following the r.f. stage is a 1R5 oscillator-converter. The oscillator fine-tuning condenser, C_{10}, covers approximately a 400-kc. portion of 10 meters and makes reception possible over a limited portion of the band, even though the r.f. and converter stages are peaked at a fixed frequency. A pair of miniature iron core i.f. transformers and a 1T4 tube are used in the 455-kc. i.f. amplifier. Next in line is the diode portion of the 1U5, followed by a shunt-type automatic noise limiter using a 1N34 crystal diode. Clipping action is automatically adjusted to the strength of the signal being received by the a.v.c. bias, and S_3 cuts the limiter in and out of the circuit.

Two stages of audio amplification are included, both for transmitting and receiving. The pentode portion of the 1U5 voltage amplifier is resistance-coupled to the 3V4 audio output and modulator stage. B_3, which supplies protective bias to the 3V4 r.f. amplifier, also provides fixed bias for the 3V4 audio amplifier.

Construction

Assembly is started by mounting the components that fit along the back edge of the 8 × 4½ × 1½-inch aluminum chassis (ICA No. 29000). Referring to the rear photograph and reading from left to right, these are: crystal holder, microphone transformer, 1U5 audio amplifier, 2nd i.f. transformer, 1T4 i.f. amplifier, 1st i.f. transformer, and immediately above, the 1R5 converter. Next, assemble the parts making up the transmitter strip along the left edge. Starting with the crystal holder these are: 1T4 oscillator, C_{18}, and the 3V4 r.f. amplifier. C_{20} mounts to the right



This sling-pack portable is completely self-contained and operates in the 28-Mc. band. It features a crystal-controlled transmitter and a superheterodyne receiver.

* 215 Crest Ave., Ann Arbor, Mich.

[1] Gary, "Amateur Radio in Detroit Civil Defense," *QST*, September, 1951.

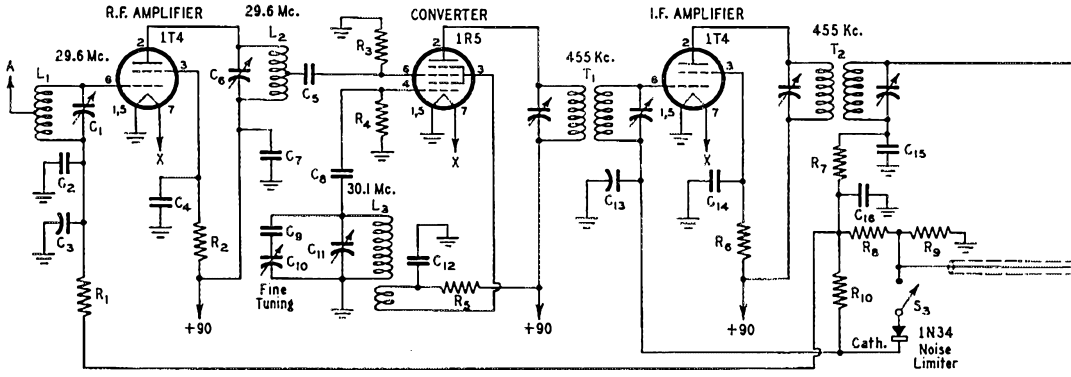


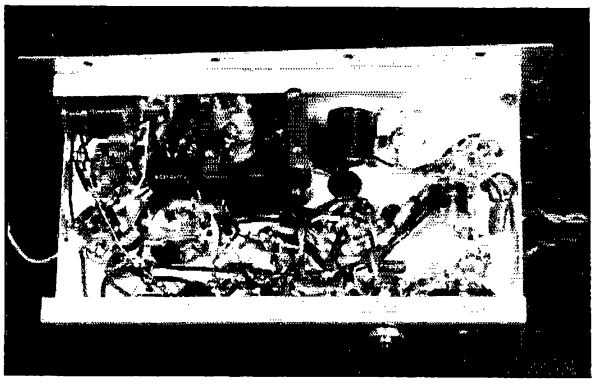
Fig. 1 — Wiring diagram of the 10-meter battery-powered station.

C_1, C_6, C_{11}, C_{20} — 25-$\mu\mu$fd. air-spaced trimmer (National PSR or equivalent).
C_2, C_4, C_7, C_{12}, C_{14}, C_{17}, C_{21}, C_{22} — 0.0047-$\mu\mu$fd. ceramic condenser.
C_3, C_{13}, C_{25} — 0.05-μfd. 400-volt paper.
C_5, C_8 — 10-$\mu\mu$fd. ceramic.
C_9 — 5-$\mu\mu$fd. ceramic.
C_{10} — 5-$\mu\mu$fd. variable (Johnson 160-102 or equivalent).
C_{23}, C_{24} — 0.01-μfd. ceramic.
C_{15}, C_{16}, C_{19} — 47-$\mu\mu$fd. ceramic.
C_{18} — 50-$\mu\mu$fd. mica trimmer.
R_1, R_3, R_{10}, R_{20} — 1 megohm.
R_2, R_6, C_7 — 68,000 ohms.
R_4, R_{11}, R_{16}, R_{21} — 0.1 megohm.
R_5, R_{12} — 12,000 ohms.
R_8 — 0.22 megohm.
R_9, R_{13} — 0.47 megohm.
R_{14} — 5.6 ohms (IRC BW-½).
R_{15} — 10 megohms.
R_{17} — See text.
R_{18} — 4.7 megohms.
R_{19} — 0.39 megohm.
R_{22} — 1-megohm volume control.
All resistors ½-watt unless specified otherwise.
L_1 — 10½ turns No. 16 enam., ⅝-inch diam., antenna tapped 2 turns from ground end.
L_2 — 10½ turns No. 16 enam., ⅝-inch diam., center-tapped.
L_3 — 8½ turns No. 16 enam., ⅝-inch diam., spaced to 1⅝ inches. Tickler 3½ turns 1/16-inch from L_3.
L_4 — 15 turns No. 22 enam., ⅝-inch diam.
L_5 — 12 turns No. 16 enam., ⅝-inch diam. Link 3 turns. L_3 and L_4 wound on polystyrene forms. Others are self-supporting.
B_1 — 1½-volt A battery (Burgess 4FL).
B_2 — Two 45-volt B batteries (Burgess B30, Burgess 5308, or RCA VS-112).
B_3 — Four 1½-volt pen light cells.
J_1 — 2-circuit jack for PL-68 plug (Mallory SCA-2B).

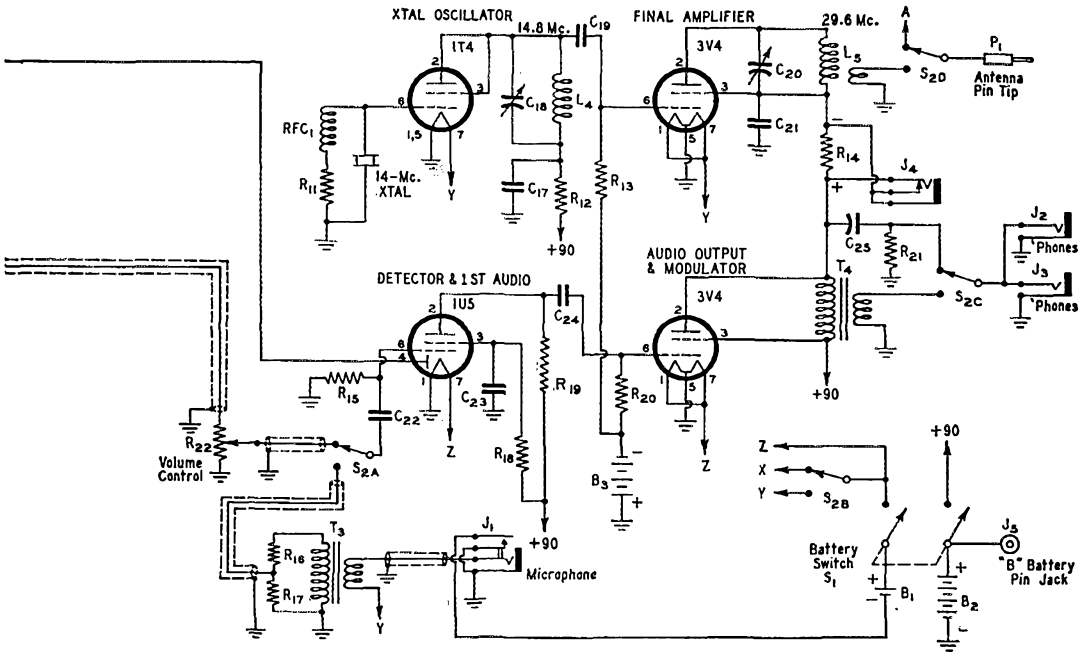
and slightly above the 3V4. On the right edge of the chassis above the 1R5 converter is C_{11}, and to the left of the 1R5 is C_6. The 1T4 r.f. amplifier is above C_6, with C_1 to the left. T_4, the output transformer, with the 3V4 to the left, is mounted in the remaining space. Finally, C_{25}, the headphone coupling condenser, is mounted on top of the chassis between the 3V4 tube and S_2. Note that all leads from S_2, except those to L_1 and L_5, pass through a ½-inch hole under S_2.

Coils L_1, L_2, and L_5 are self-supporting and are soldered directly to their associated trimmer condensers. For stability reasons L_3, the receiver oscillator coil, is wound on a polystyrene form, coated with dope, and wedged in the space between the lip on the chassis and C_{10}. Because of the small size of wire used, a coil form is also required for L_4, the crystal oscillator plate coil.

Complete shielding of the receiver antenna coil, L_1, is very important; first, to prevent oscillation due to coupling with the r.f. amplifier plate coil, L_2, and second, to prevent absorption effects with the transmitter final tank coil, L_5, when both are tuned to the same frequency. The shield box is made from a piece of copper cut as shown in Fig. 2. The edges are soldered together and self-tapping screws are used to fasten the lid to the box. After the transmitter has been tuned, check for coupling between L_1 and L_5 by varying C_1 and watching for plate-current fluctuations of the 3V4 final amplifier. If fluctuations are noted, check the contact between the shield box and its lid.



A view under the chassis of the portable station. The cover has been removed from the receiver input-coil shield.



J_2, J_3 — Open-circuit jack.
J_4 — Closed-circuit jack.
J_5 — Insulated pin jack.
P_1 — Pin plug.
S_1 — D.p.s.t. toggle switch.
S_2 — Four-pole d.t. spring return switch (Centralab 1457).
S_3 — S.p.s.t. toggle switch.
T_1, T_2 — Midget 455-kc. iron-core i.f. trans. (Meissner 16-6678).
T_3 — Single-button microphone-to-grid transformer (see text).
T_4 — 15,000-ohm plate-to-voice-coil transformer (Stancor A-3881).
RFC_1 — 2½-mh. r.f. choke.
XTAL — 20-meter crystal (Petersen Z3).

A simple shield is necessary between the coils L_2 and L_3 to minimize oscillator pulling. It is fastened to the chassis under the oscillator padder, C_{11}.

To minimize the possibility of audio oscillation, the wiring to S_2 should be the same as in the original model. Referring to Fig. 1, the four switch sections are connected in the following manner: upper left, filament circuit; lower left, headphone circuit; upper right, 1U5 grid circuit; and lower right, antenna change-over. If there is some audio oscillation, particularly while receiving, try running the ungrounded secondary lead of T_4 close to the upper right switch section of S_2. If this makes matters worse, phasing is incorrect for audio neutralization and reversing the secondary leads of T_4 will do the trick.

T_4 is a 15,000-ohm plate-to-voice coil transformer used as an audio choke. When receiving, the headphones are connected to the 3V4 plate through C_{25}. Resistor R_{21} keeps C_{25} charged and prevents the ear-shattering click that would result if C_{25} charged through the headphones when S_2 was thrown from "transmit" to "receive." When transmitting, the headphones are connected to the voice-coil winding on T_4. This allows monitoring of modulation to be made while transmitting without consuming any appreciable amount of audio power. If a substitution is made for transformer T_4, make sure that the direct-current resistance of the primary winding does not exceed 600 ohms.

T_3, the carbon-microphone-to-grid transformer, in the original model is a surplus UTC "Ouncer." The only identifying mark on it is the number 65958. This transformer is not critical and any other that will fit in the allotted space may be used.

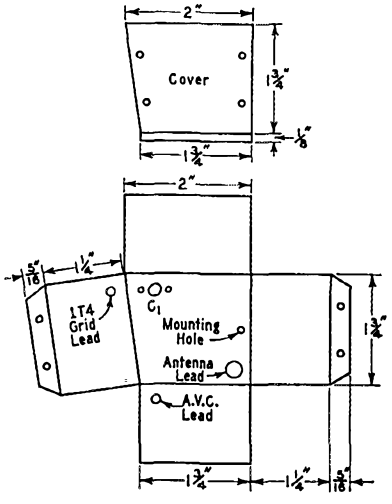


Fig. 2 — Details of the antenna-coil shield box. The material is thin copper, for easy soldering.

A handset or a separate carbon microphone and pair of headphones may be used with the unit. To use the TS-13-E handset, first remove the butterfly switch and use a short length of wire to connect together the three screw terminals found underneath. Then unscrew the microphone cap and unsolder the 820-ohm carbon resistor found connected between two of the terminals inside the microphone chamber. This resistor is connected in parallel with the headphone unit and must be removed for maximum sensitivity. Although the microphone portion of the TS-13-E handset is very sensitive, it has a bad audio peak and gives relatively poor intelligibility because of it. Much better results will be obtained if the element of a T-17 microphone, with a 0.01-μfd. ceramic condenser connected across it, is substituted in the handset. The condenser is necessary to prevent r.f. detection and consequent audio oscillation. When the above change is made, or when a separate T-17 microphone is used, resistors R_{16} and R_{17} should be removed and the secondary of T_3 connected directly to S_2. With other microphones, resistor R_{17}, the lower end of the voltage divider across the secondary of T_3, must be individually adjusted for proper modulation with the particular microphone used. Owing to the high gain of the audio amplifier only 1½ volts is required on the microphone, and it is obtained from the A battery.

Note that the microphone must be plugged in to complete the A circuit to ground. If the operator simply remembers to unplug the microphone each time the unit is not used for a length of time, it will be impossible to run down the batteries through accidental tripping of S_1. The second headphone jack has been added to facilitate two-man operation and demonstrations.

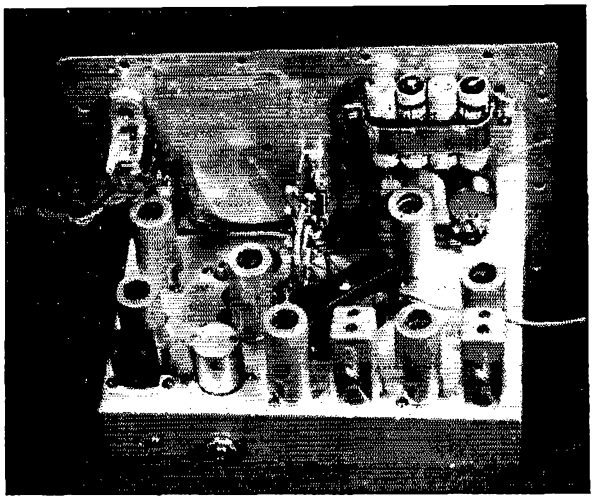
A six-foot center-loaded antenna has been used with excellent results. The upper half of the antenna with loading coil unplugs, and when turned end for end, slides inside the 3-foot section of ¼-inch aluminum tubing that is the lower half. This makes it easy to carry the portable indoors or inside of a car. The antenna assembly is mounted on the case with a pair of Johnson No. 44 feed-through insulators. P_1 plugs into a pin jack connected to the lower feed-through insulator inside of the carrying case.

Fig. 3 shows the details of the loading-coil assembly. It is made by first coating the handle of an insulated banana plug with dope and forcing it into the end of a 2½-inch length of ½-inch diameter polystyrene tubing for about ½-inch. Then a 2-inch length of solid ⅜-inch polystyrene rod is forced in from the opposite end to fill up the tubing. Next, the end of the brass wire is heated until red and then pushed into the center of the solid rod for about ½ inch. The loading coil is wound with 11 turns of No. 16 enameled wire spaced to 1 inch. These specifications gave the best results for 29,610 kc., although each coil should be individually adjusted for best loading, as will be discussed later. Connecting the ends of the coil to the banana plug and the brass wire, and coating the coil with dope, completes the upper half of the antenna. If the banana plug is to fit easily into the end of the aluminum tubing, the inside should be drilled out to a diameter of 5/32 inch.

To align the receiver, connect a v.t.v.m. to the junction of R_7 and C_{16}, apply a 455-kc. signal to the control grid of the 1T4 i.f. amplifier, and peak the trimmers of T_2 for maximum indication. Then apply the signal generator to the signal grid of the 1R5 converter, keeping the output of the generator as low as possible, and peak the trimmers of T_1. Repeat the process again for a more accurate alignment.

Next, set the local oscillator to operate on the high side of the desired signal frequency. This may be done fairly accurately with a communications receiver tuned 455 kc. above the signal frequency.

A good signal generator for aligning the receiver "front end" is a temporary crystal oscillator using the transmitter crystal. Of course, a fellow "ham" on the net frequency can also be used as a signal source. When adjusting C_6 there



A rear view of the transmitter-receiver shows how the components are distributed on the chassis and panel.

will be some interaction with the oscillator so vary C_6 along with C_{10} for a maximum v.t.v.m. indication. Similarly, it may be necessary to vary C_1 along with C_{10}, only to a lesser degree.

To tune the crystal oscillator stage of the transmitter, temporarily tie S_2 in "transmit" position with a piece of string, and connect the probe of the v.t.v.m. to the junction of RFC_1 and R_{11}. Adjust C_{18} for maximum grid voltage, which should be about −11 volts. Then, for best stability, readjust C_{18} slightly toward the high-frequency side of resonance. The protective bias of B_3 keeps the 3V4 plate current within limits while making the above adjustments.

Then plug a 0–1 milliammeter into J_4 and, with the antenna connected, adjust C_{20} for minimum plate current. Final antenna coupling and loading coil adjustments are best made with a field-strength meter, because small changes in output are more easily observed. Be sure to readjust C_{20} each time a change is made in the antenna circuit. When all adjustments have been completed, the 3V4 plate current should be about 5 ma. The shunt resistor, R_{14}, gives a 10-ma. full scale deflection with a 0–1 milliammeter.

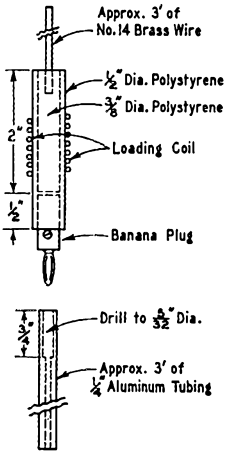
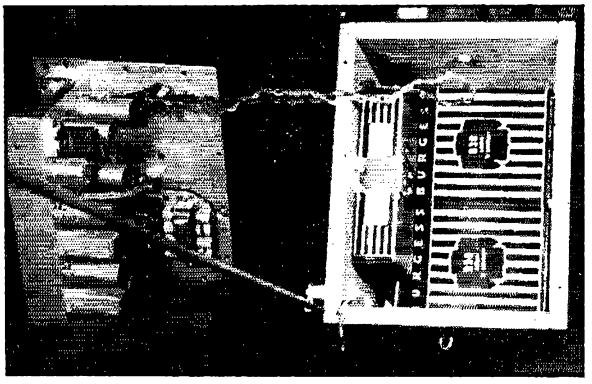


Fig. 3 — The antenna is built in two halves that can be unplugged for easier portability.

The carrying case is made from ½-inch hardwood stock, and over-all outside dimensions are 7¼ by 9¼ by 7½ inches. A 7¼ by 9¼-inch piece of aluminum is used for the top panel and bottom. Although not shown in the photograph, the inside of the case is lined with aluminum foil, folded over the top and bottom edges of the case to make good contact with the top and bottom panels. Cardboard insulation is put over the foil to prevent accidental "shorts." A replacement camera-carrying strap, with two dogleash catches sewed on, snaps into two screw-eyes on the sides of the case.



This view of the portable shows how the batteries are mounted in the box and how the antenna is supported on the side wall by a pair of feed-through insulators.

Both B batteries fit snugly on the bottom of the case, and the A battery mounts lengthwise against the back. Burgess B30 B batteries were used, although Burgess 5308 or RCA VS-112 batteries will also fit. The A battery is a Burgess 4FL.

Maximum B current, either transmitting or receiving, is 13 ma., and the A current is 300 ma. Tests have shown that the transmitter and the receiver will function with a B voltage as low as 45. A pin jack on the front panel permits "charging" the B batteries. Passing 3 or 4 ma. through them for several hours after long periods of use will prolong their life considerably. This jack also provides a convenient method of checking battery condition with a voltmeter, and a second jack could be added for the A battery.

Six months of participation in local civil defense drills with this portable has provided an excellent opportunity to check its performance. To date the DX is 6 miles over average terrain. The longest contact with a mobile station is 3½ miles. Constant communication can be maintained with mobile stations within a 2-mile radius, which makes the unit more than adequate for civil defense purposes. Using a large body of metal, such as the hood or top of a car, as a ground plane improves the signal strength.

If carefully constructed and adjusted, this unit will be a valuable addition to any civil defense network operating on ten meters.

Strays

Daniel Appleton Ward III, new son of the KW6ATs, was the first baby born on Wake Island. Will he also be the first Novice on Wake? It's not unlikely — Pop teeths his kids on RG/8U coax.

—···—

W4FF passed the observation that W4RNP is one of the few hams who reside entirely within ham-band-pass filters. The shack at W4RNP is inside an all-metal house overlooking Roanoke, Va.

1952 ARRL Field Day Rules

Annual Test for Emergency-Powered Stations, June 21st–22nd

FIELD DAY TIME is here again! Old hands won't have to be told that the FD packs more solid fun and enjoyment into a week end than any other event in the ARRL Activities Calendar. To newcomers we'd like to explain that this annual activity is a test of emergency-powered stations in the field operating under conditions often approximating those likely to be encountered in an actual emergency. Unlike most other amateur operating activities, this has grown to be largely one in which radio clubs and other organized groups function as teams in setting up and operating single or multi-transmitter stations independently of normal power facilities. It is a spectacular demonstration of amateur radio's ability to provide communications useful in times of emergency. But even if you can't arrange to participate as a member of a Field Day group, you're urged to get into the FD. If you're the proud possessor of a mobile rig, or if you have gear that can be set up afield, get out alone or with a friend and enjoy the fun. You'll find hundreds of stations on the air manned by thousands of brother amateurs eager to hook up with you!

The importance of mobile equipment in planning for emergency perhaps deserves special mention in connection with this Field Day. Mobile operation is more widespread than ever, with club groups and individuals concentrating on getting more and more mobile units on the air. This is an encouraging development, since mobile units are considered indispensable in civil defense planning. All amateurs who possess mobile gear should test it in the FD. Clubs in particular are urged to get every mobile unit owned by their members into the field and to report their aggregate-mobile scores to ARRL.

The procedure used in making Field Day contacts is simple: The general call on c.w. is "CQ FD" and on 'phone "Calling any Field Day station" or "CQ Field Day." During contact give the station you're working a signal report and the name of the ARRL section in which you're located, then stand by to receive similar information. Score your contacts according to the rules listed here and send a report of your FD activities to ARRL Headquarters.

The rules covering operation in this Field Day are practically the same as those of last year with two exceptions: First, the one-point credit previously allowed for originating any message additional to the 25-point Field Day message has been eliminated. The only message credits now allowed are for the one 25-point originated message to the SEC *or* SCM and for relaying such Field Day messages. This change was made in response to popular demand that FD "message factories," set up to originate hundreds of meaningless, rubber-stamp messages for the sole purpose of running up points, be eliminated. Second, the rules now require that the Field Day message and the FD entry specify the number of transmitters in simultaneous operation.

1952 Field Day

Starts 4:00 P.M. Local Standard Time,* June 21st
Ends 4:00 P.M. Local Standard Time,* June 22nd
**Not* Daylight Time

There is the opportunity to add points to your score for originating a special Field Day message addressed to your SEC or SCM. Study the rules carefully to learn how you may earn this bonus. The FD message is an important part of FD operations; it will give you and other participants practice in handling traffic, and it will convey information to your SEC or SCM that will enable him to evaluate emergency facilities in your section. Don't send your FD message out of your state or League section; normally it should be transmitted to a station in your state or section in order that your SEC or SCM will receive it as soon as possible.

Convenient reporting forms on which to list your FD contacts and make the necessary score computations are available upon request from League Headquarters. You may of course make up your own report forms, but please be certain to include all the information required by the rules. Mail reports on or before July 16th.

It is hoped that all amateurs, especially club and local emergency corps groups, will support the 1952 Field Day and make it the greatest amateur emergency exercise of all time. Start making *your* preparations now!

Rules

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

2. **Object:** For portable and mobile stations to work as many stations as possible; for home stations to work as many portable and mobile stations as possible.

3. **Conditions of Entry:** Each entrant agrees to be bound by the provisions of this announcement, the regulations of his licensing authority, and the decisions of the ARRL Contest Committee.

4. **Entry Classification:** All entries will be classified according to number of transmitters in simultaneous operation. They will be further classified as follows: "A," club or non-club group portable stations; "B," unit or individual portable stations; "C," mobile stations; "D," home stations operating from emergency power; "E," home stations operating from commercial power sources. Thus a club group running three transmitters simultaneously will be in the 3A classification, or a mobile station with one transmitter will be in the 1C classification.

Portable stations are those installed temporarily, for FD purposes, at sites away from customary fixed-station locations. Portable equipment or units must be placed under one call and the control of one licensee, for one entry. All control locations for equipment operating under one call must lie within a 1000-foot diameter circle.

Club or group participation is that portable-station work

accomplished by three or more licensed operators.

Unit or individual participation is that portable-station work accomplished by either one or two licensed operators.

Mobile stations are complete installations including power source and antenna, mounted in or on vehicles and capable of being used while in normal motion. If they utilize antenna supports not normal or suitable for use during motion, installations must be classified as portable instead of mobile. Each mobile entry call must be different from any other FD station participating.

Home-station participation is that work by fixed amateur stations not operating portable or mobile.

A transmitter used to contact one or more stations may not subsequently be used under more than one other station call during the Field Day period.

5. **Field Day Period:** The Field Day starts at 4:00 P.M. Local Standard Time (*not* Daylight Time) June 21st and ends at 4:00 P.M. Local Standard Time (*not* Daylight Time) June 22nd. All contacts must be made during this period. Class C stations may cross a time-zone line but may not receive credit for more than 24 hours of operation if they do so.

6. **Bands:** Each 'phone and c.w. band is regarded as a separate band. The following (and additional u.h.f.-s.h.f. bands) constitute separate bands: *A1:* 1.800-1.825 1.875-1.900 "east" or 1.900-1.925 1.975-2.000 "west," 3.5-4.0, 7.0-7.3, 14.0-14.35, 21.0-21.45, 26.96-27.23, 28.0-29.7, 50-54 and 144-148 Mc. *A2,* radioteletype and frequency-shift keying are grouped with A1, in the bands where they are allowed. *A3:* 1.800-1.825 1.875-1.900 "east" or 1.900-1.925 1.975-2.000 "west," 3.8-4.0, 14.2-14.3, 26.96-27.23, 28.5-29.7, 50-54, and 144-148 Mc. All forms of voice transmission will be grouped with A3, in the bands where they are allowed. (In Canada and Cuba, their respective 'phone bands apply.)

The use of more than one transmitter at one time in the same band is not allowed.

7. **Exchanges:** Signal reports and ARRL section (or specific location) must be exchanged in proof of contact.

8. **Valid Contacts:** In Class A, B and C, a valid contact is a completed exchange with any amateur station. In Classes D and E, a valid contact is a completed exchange with any station in Class A, B or C. Cross-band contacts are not allowed. Contacts by mobile stations may be made in motion or from any location(s). A station may be worked more than once only if the additional contacts are made on different bands.

9. **Field Day Message:** Field Day Message is one originated by a Class A, B or C station and addressed to the SEC or SCM (see address in *QST*, p. 6) stating the number of operators, the number of transmitters in simultaneous operation, the field location, and the number of AREC members at the Field Day station. Only one Field Day Message may be originated.

10. **Scoring:**

Points: Each valid contact counts 1 point.

Credit for handling messages may be obtained only as follows: 25 points for originating one Field Day message to SEC or SCM. In addition, each Field Day Message received for relay will score 1 point when received by radio and 1 point when sent onward by radio. Any FD message can be handled (originated or relayed) only once for credit. There will be a deduction of 10 points for omission of handling data or for defects in form. Copies of all messages originated and relayed must accompany Field Day reports.

Multipliers:

Power: Output-stage plate input under 30 watts: 3. Output-stage plate input over 30 and under 100 watts: 2. Output-stage plate input over 100 and under 1000 watts: 1.

Independence-of-Mains: All radio equipment independent of commercial power source: 3. All radio equipment not independent of commercial power: 1.

Battery Power (applies to Classes B and C only): 1.5. The battery capacity or size shall in all cases be adequate to permit one hour's continuous operation of the station. Charging batteries from commercial mains while batteries are connected to transmitter or receiver voids the "independence-of-mains" and "battery power" multipliers.

Multipliers do not apply to Class D and E entries.

Final Score: The final score equals the total "points" multiplied by the "power multiplier" multiplied by the "independence-of-mains" multiplier (multiplied by the "battery power" multiplier, if applicable). Where different multipliers apply during the Field Day period, points are multiplied by the multiplier in effect at the time the points were earned.

11. **Club Aggregate-Mobile Scores:** Entries under Class C may be combined to form a "Club Aggregate-Mobile Score." The club name must be noted on the individual reports, and the club secretary must submit a claimed aggregate score. Credits to the extent supported by the reports submitted to ARRL will be allowed. Only bona fide members of the club, residing in the club territory, may contribute to the aggregate-mobile club listing.

12. **Reporting:** Mail reports or entries on or before July 16th. Reports must show bands used, dates and contact times, calls of stations worked, signal reports received and sent, and ARRL sections or locations of stations worked. Reports must also show power inputs and sources of power, number of transmitters in simultaneous operation, location of station, number of persons participating, and score computations.

Sample Score

Assume a station operating in Class B with independent power and less than 30 watts input. If 41 valid contacts are made, 1 FD message originated, and 3 FD messages relayed (received and sent on), the score would be computed as follows: $41+25+6=72$ points. 72×3 (power below 30 watts)$\times3$ (independent power)$=$ 648 *claimed score.* If the station were using battery power, the claimed score would be: $1.5\times648=972$.

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. 53 this *QST*.

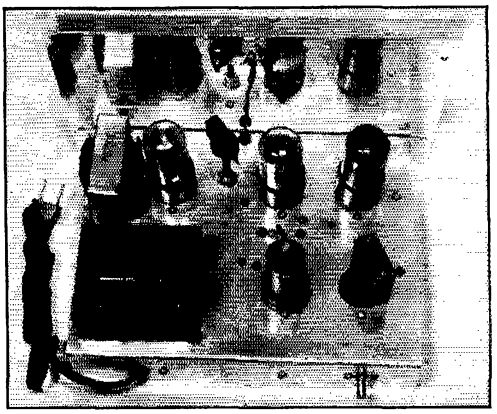
W1, K1 — J. R. Baker, jr., W1JOJ, Box 232, Ipswich, Mass.
W2, K2 — H. W. Yahnel, W2SN, Lake Ave., Helmetta, N. J.
W3, K3 — Jesse Bieberman, W3KT, Box 34, Philadelphia 4, Penna.
W4, K4 — Thomas M. Moss, W4HYW, Box 644, Municipal Airport Branch, Atlanta, Ga.
W5, K5 — L. W. May, jr., W5AJG, 9428 Hobart St., Dallas 18, Texas
W6, K6 — Horace R. Greer, W6TI, 414 Fairmount St., Oakland, Calif.
W7, K7 — Mary Ann Tatro, W7FWR, 513 N. Central, Olympia, Wash.
W8, K8 — Norman W. Aiken, W8LJS, 701 East 240th St., Euclid 23, Ohio.
W9, K9 — John F. Schneider, W9CFT, 311 W. Ross Ave., Wausau, Wisc.
WØ, KØ — Alva A. Smith, WØDMA, 238 East Main St., Caledonia, Minn.
VE1 — L. J. Fader, VE1FQ, 125 Henry St., Halifax, N. S.
VE2 — Austin A. W. Smith, VE2UW, 6164 Jeanne Mance, Montreal 8, Que.
VE3 — W. Bert Knowles, VE3QB, Lanark, Ont.
VE4 — Len Cuff, VE4LC, 286 Rutland St., St. James, Man.
VE5 — Fred Ward, VE5OP, 899 Connaught Ave., Moose Jaw, Sask.
VE6 — W. R. Savage, VE6EO, 329 15th St., North Lethbridge, Alta.
VE7 — H. R. Hough, VE7HR, 1330 Mitchell St., Victoria, B. C.
VE8 — Roy Walton, VE8CZ, Box 534, Whitehorse, Y. T.
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

A General-Purpose Frequency Standard and Multivibrator

Simple Band-Edge Marking to 30 Mc.

BY DONALD E. MORTON,* W7LBN

IT'S nice to know where you are in the band and whether you are in or out.[1] This thought, together with a good deal of respect for the FCC monitoring stations and a desire to operate near band edges, led to the construction of the frequency standard to be described. The standard can be depended on for operation as near a band edge as should ever be attempted by anyone. It is quite possible to determine the band edges within a few cycles. The unit is easy to build and operate. Aside from frequency measurement, it is very nice for calibration or recalibration of receivers, converters, VFOs and other r.f. equipment. It provides signals of very good stability and accuracy every 100 kc. from 100 kc. to 30 Mc. or higher and, at the flip of a switch, every 10 kc. in between. The cost, a very important item to the average ham, is quite low. The entire unit can be built for about eighteen to twenty dollars, buying everything brand new. Since most parts are of a noncritical nature and quite common, most may be obtained from the "junk box," cutting the cost even more.



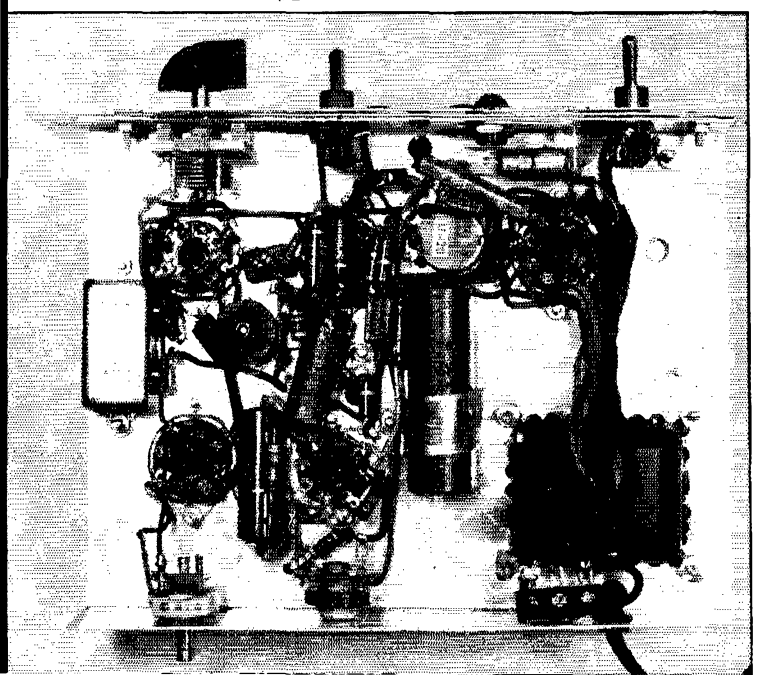
The simple frequency standard removed from its cabinet. The tubes near the panel, from left to right, are 5Y3, 6SN7 and 6F6. The shaft between the 5Y3 and 6SN7 adjusts the 10-kc. multivibrator.

Construction

The cabinet was rescued from the "junk box" and given a coat of thinned-down black enamel, which did not destroy the wrinkle finish but gave it a "new" look. Since the original panel was full of holes (one 3-inch meter hole plus several smaller ones) a new panel was constructed from transcription aluminum, which explains the extra three small holes in the panel. One of the binding posts is mounted in one drive-pin hole. These may be covered by a name plate or some such thing if desired. The aluminum was buffed down with a wire-wheel attachment to an electric drill and then given a coat of clear lacquer. The chassis was also constructed of transcription aluminum, the holes punched for tube sockets, and the various fixed components then mounted. The exact layout as shown need not be followed. The important point is to keep the crystal a reasonable distance from any source of heat.

* 2012 N. 23rd Place, Phoenix, Ariz.

[1] FCC Rules Governing Amateur Radio Service, § 12.135.



This view under the chassis of the frequency standard shows C_2 and RFC_1 mounted on the rear wall of the chassis, while S_2, S_1 and C_1 are mounted on the front wall.

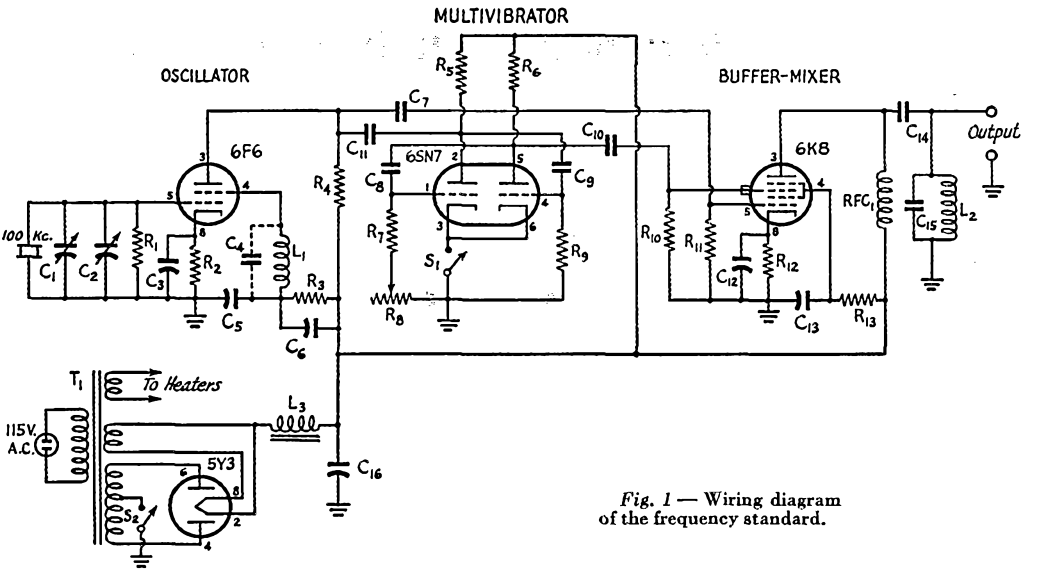


Fig. 1 — Wiring diagram of the frequency standard.

C_1 — 25-$\mu\mu$fd. midget variable.
C_2 — 15-$\mu\mu$fd. midget variable.
C_3, C_{12} — 0.1-μfd. 200-volt paper.
C_4 — 75-$\mu\mu$fd. mica. Used only with substitute L_1.
C_5, C_6, C_{13} — 0.1-μfd. 600-volt paper.
C_7 — 100-$\mu\mu$fd. mica.
C_8, C_9, C_{14} — 0.001-μfd. 600-volt paper.
C_{10}, C_{11}, C_{15} — 22-$\mu\mu$fd. mica.
C_{16} — 16-μfd. 450-volt electrolytic.
R_1 — 2.2 megohms.
R_2 — 470 ohms.
R_3, R_{13} — 10,000 ohms.
R_4 — 0.22 megohm.
R_5, R_6 — 47,000 ohms.
R_7, R_9 — 32,000 ohms (47,000 and 100,000 in parallel).
R_8 — 10,000-ohm linear potentiometer.
R_{10} — 0.1 megohm.
R_{11} — 1 megohm.
R_{12} — 750 ohms.
All resistors 1-watt unless otherwise specified.
L_1 — 8-mh. r.f. choke, or substitute. See text.
L_2 — 30 turns No. 30 enam., on ¼-inch rod, spaced to occupy 2 inches.
L_3 — 10-hy. 70-ma. filter choke.
RFC_1 — 2-mh. r.f. choke.
S_1, S_2 — S.p.s.t. toggle switch.
T_1 — 650 v. c.t., 70 ma.; 6.3 v. at 3 a.; 5 v. at 2 a. Crystal is 100-kc. (James Knights H16S).

Wiring

The filament circuits and a.c. line were wired in first. No a.c. line switch is included in the unit as it is arranged to be on at any time the station is turned on. Thus it is warmed to some degree when it is put into action. As a precautionary measure (probably not necessary) all tube-socket ground lugs were bonded together to form a little better ground circuit than would be obtained from the aluminum chassis.

The power supply was wired next. It has a full-wave rectifier and a choke-input filter circuit. No further comment is necessary, since it is similar to thousands of other supplies.

Following the power supply, the 100-kc. crystal-oscillator circuit was wired. The circuit uses a simple form of electron coupling, with the 100-kc. crystal in the grid circuit. The two condensers across the crystal are a result of experimentation. It was thought that C_1 would be sufficient, but the crystal would not come to 100 kc. until C_2 was also added to the circuit. A mica condenser with a good temperature coefficient may be used instead. C_2 is mounted on the rear of the chassis and may be seen in the photograph.

Another oscillator-circuit item worthy of mention is L_1. If the exact value is not available, a substitute may be made by using almost any tuned circuit that will resonate near 100 kc. The one used here is an 85-kc. b.f.o. transformer from a BC-453 receiver. The primary and secondary are placed in series and shunted by a small mica condenser.

Almost any crystal oscillator circuit could be used, but this type is simple and easy to get going. However, as a standard the use of the circuit alone was not very satisfactory. The frequency would change as much as 500 cycles at 10 Mc. with load changes. For this reason it was considered advisable to include an isolation amplifier in the circuit.

Although 10-kc. check points or markers are not a strict necessity, they are very convenient for in-the-band checks and for calibration of other units. It is simple and inexpensive to include a 10-kc. multivibrator with the 100-kc. oscillator and lock its tenth harmonic with the 100-kc. oscillator. With this arrangement the multivibrator is quite stable, and the accuracy of the 10-kc. points is practically the same as that of the 100-kc. oscillator. The frequency of the multivibrator can be varied to a limited extent by varying R_8, the control visible between the rectifier and the 6SN7. A screwdriver-adjustment type control would be preferred, but the shaft would not allow its being used as such.

(Continued on page 116)

RECENTLY Brian Bower, **G3COJ**, got on 80 and 20 s.s.b. with a phasing job and an 813 final — the final driven by a Class A 6AG7 on 80 and a Class A 807 on 20 — and has been getting some fine results. On 20 he has had two-way s.s.b. QSOs with **W6DMN, W2JJC** and **OE13CC**, and one-way with KT1DD, KT1UX, W2FGV and PY6BP. The 80-meter work has been confined to Europe so far. Brian points out that the QSO with W6DMN was made after the other W6s had faded out, just in case we need any more proof of s.s.b.'s ability to get through.

Arny, **W2JJC**, is still helping to hold the 14-Mc. fort, and reports contacts with **KT1DD** and **OE13CC** recently. KT1DD was using an Edmunds (W1JEO) crystal-filter job by running 150 watts peak, and he tuned up the whole thing by whistling into the mike!

Those of you who were in on this thing early will remember Jack Heidt, W2LKN. Jack is now **W4VCS** in Boca Raton, Fla., and should be on 20 s.s.b. by now.

In March we made a facetious crack about these young s.s.b. ops making a lie of the legend that you have to be an engineer to make s.s.b. work. Now we hear that **W2URX**, the second-youngest s.s.b. op, is studying engineering at M.I.T. Gosh, maybe you do have to be an engineer! Denny had W2URX/1-s.s.b. on the air from the Pi Lambda Phi house, with a BC-454 for a receiver.

N. L. Southwell, **VK2ZF**, tells us of the activity "down under." **VK2CP, VK2AC, VK3YW, ZL1AU** and **ZL4AE** are all using crystal-filter jobs, and a few of them use higher-frequency crystals than the usual 450-kc. ones. **VK2VA, VK2ZF** and **VK4CG** use phasing rigs. Most of the work is on 14 Mc., although a few have started out on 7. There isn't much 80-meter work because BCI is rather tough. Most of the s.s.b. VKs and ZLs on 20 operate between 14.15 and 14.2, around 0900 to 1100 GCT.

Don Kinney, **W8FSA**, took the tip from Villard's article in the March *QST* (page 14) and reports that it makes a very successful no-relay break-in system. The circuit as used at W8FSA is shown in Fig. 1, and there should be no good reason why it can't be applied to other receivers just as

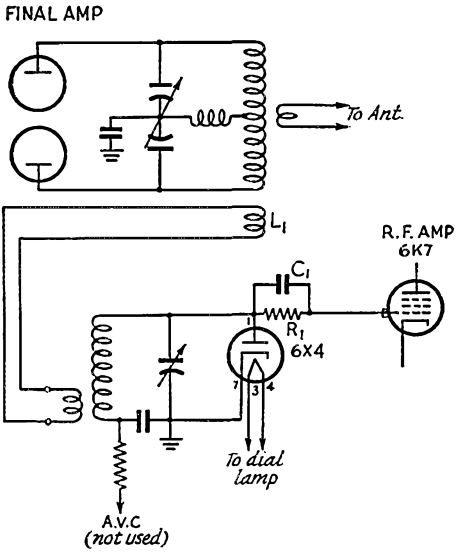


Fig. 1 — **The automatic "transmit-receive" switch as applied to the HRO-5 receiver and the kilowatt final at W8FSA.**

C_1 — 470-$\mu\mu$fd. ceramic.
R_1 — 0.47 megohm, ½ watt.
L_1 — 4 Mc.: 6 turns No. 16 enam., 3-inch diam., coupled 1 inch from hot end of transmitter tank coil. 14 Mc.: 2 or 3 turns.

successfully. Don runs a kilowatt peak to his linear, but "nothing blows up, and there is actually very little coupling to the receiver when the linear amplifier is making with the duck talk." There is a slight possibility that the 6X4 rectifier could be responsible for the generation of harmonics and consequent TVI, but Don reports none on 4 Mc., with a low-pass filter in the line to the antenna.

Al Prescott, **W8DLD**, passes along the circuit of a "series" balanced modulator that he is using to avoid the use of transformers in his phasing-type exciters. The circuit is shown in Fig. 2, and has several interesting tricks that merit your study. Although he uses the phase-shift networks that involve coupling tubes, there is no good reason why the tube-

♦

When W3MBY was in Los Angeles a few months ago, some of the local s.s.b. gang got together for an evening's bull session, and thus enabled us to show you the W6s that have been making with the single sideband. From left to right: W6s IRF BAY; W3MBY; W6s EDS BMN UOC (mobile s.s.b.), EDD BXR and PSC. (*Photo courtesy W6PSC*)

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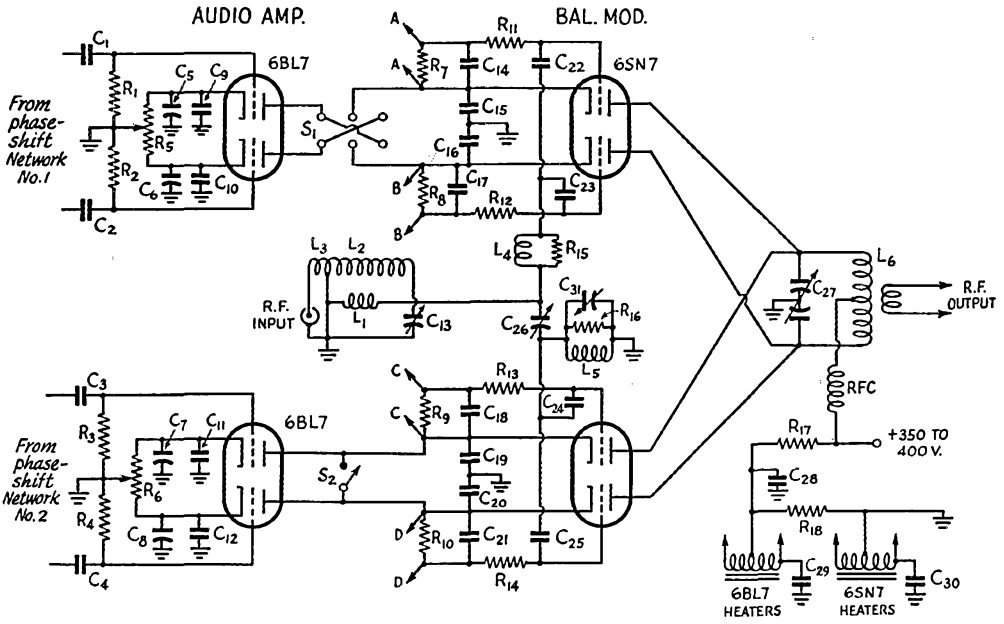

Fig. 2 — The series balanced-modulator circuit of W8DLD eliminates the need for audio coupling transformers. By-pass condensers and metering circuits make it look more complicated than it actually is.

C_1, C_2, C_3, C_4 — 0.01-μfd., 600 volts.
C_5, C_6, C_7, C_8 — 10-μfd. electrolytic.
C_9, C_{10}, C_{11}, C_{12}, C_{14}, C_{15}, C_{16}, C_{17}, C_{18}, C_{19}, C_{20}, C_{21}, C_{28}, C_{29}, C_{30} — 0.001-μfd. ceramic or mica.
C_{13} — 100-μμfd. midget variable.
C_{22}, C_{23}, C_{24}, C_{25} — 47-μμfd. ceramic or mica.
C_{26} — 75-μμfd. midget variable.
C_{27} — 100-μμfd.-per-section variable.
C_{31} — See text.
R_1, R_2, R_3, R_4 — 0.47 megohm.
R_5, R_6 — 3000- or 4000-ohm potentiometer, 4 watts.
R_7, R_8, R_9, R_{10} — 47 ohms, ½ watt.
R_{11}, R_{12}, R_{13}, R_{14} — 4700 ohms, ½ watt.
R_{15}, R_{16} — See text.
R_{17} — 0.1 megohm, 2 watts.
R_{18} — 0.2 megohm, 1 watt.
L_1 — 13 turns interwound with L_2.
L_2 — 39 turns No. 26 enam.
L_3 — 3 turns.
L_1, L_2, and L_3 wound on 1⅝-inch diam. tube base.
L_4, L_5 — See text.
S_1 — Sideband selection switch, d.p.d.t. toggle.
S_2 — Balanced-modulator disabling switch, s.p.s.t. toggle type.
Points *A*, *B*, *C*, and *D* go to a meter switch (25-ma. meter) for measuring grid current.

less or "passive" types couldn't be used. Potentiometers R_5 and R_6 control the carrier balance (or injection, if you prefer). The switch S_2 simply disables one modulator, for use when tuning up with the two-tone method.

Al says the grid currents to the 6SN7s run about 2 to 3.5 ma., and that if they aren't reading within about 10 per cent of each other the audio-balancing controls (not shown — they are ahead of the phase-shift networks) will seem not to work.

The r.f. phasing networks are a little different than any we have seen described. Al uses wire-wound resistors on 4 Mc. and makes use of the inherent inductance. At 4 Mc., L_4R_{15} is simply a 1250-ohm 10-watt Ohmite wire-wound resistor, and $L_5R_{16}C_{31}$ is a 1000-ohm 10-watt Ohmite wire-wound. At 14 Mc., L_4R_{15} is 69 inches of No. 26 enameled wound on a 1000-ohm IRC BT2 resistor, and $L_5R_{16}C_{31}$ is 36 inches of No. 26 enameled on a similar resistor, with a small mica compression trimmer across the works.

The output of the unit runs about 3 watts with single-tone modulation and good carrier suppression.

VK2ZF says the r.f. phase-shift network shown in Fig. 3 is one he has been using for some time now and finds very convenient to reset after QSY. It turned out that PK4DA had been using much the same arrangement — they both arrived at it independently. — *B. G.*

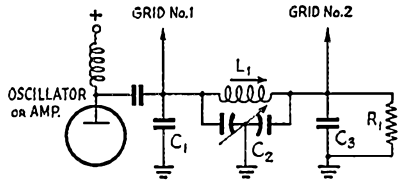

Fig. 3 — The 90-degree r.f. phase-shift circuit used by VK2ZF is simple, and easy to readjust after QSY. Constants are for 14-Mc. operation.

C_1, C_3 — 70 μμfd.
C_2 — 100 μμfd. per section.
R_1 — 300 ohms, 10 watts.
L_1 — 22 turns No. 28 d.s.c. close-wound on ½-inch diameter slug-tuned form.

COMING A.R.R.L. CONVENTIONS

June 14th — New England Division, Springfield, Mass.
June 14th–15th — Rocky Mountain Division, Estes Park, Colo.
June 28th–29th — West Gulf Division, Corpus Christi, Texas.
July 4th–6th — Pacific Division, San Francisco, Calif.
Sept. 5th–7th — Dakota Division, Minneapolis, Minn.
Oct. 3rd–5th — Hudson Division, Albany, N. Y.
Oct. 11th — Roanoke Division, Richmond, Va.

• On the TVI Front

TVI FORUM

TV lookers-in of East Rockaway, L. I., N. Y., had an opportunity recently to learn first-hand the reasons for TVI and the workable remedies. At a "better television reception" forum sponsored jointly by the YL Radio League of Long Island and the Nassau Radio Club, TV viewers listened to an authoritative and frank discussion of the TVI problem and were given a demonstration of the various types of TVI.

Panel members were Samuel L. Barriette, W2PC, of the Abington Television Co., Russell S. Miller, W2DIC, secretary of the TVI Organization of New York, L. G. McCoy, W1ICP, ARRL assistant communications manager for 'phone, and Don Merten, W2UOL, of Eldico, Inc. William L. Kiser, W2PJS, engineer of the New York City FCC office and author of articles on TVI, acted as moderator. The forum brought together, on the same platform, representatives of the TV set manufacturer, TV serviceman, amateur, and FCC.

After hearing statements of position by the panel members, the audience was shown the effect on TV receivers of diathermy, sunlamps, electric razors, radiating TV receiver oscillators, and an amateur transmitter. In the case of the ham rig, W2UOL convincingly demonstrated the effectiveness of the combination of low- and high-pass filters in eliminating interference. A question-and-answer period was held prior to adjournment.

The forum was a well-conducted affair, reflecting much planning and work by the committee in charge. Clubs interested in staging similar meetings are invited to write Chairman Viola Grossman, W2JZX, for any information they may need.

V.H.F. HETERODYNE TVI

Many amateurs still think of TVI strictly in terms of harmonic radiation at TV channel frequencies, fundamental overloading, and transient effects. E. M. Shook, W5IT, co-author with J. F. Skelton, W5MA, of "The Dallas Plan for TVI" (June, 1951, *QST*, p. 26), describes here a typical case history of "heterodyne TVI," a phenomenon not unlikely to be encountered by v.h.f. amateurs in areas where several TV channels are in use. It could also arise in such localities because of the presence of harmonics, normally falling safely outside TV channels, generated by lower-frequency transmitters.

227 West Woodin Blvd.
Dallas, Texas

Editor, *QST*:

You will recall that we pointed out in "The Dallas Plan for TVI" various combinations of frequencies which, when mixed in the front end (probably the first tube) of a TV receiver of poor rejectivity, produced beats and consequent harmful interference in an assigned TV channel. Fate seems to have tagged Channel 5 for more than its share of beats in this area.

A combination not heretofore reported but recently tracked down by W5CAE adds still another beat resulting in TVI to Channel 5. This involved W5CAE's SCR-522 on 144 Mc. running 15 watts, and showed up on his own National 17-inch TV set and at least two other TV sets in his neighborhood. One of these is a Silvertone 16-inch at 50 feet and another a General Electric 16-inch at 65 feet. The maximum interference range or the total number of TV sets affected has not been determined. This rather severe interference started some three months ago without any changes to the '522 or to the above television sets although one of the sets had been to the shop for repairs, the nature of which was not known. After endless hours of testing and debugging the '522, the basic trouble was found and tests were made to prove beyond any reasonable doubt that the 144-Mc. signal from W5CAE's '522 was beating with the 67-Mc. Channel 4 TV signal, producing in the front end of the TV receivers a difference or beat frequency of 77 Mc. This 77-Mc. beat is in the Channel 5 picture.

The first suspicion of this combination came by making a check when the Channel 5 station was *not* operating and the Channel 4 station operating. Under these conditions no picture was observed on the TV set when tuned to Channel 5. When the 144-Mc. carrier was turned on, the Channel 4 picture appeared on the screen even though the set was still tuned to Channel 5. What the devil! — 144 minus 67 gives 77!! There it was — disgustingly plain. But he did not scream for joy at this stage because of past frustrations. To make sure of his find, he hurriedly made up a pair of parallel-tuned traps for 144 Mc. and a pair for 67 Mc. Installation of *either* the 144-Mc. traps or the 67-Mc. traps in series with the 300-ohm Twin-Lead at the TV-set terminals entirely eliminated all detectable interference. The same results were obtained by similar tests on the neighbors' TV sets. A shorted 300-ohm Twin-Lead stub was installed across the antenna terminals of the TV set instead of the parallel-tuned traps in separate tests for each frequency and similar or equivalent results were obtained. Length of the 144-Mc. shorted stub was 34¾ inches and for the 67-Mc. stub 73 inches. Since the elimination of either 144 or 67 Mc. eliminated the 77-Mc. beat, elimination of 144 Mc. was chosen. Elimination of 67 Mc. would have required switching to obtain reception on Channel 4.

The unanswered question — "Why did the trouble ever start if it was once clear?" — kept bobbing up. A little reflection into the past turned up the information that some time back the Channel 4 station had increased its power. A further check indicated that the time of increased

(*Continued on page 114*)

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Panel and club officers at the TVI forum arranged by the YL Radio League of Long Island and the Nassau Radio Club. *L. to r.:* Samuel L. Barriette, W2PC, of Abington Television Co.; Russell S. Miller, W2DIC, secretary TVI Organization of New York; Thomas Hahn, W2IWE, president Nassau Radio Club; William L. Kiser, W2PJS, FCC engineer, New York City; Viola Grossman, W2JZX, Forum chairman; L. G. McCoy, W1ICP, ARRL assistant communications manager, 'phone; and Don Merten, W2UOL, of Eldico, Inc. (*Photo courtesy W2TC*)

An Improved Break-in System

One Antenna and No Changeover Relay

BY DANIEL CRONIN,* W2OUA

IT IS generally agreed that a good break-in system will allow the same antenna to be used for both receiver and transmitter, but the usual relay used to accomplish this is almost invariably noisy, cumbersome and slow in action. The author would like to describe a system that performs the function of a relay, but has none of these disadvantages.

Fig. 1 shows the general idea. It is a second cousin to the "Transmit-Receive" circuit used in radar sets, adapted to low-frequency use and using germanium crystals in place of a gas-filled spark gap. The transmitter is connected to the antenna at all times but, as the final is biased beyond cut-off, it will have no effect on the receiver during key-up periods. During these key-up periods the germanium crystals are prevented from conducting by the small bias shown. The series-resonant circuit, L_1C_1, represents a short circuit connecting the feed line to the receiver.

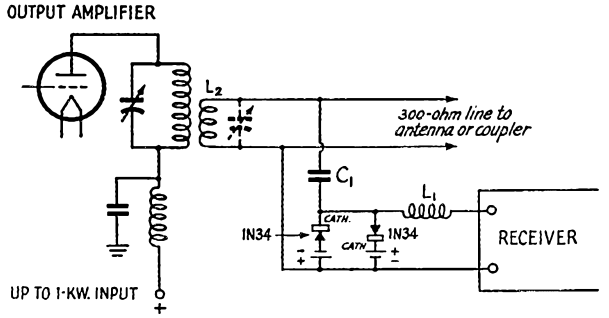

Fig. 1 — The basic circuit for one-antenna break-in operation without a relay. C_1 and L_1 resonate near the amateur band being used. If the transmitter runs less than a kilowatt, the value of C_1 can be increased and the value of L_1 decreased accordingly.
C_1 — 3.3 $\mu\mu$fd. for 7-Mc. band.
L_1 — 100 μh. for 7-Mc. band.
L_2 — Usual coupling coil for 300-ohm line. Shunt capacity may be required if not enough inductance.

When the transmitter is "on" the voltage tries to rise above the bias level of the crystals, but this is prevented by the clipping action of the crystals. Values suitable for a 40-meter rig are shown. Since the receiver coupling is through a very small condenser, the detuning of the transmitter due to the switching action of the germanium crystals is negligible.

There are two limitations to the value of the series condenser — if it is too large the crystal current will be excessive, and if too small the operating Q of the circuit will be too high and there will be a loss of received signals at the band edges. The maximum current is 80 ma. average, or 88 ma. r.m.s., for two 1N34 crystals connected as shown. The maximum Q of the circuit is a matter for the operator's judgment. If it is tuned up at the center of the band and a 3-db. (half an "S" point) drop at the band edges is considered permissible, the maximum Q is about 25 for the 40-meter band, 35 for 20 meters, and about 7 for 3500–4000 kc.

The effective receiver input resistance should be known for an accurate calculation of the Q. The Q of a series circuit at its resonant frequency is given by $Q = X/r$, where X is the inductive or capacitive reactance and r is the total series resistance.

The value of C_1 (Fig. 1) affects the current through the 1N34 diodes, so its value cannot be based on Q considerations alone. Based on the maximum current of 88 ma. mentioned above, the voltage across the feed line should not exceed $14{,}000/fC$, where f is in megacycles and C is in $\mu\mu$fd. For a 300-ohm feed line, as shown, the maximum power is thus $650{,}000/f^2C^2$. For a 300-ohm line, a frequency of 7 Mc., and a 3.3-$\mu\mu$fd. condenser for C_1, the maximum power is 1220 watts, more than enough to take care of any ham transmitter restricted to 1-kilowatt input. This assumes a flat 300-ohm line, of course, since an appreciable s.w.r. could make the voltage greater (or less) at the point where the receiver circuit is tapped on the transmission line. When calculating the power-handling ability of the crystals for 14-Mc. (or other) 'phone, remember that the peak power runs to four times that for c.w. Fortunately, reasonable values are obtained for 14 Mc., and a value of C_1 of 1 $\mu\mu$fd. is not too large for a kilowatt 'phone.

The 80-meter situation is not as straightforward, because the wider (percentagewise) band requires a lower Q or greater power-handling capability. Using two crystals in parallel for each one shown in Fig. 1 will quadruple the power-handling ability or, more simply, one could limit his operation to a smaller portion of the band.

A variation of the basic circuit is shown in Fig. 2. This particular arrangement, while more complex, uses two sections to first step up the impedance to a level where the crystals can handle the power and then step it back down to the re-

* 65 Belmont Blvd., Elmont, L. I., N. Y.

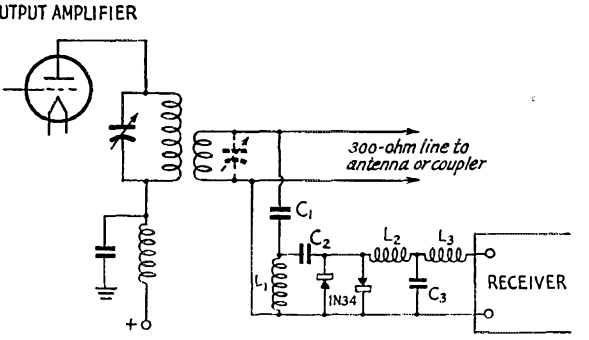

Fig. 2 — A more complex circuit, capable of handling 1 kw. on c.w. or 250 watts on 'phone.
C_1, C_3 — 1300 ohms reactance (30 μμfd.).
C_2 — 30,000 ohms reactance (1.5 μμfd.).
L_1, L_3 — 1300 ohms reactance (50 μh.).
L_2 — 20,000 ohms reactance (1 mh.).
Figures in parentheses are values for 80-meter operation. C_2 can be several small mica condensers in series, for a better voltage rating.

ceiver input impedance. It will be noted that no bias is shown on the crystals in Fig. 2, and Fig. 1 will also work without bias. Bias was used in the circuit when it was first tried, but it was later discovered that it is really not necessary, particularly where a slight loss in signal is not important (as in the low-frequency bands).

As a practical operating note, make sure that the final amplifier is really cut off, as shot-effect noise will be coupled to the receiver if any plate current flows during the supposedly idle time.

It should be clearly understood that the purpose of this device is to prevent damage to the receiver by the transmitter power. It will *not* prevent you from hearing your own transmitter any more than an antenna relay will. If you are running a kilowatt on 40 meters, for instance, it will keep the voltage on your receiver's antenna terminals below half a volt, which will prevent damage to any receiver. However, half a volt represents about "50 db. over S9" which is enough to give anyone a first-class earache if he is trying to copy some bit of rare DX two or three kc. from his own frequency. Therefore, an audio limiter or receiver quieting system of some sort is highly recommended in conjunction with a system of this type.

The only question that remains to be answered is "what happens if the germanium crystal goes bad, does my receiver go up in smoke?" The answer appears to be no, fortunately. The author has never heard of a germanium crystal opening up — it seems that the only way they go bad is by a progressive drop in back resistance that would show up only as loss of signals, not as any damage to the receiver.

In conclusion, it seems that we have secured a nonmechanical, compact and inexpensive switch that is thousands of times faster than the fastest relay — instantaneous for all practical purposes.

Strays

With the national *primaries* going on, *volting* is done at the *poles*. Even the candidates will be *atom*. *Watt* each will want is to *kilovolt* for the other. "Just *faraday* be *unbiased* and *beam* my constituent," they tell XYL *LC* over her *ratio*, trying to *converter*. This does not *ampere* to *exciter* so she may stay *ohm* and re*fuse* to *skip* out. But nothing *hertz* candidates like no *local action* at *dipoles*. So they try to *breakdown* her *resistance* and *carrier* there. "I'll sock *O* in the *nodes!*" she shouts, swinging an *opentode* shoe to *neutralize* their *drive*. Candidates, a word *televise:* Don't try to *transformer* or she'll *splatter* you with one big *sweep*.

— *Suggested by W3ITV*

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Totally blind for two years, Earl Brown, jr., W5SQW, wasted no time in securing a livelihood applicable to his handicap. He has organized TASCO (Telephone Answering Service Company) which provides Abilene, Texas, business subscribers an elaborate and complete service of this type. W5SQW is active in the nets as ORS.

W9RCG is looking for a match — he wants a bout for his BC-610 in the heavyweight class. While being manhandled by movers (*not* the finance company's) the rig was dropped a few inches. It bounced on its rubber casters and clipped one of the crew squarely on the nose.

— • • • —

A water-color by W9MRR drew favorable comment while on exhibition at the Evansville (Ind.) Museum. Entitled "The High Man," the picture was posed by W9AIN, W9KVE and W9EHU who were arranged on the W9MRR antenna mast while repairing his beam.

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W/VE amateurs in London are cordially invited to attend meetings of the Radio Society of Great Britain Members Luncheon Club. Meeting dates for 1952 are June 20th, July 18th, August 22nd, September 19th, October 17th, November 21st and December 19th. The luncheons are held at the Kingsley Hotel, Bloomsbury Way, London, W.C. 1. Arrangements can be made by telephoning RSGB Hq., HOLborn 7373.

YL NEWS and VIEWS

CONDUCTED BY
ELEANOR WILSON,* W1QON

Congratulations to the YLs and OMs who produced high scores in the YLRL-sponsored third-annual YL-OM Contest.

The YL-OM Contest is an annual highlight of YLRL activities. Each year contest interest and the number of contestants increase, and this year on the bands more YLs attracted OMs and more OMs hunted YLs than ever before. Everybody had a fine time — with the possible exception of log-checkers W3LSX and W3CDQ!

Katherine Johnson, W4SGD, winner of the YL Section, was licensed in December, 1950, and the YL-OM contest is the first she has ever entered. In December, 1951, she received her Advanced Class license and has since made WAS on 75 'phone. Katherine is the XYL of W4PZE and the mother of W4UJI and two other children. She is secretary of the Tar Heel Net.

Carl Evans, W1BFT, winner of the OM Section, is well-known to the amateur fraternity for his many excellent performances.

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

HIGH SCORERS — YL-OM CONTEST

YLs		*OMs*	
W4SGD	9760	W1BFT	684
W3JSH	5850	W4CKB	322
W3QPJ	5166	W8AJW	294
W1FTJ	5022	W4NTT	280
W3OQF	4743	W1BBN	196
W9JUJ	4352	W2BBK	160
W1SCS	3021	W2MHE	150
W7HHH	2850	W4KL	120
W9JTX	2117	W9ADM	117
W3PVH	1840	W9CXY	54

Katherine will receive a silver cup donated by W1BFT. The cup is awarded on a yearly basis, with a three-time winner obtaining permanent possession (three *successive* wins not necessary). Having won the OM Section in the 1951 contest, too, Carl retains the gold cup, donated by W8UDA, for another year. Attractive new YLRL certificates will be awarded to the top three winners — YL and OM.

Keeping Up with the Girls

Twenty-one YLs attended the March meeting of the YL Club of Los Angeles. The girls discussed plans to look over a site in the San Bernardino Mts. for Field Day operations. W6LNP and W6LMQ are added to the list of YLs who may be worked for the Lad 'N Lassie Certificate (see April *QST*, page 134). . . . W3MSU had charge of W3CAB (Washington Radio Club station) at the Science Show at the American University in Washington. W3CDQ and W3LSX helped Ethel handle some of the traffic. . . . W8GYU and OM W8BGY were the first Michigan couple to join MARS. . . . W4UTO has a 25-w.p.m. Code Proficiency Certificate. . . . Extensive net activity keeps W9AYX at her rig many hours per week. . . . W6GUS and WØZWL are MARS members. . . . W4TTM works local (Pensacola) Novices during the day on 80 and operates 10 at night. Alice is Secy.-Treas. of the Pensacola Radio Club and Asst. Editor of the club paper. . . . W1SAJ and OM W1QVC are saying farewell to the First District and returning to Missouri. . . . WN3TGW, WN3SRS, and WN3SAW are three new Third District YLs. . . . W2WP is another YL who flies about in her own airplane. . . . Having filtered out TVI, W4PPQ can now operate at any time. . . . W4LKM played hostess to W1MCW when Lou and her OM stopped by on their way home from a vacation in Florida. And W3OQF gave a party for visiting W4SGD, W3LSX, and W3MSU. . . . W6YLT operates mainly 20 to keep skeds with JA stations and their families in her area. . . . W1UGZ recently became the bride of WN1UVQ. Maude, an electronic technician, also holds a commercial license. . . . W4LAS skeds HC1OW daily on 75. . . . YLRL welcomes a new YL from Australia, VK2AMJ. Joyce operates twenty 'phone and c.w. very consistently, and she is always on the lookout for YL contacts.

(*Continued on page 118*)

New England YLs met in April at Foxboro, Mass., for their second annual get-together. YLRL matters and plans for the formation of a N. E. YL club were discussed. *Seated, l. to r.*: W1FTJ, W1RYJ, W1MCW, W1BCU, W1QON, W1SAJ, W2EWO. *Standing, l. to r.*: W1UQA, W1QJX, W1HJH, W1OME, W1BVT, W1SVN; Lil Bates, XYL of W1ONV; W1TRE, WN1UPK, WN1UPZ, W1MUW, W1FOF, W1UKR, W1HRB, W1TUD. W2WP, who flew up from Staten Island in her plane, arrived too late to be included in the picture. (*Boston Globe photo*)

Crystal-Oscillator Frequency-Shift Circuits

Simple Methods of RTTY Keying

BY MARVIN BERNSTEIN,* W2PAT

• In this article, W2PAT discusses crystal-oscillator circuits used in f.s.k. transmitters. Even if you are not an RTTY enthusiast, you might find the article worth your reading, since the keying system described offers possible application to n.f.m.

FOR reasons beyond the scope of this article, keying systems of the frequency-shift type are used almost exclusively in present-day teletype circuits. In most systems, the required frequency shift — universally a change of 850 cycles — is obtained by an appropriate capacitance in parallel with the crystal of the oscillator, as shown in the examples of Fig. 1. The same system may be applied to other crystal-oscillator circuits, of course. It is well known that in a quartz crystal oscillator, the frequency of oscillation is a function of the load impedance that the crystal looks into. The range of frequencies that may be obtained by changing the load impedance is dependent upon the magnitudes of the parameters of the equivalent electrical circuit of the crystal unit.[1] For a representative crystal unit having an equivalent series capacitance of 0.02 μfd., a frequency band of a width approximately of the order of 0.1 per cent of the nominal crystal frequency may be obtained. If the load reactance is changed by a suitable amount, it is theoretically possible to change the frequency of the crystal oscillator a total of about 1000 cycles per megacycle.

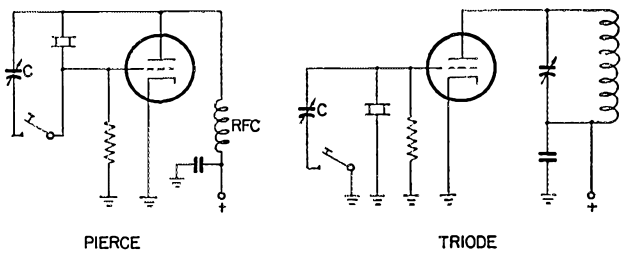

Fig. 1 — In these well-known circuits, f.s.k. is obtained by keiyng a capacitance, *C*, in parallel with the crystal.

A somewhat more complicated circuit, sometimes called the Butler circuit,[2] operates the crystal at series resonance, as shown in Fig. 2. When the key is closed in this circuit, the operating load is changed from a small value of capacitance to a restive point equivalent to the operation of the crystal near series resonance. This results in a much greater frequency change, if needed, than when working between two capacitive crystal-load conditions as in the previous circuits. The amount of frequency shift depends on the value of C_5

Keying Circuits

For obvious reasons, it is not feasible to use a keyer directly in the circuit to connect and disconnect the load condenser. While it might be possible to make use of a suitable relay, a better method is shown in Fig. 3. The circuit is not complicated and relatively few components are required. In this arrangement, a 1N34 diode acts as a remotely-controlled low-capacitance electronic relay or switch. A vacuum diode also is sometimes used. With the external circuit in Fig. 3A open, the diode appears as a capacitance

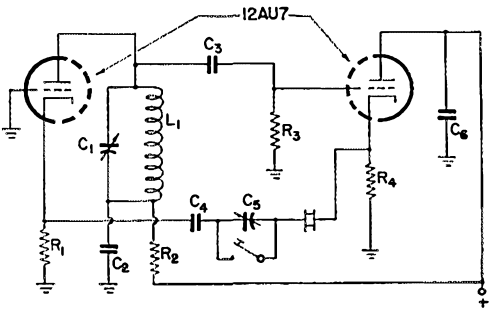

Fig. 2 — With this circuit, greater frequency change can be obtained than with the circuits of Fig. 1.
C_1–L_1 — Tuned to operating frequency.
C_2, C_4, C_6 — 0.001 μfd.
C_3 — 47 μμfd.
C_5 — 100-μμfd. variable.
R_1, R_4 — 470 ohms.
R_2 — 1000 ohms.
R_3 — 47,000 ohms.

*Signal Corps Engineering Laboratories, Fort Monmouth, N. J.

[1] Tilton, "Overtone Crystal Oscillator Circuits," *QST*, April, 1951, p. 59.

[2] Terman, *Radio Engineer's Handbook*, McGraw-Hill.

of about 1 $\mu\mu$fd. in series with the frequency-shift condenser — effectively an open circuit — and the loading condenser has no effect on the operation of the circuit. When the external circuit is closed, a d.c. current will flow as a result of rectification of the r.f. flowing in the oscillator circuit. Under these conditions, the diode has an effective resistance of only a few hundred ohms which is essentially a direct connection to the load condenser, considering the high reactances involved in the circuit. In the circuit of Fig. 3B, the action is similar, except that closing the external circuit shorts the frequency-shift condenser. In either case, the required amount of shift is easily obtained by making a few trials with the external circuit first open, and then closed, using different adjustments of the variable frequency-shift condenser.

The frequency shift in these circuits is inherently in the direction of developing a lower frequency of oscillation in the "mark" condition relative to the "space" frequency. This is contrary to the usual f.s.k. system used in this country, but it does not result in any particular difficulty; it means simply that the b.f.o. in the receiver must be set to the low-frequency instead of the high-frequency side. If the b.f.o. is adjusted to give a beat of 2125 cycles when tuned to the marking signal, then a beat of 2975 will be automatically obtained when the spacing signal, 850 cycles higher, is received.

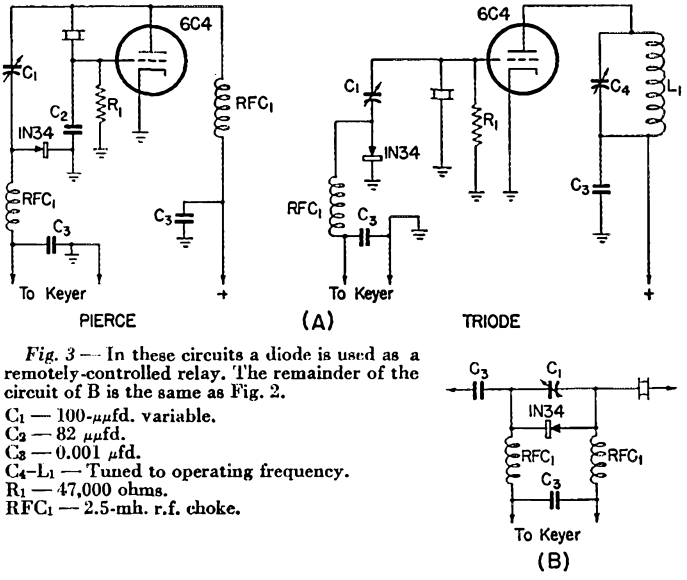

Fig. 3 — In these circuits a diode is used as a remotely-controlled relay. The remainder of the circuit of B is the same as Fig. 2.
C_1 — 100-$\mu\mu$fd. variable.
C_2 — 82 $\mu\mu$fd.
C_3 — 0.001 μfd.
C_4–L_1 — Tuned to operating frequency.
R_1 — 47,000 ohms.
RFC_1 — 2.5-mh. r.f. choke.

Modulation

The r.f. output of all f.s. crystal-oscillator circuits suffers to some degree from amplitude modulation. This is the result of changing the equivalent electrical resistance of the crystal unit, since this is a function of its operating frequency. The circuit must supply the circulating d.c. power when operating in the "mark" condition and this also changes the oscillator output. The oscillator should be followed by at least one stage that is operating as a Class C limiter to remove the associated a.m. from the output.

A carbon microphone might be inserted in the external d.c. circuit for f.m. It would appear to be a means of obtaining a degree of n.f.m. with reasonably good audio fidelity.

Strays

Don't mess around with WØCQI, WNØFOD or the ham-to-be son of WØTAV if it's an argument you're after. They were members of a team that won a first place in a recent National Forensic League debating contest. Wonder where they stand on v.h.f. antenna polarization and 40-meter 'phone!

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Eleven-meter enthusiasts have formed an international photography exchange club with W7QNC as manager. Members swap color and black-and-white slides as well as prints of their rigs, families and local scenery. Approximately a dozen groups of pictures circulate continuously with a route slip in each package. All U. S. call areas are represented on the roster in addition to KB6, KH6, VE, and VK subscribers.

KZ5s AW and WA put ham radio to work recently by 'phone-patching HC8GI through to a Canal Zone M.D. for a consultation concerning the Galapagos amateur's infected leg. Cellulitis was diagnosed by Dr. Wemmer and treatment prescribed — penicillin. This did the trick; HC8GI's next QSO through these channels reported the infection cured.

—···—

For those developing an "add-a-dozen" complex, W2FW has a hint regarding 24-hour time. Simply use a red grease pencil to letter 1300, 1400, et al, beside the regular numerals on the shack clock face. Of course, you'll still have to know what part of the day you're working on — putting the clock next to an open window with the shade up could help!

The QH (Quick Heading) Beam Antenna

A Stationary "Rotary" Array for 14 Mc.

BY PAUL SKITZKI,* W1PKW

DESPITE the widespread popularity of the horizontal rotating beam for 20-meter DX, the many mechanical problems involved are not often easily nor inexpensively solved. For the past several months, a non-rotating beam of the parasitic type has been in use at W1PKW with highly satisfactory results. The general plan is shown in Fig. 1. It consists of a vertical half-wave folded dipole surrounded by four parasitic elements. Each of the parasitic elements can be tuned, from the operating position, so that it will act as either a reflector or a director. Thus any one of several directional patterns, as shown in Fig. 2, can be obtained, depending on the reflector-director combination selected by simply flipping four toggle switches.

*29 Pennsylvania Ave., Reading, Mass.

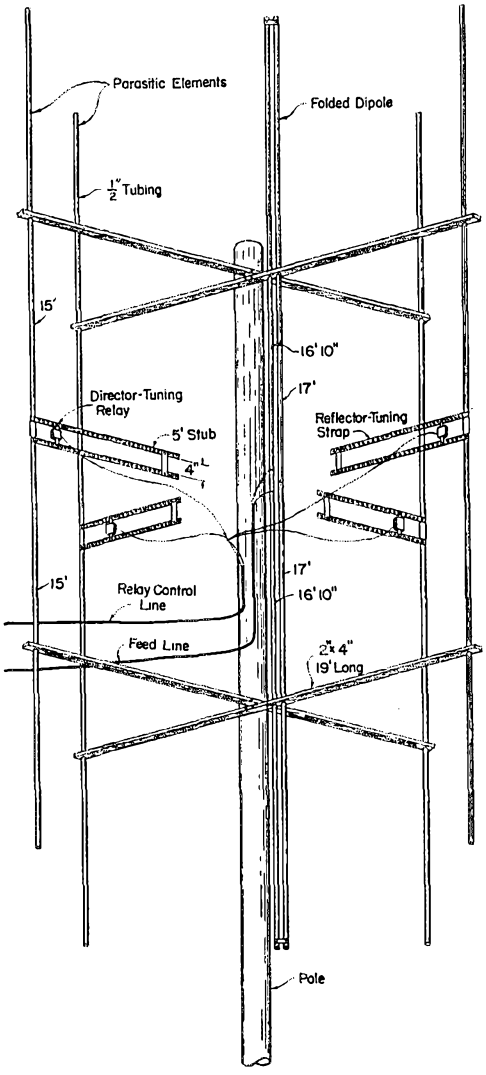

Fig. 1 — Sketch of the 5-element stationary "rotary" beam antenna. Each of the four parasitic elements can be tuned as a director or as a reflector by the remotely-controlled relays at the center, thereby altering the radiation pattern as desired.

A system of this type has several advantages. Perhaps the foremost of these is that directivity can be changed instantly without waiting for the rotator to turn. Furthermore, the pattern can just as readily be made essentially non-directional, when desired, for CQ-ing or general listening. Since no rotator is involved, the cost of the array is little more than the cost of the elements. Less space is needed — the over-all spread is only about 19 feet compared with the 33 feet or so needed for the horizontal beam — and the element supporting structure need not be as heavy or complicated, since vertical elements withstand wind and icing much more readily. A feature that many will find of more than ordinary interest is the fact that it is one of the few types of beams that can be mounted in a tree. The branches in this case can serve as a convenient means of getting at the elements for assembly and adjustment.

A stationary beam of this type can usually be adjusted to compensate for the detuning effects of large objects in its field. This, of course, is not possible with an array whose position in relation to such objects is variable.

Method of Tuning

To allow for tuning adjustments, the parasitic elements are cut slightly shorter than the appropriate length for a director. In each element, a tuning stub is added at the center to bring the electrical length up to that of a reflector. When the element is to be used as a director, the tuning stub is shorted out with a relay switched from

• Here is a stationary beam antenna for 14 Mc. whose parasitic elements can be simply and instantly switched to provide a sizable gain over a dipole in any desired direction, and gains of up to 10 db. in four favored directions. Constructionally, it is simpler than a conventional rotating job and is one of the few beam antennas that can feasibly be erected using a tree as its support as the author does.

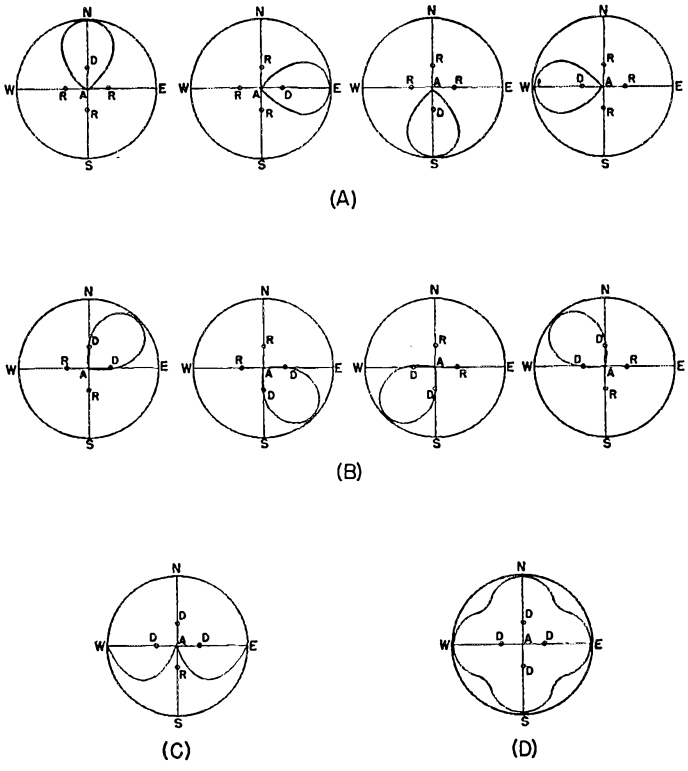

Fig. 2 — Approximate directional patterns obtainable with the stationary directional beam antenna. A — With one parasitic element working as a director and the other three as reflectors, radiation patterns in any of four different directions may be obtained. Maximum gain is about 10 db. B — With two parasitic elements acting as reflectors and the other two as directors, four new directional patterns are obtained. The maximum gain here is about 6 db. C — Broader patterns are obtainable by using 3 directors and 1 reflector. D — An essentially non-directional pattern with a gain of about 4 db. is obtained when all four parasitic elements are tuned as directors.

the operating position. Thus the control system consists merely of the four relays, and a s.p.s.t. toggle for each. With one switch closed, the associated element acts as a director while the others work as reflectors, etc.

Construction

All of the elements are made of ½-inch i.d. aluminum tubing. The folded dipole is 34 feet long. One conductor is made up of two 17-foot sections of tubing joined by a metal insert fastened in place with machine screws through the tubing and insert. The other conductor is similar, except that each section is cut 2 inches shorter to accommodate a 4-inch insulator at the center where the folded doublet is fed. This insulator can be a 6-inch length of ¾- or 1-inch nylon, bakelite or polystyrene rod, turned down for an inch at each end to fit inside the aluminum tubing. The two conductors are connected together at the ends with galvanized-iron straps that space them about 5 inches, center to center.

Each parasitic element is made up of two 15-foot sections of tubing joined by an insulator similar to the one used in the radiator. The tuning stubs are made of 5-foot lengths of 1/16 × 1-inch perforated galvanized iron strap. The perforations provide an easy means of adjusting the positions of the shorting bars and relays. The relays should be provided with weatherproof housings fitted with heavy metal tabs connected to the contact terminals and drilled to match the holes in the tuning stubs.

The framework carrying the elements consists of two pairs of 19-foot 2 × 3s or 2 × 4s, the pairs spaced about 15 feet on the pole or other support. The two pieces in each pair are fastened to the support at right angles and the pieces are bored near the ends to pass the aluminum tubing which is fastened in place with bolts or metal pins. (This gives a spacing of about 0.12 wavelength.) One piece of each pair is bored also near the center for the folded dipole. Better insulation has not been found necessary but, if desired, the crosspieces can be bored with large clearance holes and the elements insulated from the crosspieces with pieces of sheet insulation drilled to fit the tubing snugly. If the crosspieces have a tendency to sag, this can be corrected with suitable guy wires or diagonal braces. If the antenna is mounted in a tree, as mine is, the branches may serve as additional support. If a tree is not used, the support should be of wood. When fastening the crosspieces to the support, they should be orientated so that the lobes of Fig. 2A are in the most desired directions.

At present I am feeding the folded dipole with RG-8/U coaxial cable, but plan to change over to a balanced line using RG-22/U or RG-57/U. If coaxial cable is used, it would be better to use a balun or bazooka connection. The relay-control wires should be brought to the supporting structure and formed into a cable, which together with the transmission line, should be run at right angles to the elements to avoid distortion of the beam patterns. If necessary, the tuning

stubs can be steadied by guying them to the pole with rope.

Adjustment

In adjusting for operation in the 20-meter 'phone band, for example, the antenna should first be fed at 14.3 Mc. Each of the parasitic elements, in turn, should be tuned as a director by adjusting the position of the relay (closed), while the other three elements are entirely open. The adjustment in each case can be checked by maximum reading on a field-strength meter located several wavelengths from the antenna. Readings should be taken, of course, in the direction of the expected lobe. Then, with the transmitter operating at 14.2 Mc., the reflector shorting bar is adjusted on each element, one at a time, with all relays open and the tuning stubs of all other elements open. This adjustment should likewise be checked with a field-strength meter in the proper direction. Staggering the two sets of adjustments at frequencies either side of a center frequency helps to broaden the frequency response of the system.

Results

In the six months that this antenna has been in operation, more South African stations have been worked than in the previous 20 years, and excellent reports are received from all continents. With three reflectors and a director, the front-to-back ratio is really good. It is very interesting to hear a VE8 coming in strong when the beam is switched to the north and then switch to south and hear an LU or a PY working on the same frequency.

Using surplus cable and relays, the total cost of my "beam in a tree" was less than $25.00. Is it surprising that I am enthusiastic? Try one and you'll never use a rotating array again.

Coming ARRL Conventions

WEST GULF DIVISION

Corpus Christi, Texas, June 28th and 29th

The twenty-second annual ARRL West Gulf Division Convention, sponsored by the Gulf Radio Club, will be held at the Robert Driscoll Hotel on June 28th and 29th. The Corpus Christi gang is putting forth every effort to make this convention an outstanding success.

There will be a pre-convention get-together on Friday evening at the K. C. Hall with plenty to eat and drink and an opportunity to meet other early arrivals. The program committee has planned an interesting program with good speakers, contests, special group meetings, a dance and a banquet. FCC amateur examinations will be given on Saturday morning. There will be some serious business but for the most part the program has been designed for your pleasure and recreation. A special program for the ladies is planned, including a style show, a tea at the home of Mrs. W5GZ, and a boat ride on beautiful Corpus Christi Bay.

Registration for the convention is $8.00 per person. Reservations for quarters should be made as early as possible. Pre-registration and request for reservations should be sent to the Gulf Radio Club, P. O. Box 2073, Corpus Christi, Texas.

ROCKY MOUNTAIN DIVISION

Estes Park, Colorado, June 14th–15th

The ARRL Rocky Mountain Division Convention, sponsored by the Denver Radio Club, will be held at Elkhorn Lodge, Estes Park, Colorado, on June 14th–15th. A well-rounded program of technical talks, exhibits, contests and prizes, with a dinner on Saturday night and banquet at noon Sunday, will be offered to attending amateurs. There will be a special program for the ladies. Estes Park is one of Colorado's best-known vacation resort areas. Situated in a valley deep in the Rocky Mountains, it is reached by the finest highway, and offers visitors a variety of outdoor sports and scenic attractions. The Convention has been purposely scheduled to take advantage of pre-season rates, and hotel rates are moderate.

Registration is $2.50 per person. The Saturday night dinner and Sunday banquet, including registration fee, is $8.00 per person. Rooms at the Lodge, with breakfast Sunday morning, are $2.50 per person ($4.50 per person with private bath). Advance arrangements may be made with Walter M. Reed, WØWRO, 1355 E. Amherst Avenue, Denver, Colorado.

NEW ENGLAND DIVISION

Springfield, Mass., June 14th

The ARRL New England Division Convention and Hamfest will be held at the Industrial Arts Building, Eastern States Exposition Grounds, West Springfield, Mass., on Saturday, June 14, 1952. Sponsored by the Hampden County Radio Club, the convention will be one on which no effort has been spared to assure everyone a day's activities which include everything to make a big convention a real success. Unlimited free parking space is available on the grounds. The three-acre building will house many attractive exhibits, main events and contests, plus private facilities for FCC exams, technical talks by nationally-known experts and a full day's program with events of interest to everyone. A fine banquet menu, served family style, will highlight the early evening. Banquet by advance reservation only. Registration and banquet, $5; Registration only, $2. Reserve your tickets early. Send checks to Hampden County Radio Club, P. O. Box 221, Springfield, Mass.

PACIFIC DIVISION

San Francisco, Calif., July 4th–6th

The ARRL Pacific Division Convention will be held at the Whitcomb Hotel on July 4th, 5th and 6th under the auspices of the Central California Radio Council. The program will include lectures by people nationally prominent in communications, a 2-hour continuous showing of technical films, a code speed contest, transmitter hunts, a mobile contest, and conducted tours. There will be special events for the ladies, plus the usual banquet for all.

Pre-registration is $6.00 until 21st — after that date $7.50. All requests for reservations and information should be addressed to Harry Witzke, 1256 Masonic Ave., San Francisco.

Answer to **QUIST QUIZ** *on page 10*

Certainly not — and **A** should learn some of the facts of life. The r.f. filter at the key takes out clicks in the b.c. band caused by the slight spark at the key when the circuit is opened and closed, but the clicks the OO heard on and near the signal in the ham band are caused by insufficient "shaping" of the keyed signal. A keying filter (which will require larger components than the r.f. filter) is indicated, to make the keying "softer."

I.A.R.U. News

QSL BUREAUS OF THE WORLD

For delivery of your QSLs to foreign amateurs, simply mail cards direct to the bureau of the proper country, as listed below (bold-face type indicates a recent change from previous listings). *Do not send foreign cards to A.R.R.L. headquarters except those for which no bureau is here listed.*

For service on incoming foreign cards, see list of domestic bureaus in most *QST*s under the heading, "A.R.R.L. QSL Bureau."

Algeria: Via France
Argentina: R.C.A., Avenida Libertador General San Martin 1850, Buenos Aires
Australia: W.I.A., Box 2611W, G.P.O., Melbourne
Austria: Via ARRL
Austria: QSL Bureau (U. S. Occupation Forces), APO 168, % Postmaster, New York, N. Y.
Azores: Via Portugal
Bahamas: C. N. Albury, Telecommunications Dept., Nassau
Barbados: VP6PX, Wood Goddard, Bromley, Welches, Christ Ch., Barbados, British West Indies
Belgian Congo: P.O. Box 271, Leopoldville
Belgium: U.B.A., Postbox 634, Brussels
Bermuda: VP9D, James A. Mann, The Cut, St. Georges
Bolivia: R.C.B., Casilla 2111, La Paz
Brazil: L.A.B.R.E., Caixa Postal 2353, Rio de Janeiro
British Guiana: Desmond Yong, 22 Sussex St., Charlestown, Georgetown #16
British Honduras: D. Hunter, Box 178, Belize
Burma: B.A.R.S., P.O. Box 376, Rangoon
Canton Island: Francis T. Blatt, KB6AG, % C.A.A., Canton Island, South Pacific
Ceylon: P.O. Box 907, Colombo
Chile: Radio Club de Chile, Box 761, Santiago
China: **M. T. Young, P.O. Box 16, Taichung, Formosa**
Colombia: L.C.R.A., P.O. Box 584, Bogotá
Cook Islands: Ray Holloway, P.O. Box 65, Rarotonga
Costa Rica: F. Gonzalez, Box 365, San Jose
Cuba: Radio Club de Cuba, QSL Bureau, Lealtad No. 660, Havana
Cyprus: MD7XP, P.O. Box 451, Nicosia
Czechoslovakia: C.A.V., P.O. Box 69, Prague I.
Denmark: E.D.R., Box 79, Copenhagen, K.
Dominica: VP2DC, Roseau
East Africa (VQ1, VQ3, VQ4, VQ5): P.O. Box 1313, Nairobi, Kenya Colony
Ecuador: Victoriano Salvador, P.O. Box 2536, Quito
Eire: I.R.T.S. QSL Bureau, 97 St. Stephens Green, Dublin
Ethiopia: Robert Newberg, ET3AE, Box 145, Addis Ababa
Fiji: S. H. Mayne, VR2AS, Victoria Paraed, Suva
Finland: OH2NT, Kasarminkatu 25C12, Helsinki
France: R.E.F., 72 Rue Marceau, Montreuil sous Bois (Seine)
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Germany: (DL4 calls only) DL4 QSL Bureau, APO 757, % Postmaster, New York, N. Y.
Germany: (DL5 calls only) Via France
Germany: (other than above) D.A.R.C., Postbox 99, Munich 27
Gibraltar: E. D. Wills, ZB2I, 9 Naval Hospital Road
Great Britain (and British Empire): A. Milne, 29 Kechill Gardens, Hayes, Bromley, Kent
Greece: C. Tavaniotis, 17-A Bucharest St., Athens
Greenland: APO 858, % Postmaster, New York, N. Y.
Grenada: VP2GE, St. Georges
Guam: **G.R.A.L., Box 100, Agana, Guam, Marianas Islands**
Guantanamo Bay: KG4AD, Box 35Q, Navy 115, % FPO, New York, N. Y.
Guatemala: Manuel Gomez de Leon, P.O. Box 12, Guatemala City
Haiti: Roger Lanois, % R.C.A., P.O. Box A-153, Port-au-Prince
Hong Kong: Hong Kong Amateur Radio Transmitting Society, P.O. Box 541, Hong Kong
Hungary: H.S.R.L., Postbox 185, Budapest 4
Iceland: Islenzkir Radio Amatorar, P.O. Box 1080, Reykjavik
India: Amateur Radio Club, India, P.O. Box 6666, Bombay 20
Indonesia: P.A.R.I., P.O. Box 222, Surabaja, Java
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Madeira: Alberto C. de Oliveira, CT3AA, Beco Chao da Loba, 4, Funchal
Malaya: C. E. Salton, Postal Services Dept., Johore
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Monzambique: Liga dos Radio-Emissores, P.O. Box 812, Lourenco Marques
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Netherlands, Antilles: **Suffisant T-24-1, Curacao**
Netherlands East Indies: Hr. C. Loze, PK1LZ, Burg. Kuhrweg, 47 Bandoeng, Java
Newfoundland: N.A.R.A., Box 660, St. Johns
New Zealand: N.Z.A.R.T., P.O. Box 489, Wellington C1
Nicaragua: L. B. Satres, Bolivar Ave., 106 Managua
Northern Rhodesia: N.R.A.R.S., P.O. Box 332, Kitwe
Norway: N.R.R.L., P.O. Box 898, Oslo
Pakistan: P.O. Box 416, Lahore
Panama, Republic of: L.P.R.A., P.O. Box 1616, Panama
Paraguay: R.C.P., P.O. Box 512, Asuncion
Peru: R.C.P., Box 538, Lima
Philippine Islands: Elpidio G. DeCastro, Philippine Amateur Radio Assn., 931 R. Hidalgo St., Quiapo, Manila
Poland: Polski Zwiazek Krotkofalowcow, P.O. Box 320, Warsaw
Portugal: R.E.P., Travessa Nova de S. Domingos, 34–1° Lisbon
Roumania: A.R.E.R., P.O. Box 95, Bucharest
Salvador: **YS1O, Apartado 329, San Salvador**
Siam (Thailand): Frank Speir (W6FUV), Saha Thai, 4th Mansion, Raja Damnoen Avenue, Bangkok, Thailand
South Africa: S.A.R.L., P.O. Box 3037, Capetown
Southern Rhodesia: **R.S.S.R., Box 2377, Salisbury**
Spain: U.R.E., P.O. Box 220, Madrid
St. Vincent: VP2SA, Kingstown
Sweden: **S.S.A., Stockholm 4**
Switzerland: U.S.K.A., Postbox 1203, St. Gallen
Syria: P.O. Box 35, Damascus
Trieste: MF2AA, Major M.H.R. Carragher, HQ V.G. Police
Trinidad: John A. Hoford, VP4TT, P.O. Box 554, Port-of-Spain
Tripolitania: Peter Keller, MT2DZ, P.O. Box 260, Tripoli, Tripolitania, North Africa
Uruguay: R.C.U., Casilla 37, Montevideo
U.S.S.R.: Central Radio Club, Postbox N-88, Moscow
Venezuela: R.C.V., P.O. Box 2285, Caracas
Virgin Islands: Richard Spenceley, Box 403, St. Thomas
Yugoslavia: **SAJ, Postbox 48, Belgrade**

V.H.F. QSO Party

June 7th–8th — Certificates for Leaders

ARRL is pleased to announce another of its popular V.H.F. QSO Parties. All amateurs who can work any band or bands above 50 Mc. are invited to participate in this activity. The Party will be held during a 32-hour period starting at 2:00 P.M. local Standard Time, Saturday, June 7th, and ending at midnight local Standard Time, Sunday, June 8th. It will provide opportunities to work new v.h.f. DX and renew old friendships during a week end of concentrated activity on the bands above 50 Mc. Coming as it does two weeks before the annual ARRL Field Day, it is an excellent time for a pre-FD workout of v.h.f. equipment.

How To Take Part

Call "CQ contest" to get in touch with other contestants. Exchanging signal-strength and readability reports is suggested but not required. When you work another v.h.f. amateur, you must give him the name of your ARRL section. Page 6 of this issue is a register of the League field-organization set-up, and serves as a convenient section check-off list. You compete only with amateurs in your own ARRL section for the certificate award. ARRL staff members are not eligible for awards.

Count 1 point for successfully-confirmed two-way exchanges of section information on 2 or 6 meters. A one-way exchange, confirmed, does *not* count. When two-way exchanges are accomplished with your transmitter on the 220-, 420-, 1215-Mc. or higher band, you may record 5 *points* per QSO.

Multiplier

The sum of station points earned is multiplied by a section multiplier. Each time a new section is worked two-way it adds one to the multiplier. *The multiplier grows by one if you rework this same section on another band.* (Scoring differs in this respect from other ARRL competitions 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. A card to Headquarters will bring the simple form on which to report; or your own similar tabulation will be accepted.

Rules

1) Name-of-section exchanges must be acknowledged by both operators before either may claim the point(s).

2) All claimed contacts must fall in the contest period and must be on authorized amateur frequencies above 50 Mc., using permitted modes of operation.

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

4) The band your transmitter is on determines whether a QSO counts 1 or 5 points. Cross-band work shall not count.

5) 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.

6) Scoring: *1 point* for completed two-way section exchanges on 50 or 144 Mc.; *5 points* for completed two-way section exchanges on the higher v.h.f. bands. The sum of these points will be multiplied by the number of *different* ARRL sections worked; i.e., those with which at least one point has been earned. Reworking sections on additional bands for extra section credits is permitted.

7) A contact *per band* may be counted for each different station worked. *Example:* W1SNK (E. Mass.) works W1EIO (Maine) on 50, 144 and 220 Mc. for complete exchanges. This gives W1SNK 7 points (1 + 1 + 5 = 7) and also 3 section-multiplier credits. (If more Maine stations are subsequently contacted on these bands they do not add to the multiplier but they do pay off in additional contact points.)

8) Each section multiplier requires actual 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.

9) Award Committee decisions shall be accepted as final.

10) All reports must be postmarked no later than June 25, 1952, to be entered for awards. (See p. 55, May, 1948, *QST*, for form or a message to Hq. will bring a mimeographed blank for report on this contest.)

Reporting

Submit contest logs to Headquarters immediately, even if your score is small, to help in cross-checking the claims of others.

— *F. E. H.*

June, 1927

. . . The trend toward higher frequencies continues and five-meter work, both operationally and experimentally, is one of the liveliest topics of the day.

. . . "New Short Wave Receivers" depicts three approaches to reception from 20 through 5 meters — regenerative, superregenerative and superheterodyne circuits.

. . . A. H. Turner, 3AUX, presents an account of 2XM's crystal-controlled five-meter work. An SA-24 final amplifier operates on the eighth harmonic of 7-Mc. crystals.

. . . Technical Editor Robert S. Kruse deals with the problem of measurements in the ½- to 5-meter regions, pointing up the need for new concepts at such wavelengths.

. . . "A Five-Meter Transmitter" by W. H. Hoffman, 9EK-9XH, features a Colpitts oscillator circuit with a UX-852 running from 300 to 800 watts input.

. . . Edward M. Glaser, 2BRB, describes his 80-40-20 crystal-controlled rig in which a 210 drives a 203A from 80-meter crystal fundamental frequency source.

. . . Don C. Wallace, 6AM, details a method for use in determining total transmitter power consumption based upon variation in watt-hour meter revolution speed.

. . . A letter from George W. Bailey, 1KH, acknowledges with thanks the valuable assistance provided by *QST* and the *Handbook* which facilitated his getting on the air.

. . . The popularization of 20 meters continues and DX reports grow more numerous. Iraq, Hong Kong, Salvador and Siberia are countries newly available to DX hunters.

. . . Photographs and descriptions of 4TK-4OB, Jacksonville, Fla., and 9APY, Berwyn, Illinois, round out the issue.

The World Above 50 Mc.

CONDUCTED BY E. P. TILTON,* W1HDQ

As THIS issue goes to press we are still waiting for the first major openings of the spring DX season. There have been a few flashes of sporadic-*E* skip on 6, mostly in the southern states, and the signal levels on 2 are showing a gratifying improvement over the winter minimum. But activity by the v.h.f. DX fraternity is mostly concerned with getting ready for what is sure to be showing up in another week or two.

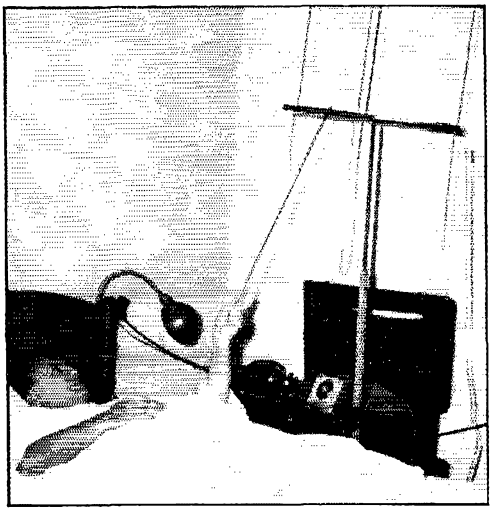
Tuning around on 6 just last night, we logged around 15 calls, some of them old hands who have not been heard from since last August. "Hello-o-o test — one — two — three. . . ." We can guess what's going on fairly easily. There's a one-eyed monster in the house now, and some changes are being made in the rig to avoid family trouble when the DX starts rolling in on 6. They're not working anybody much yet — but just let Montana or Utah show up and you'll see!

There's new life on 2, also, though much of it is a different sort. Some hardy annuals are appearing there, too, but most of the noise is being made above 145 Mc. Those WNs are not waiting for the DX season; they're hot for contacts any night, DX or local, and what a boon they are to those of us who like to see more stations on regularly! Just up and down the Connecticut Valley there are a dozen or so WN calls now on 2, and they make a world of difference in the sound of the band on an average night. Reports from many areas confirm that the advent of the Novice on 2 has definitely reversed the declining activity trend that so many have deplored in recent years.

The next few months should provide us all with a lot of fun. There'll be the June V.H.F. Party on the week end of the 7th and 8th. That could be a smaller edition of the DX Contest, if the fates that control the weather and the ionosphere are kind. Then that biggest and best of all ARRL operating activities, the Field Day, comes along two weeks later. There'll be portables working on 6 and 2 in choice locations everywhere that week end, and many of the gang who normally hang out on our lower bands will be getting a chance to see what the world above 50 Mc. has to offer in the way of operating thrills.

For the next few months, at least, activity on the bands from 50 Mc. up will not require much nursing. This could be the best summer yet — are you ready?

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



Being horizontal for more than two months (with a compound fracture of the leg) hasn't kept W3OFK off the 2-meter band. Using a suitcase station built by W3NXT and installed by W3BV and other fellow members of the Route 13 Emergency Net, Rick operates nightly from his room in the Misericordia Hospital in Philadelphia.

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

At times we wonder if hams take the trouble to read these pages carefully, particularly that portion that appears in the back pages between the ads. We got the answer when we ran a few lines on page 135 of April *QST*, calling attention to the plight of a British 420-Mc. enthusiast who had built a lighthouse r.f. stage only to find that he could get no replacement tube for it. The item concluded with the fellow's name and address. Following is an extract from his letter dated April 15th:

"Thanks very much for putting that note in *QST*. I am just a little overwhelmed with the generosity of U. S. hams, as I have received four 2C40s and one 2C44 to date, and only one sender would accept anything in return. I have also received about a dozen other letters offering tubes, including one offering me *700* 446As on a trade-or-swap basis!"

VE5NC, Boharm, Sask., finds the mobile telephone band around 35.5 Mc. very useful in spotting possible 50-Mc. openings. These stations seem to be well distributed geographically, and they operate a high percentage of the day. According to the ITU *Provisional List of Frequencies Above 27.5 Mc.*, Canada and the United States have stations sprinkled all through the space between the 10- and 6-meter bands, and many of these operate on a 24-hour basis. The nearer they are to 50 Mc. the better they serve as indicators of possible openings on 6.

Probably the best "beacons" presently operating are the Canadian stations running automatic transmission continuously on 49.98 and 49.99 Mc., signing VE9RB (Ottawa) and VE9RA (Halifax). These and the famous "big signal" on 49.8 Mc. should make it possible for many VE or W 50-Mc. DX enthusiasts to tell when the band is open.

There is commercial or government use of the frequencies either side of the 2-meter band, too, but not sufficiently to assure "beacon" service. Thus it appears that a few strategically-located transmitters operating continuously in the amateur band itself might be quite helpful in promoting observation of unusual conditions. (Let's have them somewhere other than the low end, however!) W4HHK.

Collierville, Tenn., has been running his rig automatically between 6 P.M. and midnight, though not regularly. Paul runs 300 watts on 144.916 Mc., feeding a 5-over-5 array 80 feet above ground. Antenna headings are principally north (for possible aurora), northwest, in the hope of working into Kansas, and in the direction of Dallas, about WSW. Operators in Little Rock, Texarkana, and down Dallas way have found it very useful.

About this time last year, W4GMP was intending to start 2-meter beacon operation from Key West, Florida, but a sudden transfer to the Mediterranean area made this impossible. Bob is back in the country's southernmost city again, however, and hopes to pick up where he left off. A close watch of conditions from this spot should turn up some mighty interesting propagation, as it was in the waters not far from Key West that some of the earliest experiments with duct transmission were conducted. W4GMP should make v.h.f. history if he is able to go through with his plans for operation on 6 and 2 this summer.

W3RUE, Pittsburgh, reports reception of a continuous signal on 146.6 Mc. for the past two years. This tone-modulated signal varies with weather conditions, running from S1 to S4 in the winter months and reaching S5 to S8 when the band is good in the direction of New England. It peaks in a northeasterly direction, but none of the 2-meter men Ted works in that direction knows what it is. Can anyone solve this one?

V.H.F. DX-peditions coming up! The Purple Glow V.H.F. Club of Albuquerque will have equipment operating on 50 and 144 Mc. from Sandia Crest, a 10,600-foot elevation overlooking the New Mexican desert during the June V.H.F. Party, the 7th and 8th. A rig will be operated on 7155 kc. for liaison work. All operation will be under the call, W5RFF/5. For schedules write ARRL West Gulf Director W5CA, Tijeras, New Mexico.

There will be literally hundreds of v.h.f. stations in choice locations for the ARRL Field Day, June 21st and 22nd, but perhaps the highest of all will be the one operated by WØBXM and WØNWQ, on Pike's Peak, at an elevation of more than 14,100 feet above sea level. A minimum of two transmitters will be available for 144 Mc., and one for 50 Mc., with a power of 50 watts or more. They will be in operation by noon of the 21st and will continue through 6 P.M. the following day. A mobile station will be standing by on 3995 kc.

Given some really hot sporadic-*E* openings, one of these expeditions might well bring us a new 2-meter record. The widespread activity that is characteristic of these contest week ends should help. Remember, it was during the ARRL Field Day week end that the W5VY–W8WXV record was set in 1950, only to be broken by the W5QNL–W6ZL contact during the June V.H.F. Party in 1951.

And well may we look to our laurels in this business of 2-meter DX records, for our hold on them has been threatened several times in recent months by the hams of Australia and New Zealand. VK5JD sends us word of still more contacts between the Adelaide and Perth areas, around 1200 miles. VK5GL and VK6BO made this hop in December, as previously reported. And on Feb. 9th, VK6BO worked VK5QR and VK5GL again, in an opening that lasted about 30 minutes.

Twin-Five vs. 16-Element

One of the more widely-used arrays on 144 Mc. these days is the 5-over-5 system developed by W2PAU, and described by him in *CQ*. Justifiably so, for this array combines low cost, low wind resistance, and good performance in an easily-built form. Its chief element of novelty is that the two 5-element arrays of which it is comprised are spaced a full wavelength apart, instead of the more commonly-used half-wave, or the five-eights wavelength spacing that is known to give the maximum gain when simple dipoles are stacked.

Many inquiries have come in asking for the relative merits of this arrangement and the old stand-by, the 16-element array consisting of 8 half-wave elements in phase with reflectors spaced 0.2 wavelength behind. This comparison could be made readily at W1HDQ, for we already had a 16-element array working on 220 Mc. A Twin-Five was built and erected at about the same height, and a series of receiving and transmitting tests conducted. The 16-element array proved the better by margins of 2 to 4 db., about what might be expected, as the frontal area of the 16-element job is twice that of the 5-over-5.

Then the spacing of the Twin-Five was reduced to five-eights wavelength and the checks repeated. These indicated that the closer stacking reduced the gain by 1 to 2 db. The actual power gain of the two systems was not checked, because of the considerable error that is likely to be made in quantitative gain measurements, except under carefully-controlled conditions. We just wanted to know how these two popular antennas compared, and the answer is just about what might be expected: All other things being equal, the best v.h.f. antenna system is the biggest one.

In the course of working for minimum standing-wave ratio on the 5-over-5 we hit on a simple way of matching this type of array. Because the phasing line between the arrays is a full wavelength long, a wide variety of impedances can be matched by tapping the feed line onto the phasing section at the proper point. Folded dipoles of any convenient conductor ratio can be used, as a moderate standing-wave ratio is of no importance with a phasing section of open-wire line.

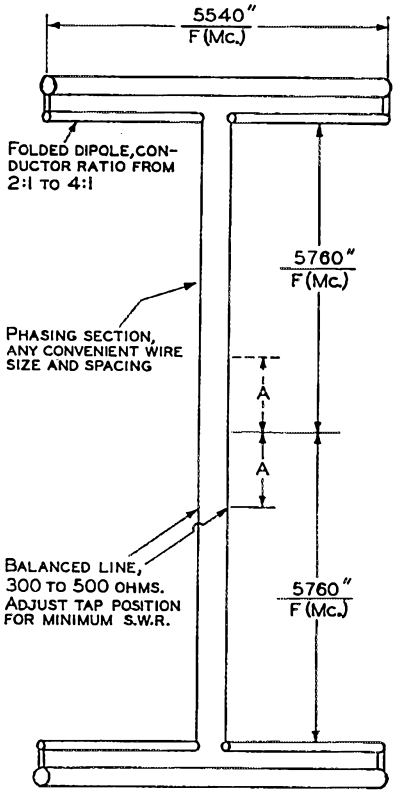


Fig. 1 — Driven-element modification of the popular W2PAU Twin-Five array. Matching is accomplished by sliding the point of connection of the transmission line up or down from the midpoint of the phasing section. Dimension *A* is about 10 to 12 inches for 144 Mc.

We used folded dipoles of approximately two-to-one conductor size, and a phasing section of Gonset Line (No. 18, spaced one inch). With 300-ohm Twin-Lead for the main transmission line, minimum s.w.r. was obtained with a connection about 8 inches above or below the center of the phasing section. For a 144-Mc. model using similar dipole conductor ratios, the point of connection would be about 10 to 12 inches either side of the midpoint of the phasing section.

Folded dipoles of uniform conductor size, or even split dipoles, could be used, but these would make for higher standing-wave ratio on the phasing section and the point of connection of the transmission line would be somewhat more critical. The feed impedance of each array is repeated at the center of the phasing line, and since there are two

arrays the impedance presented to the transmission line is halved. An adjustable "Q" section could be inserted at the center, but sliding the transmission line connection up or down the phasing line is simpler and more convenient.

V.H.F. Net News

One of the best ways of promoting greater use of the v.h.f. bands is to organize some form of net. Long experience has shown that the average ham enjoys gathering with his fellows regularly on the air, and he will do it religiously, even though he may not be given to other forms of local operating activity. Knowing that there will be stations on the air at a specified time encourages prospective users to give the v.h.f. bands a try, and often they are pleasantly surprised to find how many stations they can hear and work. Participation in net operations tends to keep operators on 6 or 2 the year round who would otherwise show up only during the DX season. A net is a fine means of maintaining club interest.

Obviously, there are many reasons for net organization other than the primary one of training for emergencies. To further interest in v.h.f. net activity, we propose to run a table of net information in these pages from time to time. The first such table appearing below is compiled from memory and from recent correspondence. It is far from complete, of course, and we solicit more listings and corrections of those we already have. Let's have the dope on *your* group.

Name or Area Served	*Frequency*	*Control*	*Date and Time*
Minute Men (E. Mass.)	51	W1IN	Sun. A.M.
New England 50-Mc. Net	50-54	W1CLS	Mon. 8 P.M.
Horsetraders (W1, 2)	50-51	W1HDQ	Tues. 7:30 P.M. EST
New York - New Jersey	50-54	Rotates	Nightly, 10 P.M.
N. Y. State C. D., Zone 9	144 (?)	?	Fri. 8 P.M.
N. Y. State C. D., Zone 10	145.26	W2TBD	Mon. 10 P.M.
Phila. High Freq. Club	147.3	?	Thurs. 8 P.M.
Intercity (Phila.)	147.3	?	Mon. 8 P.M.
York Road Radio Club (Phila.)	146.6	?	Wed. 7:30 P.M.
Oak Ridge (Tenn.) Emergency Net	50.7	?	Tues., Fri. 7 P.M.
Columbus, Ohio	146.34	?	Mon. 8 P.M.
Two Meters & Down Club (L. A.)	144-148	W6IHK	Mon. 8 P.M.
Jackson, Mich.	145.6	?	Wed. 8:30 P.M.

OES Notes

One of the problems in 2-meter mobile work is that of oscillator instability. W2UTH, Rochester, N. Y., solves this with a crystal-controlled converter that works into a Gonset job, tuning the latter from 26 to 30 Mc. Current drain is less than one ampere from the car battery and 8 to 10 ma. from the plate supply. Stability is, of course, limited only by the tunable converter and receiver with which it is used.

Two new OES appear in the Philadelphia area this month. W3QMO and W3UKI. W3UKI has a very simple modification of BC-457 or ARC-5 4-5.3-Mc. transmitters for VFO use on 2 or 6. Excellent stability reports are received on c.w. as well as 'phone. In areas like this one, where 2-meter activity is booming, VFO is becoming popular.

Florida's only reporting OES is W4AYX, Clearwater. He finds it a little hard to generate much in the way of material to report, in view of the sparse activity, his recent work consisting mostly of occasional QSOs with WN4TKE and W4GFE of St. Petersburg.

W6CFL, Los Angeles, is still working on 2400-Mc. gear. His frequency meter, homebuilt, had been tentatively calibrated by means of Lecher wires, but Tuck was a little in doubt as to the accuracy of this method at such a high frequency, so he got W6NLZ to check the calibration against a commercial standard. Though the wavelength for the band is only 2.41 to 2.57 inches, his calibration turned out to be adequate for amateur purposes. Tuck makes the observation that putting these frequencies to practical amateur use is quite a different matter from merely playing with them under laboratory conditions.

W6DVJ, San Diego, reports some experiments on 10,000 Mc., and W6ODB says that W6LWT, Chula Vista, is also working on that band. Let's have more details, boys. We want to record the full story of any work being done in our microwave assignments.

W8WRN, Columbus, Ohio, has decided that something more than an indoor Yagi antenna is going to be needed to work W8CPA on 420 Mc. An array of 8 half-waves in phase with a screen reflector is in the works. Ken is also set up to work on 50, 144 and 220 Mc.

A major problem for W8FKC, Hudson, Ohio, is the designing of a single antenna system (or several in one assembly) that will work on 144, 220 and 420 and yet require just one support. He can think of several ways that it might be done, but he doesn't have too much time available, so if anyone has a proven system, Ralph would like to know about it. Any suggestions?

W9CFP wants it known that the Racine Megacycle Club will have a 144-Mc. station operating for the ARRL Field Day, probably signing W9MMF/9.

W9IFA, Carrollton, Ill., is looking for 144-Mc. stations in Springfield and vicinity. He is on 144.6 Mc. Tuesdays and Thursdays at around 9 P.M., looking in that direction.

(*Continued on page 120*)

2-Meter Standings

	Call				*Call*		
	States	*Areas*	*Miles*		*States*	*Areas*	*Miles*
W1HDQ	16	6	650	W5SWV	7	2	—
W1IZY	15	6	750	W5FBT	6	2	500
W1MNF	14	5	600	W5IRP	6	2	410
W1BCN	14	5	580	W5ONS	5	2	950
W1DJK	13	5	520	W5FSC	5	2	500
W1CTW	12	4	500	W5DFU	5	2	275
W1KLC	12	4	500	W5JLY	4	2	650
W2BAV	21	7	1175	W6ZL	2	2	1400
W2NLY	18	6	750	W6WSQ	2	2	1390
W2PAU	16	6	740	W6PJA	2	2	1390
W2AZL	16	6	—	W6EXH	2	2	193
W2SFK	13	6	—	W6ZEM/6	1	1	415
W2DFV	13	5	350	W6GGM	1	1	300
W2CET	12	5	405	W6YYG	1	1	300
W2DPB	12	5	500				
W2QED	12	5	365	W8WJC	21	7	775
W2FHJ	12	5	—	W8BFQ	21	7	775
W2QNZ	12	5	—	W8WRN	19	7	670
W2BVU	12	4	260	W8WXV	18	8	1200
W2UTH	10	6	—	W8UKS	18	7	720
W2ORI	10	6	620	W8EP	17	7	—
				W8WSE	16	7	830
W3NKM	19	7	660	W8RWW	16	7	500
W3RUE	18	7	760	W8BAX	15	6	655
W3QKI	17	7	820	W8FQK	13	7	—
W3KWL	15	7	560	W8CYE	12	6	—
W3LNA	14	7	720	W8CPA	12	—	650
W3GKP	14	6	650				
W3OWW	13	6	600	W9FVJ	20	7	790
W3KUX	12	5	575	W9UCH	20	7	750
W3PGV	12	5	—	W9SUV	19	7	—
W3LMC	11	4	400	W9EQC	18	7	820
				W9BOV	15	6	—
W4MKJ	16	7	665	W9WOK	15	5	690
W4HHK	15	6	660	W9MBI	14	—	—
W4JDN	13	6	—	W9AFT	14	—	—
W4JFV	13	5	830	W9NFK	12	7	69
W4IKZ	13	5	650	W9UIA	12	7	540
W4JFU	13	5	720	W9GTA	11	5	540
W4OXC	13	7	500				
W4CLY	12	5	720	WØIHD	15	6	725
W4JHC	12	5	720	WØNFM	14	7	660
W4OLK	12	5	720	WØEMS	13	5	1080
W4FJ	12	5	700	WØZJB	12	7	1097
W4LRR	5	2	900	WØWGZ	11	5	760
				WØHXY	8	3	—
W5JTI	14	5	670	WØJHS	7	3	—
W5QNL	10	5	1400				
W5CVW	10	2	1180	VE3AIB	12	6	600
W5MWW	9	4	570	VE1QY	11	4	900
W5AJG	9	3	1260	VE3BOW	8	5	520
W5ML	9	3	760	VE3BQN	7	4	540
W5ERD	8	3	570	VE3TN	7	4	480
W5VX	7	4	—	VE3BPB	6	4	525
W5VY	7	3	1200	VE3AQG	6	4	520
W5FEK	7	2	580	VE3DER	6	4	450
W5ABN	7	2	450	VE3EAH	5	4	380

U. S. N. R.

Code Practice

The Naval Reserve training centers at Los Angeles and Santa Barbara, California, are now transmitting code practice. The transmissions are automatic, with messages sent at speeds shown below. Although intended primarily for Naval Reserve training in the 11th Naval District, these transmissions are available for use by amateurs.

Station	*Location*	*Speed*	*Kc.*	*Times and Days*
N1RRA	Los Angeles, Cal.	5, 10, 15 w.p.m. (each approx. 20 minutes)	2096	8:15 to 9:30 P.M. PST, Mon. and Wed.
N1RRF	Santa Barbara, Cal.	5, 10, 15 w.p.m. (each approx. 20 minutes)	2096	8:15 to 9:30 P.M. PST, Tues. and Thurs.

Activity Notes

A group of radio amateurs in the Toledo, Ohio, area is conducting emergency radio drills on Sunday mornings in the 160-meter band. K8NRT acts as net control with R. G. Brob, RMN3 (W8YFJ), at the operating position.

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The St. Joseph, Missouri, Amateur Radio Operators Club holds its regular monthly meetings at the local Naval Reserve training center. Two of the main projects of the club are assisting in local TVI problems and preparing for civil defense.

— • • • —

The new Organized Electronics Company at Anderson, S. C., has been assigned the call K4NBV. W4SSN is the stationkeeper for this company.

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K8NRN, Naval Reserve Training Center at Akron, Ohio, operates on an emergency radio net with amateurs in the Akron area. Tests are held Sunday afternoons on the 160-meter band.

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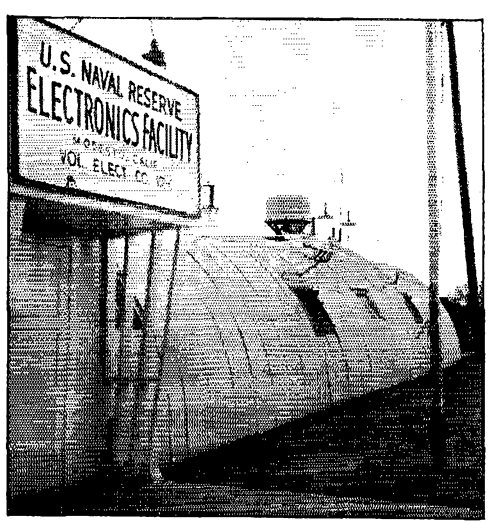
W8WV, Cleveland, Ohio, W3AOA, Springfield, Pa., and W3ATU, New Castle, Delaware, are active in a weekly radio drill held for individual Naval Reserve radio stations of the 4th Naval District.



Volunteer Electronics Company 12-6 quarters, Modesto, California (K6NRM). This company has at present a total membership of 73. The Chief of Naval Operations and the Chief of Naval Personnel recently commended the commanding officer, Lt. Kenneth W. Biesemier, for the outstanding achievement of this unit.

Preview — DX Contest High C. W. Scores

As promised last month, here is a compilation of high *claimed* c.w. scores of participants in the 18th ARRL International DX Competition. Though relatively poor band conditions brought scores down as anticipated, it is apparent that if the ionosphere completely dried up and blew away old-school DXers would *still* be knocking 'em off. Some of the statistics at hand:

Scores, W/VE: *W8JIN* 237,390, *W3LTU* 184,212, *W6AM* 167,562, *W9LM* 162,771, W8BTI 158,100, *W4ESK* 156,006, W4BGO 155,925, W6MVQ 150.174, W4BRB 142,749, W4CEN 138,600, W3PDX 134,505, *W1LOP* 123,954, W3FQZ 109,692, W1AXA 104,895, W6TT 103,752, W6YRA 103,676, W3IYE 96,384, W8DX 90,506, *VE2WW* 88,893, W9DUY 87,750, W4HQN 87,462, W8DUS 86,304, W6PYH 85,668, W8ACE 84,870, *W2GGL* 81,720, W6EPZ 81,396, W1TX 74,015, W4NNH 69,960, W6RBQ 68,970, W8CVU 68,364, W6DFY 64,842, *W5FNA* 64,269, W2UWD 59,220. *WØTKX* 58,176, W4OM 54,924, W4VE 54,144, *W7PGX* 53,900, W2AWF 53,262, W4BBP 52,164, W3DRD 51,381, *VE3CCK* 51,168, W1FTX 50,904. (Italics, call-area highs.)

Scores, non-W/VE: KV4AA 541,890, KG4AF 518,833, VP7NM 190,038, CO2BC 177,954, XE2OK 131,372, KH6DK 110,925, CN8EX 100,758, ON4QF 69,042, G5RI 65,286, ZE3JP 61,920, VP9AL 54,694, OQ5RA 51,356, KP4OD 45,072, KL7WC 33,390, FA9RZ 32,085, GC4LI 31,724, VR2CG 30,393, OZ1W 28,196, CE4AD 28,117, OZ4KX 24,544, KL7NXI 23,600, KL7ANJ/KL7 22,968, DL2RO 22,794, HC2OS 20,631, G6GN 18,262, PAØKW 16,874, OH6NR 16,200, PAØVB 15,900, VK3AHH 15,892.

High contact totals, W/VE: W8JIN 410, W3LTU 357, W8BTI 340, W9LM 337, W4ESK 321, W6AM 321, W4BGO 315, W4CEN 315, W4BRB 311, W3PDX 305, W1LOP 283, W3FQZ 277, W6TT 262, W1AXA 259, W6YRA 258, W8DX 256, W3IYE 251, W9DUY 250, VE2WW 249. Outside W/VE: KG4AF 2085, KV4AA 2015, VP7NM 1114, CO2BC 1043, CN8EX 805, XE2OK 789, KH6DK 725, ON4QF 622, G5RI 558, ZE3JP 518, OQ5RA 467, VP9AL 452, KP4OD 414, GC4LI 375, KL7NXI 353, KL7ANJ/KL7 348, OZ1W 347, FA9RZ 343, OZ4KX 315, VR2CG 307.

Top multipliers, W/VE: W8JIN 193, W6AM 174, W3LTU 172, W4BGO 165, W4ESK 162, W6MVQ 162, W9LM 161, W8BTI 155, W4BRB 153, W4CEN 150, W3PDX 147, W1LOP 146, W1AXA 135, W6YRA 133, W3FQZ 132, W6TT 132, W4HQN 129, W3IYE 128, W8DUS 124, W2GGL 120, W6EPZ 119, VE2WW 119, W6PYH 118, W8DX 118, W9DUY 117, W8ACE 115, W1TX 113, W5FNA 111, W6RBQ 110, W8CVU 108, W6DFY 107, W4NNH 106, W1FTX 101, W7PGX 100. Outside W/VE: KV4AA 90, KG4AF 83, CO2BC 57, VP7NM 57, XE2OK 56, KH6DK 51, ZE3JP 43, CN8EX 42, VP9AL 41, G5RI 39, HC2OS 39, ON4QF 37, OQ5RA 37, KP4OD 36, KL7ANJ/KL7 33, VR2CG 33, CE4AD 31.

Some high W/VE different-countries-worked tallies: W6AM 87, W8JIN 85, W4HQN 79, W3LTU 78, W6MVQ 78, W9LM 78, W8ACE 75, W8BTI 75, W1LOP 73, W3IYE 73, W4CEN 73, W4NNH 72, W4OM 71, W1AXA 70, W3PDX 70, W8DUS 70, W9DUY 70.

These claimed figures include those of multi-operator classification. All entries will be subject to intensive checking prior to the announcement of final results.

FEED-BACK

Not even our regular April contributor Larson E. Rapp, WIOU, would be able to obtain the calculated vertical-radiation contours given in Fig. 2 of last month's "The Truth About the Vertical Antenna," by B. W. Griffith, W5CSU. Obviously, the graphs for Figs. 1 and 2 were transposed.

How's DX?

CONDUCTED BY ROD NEWKIRK,* W1VMW (Ex-W9BRD)

How:

YM4AA, OE3AH, J5CC, G6s NF and WY, OK1BC, ON4AU, ES5s C and D, D4BIU, LY1J, K6CGK, PAØGN, YR5VV, GM8HP, K5AY, CM2AD — remember those signals and fists of the late Thirties? And how about some standout 'phones: KA1ME, G6LK, VKs 2GU and 4JU, XE1GE, K4SA, ON4VK, CO2s JJ and WM, PAØUN, HB9J, Fs 8ZF and 3OO, ZU6P . . . we could fill a page with them. You can go back further for some more stalwarts if you're a real OT.

Those fellows were landmarks, all right, or should we say *band*marks? VP5PZ's tapelike buzz, U2NE's bug flitting around 14,425 kc., GM6RG's booming 28-Mc. 'phone. . . . Some of those old faithfuls are QRT, off to the land of no QSB. Others, and darned few, we'll bet, have drifted off to new interests. The rest can still be found going strong albeit with changed calls.

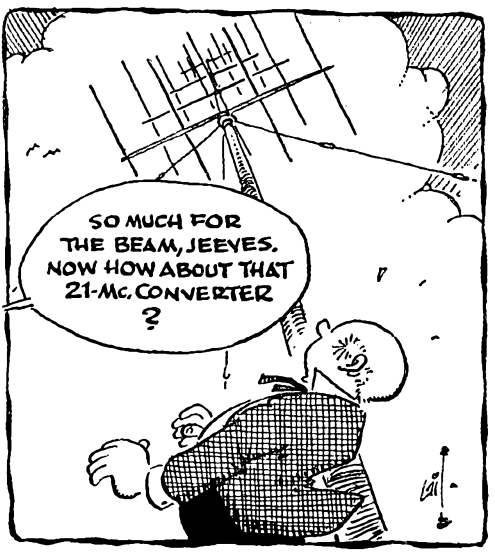
A sweep across the bands today will disclose a fresh crop of stand-bys whose signals will similarly linger: 'Phones VP3LF, GD6IA, VQ4ERR, XE1AC, TI2FG, YS1FM, HCs 1JW and 2JR, VP6FO, ZE1JE, ZS6DW, G2PU, PY2CK, I1SM, VU2CQ and YV5AB. The c.w. of ON4QF, OQ5RA, F8EO, KV4AA, IS1AHK, PY7WS, OH3NA, CE3s AG and DZ, XF1A, KH6IJ, PK4DA, UM8KAA, LU3EL and ZL1BY will echo long.

It's not necessarily the sock or rarity that causes these birds to stick in one's mind: it's the *consistency*. Whenever the bands open up for a particular part of the world there are the old reliables rolling through. May the logs of these guys continue to fatten through the years!

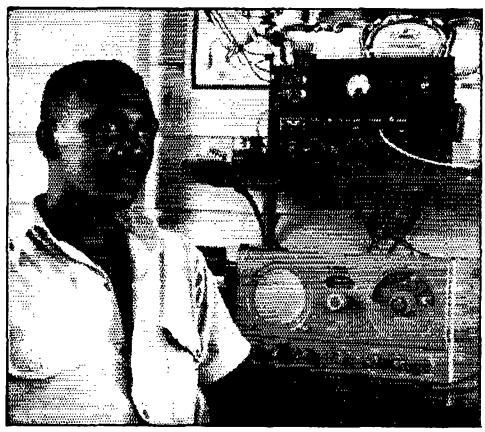
What:

Settling down finally in his new QTH, W9HUZ employed a temporary ground-plane antenna on *twenty* to raise **VP8AU** (14,046), **FF8AG** (001), **CT2BO** (075), **MI3SL** (060), **TG9HW** (020), **JA8AB** (030), **KG6ABN** (110), **ZB2I** (082) and **ZE3JP** (020). He must get the new beam up fast because the two-year-old jr. op keeps falling into the post-holes in the back yard. . . . W1AW (Chas) found **ZD4BI** (004) frisking about; UI8KAA and UAØKFB wouldn't give W1APU a tumble. . . . "From the world's poorest QTH," W2SHT mentions working **KR6AF** (093), **9S4AX** (063), **EL2R** (120), **KT1DX** (093) and **CT2AE** (030) . . . One NQ5AX who said he was running 3 kilowatts in Africa pulled the leg of W2IDH — or did he? . . . W4THZ/4 surrounded **CT3AA** (020), **AG2AG** (010), **EA9s BF** (024), **BD** (085), **FQ8AF** (090), **OE13s** HL, HP, RB (075), **YUs 2CK** (085), 3AC, **MI3s** RR, US (080), **TF3KG** (080) and a GC5; Joe has 300 watts and a vee. . . . "Although this may not interest the old-timers, I think that other new hams like myself might like to know that it can be done." W9OWK/1 took his first crack at 20 c.w. and knocked off 20 countries in three days, using just 50 watts and a long-wire radiator. These included TF3AB, **OX3BQ** (108), TI2AB and EK1AD. . . . WØFID plans to ship as a sea Sparks during the summer and meanwhile nailed VS7XG, CP1BK and an MI3 for new ones. . . . **TF3SF** (030), KT1OC, KG4s AF, AO, and TI2TG should have QSLs on the way to W2INE by now. George is curious about an XE5AK in his list. . . . FAs 9RZ and 8BG, as well as a KT1 and a TF3, were prey for W4RNP's 4D32, giving him half a DXCC so far. . . . JA8OT, some JA2s, **KG6FAA** (240), **OQ5PE** (030), **YUs 1CX** (018), **3AT** (030), **KX6AH** (080), **VK9DB** (065), **VQ4CO** (030) and **VS6AE** (080) were riddled by WØAIH. . . . W6EAY hasn't been stopped by conditions: **CP1BK** (035), **VP3TF** (040), **CX4CZ** (010), **VP1AA** (025), YS1O, EL2A, **VP8AP** (010) and an FQ8 took his bait. . . . SWL Norm Duxbury can find his way around on c.w. to the tune of CN2AD, AP4A, FB8BE, EA8s AE, AW, LB5Q, SU1AD, 4X4s BD, DK, 3V8AE, OE13SC, SP3PF and ZB1BP. . . . W5KUC and W5UCQ, scribes of the West Gulf DX Club's *DX Bulletin*, account for the following c.w. activity: **CRs 4AL** (060), **6PI** (080), **CT2BO** (080), **CP1DC** (100), **DUs 1AP** (025), 1MB (040), 9VL (250), **EAs 8BF** (072), **9BC** (036), **FD8AB** (018), **FF8AG** (070), **FK8AI** (030), **FO8AC** (025), **FU8AA** (160), **GCs 4LI** (018), **5OU** (085), **KG6s AB** (013), **ACY** (029), **KH6s QY/KC6** (005), **AKV/KJ6** (030), **KX6AL** (010), **MP4BBD** (082), **OX3GL** (065), **OQ5RA** (005), **HE9LAA** (045), **HH3L** (035), **HP1BR** (005), **LZ1KAB** (030), **SP1SMX** (015), **TFs 3NA** (015), **5SV** (050), **5TP** (040), **7SF** (030), **VK9s MR** (047), **XK** (013), **VPs 2SG** (080), **2GH** (022), **8AE** (100), **8AJ** (145), **VQs 2GW** (069), **3CP** (056), **5AU** (005), **5CK** (048), **VRs 1A** (105), **2CG** (045), **6CA** (070 t5), **VSs 2CY** (108), **6CG** (055), **7RSC** (075), **VU2s EJ** (112), JK (025), NB (065), **VQ8s AN** (020), CB (105), **YUs 1AD** (025), **1AP** (120), **1AS** (033), **1CNA** (120), **3BC** (045), **ZB2A** (077), **ZC4XP** (055), **ZDs 1SS** (009), **2HAH** (065), **9AA** (030), **3A2AH** (100), **3V8AB** (010), **4X4BC** (090) and **9S4AX** (023) were worked or heard. **HB4FE** (045) and **OP5QF** (046) are on the query list. . . . Recommended by W4KE are OA5A, YU3AB, TI2TG and KT1UX. . . . Walt Mulvey, who used to furnish us some valuable squibs as an SWL, knocked off his first DX as W1TSZ. It was **KZ5BC** (010). . . . W2APU worked LZ1KAB which was operated in turn by LZ1s DP and HI. Contrary to belief, the LZs say they *do* like to QSO W/VEs.

Twenty 'phone is being hit hard at W9KAS. Glen is up to 85 worked through the coöperation of guys like **OX3BF** (365), MI3DW, **OE13GK** (310), HP5LB, CN8s CD, FH,



* DX Editor, *QST*.



The neat low-power installation of VP6CS, St. Michael, Barbados. Cecil is no stranger to the 20-meter c.w. gang and works 10 as well. (*Photo by W2AIS*)

FO, GD, KT1s CH, LU, CE3NZ, VP2AF, VQ4AC and JA2CC . . . . KG6FAA (240), CN8EI (265), some JA2s and VP9AD succumbed to WØAIH . . . . The n.f.m. of FF8AF is good for a QSO and QSL, states W2TXB . . . . Two-way 'phone QSOs in the log of XE1AC are EA8AW (364), W4CG/KV4 (230), VP8AP (162), DU1AP (190) and ZS2MI (184) . . . . The *DX Bulletin* of West Gulfer W5KUC lists enough 'phones to keep you busy for awhile: AG2AC (200), CRs 5AC (160), 6AH (245), AN (135), CT2AE (105), DU7SV (310), EAs 8AN (330), 8AP (340), 8BK (360), ØAD (315), ØAC (125), ELs 5A (340), 5B (336), 6A (348), 9A (330), FF8s BA (350), CN (340), FA8DD (330), FQ8AK (300), GD6IA (180), HC8MM (391), HI6EC (175), IS1s EHM (200), SMB (205), KT1BB (346), KW6BC (245), W6HQH/KM6 (290), LX1s DC (145), DU (215), MI3s RH (315), RR (380), US (340), OX3MW (355), PZ1WK (165), SP9KKA (200), TF5SV (165), VK9DB (112–320), VPs 2GX (190), 2LE (337), 3LF (142), 8AJ (145), VQs 2DT (100), 3CP (320), 4AC (367), 4AQ (203), 4CO (200), 4BU (105), 4ERR (203), 4FCA (165), 5AU (150), 8CB (325), ZB1JK (178), ZC6AD (200), ZD4s BB (352), BF (140), ZPs 2BB (125), 3NB (190), 3XA (382), 4AF (184), 4CA (373), 5CM (335), 7AF (133), 5A2s TL (315), TN (382) in the evenings; DU1s AP (126), JI (189), FA8CF (325), JAØIJ (190), KR6HW (180), OE13GK (310), SP5AU (138), TA3AA (225), VK9YT (366), VP7NT (150), VQ3BM (180), VSs 1DS (200), 1GA (170), 1AX (335), VU2s JA (305), JU (220), XZ2s EM (160), KN (305), ZD6RD (350), ZK2AA (230) and 5A2TP (160) for early risers.

W1AJO found a sortie on *forty* quite sporty. CN8EX (7090), CT2BO (090), EAs 8BF (125), 9BB (085), HR2ZE (060), YU2AKL (020), VP9AY (105) and ZS3K (075) met with Chuck's approval . . . . At W2AIS we find HE9LAA (027), KX6AH (020), VK2QZ/P9 (020) and ZK2AB (012) freshly logged. The VK2 was on Kitava Isle of the Trobriand group, Papua on the Countries List . . . . W1BGJ works VKs just before breakfast and W8HBL/4 hears ZLs quite well at the same time . . . . VK5XK is *still* after Delaware around 7036 kc. and 7016 kc. according to W3DLI . . . . All non-W/VE c.w. isn't carried on near the low edge — W4SOY found CM8CM (145) and CM7CB (222) available . . . . YVs 5DE, 6AO, FA8s BG, DA, CN8BL, TI2PZ, YO2BC and many other Europeans have been working W4KE of late . . . . YV5FH answered WØFID and W9HUZ accumulated the following: KH6QY/KC6 (047), CX1KB (028), FF8AC (027), VK9XK (020), VP5BH of the Caymans (015) and a ZS3. . . . . A pair of 826s at W4TUL were good for HR1KK (037), LUØDDH (160), YV5FA, HK5DH, many KH6s and ZLs.

On *eighty*, WN4TVQ managed VP7NZ, CO2PY and KP4PW for some neat Novice DXing. Buddy W4TVS worked these, too . . . . KH6QY/KC6 (3510), LUs 1EP (3513), 3EL (3512), VP7NM (3515), XE2OK (3516), KG4AF (3510) and ZS3K (3513) entertained W9HUZ . . . . W4KE ambushed VP7NW, ZL1HM, KH6s PM, IJ, PY7WS and KZ5DE . . . . W5TFA graduated from Novice ranks in time to snag FA8BG, KG4AD, CO2PJ and a VP7 . . . . OQ5BC was QRT and in Belgium when somebody bandied his call sign about the 3.5-Mc. band. OQ5RA writes further, "No OQ5 had been operating in the 80-meter band before myself on March 23rd, 1952. I put my rig on 3.5 Mc. to test the conditions and the QRN; QSOd DL3SC, DL1FF, ZS2HI, VQ4HJP, ON4QF, PY7WS and LU7AZ." Andy will use the band again more frequently when conditions are improved . . . . On *seventy-five*, 'phones ZS6KD (3691) and ZS6DW (3695) were still poking through the rising QRN at W1ATE.

While *one-sixty* may have gone into summer hibernation, W2QHH gave it that so-called Parthian shot. Howy's 6L6 knocked off VP4LZ (1982) for his third 160-meter continent.

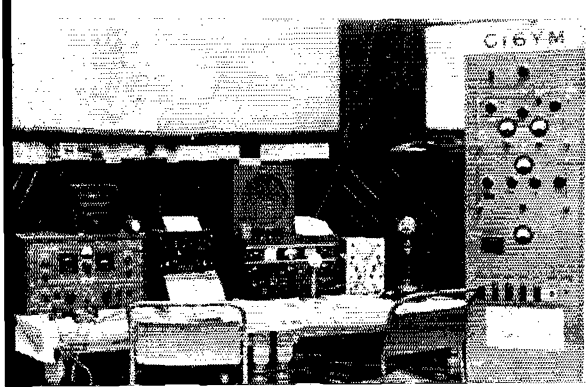
Men with a yen for *ten* may find encouragement in some scattered reports. W5TFA worked 'phones OA1E, CE3CZ, ZP4BB, LU8DF, KS4AR and TI3LA while W9ICF tallied ZD9AA (28,400) . . . . On c.w., KH6s AEX, IJ, MG, LU3EL and KZ5LY were raised by W4KE . . . . W1AJO batted his key for ZK2AA (28,050) and VR2CG (28,075).

Although *fifteen* did not exactly open with a DX bang, many W/VEs were observed warming things up as soon as skip came in during the morning of May 1st. At this writing HC, OQ5, OZ, PJ, PY, ON4, VE/VO, W/K, XZ, ZE, ZL and U.S.S.R. amateurs have been authorized use of 21 Mc. by their governments. More countries are expected to follow suit shortly — see you on 15!

Where:

Ex-KR6EK, now W7MRX, still gets cards for KR6 stations as a result of his once acting as Okinawa's QSL bureau manager. The bureau address is: Okinawa Radio Amateur League, APO 331, c/o Postmaster, San Francisco, California.

CR5JB	Box 37, Bolama, Portuguese Guinea
CR6PI	Box 191, Luanda, Angola
EL2A	C/o Firestone Rubber Plantation, Harbel, Liberia
EL2P	C/o PAA, Roberts Field, Liberia
FF8AF	Box 325, Abidjan, French West Africa
FY7YB	QSL via W9AND or via PFC M. W. Godwin, C-9, AF24630695, 123rd AC/W Sqdn., 155th Tactical Control Gp., Donaldson AFB, Greenville, S. C.
KH6QY/KC6	John H. West, Communications Station, Ponape, Carolines
KL7AON	L. A. Dyson, MT, c/o Stn. Mgr., CAA Admn. Bldg., Merrill Field, Anchorage, Alaska
M1B	Geom. Mario Grazana, Piazza del Stradone, Republic of San Marino
OQ5PW	Paul Watteaux, c/o Socobanque, Stanleyville, Belgian Congo
OX3BQ	QSL via J. Hermann, W8TSF, 8½ Church St., Athens, O.
PAØMOT	Lt. W. Willemse, 7th Co., 1st STU Regt., Ft. Benning, Ga.
ex-VK1BS	Wm. Storer, c/o Nurse J. Mills, Prince Henry Hospital, Little Bay, Sydney, NSW, Australia
VP3WO	Shemuel C. Wong, Apt. 2, Blk. 1, Laing Ave., Ruimveldt, British Guiana



♦

GI6YM is the comfy club station of Belfast's YMCA; its 150-watter is active on all DX bands. The rig is a converted RAF job and several antennae are available.

♦

***QST* for**

ex-VQ4SGC	S. G. Crow, 12 Oaklands Ave., Edmonton, London N. 9, England
ex-VS9AH	J. B. Halton, 22 Hugh St., Bransty, White Haven, Cumberland, England
YV5FL	(QSL via YV5AP)
ZD4BF	Box 7, Takoradi, Gold Coast
ZD4BI	Sgt. Wm. F. Baron, Gold Coast Sig. Sqdn. Giffard Camp, Accra, Gold Coast
3A2AQ	Lt. Col. James E. Ligon, F7BB, Chateau Melleray, St. Denis-en-Val, Loiret, France
ex-5A2TH	T/Sgt. John Wylie, Hq Sqdn., 1600th Westover AFB, Mass.
5A2TP	Cpl. Don Jones, AF12286899, Flight C, 7th Air Rescue Sqdn., APO 231, c/o Postmaster, New York, N. Y.

W1s APU DJV RWS AW (Chas), W2s EEY ESO PZM TXB ZQW, W4RNP, W8s SWG SYC, OQ5RA, N. Duxbury, Northern California DX Club's *Dxer* and West Gulf Division DX Club's *DX Bulletin* put the finger on these.

Kashmir's 4UAJ, operated by United Nations radio officer Ted Gull, is a choice addition to any DX log. India includes Kashmir on the Countries List. (*Photo courtesy W8HGW*)

Tidbits:

Afghanistan's amateur radio freeze appears to be thawing somewhat. YA3UU cards are coming through and he's okay, operating 20 c.w. from Kabul with 25 watts and an 840A. HZ1MY (W6MLY) has a permit to put a rig on the air there, too. Stations whose call signs end with MY or VB in the Middle East area (VS9, MP4, FL8, YA3, et al) should be QSLd to HZ1MY. He and a friend intend to be very active in those parts! . . . . W2AIS is heading for KH6 for keeps after working 150 countries from a QTH in the shadow of N.Y.C.'s RCA building. The breakdown was 128 countries on 14 Mc., 109 on 7 Mc. and 63 on 3.5 Mc. . . . . A Far-Eastern friend of SWL S. Brookner asserts there is no amateur activity in Tibet at present. The latest AC4YN heard on 20 was just as you surmised . . . . W2GDW and W8VTC (ex-W4JXB) were sent cards verifying QSOs on 14 Mc. despite the fact they don't work the band. Some game is afoot, no doubt . . . . G5CP paid a personal visit to ham friends in the St. Louis area. W9s ICF and PAM were among the hosts, the latter's XYL also being from England . . . . EL2R tells W8YGR a heavy work schedule has put him behind in QSLing — patience, please . . . . PAØMOT came to the States for a four-month communications course at Ft. Benning, Ga. . . . . Italian amateurs did themselves proud in quickly organized emergency work during the Po River's latest rampage. Their excellent performance should go a long way toward liberalization of I1 regulations, especially with regard to mobile and portable activity . . . . OE13GK is coming back home . . . . Ex-CP1AA-CT2BK is now back on the air looking for old DX buddies. Henry's new tag is CP1BK. "Low power but working all states!" he told W6BAX . . . . Former operator of ZB2A, R. A. Butterworth, is sought by W9ICF . . . . W2BXY has it from F8CJ that HB9AW's trip to Clipperton Isle this summer will put FO7AW on the air. F8EX/AR closed down and a new FB8 will fire up on Terre Adelie, call unascertained, says G4FN . . . . DXing may seem a man's game but W8BFQ has over 120 countries on 28 Mc. and W1s FTJ and MCA are possessors of BERTA certificates . . . . We await info on the OP5QF that intrigued VO2B. Could it be ON4QF on the prowl again? . . . . OQ5RA says all OQ5AA contacts have now been confirmed . . . . W1IKE finds that DU amateurs are still restricted to QSOs among themselves or with U. S.-citizen-operated stations. PARA is hopeful that this ban will soon be lifted. Secretary DeCastro writes, "Present activity is 3.5-Mc. local rag-chewing and 14-Mc. U.S.A. contacts." Ten meters opens up in the Philippines on rare occasions for periods averaging but 30 minutes' duration . . . . DL4AF is now stationed in N. J. after visiting the hometown gang, including W5s DRW, BAB and PUN, in Siloam Springs, Ark. . . . . GM8SV will leave Aberdeenshire in favor of Bahrein Island for a three-year stint replete with ham gear, we are advised by W1BFK . . . . DXCC may not be impossible from Idaho but, as W7KIL points out, it's no cinch. W7FBD is awaiting the necessary confirmations from 111 countries QSOd from an Aberdeen QTH. W7KIL quotes more statistics to say there must be some unaccounted-for factor serving to make the eastern W7 call area a dud for DXing . . . . The former operator of DL4IA, PX1AA and 3A2AP has been issued the call W1VKS. Anyone still needing QSLs for John's European activity may reapply to 12 Merton Street, Newton, Mass. . . . . A method to obtain ZA1AB's QSL is sought by W6AM. W2PZM can't shake cards loose from MD2PM, FK8AB, KR6s, VP2s or VP4s. W2DJT is having the same trouble with EA8BF, VP5s, CR7AG and F9QV/FC . . . . They're not answering Ws any more but some notes on U.S.S.R. amateur regulations may be of interest. They have three classifications — Novice, Class II and Class I. The newcomers are allowed 10 watts of c.w. on 1715–1800 and 3500–3600 kc.; Class II operators may work 40-watt-maximum c.w. on the Novice bands as well as 7000–7100 and 14,000-14,400 kc.; Class I hams may operate 'phone or c.w. on the aforementioned bands plus 21,100–21,450 and 28,000–29,000 kc., all with a maximum input of 200 watts. In addition, all classes are permitted A3 and A1 emission on their 85–87 Mc. band. This via W2TUF. [Sounds good, Boss, but where are those guys? — *Jeeves.*] As you may have deduced from "Where," F7BB is giving Monaco a whirl as 3A2AQ. He wants it known that he'll QSL all contacts . . . . VQ4SGC is now an "ex" and is headed for VP5 territory. Note the "Where" section for his interim QTH . . . . Would-be-ham H. Suzuki of Shizuoka-Ken, Japan, drops a line to say there is great anticipation among JARL members of an early licensing . . . . W9OSY/8 and W2YNI plan to team up for some rare-DX operation in Africa during 1953. Anticipating licensing red tape, they are starting the ball rolling early . . . . On December 8th, 1949, W6EAY worked VK3XK. On December 9th, 1951, Eric raised VK9XK — same operator but new country, almost exactly two years apart . . . . The spirit of QRP continues strong in some quarters. W8OPG worked over 90 countries with a 6L6 running fifty watts; his receiver is a 3-tube regen . . . . Let's see what we can dig from VP8AU and VP8AP letters loaned us by W2APU and W6AM respectively: AU now runs 40 watts to a 6V6-6L6-807s line-up. The power source is a "bloody menace!" — 220 or 440 volts *d.c.* Jock says VP8s AB, AI, AP and AS are active in the Falklands, the latter without 'phone; VP8s AR, AT and AU work from South Georgia with AT and AU anticipating the addition of voice gear; other VP8s include AE on So. Shetland, AK Deception Isle, AO King George Isle and AJ Graham Land. "[Meteorological ham] stations are issued a call sign for the station and not to individual ops which causes quite a mix-up," adds VP8AU. VP8AP (GM3EYP) emphasizes this, writing, "You'll find most of the VP8 calls have changed hands this year again." VP8AP will return to Scotland at the end of this year and then hopes to visit the U.S.A. in early '53.

—•••—

Jeeves is having trouble with it, too. He keeps calling our new band 21 meters or 15 Mc.

Correspondence From Members-

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

PUBLIC SERVICE

Red Cross Disaster Headquarters
Southern Tornadoes of 1952
Little Rock, Arkansas

Editor, *QST:*

From many sources, as well as first-hand knowledge, we are fully aware of the splendid service rendered by amateur radio operators during the emergency period following the tornado which struck this section of the country on March 21, 1952. Many of these men not only reached the stricken areas immediately, but worked untiringly until normal communications were restored.

While we have had the opportunity to thank Dr. George Bean of Little Rock personally for his outstanding work in connection with the Judsonia network, we would like to take this opportunity to express our appreciation on behalf of the tornado victims to the thousands of members of the American Radio Relay League who have served their friends and neighbors during the disaster.

— *Richard F. Gordon, Director*

Faulkner County Chapter
American Red Cross
Conway, Arkansas

Editor, *QST:*

As Chapter Chairman of the Faulkner County Chapter of the American Red Cross, I want to express our appreciation to . . . your members and their clerical assistants who used their radio equipment in the Arkansas disaster area. . . .

The people who suffered most were in the area of Bald Knob, Judsonia, and Searcy. I am sure that these people would like to join me in this expression of appreciation for the splendid coöperation your members gave during this emergency.

— *W. C. Ferguson, Chairman*

Memphis-Shelby County Chapter
American Red Cross

Editor, *QST:*

On behalf of the Memphis-Shelby County Chapter of The American National Red Cross, I want to thank the Memphis Amateur Radio Association and members of your League for their continuing help and coöperation. During the recent storm emergency in this area, the work of the Red Cross in disaster areas was greatly expedited by the amateur radio members. Medical and nursing staffs were quickly deployed to the stricken area and many welfare inquiries were answered because of the excellent work of those who are affiliated with your organization.

We are proud of the devotion to duty which the amateur operators of Memphis have shown on so many occasions, and we want you to know that we greatly appreciate the fine spirit of these men.

— *Leslie R. Boyd, Manager*

OBVIOUSLY

Johns Hopkins University
Baltimore, Maryland

Editor, *QST:*

I have followed Dr. Rapp's theoretical work for several years and must say that the profoundness of his latest theorem (page 24, April *QST*) is matched only by the lucidity of its presentation. It is a relief to observe that his latest proposal will complement, rather than overshadow, the Suppressed-Sideband Defunct-Carrier (s.s.d.c.) system which W3OVB and I developed last year.

In this, one simply runs the audio into a frequency compressor before modulation, and then expands the audio frequencies again after detection in the receiver. Thus a 'phone signal can be made to occupy a very narrow bandwidth.

Since frequency compression increases the power *density* in the sidebands, one can maintain the same communications efficiency by reducing the transmitter power *in exactly the same ratio* as the frequencies are compressed. In fact, the First Finagle Theorem shows that if bandwidth and power are reduced in the correct proportion until they are both *zero*, performance is just as good and may even improve a little. Obviously, once the adjustment is complete, operation is best carried out with all power supplies turned off, since the average power input is zero.

'Phone men who have tried this system report that not only is TVI reduced, but the life of the tubes is greatly prolonged.

— *P. R. Chagnon, W1RJN*

YOUR LEAGUE

23 Willow Hill Road
Clayton 24, Missouri

Editor, *QST:*

Your congratulatory folder and invitation to join ARRL arrived today. . . .

While your folder ably described the benefits ARRL offers hams I don't believe you stress sufficiently the fact that a member owes something more to the League than simply a membership. It seems to me that, like most everything else, one gets out of a friendship or membership in an organization just about what he is willing to put in it.

Thus, while we are granted the *right* to use the air through FCC licenses, our activities should be a combination of enjoyment *and usefulness.*

— *E. R. Hurd, jr., WØFBT*

2154 Woodward Ave.
Lakewood, Ohio

Editor, *QST:*

I would like to express my gratitude for the fine job the League did during the past year toward the upholding and betterment of amateur radio in general. I wonder if the rest of the fellows appreciate the fact that if it were not for the League's work over the 30 years of its existence, amateur radio as we know it today would not exist. An example of this type of work that was accomplished this year was the winning of the Wright and Lord cases. These indirect, or intangible, yet very real benefits for ham radio, accomplished by the League, are one of the most important reasons that I am continuing my membership.

— *Robert E. Bartlett, jr., W8FTD*

7-MC. TEEN-AGE NET

418-A Highland Ave.
Collingswood, N. J.

Editor, *QST:*

I have been in the ranks of amateur radio now for about a year and a half, and in that time I've begun to realize the importance of accurate and rapid communication, especially that of the various nets. With this in mind I would like to see organized a cross-country 40-meter net run by teen-age hams.

Although this net would be made up of teen-agers, I feel that it could prove to be of great value to all the members. Many like myself who are faced with military duty after graduating from high school or in the future would find this experience very helpful in attaining a higher position in our armed forces. It could also prove its worth in times of disaster which could strike any part of the country.

— *Les Hart, W2FUA*

Hints and Kinks For the Experimenter

REMOVING ACETATE COATING FROM ALUMINUM RECORDING DISCS

Most hams are familiar with the fact that aluminum-base transcription discs used in the broadcast field are a very convenient source of aluminum for use around the shack. They are also familiar with the fact that the acetate can be removed from the aluminum by soaking the disc in very hot water. Since 16-inch diameter containers for boiling the discs are not readily obtained, the following method is suggested:

Scrape off the coating all around the edge of the disc with a knife. Then place the disc in the oven for about five minutes. The acetate can then be removed by inserting a knife blade under the scraped edge and peeling it off. Caution: Do not walk away and forget that the disc is in the oven, because the acetate will burn quite readily if overheated. — *Lynn Stedham, W4HZT*

ANOTHER "MONITONE" MODIFICATION

Having a "Monitone," and needing a code-practice oscillator to school my two jr. ops for their Novice ticket, I came up with the idea shown in Fig. 1. It is passed along to others who may find it of interest as a means of adding another piece of equipment to the station without taking up more space on the operating desk.

By lifting the center-tap of the power transformer and inserting about 3300 ohms, a bias voltage is developed when current flows through the resistor. After filtering with the values shown in the diagram, about 6 volts d.c. bias is obtained. This is connected, through an open-circuit jack (insulated from the chassis), to the junction of R_8 and R_9 in the grid of the 6J5 in the Monitone.

This arrangement operates the relaxation oscillator very nicely through the full tone range. I have found it useful in adjusting my bug to my liking as well as for sending code practice. — *Charles E. Tamm, W1MIV*

TRANSFORMERLESS SUPPLY HINT

In circuits using a transformerless power supply it is often suggested, as a safety precaution, that a single lead be run from the "high" side of the equipment to the a.c. plug with the return circuit made by an external ground connection. About half of the time the plug is put in the wrong way, and nothing happens until it is reversed.

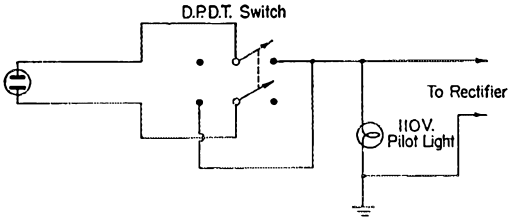


Fig. 2 — Handy way to get around the problem of polarization of a.c. input to transformerless power supplies.

This inconvenient condition may be eliminated by marking the polarity of the outlets to be used or, where this is impractical, using the circuit shown in Fig. 2. Note that the position of the switch that corresponds to "on" is determined by the way the plug is inserted in the outlet. — *Henry S. Burden, W4MRK*

CURING BACK-LASH IN THE BC-342

It is a simple matter to cure back-lash in the BC-342. This is done by tightening the screw which pushes against the end of the rotor shaft of the main tuning condenser. To get at this screw it is necessary to remove the shield cover which houses the oscillator circuit at the left end of the receiver. Remove the numerous machine screws which fasten the cover to the main chassis, tighten the screw, and the job is done. — *K. G. Bucklin, W2CDP*

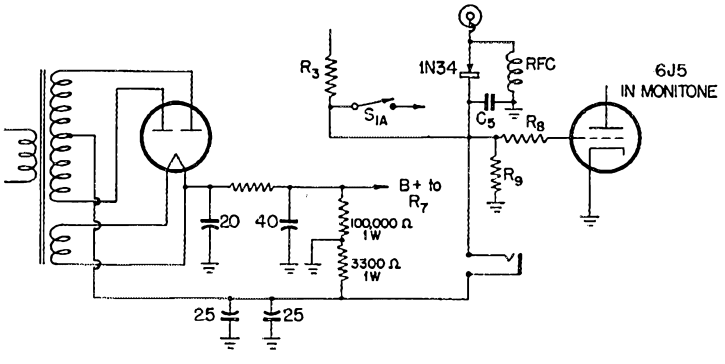


Fig. 1 — Still another modification of the famed "Monitone." This one converts it to a code-practice oscillator at low cost.

Operating News

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

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

All Set for Field Day, June 21st–22nd? Don't miss this annual top event in operating. Make it an exercise in emergency preparedness, as well! A number of clubs write that they are going to have opportunity for each operator, regardless of experience, to have a crack at the operating and logging to get experience and know-how. Some who stress the competitive side more are even arranging a second FD entry in the name of the club to specialize in such things, at the same time the multi-transmitter entry gets the cream of the planning and operational staff attention. The Novices along may operate at Set-up 2, of course, only at times when it is limited to crystal control, proper power level and Novice frequencies.

All clubs, we hope, will have members with car-mobile along. Each such can be encouraged to work at any time the operator is not on duty at the club's entry. Give each such mobile a try-out on the side. In reporting, whether near your FD gang or not, *name your club*. This makes another type entry crediting the club with an *aggregate-mobile score*. In whatever status operated afield, each group should remember to start the *one permitted* official message, for the points credit in that department of scoring and for a real test of the operator's *ability to move a message* and get proper QSL under field conditions.

See all the FD rules elsewhere in this issue. *Get on the air* on this Field Day week end. Have a part in this biggest of all organized operating activities.

Novice Frequencies and Net Operation. A transmitter that works 3.7–3.75 Mc. is of course highly recommended for the *first* transmitter (construction for other bands can come later). Keep this busy, swap QSLs, and make WAS (Worked All States) your aim and you are well on the way to your coveted General Class ticket while the QSLs are rolling in. FCC itself has now proposed some 7- and 21-Mc. privileges for the Novice, and by July should have the reactions of the ARRL Board of Directors and the fraternity at large in hand to be able to determine the course.

Our ARRL Net Directory includes several Novice Nets . . . and we hope to see many more. There is nothing like a net for learning snappy procedure, for efficient handling of traffic, for the pleasant associations of a fraternal radio group, working together on the air for common purposes and progress. (While nets are popular on "80" let us suggest formation of such on all the other Novice frequencies now in the list or to be set aside.)

Improving the Effectiveness of Novice Operation. WNØHFY-WØHFY writes to emphasize and add suggestions to those recently presented in this column. Let us quote his main points. "(1) Enjoyment in work in our band is impaired when you hear a fellow test unnecessarily or send unduly long CQs. (Example: CQ CQ CQ CQ CQ CQ CQ CQ CQ CQ CQ CQ, thrice repeated, DE WNØ —, sign with improper use of AR, then a long drawn-out K.) Excessive CQ calls and lengthy transmissions scare off replies! MAKE THE LENGTH OF THE CQ SUIT THE CONDITION OF THE BANDS. After five o'clock when the band crowds up, make any CQ short. You will thus be assured of an answer in many cases. (2) Testing on the air for long periods of time without break is a bad abuse and contrary to FCC proposed regulations to prevent such! Take proper time to adjust rigs *carefully* before testing on the air. (3) RCC members please *sign* RCC after their calls now and again to spread the *fraternity* of amateur radio. (The only way I got into the RCC was the list of WNs given in April *QST*.) (4) At night when 80 is crowded, get three or four other WNs in your

Larry Powell Goodman, WN4TIG, is the first to submit (while still a Novice) cards to ARRL Hq. confirming contacts with all 48 states. Every one of Larry's WAS contacts was made in the heavily-populated 80-meter Novice subband, which makes this "first" all the more notable. WN4TIG uses a home-built 807 rig running 60 watts input and an HQ-129X receiver. The antenna is a half-wave atop a 120-foot-high building.

area to go up to 11 meters and have a round table to get the code speed up. (A swell bunch of guys are in the Novice Net, net controls WØDYD and WNØGHX, 3743 kc. Meeting at 3 P.M. CST Saturday and Sunday, 5 P.M. CST Tuesday and Thursday, welcomes new members.)" Additional to WØHFY's comments: It definitely helps procedure and know-how about traffic to listen to some of the ARRL Section Nets, some of which are active the year 'round. Join a Novice net if possible. Aim to report in on other nets as soon as you are General Class and can go to those frequencies!

The Significance of 73; Its Proper Use. After the Civil War Andrew Carnegie administered both the telegraphs and the railroads. On his reaching the age of 73, the Order of Military Telegraphers gave him a testimonial dinner. It is said that from this the term 73 came into wider use as a symbol of good wishes. The 73 was in use many years before this dinner in '08, however. In 1859 the telegraph people held a convention, featuring a discussion on saving of "line time." In a code of figures running from 1 to 92 the symbol 73 was included to mean "My compliments or best regards." The expressions 30 (the end) and 4 (Where shall I go ahead?) from this list are still useful though most other symbols of the time are obsolescent. The book *Mathematics for the Millions* states that Pythagoras invested numbers and figures with moral qualities. Among the qualities given figures: 3 — potency, 7 — health, 8 — love. From this 73 conveys "strength and health" and 88 "love."

Since the correct definition of 73 is *best regards*, it is incorrect ever to combine a redundant *best* or 's with it, either when having your QSL cards printed or when you are on the air.

Mobile and Summer Operation. With the prospect of long summer days and post-FD work and vacations in mind, the mobile operating possibilities are more important than ever. *Regular activity* with portable and mobile equipment is the only way to be sure of being operational when the real test or emergency may develop. We suggest to one and all that *every mobile* be registered and have an up-to-date endorsed Official Mobile Unit identification from the local EC and an EMERGENCY RADIO UNIT card posted in the automobile or other vehicular installation to give amateur radio the utmost credit for what it can do at all times.

W1AW Summer Schedule. Note elsewhere in these columns the complete summer schedule of W1AW. The advent of Daylight Saving Time makes us follow last year's pattern with respect to operation in terms of EDST. For you fellows who stay on Standard Time, note that June 1st will mark the date for a change in one hour in copying things to which you are accustomed from W1AW, such as Official Bulletins at 8, 9, 11:30 and midnight and 9:30 P.M. Code Practice.

BCNU in the Field Day . . . don't forget it's June 21st-22nd! — *F.E.H.*

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 June 19th at 2130 EDST. Identical texts will be sent simultaneously by automatic transmitters. Frequencies of transmission from W1AW will be 1887, 3555, 7130, 14,100, 28,060, 52,000 and 146,000 kc. The next qualifying run *from W6OWP only* will be transmitted on June 6th at 2100 PST on 3590 and 7248 kc.

Any person may apply; neither ARRL membership nor an amateur license is required. Send copies of *all* qualifying runs to ARRL for grading, stating the call of the station you copied. If you qualify at one of the five speeds transmitted, 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. References to texts used on several of the transmissions are given below.

Date	Subject of Practice Test from April *QST*
June 3rd:	*The "Bandbox"* . . . , p. 11
June 5th:	*Automotive Radio Noise Elimination*, p. 17
June 10th:	*A V.H.F. Transmitter* . . . p. 26
June 13th:	*A Four-Purpose Communication-Receiver Auxiliary*, p. 33
June 16th:	*Evolution of a 75-Meter Tunable Whip*, p. 38
June 18th:	*A Compact Portable 2-Meter Emergency Station*, p. 41
June 24th:	*How a C.W. Traffic Net Operates*, p. 48
June 27th:	*Technical Topics*, p. 54
June 30th:	*Stretching the Junk Box*, p. 56

DX CENTURY CLUB AWARDS

HONOR ROLL

W1FH.....246	W6ENV....236	G6ZO.....230
W8HGW....241	W3CPV.....233	W3JTC.....229
W3BES.....241	W3GHD....233	W6GRL.....229
W6VFR.....238	W6AM.....233	W3EVW.....229
WØYXO.....238	W2BXA....231	W2QKS.....228
G2PL.....238	W3KT.....230	W6SN.....227

RADIOTELEPHONE

W1FH.....215	XE1AC.....210	W1JCX.....193
VQ4ERR....213	W8HGW....198	W2BXA.....190
PY2CK.....212	W9RBI.....195	W3LTU.....187
	W1NWO...194	

From March 15 to April 15, 1952, DXCC certificates and endorsements based on postwar contacts with 100-or-more countries have been issued to the amateurs listed below.

NEW MEMBERS

FA8IH.....174	EA3FL.....109	ZL2GH.....101
CN8MI.....136	F3FA.....107	W1GKJ.....101
KL7PI.....134	I1AEG.....106	DL3FM.....100
W5BZT.....118	SM5AQW...104	W7JUO.....100
W8JBI.....113	SM5AOI....103	FG7XA.....100
EK1AO.....111	HB9MQ....102	I1CJW.....100
	ZS2U.....102	

RADIOTELEPHONE

I1FLD.....110	VE3AUJ....102	W4NQN.....100
HB9ID.....109	W6PKI.....101	W3AM.....100

ENDORSEMENTS

W5ASG.....215	W3JYS.....151	W9AHP.....131
W3DKT.....200	W3CGS.....150	W7AYJ.....130
VO6EP.....190	G8GB.....142	LA5Q.....121
W8DMD....190	KZ5WZ.....141	W8EKK.....121
G3DO.....188	EA2CA.....141	W3LVF.....120
W6CYI.....176	WØCU.....141	W2BYP.....116
W4DKA.....171	VE2BV.....140	W6MUF.....112
W1QF.....153	ON4PA.....137	W4DPE.....110
ON4GU.....152	W7AH.....132	W9HQF.....110

RADIOTELEPHONE

W4HA.....161	EA2CQ.....134	W1HX.....130
F9HE.....150	ZS1DO.....133	CX4CS.....130
TI2TG.....142	G2MI.....133	W2VWN.....120
EA2CA.....140	G4ZU.....132	W8LJ.....110
VE3KF.....135	W1KJU.....132	

Each AREC group which conducts an emergency learns some lesson. It learns that pre-organization is a requisite even though the exact type, extent and duration of an emergency cannot always be foreseen. It learns that you cannot operate low-power rigs on 75 meters without experiencing QRM, that prior contact with civic and relief officials is needed, that personal traffic has to be held until all official traffic is cleared, and most of all that improvisations which are necessary in conducting emergency communication in a particular circumstance are most effective if arising out of basic preparedness patterns such as those which have been the doctrine of the AREC for many years.

The March and April emergencies experienced in the Middle West are certainly no exceptions to the above observation. Correction of faults and preparation for "next time" are the chief benefits we derive from our participation in emergency communication. As someone recently remarked, there has never yet been an emergency communications job which was conducted perfectly, and perhaps there never will be. But the ideal continues to be our objective, nevertheless. Each emergency group which is involved in a communications emergency would do very well to conduct a post-emergency critique to pinpoint their shortcomings and see that they are corrected — and let us know about these deliberations so that other emergency groups may benefit from the lessons you have learned.

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A tornado hit Fayetteville, Tenn., on Feb. 29th at 1630 CST, causing death, injuries and extensive damage. At 1830 W4AEE and W4AY got on 3980 kc. and found W4IWV trying to contact the disaster area, without success. W4NJE, W4RLD and W4SZE were asked to take emergency gear to Fayetteville. At the same time, SEC W4AEE advised W4SPN/M, W4SNZ/M and W4LJU/M to proceed from Nashville to Fayetteville via Lewisburg. These mobiles established contact between Fayetteville and Lewisburg at 2200. W4NJE at Lewisburg then worked into Nashville to W4PQP and W4MB on 10 meters. W4SQM and W4OGV/M from Alabama moved into the disaster area. The Murfreesboro group set up in Lincoln County Hospital, Fayetteville, and was operating by 2230.

Due to skip on 75, the following stations assisted in relays to Nashville: W4s CUK GL LNF, W5GG, W3BHR and W9DUA. W5GG stayed with us until 0215 March 1st, when emergency gear and mobiles were sent home. Wire communications were then handling essential communications by amateurs. Stations in Nashville known to have been active on 75 were assisted by W4s AEE IKG AY and AXD.

At 0700 March 1st W4AEE contacted W4MQV with the help of W8BXO/M who was passing through. W8BXO/M was given some Red Cross traffic and helped W4MQV get his station on the air, after which he continued on his way north. W4MQV was on the air all day March 1st, handling welfare messages.

The emergency was declared ended by the SEC on Sunday morning March 2nd when traffic was all cleared.

— *W4AEE, SEC Tennessee*

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On Saturday March 22nd a gale which whipped up 15-foot waves hit the shore at Crescent Beach on Lake Ontario with a force that did tremendous damage to property. The Red Cross was informed that further damage was imminent. We were instructed to get a radio car to investigate the situation. We reported at 2000 that 15-foot waves were covering the roads and flooding was taking place 1000 feet from the shoreline. By 2200 three mobiles were in action with VE3KM as control. Communication was perfect by 2330.

At 0230 the original group of three mobiles was replaced by three more who operated until the all clear was given at 1000 Sunday. Meanwhile Headquarters control was shifted to the Red Cross Society where we were handy to a six-line telephone board. Some 30-odd messages were handled along with 60 service messages. This emergency was our second one in two years. All hands said it was a real test of equipment and a lot was learned from the experience. Those who took part: mobiles VE3s AEI AQA BV DHQ JU QT XZ; controls VE3KM and VE3WE. — *VE3KM, SEC Ontario*

NATIONAL CALLING AND EMERGENCY FREQUENCIES

C. W.	*'PHONE*
7100 kc. (day)	3875 kc.
3550 kc. (night)	14,225 kc.
14,050 kc.	29,640 kc.
28,100 kc.	

During periods of communications emergency these channels will be monitored by stations of the National Emergency Net for personal-inquiry traffic. At other times, these frequencies can be used as general calling frequencies to expedite general traffic movement between amateur stations. Emergency traffic has precedence. After contact has been made the frequency should be *vacated immediately* to accommodate other callers.

The following are the National Calling and Emergency Frequencies for Canada: *c.w.* — 3535, 7050, 14,060; *'phone* — 3815, 14,160 kc., 28,250 kc.

Kings County (New York) EC W2BIV reports the following activity in connection with the plane crash in Queens, N. Y., on April 5th: W2DIR/M rushed to the scene of the accident and was passed through police lines by virtue of his civil defense emergency placard. In this position, he was able to be of material assistance to WNYC, whose mobile unit could not get close enough to the scene. WNYC wanted an eye-witness account for rebroadcast. After considerable moving about to find a favorable transmitting location, W2DIR/M gave his eye-witness account to W2OQK, who patched it to the studio to be recorded. This transmission was made at 1106 and the rebroadcast from WNYC at 1126. Other mobile units who were on the scene were W2s AOC JSV MYR and WDT.

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Thirteen SECs submitted monthly reports for February activities, an increase of *one* over January. Of these 13, five were from sections not reported in January, and four sections which reported January figures did not repeat in February. January reports showed an AREC membership of 1998 in those sections reporting; February reports showed 2215, a good increase but of course a very small part of the total membership. January reporters included Ark., B.C., Colo., E. Bay, E. Fla., Ga., L. A., Me., San D., Santa C., Sask. and Tenn. *New* reporters in February were Ala., Mont., Okla., W. N. Y., and Wis.

March reports on hand at this writing seem to show some new sections while most of the regular reporters are again on deck. Let's keep up that increase, gang.

♦

A civil defense get-together in Olympia, Wash., brought together Governor Arthur B. Langlie and these prominent amateurs. *L. to r.:* W7FWD (Asst. Director, Northwestern Division), W7BG (Vice Director, Northwestern Division), Governor Langlie, W7CZY (Wash. SCM), and W7BTV (SEC Wash.).

A.R.R.L. AFFILIATED-CLUB HONOR ROLL

In accordance with the League policy for a special recognition of all affiliated clubs whose *entire membership* consists of members of the League, it is a pleasure to present herewith the latest Honor Roll of such affiliated clubs. The listings of clubs with 100 per cent ARRL membership are all determined from information supplied in the 1952 affiliated-club questionnaire or Annual Information Survey. There will be an additional *QST* Honor Roll published somewhat later this year to take care of those clubs reporting results of ARRL membership drives being conducted currently. This can also include consideration of full reports from any affiliated societies whose questionnaires gave incomplete information as well as others who may qualify for the listing on completing their membership program.

Central Illinois Radio Club, Bloomington, Ill.
Connecticut Wireless Association, West Hartford, Conn.
Dan'l Boone Radio Club, Columbia, Mo.
The Enid Amateur Radio Club, Enid, Okla.
Fort Stanwix Amateur Radio Association, Rome, N. Y.
Fountain City Radio Club, Knoxville, Tenn.
Gallatin Amateur Radio Club, Belgrade, Montana
Kingsport Amateur Radio Club, Inc., Kingsport, Tenn.
The Lower Columbia Amateur Radio Assn., Longview, Wash.
Odessa Amateur Radio Club, Odessa, Texas
Oklahoma A. & M. College Amateur Radio Club, Stillwater, Okla.
Pioneer Radio Club, Fremont, Nebr.
Providence Radio Association, Inc., Providence, R. I.
Queen City Emergency Net, Cincinnati, Ohio
Reading Radio Club, Reading, Pa.
Ridgewood Amateur Radio Club, Westwood, N. J.
South Lyme Beer, Chowder and Propagation Society, West Hartford, Conn.
Suburban Radio Club, St. Louis, Mo.
Valley Radio Club of Eugene, Ore.
York Road Radio Club, Elkins Park (Phila.), Pa.

ELECTION RESULTS

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

Oklahoma	J. M. Langford, W5GVV	Feb. 15, 1952
Georgia	James P. Born, jr., W4ZD	Mar. 8, 1952
Connecticut	Roger C. Amundsen, W1HYF	April 15, 1952
Arizona	Albert Steinbrecher, W7LVR	April 15, 1952
Tennessee	Mark M. Bowelle, W4CXY	April 15, 1952
Alberta	Sydney T. Jones, VE6MJ	May 1, 1952
Louisiana	Robert E. Barr, W5GHF	May 31, 1952
Nevada	Ray T. Warner, W7JU	June 15, 1952
Virginia	H. Edgar Lindauer, W4FF	June 15, 1952
Eastern Massachusetts	Frank L. Baker, jr., W1ALP	June 15, 1952
Ontario	G. Eric Farquhar, VE3IA	June 15, 1952
Manitoba	A. W. Morley, VE4AM	June 15, 1952
Idaho	Alan K. Ross, W7IWU	June 17, 1952

ELECTION NOTICE

(To all ARRL members residing in the Sections listed below.)

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

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

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

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

The following nomination form is suggested: (Signers will please add city and street address to facilitate checking membership.)

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

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

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

You are urged to take the initiative and file petitions immediately. — *F. E. Handy, Communications Manager*

Section	*Closing Date*	*SCM*	*Present Term Ends*
New Hampshire	June 2, 1952	Norman A. Chapman	Aug. 15, 1952
West Indies	June 2, 1952	William Werner	Aug. 15, 1952
Arkansas	June 2, 1952	Dr. John L. Stockton	Aug. 16, 1952
Yukon *	June 16, 1952	W. R. Williamson	Mar. 17, 1949
San Francisco	June 16, 1952	R. F. Czeikowitz	Apr. 14, 1952
Montana	July 1, 1952	Edward G. Brown	Sept. 1, 1952
Santa Clara Valley	July 1, 1952	Roy I. Couzin	Sept. 5, 1952
Colorado	July 1, 1952	M. W. Mitchell	Sept. 15, 1952
Canal Zone	July 1, 1952	Everett R. Kimmel	Sept. 15, 1952
Alabama	July 1, 1952	Dr. Arthur W. Woods	(resigned as of 8-1-52)
Rhode Island	July 15, 1952	Roy B. Fuller	Oct. 1, 1952
Northern Texas	Aug. 1, 1952	William A. Green	Oct. 15, 1952
San Diego	Aug. 1, 1952	Mrs. Ellen White	Oct. 16, 1952
Maritime *	Aug. 1, 1952	Arthur M. Crowell	Oct. 16, 1952
Kansas	Aug. 15, 1952	Earl N. Johnston	Oct. 29, 1952
Sacramento Valley	Aug. 15, 1952	Ronald G. Martin	Nov. 1, 1952
Western Mass.	Sept. 2, 1952	Victor W. Paounoff	Nov. 10, 1952

* In Canadian Sections nominating petitions for Section Managers must be addressed to Canadian Director Alex Reid, 169 Logan Ave., St. Lambert, Quebec. To be valid such petitions must be filed with him on or before the closing dates named.

BRIEF

W2OOG/2 will operate as a 500-watt field station on the historic Battle of Monmouth battleground located between Freehold and Old Tennent, N. J., during the Annual Camporee of Monmouth Council Boy Scouts of America, June 6th through 8th. Members of Troop 71, Oakhurst, N. J., will assist in assembly of the station. These operating frequencies will be included: 14,280 kc., 'phone; 3916 kc., 'phone; 144 Mc., 'phone; and 3750 kc., c.w. Communication with Novice Class stations will be welcomed on the latter frequency. W2OOG/2 will also be interested in contacting other Scout stations throughout the world. All QSOs will be QSLd with specially prepared cards.

A.R.R.L. ACTIVITIES CALENDAR

June 6th: CP Qualifying Run — W6OWP
June 7th–8th: V.H.F. Contest
June 19th: CP Qualifying Run — W1AW
June 21st–22nd: ARRL Field Day
July 12th: CP Qualifying Run — W6OWP
July 18th: CP Qualifying Run — W1AW
July 19th–20th: CD QSO Party (c.w.)
July 26th–27th: CD QSO Party ('phone)
Aug. 3rd: CP Qualifying Run — W6OWP
Aug. 18th: CP Qualifying Run — W1AW
Sept. 5th: CP Qualifying Run — W6OWP
Sept. 10th: Frequency Measuring Test
Sept. 16th: CP Qualifying Run — W1AW
Sept. 20th–21st: V.H.F. Contest
Oct. 4th: CP Qualifying Run — W6OWP
Oct. 11th: Simulated Emergency Test
Oct. 15th: CP Qualifying Run — W1AW
Oct. 18th: CD QSO Party (c.w.)
Oct. 25th: CD QSO Party ('phone)

BRASS POUNDERS LEAGUE

Winners of BPL Certificates for March traffic:

Call	Orig.	Recd.	Rel.	Del.	Total
W6KYV	406	2606	626	1976	5614
W3CUL	271	2618	2250	352	5491
W6HQX	43	1078	1027	51	2199
W6HK	101	2126	1694	326	4247
KG6FAA	830	734	370	302	2236
KR6AF	289	2384	2144	257	5074
W9JUJ	32	866	812	14	1724
K4WAR	334	589	509	80	1512
K9FAE	40	636	557	75	1308
W1CRW	16	587	539	7	1149
W5QHI	189	341	504	20	1054
W6BAM	54	460	329	136	979
JA8AB	110	373	298	75	856
KG6ACQ	68	367	288	79	802
W7CZY	7	390	373	5	775
W8ZGT	5	354	350	4	713
K7AIR	58	373	230	29	690
W7IOQ	34	284	296	32	646
W9EBX	36	300	250	50	636
W4PJU	8	311	265	46	630
W6BPT	10	302	289	13	614
W2RUF	34	320	198	55	607
W3NHI	8	311	250	35	604
W2BO	45	250	230	45	570
KZ5AA	24	269	232	37	562
W2BTB	13	252	283	7	555
W6ELQ	5	269	250	10	534
WØSCA	1	261	254	7	523
W5ROZ	8	257	251	6	522
W9TT	22	238	215	46	521
W4SHJ	59	223	211	19	512
W5MN	23	242	194	48	507
WØKHQ	4	1	498	1	504
Late Reports					
W1CRW (Feb.)	9	609	593	11	1222
W1CRW (Jan.)	11	560	549	8	1128
KR6AF (Aug.)	467	624	475	149	1715
KR6AF (Sept.)	458	370	230	140	1198
KR6AF (Nov.)	387	1375	1206	148	3116
KR6AF (Dec.)	660	1242	1113	166	3181
KR6AF (Feb.)	487	978	790	188	443

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

W2OBU 336	W7BA 177	W3PZW 116
W6ESR/6 311	W6GJP 146	W5FOM 105
W9NZZ 207	W6NCP 127	KR6EM 102
W1AW 179	W8ARO 119	

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

TRAFFIC TOPICS

We continue to get complaints about traffic which is held up en route to its destination and, upon arriving, garbled almost beyond recognition. We ourselves have delivered some traffic with long whiskers, and have been duly embarrassed in so doing.

Traditionally, it has been the responsibility of every amateur who handles traffic to pass it along toward its destination or deliver it within 48 hours after receipt; but obviously if everybody held a message for 48 hours, and it went through as many as 10 relay stations, it would be a long time arriving at its destination. So let's get rid of that message *as soon as possible* after receipt, and not feel obliged to hold it for 48 hours. This aspect of traffic handling needs a little more emphasis, since traffic which is "slower than walking" brings loud, derisive hee-haws from our public.

On the matter of message garbling, this can be attributed only to slovenliness in operating, since no operator should QSL a message unless he is *absolutely certain* that he has received *every part* of it correctly. The receiving operator is the one at fault, since it is his responsibility to receive the message correctly, regardless of how poor the sending of the transmitting operator, or how bad the propagation conditions or QRM.

If we cannot assume this responsibility, then we should adopt some common-sense axioms recently suggested by W2COU and some of his cohorts, such as spelling out all numbers, repeating difficult or unusual words or phrases, increased and more widespread use of break-in operation, and use of the word "repeat" in the text of a message wherever omission or incorrect transmission of such a word would change the meaning, for example: "WE WILL NOT REPEAT NOT DO IT." It is easy to see what the omission of the word "not" would do to the meaning, or how copying it as "now" would similarly foul things up.

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In our March 1952 Emergency & Traffic Bulletin, now in the hands of practically all stations on our NCS mailing list, the statement was made that TLJ was the only Trunk Line in operation during 1951. This referred, of course, only to ARRL Trunk Lines and was not intended as a slight to other net organizations with the words "Trunk Line" in their name. A couple of TLAP members strongly objected to this statement, and with good reason!

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ARRL Trunk Line J will continue all summer, six nights per week, on 3565 kc. at 1945 CST. TLJ accepts traffic and will QSP in any direction via NTS or its own scheduled outlets here and overseas. TLJ is largely the same old gang, still doing business as usual. — *W9TT, Manager TLJ*

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National Traffic System. Further study of the possibilities in the Transcontinental Corps indicates that a maximum of some 60 different stations could participate in this NTS function, giving all possible division of all TCC functions among this number of amateurs. A bare minimum of four amateurs *could* perform all the TCC functions provided these four did it five nights a week and spent several hours each night. Judging by the applications coming in at this writing, we are going to wind up with plenty of vacancies, so if you are interested in performing long-haul traffic relay on a regular basis, even if only once per week, don't hesitate to get your application into Headquarters. Organization and operation will proceed under Headquarters management until a TCC Manager can be selected.

Applications are especially desired from operators who can operate at "odd" hours, such as between 0000 and 1900. Such operators were previously excluded from NTS participation because of their inability to operate between the hours of 1900 and 2400. In the Transcontinental Corps, we may very well have need of long-haul relays at odd hours.

March reports:

Net	Sessions	Traffic	High	Low	Average	Most Consistent
EAN	21	678	67	1	32.3	All
CAN	12	203	29	3	17	
(Feb.) [1]						
CAN [1]	6	62	20	8	10	
1RN	34 [2]	299	32	0	8.8	E. Mass.
2RN	42	315	23	0	7.5	JN
3RN	40	224	20	0	5.6	MDD
4RN	42	285	38	2	7	S. C.
RN5	36 [3]	369	26	4	10.3	Okla.
RN6	52	1461	75	3	28	
RN7	52	345	25	0	6	Wyo., Idaho
8RN	33	112	15	0	3.4	Mich.
9RN	27	519	67	1	19.2	Ill., Ind.
TEN	42	933	100	4	22.2	Kans., Ia. Minn.
TRN	38	63	9	0	1.7	Ont.
TLCN	21	226	27	0	10.7	
(Ia.)						
NYS	26	303	29	3	11.5	
(N. Y.)						
QIN	67	805	34	0	12	
(Ind.)						
QMN	52	352	22	0	6.7	
(Mich.)						

[1] Incomplete report.
[2] Out of 42 sessions held.
[3] Out of 44 sessions held.

If we had a March report from PAN, we would have that 100% we have been aiming at for quite a long time. Maybe next month.

Eastern Area Net: EAN was in session 18 hours, 43 minutes, with traffic moving at the rate of one message every 1.65 minutes. 2RN is tops in attendance for the first three months of 1952.

Central Area Net: WØHMM is Acting Manager of CAN.

We hope to be able to announce the identity of the new Manager next month.

Second Regional Net: The 1830 session improved in popularity. On Friday a special 1800 session for informal comment, suggestions, gripes, etc., will be conducted.

Fourth Regional Net: W4ANK is resigning as Net Manager effective as soon as a replacement can be found.

Fifth Regional Net: Certificates have been issued to W4s SON and SUF and W5s ASA STA TMB and TMC.

Sixth Regional Net: W6s EXH FMG GIW GJ GQY GYH IPW and PIV have been issued certificates.

Seventh Regional Net: W7s HKA LVU and PKX have received certificates.

Thirteenth Regional Net: TRN plans to operate three nights a week at 2100 EST during the summer. VE3ATR has performed an outstanding job.

W1AW SUMMER SCHEDULE

(June 1 through September 30, 1952)

(All times given are Eastern Daylight Saving Time)

*Operating-Visiting Hours:**

Monday through Friday: 1300–0100 (following day)

Saturday: 1900–0230 (Sunday)

Sunday: 1500–2230

* Exceptions: On week days from July 10th through August 12th the station will not be open until 1900, to provide for attendants' vacations. W1AW will be closed from 0100 July 4th to 1900 July 5th in observance of the Independence Day holiday. A mimeographed local map showing how to get from main highways (or from Hq. office) to W1AW will be sent to amateurs advising their intention to visit the station.

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

Frequencies:

C.W.: 1885, 3555, 7130, 14,100, 52,000, 146,000 kc.

'Phone: 1885, 3950, 14,280, 52,000, 146,000 kc.

Times:

Sunday through Friday, 2000 by c.w., 2100 by 'phone

Monday through Saturday, 2330 by 'phone, 2400 by c.w.

General Operation: Use the chart below for determining times and frequencies for W1AW general contact with any amateur. Note that since the schedule is organized in EDST, the operation between 0000 and 0100 each day will fall in the evening of the previous day in western time zones.

Code-Proficiency Program: Practice transmissions at 15, 20, 25, 30 and 35 w.p.m. on Monday, Wednesday and Friday, and at 5, 7½, 10 and 13 w.p.m. on Sunday, Tuesday, Thursday and Saturday are made on the above-listed frequencies. Code practice starts at 2130 each day. Approximately 10 minutes' practice is given at each speed. On June 19th, instead of the regular code practice, W1AW will transmit a certificate qualifying run. W6OWP will transmit a certificate qualifying run on June 6th.

MEET THE SCMs

Norman A. Chapman, W1JNC, who soon will complete his first term as SCM of New Hampshire, maintained an interest in amateur radio for many years before receiving his first license in 1935.

SCM Chapman is Assistant Director, participates in ARRL Sweepstakes and Field Day activities, is a member of the Concord Brasspounders and one of its past-presidents. He holds RCC and Code Proficiency certificates and two Public Service certificates, one for services performed during

the South Amboy, N. J., explosion in May, 1950, and the other for his work in the November, 1950, Northeastern hurricane.

Three transmitters are in use at W1JNC, a Collins 32V-2, a 6L6-807-p.p. HK-24 job, and p.p. T20s driven by a 6L6-807 exciter. A Stancor 203A is available for emergency use. The station receiver is a Collins 75A-1 and antennas are a 10-meter beam and an 80-meter folded dipole. Although most operation is conducted on 75 meters, 80, 40, 20, 15, 11, and 10 meters also are used.

Norm's favorite sport is football and when time permits he indulges in some skiing and fishing. He's employed as a salesman by Evans Radio.

BRIEF

In 1934 W1FPS received a QSL from W1GEY with the call W1CVK struck out. This year, eighteen years later, W1FPS received another card, this time confirming a W1CVK QSO with W1GEY crossed out. W1FPS wonders when this fellow's QSL stock is going to get in phase with his call signs!

W1AW GENERAL-CONTACT SCHEDULE

(In Effect June 1 to Sept. 28, 1952)

W1AW welcomes calls from *any* amateur station. Starting June 1st, W1AW will listen for calls in accordance with the following time-frequency chart.

Time (EDST)	*Sunday*	*Monday*	*Tuesday*	*Wednesday*	*Thursday*	*Friday*	*Saturday*
0000–0100[1]	.....	.....	3555	7130	3950	7130	3555[3]
1300–1400[2]	.....	21/28 Mc.	21/28 Mc.	21/28 Mc.	21/28 Mc.	21/28 Mc.	.....
1500–1600	.....	7130	14,100	7130	14,100	7130	.....
1600–1700	.....	14,280	7130	14,100	14,280	14,100	.....
1800–1900	.....	14,280	14,280	14,280	14,100	7130	.....
1900–1930	.....	3950	.....	3555	.....	14,280	.....
1930–2000	.....	14,100	.....	3555	.....	14,280	.....
2000–2030[1]	14,280	3555[3]	14,100	14,100	7130	14,100	.....
2030–2100	14,280	3555	14,100	14,100	7130	.....	.....
2100–2130[1]	146 Mc.	52 Mc.	146 Mc.	52 Mc.	52 Mc.	.....	.....
2230–2300	.....	.....	1885	.....	1885	.....	.....
2300–2330	.....	.....	3555	.....	3950	.....	.....
2330–2400[1]	.....	3950	3950	3950	3950	3950	.....

[1] Starting time is approximate. General-contact period on stated frequency begins immediately following transmission of Official Bulletin, on c.w. at 0000 and 2000, on 'phone at 2100 and 2330.

[2] Operation will be on 21,420 or 28,768 kc., whichever band shows the greatest activity.

[3] W1AW will listen for Novice Class licensees on 3700–3750 kc. before looking over the band for other contacts.

Station Activities

SCM — AEC — ORS — CP — SEC — OBS — TLS — OO — OES — A1 OPR — EC — DXCC — CLUBS — RM — OPS — RCC

> • **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, John H. DuBois, W3BXE — SEC: ISE. RMs: AXA, BIP. E. Pa. Net: 3610 kc. Excellent reports, in the form of bulletins and letters, were received from several club secretaries for March. The *Deleam News* (Delaware-Lehigh ARC of Easton) covers participation in the Easton Hobby show, emergency work during the recent Lehigh River rise, a trip to the Naval Armory, F.D. plans, and member activities. The Phil-Mont Mobile Club continues to turn out the *TVI Retreat.* CIM provides a 24-hour monitor for its calling frequency of 29,493.2 kc. The Car-Le RC (Lehighton) reports election of the following for 1952: UQL, pres.; OWP, vice-pres.; AIW, secy.-treas.; SEB, act. mgr. Abington Twp. ARA of Jenkintown checks into E. Pa. Net at 2000 EST Mondays and will be in 2-transmitter class on F.D. using RQY/3. The Lancaster Radio Transmitting Society, with the club call NMR, is closely tied in with local c.d. set-up and city officials were impressed with demonstrations in the recent Hobby Show, Boy Scout Hq. display, and current code classes. Members of the York AREC furnished c.d. and city officials with communications during the severe storm on April 5th and the YARC now has a 2.5-kw. generator for emergency use. York AREC operation is on 144.8 Mc. The Pottstown ARA has appointed IGF local TVI committee chairman, assisted by BIP, IGW, and MXU. Eight stations are reported active in a 2-meter net in the Scranton Area, meeting at 2100 Sundays. The Philadelphia Area Council of Radio Clubs is preparing to broadcast meeting results on all 'phone bands. A section net bulletin is being issued by BIP, covering traffic activities and present ORS status. Average attendance on E. Pa. Net was 10.4 for March and February and 10 for January. CUL expects to have a kw. on h.f. soon. EU has a new QTH: R.R. 2, Wapwallopen. UKI reports some 2-meter DX openings and QMO is working on twenty-element array to go after it. PSH has switched from radio-controlled boats to planes, this time on 6 meters. SNY expects to have 1-kw. 'phone/c.w. rig completed by summer. Field Day is coming up, fellows. All set? Traffic: W3CUL 5491, NHI 604, BIP 300, AD 135, LQV 59, PYF 48, AXA 46, VR 35, PDJ 33, QLZ 33, ADE 30, BFF 14, QEW 6, CAU 5, HA 5, BES 1, SNY 1.

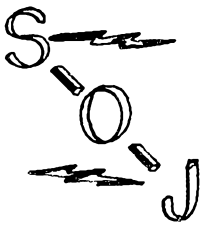
MARYLAND-DELAWARE-DISTRICT OF COLUMBIA — SCM, James W. John, W3OMN — On Mar. 17th Dr. W. B. Kouwenhaven spoke to the Baltimore Amateur Radio Club on "The Effects of Electricity on the Human Body" and on April 7th KDD was the speaker. An auction followed the regular meeting. The Chesapeake Amateur Radio Club showed two interesting movies at its March 18th meeting. OMN and FWP attended the meeting. On March 9th the CARC set up equipment at the Baltimore Co. C.D. Headquarters at Towson, Md. Operating under the call AFM/3 QSOs were held on 7, 14, 28, and 144 Mc. Dr. Kramer described "A Six Meter Field Trip to VP7-Land" to the Washington Radio Club on March 22nd. Movies were shown at the April 5th meeting. In March the Rock Creek Amateur Radio Assn. nominated and elected the following officers: RGX, pres.; OBR, sr. vice-pres.; FNU, jr. vice-pres.; PZK, treas.; RXK, secy.; AIR, GA, OMN, and PWB, executive committee. The Capitol Suburban Radio Club meeting was at NOL's on March 22nd and at KAN's on April 4th. Field Day plans were discussed. KCQ and TT resigned as directors of Maryland Emergency 'Phone Net, since both of them added /4 to their calls. The Washington Radio Club operated a station, CAB, at the American U. Science Show in March. CDQ has a new Viking transmitter and has been heard modulating it FB on 28 Mc. JHW is in his new QTH. The Delaware Amateur Radio Club transmits code practice on 3760 kc. at 6:15 P.M. for beginners and Novices. MCD is working out FB with 18 watts on 160-meter 'phone. LZM started MDD slow net (MDDS) on April 7th at 1830 EST on 3650 kc. Sessions are held each Mon., Wed., and Fri. Maximum speed is 13 w.p.m. The Washington Area held Civil Defense CPX on Mar. 22nd. Amateur radio facilities were available for the use of c.d. officials. ECL, ex-8ECL and 3NAM, is active on 3.5-, 7-, and 14-Mc. c.w. with 400 watts to an 813 final. Amateurs in the Washington Area are urged to refer their TVI complaints and problems to the Washington TVI Committee. Details are available from any of the area radio clubs or by calling OQF on Logan 3-7907. Traffic: W3PZW 418, LZM 289, QZC 119, COK 45, ONB 40, AKB 33, MCD 24, TT 22, FWR 18, CQS 8, LUL 2.

SOUTHERN NEW JERSEY — SCM, Lloyd L. Gainey, W2UCV — The Delaware Valley Radio Assn. held an election of officers at the March meeting and the following were elected: QOK, pres.; UAE, vice-pres.; ZI, secy.; C. Rebman, treas. An interesting c.d. drill was held in the State Mar. 25th with a test message originating on 80 meters and relayed to coöperating 10- and 2-meter nets. The coverage throughout this section was excellent, with 2 meters carrying the major load. The SJRA has formed a TVI committee, with QZG as chairman. Many club members have volunteered their services to the committee and the FCC has assured us of their full coöperation. It is hoped a committee of this type will be formed in the Vineland Area soon. FCV is the proud papa of a brand-new YL. YT set sail for the Mediterranean. The Hamilton Township Radio Assn. is going all out for the forthcoming Field Day. QTH will be the Coliseum Bldg. BQ received his Extra Class license and it is interesting to note that he holds license No. 4 in this area. Members of the Camden Co. 2-meter mobile emergency net participated in a large scale c.d. drill in West Chester, Pa. This was a good demonstration of amateur coöperation between sections. Somerset County amateurs are currently planning full-scale c.d. activities. ZI now is on 2 meters with an SCR-522. Traffic: W2ZVW 181, K2BG 130, W2RG 126, LTI 76, ZI 16, HAZ 8.

WESTERN NEW YORK — SCM, Edward G. Graf, W2SJV — SEC: UTH. RMs: RUF, COU. PAM: GSS. NYS, 3615 kc. 7 P.M.; NYSS, 3595 kc., 8 P.M.; NYS, 3980 kc., 6:30 P.M.; NYS C.D. 3970-3509.5 kc., Sunday 9 A.M. The Niagara Falls Club is planning for Field Day. American Airlines has supplied 125 of its ham operators with 5-color plastic QSL cards through the efforts of company officials and PXH and VQ. New officers of RAWNY are AYA, pres.; TKO, vice-pres.; GIH, rec. secy.; YZD, treas.; 1TGZ/2, corr. secy. 8KCM returned to the Buffalo Area. GVJ is on 7 Mc. 1DX, Assistant Technical Editor of *QST*, gave an illustrated talk on "Modulation Systems" at a meeting of the radio clubs in the Buffalo Area. UXP worked NLY on 144 Mc. for a New Jersey contact. UTH worked 1HDQ and 4AO on 144 Mc. for his 9th and 10th states. Zone 9 of NYS C.D. operates zone net on 2 meters. Officers elected by the Lockport Club are. FAN, pres.; YLT, vice-pres.; FXU, secy.; WN2ELS, treas. WLT, chief engineer at WWOL, calls attention to b.c. newscasts with a transmission in code of "QST please stand by for latest news." CWB and RJY are on 28 Mc. SOK and ZRC were heard playing chess on 2 meters. PPY has new 129X. ZUR is a new station on 2 meters in the Rochester Area. TEX reports that pennies are marked "In God we trust" for those who use them as fuses. K2BS has ham shack in a trailer because of his employment taking him to the Niagara Falls Area. WOW is active on 3.5 and 7 Mc. KBT meetings are devoted to Field Day. JEY is active in NEN with *QST'S* "Novice one-tuber" and has worked 20 states and 2 Canadian provinces with QRP rig. SNI is using Harvey-Wells, FLZ 2E26 final, and ZHV a 522 on 144 Mc. WN2ALL is experimenting with sixteen-element zig-zag array. The Niagara Mohawk Power Club was shown three technical movies by N. Bauman. The NMP Net of the Western Division had 12 stations participate in a drill Mar. 31st. UXP is working 420 Mc. 2RN is making an excellent showing under the managership of COU. The Wayne County Net meets Sunday on 3853 kc. at 8:30 A.M. WN2CJA is active in emergency and c.d. work. ZOL, BTB, and YLG visited ye SCM and others in the area. In the January issue of the *Cronical,* Harrison Radiator publication, a section was devoted to ham employees with pictures of them operating various stations and explaining amateur radio and its participation in c.d. and emergency work. Those pictured were DAA, FAN, ROA, and ZOC. W2IJR passed General Class exam and dropped the N in her call. BTB and RUF make BPL. Traffic: (Mar.) W2RUF 607, BTB 555, COU 199, NAI 197, ZOL 172, DJF 112, GSS 98, OE 47, SJV 41, K2DG 13, W2QAA 8, EMW 6. (Feb.) W2OE 53, PGT 13.

WESTERN PENNSYLVANIA — SCM, Ernest J. Hlinsky, W3KWL — Monthly activity reports for this section will be limited to those actually making reports either by club papers or individually. Those who fail to make reports direct to your SCM should not expect write-in on word-of-mouth reports. All official appointees are urged to check their certificates for annual endorsements. Up Emporium

(Continued on page 74)



Here's an unsolicited letter from W9LCG to W1CTW at National which we think will interest you.

9th April, 1952

FROM THE MILL OF W9LCG
RALPH CURTIS COLE
8157 HARPER AVENUE, CHICAGO 19

Dear Cal:

Just wanted to tell somebody, and decided you would be about as good as anyone! Hi! Anyway, you were the one with whom I discussed the Select-O-Ject, and my method of connecting it between the noise limiter and audio of my HRO-7.

Well, it has been so good that I just had to express my good wishes to National for bringing it out! And, then the other night I heard some more things about it, and it made me write to let you know how swell it is.

In my neighborhood, similar to yours (I often think of you aiming across the busy highway) the QRM caused from local troubles is all you need at times to wash out any QSO with ordinary means of inhaling signals! So, the Select-O-Ject has been a main factor in enabling me to work thru what otherwise would have cancelled the chat.

But, there is a new feature on the air now, these doggone electronic ionospheric disturbances! They raise cain on most of the bands, I guess, but on forty I have measured the noise level at 10 to 15 db over S9! (On the HRO, using 66 foot wire for antenna.) With the Select-O-Ject in cw position, you just do not hear this racket at all!

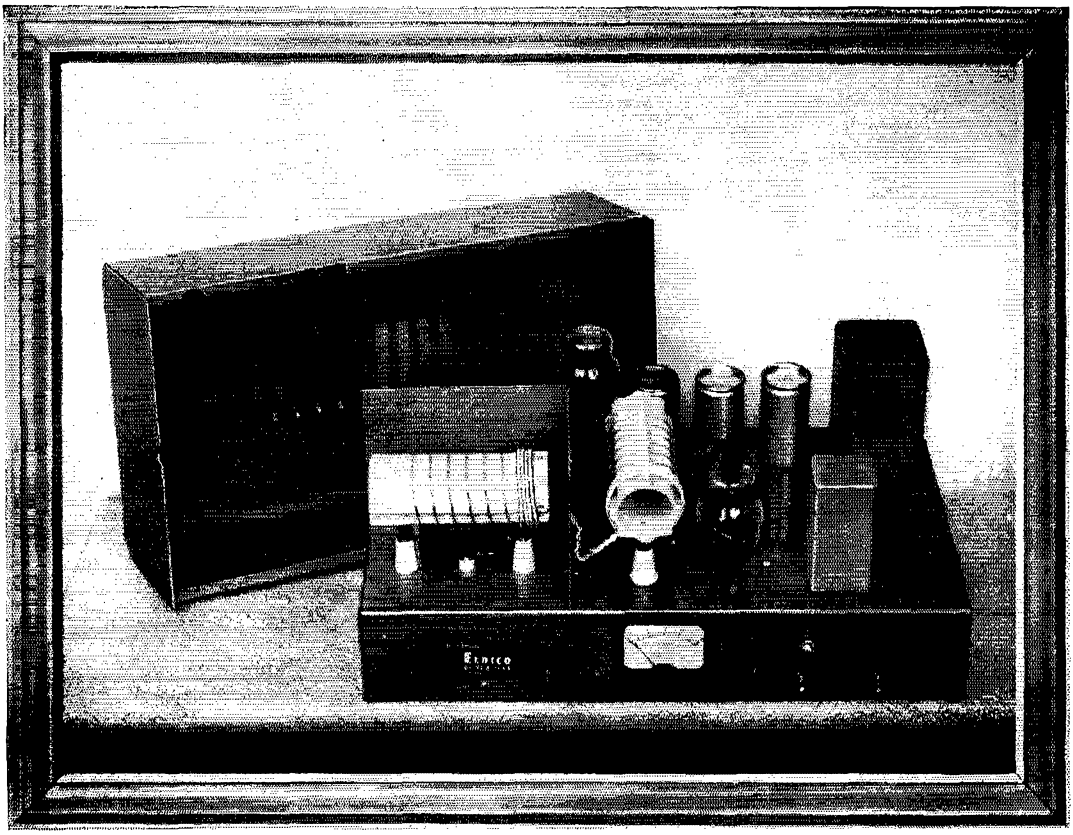
The other night, one of the old timers, W9JMG, who lives in Park Forest, arranged a sked for me with one of the novices there. JMG went over to the lad's house to show him how radio would perform, and found he had one of the NC-125's. I was working on 7290 kc and they were on 3748. Right on the dot, I started calling, and in a couple of minutes they came back to me, and we had a demonstration lasting over an hour and a half. However, here is the part I like: JMG told me that when they first turned on the receiver and listened to the 40 meter band, they were very disappointed, because the noise was S7, and at the distance, they knew I would not have a strong signal (about 25 miles — too close). Then he thought he would try the Select-O-Ject, and there I was! Without it, they couldn't even locate me. With it, I was R5. I have noticed this effect many times, the background drops dead, and the signal can be read with ease. I don't think many of the boys realize this. I know, at first, I listened for the increase in signal strength, and was disappointed. Then, when I switched back and forth, and noticed the effect of the Select-O-Ject, it was most startling.

I put a neon bulb across the input to the HRO and work my 814 at 150 watts input and hear my own signal just enough to monitor it nicely. (Also using the noise limiter at some freqs.)

So, that's the story. Just wanted to thank you again, there at National, for giving us receivers like the HRO and making gimmicks like the Select-O-Ject!

Very 73,
RALPH

TR-75's ARE 1 FOR 3



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In Eldico's own "tobacco survey", it was discovered that as many as one out of every three commercial transmitters being used by the Novice Hams is an Eldico TR-75. It is a simple test to run—get on a Novice Band and listen for the good signals —work them and you will find that many of the transmitters are TR-75's.

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★ ***We Offered Our Apology*** ★

★ . . . in the February QST advertisement because we could not deliver as many TR-75TV's as were ordered from our distributors. However, two shifts have been working on all Eldico products since that date, and we are pleased to announce that over 1,000 TR-75TV's are now being shipped to our distributors. Naturally this quantity will not meet the demands completely, but we have gone a long way, as per our promise, to boost production to the limit. We extend our thanks again for your patience, wish you happy operating with Eldico, but still offer this note of caution: ★

★ "We will do our best to supply the Eldico line of products, but they will be in limited supply for the Duration." ★

★ Don Merten, W2UOL ★

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

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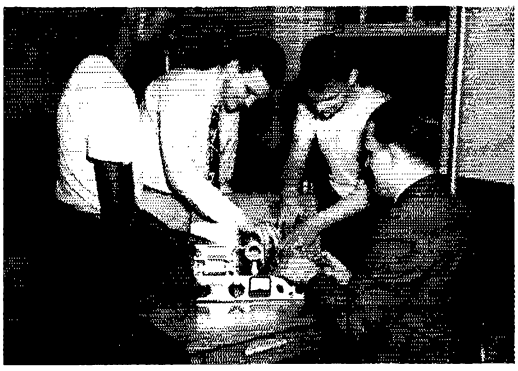

LIVING PROOF OF NOVICE COURSE SUCCESS

Living proof of the success of the Eldico's "Blind 'See' a Way to Ham Radio" program are: (left to right) Christopher Kiler, 16, of the Bronx, N. Y.; Leonard Reynolds, 15, Orangeburg, N. Y.; and Charles Wetmore, 15, Middletown, N. Y. Their instructor, famous Bob Gunderson, is shown with the students of the Eldico "Private Tutor" Novice Radio Course who passed their FCC Novice Examination on Thursday, April 10th, and are now awaiting their Novice Licenses. About 25 sightless men and women are studying under this Eldico plan which is available free to any blind person interested in amateur radio. See our April, 1952 QST advertisement or your distributor, or write direct to Eldico.

***ANYONE* CAN SEE** that the easy and fast way to learn ham radio is with the unique Eldico "Private Tutor" Novice Radio Course . . . the tested and proved method. Code records include five unbreakable long-playing 12" records, Columbia recording, giving a total course of instructions of almost five hours, or equal to fifty standard speed records. The six theory lessons, profusely illustrated, cover theory, rules and regulations, equipment operation, and on-the-air techniques. Includes step-by-step construction of a novice transmitter and test equipment.

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(*Continued from page 70*)

way, the *Bucktail Hamster* of the Bucktail Amateur Radio Club reports good progress on the club house. KUN keeps things humming with his traffic work. DNO is well established as a native of Emporium. Up Lake Shore way, QN reports for the Radio Assn. of Erie via newspaper clippings. Code classes are in full swing as a club project. PIY uses Sunday mornings for on-the-air code practice. KNQ keeps Erie on the traffic nets with his timely QNI into the W. Pa. Net. Down Pittsburgh way, the Steel City Amateur Radio Club sends in its regular publication. NKM, MPO, RXT, HIK, NRQ, and Jack Engel do a swell job on the club paper. New club members are RSL and Novice 3SVJ. RXT is organizing a high-frequency emergency weather net on 2 meters. Net Control is KWH. The time is Wednesday at 8 P.M. Stations active on v.h.f. are NKM, KWH, JAV, OVM, OJM, UHM, QYK, LSE, TIF, MON, and 8EP. WN3SDV is awaiting General Class ticket. We understand that the SCARC will give plenty of competition on Field Day. LAT, from Butler, says a new club called the Butler Amateur Radio Club has been organized with club rooms at the Deshon Veterans' Hospital. KZW is president. LXE, from Indiana, is waiting patiently for his Collins kw. rig. UVD, from Jeannette, reports a local net on 3510 kc. going strong, with UVD, TTN, APH, TVA, and UVK reporting. WN3SVY now is a member of RCC. The new EC for Mercer county is CJF, who is doing a swell job as NCS on the 2-meter Penn.-Ohio Net each night at 6:30. WN3SVE and WN3SXF do a wonderful job on 2 meters. Traffic: (Mar.) W3NCD 120, JSH 89, NUG 55, KUN 54, UHN 39, KWL 18, KNQ 2, MIZ 2. (Feb.) W3KNQ 4.

CENTRAL DIVISION

ILLINOIS — SCM, H. F. Lund, W9KQL — Section nets: IEN, 3940 kc.; ILN, 3515 kc. SEC: QLZ. Asst. SEC: HPG. RM: BUK. PAM: UQT. New Novice tickets were issued to RVE in Mt. Prospect; REP in Chicago; SBG, SBT, and SCA in Springfield. HNL, with his college degree safely in his pocket, has more time for hamming and is rebuilding his kw. rig. With a new Viking, WFS works a lot of 'phone, but his first love still is c.w. DX. 28-Mc. activity has improved up Chicago way since civil defense talks have been given at several clubs. Newcomers to the band include LQF, NLB, and JJG. The St. Clair Club uses 29.520 Mc. on Tuesday nights for a get-together. APX finished building his new house and has returned to the air with a 75A and 32V-2. BA reports no TVI from a Meissner 150-B with a 28-Mc. ground-plane vertical. GPN is mobile. DEC, 5CNQ, 5TQT, 6AUW, and 8FNP are attending communications school at Scott AFB. ICF has his 28-Mc. beam tied down with clothesline until after the tornado season; he's looking for an automatic dryer to keep the XYL happy. Welcome to the Whiteside VHF Radio Net as the newest ARRL affiliate in Illinois. 4CVO/9 now is 9RCG, 4PAS/9 has drawn 9AUL, while 4KYD/9 received 9RGN. KTI signs from Round Lake. UQT is chairman of the Illinois Radio Club Council, CVF is vice-chairman, and GOJ is secy.-treas. The Egyptian Amateur Radio Club has been reactivated and all hams in the southern counties are welcome. BJE or ESB can give you the details. RCG attended the IRE Show in N.Y.C. Upon his return he found he had an OTC certificate. TXN QSYed to 7228 kc. to get away from b.c. station. YIX meets many of his old friends on the party-line net on 147.5 Mc. The Midway Radio Club has been newly organized with headquarters at Zion. Officers are DOR, pres.; CLI, vice-pres.; QAB, secy.; NJE, treas. Traffic: K9FAE 1308, W9EBX 636, EHS 163, CSW 142, STZ 97, YIX 82, BUK 79, CEE 79, SXL 55, KQL 43, CTZ 36, LXJ 33, YTV 31, EAD 16, MRQ 13, NN 10, DOR 6, DUA 5, SKR 2.

INDIANA — SCM, Clifford C. McGuyer, W9DGA — If your county does not have an EC, make recommendations to the new SEC, J. H. Barnett, LZI, 20 Meridian Place, Indianapolis. HDB has kw. rig on 14-Mc. 'phone and c.w., and has 15 states confirmed on 144 Mc. RZS lost receiver, frequency meter, and most of his rig when his shack caught fire. The New Castle Amateur Radio Assn. is reorganizing. ZSC won a 75-A Collins receiver at the Dayton Hamvention. INU has new SX-71 receiver. OFD now works 80-meter c.w. IFN and WN9PVQ are in the armed forces. JRY works DX without TVI. LZP and RZS had fine averages in the last Frequency Measuring Test. REW and MYJ are building identical clamp-tube modulation rigs. KTX has BC-221 meter. The Indianapolis Radio Club toured the WFBM-TV studios. NH was heard in New Zealand on 160-meter c.w. KAS has 'phone WAC. New ARRL appointees include GSY as OES; KTX as OO; HGV as EC for Jackson County; MUR as EC for Wayne County; CWH as EC for Johnson County; FYM as ORS; and KAS as OPS. ZIB was 75- and 10-meter mobile and is building 2-meter mobile. JBQ reports RFN c.w. traffic for March as 125. WBA is a busy man in the evenings, working nets on 160, 10, and 75 meters. OMD is a doctor and works mobile en route to his patients. ZIB, JBQ, LZI, and TT helped out on traffic from the storm area in Arkansas. INU is a very active OO. FYM is a member of the Early Bird Transcon 'Phone Net. MUR is a member of MARS. KAS has 85 countries on 20-meter 'phone. BKJ reports IFN traffic in March was 179 and covered 44 cities. MYJ works 10-meter mobile. CWH has screen-modulated 807 on 75-meter 'phone. JFJ is building new TVI-proof rig. PAS has dropped the N from his call. YVS TVI-proofed his rig. VNV returned from Mexico in fine shape. BSZ has 7 students in his Novice class. CVO is going mobile on 50 Mc. KRJ has a new 75-meter 'phone rig. CWB has a new mike. Traffic: (Mar.) W9JUJ 1724, TT 521, NZZ 303, JBQ 230, TG 196, DGA 113, BKJ 110, KTX 102, HUV 89, WBA 74, FYM 51, DOK 39, PMT 38, FSA 35, VNV 32, FZW 30, QLW 30, CVN 26, KDV 19, BDP 18, ZIB 17, CWH 12, KAS 11, GSY 7, YVS 6, MUR 5, NH 5. (Feb.) W9JBQ 134, PMT 44, YB 41, FZW 31, KDV 18, ZIB 5, RZS 2.

WISCONSIN — SCM, Reno W. Goetsch, W9RQM — SEC: OVO. PAM: ESJ. RMs: IQW, CBE. C.w. net (WIN) 3625 kc., 7 P.M. daily; slow speed at 6:30 P.M. 'Phone net (BEN) 3950 kc., 6 P.M. daily. HDV worked LUQ on 144 Mc. for the first DX out of Green Bay. New Novices in Green Bay are WN9SAP, WN9RXN, and WN9RYW, the latter a YL. IZE is having PE-103 trouble with his mobile. The Dells Region Club elected JEK, pres.; C. Manteufel, vice-pres.; NFX, secy.-treas. NLA replaces JEK as EC. Their Emergency Corps is conducting tests from Baraboo Bluffs on 29,620 kc. with ground plane vertical antenna. After hearing all the 000 numbers in the DX Test, KXK has his mind set on a kw., too. The Neenah-Menasha Club elected RNZ, pres.; UPB, vice-pres.; HHC, secy.-treas. GJY is EC and ZVY is TVI committee chairman. HHC reports five new Novices there, one a YL, daughter of UPB. WVRA elected EWM, pres.; FZC, vice-pres.; IZE, secy.; GKO, treas.; and KJM, custodian. Club station NUW is Net Control for Emergency Corps drills on 29,620 kc. each Monday at 8 P.M. A demonstration of the mobile net was given the Rotary Club under the guidance of VHA, the EC. PFK registered within .0003 per cent in the February F.M.T. NLE now is at Little Chute. ERW now is NCS for WIN on Wednesday. Mancorad reports two Novices, WN9QNO and WN9RYN. 4RVP/9 now is GPC. Washington Jr. High School has its new call, DWR, with ZKB as trustee. CFP reports that the Racine Club will have 144-Mc. rig on during Field Day. FAN reports PYM is back on 144 Mc. SMP now is DL4TT and is looking for Wisconsin contacts. The BEN picnic is scheduled for July 20th. LEE, NYS, and EYN get together on 144 Mc. at 2030 daily. New appointments: PYM, TSW, and NLA as EC; ADM as OO; HDV as OPS; ERW as ORS; and CFP as OES. Appointment renewals: EWC, ELY, and SGG as EC; BVG, KZZ, and IHW as ORS; and IHW as OO. CGO/4, in Florida, is on 7 Mc. looking for contacts in Antigo-Wausau. Traffic: W9ERW 155, SFL 85, CBE 73, KXK 53, IFS 43, FXA 29, NEV 29, IQW 25, DR 14, RQM 13, CFT 9, IHW 7, IZE 4, SGG 4, OVO 3, SDK3.

DAKOTA DIVISION

NORTH DAKOTA — SCM, Everett E. Hill, WØVKP — The North Dakota Ham Picnic will be held in Mayville Park June 8th. The Fargo gang has made arrangements for a swell program with some excellent speakers. If you wish to arrive early somcone will be on hand to greet you from 10 A.M. on. Bring your own lunch; however coffee and ice cream will be served. So put the XYL and the kids in the car along with the mobile rig and head for Mayville. Prior to your attending the picnic give some thought to applying for an operating appointment. County EC, ORS, and OPS appointments will be made. Any local get-togethers should be brought to the attention of your SCM, who will try to attend. Everyone is urged to continue his net activities during the summer. In view of our civil defense needs we should expand our activities rather than slacken off. I will be seeing all of you at Mayville. Traffic: WØLHB 45, EXO 23, JVP 22.

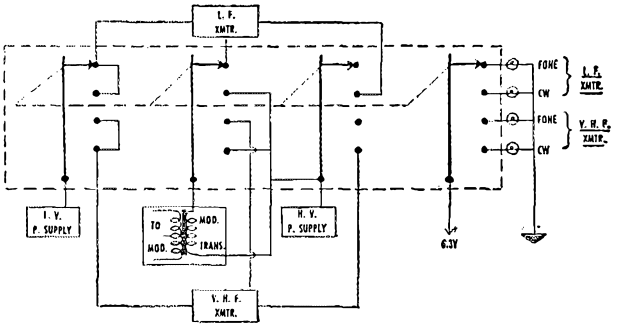
SOUTH DAKOTA — SCM, J. W. Sikorski, WØRRN — The Black Hills ARC's Annual Hobby Show was a huge success. More than 100 messages were handled. YQR has invested in an HRO-50T1. TOB has been reassigned his old call, BJH, and his XYL, ex-4TMG, now is WØIIL. LMB has graduated from a TBS to an 813. CSB is a new ORS and acts as NCS on the South Dakota Net once a week. CQI is converting a surplus GP-7. HWS is Assistant EC for Minnehaha County. BQG maintained daily schedules with members of SFARC during the flood at Trent. No reports have been received from members of the 75-meter 'phone net for two months and the 160-meter net for four months. BQS became the second mobile in Sioux Falls. GCP, SEC for Eastern South Dakota, is rebuilding the AREC and has a good start. Please help him out. Traffic: WØEHO 55, PHR 52, CSB 33, ZWL 26, GCP 11, RRN 4.

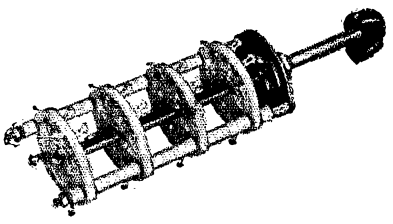
MINNESOTA — SCM, Charles M. Bove, WØMXC — The Mid-American and Dakota Division ARRL Amateur Radio Convention will be held Sept. 5th, 6th, and 7th at the Nicollet Hotel in Minneapolis. This will be the week following the State Fair. The convention committee is going to sell tickets on a time payment basis. If you want tickets on this plan drop a card to Joe Tomczyk, WØDBC, 3306 Aldrich Ave., No. Minneapolis. Advance tickets are $7.00 and tickets at the registration desk are $7.00. KOW is building a mobile rig for 75 meters. PDN is back on mobile using the new 5763 tube. BBV is flying jets over in Okinawa. WN9GHX, of Hector, and a bunch of Novices are starting a Novice net on 3743 kc. They meet Tues. and Thurs. at

(*Continued on page 76*)

MALLORY HAM BULLETIN

Switch Common Power to several RF Transmitters with Mallory "Hamband" Switches





Mallory #1600 Series Rotary Switches, better known as "Hamband" switches, were designed especially for coil switching in high frequency transmitter service. However, the heavy, wide-spaced contacts, high quality ceramic insulation, and positive indexing which make these switches so desirable for use in transmitter plate circuits, also, give them exceptional capability for many other switching functions.

For example, the diagram above shows how a #164C (4 section "Hamband" switch), connected as a circuit changer, permits operation of two separate RF chassis from common power supplies and a single modulator. VHF operators in particular, who operate separate rigs above and below 50 megacycles, will recognize the economy and convenience this arrangement adds to such a station. With contact carrying ability of several hundred milliamperes, and with 1000 volt insulation, this switch is entirely adequate for transmitter powers up to 100 watts.

The circuit shown was devised by a dyed-in-the-wool VHF man to permit the addition of a low frequency RF unit to his existing VHF transmitter, and still use only the common power supplies and single modulator shown. However, there is no reason why a dyed-in-the-wool *low frequency* man couldn't make the change the other way 'round, and let the #164C switch help him explore the possibilities of VHF operation with a minimum expenditure of funds for new gear.

When using the #164C for this application, the usual high voltage wiring precautions should be observed, even though the exact circuit arrangement may be modified to suit individual requirements. The one shown has the indicator-lamp circuit located adjacent to the panel, the low voltage supply next, then the high voltage, and last the modulator transformer shorting section for CW operation. The physical location of the switch in relation to the power supplies, modulator and RF chassis is not important, and may be placed for maximum convenience. The circuit shown has the switch located within the modulator housing. Separate input and output sockets for each piece of equipment are mounted at the rear of the modulator.

The convenience and efficiency added by this circuit has been reported by its user to be most satisfying. Why don't you investigate the money saving possibilities Mallory rotary switches offer? Your Mallory distributor will be glad to help you select the right one.

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5:00 P.M. and Sat. and Sun. at 3:00 P.M. We would like to build this net up so be sure to check in whether you have traffic or not. GHX is Net Control. IHN has been visiting JNC in the Cities. ATD is on the air with s.s.b.s.c. with 10 watts input. JRI is building a single-sidebander. EG has a new Viking transmitter and VFO. UVR, of Tower, worked 9GDD, of Superior, on 144 Mc. This is the first link between the Iron Range and the Twin Ports on 144 Mc. DQL has a new Lysco on all bands with an input of 40 watts. The chief of the CAA at the Wold Chamberlain Airport wishes to thank the boys on the net for handling airport condition reports and hopes that we can continue this service in the fall. CQZ is an instructor at St. Mary's College. WNØGDP now has his General Class license and HED received his Advanced Class license. WEF now is located at Cherry Point, N. C., at the Marine Air Corps station. IICKG, from Italy, is going to school in the Twin Cities. Don't forget to join the AREC. For information write BOL. Traffic: WØITQ 309, HEO 166, W2ZZA/Ø 94, WØUCV 84, AA 49, KNR 29, MXC 20, GGQ 15, FWN 14, TKX 14, BRA 13, CWB 13 DQL 13, TJA 13, RXL 7.

DELTA DIVISION

ARKANSAS — SCM, Dr. John L. Stockton, W5DRW — Biggest news this month is the activity by amateurs in the State in handling emergency traffic for the tornado areas. See complete write-up in a coming *QST*. A "well done" to all who participated. The University of Arkansas Radio Club has club station YM back on the air. The Ozark C.W. Traffic Net was reactivated the first of April, meeting on 3695 kc. at 8 P.M. CST. RYD enjoyed his first LO-NITE and also handled his first traffic which was related to the emergency in the State. LOK has moved from the State to a new job. PUN is in the armed forces. MU has 32V-3 and 75A-2 on from North Little Rock. TNM is EC for Fayetteville and has a good emergency plan. HPL and PZB are ECs for the City and County of Ft. Smith. Traffic: W5RWJ 325, EA 65, AQF 33, DRW 27, LUX 19, RYD 13, MRD 12.

LOUISIANA — SCM, Robert E. Barr, W5GHF — SEC: IUG, PAM: CEW, RM: NG. Effective May 1st, USN sends ARRL Official Bulletins as follows: Mon. through Fri., 1230 CST, 7100 kc.; Fri. through Mon., 1930 CST, 3750 and 7100 kc.; speed 15 w.p.m. USN has new Bogen BC-610F made exclusively for the ham bands. SPZ is the chief operator at USN and has a full kw. rig at home, with 3-kw. emergency generator. E. B. Hazelwood, IUG, Route 1, Baton Rouge, now is the Section Emergency Coördinator. Applicants for EC appointments should contact IUG. He also will appreciate your ideas toward a better state organization. FYZ is Emergency Coördinator for Minden and vicinity. FMO now is an Official Observer, Class I, and will gladly measure your frequency in his spare time. Hats off to the Alexandria fellows for an excellent meeting in their city Mar. 30th. Several officials of ARRL and MARS were present and plans were formulated for state-wide emergency services under the new SEC. TEB (Mrs. FYZ) holds down the MARS skeds while Ernie is away from home. FYZ is one of the latest OPS and OBS appointees. AOO/BV now is permanently located in Abbeville under call AOO. WN5TRQ graduated from the Novice ranks to W5TRQ and is active on 40-meter c.w. with 10 watts to an 807. TRQ is one of the products of CNG's code skeds last summer. UZA, Springhill, is moving into the low-frequency c.w. bands after several years on 28 Mc. as 2GRY. GXO lost his father recently. KRX is new ORS in Cinclare. Traffic: W5NG 276, MWE 237.

MISSISSIPPI — SCM, Norman B. Feehan, W5JHS — SEC LPL reports the following new ECs: BRQ, CUU, KHB, and OSN. WN9QXB/5 is WAF at Keesler AFB. WN5VEA is new Novice in Gulfport. A beam-raising party was held at SMD's house with the following present: TUO, QQZ, QPZ, FZK, UOO, TBI, SCE, JHS, 4LAT/5, 9OQE/5, WN5TNO, and Dick Schep from the Hague. The Pascagoula Radio Club held a week-end Field Day and picnic with plenty of good sea food. Emergency rigs were tried out on 10, 40, and 75 meters. Those participating were SZG, WA, RWN, SGJ, UHU, SRD, QNS, and LBY, as well as quite a few WNs who were awaiting their calls. Word was received from RMC, who writes he is in Korea with RUT and JFE. When JFE said goodbye to RMC at Keesler he did not expect to find himself greeting him again when he arrived over there. Since this letter was received we are sorry to learn that JFE has been wounded and now is back in the States. Traffic: W5WZ 193, JHS 92, RIM 62.

TENNESSEE — SCM, D. G. Stewart, W4AFI — Again in March during the tornado which struck West Tennessee and other areas, Tennessee amateurs came through with an excellent performance in true tradition of the fraternity. Thanks, fellows, for such splendid, willing, and coöperative service. The two recent disasters reflect advance planning and emergency organization. All are urged to keep their emergency gear in trim and register with AREC. The Kingsport Amateur Radio Club operated TRC at the local Hobby Show and accepted overseas traffic for clearance via MARS. The Fountain City Club was host to FCC Engineer Hudson, who talked on the aspects of TVI in fringe areas. PML and WN4UWK are a father and son team. Congrats to NJE's XYL, now WN4VJX, on 3737 kc. OGG is back with us at Sewart AFB. RLF is covering all bands with a new 32V-3. FLW is running skeds on 50 Mc. with JAG and is installing mobile rig in new auto. SZI has a new HRO-50T1 box. ATW, an old-timer, can be heard regularly around 3635 kc. CXY week-ends on Watts Bar with portable gear and plenty of worms. APC has top traffic total for the section this month. LUH completed his move to a new home next door and has a super de luxe ham shack. AFI is attempting conversion of SCR-522, so watch out 144 Mc. Traffic: (Mar.) W4APC 409, AGC 395, CXY 256, AEE 138, IIB 95, BAQ 79, ODR 72, K4FAY 46, W4RMJ 24, PMR 20, NJE 18, AFI 13, FLW 11, RHO 8, SZI 8, NDC 4. (Feb.) W4NJE 10.

GREAT LAKES DIVISION

KENTUCKY — SCM, I. W. Lyle, jr., W4KKG — RRU is a new OBS. BXU has taken a night job so will be missed on the KYN. SFD meets with the 89 Club. TAV handles lots of traffic and looks for DX also. BDN has joined AREC. TRQ is a regular on KYN, likewise KTA. MWX is busy with RM duties. SZL is operating 7 Mc. and says VKC is a new ham at Cave City. CDA says all of us should originate more messages for the nets. VP, CNE, SHD, MDB, OXT, TFK, and KKG attended the Dayton Hamvention. SMU now is a member of MARS. VKZ is a new ham in Covington. MRT works all bands and is quite regular on KYB. WBG gets around the land! BAZ is devoting most of his time to AREC. MWR ran up a nice traffic score on KYB. Do you need a correct frequency check? Call JUI. He can make it. TZT has joined AREC. New ORS: JDU, NBS, KTA, OGP, and CNE. New OPS: MVL, MWR, MRT, NEP, NGN, RFI, RRU. NBY is new PAM for Kentucky. MGT has a new electronic keyer. He probably burned up the old one handling so much traffic. Hi. It's vacation time now, gang, so guess I'll go fishing. See you next month. Traffic: W4TAV 397, MGT 331, WBG 212, MWX 121, BAZ 93, KKG 87, MWR 62, BXU 27, KTA 27, TRQ 21, VP 14, MRT 13, CDA 11, SMU 10, SZL 2.

MICHIGAN — SCM, Norman C. MacPhail, W8DLZ — Asst. SCM (c.w.) J. R. Beljan, 8SCW. Asst. SCM ('phone) R. B. Cooper, 8AQA. SEC: GJH. RMs: ELW, UKV, YKC. PAM: UTH. New appointments: OBS to AHV; ORS to RTN; EC to FCP (Kent County) and GEH (Ottawa County); OES to OWK. New officers of the Huron Valley Amateur Radio Assn. are JYJ, pres.; ZGS, vice-pres.; AQK, secy.; CSG, treas. The Great Lakes Emergency Net meets on 1880 kc. at 1930 EST Tues., Thurs., and Sat. Section net certificates for QMN have been issued to HKT, NOH, RTN, URM, and YKC. FBV sends a clipping telling of the Blossomland Amateur Radio Association's plans to use 5 mobile units in the forthcoming blossom festival in Benton Harbor and St. Joseph. RJC reports overseas traffic hard hit by propagation conditions. ILP and the Edison Radio Club of Detroit are mighty pleased with the new trailer the club bought for its emergency generator. DQL is running 5 watts on QMN! QIX has a new rig with an 812A final. FX reports many Detroit Amateur Radio Assn. members are going through the OCD classes for c.d. AHV has his TVI licked with a pair of 250THs on 28 Mc. EXZ made WAC on 7 Mc. GLS has a new QTH, 17543 Ramsgate, Birmingham, Mich. Would appreciate some letters with news items about club activities and members from club secretaries. The Grand Rapids gang is busy making plans for Field Day. HKT is back on the air after a two-week tour of duty at Norfolk, Va. Michigan traffic men are tipping their hats to ZGT, Lillian, who made BPL for the second consecutive month. RXY reports c.d. drills in Lansing on 29,610 kc. every Thursday at 7 P.M. Both Lansing and Grand Rapids have organized TVI committees with BMH chairman in Lansing and IV in Grand Rapids. AXP has a new QTH in the country, and reports his new crop of antennas is coming along fine. CTC is heading for a two-week rest in Florida. Traffic: (Mar.) W8ZGT 713, RJC 382, ELW 249, QBO 165, SCW 107, DAP 103, WXO 96, RTN 86, IV 83, YKC 80, JYJ 76, URM 73, DLZ 65, ZLK 64, ILP 50, DQL 44, FBV 39, AQA 37, COW 35, SPF 30, THG 29, LR 25, ACW 21, WVL 18, QIX 17, EGI 12, FX 11, AHV 9, GJB 8, TBP 8, EEF 7, KBI 7, LLD 7, ENX 6, SWF 6, EXZ 4, SJF 2, WN8JPC 1. (Feb.) W8ELW 144, RTN 96, YKC 82, UKV 21, FFG 17, NQ 7, TBP 6, YMO 6.

OHIO — SCM, John E. Siringer, W8AJW — Asst. SCMs: C. D. Hall, 8PUN, and J. Erickson, 8DAE. SEC: UPB. PAM: PUN. RMs: DAE and PMJ. ARO is the only one in this section making the BPL this month. New appointees are ARO as ORS, UEY as OES, and TLW as OPS. UPB needs ECs in the following counties: Williams, Fulton, Henry, Defiance, Paulding, Wyandot, Mercer, Preble, Adams, Madison, Logan, Erie, Huron, Lake, Ashland, Holmes, Wayne, Coshocton, Tuscarawas, Knox, Licking, Hocking, Vinton, Jackson, Monroe, and Gallia. UPB further states that he will be on 7250 kc. from 3:00 to 4:00 P.M. June 22nd to accept any traffic for the SCM or SEC from Field Day stations. The Dayton Hamvention was a great success with about 850 attending, among them 2IOP. By Goodman from Headquarters, and Phil "TVI" Rand. Emery Lee and Ed Heiser, FCC Examiners, gave tests to 237 people at the Hamvention, a record-breaking exam and

(*Continued on page 78*)

the first time license exams were given in Dayton. On the following night By and Phil addressed a group of 150 people in Cleveland at the WHK studios. ZJM put in 50 hours during the DX Test. PNJ worked VP5BP for his 79th country. DMJ has new Eimac mobile rig. The first Dog House Net picnic is scheduled for May 4th at Serpent Mound State Park. Six squelch-type receivers are continuously monitoring 29,560 kc. and one on 29,640 kc. in the Akron Area. On May 3rd the BSWRA is holding its Silver Anniversary celebration. In November the CWA will celebrate its 30th anniversary and its 25th since becoming incorporated. FNX is back on the key on 3.5 Mc. Active Ohio stations in 8RN are IB, SG, DAE, YCP, FYO, RLR, and LJH. FEZ is Asst. EC in Lorain County. HOM has picked up a new HQ-129X. On Mar. 29th the CACARC held a 10-meter ground-wave contest. We wish to welcome the Tiffin Amateur Radio Club as an ARRL Affiliated Club. According to *Carascope*, HAM and his XYL, HPO, have moved to California. Latest report on Ohio auto tags is that they will be issued in 1953. If your QTH and call letters were correct in the Summer 1951 *Callbook* you will receive an application from the Bureau this coming fall. Return same by Dec. 31, 1952. If you have moved since the publication of the aforementioned *Callbook*, forward this information to the CARA, Box 1073, Columbus 16, Ohio. The CARA will properly route all changes. Officials of the Canton Club are EAR, pres.; TND, vice-pres.; and EKL, secy.-treas. New officers at Toledo are BGU, pres.; IZQ, vice-pres.; YGR, corr. secy.; GEN, rec. secy.; and CRA, treas. The TRC gang did a swell job during the scare which followed the rupturing of a 24-inch gas main north of the city. The Toledo gals have come up with another FB recipe. This time it's raisin cookies. The Springfield *Q-5* informs us that its 3rd contest is now in progress, new members are HBJ, IFC, JY, and GIQ, and five new WN calls have been issued in the area. In conclusion, it might be said that reports are coming in somewhat better. Let's get away from the double traffic list by mailing reports during the first three days of the month. Traffic: (Mar.) W8ARO 299, FYO 271, UPB 133, DAE 91, YCP 60, PMJ 51, YGR 33, AL 30, DMJ 20, GZ 12, BEW 11, QIE 10, PUN 9, AJW 8, BFH 7, ET 5, LCY 5, DZO 3, FJX 1. (Feb.) W8UPB 137, GAV 33, PUN 9.

HUDSON DIVISION

EASTERN NEW YORK — SCM, Stephen J. Neason W2ILI — RMs: TYC, KBT. PAMs: IJG, JQI. BM has received his Extra Class license. GXO is a new ham in Leeds; he operates on 1.8-Mc. 'phone. WN2EWO now is General Class and is active on 1.8-Mc. 'phone; also c.w. on other bands. NRD is working nice DX using a Signal Shifter with fifteen watts input, he needs Africa for WAC. WNs KHQ, IJM, JKJ, and LBC are new members of the Rip Van Winkle Club. NYS meets on 3615 kc. at 7 P.M.: NYSS on 3595 kc. at 8 P.M. daily. Please note time change of NYSS. Byron Goodman, 1DX, was the guest speaker at AARA. GTI was named "Man of the Year" by insurance men and also by the Junior Chamber of Commerce. KLZ is working on 144 and 420 Mc. YXE has returned from a vacation in Florida and is working hard on AREC. WIK is on 144 Mc. SUL, EC for Albany County, is putting out a news bulletin for his AREC gang. GTG reports that the Schenectady Novice boys have started a net. It operates Thursday at 7:30 P.M. and Sunday at 1 P.M. The frequency is 3735 kc. If you are interested, please drop a card to GTC or the SCM. The AARA will sponsor the Hudson Division Convention. It will be held in Albany sometime in October. JQI now is mobile and has a new Bandmaster in the gas buggy. BRS, EC for Rotterdam, reports the AREC gang working hard on the new equipment for 50 Mc.; the rigs are coming along fine. EFU finds conditions bad on 7 Mc. Appointments: WIK as EC. Endorsements: SUL as EC, YIA as EC, ILI as OO, ANB as OPS, PHO and WBH as ORS. DMC, the Crystal Radio Club, Valley Cottage, held a very enjoyable 21st anniversary dinner at Congers, New York, Mar. 22nd. The Club was founded in 1931 and now has 21 very active members, principally on 7 and 28 Mc. Traffic: (Mar.) W2TYC 176, LRW 151, ILI 58, EFU 54, PHO 44, VP 19. (Feb.) W2LRW 131, GTC 24.

NEW YORK CITY AND LONG ISLAND — SCM, George V. Cooke, jr., W2OBU — Asst. SCM, Harry Dannals, 2TUK. SEC: SYW. RM: TUK. PAM: YBT. The YL Radio League of L.I. and the Nassau Radio Club conducted an open forum for television reception education at which 1200 hams and friends listened to outstanding speakers and actual demonstrations of TVI elimination was given. This, in combination with the TVI Organization of N.Y., should go a long way to help clear up the situation here. The FLIRC meets on a newly-formed net at 1130 Sundays on 147.6 Mc. weekly and is pushing a plan for member clubs to form TVI committees. With intensified c.d. drill with public participation our AREC/c.d. nets are increasing membership tremendously. All ECs are instructed to send the SCM Form 5 so a full accounting can be made on a monthly basis. Many clubs are stepping up Field Day plans and your SCM will be at W1AA/2, at Amityville, to receive your Field Day messages for those extra points. The NLI Traffic Net will shorten schedues for the summer by

(Continued on page 80)

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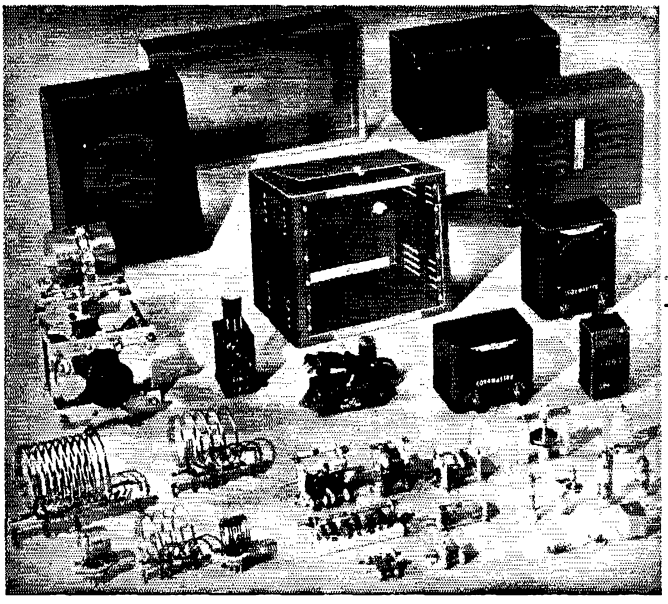

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operating on 3630 kc. Mon., Wed., and Fri. until mid-September, when full 5-night operations will resume. Net time will be 1930 DST. The NYC-LI 75-Meter 'Phone Net boasts 20 members and has a working arrangement with New Jersey, Connecticut, Pennsylvania, and New York State nets, operating on 3910 kc. at 1000 Sundays. 7DTC, ex-2UTB, now is on 14 Mc. and looking for the old gang. OZA, OKX, DKH, QPQ, MWB, and AOD are the local gang on 420 Mc. and having loads of fun. Let's see more of the gang up there. PAA has a new sixteen-element beam on 420 Mc. and works steady skeds with GNB (9 miles), JND (12 miles), SMY, and PTO, and is looking for contact with VRE, in Rye, HG, DOC, DNT, DGF, and 1PBB. Newest members of the Mid-Island Club are STG, HBF, and DYP. The Club increased membership to 40 and has formed its TVI committee. JZX is conducting code practice at 1100 Mon., Tues., and Thurs. and on Tues. and Wed. at 1800 on 3805 kc. EEY upped power to 130 watts and is increasing his traffic score. VNJ visited W6-Land for a vacation and contracted chicken pox. DIC, maintaining 5 net schedules, has received OBS appointment for distribution of Official Bulletins. KDC, ex-SCM of the section, is operating a new Viking polishing up on c.w. and has received OO, Class III, appointment. PF received Extra Class license as Dave was first licensed back in 1917. WDP completed 200-watt rig on 144 Mc. and is making excellent station records. MZB is back from Korea and is active again on 3.5 Mc. The Kings County AREC bulletin, *The Silent Watch*, is an outstanding publication and credit goes to BIV, Brooklyn EC, QGK, and EZJ for their part in its printing and contents. A mass migration is on, FI's new QTH is Wantagn, WN2KFV has gone to Malverne, and TUK has moved to Bethpage. These members of the Nassau Club report 5 transmitters will be operated at Garden City on Field Day. IPX has been called to active duty with the Navy. MHE now is living in Pleasant Valley, N.Y., and says he will represent Eastern New York in all CD Partics. The New York Radio Club increased its membership by adding AVA, GAW, LNF, and MMU to its roster. DZK has been appointed ORS. AAG received OES appointment. CXG is back on the air after a long spell of inoperation. UCB, while recuperating from a very serious operation, can be heard on 20 and 75 meters. Let's see how many LOs we can work in the section next month and make for some hot competition in the July CD Party. Traffic: (Mar.) W2BO 570, OBU 462, LPJ 254, EC 166, VNJ 147, GP 77, OJX 73, JBQ 68, JZX 55, VL 48, DZK 39, BGO 34, OUT 33, TUK 24, PF 19, DIC 18, LRI 18, YBT 18, CLG 11, IN 11, QOW 6, KDC 5, BQP 4, EEY 4, DLP 1. (Feb.) W2JBQ 106, PZE 42, KYN 40.

NORTHERN NEW JERSEY — SCM, Thomas J. Ryan, Jr., W2NKD — SEC: VQR. RM: CGG. PAM: CCS. Civil Defense 'Phone Net meets Sun. at 0930 on 3993 kc. Civil Defense C.W. Net meets Tues. at 1930 on 3505.5 kc. RG is NCS of the c.w. net. Are you familiar with the station that represents your area? Prior to a real emergency you should know his call, location, and how to get in touch with him, particularly if commercial phone lines are out. Find out the location of your area's c.d. headquarters and know a route using secondary roads for travel during an emergency. If you have ANY questions about amateur radio in civil defense, get in touch with VQR. His name is Lloyd Manamon. He lives at 410½ Fifth Ave., Asbury Park, and his phone is Asbury Park 1-0649J. He will welcome your inquiries. Now for news from around the section. CCU reported the Hasbrouck Heights c.d. station in the local high school now is on 144 Mc., as well as being NCS on the 29,510-kc. net. All radio personnel have been trained to take over the operating position and run the nets. The Westwood c.d. station in the Municipal Bldg. uses a Harvey-Wells and a Super-Pro. JKH switched to c.w. during the DX Contest and liked it so much he's sticking on it. QQF is the new secretary of the Tri-County Radio Assn. Joe Wilson gave the Garden State Club an illustrated talk on Russian communication equipment. VYB, in the Navy, now is on from Key West, Fla., using 4OVP. WN2BVK is the newest licensee we heard from in Nutley. New members of NNJRA are WEC, IML, and LJQ. MMG reported the election results of the Ocean County ARA as follows: TPU, pres.; AWR, secy.; and DUR, treas. OUS, NCS of the Monmouth County 147.150-Mc. net, which meets at 2100 on Mon., reports the following line-up of stations which report in regularly: AGL, BYK, CQB, DFB, DME, EDJ, ENM, EUG, GDI, GSA (Red Cross Hq.), HIA/m, HJL, LNK, NDU, PAT, PMQ, SWW/m, and ZL. The Summit c.d. group participated in the search for a boy who was found to have drowned in the Passaic River on March 12. In the group were GZZ, MTJ, ROY, ZKT, and CZA. Traffic: W2CCS 314, CGG 74, RQI 3, NIY 2.

MIDWEST DIVISION

IOWA — SCM, William G. Davis, WØPP — SEC: VRA. Asst. SCM, Albert J. Ploog, ØSCA. RMs: QVA, SCA, and HMM. TWX is recuperating from a serious illness, for which we are all thankful. BDR came closer to BPL, which is quite an achievement for a blind ham. He's second high in traffic for the State. UJC is a new member of TLCN. BDR has Advanced Class license. DET now is in Dubuque.

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GJT is president of the Marshalltown Club, with BDR as "veep." SCA and BDR represented the Iowa section at the recent directors' conference in Kansas City. TVC is working 1905 and 1910 kc. pretty hard. The Boone Mike and Key Club elected KBE, pres.; BTX, vice-pres.; HVF, secy.-treas. The Club reports a membership of 32. The Iowa 160 Net now meets at 7 P.M. instead of 6:30. EHL has his General Class ticket and reports the following new hams at Ames: WNs HYZ, HXC, HXL, and HZT. WNs now advanced to General Class are HTN and HRT. CVW reports on his ham-minded family. The XYL is DEW and jr. operator is EDZ, with an 8-year-old harmonic looking to be added to the ham roll. This is the result of the work of the Spencer Club. BWL and FLM had a visit from 9YSZ. New ECs are SEF, RFC, and DFC. The Waterloo Club now has a code class of 25. TLCN handled traffic totaling 226 this month. PP "whupped" the TVI. Traffic: (Mar.) WØSCA 523, BDR 350, YTA 189, NYX 47, DFD 32, WMU 11, DIB 6, TVC 2. (Feb.) WØBDR 353.

KANSAS — SCM, Earl N. Johnston, WØICV — SEC: PAH. PAM: HEC. RM: FDJ. The CKRC of Salina recently acquired a Viking I and SX-76 receiver for its club station through the assistance of the City, the civil defense program, and CKRC members. STC will be custodian and the station will be operated on all bands for drill and test purposes or actual disaster operations. The station will be set up in the City Hall in a room set aside by the city for communications in connection with disaster and civil defense work. Incidentally, Chief Police Salmans of Salina has a new SX-28 receiver. WNØFOG now has WAS. IYR is back on 160 meters. WNØIHN is the second new Novice in CKRC. FDJ reports QKS and QKS SS drills which numbered 113. NIY has a perfect attendance record, with FDJ a close second with 105, and BLI third with 78. QKS will operate throughout the summer, meeting at 2030, Mon., Wed., and Fri., on 3610 kc. instead of regular sked. The KNRC sponsored a lecture on TVI with TV set-owners, servicemen and hams attending. The Atchison Radio Club, meeting the 1st and 3rd Fridays, heard an interesting talk on the Transistor on Feb. 15th. Most of the members get on 28 Mc. on Friday nights. WNØHAW lost his antenna in a recent storm. YFE has TVI licked and the XYL back in circulation so he will be very active from now on. Traffic: WØNIY 172, BLI 130, BET 43, FDJ 32, YFE 30, KXL 13, PB 10, ICV 6, LIX 3.

MISSOURI — SCM, Clarence L. Arundale, WØGBJ — SEC: VRF. Our new Director, OZN, assisted by Vice-Director MVG, held a Midwest Division Conference in Kansas City, Mo., on Mar. 9th. The HARC furnished the meeting place in the Red Cross Building. The meeting was opened by VRF, who introduced OZN and MVG. Representatives from this Division were present to discuss their views on the many subjects confronting the hams today and to make recommendations to the Director. A number of Missouri stations participated in the emergency communications resulting from the tornado passing through Arkansas and Southeast Missouri. EBE handled considerable traffic with them. PTG was alerted early on March 21st and established contact with the disaster area. Others reported as participating were ANB, YQJ, RMX, and CEX. No doubt many who helped did not report their work. We all extend our sympathy to OUD, whose mother recently passed away. HRS is a new ham in Warrensburg. DHN and IQY made excellent records in the recent Frequency Measuring Tests. BVL is a new OPS and reports the Early-Bird Transcontinental Net averaged 9.92 messages per session during March. ETW is a new ham in Kirkwood and is on with an HRO and a 100-watt rig. KIK now is able to run 40 watts without TVI. KØWBD files a nice traffic report. GCL has completed 10-meter mobile unit. QMF is in MARS 'phone net. The Rolla Club is stressing v.h.f. and is assessing a fine of 25¢ each month on each member not having a rig operating on 2 meters. GAR says conditions on 7 Mc. are bad on traffic. ARH won singles and all-events bowling title in the home town. Thanks, fellows, for the prompt reports. Traffic: (Mar.) WØQXO 439, BVL 193, PME 187, GBJ 152, GAR 98, EBE 71, KØWBD 69, WØCFL 54, CKQ 53, HUI 42, PTG 40, OUD 39, WIS 21, KIK 20, QMF 20, NNH 17, GCL 4. (Feb.) WØCKQ 26.

NEBRASKA — SCM, Guy R. Bailey, WØKJP — Your SCM attended the Midwest Conference in Kansas City March 9th, and reported back to the section clubs. EGQ is transmitting code practice Mon. through Sat. on 3750 kc. FQB is changing his fist with a new Mon-Key. UVU is sporting a new car and soon will be mobile with it. Roy still is doing a fine job with 75-meter net. KDW is keeping South Central Nebraska on the c.w. map. FQB is keeping sked six nights per week with 6LEY, also working TLCN, TEN, and Nebraska c.w. nets. AUH keeps sked with 7LDT and during the Arkansas emergency kept sked with 5TOE and ØGBJ March 22-24. Lyman also reports in Nebraska C.W. Net, RN7, and TEN. BZC still is keeping his weekly sked with BOQ. Hope he can get on 75 net soon. How about it, Walt? NENRC omitted its April meeting because it fell on Easter Sunday. BTT now has Advanced Class license. JDJ is doing a fine job as SEC, but is having the same old trouble. It seems everyone wants the other fellow to do the work. Keep trying, Fran. The Ak-Sar-Ben Radio Club held a pot-luck dinner March 29th. A fine time was had by all

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present. The SCM was sorry to have missed it. Traffic: KØWBF 56, WØFQB 56, KDW 37, BZC 23, AUH 20, HXH 12, VPR 10, HQQ 9, EGQ 7, ZJF 6, HZP 1.

NEW ENGLAND DIVISION

CONNECTICUT — SCM, Roger C. Amundsen, W1HYF — SEC: LKF. PAM: STU. RM: KYQ. CN, 3640 kc.; CPN, 3880 kc.; CEN, 29,680 kc. AW made BPL on originations. KYQ is our new RM and is busy with CN. RWD is starting a club. RRE has new Advanced Class license. 2VMX/1 has Extra Class commercial telegraph and telephone for three new ones. NEK is a new OPS. TUX now has General Class instead of Novice Class license. WN1TUO was laid up because of an operation. OAX now is mostly mobile. TDM worked mobile on his Florida trip. EBO and CUH are both busy as bees as ECs. JRU has several skeds per week from 160 to 10 meters. BDI is rebuilding for higher power. AOS is the champ letter-writer of the section. He has a simple mobile antenna get-up. The *New London Day* gives nice publicity to hams and MARS. BVB does lots of OO work. KYQ leads CN with 20, and AYC, CUH, and RRE triple-tie for second with 15 during a month which has found conditions at their worst on 80 meters. HYF made two trips to W3- and W4-Land., he also visited BGT and LV. 4GKY visited Connecticut. This is one last notice of the section meeting to be held at the New England Division Convention on June 14th at the Eastern States Exposition Grounds near Springfield, Mass. Net certificates will be handed out and plans formulated for the next season. ORS, OPS, OO, EC, and other appointment-holders miss a lot of good operating practice by not operating in the quarterly CD Parties. Likewise, EC holders are not taking full advantage of the monthly LO-NITES. You are the losers. See you in Springfield. Traffic: W1SJO 441, AW 241, EMF 170, KYQ 150, HYF 131, LV 128, STU 65, BDI 61, NBP 53, HUM 44, JRU 27, NEK 26, BVB 23, RRE 15, CUH 13, RWS 6, ODW 4.

MAINE — SCM, Orestes R. Brackett, W1PTL — SEC: IGW. RM: LKP. Net frequencies and time: Pine Tree Net, 3596 kc., at 1900, Mon. through Fri.; Sea Gull Net, 3960 kc., Mon. through Fri. An error was made by FCC in giving a two-letter call, UO, to a new ham and this has been changed to *UOI*. Two more of the old-timers have received their Extra Class licenses — FV and BAD. Congratulations, gentlemen. A new ham in Skowhegan, VFB, Doc Parker, is doing a very fine job on 28 Mc. JIS is visiting friends in Massachusetts. VFL is a new XYL on the air, but they say her OM is sore because he wanted it to be VFO. The new certificates of the Abusive Net now are available to all those who work ten of the more than twenty stations that are in the net (10 meters by the way). I might add that it is a masterpiece, one that sure is worth a lot of effort, so get your beams headed in to the northern part of Maine. The Sea Gull Net will not operate while Daylight Time is in session. Reports are that there are thirty-two hams in the Lewiston-Auburn Area, including 6 Novices. A hamfest at Kesar Lake put on by the Oxford County Radio Club will be held on June 29th. IGW has been assigned his old call, BYK. Traffic: W1LKP 67, SEJ 43, OHT 26, BTY 21, EFR 20, HXQ 20, OLQ 15, AFT 7, BYK 7, BX 6, AWN 5, KTT 5, QEK 5, IXC 4, KKZ 4, DEG 2, EOP 2, NIQ 2.

EASTERN MASSACHUSETTS — SCM, Frank L. Baker, jr., W1ALP — New appointments: FEC as EC for Middleboro, TTY and UIQ as OBS. Appointments endorsed: As EC: OSX, Braintree; PLQ, Watertown; MBQ, Vineyard Haven; IAP, Lexington; SKN, Medford; QMJ, Norwell; JYC, Sudbury; INC, Melrose. As OBS: IH. As ORS: IH, AAL, DWO; As OPS: AAL. Sorry to have to announce the death of DRL, of Hingham. MEV is moving to Bangor, Maine. QVC and his XYL, SAJ, are moving back to Kansas. WN1VHD, WN1UMM, and FJW are on 144 Mc. WN1VJC is a new ham in Quincy. The T-9 Radio Club held a meeting at IPK's QTH with an election of officers. The South Shore Club had an auction, with AKY doing his stuff again and ALP speaking at the meeting. The Eastern Mass. Club had PIM as a speaker and Mr. Corey of N. E. Power Co. The Braintree Radio Club is holding its annual banquet. The Quannapowitt Radio Assn. had Mr. Lynch of G. E. Co. as a speaker. BAQ reports that the following assisted in the Watertown alert: CTW, KNW, LXR, GEO, LLY, THO, and WN1VAF. Now mobile on 53.4 Mc. are BAQ, CTW, KNW, LXR, GEO, and FWQ. Winthrop has been assigned 53.725 Mc. for c.d. work. Note in the Region 5, 2-meter suggested frequencies, the committee has changed the State of Massachusetts to 145.5 Mc. and Revere, Reading, and Belmont to 145.4 Mc. The Region 5 committee is made up as follows: Sector 1, MVO; Sector 2, DFS as chairman; Sector 3, KTG, secy.; Sector 4, RM; Sector 5, ALP; Sector 6, TQP. THT is Asst. EC for Revere. BGH is chasing DX on 14 Mc. Larry Connell, 1.8-Mc. DX man, has cards from UA9 and 2 OKs; he uses 60 watts. PLQ, Watertown EC, reports the following assisted during the alert: ADL, AKD, IXD, IXJ, TCV, LNX, MR, PAG, OMD, QQB, and 3NMG. TVZ is working DX on 14 Mc. A Sector test was held recently in Region 5 using mobiles and these hams took part: At Central Control on 144 Mc., AMK; on 28 Mc., IPA and TQP; mobile on 28 Mc., FJW, TAJ, SSQ,

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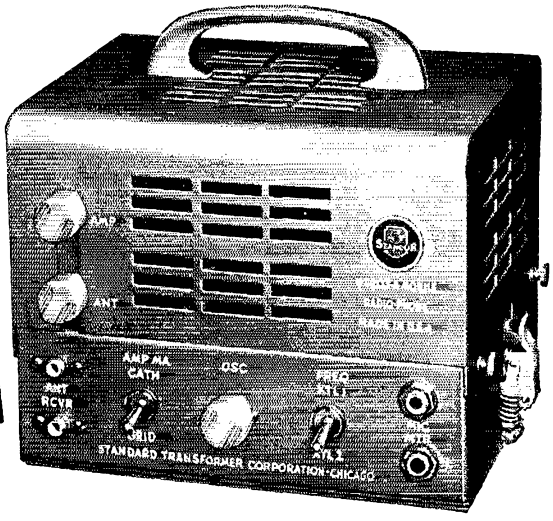

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UBU, PMZ, SQB, RWO, SZB, MZF, and SOA. OUP had JOW in the car, SCR had KTG, IDR had ALP, SPL had DFS, JIL had MVO. Mobiles on 144 Mc.: KSA, OEF, MUD, and MCR at MOS. 2DEB/MM has worked the gang on 28 Mc. several times from Boston. AWA reports the following: BJN has new Quad on; new stations on are IHI, OOY, and GJO. Heard on the Horse Traders Net: PS, LSN, NWL, EAF, GJO, OOY, COS, LPF, ZRC, IHI, RO, AOP, IXJ, ICP, LJ, PNB, ELP, AKE, NXL, LXR, DPI, and HDQ. New England Net: CLS, 3UTS/1, ZAC, BPF, DJ, AKC, RO, DJO, THO, IXJ, and LSN working 2IDJ on the band-opening. AWA is rebuilding. SNZ has been conducting the Haverhill Net. AAL now is a member of the Old Timers Club. The Everett Amateur Radio Assn. elected RLF, pres.; TOD, vice-pres.; KNA, treas.; PJ, secy. CTR, PJ, and RLF are building small rigs for mobile work. BHD has crystal rig walkie-talkie on Everett Net frequency. UBY is a new ham in Malden. DXO is on 28 Mc. Sil Deveau, of Wakefield, passed Novice Class exam. FEC is building a mobile rig for 28 and 1.8 Mc. The Middleboro gang has a net on 1.8 Mc. New Novice calls: VIB and VII. SNZ is on 3.9 Mc. UBB is mobile on 28 Mc. 3RHV is back in Haverhill. JYH is a committee member of the New England Division Convention to be held in Springfield June 14th. UAL, of Mansfield, has his General Class license. JJY is very active in MARS and reports that K1WAF is active again, also that QHC has joined up with him. UFJ dropped the N out of his call. New Wellesley hams are VCJ and WN1s VHM and VDH. The Club made a trip to WHDH. AKN has a Johnson Viking on all bands. New Deep Sea Dragnet frequency is 3970 kc. DMS has a mobile rig on 28 Mc. CTR is a member of the MARS Dog Net. RSE has been reporting into many nets. Traffic: (Mar.) W1EMG 481, SS 203, JCK 198, NUP 198, MME 113, LM 101, TY 98, DMS 65, BY 23, SCS 22, AAL 18, WU 18, AVY 15, RSE 14, CTR 11, AKN 10, DWO 6, SUR 5, ALP 4, PU 4, PEX 3. (Feb.) W1PEX 7. (Jan.) W1PEX 1.

WESTERN MASSACHUSETTS — SCM, Victor W. Paounoff, W1EOB — SEC: JYH. PAM: RDR. RM: BVR. West Mass. Net (WMN) meets at 7 P.M. Mon., Wed., and Fri. on 3725 kc. BVR is wiring up Eldico TR75TV in an effort to eliminate TVI on all bands. BDV is heading for Maine again with new low-power 'phone rig. WN1TVJ expects to operate portable from Camp Wonocksett in East Jaffrey, N. H., this summer. TRB is troubled with poor location and unsatisfactory antenna arrangement. While strolling down 48th Street in New York City, met MUN and had a pleasant gabfest. SDT is on 75-meter 'phone and 80- and 40-meter c.w. handling traffic with TCPN and Deep Sea Dragnet. EHH and GUI have the first known 6-meter mobile rigs in the section. LFI is sporting a new Viking. AAP is Assistant EC for Worcester. AGM has returned from a month in Florida. RDR is completing work on kw. for 75-meter 'phone. The Hampden County gang is hard at work completing preparations for the ARRL New England Division Convention to be held June 14th. See you all there for the best time ever had. SPF (Worcester EC) simulates emergency for his weekly drills. Recently JWM/m spotted a fire and alerted the fire department through the EC net. The fire was under control in jig time. The boys no longer are satisfied with the simulated type of emergency. RVW is having excellent results with 6BQ7 2-meter converter described in the 1952 *Handbook*. Traffic: W1BVR 110, SDT 11, BDV 5. WN1TVJ 2.

NEW HAMPSHIRE — SCM, Norman A. Chapman, W1JNC — RM: CRW. The Merrimack County Emergency Net was alerted on Sunday, April 6th, by BXU, Emergency Coördinator. Seventeen stations checked in covering the townships of Allenstown, Boscawen, Bow, Concord, W. Concord, Pembroke, Penacook, and Suncook. Participating stations were AIJ, AOQ, APK, BFT, BXU, EAW, JNC, LCD, OE, RIS, RZD, SJS, RMH, TDJ, TTU, and OGZ, with QYZ operating mobile. All traffic from the Farmington Sportsman Show was cleared by TBS on 144 Mc. to FZ, who relayed to the N. H. Net on 3685 kc. UON now is General Class. AIJ is giving code practice on 28 Mc. WN1UXS is a new Novice in Charlestown. If you want an accurate frequency check schedule QHS, our Official Observer. FZ has been appointed an Official Relay Station. CRW is rebuilding his kw. rig. The Nashua Mike and Key Club holds meetings on the second and fourth Friday. Drop in and see the new club house. What say, gang, let's get out the old covered wagon and head west to the ARRL New England Division Convention, June 14th, West Springfield, Mass. It's hamfest time again, let's go. Have fun on Field Day. FB on the traffic reports this month. Traffic: (Mar.) W1CRW 1149, FZ 127, SAL 54, PFU 41, SJS 28, JNC 26, TDI 17, TNO 16, GMH 10, POK 4. (Feb.) W1CRW 1222. (Jan.) W1CRW 1128.

RHODE ISLAND — SCM, Roy B. Fuller, W1CJH — SEC: MIJ. RM: BTV. PAM: BFB. The Rhode Island Net (RIN) meets Mon. through Fri. at 1900 on 3540 kc. The members of RIN met at the headquarters of AQ to plan for the coming summer traffic season. TJR is conducting code practice sessions Mon. through Fri. on 3850 kc. at 1600. This should be a good time for the XYLs and YLs to get started. KNE, president of NAARO, has left for Tennessee and will be active there under the call 4KNE. The c.w. gang should look for him on 7 and 14 Mc. The call AIT has

(Continued on page 88)

been reissued to the Sacred Heart Academy Radio Club, Brother Eymard, UTA, trustee. The Rhode Island Civilian Emergency Net (RICE) meets Wednesdays at 2000 on 28,960 kc. All 10-meter men are invited to join in. Net Control is PAZ. Traffic: W1BBN 92, BTV 73, TRX 40, OIK 22.

VERMONT — SCM, Raymond N. Flood, W1FPS — PAM: AXN. RM: OAK. The Burlington ARC holds meetings the last Monday of each month at U. S. Naval Reserve Training Station at 8 P.M. Officers are SEO, pres.; TZL, vice-pres.; NLO, secy.-treas. TZL and TZM are on 80-meter c.w. with nice rigs. VEB, Dick Levigne, is a new ham in Winooski on 28-Mc. 'phone with Viking I and NC-183. VDX, Ralph Abraham of Burlington, is on 28 Mc. with TBS-50, SX-71, and Workshop beam. WN1UND, Cy Ferland, is on 3.5-Mc. c.w. and 144-Mc. 'phone with SCR-522. NXP is working into the Montpelier Area on 144 Mc. MMN has been reported working IT on 144 Mc. The Rutland C.W. Radio Club had an FB c.d. meeting on Mar. 25th. TFB is looking for ham band coils for an RU-18-19 Navy receiver. Richard Steeves, WN1VER, is a new ham in St. Johnsbury. WN1UHL has Tech Class ticket now. Hope to see you all at the New England Division Convention in June. Traffic: W1OAK 272, RNA 193, AVP 88, IT 26, TAN 26, BJP 20, ELJ 17, FPS 17, TXY 14, NLO 10, TFB 8.

NORTHWESTERN DIVISION

ALASKA SCM, Glen Jefferson, KL7NT — Acting SCM, Jack M. Walden, KL7BK — PJ and BK visited Fairbanks for a week, met many of the Fairbanks gang, attended the regular club meeting, and were shown a fine time by the northern brethren. The Fairbanks Club is busily engaged in getting communications organized for c.d. in the area. C.d. mobile activity in the Anchorage Area is being coördinated by AGU. AGU is the proud possessor of a new 20-meter beam and a new car. The first means he is on 20 meters most of the time when he isn't busy moving the mobile rig to the second. PJ and YG are getting packed for transfer to Washington, D. C., in the near future. The Anchorage and Fairbanks Clubs are spearheading a move to get call-letter plates for the hams. All interested in such should communicate immediately with EC, Box 406, Anchorage. We'll need the help of all on this project. Traffic: KL7AIR 690, AA 463, AIZ 362, YG 200, PJ 49.

IDAHO — SCM, Alan K. Ross, W7IWU — Burley: EC HAH reports Rex Roberts, Director of the Northwestern Division, met with the Magic Valley Radio Club Mar. 24th. Invited also was the Twin Falls Key and Mike Club. Moscow: WJT is applying for OBS appointment and still keeping skeds with dad, ØCIQ, on 7155 kc. with a 304TL through a Mex 'phone QRM and busy as chief engineer for Interstate Radio, Inc. (Remember 7155 kc. for Idaho on 7 Mc.) An Idaho QSO Party is announced for Sunday, June 8th. Use 1995, 3935, 3638, and 7155 kc. and the 50- and 144-Mc. bands for the V.H.F. Contest, also scheduled for this week end. Use any band, but the above frequencies are nets where Idaho stations meet. This should be a warm-up for the Field Day, June 21–22, so use your emergency gear if desired. Traffic: W7GHT 150, NH 136, MKS 46, FIS 29, LQU 14, IWU 10, HAH 2.

IDAHO SECTION QSO PARTY

The party will be held Sunday, June 8th, 12 noon until 12 midnight MST. Any band may be used, but net frequencies 1995, 3935, 3638, and 7155 kc. will be most productive. General call is "CQ Idaho" and the object is to make as many Idaho to Idaho contacts as possible to test Idaho radio coverage. Exchange reports and QTH. Watch the Novice bands, too. Score one point per station multiplied by the number of different cities contacted. Use 'phone or c.w. Contacting the same station on different bands counts as another point (75 and 80 are two different bands if one 'phone and one c.w. respectively). Send scores to your Idaho SCM, W7IWU, before July 15th. First prize is a new *Call Book*.

MONTANA — SCM, Edward G. Brown, W7KGJ — Walter Johnson, of Malta, Mont., writes he and three others plan to fly to Billings for their examinations as soon as arrangements can be made. Three of the boys are after their Novice Class licenses. Walter has held a ticket before so he plans to take the General Class exam. CT returned from Denver with his 2nd-class commercial radiotelephone license. Since returning Les has been making high frequency test for the Mountain States Telephone Co. 8BTV recently moved to Billings from Wheeling, W. Va. KGF plans to attend a family reunion in Minnesota the last week in June. GFV will motor to Colorado to visit relatives. OIQ was home for a few days en route to KH6-Land and a new assignment after completing electronic course at Treasure Island. CPY recently attended a Gallatin Valley Radio Club meeting on the way home from Arizona. JDZ is commuting

(*Continued on page 90*)

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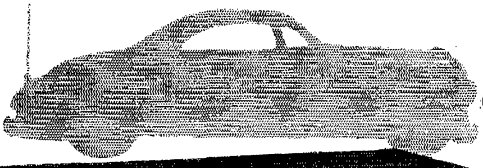

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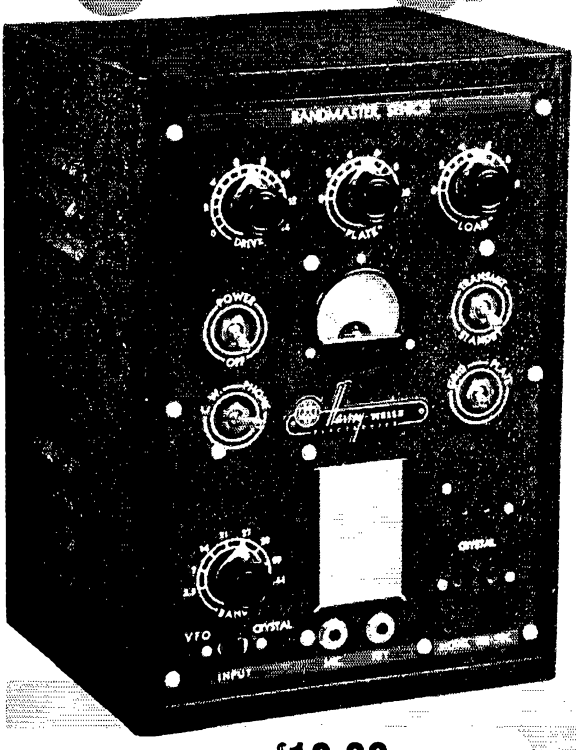

BANDMASTER SR. — $16.68 DOWN

A complete ready to go transmitter including the new crystal-oscillator-vfo switching circuit. Phone or CW — eight bands — 80, 40, 20, 15, 11, 10, 6 and 2 meters. Ideal for either mobile or fixed station use. Will operate from A.C. power packs up to 450 volts at 275 ma., vibrator supply or dynamotor supply for portable mobile operation. Employs Pi antenna matching network. Power input to final is 50 watts with 450 volt power supply on bands 1 through 7, 30 watts on band 8. No tuning adjustments necessary except those required to resonate final output to the antenna. May be mounted on rack panel with power supply. For use with carbon microphone. No plug in coils. CONTROLS: Band Switch, Excitation Control, Antenna Loading, Amplifier Tuning, Power-on Switch, Carrier-on Switch, Meter Switch. Antenna network will match non-reactive feeder of approximately 50-500 ohms. Frequency calibration chart on front panel as well as two scale grid and plate DC milliammeter. TUBES: 6AQ5 crystal oscillator, 6AQ5 buffer-multiplier, 807 final amplifier, 2—6L6G class B modulators. In sturdy steel cabinet, 8" wide, 12" high, 8" deep. 20 lbs. Net Price $111.50.

BANDMASTER DELUXE — $20.63 DOWN

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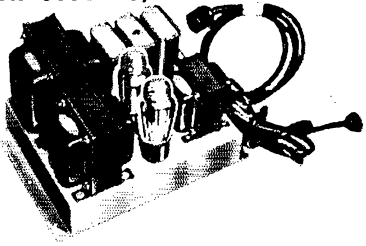

TYPE APS-50 — delivers 425V at 275 ma., and 6.3V and 4 amps. May be mounted on rack panel. For 110V AC, 50-60 cycles. Hi-lo switch on high voltage. Two 5U4G rectifiers. 11 x 6⅞ x 8¾". 27 lbs.

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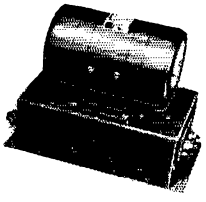
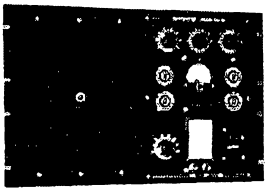


TYPE DPS-50 — dynamotor supply for portable operation, delivering 300V at 250 ma. Operates from 6V storage battery. 10⅛ x 5¼ x 5⅞". 16 lbs. For 6V, $87.50. For 12V (400V @ 250 ma.), $54.50.

RACK PANEL $5.75



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RADIO SHACK
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between Belgrade and Whitehall because of a change in duties. Ben had tough luck with his new HRO-50T1, which blew filter rectifier and output transformer. The Billings Club held a meeting at the new home of LCM in Huntley Mar. 25th. Traffic: W7JDZ 125, KGJ 31, CT 14, LBK 4.

OREGON — SCM, J. E. Roden, W7MQ — ITZ reports that the Southern Oregon Radio Club of Grants Pass now is an ARRL Affiliated Club. HSL is new Net Manager for OEN 3600-kc. Net. WJ, the RM, is making plans to take care of the newly-licensed Novices and to make c.w. attractive for them. JPM recently returned from Japan and will be back on the air on 29 and 3.5 Mc. HSL is new ORS appointee. WN7QLX, the XYL of NQD, is quite proud of her new license. HAZ reports that the Baker Club, NYW, is really going strong in activities. SY soon will be on the air with a suitcase portable he is building to take along on his trips over the State. NOB is keeping a lot of schedules with other YL operators over the country. QZW is a new Novice in LaGrande. New officers of the Astoria Amateur Radio Club are as follows: FNX, pres.; PJK, vice-pres.; EBD, secy.-treas. LT, of Portland, is on his way home from the Orient. Ex-ØHDO, now of Salem, has just received his W7 call, RBU. JKU has returned from a trip to Florida and reports very much activity along amateur emergency set-up there. New officers of the Albany Amateur Club are as follows: KKP pres.; OU, vice-pres.; FJY, secy.-treas. CN now has his first mobile in his new Frazer. Coos Bay also had an election with the following results: LXW, pres.; OLH, vice-pres.; IF, secy.; LXA, treas. KL expects at least 500 amateurs to storm Eugene for the big OARA Convention. Traffic: W7II 431, APF 289, OJG 175, MQ 95, GNJ 53, HDN 34, AWI 31, FY 22, HJU 15, KTG 15, DZT 11, KYO 11, ADX 8, BDN 8, NFU 6.

WASHINGTON — SCM, Laurence M. Sebring, W7CZY — SEC: BTV. PAM: NRB. RM: FIX. NSI is experimenting with a Discone antenna. KCU is busy campaigning for a certain political party. New officers of the Clark County Amateur Radio Club are PNY, pres.; OZJ, vice-pres.; LTY, treas.; QON, secy. The first hams in Ocean Park are WN7RDR and RDU. College keeps KNV busy. LVB and GAT are on 220 Mc. AIB has net antenna for 40, 20, and 10 meters. ZU spends his time commuting to the East Coast for Boeing. BG has his Extra Class license and first bad case of TVI. KIL made 8019 points in the DX Contest with 400 watts. Active in c.d. work in the Bellevue Area are AWG, JWE, GXP, OYO, KO, OTA, and KOM. OEX has new twin dipole 20-meter beam. HRC has a TBS-50 on 75 meters. BA has 4-over-4 10-meter beam on a 95-foot tower. KZP worked mobile-to-mobile from Bellingham to Pendleton, Ore., daytime. Taking part in mobile hunts are CO, KZP, OYO, HRC, CBE, BA, PGY, RT, AWP, and JPH. JWE has a pair of 814s clamp-tube modulated on 75 and 20 meters. AQA is doing a good job on overseas traffic for servicemen. OIH is using 15-watt 10-meter mobile. OEB made WAC in the DX Contest. MTX is fighting TVI. PFZ and GJU are going after the rare ones. PHC sold his rig and went off the air. JJK is handling a TTY circuit in Texas. HMQ is back on the air after a serious illness. OGP is in Alaska at KL7NR. MPH is attending the U. of Washington. MCU graduated from the Coast Guard Electronics School. NDO returned from JA-Land. Traffic: (Mar.) W7CZY 775, IOQ 646, BA 392, HKA 204, TH 128, AWG 108, FIX 87, EVI 78, LEV 74, EHH 55, KCU 53, NWP 41, ETO 40, FWD 31, AIB 29, FRU 28, PGY 18, ZU 15, LVB 14, CZX 13, EVW 10, NRB 9, NTU 9, EBU 8, GAT 8, KTL 6, OEB 6, AVM 5, CWN 1. (Feb.) W7IOQ 742.

PACIFIC DIVISION

HAWAII — SCM, John R. Sanders, KH6RU — HARC had an interesting talk on Crystalography by personnel from the Pearl Harbor Lab. The Honolulu YL Club meets once a month with increasing numbers becoming licensed members via the Novice exam. Among the YLs, AFL is NC for a MARS c.w. net and TI is NC for a MARS 'phone net. AFN has 600 watts on 3.9-Mc. 'phone and works the East Coast. The Maui Club had a talk on radio noise measurement from outer space. AFT is new secretary for the Maui group. MW finished a temporary assignment in the Philippines and now has gone to Guam. AEX will transfer to Guam shortly. More than a dozen took the spring FCC exams in Hilo. Among the few who have thus far taken the Extra Class exam in Hawaii are SL, AO, and KS. TRV has new tape recorder. RU visited Hawaii and Maui and will be seeing you fellows on Kauai shortly. *Far Pacific Area:* KG6ACQ is a newcomer to the BPL ranks this month and KG6FAA rounds out a solid year of BPL with the Hawaii section. Please radio your reports promptly on the first of the month, fellows. They are not arriving in time. KR and JA stations lacking BPL certificates, please furnish your mailing address. Traffic: KR6AF 5074, KG6FAA 2236, JA8AB 856, KG6ACQ 802, KR6EM 330.

NEVADA — SCM, Carroll Short, jr., W7BVZ — SEC: JU. ECs: HJ, JLM, JVW, KIO, KOA, MBQ, TJY, VO, and ZT. RM: PST. OPS: JUO. OO: LGS. Nevada State frequencies are 3660, 7225, and 29,360 kc. Newest Novice in Boulder City is John Tolson, WN7RGY. He and QIH are studying evenings for the General Class examination. MMK has a converter and a low-powered transmitter on 50 Mc.

(*Continued on page 92*)

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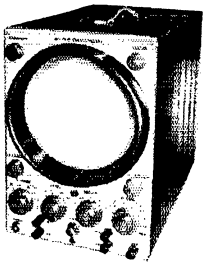

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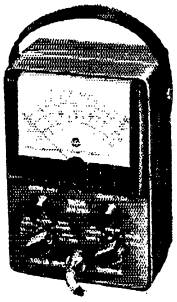

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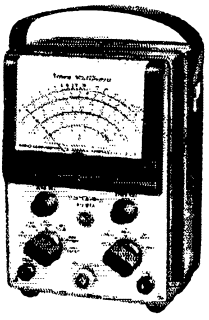
84-087. WV-77A Junior VoltOhmyst. *Net*. **$47.50**

RCA WV-97A SENIOR VOLTOHMYST



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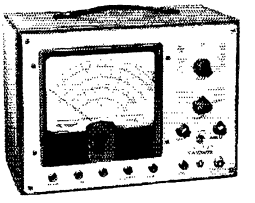
84-085. WO-56A Oscilloscope. *Net*. . **$217.50**



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WG-264 Demodulator Crystal Probe. For use with above VoltOhmysts. Extends RF range to 250 mc. Permits reading all FM and TV RF voltages. Shpg. wt., 12 oz. **84-084.** *Net*. **$7.75**

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City . . . . . Zone . . . . State . . . . . .

KJQ and BVZ also are on 50 Mc. JLN has just completed an exciter covering all bands, 160 through 6 meters. JUO made DXCC. 6PWE, an ex-Nevadan, is recovering from a bad electrical burn over in W6-Land. WNØFWX/7 is on the air from Boulder City. TKV is on 28 Mc. from his new QTH with an indoor antenna. Ray works locals and the 'Vegas gang with it. BVZ attended the pre-directors meeting in San Francisco as the official delegate of the Southern Nevada Club.

SANTA CLARA VALLEY — SCM, Roy I. Couzin, W6LZL — SEC: AEV. ECs: CLF, IXJ, JWD, QIE, and TFZ. Club activities for March: The SCCARA had a speaker from Eimac at its March 10th meeting. The Monterey Bay Radio Club had a discussion on civil defense at its March 18th meeting. The NPEC had at its first meeting a guest speaker from A.T.&T. The subject was "Microwave Technique." The meeting was held March 1st. The second meeting of NPEC was held on March 15th and was a business meeting. New appointee is JWD as EC of the Palo Alto Area. CAZ, CLF, FTG, QCB, and YHM had certificates endorsed. FOA's EC appointment was cancelled. HC had to give up the managership of MTN because of outside work. YHM still is fighting TVI but checking into nets with a buffer. WN6OUX now is W6OUX, OUX's XYL now is WN6NNI. CIL's new QTH is Redwood City. MMG is active on BAN and is NCS on Friday nights. JQD's XYL now is WN6MWW. Another new call is WN6NMV. The following stations have been active on weekly c.d. drills in the Palo Alto Area: LCN, QXP, UCE, YWD, IUV, WMO, FTG, CAZ, FOA, and VW. With two exceptions all stations have equipment which can be used either on 6 volts d.c. or 110 volts a.c. The net meets Monday evenings and the proposed frequency is 146 Mc. AEV, our SEC, reports that activity has increased, especially in the Palo Alto Area, and also the southern end of the section is going good now. IXJ has been appointed senior EC for the county of Santa Clara and CLJ is the senior EC for the counties of Monterey, Santa Cruz, and San Benito. Traffic: W6BPT 614, YHM 65, HC 62, NW 47, MMG 30, CIS 6.

EAST BAY — SCM, Ray H. Cornell, W6JZ — Asst. SCMs, Guy Black, 6RLB, and Julio Amaro, 6WGM. SEC: RVC. RM: IPW. PAM: KZF. WGM has accepted the job as Asst. SCM. The April meeting of CCRC was held at HC's home in San Jose. TVI Committee work as well as the forthcoming Pacific Division Convention were topics of discussion. TVI Committees in all important areas within the section are functioning smoothly. In the Metropolitan Oakland Area (Richmond to Hayward) hams are invited to seek the aid of the East Bay TVI Committee, Box 71, Berkeley, Calif. A form letter and questionnaire is available, which you may slip under your neighbors' doors for them to answer and mail in if they have TVI. The following have agreed to work with the East Bay Committee: Berkeley Area: RLB chairman, VSV, MXQ, KEK, CTL, BFZ, NZG, and LBJ. Oakland Area: B. W. McKinney chairman, EXY, MFZ, JIG, and JBI. HOR won the Oakland Radio Club's code-sending trophy. MFZ was the former holder. Bob also is Field Day chairman for ORC. KZN is chief operator at OT. QVQ is working on Rothman modulation for his rig. The Region 3 c.d. organization is building 6-meter equipment for the 53.65-Mc. channel assigned to them. Neil Scott, of Richmond, now is in the USAF at Spokane. CQK described relays and simplified auto-call system at the NBARA April meeting. VSV and MXQ demonstrated amateur television to the SARO. The UC Radio Club's beam was blown down recently. Watch the *Daily Cal* for announcement of their noontime meetings. LGW had deloused his Meissner with gratifying results. LIL is installing his mobile in the new Ford. K6DX is making a trip to Hawaii. Frank Roach, of FCC, talked to the Martinez Club on April 10th. WOJ, NTU, and JIG received OBS appointments. LMB got two new VP8 countries. IZW also is new Vallejo call. Solano County Emergency Net meets Thurs. at 1900 on 28.62 Mc. BAN held 35 sessions, handled 77 messages in March. BRAT scores were IPW 48, JOH 45, MMG 28. JOH received ORS appointment and Net Certificate. The Southern Alameda County c.d. communications set-up is very well organized under the direction of OU. Drills or discussions are held every Tues. night at headquarters, Alameda County Sheriff's radio station. Chief operator is BNB, with JPT, GGS, and FXA assisting. Other participants are UZX, WN6NCL, QEH, QZZ, TUN, KSP, JOP, TQJ, JNY, ANK, HSR, INE, KKB, AAQ, VJS, TM, IXV, UFD, GIB, and KNJ. Traffic: W6IPW 110, JOH 97, AKB 26, NGC 14, YDI 14.

SAN FRANCISCO — SCM, R. F. Czeikowitz, W6ATO — Phone JU 7-5561. SEC: NL. Phone PL 5-6457. *Marin Area:* EC: KNZ. Tamalpais Club EC: ZUB. The Marin County Amateur C.D. Net meets every Monday at 8 P.M. on 1995 kc. Net Control is BZK who, with the help of the C.D. Authority, is sporting a new Johnson Viking and NC-125 — with a Johnson VFO in the offing. An invitation is extended to all Marin County amateurs to check into the Net, which has been in operation over a year. Very good coverage is obtained throughout the County. Congratulations to the new officers of the Tamalpais Amateur Radio Club. OZC remained as the secretary, while the other officers are ZUB, tech. director; KEW, prize chairman; FQS, master at arms; and ZQK, publicity director, to whom

(*Continued on page 94*)

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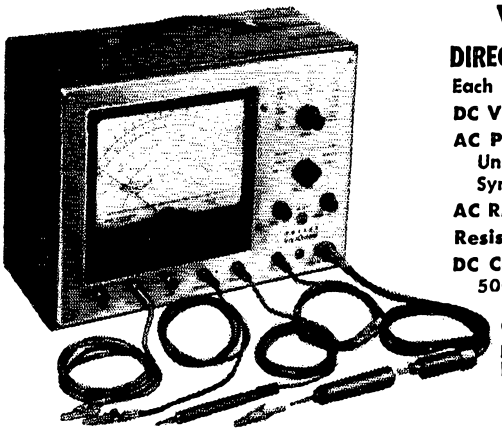

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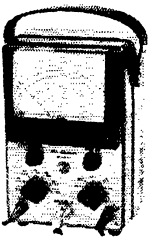

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thanks go for all the news from this Area. ZUB has been appointed to serve as temporary chairman of the TVI committee, while IKO has been elected to represent the Club at the annual Pacific Division ARRL Board of Directors' Meeting. Construction has started on the Club transmitter, with the members donating the parts and HYT the manual labor. The rig will be in operation on Field Day, for which plans are complete. The spot will be the Pozzi Ranch property at Black Point. YME has moved to Forest Knolls and gets out O.K. FYJ reports in from the Marin Radio Amateurs Club with 81. He is TVI-proofing his p.p. 813s on 20, and has completed the job on 75 meters. The Marin Radio Amateurs Club meets the second Friday at the American Legion Hall, Larkspur. The Tamalpais Amateur Radio Club meets the third Friday at the home of OZC, in Tiburon. *Eureka Area:* EC: SLX. EC Kirkwood attended the February meeting of the San Francisco Radio Club and, we understand, picked up a bargain or two at the radio gear auction. He was accompanied by his son, who is stationed at the Navy's Treasure Island. The HARC continues its emergency drills on 28 Mc. and holds its regular club meetings on the second and fourth Fridays in the YMCA rooms, rear of Mun. Auditorium, entrance on "E" St., Eureka. *Santa Rosa Area:* EC: LOU. The SCRA has formed a TVI committee consisting of ADM, DZM, and KIW. Most of the amateurs in the vicinity are doing all possible to their rigs to make them TVI-free. The Sonoma County Radio Amateurs meets the first Wednesday in the Tap Room of the Grace Bros. Brewery, Second St. west of the Freeway, Santa Rosa. *San Francisco Area:* EC: BYS. UEV and SWP continue to handle the bulk of the traffic for San Francisco. The TVI committee continues to help eliminate interference problems and has been able to keep up with all cases turned over to them by the FCC. REMEMBER THE CONVENTION IN SAN FRANCISCO JULY 4TH, 5TH, AND 6TH. Make your plans to attend. An excellent time is promised for all by the chairman and the Central California Council of Radio Clubs. The SFRC meets the fourth Friday at 1641 Taraval St., San Francisco. Traffic: W6FYJ 81, ATO 5.

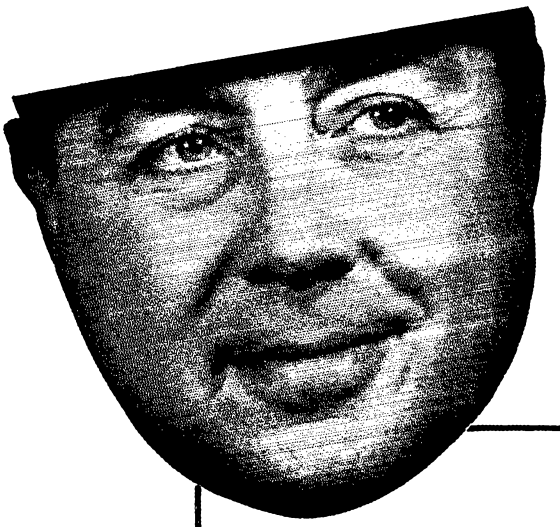
SACRAMENTO VALLEY — Acting SCM, Willie van de Kamp, W6CKV — PBM is a new ham in Woodland. OXG now is 160-meter mobile. IOI moved to Ukiah. JDN operates portable from back of pick-up. KAR soon will be active again from Susanville with 500 watts on 160, 80, and 40 meters. IQP has given up 10 for 160 meters. WN6MWR is station-keeper for Chico Naval Reserve. LHP now is located in Susanville. DGK moved to Sacramento. KXD is active again on 160 meters. PIV joined the PA Net to help build up traffic total. KME keeps in touch with activities via 2-meter mobile. LTI paid the Chico gang a visit. DTV also made the rounds in Chico. GERC held a successful auction. HBM discarded all 75- and 10-meter gear and has gone 100 per cent 2-meter mobile. Traffic: W6PIV 294, JDN 69, GDO 57.

SAN JOAQUIN VALLEY — SCM, E. Howard Hale, W6FYM — SEC: FYM. RM: EXH. ECs: BCL, CQI, EHN, FIP, GCS, GKX, JPU, UJ, and VRF. ORS: EXH, GIW, JQB, LRQ, and QUE. OPS: IAZ. OBS: EXH, GRA, GS, GWQ, and OHT. OES: FYM, RJE, and UWY. OOs: FKL, HZE, and JQB. The Fresno gang held an emergency test Mar. 22nd under the direction of EC JPU. The Turlock Club sponsored a 2-meter Hidden Transmitter Hunt Mar. 30th with DVS and LLO as co-chairmen and hiders. Winners in order were ADB, GIW, DIY, and ERE. A picnic was held at the transmitter site and attendance was over 50 from Stockton to Fresno. All active amateurs in this section, especially those in the mountain areas, who would like to participate in the "flood warning" system being set up at the request of Governor Warren under the direction of KME in Sacramento, are urged to contact your SCM if you have not already been contacted in this regard. AL, of Lodi, is vacationing in VK-Land. The Stockton Club has set its annual picnic for June 15th, probably at Calaveras State Park. The Taft Club, with ZSO as president, now is an ARRL Affiliated Club. The EC appointment for Taft and Western Kern County has been changed, with HZE bowing out in favor of UJ. SJVN on 3525 kc. had 158 check-ins during March. The number climbs each month. Have you checked in yet? Traffic: W6JQB 395, IAZ 118, EXH 112, K6FAJ 73, W6GIW 38, FEA 33, WJF 12, FYM 3.

ROANOKE DIVISION

NORTH CAROLINA — SCM, J. C. Geaslen, W4DLX — The Mecklenburg Amateur Radio Society of Charlotte held a hamfest May 25th at the Fireman's Hall in Charlotte. RRH, of Morganton, has been made NCS on the NC MARS Net. The Greensboro Club has renovated the club house and is putting on a big meeting to round up the old gang and also gather in the new hams in that area. RRK, an ex-W2, is active on 75 meters. MKT, Winston-Salem, has the honor of being the first North Carolina station on single sideband. FRH, Raleigh, is new NCS on the Tar Heel Net. RWL has been keeping ATC active on the NCS. HUW has a full gallon going, in spite of TV. CVQ has been blessed with a new family, a whole flock of puppies. Anyone want a dog? ANU recently had a bad accident. Here's hoping you are out soon, Wiggs. BBZ, Wilming-

(*Continued on page 96*)



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ton, is experimenting with long wires on 20 and 10 meters. At a recent meeting there EC was appointed as EC for New Hanover County by ZG. IMH, Plumtree, is trafficking on TLAP, NCN, and 4RN. BDU, Charlotte, is the proud possessor of a new receiver, as is WN4TYR. New Novices here are VGH, VFM, and VHH. Field Day soon will be here, so let's have a lot of activity and please report what your gang does for Field Day, however small. Traffic: W4AKC 143, IMH 124, RRH 61, BDU 30, ONM 29, DLX 26, CGL 14, CVQ 13, REZ 12, BAW 10, ROD 9, HUW 8, W8AUB/4 4, W4BBZ 2.

SOUTH CAROLINA — SCM, T. Hunter Wood, W4ANK — The Florence ARC has 20 licensed members and is planning ARRL affiliation. TSU, the Club president, is looking for South Carolina v.h.f. stations and is building an amateur TV transmitter. The following are members of the South Carolina Novice Net, which meets at 4 P.M. Sundays on 3740 kc.: WN4TEG, THH, UFP, UNO, UNP, UOQ, USW, UTZ, and UVM, with TWX manager and NCS. TWX has received General Class license. FM has new 40-watter on 75 meters and is building a 160-watt final for 160 meters. FFH is the new PAM for South Carolina. EDQ, FFH, and TSU are Official Phone Stations. MPR is the Emergency Coördinator for Marion County and JDK is EC for Florence County. All net members should be OPS or ORS. Stations interested in a South Carolina c.w. net on 80 meters, please contact the SCM. The Charleston Shipyard Radio Club now has 63 members. Traffic: W4ANK 270, CHD 55, FFH 52, AZT 26, EDQ 14, FM 9, WN4TWX 2, WN4TWW 1.

VIRGINIA — SCM, H. Edgar Lindauer, W4FF — Plans for that hamfest sponsored by the Shenandoah Valley Amateur Radio Club to be repeated at Dickey Ridge Sky Line Drive have been finalized for Aug. 3rd. Specific details will be forthcoming from Winchester. RKC/4 played host at the Apple Blossom Festival in May handling plenty of traffic for last minute seasonal traffic totals just prior to the regular winter season's shut-down of nets. New officers of SVARC are WN4TGC, pres.; KX, vice-pres.; Fred Stinson, secy.; TCK, treas.; ATQ, act. mgr. WNs TSF, WGK, and WQT discarded the Novice portion of their calls by successful exams for General Class. Announcement of the Saturday Nite Net, SNN, at 1930 and 2145 EST on 3615 kc., brought QNI from 2RN, 3RN, 4RN, NYS, S. C., Fla., Md., D. C., Va., W. Va., Pa., Mich., Ind., Kans., Mo., and Tenn. on the first session. Purpose of this net is to help diminish heavy traffic hooks which otherwise would accumulate over the week end. SHJ, SUC, ANK, and AKC take turns at NCS. Northern Va. Emer. Net meets each Sunday 1230 EST on 29,200 kc. Its present coverage includes the counties of Frederick, Warren, Clarke, Shenandoah, and Loudon. SVARC station RKC is NCS. ATQ does a similar job same period on Novice frequency. SHJ socked BPL two consecutive months. SUC is new ORS with NCS duties on Friday session of VN. Official Observers with wet ink appointments are RVO, HQN, and EYX. FF begins his new term of office June 15th and thanks the fellows for the privilege of serving them again. KFC is doing a swell job as editor of *VN Bulletin*. SAD can QSP traffic to W. Va. on nightly sked. K4AF has around-the-clock sked overseas any direction and awaits your call on 7140 kc. anytime. NUU made four frequency measurements within 23 parts per million using 75-A2. Virginia Novice Net meets Mon., Thurs., and Fri., 3707 kc. WN4UHG is NCS, with TVI and UNA as Alt. NCS under the leadership of OKN. Traffic: W4SHJ 512, SUC 325, FV 169, FF 131, MWH 124, KX 87, NAD 61, KFC 56, OGX 54, JAQ 52, PWX 45, NV 35, PXA 34, KSW 25, SAD 19, NUU 17, EYX 8, IYI 8, LK 7, LW 3, OKN 3.

WEST VIRGINIA — SCM, John T. Steele, W8MCR — Your SCM needs news of activities in the section. What you see in *QST* is what you fellows tell me. If you want to see it in print, please tell me about it. GBF and PZT are busy getting new hams started. YMN made WAS, 46 on 75-meter 'phone, 2 on 80. YPR is new SEC. CLX is EC for the Charleston Area. Activity is picking up around Charleston on c.d. GEC now has Advanced Class license and can be heard on 75-meter 'phone. FYD and WHR are doing a nice job calling the 'phone net. WN8HWI writes, asking about a WN net. He suggests that some RM or ORS go down and help organize it. How about it, fellows? GEP has Advanced Class ticket. The Princeton Radio Club is doing a nice job coöperating on TVI and has a committee which investigates all complaints. The Charleston Amateur Radio Club now holds two meetings per month, the second Tues. and the fourth Fri. HUG has moved to New Orleans. WVN now needs an outlet in Parkersburg. BTV moved to Montana and is looking for W. Va. contacts on 80 meters. FUS is holding out on the boys; he claims he knows how to de-TVI a Johnson Viking but won't talk. Traffic: W8AUJ 451, GCZ 30, GBF 21, GEP 19, DFC 18, MCR 18, YMN 18.

ROCKY MOUNTAIN DIVISION

COLORADO — SCM, M. W. Mitchell, WØIQZ — SEC/RM/PAM: KHQ. Asst. SEC; PGX. It is with sorrow we report the passing of a very well-known ham on the 20-meter band, ZEA. His many friends on the amateur bands will miss him. KHQ makes BPL again this month.

(*Continued on page 98*)

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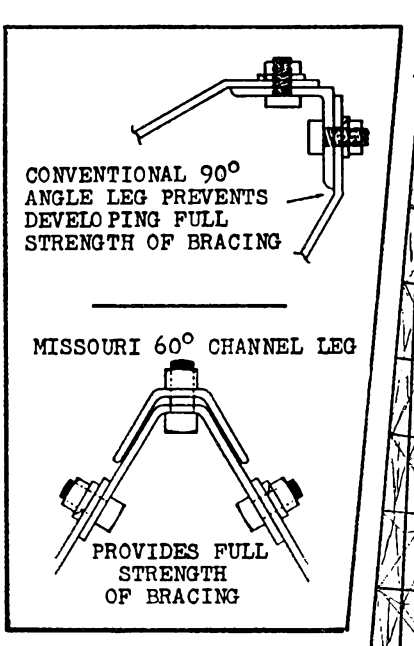

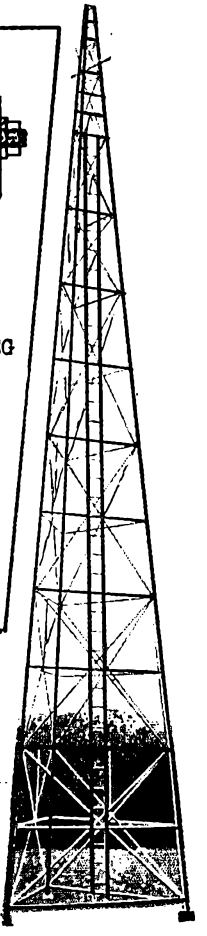

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He also is new RM for Colorado, as LZY has resigned because of work schedule and ZJO has temporarily retired. New Extra Class licensees are DD, IC, OTR, COZ, and Mr. Kline, the engineer in charge, and his assistant, Mr. Kirkvold. A QRM meeting of the Denver Area was held recently with representatives from the airlines, police, taxi, and broadcast and radio servicemen in attendance. BJN heads the committee and IC is chairman. Good progress was reported. The boys are doing a good job of getting set for TV if and when it ever gets here. BXM reports again for the Colorado Springs gang. HDU has been on a trip to Missouri and Illinois and has a new HRO-50T. WNØIBM has been keeping the Novice band hot on 80 meters. Yours truly has installed a 6146 driver for the final and had to link neutralize it. Am able to report that there are no more bugs left in the rig at IQZ. Now for building a mobile transmitter for three bands with all that debugging to do all over again. AGY was a visitor at IQZ. MOM left for California to work in a plane factory. Traffic: WØKHQ 504, WUR 4.

UTAH — SCM, Floyd L. Hinshaw, W7UTM — The Annual Banquet of the Utah Amateur Radio Club was held at the Rose Garden Inn, Mar. 12th. LCA's XYL won the drawing for a nice electric clock. PHR was elected UARC president to fill the vacancy caused by the transfer of NUZ. BED has returned from a two-month vacation spent in the Midwest. KVS and QXT are both active on 7 Mc. in St. George. MY is keeping the CAA station running smoothly at Hanksville. IS says, "Variety is the spice, etc.," so has turned active direction of the Utah c.w. net (3700 kc.) over to SP. KCT returned from an auditors' meeting in San Francisco and says it was "too wet." Now is the time to make reservations and plans to attend the Rocky Mountain Division Convention at Estes Park, Colo., June 14 and 15th. Reservations should be sent: c/o Walter M. Reed, 1355 E. Amherst Ave., Denver, Colo. Traffic: W7UTM 96, JVA 2.

WYOMING — SCM, A. D. Gaddis, W7HNI — The YO Net, on 3622.5 kc. at 7:00 P.M. week nights is proving to be useful to Wyoming traffic, with PKX, LVU, AEC, HRM, HNI, and K7FAO reporting regularly. You are invited to help. Your SCM visited the Casper Radio Club. Plans for the 1952 hamfest, to be held at South Fork Inn near Buffalo on July 19th and 20th, were discussed. Mark your calendar! WN7QBN now is W7QBN. Congrats, OM. HRM on 'phone? Don't believe it! 5OBB/7 is on 7 Mc. in Cheyenne. KUB and CGK are sporting new 75-meter mobile rigs. EUZ found time to take HDS to the club meeting. 5SDK/7 is on 10-meter mobile. PJT is a new ham in Farson. More traffic originated within Wyoming is needed in order to keep your new YO Net going, so pitch in and help, gang. Traffic: W7PKX 322, LVU 33, HNI 5, AEC 4, GS 4.

SOUTHEASTERN DIVISION

ALABAMA — SCM, Dr. Arthur W. Woods, W4GJW — BFM is ORS and OPS, meets AENB, AENP, Tenn. Net, and two MARS nets. DXB answers the roll faithfully on AENP and meets Tenn. Net occasionally. EJZ spends 85 per cent of his time in traffic, and racked up 111 in February alone, despite second-harmonic trouble. ICO divides time 50–50 between traffic and ragchewing and meets AENP regularly. KIX is the mainstay for this section on RN5 and delivers traffic through AENP and AENB. OAO, who meets AENB, RN5, and FN, is about finished with bigger power supply with complete regulation. PPK meets AENB, AENP, and AENR, spending 30 per cent of his time ragchewing only. AENR had a successful steakfry and a picnic at Springville within two weeks, both affairs being well attended. All nets are in a high degree of preparedness for emergencies, a situation which justifies the existence of amateur radio in conformity with FCC tenets. Traffic: W4EJZ 92, KIX 60, HFP 46, DXB 34, ICO 22, OAO 18, BFM 17, PPK 10, GJW 8.

EASTERN FLORIDA — SCM, John W. Hollister, jr., W4FWZ — Tampa would like to put in a bid for the Southeastern Division Convention for 1953. Any others interested? MARS: A big contest is on with real valuable prizes. Write A4USA for full details. Clearwater: The Club is planning Field Day program. AYX has moved to St. Petersburg. SIZ now is Class A. Clewiston: PJV again makes BPL. Dade City: SAS was portable at the Scout Camporce. Ft. Lauderdale: The Broward Radio Club has been regenerated with IM, FNR, QBY, CON, and JVF as officers. The BE Net, with IM, JVF, EUV, K4AF, and K4WAR was alerted to handle Red Cross traffic in three shifts. Jacksonville: FJC, with his p.p. 810s, is back on 3945-kc. traffic. FJC also is doing a bang-up job with JARS *Beam*. Lake City: IQV has gone to Honduras on forestry work. Lakeland: NAK reports progress on reactivating the Club. Miami: TRP, with his 400-watt Temco, says, "Will DX please QSL via W4NVU, Box 104, Miami." Bob is OO and OBS. New Port Richey: KJ sent messages into the tornado area for the local telephone company as lines were down. Hal got his 137-ft. doublet up fed with RG8U. Okeechobee: PZT works five nets. Ulmer reports KDQ is in town now. Orlando: MSX, OARS vice-president, is running a half gallon with 6F6 controlled-carrier clamp-tube modulation.

(*Continued on page 100*)

$AVE $$$ on the COLLINS 75A-2 AMATEUR RECEIVER with a "Surprise" Trade-In Allowance on Used Communication Equipment

Now you too can snare those scarce DX stations with the 75A-2 and save money on the bargain! Thanks to "Surprise" Trade-In Allowances on used (factory-built) communication equipment, hams everywhere are making dreams come true with the 75A-2—acquired the money-saving way with a bigger-than-ever allowance on used equipment.

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Sarasota: THX has dropped the "N" from his call. Bob is going after DX with 25 watts on 14 Mc. and 100 watts on 28 Mc. LMT is working on mobile installations and converting military gear. West Palm Beach: CKB is working hard for YL/WAS award and had 38 states at last report. Thanks for all the fine reports. Keep 'em coming, fellows. Traffic: (Mar.) W4PJU 630, DRD 249, FPC 166, MSX 133, PZT 112, LMT 91, FJC 87, WS 78, KJ 67, THX 64, HWA 45, FWZ 43, TKD 30, RWM 25, DES 10, WN4TYE 10, W4IM 5, IYT 5, TRP 5, NAK 4, RT 3, AYX 2, CKB 2, SAS 2. (Feb.) W4DRD 219.

WESTERN FLORIDA — SCM, Edward J. Collins, W4MS/RE — SEC: PQW. EC: PLE. GQM qualifies for OO appointment with an error of only 14.4 parts per million PAA, BFD, UCY, PQW, and FHQ meet in a nightly 10-meter round table. DAO is getting more active. MUQ and JPA are returning to the air mobile. PQW is c.d. amateur representative. PAA is fighting new electronic key. WN4UTB and VCB are now W4UTB and W4VCB. RZV has deserted 10 for 75 meters. SZH keeps 28 Mc. hot. AXP is rebuilding. UC is getting the gang ready for 21 Mc. QK is looking at 75 meters. QX is a newcomer to Pensy. So is ISW. VR keeps WCOA going. PTK is working hard on 75-meter mobile. TTM works 28 Mc. VCB has 32V-3 on order. NJB is trying Rockwell modulator. ART, PQW, and MS have 2-meter gear going. OHS is at the U. of Fla. NFN is hot-rodding. GPH is going 2 meters. NOX keeps the key busy. ROM still is fighting Yankees. FDL is on 14-Mc. 'phone. Traffic: W4AXP 32, MS 2.

GEORGIA — SCM, James P. Born, jr., W4ZD — New officers of the Amateur Radio Club of Albany are TCI, pres.; KLJ, vice-pres.; AUI, secy-treas.; NLY, act. mgr. K4WAR has a new 14-Mc. beam. He also has worked 104 KZ5s and is believed to be the first Stateside station to work that many KZ5s. EJC has a new p.p. 4-125A final on 3.85-Mc. 'phone and soon will have a kw. final completed for 7 Mc. POI recently visited EGK and his XYL, who now is WN4VKL. OSE, Route Manager, reports the Brass Pounders Net (4BPN) and the Georgia Novice Net (GNN) are doing nicely and traffic is increasing. ACH is the Net Control of the South Georgia Rag Chewers Net, which meets every Sunday at 1400 EST on 3985 kc. NXD now is on 3.85-Mc. 'phone with a new rig. BOC is vacationing in Florida with a new mobile rig. OPS now has his Advanced Class license and is active on 3.85-Mc. 'phone. BIW sends code practice on 3790 kc. every Friday from 1930 to 1935 EST at 7, 10, and 16 w.p.m. The Atlanta Radio Club's hamfest will be held June 8th at Robinson's Tropical Gardens on Paces Ferry Road on the banks of the Chattahooche River. A National HRO-50-T receiver will be given to some lucky attendant. Members of any net in Georgia are eligible for membership in the Georgia Cracker Radio Club. Any net member interested, please contact the Club secretary, NS, 129 North Candler St., Decatur, Ga. Traffic: K4WAR 1512, W4FBH 132, ACH 126, EJC 52, ZD 41, OSE 34, NS 32, POI 23, MTS 8.

WEST INDIES — SCM, William Werner, KP4DJ — SEC: ES. KV4AU, KP4PT, and ZK joined the AREC. KH6PO now is KP4RP. RK and AQ received Advanced Class licenses. CY has been appointed NCS of 10-meter AREC Net which meets Fridays at 8 P.M. on 28.8 Mc. RA, appointed Assistant EC for 10-meter organization in the San Juan district, also accepted duty as c.d. radio officer. New officers of PRARC are CB, pres.; CN, vice-pres.; DV, secy.; BV, treas.; CI, CO, DJ, HZ, and KD, directors. HN has new four-element 6-meter beam and auto-keying 50-watt transmitter. KV4AU reports to the Southeastern Area Net nightly. RD has a new Viking. WP4s request KP4 QSOs on 3735 kc. CI is using 136-ft. Windom on all bands. HX is building a kw. to keep skeds with his family in the States. JM and DU are leaving for Brazil. AK and OD moved to new QTHs. AREC net attendance continues to increase, averaging 15 stations each session. KV4AI has a Viking transmitter. KV4AE is on 3.5 and 7 Mc. with 20 watts and "V" antennas. KV4AX is on 14-Mc. c.w. with 40 watts. Please return Red Cross Disaster Communications Service application forms. Traffic: KP4DJ 20, OD 8.

CANAL ZONE — SCM, Everett R. Kimmel, KZ5AW — Although busy with EC duties and a dry-run Field Day, NM still found time to run 400 contacts and a score of 42,330 in the 'phone section of the ARRL DX Contest. The Crossroads Radio Club on the Atlantic side has a regular spot in each meeting for QRM reports, at which time direct corrective action is taken, usually the reporter and reportee teaming up to iron out the problem. When the XYL of Fisherman John, FJ, received her new call, CN, she was promptly nicknamed "Catfish Nelly." FJ and CN make the seventh OM-XYL team. Galapagos Islander HC8GI, with an infected leg, was able to consult directly with a medico in the Canal Zone, via WA and a 'phone patch. Newly-painted, spotless KZ5AA (AC5AA) is open for traffic, mostly 14-Mc. 'phone from 0600 to 2300. Traffic: KZ5AA 562.

SOUTHWESTERN DIVISION

LOS ANGELES — SCM, Samuel A. Greenlee, W6ESR — SEC: KSX. PAM: PIB. RMs: FYW and GJP. Section traffic nets: Monday through Friday — c.w.: So.

(*Continued on page 102*)

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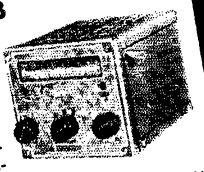
FIRST with the NEWEST for PEAK PERFORMANCE!

New SONAR 3-BAND RECEIVER Model MR-3



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Covers 75, 20 and 10 meters. Stages: 12AT7 grounded grid R. F., B. F. O.; 6U8 osc.-mixer; 2-6CB6 I. F. stages (6-7kc); 6AL5 2det., N. L.; 6AT6 audio; 6AQ5 audio (4.5 watts); OB2 voltage regulator. Sensitivity: 1 microvolt. A. N. L. and B. F. O. push button operated. Requires 250 volts at 80 Ma. D. C. Supplied with tubes, but less power supply and speaker. **89.95**

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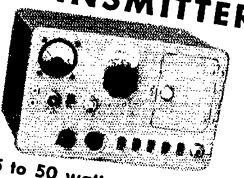

35 to 50 watts multi-band "Commander" Transmitter

Famous GONSET brings you a 35 watts phone, 50 watts C.W. transmitter measuring only 5⅜" high, 8⅛" wide, 7⅛" deep! Small enough for under-dash mounting in your car! Features: 1.7 to 54 Mc., continuous frequency range, matching to any antenna! Requires 300 volts D. C. at 200-235 Ma. and 6.3 volts at 3.15 amps. Complete with tubes and coils for 10-11, 15, 20, 40, 75 and 80 mtrs. **124.50**

New MORROW 2 and 3 Band Mobile Converter

Features full-width illuminated dial, built-in automatic noise limiter, 3-gang 20-1 ratio tuning condenser, separate isolated coils for each band and stage, single-point tuning: high image rejection, birdies negligible, antenna trimmer on front panel, low drift precalibrated oscillator, AVC on preselector for no strong signal blocking. I.F. output frequency 1525 Kc. Gray hammertone finish. Complete with instructions for easy installation with any auto receiver.

2BR, 10 & 75 meters..... **53.85**
3BR, 10, 20 & 75 meters..... **63.75**

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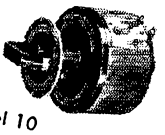
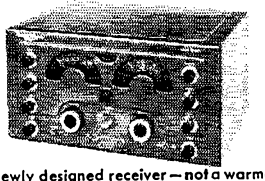


Model 10

This compact unit is actually a variable transformer rated at 150 watts capacity! Input voltage of 120 volts 60 cycles smoothly delivers 0-132 volts continuously variable. Only 3" diameter, 2⅛" deep and mounts like any rheostat. **8.50**

TERMINAL has the most complete stock of POWERSTAT in New York! Check with TERMINAL for POWERSTAT answers to your variable AC voltage control problems.

New NATIONAL NC-183D RECEIVER



A newly designed receiver — not a warmed-over version of the famous NC-183! New-type miniature tubes in the R. F. and I. F. circuits for improved sensitivity and selectivity. Dual conversion I. F. System, with a 1720 Kc. first conversion frequency, gives sharp selectivity similar to the HRO-50-T1. Fully adjustable automatic noise limiter, amplified and delayed A. V. C., and instant band change. The finest communications receiver at anywhere near this price. **369.50**

SPEAKER, 16.00
NBFM-83-50, 17.00
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New HY-LITE

Well-known 2 and 3 element HY-LITE Beams are now available for 15 meters. Can also be supplied in combination with either a 10 or 20 meter or 2 or 3 element beam.

2E15T (illustrated) 45.50
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New FREQUENCY ASSIGNED FOR MODEL RADIO CONTROL!

(Effective March 24, 1952, the frequency of 27.255 mc. has been assigned for radio control of objects or devices. The tolerance is .04%.)

PETERSEN CRYSTAL, Type Z-9

9085KC with high 3rd Harmonic output at 27.255 mc. This holder is similar to the Ham Crystal and will fit a Loctal socket or the proper Crystal socket. **4.90**

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Calif. Net (SCN), 3600 kc. at 2030 (first session, outgoing traffic 1915). El Capitan Net (ECN), 3655 kc. at 1930. BPL this month was made by KYV, HK, ESR/6, GJP, and NCP. The Inglewood Club ran the message center at the L.A. Hobby Show. No "rubber-stamp" messages were accepted, hence all traffic originated was well accepted by all the nets. Special credit goes to SCQ and RL and the teletype boys for their fine display; also to the gals of the YLRC for their fine work. A low bow to HQX, at Camp Pendleton, for his grand help in moving Pacific traffic. A new reporter this month is HK. Although all his traffic is APO and handled on 'phone, Frank is an FB c.w. operator. NCP reports that while in contact with AK1AA in Alaska he received a telephone request for information on long-lost relatives there. It was patched through within 20 seconds! FMG and HK sent information on MCAN/4 (HQX, NCS) on 3905 kc. This net handles APO traffic direct and operates daily from 11:30 A.M. BLY reports: CQQ has a new Viking; FGC now is s.s.s.c.; CEA's little 5-watt mobile sounds like a kw. YUY has new 144-Mc. converter and EXB is "a-comin' down the mountain" (changing QTH). OHX is busy with skeds on 'phone and c.w. K6EA says he has Extra Class license, that the LB Club will use his call on Field Day (GAU, chairman); and that he is all set for 15 meters. BHG got a taste of C.L. traffic and is straining at the leash. PIB is a millionaire (in penicillin units after virus infection). We regret to report the resignation of CE as RM. New Manager for SCN is GJP. DTY is changing jobs so he can do more hamming! COF invites the swallows to try out his new beam en route to Capistrano. GEB got Extra Class license. Rebuilding: LDR, COZ, and MVF. IDU reports a new emergency net, the Mobileers, on 29,456 Mc., which sometimes has a fox-hunt as a drill (new switch?); that DYU has vertical on 75 meters, CEV is 75-meter mobile. WN6MWA is active on 2 meters and CEV, DYU, and IDU now are Advanced Class. FYW (RM) says ECN is working FB on new frequency. You fellows who prefer a moderate-speed traffic net, try ECN, you'll like it. CIX is completing a new frequency standard. YLRC notes: WSV reports very red faces when some OMs (with names mistaken for YLs) receive invitations to attend YLRC doings. KYV received a special citation from high Signal Corps brass for his FB Pacific traffic-handling. MU is QRL — dentists. GJP is building new "3-qt. rig" (100 proof?). Thanks also to BUK, CFL, EBK, EPL, GKM, KQS, MVF, WOO, and WN6NJU for their reports. AREC notes per KSX. SEC: The Val Area Net has decided to split to three separate nets each to coördinate with the other. They are: Glen Area (ZGZ); Burbank Emergency (GSD); and West Valley (ZPS). VCU did a bang-up job as EC of Val Area. BLY and DCB now are Asst. SECs. Crescent Bay is going great guns under FPD. The San Bernardino C.D. pulled a surprise drill with FB results, according to EC HKD. New EC for Santa Barbara is ZSM. The Red Cross station, HGV (CSS,EC) was in a parade during the recent plasma drive. A decorated truck, M/M equipped, staged a successful communications demonstration. Traffic: W6KYV 5614, HK 4247, GJP 382, ESR/6 311, NCP 304, FMG 209, HLZ 118, DDE/FAE 92, BLY 82, BHG 61, PMS 51, K6EA 48, W6OHX 46, PIB 39, CMN 32, HOV 32, IZO 26, CE 22, FYW 21, DTY 20, ESR 16, FE 16, COF 12, WOO 5, KSX 4, GEB 3, LDR 2.

ARIZONA — SCM, Jim Kennedy, W7MID — LBN, formerly of Phoenix, reports from Cherbourg, France, with a nifty call, F7AY, while his mom, Inez, keeps the home fires burning with her rig on the 3.5-Mc. Novice band. A new call in Phoenix is QZP, on 7-, 14- and 28-Mc. 'phone and c.w. with an 807. QJV, of Prescott, after 17 days as a Novice, got his General Class ticket, and is on 7 Mc. UKK got his 2nd-class radiotelephone ticket at St. Johns. OWL and MNU, of the same town, are QRL with school work. PZ is hard at it for his DXCC, with 105 countries worked and 87 confirmed. PKU got his 25-w.p.m. sticker and checks into six different nets on 'phone and c.w. MLL runs slow-speed code practice on 3515 kc. at 7 P.M. Mon., Wed., and Fri. K7NRZ and 7BH are the traffic mainstays on c.w. for the Phoenix Area. Anyone interested in 2 meters in Phoenix? KTJ, OZP, K7NRZ, KYE, MID, and others are on 2 meters at present, with others expressing plans. Traffic: (Mar.) W7BH 145, PKU 37. (Feb.) W7PKU 89, PZ 2.

SAN DIEGO — SCM, Mrs. Ellen White, W6YYM — Asst. SCMs: Shelley E. Trotter, 6BAM; Richard E. Huddleston, 6DLN; Thomas H. Wells, 6EWU. RM: IZG. ECs: DEY and IOK. Because of illness our SEC, NBJ, has been forced to resign. The post is open to any qualified amateur in the section. Any suggestions for a new SEC should be forwarded to your SCM. New appointees: ORS: BKZ and TET. OES: LWT. OO: 9OYJ/6. OBS: BKZ. IZG reports considerable activity on SSN by TET, GTC, BAM, KFO, IZO, OHX, FCT, IYG, and W7s PKO, BII, FMG, and NDJ. BAM now is keeping skeds with 3CUL as K4WAR is unable to carry so many skeds. Two more new YLs in the San Diego Area are IYU and WN6MVV. VJT's XYL. Any YL interested in participating in the 80-meter Wednesday night net is urged to call in on Wednesday nights. LWT is currently operating on 10,000 megs. and is thinking of trying pulse-position modulation. The ham radio bug is biting DVJ's mother! The section is glad to hear FTC is back on the air. The Orange County Amateur Radio Club is sponsoring a class in code and theory which began April 2nd at 7:00 P.M. at the Santa Ana Junior College. Traffic: W6IIQX 2199, BAM 979, ELQ 534, GTC 34, FCT 8, BKZ 3, DVJ 2.

WEST GULF DIVISION

NORTHERN TEXAS — SCM, William A. Green, W5BKH — Asst. SCM, Joe G. Buch, 5CDU. SEC: JQD. RM: QHI. PAM: IWQ. Appointments as OPS were made to IWQ, PAK, and SGR. A new ANCS for NWTEN is PXI, who is relieving IWQ. During the Arkansas storm emergency QHI did a fine job of liaison between the disaster area and various section nets, making BPL in the process. The Tex/Ok Traffic Net was standing by to render all aid possible to the Arkansas and Alabama emergency nets. 1EZ, EC for Dallas, is making preparations for participation in the Alert America Convoy. Congratulations to EBW, the new MARS director. The Abilene ARC elected FOQ, SQW, and UFP as president, vice-president, and secretary, respectively. The Pampa ARC soon will have a Viking transmitter. The Amarillo ARC enjoyed a ladies' night. HCH lost his home and equipment in a fire. QFK has worked 7 states on 160-meter mobile. IJC and HCH now hold Extra Class licenses. VIM was heard in Bombay on 73. New equipment department: UIJ has a 813 rig, BFF a new rig, TLW a 10-meter mobile, PYQ a 75-meter mobile, QHI a 600-watt amplifier to go with the 75-meter vertical, and SRQ an SX-71. TYV and TKZ have been promoted from Novice to Conditional Class. WN5TXB has 31 states confirmed with 475 contacts. Traffic: (Mar.) W5QHI 1054, PAK 231, BKH 164, ARK 113, RRM 54, ASA 47, SQW 47, JOG 46, JQD 45, IWQ 42, CWE 40, RHP 32, GZH 31, SGR 31, PCN 30, LEZ 26, TLW 26, TFB 23, KPB 18, UTW 16, IBD 9, ROH 6, SRQ 6, WN5TXB 6, UFP 6, W5PYQ 5.

OKLAHOMA — SCM, Jesse M. Langford, W5GVV — SEC: AGM. RM: OQD. PAMs: GZK and ATJ. ROZ operated portable at the Annual Rattlesnake Hunt at Okeene. The Bartlesville Emergency 'Phone Net celebrated its first anniversary and invites anyone who can, to check in each Saturday at 1330 on 3860 kc. RIT operated portable at Camp Polk during the maneuvers. SLC moved to get away from TVI and landed in the midst of neon signs. TKC is on 1.9-Mc. 'phone. TMY has 1.9-Mc. AREC net well under way. GGK gave a talk on mobile converters. PAA is being used by the students at Arco Center to keep in touch with their homes. WN5VEO is a new Novice in Holdenville. PGN has acquired a new Panadaptor and NVD has a new HRO-50T. The Pioneer Radio Club is offering a complete transmitter in the Novice Contest. GZK represented the Oklahoma section at the Northeast Texas Picnic held at Commerce April 20th. FJ now is working in Houston. PA has been in Canada taking care of company business. FOC and OQD were busy getting organized for the Easter Pageant traffic from the Lawton-Fort Sill Area. FKL and QXL are expecting new assignments soon. PDD and PDC have moved to Dumas, Tex. Gang, how about sending in a little news from your section? Traffic: W5ROZ 522, MRK 422, OQD 149, GZK 141, FOM 139, MQI 104, JHA 62, SWJ 51, NOV 44, MFX 41, RIT/5 34, GVV 33, PHR32, KY 18, ADC 15, EHC 15, FKL 15, ESB 11, CKQ 7.

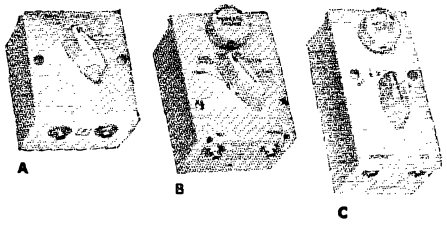
SOUTHERN TEXAS — SCM, Dr. Charles Fermaglich, W5FJF — RVE is working all bands with 150 watts fixed and 12 watts mobile. RSJ is working 80-meter c.w. DX and RN-5, and has 1 kw. to a pair of 813s. QOF is working 7 and 28 Mc. RGA, now in the Navy, can be heard from W7QXU. FJF claims the DX record for Southern Texas on 75-meter mobile — 1500 miles S8-9. STG is a student at U. of T. and has 450 watts on 80 to 10 meters and 25 watts on 10- and 11-meter mobile. KFY reports: TPP is going to town on a new 10-meter mobile converter. WN5TQU, San Antonio, is blind and is enjoying ham radio. KFY donated his ninth pint of blood to the Red Cross blood bank. TTW works 40- and 80-meter c.w. DSB reports: Mar. 19th fair opening to Houston on 2 meters, then on the morning of Mar. 20th WN5TFW, Port Neches, worked MWW in New Boston for a pretty good hop. ONS, from Victoria, came pounding into Beaumont Mar. 28th along with the Houston boys, and Houston came in again on the 29th. PMM, NZX, and TAF are coming through FB. WN5UVB is on 144 Mc. with 522 and five-element beam. WN5TOL is a new member of the Novice Emergency Net of Tex. which meets at 1900 on 3706 kc. AQE is active in OLZ, NTX, and STEN and reports the Winkler County ARC purchased a grid-dip meter. The Club plans to join the Odessa Club in the Field Day activity. MN has early-morning sked with ØTQD, 3CUL, ØQXO, and 5PTV. KBP, of El Paso, reports that he and GI, and EC, and the El Paso hams are in favor of RACES; also that the EPEN meets on 29,640 kc. every Monday at 7 P.M. MST and recently added 29,620 and 29,600 kc. as alternate frequencies. FXN has 146 worked and 134 confirmed. BDT/AXY and ONS made the grade on 220 Mc. WN5TGJ reports a new club — the Allen Academy Radio Club. The Club has a BC-348 and a 6L6 with 20 watts on 80-meter c.w. W5MRR is sponsoring the Club with Mr. Jenkins, and officers are WN5TGJ, pres.; Bizet, vice-pres.; M.F. Williamson, secy.; R. N. McManus, treas.; F. Odom, sgt. at arms. RN5 really is going to town. OGU is a communications officer in TSGRC. TGE is VFO on 80 to 10 meters. TQQ is mobile on 28 Mc. up in Austin.

(Continued on page 104)

LOOK STEINBERGS LOOK

SUPER SPECIALS

JACK BOXES



(A) BC-345. 3½" x 3" 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-position 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¢

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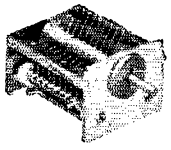
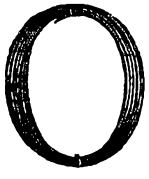


75 mmf. 4250 peak voltage, ceramic button insulation, adjustable spacing straight-line capacity, precision construction, 3¼" long, 1¾" wide, shaft ¼" x 1", adjustable tension, double-bearing..... **89¢**

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". A one-time buy. **$1.95**



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Under-dash Mobile Xmtr.

VFO or Crystal control. Direct-reading VFO on all bands—75, 20, 11, 10. • Plate modulation • Completely band-switching, fone or CW. • 50 Watts max. input. Power required: 300–500 V.D.C. at 250 ma., 6.3 V AC or DC at 4.5A. • Uses 3-6AG5, 6AR5, 6C4, 12AU7, 2-6L6G, 807, (included). • Only 7½" x 7½" x 12", 14½ lbs.

For carbon mike input..... **$139.00**
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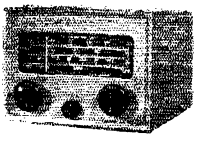

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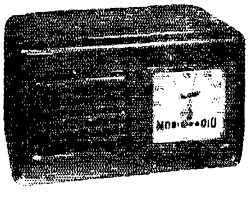

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73, Jule Burnett, W8WHE

QZG has a new 400-watt transmitter on all bands. W5TNR has 120 watts on 80 meters with ECO. LWN now is in Victoria operating 75-meter mobile and building p.p. 813 for 75 meters. ONG bought a new TV set so he has to TVI-proof his rig. ONS really goes in for 2 and 6 meters with 500 watts. Your SCM recently visited GYP and OUT. PTV reports activity in the South Texas Traffic Net is increasing every day. WN5ULN and W5PZG are new hams in Texas City. PZG runs a gallon on 75 meters and usually works his brother, QIU, in Beaumont, each A.M. just above 3900 kc. Traffic: (Mar.) W5MN 507, PTV 406, QFA 165, RTT 129, QDX 98, W4RZU/5 53, W5IZB 31, QEM 25, PZS 20, AQE 3. (Feb.) W5PTV 504, QDX 127, QFA 84, RTT 84, QEM 60, PZS 58, CPG 52, IZB 41, QGU 24.

NEW MEXICO — SCM, Robert W. Freyman, W5NXE — SEC: PLK. RM: NKG. PAM: BIW. PAM v.h.f.: FAG. State 'phone net, 6:00 P.M., 3838 kc., Tues. and Thurs. 3838 kc., 8:00 A.M., Sun. State c.w. net, 3633 kc., 7:00 P.M., Mon. through Fri. The New Mexico State Picnic was held June 1st, 17 miles north of Mountainair. The Los Alamos Radio Club donated an SX-24 to the New Mexico Boys' Ranch Radio Club. NXF has received his first endorsement for 100 contacts for Sandia Friendship award. FPB has endorsement for 75 and is going for 100. Good work, fellows. QIT is leaving Albuquerque for sea duty. KWP and MYI are working on 6-meter gear. FAG is back on 2 meters in Albuquerque and negotiating for 2-meter remote relay station on top of Sandia Mountain. RMK has an 813 ready to go, 80 through 10 meters. The SCM, SEC, PAM, and editor of *CQ NM* all attended the organizational meeting of the Pecos Valley Amateur Radio Club in Roswell. The turnout of the active amateurs in the southeastern corner of the State was excellent. We expect to hear more from the Pecos Valley on Field Day. BIW has completed his portable 1625 rig. JZT is a new ORS. Eleven hams took the Extra Class exam in Albuquerque, including CA, CTG, NXE, and NZT. CU is at Mountainair. Traffic: W5NXE 97, NKG 82, PLK 65, IGO 57, ZU 49, JZT 18, NZT 11.

CANADA
MARITIME DIVISION

MARITIME — SCM, A. M. Crowell, VE1DQ — SEC FQ. EC: EK. RM: OM. The present trend in this area is toward 75-meter mobile 'phone. Among those quite active are GL, BC, FQ, AW, TA, ET, and DQ. Recently active on 3.7 and 3.8 Mc. from home stations are SV, ADA, DG, HT, RR, GO, XR, SI, and AH, who formerly was active on 28-Mc. 'phone as VV. NO sold his TV-12 rig. HC is active in AFARS and has been giving a lot of time to c.w. lately. PT and ME also are quite active in the AFARS 'phone net. VE2AEG/1 has returned to his home QTH after a whirl at low-power portable while attending a course in this section. EK would like to hear from all interested in emergency work, with or without gear. HO is the call of the Naval Amateur Radio Club at Cornwallis. The boys are on A-1 and A-3 with 400 watts to a pair of 4-125As mostly on 14 Mc. The *FARC Bull* reports that the FARC has accepted the offer of the local Boy Scout Troop of the use of club rooms in the Legion Scout Headquarters. ZK is a new club member. WL is a new OES. OM reports conditions very poor in March. Traffic: (Mar.) VE1YV 180, AL 117, OM 64, MK 58, AAK 29, ZM 20, ZO 20, ABJ 12, FR 8, ZB 8, AAN 7, HT 7, AAL 6, PS 6, AB 5, JA 5, XA 5, XH 5, ZE 5. (Feb.) VE1HO 218. (Jan.) VE1HO 229.

ONTARIO DIVISION

ONTARIO — SCM, G. Eric Farquhar, VE3IA — With regret we report the resignation as Asst. SCM ('phone) of FQ, because of the pressure of business. Earl, during his four years of service, gave much time and thought to the game and we certainly hope his absence will be of short duration. New officers of the Mohawk Amateur Radio Society are BBV, pres.; BOW, vice-pres.; BGT, secy.; BIK, act. mgr. Quinte ARC has over 50 per cent ARRL membership! The Florida sun certainly agrees with NN. Kingston Amateur Radio Club officials are CAQ, pres.; CAV, vice-pres.; BCK, manager; AXK, secy. The Ontario section net battles conditions. Those attending regularly are ATE, ATR, SG, WY, DU, BME, BMG, EAM, BUR, GI, BL, BOZ, OD, EAU, BVR, and BIU. From the Dept. of Transport the following changes are recorded: Effective April 1st, the portion of the 14-Mc. band between 14,350 and 14,400 kc. is withdrawn. Effective May 1st the new band 21,000 to 21,450 kc. is authorized. The Brantford gang is very active on 144 Mc. and has one mobile and fourteen fixed stations active. The March meeting of the Kitchener-Waterloo Radio Club was well attended. BGD gave an excellent technical discussion regarding i.f. band-width requirements in communications receivers. W1DX, Asst. Technical Editor of *QST*, was a most welcome visitor to the Hamilton Amateur Radio Club special meeting held during the latter part of March. By, on this his second visit to Hamilton, renewed old acquaintances and met many newcomers. His talk on "Modulation Systems" and answers to numerous problems were greatly appreciated. Thanks are extended to XZ, who made the place of meeting possible. Traffic: (Mar.) VE3ATR 157, BUR 111, IA 104, BJV 61,

(Continued on page 106)

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437	2⅛	x 4	x 1⅝	.72
438	2¼	x 4	x 2¼	.95
439	2¼	x 5	x 2¼	.98
441	3	x 5¼	x 2⅛	1.05
440	4	x 5	x 3	1.08
442	5	x 6	x 4	1.33
443	5	x 7	x 3	1.49
447	5	x 17	x 4	3.75
444	6	x 8	x 3½	2.18
445	6	x 10	x 3½	2.69
446	7	x 12	x 4	3.19

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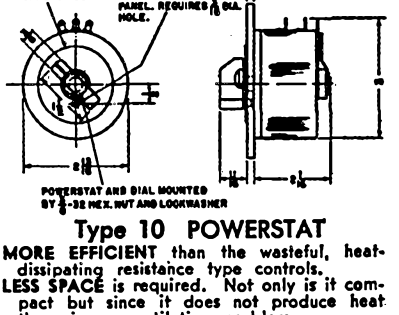

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A-3109	PP2A3, 6A3, 6B4, 6L6, 45, 46, 59	6000 c.t. 3800 c.t. 3000 c.t.	5000-8000 10000	80	100	25	3¼	2⅝	2¾	5.00
A-3110	PP6L6, 807, RK41, HY56, HY61, HK24	6600-3800 c.t.	4000-5000 7500-10000 12000	175	150	60	4¼	3½	3¾	8.53
A-3113	PP-800, 809, TZ-40, T-55, HK-54, RK-31, HY-40, 811, 807, 812	15000-6900 c.t.	3000-4000 5000-6000	250	300	175	4⅝	3¹³⁄₁₆	5⅝	12.94

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⅝	½	.062	.23
¾	⅝	.062	.29
1	⅞	.062	.38
1½	1¼	.125	1.13
2	1¾	.125	1.50

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⅜	.21	1½	3.30
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DGZ 48, WY 24, DBJ 13, KM 12, SG 12, EAU 8, VJ AUU 3, DFE 3. (Feb.) VE3AHA 62, DGZ 61, BL 45, BMG 34, BER 32, PH 9, AUU 8. (Dec.) VE3BJV 97.

QUEBEC DIVISION

QUEBEC — SCM, Gordon A. Lynn, VE2GL — BB has new Clapp oscillator into BC-457 into new dipole on 3.5-Mc. c.w. LO has new preamplifier on his CSR2 receiver bringing in plenty of stations. CA reports a very quiet month because of poor conditions to the north on 14 Mc., with Phyl missing her sked five times. AQO is ex-VE3AIQ and has 150 watts on 7-Mc. c.w. from Valois. BK has the new mobile rig about completed and will be operating for Field Day. PQN continues to function although traffic is very light. LO, AKJ, and CD are the most regular attendants. The Radio Inspector's office requests that amateurs desiring interviews re licensing, alterations, or examinations, make appointments before proceeding to the office in order to avoid disappointments, as the inspector who handles this phase of the work may be absent from the office on inspection duties. Reports this month are at their extreme low in numbers. Once again you are requested to send you rreports of activities to the SCM for this column. Traffic: VE2CA 48, CD 47, GL 24, LO 8, AKJ 5.

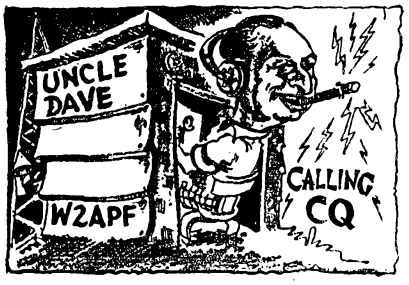
VANALTA DIVISION

ALBERTA — SCM, Sydney T. Jones, VE6MJ — May I express my appreciation for the privilege of serving you as your SCM for another term. HM still keeps skeds with the boys in the Arctic and is handling a fair amount of traffic. EH has moved to a new house and is QRL building a super ham shack in the basement. LQ has moved to temporary QTH and expects to build a new house. DT is in charge of civil defense communications for Stony Plain Area. OD suggests that we contact the weather man or, better still, the sunspot man and have him arrange better conditions. FF has made weekly trips to Edmonton to visit his sick father and has given his mobile rig a good workout en route. TW gave a very interesting talk on high-fidelity systems at the NARC meeting. The Medicine Hat Club installed the following new officers: JF, pres.; ZP, secy.; ES, treas. NA's suggestion re lining up the western nets on one frequency has merit. Has anyone other suggestions? LG visited Vancouver for a conference with Army officials re summer camp. MJ has built a Select-O-Ject which helps out in the QRM. Traffic: VE6HM 156, OD38, MJ 30.

BRITISH COLUMBIA — SCM, Wilf Moorhouse, VE7US — ALJ sent a report re the c.d. meeting at Abbotsford. C.d. sub-committee chairmen are AFA, AFB, JX, YI, and DZ. AA is rebuilding. The AREC gang still is very active on 3755 kc. DD acts as M.C. over ARARS Net on 4290 kc. A c.d. bulletin is in press re amateur participation in c.d. links. PO has been active with the c.d. planners in Victoria. LP/7 now is established in Nanaimo. AMH, ARD, and AIJ joined AREC. AMH and AHV now are Class A. The 21-Mc. band probably will cause TVI in fringe areas. US is chasing bugs in his new rig to try to remove all harmonics. ASA is on 40 Mc. but with spotty results. DH has a better signal lately. Mobiles is the subject of controversy to be handled by the CGM. VO is chasing ZS on 75 meters. JB is on nets. FB is busy with VARC and BCARA. BJ still is on 5PX Net. GR is heard again on 75-meter 'phone. AREC hams now are re-registered with c.d., RCMP, AFARS, Red Cross, etc. Active stations are listed separately from "supporting" members. Mobiles are expected to be in full operation and under an AREC plan soon. QC revises AREC lists to eliminate all deadwood calls. AIO's call has been changed to YM. AQS is wandering around the Queen Charlotte Islands. ACC got himself a ZL contact on an otherwise dead 40-meter band. LD is active again with a very FB fist. The new QTH of QZ is Pt. McNeil. Traffic: VE7QC 45, AA 34, US 30, DH 14, AOB 13, AIO 2, CX 2.

PRAIRIE DIVISION

SASKATCHEWAN — SCM, Harold R. Horn, VE5HR — The second civil defense amateur communications drill from Fort Qu'Appelle was held and in spite of poor conditions was a success. Considerable traffic was handled, and our thanks to OF for his good work at the controls of his station. KL was on hand and gave valuable assistance. 6MJ did an FB job of QSP when local conditions were difficult. BZ (SEC) shows good progress throughout the section in his report, and is holding drills of stations operating on other than commercial a.c. mains. Don't forget the hamfest at Regina. Further particulars under Hamfest Calendar. When this reaches print, a number of you either will be on or trying to get on 21 Mc. OC has been chasing DX and in a 10-hour 6-minute period worked 17 different stations to make WAC twice and one short for the third. Anyone beat that record? PJ is boosting power to 250 watts. VL passed the exam for 'phone and is heard on 75 meters. DI migrated to 75 meters after a number of years elsewhere. Has your appointment been endorsed up to date? If not, please send it along. See you in Regina at the hamfest. Traffic: VE5TE 49, OF/p 45, HR 40, YF 38, GO 3.



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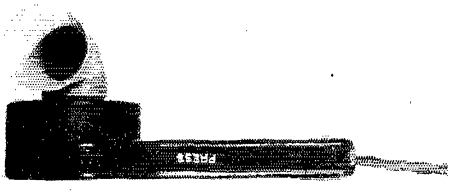
Hallicrafters S-81 & 82	49.50
Eldico 2 meter receiver kit	59.95



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Capacity 10-75 mmfd. .100" spacing, dimensions 3¾ D x 2¼ H x 2¾ W. Each	1.20
Capacity 4-50 mmfd. .100" spacing, dimensions 3¼ D x 2¼ H x 2¾ W. Each	1.20
Capacity 10 mmfd. .020" spacing, dimensions ¾ D x 1¼ H x 1¼ W. Each.	.70
Capacity 25 mmfd. per sec. .020" butterfly, dimensions 1¾ D x 1⅝ H x 1⅝ W. Each	1.35
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4, 5, and 6 pin ceramic sockets made by E. F. Johnson. Each	.20
GE plate circuit relays, 8000 ohm, DPDT, contacts close at 8 ma. Each	1.95
2 mfd. 1000 V oil cond. Each	2.95
2 mfd. 2000 V oil cond. Each	5.95
4 mfd. 3000 V oil cond. Each	9.95

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Collins 32V3 Transmitter less mike or crystal	$775.00
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Harvey-Wells Bandmaster DeLuxe	137.50
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B-129 10 meter transmitter	29.95
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A-140 mobile CAP transmitter	29.95
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Gonset Tri-Band	47.50
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Grid Dip Meters	
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National HRO5 with power supply, ABCDEF coils 100 KC, calibrator and NBFM adaptor	215.00
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Beat-Frequency Exciter

(Continued from page 13)

requisite for satisfactory break-in operation. Keying of the mixer stage accomplishes the desired result.

The 6BE6 converter tubes present substantially constant loading to the variable oscillator. To preserve this condition, cathode keying cannot be employed. However, the tube design is such that Miller effect with changes in space current is negligible. Thus, interruption of the plate and screen supply offers an excellent, if somewhat unorthodox, method of keying.[3] The electrical circuit can be traced back from the key in Fig. 1. Shaping on both "make" and "break" is provided, with greater emphasis on the "break" characteristic. This gives the type of keying generally accepted as most desirable. The larger-than-usual (0.1 μfd.) plate and screen by-pass condensers, as well as the plate decoupling and screen-dropping resistors, are all part of the shaping network. The "make" lag is introduced in the screen lead through L_6, which is the primary of a replacement-type 50L6 output transformer. Where the 6AQ5-6L6 output section of Fig. 2 is used, the screen of the 6AQ5 is connected to the key circuit as indicated. This is a further safeguard against the presence of residual key-up signal.

Tuning Up

With both oscillators on, and plate and screen voltage applied to the mixer, set the variable oscillator on 3000 kc. with the aid of a receiver. Now tune the receiver to 3500 kc. The desired beat should be clearly audible. Next adjust the mixer tuning condenser to give maximum signal strength. Repeat this procedure, setting the variable oscillator at 2650 kc., and tuning in the beat at 3850 kc. This establishes basic tuning ranges on the oscillator and mixer dials.

Now, connect the mixer output to the stage to be driven and make the necessary adjustments in the mixer tuning to show maximum drive, as indicated by the plate milliammeter of the driven stage.

The next step is to adjust the variable-oscillator coupling condenser, C_{15}, to the minimum value necessary to maintain full drive from the mixer. The plate tank circuit of the crystal oscillator should be detuned in like manner. Since the 6BE6s drive very easily, there is no object in overdriving; in fact, undesirable interaction could result if the drive were excessive.

The unit is now ready for final calibration and installation. In operation, the procedure is to set the oscillator tuning dial first and then trim up the mixer tuning as required to give necessary output. If the output section of Fig. 2 is used, the bandpass coupler is adjusted by varying the settings of C_1 and C_2 until fairly uniform drive

(Continued on page 110)

[3] Since this places the "hot" side of the key at 150 volts above ground, a keying relay is recommended as a safety measure — *Ed.*

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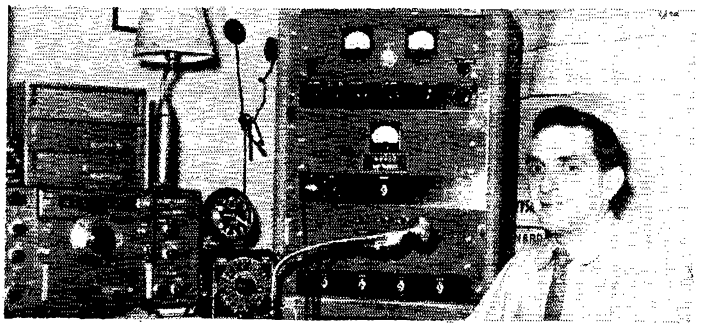

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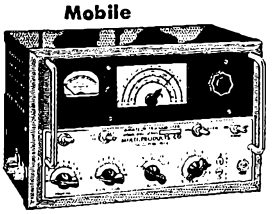

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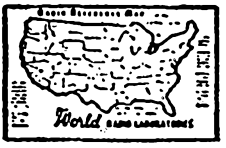

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over the 3500–3850 kc. band is secured. Oscillator tuning and output controls in this case are the only ones requiring adjustment for QSY. To "zero in" on a station to be called, switch S_1 applies just enough voltage to the keyed circuit to provide a usable signal in the home-station receiver.

To maintain the keying characteristic through following transmitter stages, it will be necessary to observe two precautions. (1) In stages where fixed bias is used, the amount of this bias should be just sufficient to cut off plate current. Additional operating bias should be secured through grid resistance. (2) Adequate drive must be provided for each stage.

Miscellaneous Notes

While the special problems of c.w. operation make the heterodyne exciter especially attractive in this field, it is equally adaptable to 'phone work. To cover the 75-meter 'phone band, a 6850-kc. crystal must be substituted for the 6500-kc. one used for c.w. The 'phone band will be covered in the 2850 to 3000-kc. range of the variable oscillator. The reason for doing this is to prevent interference from the difference beat between the variable-oscillator fourth harmonic and the crystal frequency. This interference would occur within the limits of the 75-meter 'phone band were the 6500-kc. crystal and corresponding variable-oscillator frequencies to be used.

Narrow-band f.m. is readily obtained by connecting any of the standard reactance-tube circuits to the variable-oscillator circuit. An important advantage of the heterodyne unit is that deviation is unaffected by exciter loading. This factor also makes the unit ideally suited for frequency-shift transmission on bands where such operation is authorized. In commercial frequency-shift work, the heterodyne principle has seen wide application.

Since the unit described in the foregoing paragraphs is intended for general coverage, 80-meter fundamental output is provided. It should be pointed out, however, that other oscillator-frequency combinations may be evolved to permit fundamental output on higher- frequency bands. Aside from the stability achieved through such application, it is well to note that at the mixer output, the beat frequency is very nearly pure fundamental, with minimum harmonic content. Here, conceivably, may lie a new avenue of approach to the TVI problem.

Conclusion

A commonly-voiced objection to the beat-frequency system is the apparent complexity of the circuit. But is this complaint justified? However, compared with a conventional VFO rigged to provide zero key-up signal, adequate shaping and negligible loading reaction, merit of the heterodyne exciter takes on new meaning. Why not give the idea a try? Chances are, you'll be agreeably surprised!

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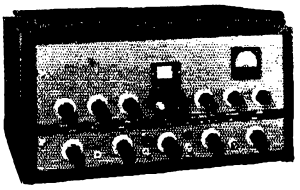

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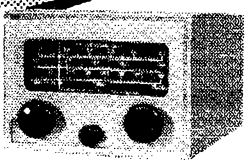

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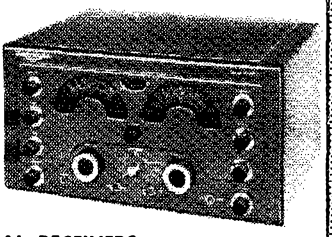

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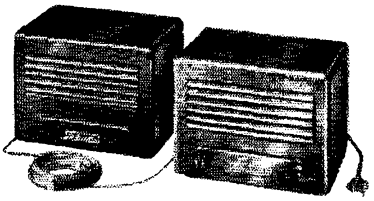

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432-Mc. Converter

(*Continued from page 16*)

A test signal is necessary here, also, as the noise peak in both the mixer and r.f. stages is very broad and hard to find by itself. There is a marked peak in signal strength, however, when these stages are tuned on the nose. They can be peaked on a signal at 434 Mc., after which only a slight readjustment is necessary at either 432 or 436 Mc.

No gain control is shown in the i.f. amplifier, as an i.f. gain control is included in the 50-Mc. converter with which the 432-Mc. job is used.[1] If the 50-Mc. equipment has no gain control, one should be provided in the 6AK5 stage. The overall gain should be set so that the noise just begins to read on the receiver S-meter. The strength of the 432-Mc. signals may then be read in terms of S units over the noise, a useful basis for recording the results of the many kinds of receiver, transmitter and antenna experiments that form so large a part of the present 432-Mc. picture.

A slight improvement in over-all signal-to-noise ratio can be effected by the use of a cascode-type 50-Mc. i.f. amplifier stage in place of the 6AK5 stage shown. This would be more important, however, if no r.f. stage were used ahead of the mixer. Where a properly-working 432-Mc. r.f. stage is used, it will largely determine the noise figure of the entire system. If no r.f. stage is used ahead of the mixer, the noise figure of the system will be roughly equal to the sum of the noise figures of the mixer and the i.f. amplifier following it.

One factor should be emphasized to point out the value of this converter approach to the 432-Mc. receiving problem. Selectivity is all-important in improving the signal-to-noise ratio of any v.h.f. or u.h.f. receiving system. Only by using a completely stable front end is it possible to reduce the passband of the 432-Mc. system to communications receiver proportions. The improvement obtained when one changes to this degree of selectivity from that commonly used in radar-type receivers that cover the 420-Mc. range may amount to many decibels. The best front end in the world is largely wasted if it is followed by an i.f. system that is broader than the minimum necessary to pass intelligible voice signals.

— E. P. T.

Antenna-Mystery Solver

(*Continued from page 27*)

Mac — you're blocking my receiver out here in Kansas — breaking down the door to the shack. How many kw. are you running?" I was back on the air.

Lately, I have tried various lengths of wire, sizes of pipe, a drain pipe, different types of metallic clotheslines, and once I hung an empty garbage can on the end of a test piece of wire (for additional capacity). Some 4 – 0 cable and some

(*Continued on page 114*)

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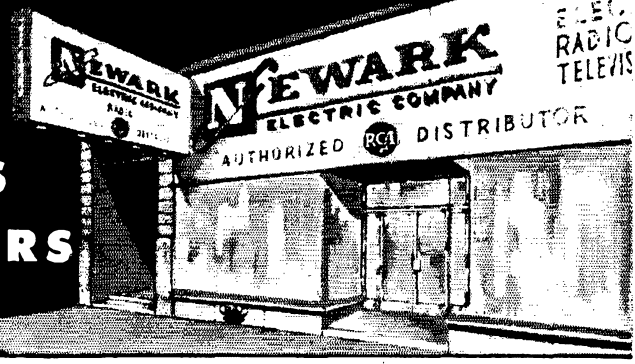

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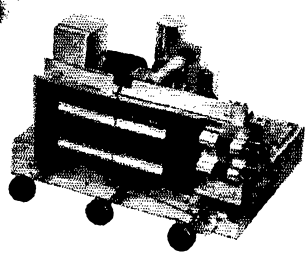

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No. 40 wire were tried and both worked fine. And the same results were obtained on 80, too.

Essentially, the method is an ancient one. All you do is to take any old piece of wire that exhibits capacity to ground (and it will be hard to find one that doesn't) and make it a part of a resonant circuit.

The black-box method is good. One can place it up where the wire begins, and if you have a splashproof case to keep the rain and snow off the coil and condenser, so much the better. Coaxial cable is convenient to feed the thing from any necessary distance, without regard to resonant lengths or insulation problems.[1]

This arrangement is helpful in combatting TVI; and you don't always need an airtight box for the rig to do it. My rig is built on an open chassis and, although it tickles my own TV set about 20 feet from the transmitter, it fails to bother the set next door.

[1] Provided the standing-wave ratio on the line is low. This can be readily checked with any of the several bridges that have been designed for the purpose, and the s.w.r. can be minimized by proper coupling between the link and L_1 (Fig. 1) when the antenna is connected and the circuit is brought to resonance with C_1 — *Ed.*

TVI Front

(Continued from page 44)

power on Channel 4 coincided with time the TVI started. Airline distance from the Channel 4 station to W5CAE is approximately 4½ miles.

I think this has significance especially in the light of your recent correspondence with TV manufacturers. It adds to the proof that component frequencies making up these beats are *not* confined to a small part of the spectrum near a specific TV signal. The poor rejectivity generally encountered in TV sets here indicates they will accept harmful radiations on frequencies practically anywhere in the spectrum. Granted, some TV sets may have a little extra attenuation on frequencies in the broadcast band or the set's intermediate frequency. The possibilities for harmful interference due to *beats alone* are almost limitless.

You probably have read this in less than five minutes. Description of the cause and cure of this one case of TVI sounds simple and straightforward. One might think W5CAE played around with this trouble and got it all fixed up in a few minutes one Sunday morning before Sunday school. He actually battled the thing every spare minute for three months and, of course, denied himself the privilege of operating at will over the same period.

It seems rather futile to pass this type of information around to the amateur without warning him not to fix up a single TV set. If the amateur continues to fix TV sets the manufacturers will never know how inadequate their receivers are. The manufacturer will continue to bask in the sunshine and the amateur will continue to grope in the dark under the yoke of this misinterpreted and misapplied word — *coöperation*. The more nearly the amateur imitates a doormat, the less chance he has of commanding public confidence and respect. The way I see it, this playing doormat is contributing a challenge to his very existence.

— *E. M. Shook, W5IT*

Frequency Standard and Multivibrator

(*Continued from page 41*)

Adjustment

The easiest way to set the multivibrator frequency is to pick two adjacent 100-kc. points on a receiver, using the 100-kc. oscillator. Then turn on S_1 and count the number of signals appearing between the 100-kc. points. Vary R_8 until you have nine signals between the 100-kc. points. The multivibrator is then running at the proper frequency and is locked in with the 100-kc. oscillator.

R_8 will probably take care of any component variations and, once set, will not usually require any further adjustment. If R_8 will not set the multivibrator frequency properly it may be necessary to try slightly different values in place of R_7 and R_9.

The signals from the multivibrator will in most cases be somewhat stronger than those from the 100-kc. oscillator because a multivibrator is very rich in harmonic output.

Because of the difference in signal strength between the 100-kc. oscillator and the multivibrator output, it was decided to use a mixer amplifier to provide output signals of nearly the same strength. And, as mentioned earlier, more isolation for the 100-kc. oscillator was desirable. The first attempt used a 6L7 as the mixer-buffer amplifier. It worked but not as well as we wanted it to. The 6K8, connected as shown in Fig. 1, performed considerably better. The values are not at all critical. The values of grid resistance (R_{10} and R_{11}) were picked to give more gain to the 100-kc. signal than to the 10-kc. signal, to aid in keeping the two signals at nearly the same strength.

The roughly-tuned output circuit is probably not necessary for most applications, but it does aid some in increasing the harmonic strength. It is resonant somewhere near 14 Mc. — the exact frequency is rather unimportant. The inductance is mounted directly across the condenser associated with it. Some users may not find it necessary for their purposes.

Stability Tests

As no audio equipment was available to measure the beat frequencies with any degree of accuracy, it was difficult to check the drift of the unit from a cold start. After a 2-hour warm-up period, the drift was within about 3 cycles for several hours, as checked against WWV. The warm-up time and drift might be further decreased if the unit were built on a larger chassis and the crystal farther removed from all sources of heat and/or an oven was incorporated. For most purposes the added cost and work are not justified.

Another test made on the unit was to determine the effects of line-voltage variations on frequency. The line voltage was raised or lowered 20 volts while having the unit zero beat with

(*Continued on page 118*)

WWV. The result was a rapid flutter for less than ten seconds and then the frequency would return and settle within a cycle or two. This resulted in the omission of a voltage regulator that was originally contemplated.

From these tests it can be seen that the unit is affected much more by temperature changes than by the line-voltage variations. The standard has proven very satisfactory for band-edge operation and for calibration purposes. It has been in operation for several months, and no difficulty at all has been experienced.

For most satisfactory operation it is recommended that the unit have as long a warm-up time (up to two hours) as is possible. S_2 was included so that the plate power can be cut off, as is often desirable when making a check. The unit is used much as a signal generator. A shielded cord with alligator clips is used to connect the standard to the item under test.

The use of this standard has provided many hours of band-edge operation without the worry of a pink ticket.

YL News and Views

(Continued from page 47)

Miscellany

The YL expression "33" as originated by W2RUF meant "Love sealed with friendship between one YL and another YL." The term connotes sincere best wishes and is used only among YLs.

—•••—

YLRL Secy.-Treas. W1BCU thanks all of the YLs who have sent notes and letters to her along with their dues. As much as she'd like to, Peg regrets that she isn't able to return individual replies.

At the midwinter Hamfest in Grand Rapids the above YLs enjoyed meeting and engaging in some feminine rag-chewing. *Back row, l. to r.:* WN8JPC, W8SJF, WN8HIX, W8GYU, W8FPT; *front row, l. to r.:* WN8IRI, W8ATB, WN8JDU.

World Above 50 Mc.

(*Continued from page 57*)

Finding the 420-Mc. Band

If you're a 2-meter operator, locating the 420-Mc. band is no great problem, in view of the harmonic relationship between 144 and 432 Mc., but a fellow just getting started may have some trouble being sure he's on the right frequency. W2MWB, Woodhaven, L. I., uses the oscillator in his TV set for this purpose. With receivers having a sound i.f. of 21.25 Mc., tuning to Channel 9 puts the second harmonic of the receiver oscillator on 426 Mc. Check points at 438 and 450 Mc. are available by switching to Channels 10 and 11, respectively.

50 WAS Mc.

WØZJB	48	W4FNR	39½	W8LBH	39
WØBJV	48	W4IUJ	38	W8BFQ	39
WØCJS	48	W4BEN	35	W8LPD	37
W5AJG	48				
W9ZHL	48	W5VY	47	W9ZHB	48
W9OCA	48	W5GNQ	46	W9QUV	48
W6OB	48	W5JTI	44	W9HGE	47
WØINI	48	W5ONS	44	W9PK	47
		W5ML	44	W9VZP	47
W1HDQ	47	W5JLY	43	W9RQM	47
W1CLS	46	W5JME	43	W9ALU	47
W1CGY	46	W5VV	42	W9QKM	46
W1LLL	44	W5FAL	41	W9UIA	45
W1KHL	44	W5NHD	41	W9UNS	45
W1HMS	43	W5FSC	41		
W1LSN	42	W5HLD	40	WØQIN	47
W1EIO	41	W5HEZ	38	WØDZM	47
				WØNFM	47
W2RLV	45	W6WNN	48	WØTKX	47
W2BYM	44	W6UXN	47	WØKYF	47
W2IDZ	43	W6TMI	45	WØHVW	45
W2AMJ	42	W6IWS	41	WØJOL	44
W2MEU	42	W6OVK	40	WØJHS	43
W2FHJ	41			WØPKD	43
W2GYV	40	W7HEA	47	WØMVG	41
W2QVH	38	W7ERA	47	WØIPI	41
W2ZUW	35	W7BQX	47		
		W7FDJ	46	VE3ANY	42
W3OJU	45	W7DYD	45	VE3AET	35
W3NKM	41	W7JRG	44	VE1QZ	32
W3MQU	39	W7BOC	42	VE1QY	31
W3JVI	38	W7JPA	42	XE1GE	19
W3RUE	37	W7FIV	41		
		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.	
W4FBH	46	W7ACD	40		
W4EQM	44				
W4QN	44	W8NSS	46		
W4FWH	42	W8NQD	45		
W4CPZ	42	W8UZ	43		
W4FLW	42	W8YLS	41		
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Happenings

(*Continued from page 32*)

States, it is also proposed to amend certain subparagraphs of the foregoing section to delete availability of the frequency band 235–240 Mc, as an alternate for the band 220–225 Mc, and to remove the conditions under which the band 220–225 Mc, up until January 1, 1952, was available for amateur use. It is further proposed to amend Section 12.23(e)(2) of Part 12, in which the frequency bands and types of emission available for use of persons holding the Novice Class license are set forth, by deleting the frequency band 26.96 to 27.23 Mc, and substituting therefor the frequency band 21.15 to 21.30 Mc. The proposed amendments are set forth in an Appendix hereto attached.

3. The amendments proposed are issued under the authority of Section 4(i) and 303(c), (f), (i), and (r) of the Communications Act of 1934, as amended, the provisions of the final acts of the International Telecommunications and Radio Conference, Atlantic City, 1947, and the agreement concluded at the Extraordinary Administrative Radio Conference (Geneva) 1951.

4. Any interested person who is of the opinion that the proposed amendments should not be adopted, or should not be adopted in the form proposed, may file a written statement or brief setting forth his comments on or before August 1, 1952. Persons desiring to support the amendments may also file comments by the same date. Comments or briefs in reply to the original comments or briefs may be filed within fifteen days from the last day for filing the said original comments or briefs. The Commission will consider all such comments, briefs, and statements before taking final action. If any comments are received which appear to warrant the Commission in holding an oral argument before final action is taken, notice of the time and place of such oral argument will be given such interested parties.

5. In accordance with the provisions of Section 1.764 of the Commission's Rules, an original and three copies of all statements, briefs, or comments shall be furnished the Commission.

FEDERAL COMMUNICATIONS COMMISSION
T. J. SLOWIE
Secretary

Released: May 1, 1952

APPENDIX

(1) AMEND SECTION 12.23(e) BY SUBSTITUTING THE FREQUENCIES 21.15 to 21.30 Mc. FOR THE FREQUENCIES 26.960 to 27.230 Mc.

(2) AMEND SECTION 12.111 IN THE FOLLOWING PARTICULARS:

(a) DELETE PRESENT SUBPARAGRAPH (11) OF SECTION 12.111(a).

(b) AMEND SECTION 12.111(a) SUBPARAGRAPH (5) TO PROVIDE AS FOLLOWS:

(5) 21.00 to 21.45 Mc, using type A-1 emission;
21.10 to 21.35 Mc, using type F-1 emission;
21.00 to 21.10 Mc, and
21.35 to 21.45 Mc, using type A-3 emission and narrow band frequency or phase modulation for telephony.

(c) AMEND SECTION 12.111(a)(10) TO PROVIDE AS FOLLOWS:

(10) 220 to 225 Mc, using types A0, A1, A2, A3, and A4 emission and special emission for frequency modulation (radiotelephone transmissions and radiotelegraph transmissions employing carrier shift or other frequency modulated techniques).

(d) AMEND SECTION 12.111(a) BY RENUMBERING PARAGRAPHS IN NUMERICAL SEQUENCE IN ACCORDANCE WITH THE FOREGOING ADDITION AND DELETION.

HAM-ADS

(1) Advertising shall pertain to radio and shall be of nature of interest to radio amateurs or experimenters in their pursuit of the art.

(2) No display of any character will be accepted, nor can any special typographical arrangement, such as all or part capital letters be used which would tend to make one advertisement stand out from the others.

(3) The Ham-Ad rate is 30¢ per word, except as noted in paragraph (6) below.

(4) Remittance in full must accompany copy. No cash or contract discount or agency commission will be allowed.

(5) Closing date for Ham-Ads is the 25th of the second month preceding publication date.

(6) A special rate of 7¢ per word will apply to advertising which, in our judgment, is obviously non-commercial in nature and is placed and signed by a member of the American Radio Relay League. Thus, advertising of bona fide surplus equipment owned, used and for sale by an individual or apparatus offered for exchange or advertising inquiring for special equipment, if by a member of the American Radio Relay League 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.

Having made no investigation of the advertisers in the classified columns, the publishers of QST are unable to vouch for their integrity or for the grade or character of the products or services advertised.

QUARTZ — Direct importers from Brazil of best quality pure quartz suitable for making piezo-electric crystals. Diamond Drill Carbon Co., 719 World Bldg., New York City.

MOTOROLA used communication equipment bought and sold, W5BCO, Ralph Hicks, 204 E. Fairview, Tulsa, Okla.

SUBSCRIPTIONS, Radio publications a specialty. Latest Call Books, $2.50. Earl Mead, Huntley, Montana. W7LCM.

QSL's-SWL's Meade WØKXL, 1507 Central Avenue, Kansas City, Kans.

QSLS: 100, $1.95 up. Samples 10¢. Griffeth, W3FSW, 1042 Pine Heights Ave., Baltimore, Md.

WANTED: Electro Importing, Marconi, DeForest, Wireless Specialty Apparatus, "Ultimate" bug key, early crystal detectors, Collins "Wireless Telegraphy", Marconigraphs, Wireless Age, Electrical Experimenter, early catalogs, QSTs before 1921. Please state details and price wanted on any above items. Louis Rizoli, W1AAT, 100 Bay View, Salem, Mass.

ANNOUNCING Chicago Hamfesters Radio Club Eighteenth Annual picnic at Frankfort Grove, Ill., Aug. 10th, 1952. Donations $1.50.

5-Element 2-meter beams. Riverside Tool Co., Box 87, Riverside, Ill.

WANTED: Your surplus radio receivers, transmitters. ARC-1, ARC-3, ART-13. We buy anything. What have your Tom Allen, 159 Carlton Ave., Brooklyn 5, N. Y.

QSLS! Taylor, (W5VME) Little Rock, Miss.

QSLS, SWLS. America's Finest! Samples, 10¢. C. Fritz, 1213 Briargate, Joliet, Ill.

WANTED: TG-29 telegraph repeater, I-193-A relay test set. Also wanted: Teletype 1/40th HP synchronous motor. W6ITH, Moraga, Calif.

ELIMINATE TVI. Shield your rig. 26 gauge heavy plated bright steel. Perforated 75 #53 holes per in. Easily cut forms and soldered. Sheets 29" x 23", 2 for $3.50; five for $6.50 postpaid. Sample dime in stamps. Republic Television, Inc., Dumont, N. J.

DON'T fail! Check yourself with a time-tested Surecheck Test similar to FCC tests. Novice, $1.50; Conditional and General, $1.75; Advanced, $2.00. Amateur Radio Supply, 1013 Seventh Ave., Worthington, Minnesota.

QSLS: Fluorescent QSLs radiant and glowing with quality-control. QSLs Kromekote three colors and up. Rainbow maps, DX QSLS. Samples rushed, 10¢. Uncle Fred, Box 86, Lynn, Pa.

QSL and SWL cards. Samples. W1SQF, Minner, Candia, N. H.

PHONE patch schematics, practical discussion, $1.00. Nichols W1MRK.

WANTED: Top prices paid Navy selsyns 1F, 1G, 1CT, 5F, 5G, 5CT and BC-348; BC-221, AN/ART-13, AN/ARC-1, AN/ARC-3, RTA-1B. Lectronic Research, 719 Arch St., Philadelphia.

FOR Sale: RG-8U Coax in 29 ft. lengths with fittings, $2.00 plus postage. C. F. Moretti, W2AIH.

ANNOUNCING ARRL New England Division Convention and Hamfest, sponsored by Hampden County Radio Club, at Eastern States Exposition Grounds, West Springfield, Mass., Saturday, June 14, 1952. Registration and banquet, $5.00. Registration only, $2.00. Send checks to Albert Jackson, W1OBQ, Treasurer, P.O. Box 221, Springfield, Mass.

WANTED: Your attendance at the Mid-American and Dakota Division ARRL Convention, September 5, 6 and 7, 1952. Nicollet Hotel, Minneapolis, Minn.

FOR Sale: Hallicrafters SX42, RCA AR88D receivers. Triplett 1183 tube and set tester. Make offer. R. MacGregor, 7049 Western Avenue, Washington, D. C.

QSLS? QSLS? Modernistic? Cartoons? Mobiles? Largest variety of QSL samples: 25¢. Sakkers, W8DED, Holland, Michigan.

WANTED: TV antenna rotator, Millen VFO, Variac; Triader; new and used 100TH's, 10-meter mobile xmittrs, receiver and converter. W9MKU, 703 S. Embarrass, Tuscola, Illinois.

SELL or trade: one BC-348C, 1 BC221-M with power supply, 1 New Vue 4 x 5 press camera with tiltable tripod, 4 holders, 2 photo-flood lamps, G-E exposure meter. L. M. Evans, W5RRL, Box 331, Paris, Texas.

T23/ARC5, $25; PE103A, $25; BC-924, $20; BC-457, $6; 829B, $6; 304TL, $6; 2E25, $3; 2E26, $3; 812A, $2.50; 5763, $1.50. Other surplus, A. J. Arnold, W5WX, Box 706, Amarillo, Texas.

COMMERCIALLY built 700 watt AM fone xmittr with VFO and band-switching exciter. Built on chrome caster dolly with negative peak clipper and LP filter. Free from TVI. $535 F.o.b. Write W9DSV, Box 261, Webster, Wis.

SELL: Complete station 60W phone, 10–75 meters, in cabinet; VFO SX-17, Gonset beam accessories. Also RBL-3. This area. W3VYW, 12 Hudson View Terr., Newburgh, N. Y.

SELL or swap: bound Sam's Photofacts, 1–30, Riders manuals, NC46 rcvr. Need: 75-meter mobile rig. What have you? W5SIP, 2007 Vance, Alexandria, La.

FOR Sale: BC-610 transmitter, up to 1 Kw, complete with 80, 40, 20, coils, extra tubes, excellent condx. Best cash offer takes. Will accept Viking as part trade. Also Hallicrafters SX-42, with spkr, like new. John Brownston, 2533 42nd St., Sacramento, Calif., W6LPN.

FOR Sale: One HRO50T1 with spkr and A, B, C, and D coils; NBFM adapter like new, $350. Johnson Viking kit in factory sealed boxes: $209.50. 4D32, $19.95. One 10-meter Subraco MT15X with DS400 mobile power supply. Slightly used, $135. Elmac A54 transmitter in factory sealed box, $139.95. WØBUI, 1501 East Bates, Englewood, Colorado.

10–20–40 element 2-meter aluminum Brownie beams. Made to order. Write Snyder, W3LMC, 4330 Glenmore Ave., Baltimore 6, Md.

HAMFEST: Just to remind you of the Starved Rock Radio Club Hamfest June 8th. See Hamads and Hamfest calendar in May QST or write W9MKS, Box 22A, Utica, Illinois.

SELL or trade: 522, $25. Command rcvr 550–1500 Kc, $15. Some conversion on both. Want: camera, photo equipment or binoculars. W7FOM, Laurence B. Smith, RFD 1, Missoula, Montana.

BIRTH announcements, ham-styled. 25 for $1.00. Narvestad, Granite Falls, Minn.

MONITOR your rig with our Little Snooper pocket radio. Untuned, responds all waves up to 55 Mc. Order one today. $3.00 ppd. Snooperadio, 50 Elm Ave., Cincinnati 15, Ohio.

1N34 diodes, prepaid USA. 7 for $4.65; crystals, ham band 3525, 3655, 3735, 3825, 3980 Kc., $1.25. Sell your surplus tubes and equipment. Free Tabogram. "TAB", 109 Liberty St., New York, N. Y.

SELL Hallicrafters S40A, $45. Want BC348 rcvr. W6GVV, 2429 San Carlos, San Carlos, Calif.

NEW crystals for all commercial services at economical prices; regrinding or replacement crystals for broadcast, Link, Motorola, G-E and other commercial types. Over 16 years of satisfaction and fast service! Eidson Electronic Company. Phone 3-3901, Temple, Texas.

COLLINS 32V1 transmitter, new condition, in orig. carton, with manual and factory inspection tags. Used only a few hours. $475 cash. W3ALX, Henry H. Moyer, 934 Wyoming St., Allentown, Pa.

QSTS for sale, complete volumes 1937 thru 1951. Six with ARRL binders, excellent condition. Lot only. Ship F.o.b. Milwaukee, Wisc. $55. P. H. Smith, 2210 Lefeber, Wauwatosa 13, Wisconsin.

WANTED: In like-new condition Workshop 20 meter beam, Workshop or Johnson Rotator HRO-50 T-1 description and price. W7BA, Seattle

FOR Sale: Collins 32V2. Same as new. $550. F.o.b. Durham, N. C. F. M. Whitaker, 816 Wilkerson Ave.

FOR Sale: National CRU oscilloscope, $20; National HFS receiver/converter, $115; Masco 17 watt MA-17 amplifier; $25. 10 over 20 all aluminum beam with housed prop pitch rotator, direction indicator and control cable, $95; SCR-522 transmitter and power supply in working condition, $40. E. F. Finder, W9CGZ, 206 So. First St., Champaign, Ill.

SALE: Model ATD transmitter and/or dynamotor. Both units brand new, never used. Best offer. W1VFJ, 121 Lovell Road, Watertown, Mass.

FOR Sale: Meissner 150B exciter unit. Tunes 1.5 to 15.5 Mc., $30; BC-453 (Q-5'er) converted 110v with spkr, $20. W5IVF, 1608 Fairview, Monroe, La.

FOR Sale or trade: one Mark II tank radio with accessories. Nilson's Master Course in radio communication; NRI radio course. Need ham gear of all kinds. Hart, WØIBZ, 8715 Rosalie, Brentwood 17, Mo.

HALLICRAFTERS HT-17, used, but in excellent condition, 80-m coils, $45. WN1TYG, Dryden, Maine.

FOR Sale: low power phone/cw transmitter, back issue radio magazines, many tubes, parts and books. List available. Ernest Austin, 743 Erie Ave., Chillicothe, Ohio.

NATIONAL NC240D with matching spkr, for sale (just acquired HRO. Very good condition. $150 F.o.b. Boonton, N. J. Will consider Panadaptor as part payment. W2RQI, Urbach, 449 Hill, Boonton, N. J. Boonton 8-0187W.

TRADE: Kilowatt all band fone, value $800 for good "jeep". Sell: Aussie type HRO, all bands, 6 DC-110 Ac, rcvr, $100; Gonset 3-30, $25; 200-w 80m fone, $100; mobile 80-m xmittr-ant., $50; BC654 with PE104, PE103A, $75. Extra tubes, meters. W8EYV, Swishers, Keyser, West Virginia.

THANKS for response on Call Books. Now require following issues: 1951 summer, fall; 1949 fall; 1946 winter; 1945–46; 1945 all; 1942 summer, fall; 1938 summer, 1935 winter; 1934–35 spring, summer; 1934 winter; 1933–34, summer, fall; 1932 winter; 1931–32 summer, fall; 1930 spring, summer; 1929 winter; 1928–29; spring; 1928 all four; 1927 spring, summer; 1926 winter 1925–26, spring, summer; 1925 summer, fall; 1924 winter 1923–24, summer, fall; 1923 summer, fall; 1922 all. Also U. S. Govt. printing office editions "Commercial Stations", 1922, '25, '26 "Amateur Stations", 1925, '26. Bob Willits, W1PN, Box 26, Hyannis, Mass.

10 and 20 meter beams, $23.25 up. Aluminum tubing, etc. Willard Radcliff, Fostoria, Ohio.

75A1 factory modernized. TBS50C, both new condition. W8GWA.

TEST equipment as well as reconditioned receivers and transmitters are frequently available, such as Hickok 288X, $100; Hickok 620, $125; Triplett 3433, $98; RCP 705, $29.50; Transvision FSM-1, $39.50; etc. Write for latest list; terms, trades available at northern New England's largest ham supply house. Evans Radio (Carl, W1BFT), Concord, N. H.

WANTED: One modulation transformer for BC610 transmitter. If you know where I can buy one or get mine repaired, please advise. Jeff Whitaker, 827 Church, Marietta, Ga. W4UAT.

DIAGRAMS: BC229 receiver, RU-18 receiver, both show parts values; 50¢ each. BC-430 transmitter, no parts values, 25¢. Want diagram for APN-1, BC733D. Sell like new approved A-200 signal generator, 100 Kc to 75 Mc, $22. Want National 1-10 or HFS. W4NZV, 119 No. Birchwood Ave., Louisville 6, Kentucky.

TELETYPE midget printers, transmitters, polarized relays, sold only to licensed amateurs under rules of VHF Teletype Society. Write for information and prices. Will trade. Want test equipment with TS or 1 prefix. Arrow Appliance Co., 25 Harrison Court, Lynn, Mass.

SELL: Mobile transmitter, Millen exciter, modulator, 6VDC Gen-E-motor supply, 110 VAC supply, all enclosed in hinged cover cabinet, complete with cables, control box for under-dash mounting, coils for 75, 20, 10; Master Mobile antenna model, 132X with 75-20 meter coils. Best offer over $100 takes all. Capt. N. Gertz, Sig. Co. 3d Marine Div., Camp Pendleton, Oceanside, Calif.

WILL trade 500 w Cw/Fm TVI-proof deluxe transmitter plus cash for Collins 32V-2. All replies answered. Write for full particulars to P. C. Patton, WØEWQ, 2221 Mascot, Wichita, Kansas.

COLLINS 310-B1, excellent condition, best offer over $200. National 101X, very good receiver, with spkr, $100. WØBNF, 822 West 22nd St., Kearney, Nebraska (P.o.b.).

SELL custom-built all metal 5' x 3' radio desk with sloping full length control and speaker panel, typewriter well, large sliding drawer takes standard 10½" x 19" x 15" panel mounted receiver or other equipment, plenty of room to build in a complete hi-power station. Complete with Wilcox compressor amp., dual-channel line amp. low voltage DC supply, control panel, speaker, for $150; less amplifiers and DC supply, $100 F.o.b. Address inquiries to Purchasing Dept., Chicago and Southern Airlines, Inc., Municipal Airport, Memphis, Tenn.

SALE: SCR522 used. Receiver tunable for 6 meters. Less power supply, $30. F.o.b. Tucumcari, N. M. W5NUN.

WANTED: Collins 30K-1 in new condition. All letters answered. Samuel Strauss, W2RCN, 5335 203rd St., Bayside, L. I., N. Y.

WOULD like to make contact with a local ham operator to help me with code and theory necessary to obtain a ham license. Please contact P. Volente, 7 West St., Lynn, Mass.

QSLS. Brownie, W3CJI, 433 Chestnut, Emmaus, Penna.

SELL: Lysco 129B 10-11 meter mobile xmttr, w/tubes, $27, trade or best offer. W1TZA, 208 Ashley Ave., West Springfield, Mass.

SELL or trade: 12 RCA type VC-1-C crystals similar to James Knights type JK-H-17, 4325.833 Kc, 4444.44 Kc, 10.98071 Mc, 11.28571 Mc. Best offer. W2OBH, 200-27 46th Ave., Bayside, L. I., N. Y.

SELL: BC-348-Q receiver, AT-7 xmittr and gear worth $290, all for $175. Ray Joseph, WØBXT, Hopkinton, Iowa.

HT9 with coils for 80-40-20-10, in excellent shape, $200. National HFS with pwr supply as new, $100; Hammarlund Super Pro with pwr supply, good shape, $60; Meck T-602 transmitter with coils for 80 and 10, $75; PE-103, $20; Gonset Tri-Band, $35; Master Mobile Mount and ant, complete, $150. SCR522 Trans and rcvr, $30. M. W. Chambless, Box 1648, McAllen, Texas.

SWAP: 152A for HF10-20. W6HQH/KM6, Navy 3080, Box 18, % FPO San Francisco, Calif.

WANTED: Super Pro cabinet; state price and condition. W1BIC, 198 Millrock Rd., New Haven, Conn.

GLOBE Champion for sale, with coils for 10, 20, 80 and 160 meters. Like new. Best offer over $250. Howard Hawes, W1SCU, Union, Me.

NOVICES: NC-33 receiver, excellent condition. Best offer. Dubov, 3100 Brighton Second St., Brooklyn, N. Y.

QSLS, SWLS. High quality. Reasonable prices. Samples. Write Bob Teachout, W1FSV, 40 Elm St., Rutland, Vermont.

McELROY code tape machine with 15 rolls of extra tape, in good condition. First 35 dollars takes it. J. Schoenberger, 514 Onderdonk Ave., Brooklyn 27, N. Y.

QSLS! Samples? Tooker, Lakehurst, New Jersey.

WANTED: Collins 310 series exciter or Millen VFO 90711. State condition and lowest price. Donald Cameron, KW6AU/W8, 1619 Milburn Ave., Toledo, Ohio.

TRANSFORMERS 1000 Va, 4400-2200-1100-1100-2200-4400. G-E $15. 2MJ condensers, 4000 VDC, continously. $9. G-E, both guaranteed. Dawson, 5740 Woodrow, Detroit, Mich.

SELL mobile outfit: 30w, 807 bandswitching 75 and 20 m phone xmittr with built-in VFO; 425 v, 375 Ma, 6VDC dynamotor; Gonset Tri-Band converter. All new and complete with cables, relays, meters and schematic. Ready to operate. Goes to first offer over $90. W4JUX.

SELL: Stancor P-9920 for BC-610 also BC-221-F complete, less batteries both new. Best offer. F.o.b. Hagerstown, Md. W3OXL, Firman, 833 View Street.

WANTED: Millen 90810 transmitter, in good condition, with 2-meter coils. Write price wanted to "Doc" Hagerthy, W1RYM, Scarboro, Me.

FOR Sale: 260 ea., G-E type 1-14, 5 amp. (good accuracy at 400% load), 110 volt, 60 cycle, 2 wire meters with glass covers, completely overhauled and calibrated since removal, 90 day guarantee, $3.50 each, 10% discount in lots of four, F.o.b. Rockville Center, N. Y. Contact Chief Engineer, Dept. of Pub. Utilities & Public Works, Rockville Centre, N. Y.

FOR Sale: Best quality new parts for push-pull 4-125A 1000 watt final, complete with power supply, meters, cabinet, everything; TVI proof. Catalog price, $304. Will sell for $230. Buyer must call for. Dr. C. Scheifley, % Mayo Clinic, Rochester, Minn.

BARGAINS: New and reconditioned Collins, National, Hallicrafters, Hammarlund, Harvey-Wells, Elmac, Gonset, Morrow, RME, Millen, Meissner, Johnson, others. Reconditioned S38, $29; S53, $49; S40A, $69; S40B, $79; SX43, $119; SX71, $149; SW54, $35; NC57, $69; NC57B, $79; NC173, $139; HQ129X, $139; SP400X, HFS, NC183, HRO5TA1, HRO7, HRO50, HRO50-1, SX42, SX62, DB22A, HF-10-20, VHF152A, RME45, Collins 75A1, 32V, Lysco 600, Bandmaster Transmitters, others. Shipped on trial. Terms. List free, Henry Radio, Butler, Mo.

BC-610 for sale, Less than 100 hours operation. Factory modified for 10 meters. Complete with speech amplifier, coils for all bands, antenna tuning unit, $500. Located in Mt. Vernon, N. Y. Address inquiries: W2CSU, F. L. Sherman, 155 Washington Lane, Jenkintown, Pa.

SELL or trade: RCA Model 154 beat frequency oscillator, Hallicrafters SX25, factory overhauled February '52; Model E Argoflex, Revere movie camera, polaroid Land camera. Want: UTC S47 plate transformer, grid dipper, DC milliameters, test instruments, Gonset triband converter. Larry Kleber, Belvidere, Ill.

FOR Sale: Hallicrafters SX-28A, like new, $25; two complete Abbott TR-4 2-meter receiver-transmitter with power supplies and microphones, only $60 for both. Peck, W2OIF, 205 Perrine Ave., Auburn, N. Y.

HARVEY-WELLS Bandmaster deluxe, $109; APS50, $32.50; DPS-50, $69.50; Gonset 3-30, $27.50; Shure Ranger mike, $12; Turner 22X, $10; Heath VTVM, $15; Heath signal tracer, $10; All perfect condition. F. S. Eggert, W8FIL, 11833 Wisconsin, Detroit 4. Mich.

FOR Sale: NC-183 receiver, speaker, NBFM adapter. Used about 100 hours. Excellent condition, $250. G. Turner, W1QWI, Nantucket. Mass.

FOR Sale: House cleaning: Best offer takes: New ARC-5 (5.3-7 Mc); New ARC-5 (3-4 Mc); BC-453-B; MD-7/ARC-5; BC-456-E; BC-454-B; BC-455-B; GF-11 (3 coils); Two-TU5B; new 814; BC-442-A, plus several racks and control heads. New PE103. Sell all or part. F.o.b. Anderson, Ind. W9MTU, Box 789.

SELLING: 2 Simpson 303 VTVM, $37.50; CW3 Wilcox receiver, $10; BC344D receiver 150-1500 Kc, $40; Jackson 636 Tubetester, $40; Garrard 2-speed turntable, $35. R. Guttentag, 89 East 3rd St., New York City 3, N. Y., Tel. IL 8-8800.

BARGAINS! Extra special! Motorola P-69-13 mobile receivers, $29.50; Globe King, $315; HT-9, $199; HRO-50, $275; Lysco 600, $109; SP-400X, $249; HRO-7, $199; Collins 75A1, $275; HRO-5T, $175; SX-71, $159; HRO Sr., $119.50; RME 2-11, $99.50; RME-45, $99; Meissner EX shifter, $59.50; S-40A or SX-16, $69.50; VHF-152A, $69; HR-10-20, $59; SX-24, $69; Globe Trotter, $79.50; Meissner Signal Calibrators, $24.95; MB611 Mobile transmitter, $29; 90800 exciter, $29.50; RCA Chanalyst, $79.50; XE-10, $14.95, and many others. Large stock of trade-ins. Free trial. Terms financed by Leo, WØGFQ. Write for catalog and best deal to World Radio Laboratories, 740-44 West B'way, Council Bluffs, Iowa.

QSL cards printed. Atlantic Press, Clifton, N. J.

SELL: Like-new VHF 152A, $65; 75-meter phone transmitter, BC696 speech amplifier, 6L6 modulators, power supplies for both very compact, $50; BC455B, $6.50. Hays Sneed, W5RY, 643 Eagle Ave., Jackson, Miss.

WANTED: Motorola mobile rig, also Gon-Set, dynamotor supply. For sale: Weston photo-cell and relay. Box 382, Newark, N. J.

SELL: Command xmittrs 2-459; 2-696; 458; 2.1-3 Mc. Excellent condx, converted with tubes. $80 or make bid on units. Harold Curtis, WØERW, Anselmo, Nebr.

2 METER test equipment: I-13A Signal generator xtal or Master Osc. 100-155 Mc with I-139A test meter, $40. I-95A field strength meter, vac. tube, 100-155 Mc, $25. Both, $55. D. R. Marsh, jr., 10004 E. 35th Terrace, Kansas City, Mo. WØTOQ.

WANT: Test equipment with TS or I prefix, TCS, ART-13, ATC, BC-1306, PE-237, BC-639, RA-42, RA-34, BC-348, BC-312, BC-342, APS radar, Tech manuals. T. Clark Howard, W1AFN, 46 Mt. Vernon St., Boston 8, Mass.

WANTED: Kilowatt final and modulator, or parts therefor; also books on acoustics, noise, sound. Will trade BC-1016 code recorder, ART-13, etc. John Longley, W2ANB, Slingerlands, N. Y.

SELL: Gonset Tri-band, $36; Carter dynamotor 500V at 200 Ma., output, 6VDC, input with filter and starting relay, $22 F.o.b. W8EZX, Vogel, 15813 Invermere, Cleveland 28, Ohio.

FOR Sale: two newly-converted T-69-20-A Motorola transmitters, one for 75 and the other for 10-meter fone complete with power supply, control head, cables, Master-mount base and antenna with Mallard 75-meter loading coil. Merely exchange plug-in r.f. units to go from one band to the other in 60 seconds. Original cost $155. Will accept best over $100. Crated F.o.b. Sheboygan, Wisc. Terms: C.O.D. Reason for selling: XYL says no rig in forthcoming new car; W9LXC.

TRADE up to three 304THs for like number 813's or similar tetrodes. W5SVR, Mancum, Okla.

FOR Sale: SX-71, signal shifter, FM modulator, complete 10-metemobile station. Henry Blesse, W2VXZ, 13-05B Sperber Road, Fairr lawn, N. J.

QSLS: $2.00 will bring you 100 two-color cards, 24 hour service. Wahl, W3GFF, 1805 Kenilworth Ave., Washington 19, D. C.

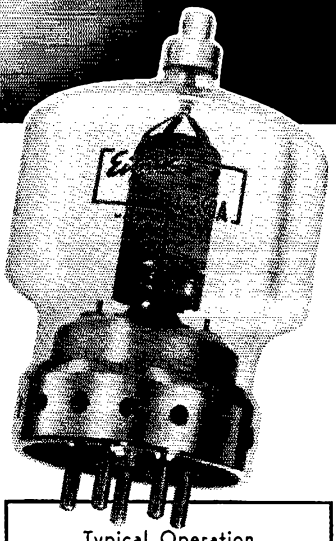
VP2MY on vacation in U. S. A. and would be glad to meet hams in New York and Pennsylvania area. Frank DeLisle, 1129 Main St. Emmaus, Penna.

Index of Advertisers

WORK YOUR FAVORITE BANDS with the EIMAC 4-250A

Low driving power with high output plus compactness, neat design and durability make Eimac's 4-250A the amateur radio operators best buy for operation through 54 mc. Only two to three watts are needed to drive this power tetrode to a kilowatt when used as an amplifier in the new 21 mc. band and other regions including the 54 mc. band. A pair of 4-250A's will loaf along at a thousand watts in Class-C fone service. Rated at a maximum plate dissipation of 250 watts this tube requires only simple circuits to give top performance and less TVI. As a modulator two 4-250A's will deliver as much as 750 watts audio with resistance coupled 6SJ7's as drivers. A proven performer, the 4-250A gives dependable operation as an amplifier, oscillator or modulator.

Information about the 4-250A can be obtained from your Eimac dealer.



Typical Operation
(frequencies below 75 mc.)

Radio Frequency Power Amplifier and Oscillator Class-C FM or Telegraphy (key down conditions one tube).

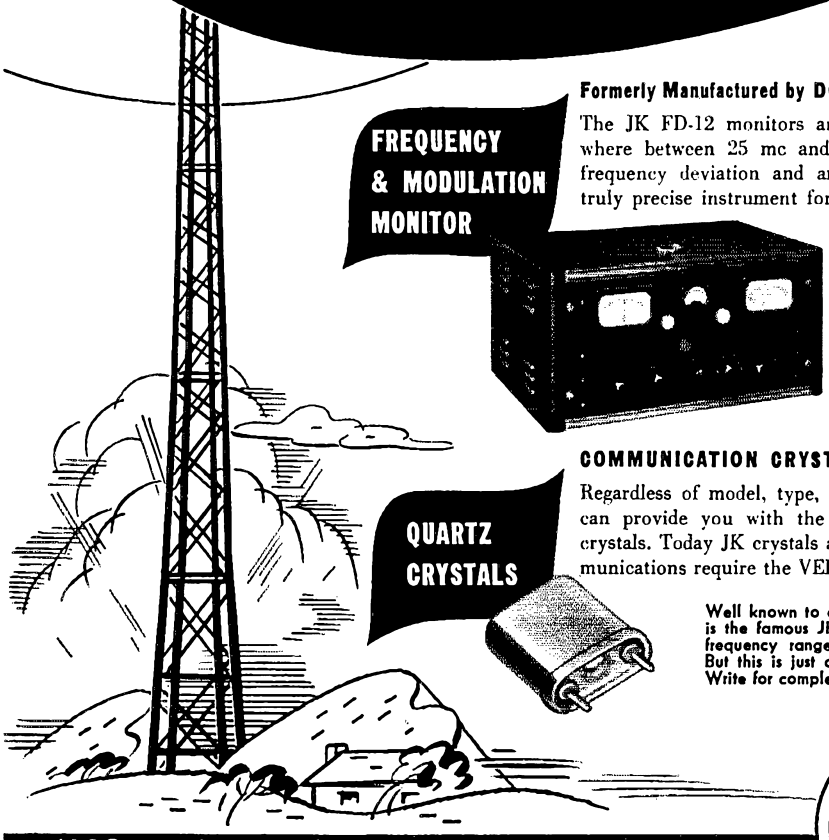
D-C Plate Voltage	3000 volts
D-C Screen Voltage	500 volts
D-C Grid Voltage	—180 volts
D-C Plate Current	345 ma.
Plate Power Input	1035 watts
Plate Dissipation	235 watts
Plate Power Output	800 watts

Eimac TUBES

EITEL-McCULLOUGH, INC.
San Bruno, California
Export Agents: Frazar & Hansen, 301 Clay St., San Francisco, California

Keeping communications "ON THE BEAM"

JAMES KNIGHTS



Formerly Manufactured by DOOLITTLE RADIO, INC.

FREQUENCY & MODULATION MONITOR

The JK FD-12 monitors any four frequencies anywhere between 25 mc and 175 mc, checking both frequency deviation and amount of modulation. A truly precise instrument for communication systems!

When used for different bands, plug-in type antenna coils provided. Crystal accuracy guaranteed to be ± .0015% over range of 15° to 50° C. Meets or exceeds FCC requirements.

COMMUNICATION CRYSTALS for the CRITICAL!

QUARTZ CRYSTALS

Regardless of model, type, or design, James Knights can provide you with the very finest in stabilized crystals. Today JK crystals are used everywhere communications require the VERY BEST.

Well known to every communications man is the famous JK Stabilized H-17, with a frequency range of 200 kc to 100 mc. But this is just one crystal in the JK line. Write for complete crystal catalog!

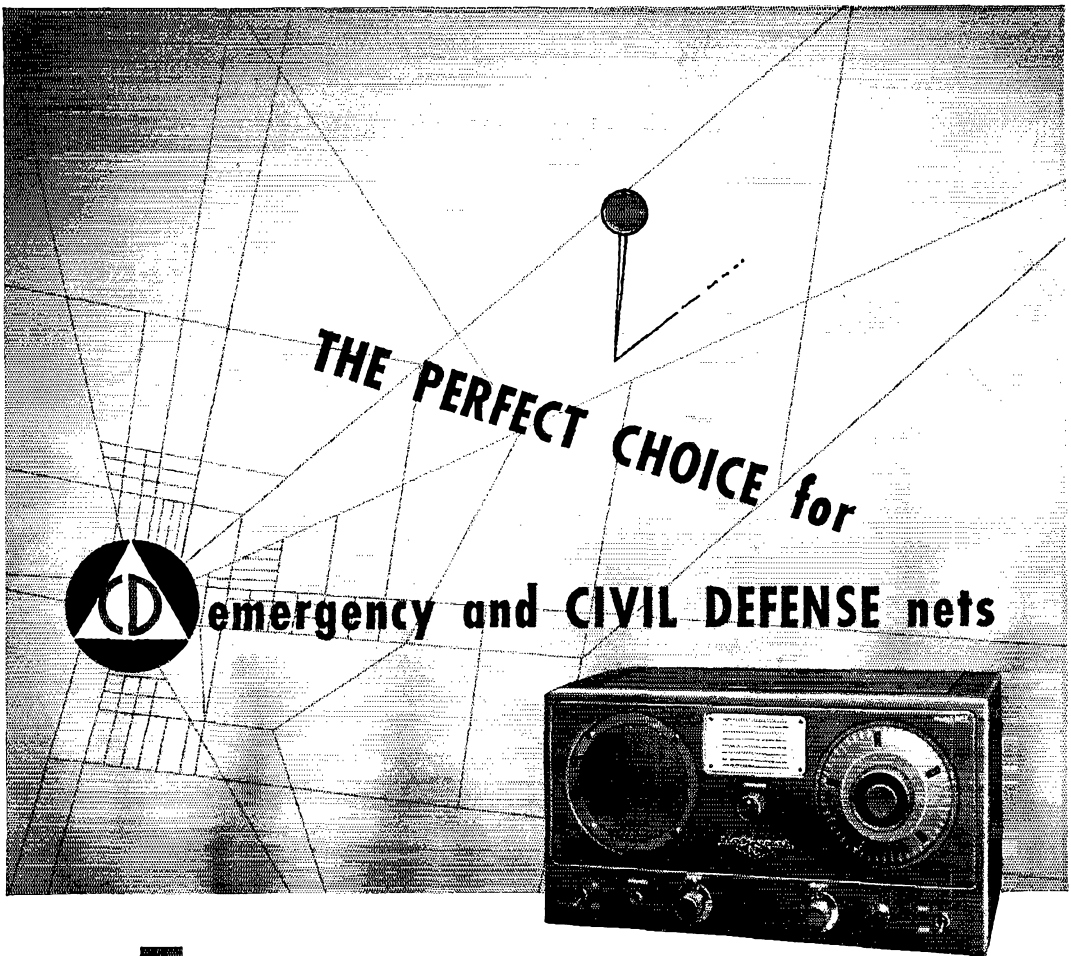
ALSO manufacturer of the James Knights Frequency Standard.

THE JAMES KNIGHTS COMPANY

SANDWICH 6, ILLINOIS

JK PRODUCTS

PRINTED IN U.S.A.
RUMFORD PRESS
CONCORD, N.H.



The most versatile and widest range receiver in the VHF field!

The HFS is the *only* moderate-priced receiver covering the entire VHF spectrum from 27 mcs. to 250 mcs. in 6 bands. Receives AM, FM and CW with exceptional selectivity and sensitivity. Can be used as either fixed or portable receiver, operating from a standard power supply, 6-volt vibrator-type supply or a combination of "B" and storage batteries.

Can be used as a complete receiver or a converter for any receiver tuning to 10.7 mcs.

In range, versatility, price and performance, the HFS stands alone in the VHF field!

(incl. all coils)

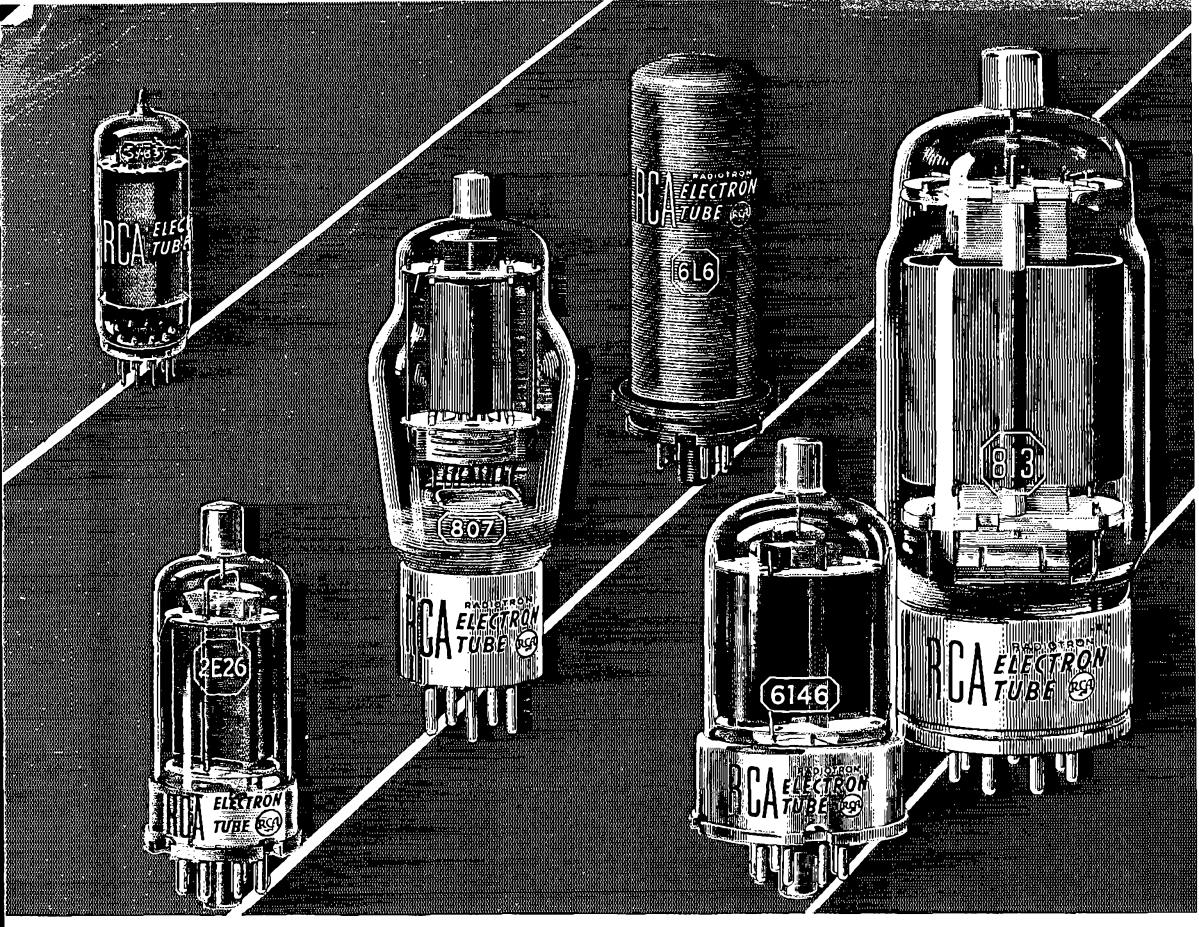
POWER SUPPLY, $22.43*

*Slightly higher west of the Rockies.

National

NC

NATIONAL COMPANY, Inc.



Why beam power tubes are the best your transmitter can use

SIMPLY STATED, beam power tubes combine good output efficiency with low drive requirements.

But, let's get down to cases . . .

. . . because you get high output with low driving power, you need fewer intermediate stages. Fewer stages mean a compact, efficient transmitter.

. . . since high driving power is *not* a requirement, there is less chance of TVI.

. . . if economy is a factor, remember that most beam-power-tube circuits can use simple, inexpensive, low-voltage power supplies.

. . . beam power tubes are superior for quick-change, multi-band transmitters because they seldom require neutralization in well-designed circuits.

. . . the fact that plate voltage can be changed without affecting other circuit adjustments makes it simple to reduce power for local QSO's.

. . . beam power tubes operate efficiently as frequency multipliers, drivers, finals, and modulators.

There you have the reasons why beam power tubes lead all other types in modern transmitter design.

And remember—there's an RCA beam power tube for every input up to 500 watts . . . and every frequency from 1.8 to 148 Mc.

TUBES FOR THE PROFESSIONAL
. . . PRICED FOR THE AMATEUR

The dependability of *commercially proved* RCA Tubes costs you no more. Buy genuine RCA Tubes and you buy the best. See your local RCA Tube *Distributor*.

RADIO CORPORATION of AMERICA
ELECTRON TUBES **HARRISON, N. J.**