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VOLUME XXXVI • NUMBER 7

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

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INDEXED BY
INDUSTRIAL ARTS INDEX

CONTENTS

TECHNICAL—
A High-Powered Driver-Amplifier for 144 Mc.
E. P. Tilton, W1HDQ 11

The Siamese Paddle..............Myron Hexter, W9FKC 16

A Phase-Angle Detector for R. F. Transmission Lines
G. Robert Mesger, W2BLL 17

Two-Element Driven Arrays........L. A. Moxon, G6XN 28

Antenna-Mast Loading and Guying
Charles Kandel, W2VOU 42

Constructing Safety Interlocks from Standard Parts
Ronald L. Ives 45

Simple VFO Construction for the 75-Meter Phone Band
Charles McDowell, W4IIX 46

A 200-Watt for 160...Robert M. Resconsin, W1TRF 48

Technical Topics — "How Come No 160?" .............. 60

MOBILE—
A Quadriband Mobile Transmitter
Charles J. Schauers, W6QLV 24

NOVICE—
Getting the Most Into Your Antenna
Richard M. Smith, W1FTX 21

OPERATING—
Recap — DX Contest High Claimed C.W. Scores........... 64

GENERAL—
Arkansas-Tennessee Tornadoes...George Hart, WINJN 51

ARRL Articles of Association and By-Laws............ 54

"It Seems to Us . . ." ........... 9 The World Above 50 Mc. .... 61
Quix Quiz 10 United States Naval Reserve .... 64
Hamfart Calendar 10 How's DX? ....... 68
Feed-back 10 Hints & Kinks ........ 68
Silent Keys 20 Correspondence from Members .... 69
Happenings of the Month 38 Operating News ........ 70
YL News and Views 39 With the AREC .... 78
On the Air with Single Sideband 40 In QST 26 Years Ago ... 60

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104 N. 11th, Pawhuska, Okla.
NEW CHARTER AND BY-LAWS

When the American Radio Relay League resumed activity at the close of World War I, it was operating under a constitution which provided for the government of our affairs by a Board of seventeen directors elected by the membership. But every member of the Board was a director-at-large, elected by popular vote of the entire membership and usually nominated by the Board itself; five of the directors thus elected were also paid officers on the Hq. staff. As the League grew our leaders foresaw the desirability of more democratic government which would provide for regional representation, with each director elected by and responsible to the membership in his particular region or division. This was a cause largely championed by the late Kenneth B. Warner. On December 18, 1923, the Board adopted a new Constitution & By-Laws, drafted by Warner and the Executive Committee to accomplish the desired ends, and the Board in effect voted itself out of office to be replaced by new men nominated and elected by each division.

The 1923 Constitution and By-Laws has served the League, and well, for nearly thirty years. But over that period many minor changes were made here and there by the Board to remedy particular situations — changes in the mechanics and dates of elections, filling of director vacancies, eligibility requirements and interpretations, etc. Although the fundamental principles remained constant, the effect was to build on the sound structure a series of "cupolas" which eventually became confusing and in some cases actually conflicting, were not properly by-laws of a corporation in others, etc. At its 1950 meeting the Board set up a Constitution Revision Committee to study the problem; the Committee, with the assistance of the General Counsel, did its job well — so well in fact that the Board at its 1951 meeting adopted the draft of new Articles of Association almost without change, and at its meeting just held in May completed the job by adopting, effective July 1, 1952, the draft of new By-Laws and supplementary regulations also almost without amendment.

The basic concept of the League’s structure and government remains unchanged. Those principles which are unchanged are embodied in the Articles of Association — the purposes of the ARRL as a non-profit membership association, the government of our affairs by a Board elected by members to represent their divisions, the authority of the Executive Committee (which now includes one director) in the intervals between Board meetings, the barring of membership on the Board to those with commercial interests, and the like. In the By-Laws are those provisions which may need change from time to time to meet our future needs — divisional boundaries, the mechanics of elections, dues rates, meeting dates, standing committees, etc. Supplementary rules and regulations state League policy in matters of conventions and affiliated clubs, and now in process of formation are rules and regulations governing the Communications Department.

Beginning on page 54 of this issue we publish in their entirety the texts of the new instruments of government of your League. They merit your careful reading.

NOVICE PROMOTION

Do you have a friend or acquaintance you're trying to interest in ham radio, but you can't get the bug to bite quite deeply enough? Precisely the push he needs may be furnished by a new promotional booklet the League has just produced, entitled "You Can Be There."

In two colors, and pocket-size for ease in handling and distribution, the booklet points up the Novice Class license not only for the enjoyment of two-way radio communications but also as a stepping-stone to a professional electronics career in industry or military service. Part of the promotional campaign undertaken at the instructions of the Board of Directors, it has had a first printing of 100,000 copies which are currently being distributed in quantities through youth organizations, civic and educational groups, and through electronics manufacturers and distributors.

We call it to your attention not only as information but also so that you may make use of it in your own activities if desired. Should you be promoting amateur radio in a local Boy Scout troop, for example, we'll be glad to send you sufficient copies for individual distribu-
tion. Should you be giving a talk on amateur radio before civic clubs and the like, you might want copies to distribute afterwards to interested members of the audience. Perhaps you will want to contact science instructors in the local schools to see if classes or after-hour clubs would be suitable recipients. Though too expensive to be left in quantity on a public counter as "throw-aways," we'll gladly furnish any reasonable number of copies you request provided you indicate how the booklets are to be used.

We think the booklet does a pretty good job of creating an initial interest in amateur radio on the part of casual readers, and will help accomplish the aim of attracting numbers of new people into our game through the Novice license.

FEED-BACK

In W6OWP's article, "A High-Frequency Exciter for Better C.W. Signals," in the June issue, L1 in the caption under Fig. 1 on page 12 should have a diameter of 7/8 inch instead of 5/8 inch. Last-minute revisions in the circuit of Fig. 2 on page 13 conspired to scramble the capacitance values. The caption should read as follows: C1, C2 - 100-µfd. trimmer; C3, C6, C7, C8 - 0.01-µfd. disk ceramic; C4 - 0.1-µfd. 600-volt paper; C5 - 100-µfd. mica; C9 - 100-µfd. variable.

QUIZ QUIZ

A tested his phone transmitter with a 100-watt lamp used as a dummy load, and observed that the brilliancy of the lamp increased as he spoke. This is proper, he reasoned, because the total output power increases with modulation. However, he notices that the S meter on his receiver stands still on any phone signal except those where controlled carrier is used, and he reasons that the S meter should kick up with modulation just as the lamp does, if the S meter is an indication of the power of the received signal. B tells him that the S meter doesn't kick up because it is in a circuit with a long time constant and consequently can't kick up except under sustained modulation. Who is right?

(Answers to page 110 for the answer)

COMING A.R.R.L. CONVENTIONS

July 4th-6th — Pacific Division, San Francisco, Calif.
Sept. 5th-7th — Dakota Division, Minneapolis, Minn.
Sept. 14th — Vermont State, Burlington, Vt.
Sept. 27th — New Hampshire State, Nashua, N. H.
Oct. 3rd-5th — Hudson Division, Albany, N. Y.
Oct. 11th — Roanoke Division, Richmond, Va.

HAMFEST CALENDAR

ALASKA — Saturday and Sunday, August 2nd and 3rd, at Copper Center Roadhouse, Fairbanks -- the All-Alaska Hamfest. Plenty of mobile activity is expected, and a special calling frequency of 3802 kc, has been established for the Hamfest. For further details contact KLM7NT.

ARKANSAS — Sunday, July 13th, at Lake Conway, 8 miles south of Conway on U. S. Highway 65 — an Arkansas hamfest sponsored by the Conway Amateur Radio League. The hamfest will be picnic style, and officials of CAP will be on hand to discuss communications in the CAP. For further details, write to WNB7IC, 340 Davis St., Conway.

CALIFORNIA — Saturday, August 9th, at Wieland's Brewery, San Jose — the third annual Central California Barbecue, sponsored by the Santa Clara County Amateur Radio Association. Activities start at 3 p.m., with dancing at 8 p.m. Registration fee is $5.00, with a chance at a mobile converter for those who register prior to August 3rd. Make registrations to SCCARA, P. O. Box 6, San Jose.

IDAHO — Friday, Saturday and Sunday, Aug. 2nd, 3rd and 4th, the annual meeting of the WIMU and convention at Big Springs, Idaho. This is the annual get-together of the amateurs in Wyoming, Montana, and Utah. A full program is planned, and adequate accommodations are available at dude ranches, lodges and inns. The site of the meeting is near Yellowstone Park, so fit it into your vacation plans. For further information write to Mrs. R. Darl Dawes, Box 668, Bozeman, Montana.

ILLINOIS — Friday, July 4th, at the clubhouse grounds of the Egyptian Radio Club — the Annual Picnic and Hambo'ree. The club grounds are located one block south of new Chain of Rocks Canal Bridge on highway 65 between Mitchell, Ill., and the Mississippi river. No admission charge. Food and drinks available. Contests and awards.


INDIANA — Sunday, July 21st, at Brookside Park in Indianapolis — picnic of the Indiana Radio Club Council sponsored by the Indianapolis Radio Club. $1.00 registration, with games and awards for young and old.

MAINE — Saturday, July 26th, at the Eastland Hotel in Portland — the Fourth Annual Down East Hamfest. Registration will start at 11:00 A.M., with the banquet at 6:30 P.M. The registration fee is $4.50, and advance reservations should be made with Lee Johnson, W1QIQ, 92 William St., Portland.

MICHIGAN — Sunday, July 27th, at Kensington State Park, 20 miles Northwest of Detroit, near Milford — the second annual picnic of the Inter-County Amateur Radio Club. There will be swimming, games and transmitter hunt, special awards for the ladies and children. A Johnson Viking wired, tested and complete with tubes, will be among the many valuable items awarded. Tickets are $1.00 each. Bring your lunch and come early. Get your tickets at the picnic or write to W8HYM, 17303 Lenore, Detroit 19, Mich.

VIRGINIA — Sunday, Aug. 3rd, at the Dickery Ridge picnic grounds on the Skyline Drive, near the Front Royal entrance — the second annual hamfest of the Shenandoah Valley Amateur Radio Club. Registration is $1.00, with a fried chicken dinner available for an extra $1.25. There will be plenty of activities and awards, and all registrations should be made prior to July 27th. Write to the Shenandoah Valley Amateur Radio Club, P. O. Box 139, Winchester, Va.

WYOMING — Saturday and Sunday, July 19th and 20th, at South Fork Camp on Powder River in the Big Horn Mountains — the Annual Wyoming Hamfest for 1952, sponsored by the Casper Radio Amateur Club. The only charge will be for the banquet and lodging. For further details, write to L. D. Brandm, W7AMU, 342 South Elk St., Casper, Wyoming.
A High-Powered Driver-Amplifier for 144 Mc.

An All-Tetrode Transmitter Design for the V.H.F. Enthusiast

BY EDWARD P. TILTON,* WJHDQ

In the course of the TVI program currently underway in the Headquarters Lab, there arose a need for a 2-meter rig that would be capable of generating something approaching the legal limit of power, to check overload characteristics of representative TV receivers. More than two years’ experience with the 450-watt rig at WJHDQ1 had shown it to be substantially free of TVI on 144 Mc. when operated in the presence of a usable TV signal from our semi-local Channel 6 station. Would jacking the power by another 3 db. make any difference? The 144-Mc. powerhouse shown here was built to find out.

Many hours of tests at up to 800 watts input have shown that it doesn’t; that, if reasonable precautions are taken in design and construction, TVI problems are not greatly complicated by the use of high power in the 2-meter station, so long as the rig is not amplitude-modulated. Even with a.m., TVI potentials do not go up with power as rapidly as one might think. The crux of the matter seems to be that 2-meter TVI is caused not by the 144-Mc. r.f., but by harmonics of lower-frequency stages that fall in the TV channels, and by audio circuit pick-up closely akin to the midget-receiver BCI that has been with us for years. There are high-band image problems in some older receivers, and occasional beats with other frequencies in use locally, but in our experience with current production receivers we’ve found little evidence of r.f. interference from pure 144-Mc. radiation, even with several hundred watts in a horizontally-polarized array just a very few feet from the TV antenna.

In most 2-meter work few of us need or even desire really high power. We seldom have to beat down others on the same frequency, but there are times when it’s nice to be able to pour it on. In auroa DX work, for example, it has been almost universally true that the high-powered stations work the choice stuff.

If facilities are not available for modulating the full power capabilities of the rig, input can be dropped to 200 watts or less with little change in efficiency. Just because the transmitter is capable of close to a kilowatt input is no reason that it must be run that way. And if we’ve been in the habit of straining to get the utmost out of 2-meter gear by running it almost to the limit of endurance (and sometimes beyond!), it is comforting to be able to generate a sizable signal with everything running well below its ratings.

Three push-pull stages are used, beginning with a pair of RCA 5763s which triple from 48 to 144 Mc. If a 2-meter rig capable of putting out 5 to 10 watts is already available, this stage can be omitted, and only the two 144-Mc. stages built into the assembly. The first is a dual-tetrode amplifier using an Amperex AX-9903. With some modification of the circuits, an 829B might be used, but the lower input and output capacitance of the 9903 make it preferable. An 832A may be used interchangeably with the 9903, but care is necessary to avoid exceeding its ratings; so the larger tube is recommended. The final stage uses a pair of Eimac 4-125As, with a low-C tank circuit made of copper tubing. The manufacturer’s ratings allow slightly over 600 watts input on plate-modulated phone and 800 watts on c.w. at 150 Mc.

*V.I.F. Editor, QST.


Panel view of the high-powered 2-meter transmitter. At the bottom left are the filament switches and the knob for the screen-neutralizing adjustment. The two knobs, lower right, are the tripler and driver plate tuning, ganged, and the antenna coupling adjustment. Jacks in the tripler-grid, driver-grid and driver-cathode circuits are at the far right. The large knob at the upper center is for turning the plate tuning capacitor.
TRIPLEX

5763

AMPLIFIER

Fig. 1 — Wiring diagram and parts list for the high-powered 144-Mc. transmitter.

C4, C5 — 10-μfd.-per-section butterfly variable (Cardwell ER-6-BF/S. Johnson 10LB15 alternate; see text).
C6, C7 — 10-μfd. mica.
C8, C9 — 0.001-μfd. disc ceramic.
C10 — 0.005-μfd. disc ceramic.
C11 — 50-μfd.-per-section split-stator variable (made from Millen 19140; see text).
C12 — Plate-line tuning adjustment (made from neutralizing condenser; see text).
C13 — 0.001-μfd. 5000-volt mica.
C14 — 0.25-μfd. tubular.
R1 — 350,000 ohms, 1 watt.
R2, R3 — 10,000 ohms, 1 watt.
R4 — 100 ohms, 1/2 watt.
R5, R6, R7, R8 — 10,000 ohms, 10 watts.
R9 — 5000 ohms, 10 watts.
R10 — 27,000 ohms. Use only if needed; see text.
L1 — 1 turn No. 14 enam., 3/8-inch diam.
L5 — 2 turns No. 18 enam., spaced 3/8 inch, 1/2-inch diam.
L6 — 2 turns No. 14 enam., spaced 3/8 inch, 1/2-inch diam.

Electrical and Mechanical Features

The exciter needed to drive the tripler is not shown, as plans call for a general-purpose v.h.f. exciter to be built later. For the present, a small 50-Mc. unit described in the 1952 ARRL Handbook is being used, but almost anything capable of 3 to 5 watts output on 48 Mc. should serve. If the exciter has no stages operating lower in frequency than 24 Mc., a prolific source of TVI in the form of unwanted harmonics can be eliminated.

The tripler circuit is extremely simple, but it supplies the necessary drive for the 9903 amplifier with ease. The plate circuits of these two stages are gang-tuned. They may not track accurately over large frequency changes, but the 2-meter operator seldom jumps around the band extensively, and if a major change is required, the inductances can be altered by spreading or squeezing the turns to take care of tracking. By slight rearrangement of parts the tripler could be tuned by a separate control. Straps of flashing copper 3/4-inch wide are used for the leads from the 5763 plate to the stator terminals of C1, to hold down lead inductance.

It will be noted from the bottom view that copper sheets are mounted on the bottom surface of the chassis covering the area of the driver and final stages, to improve grounding conductivity. Only one other element of novelty appears in the driver stage: the grounding of the rotor of C2 through a 100-ohm resistor, R3. Originally this butterfly capacitor was mounted on an aluminum bracket, grounding the rotor directly, but the resistor was substituted to stop a 250-Mc. parasitic oscillation. The rotor is now mounted on a polystyrene plate. The rotor of C1 is grounded directly to the aluminum bracket that also serves as a mounting for the 9903 socket. Note that ventilation holes are drilled through the copper plate and chassis just above the driver tube.

Plate leads for the 9903 should be very pliable material, silver or copper ribbon preferred to braid. The glass seal around the plate pins is fragile, so there should be no mechanical strain.

Standard heat-dissipating connectors must be filed down by about one-third of their total diameter, because of the close pin spacing on the 9003. Cardwell butterfly capacitors were selected for $C_7$ and $C_8$ because of their provision for ganging. Should these not be available, other types including the Johnson 10LJB15 can be substituted by soldering a ganging extension on the rear end of the rotor shaft of $C_8$.

Mounting the driver-plate and final-grid circuits so as to permit direct inductive coupling was ruled out in favor of separated circuits and link coupling, as shown. This reduces capacity coupling and makes the transferring of unwanted harmonics to the amplifier less likely. With low-drive tetrodes, even a small amount of energy (such as the 9th harmonic of a 6-Mc. crystal or the 8th harmonic of a 24-Mc. stage, examples of TVI possibilities in Channels 2 and 9 or 10) can be passed on and amplified if there is appreciable capacity coupling. This precaution can be carried further by providing link coupling between the tripler-plate and driver-grid circuits, and if Channels 9 or 10 are in use in the builder's locality this might be a desirable procedure.

The final stage has several novel features. The relatively high input and output capacitances of the 4-125As rule out conventional coil-and-condenser circuits at 144 Mc., so no grid tuning capacitor is used, and only a very small variable capacitance is used across the plate line. The entire grid circuit is made of $\frac{3}{8}$-inch copper strip. Two pieces $1\frac{1}{2}$ inches long connect the grid terminals to feed-through bushings that are provided for neutralizing tabs, if needed. The center portion is an egg-shaped loop also mounted on the feed-throughs, as seen in the bottom view. The bushings are mounted near the inner corners of the tube sockets, in holes that are drilled larger than needed to pass the ceramic portions of the bushings, to keep grid-to-ground capacitance to a minimum. More about these later.

The most critical neutralizing adjustment is provided by the variable screen-to-ground capacitor $C_9$, a split-stator variable the rotor of which is grounded through a metal mounting pillar between the two sockets. A modified single-section unit was used because its construction assured a symmetrical path from rotor to ground for each half of the assembly. It can be made from any of several standard single-section variables having ceramic supports at both ends.

A strap of brass or aluminum is first screwed to the metal mounting brackets at each end, tying them together electrically and mechanically. Then the stator bars are sawed in half, leaving an equal number of plates on each side. A Millen double-end-plate variable (19140) was used, but 100-mfd. models would serve equally well, as the required neutralizing capacitance turned out to be about 30 mfd. on each side. The 19140 had 9 plates each on the stator and rotor originally. The middle stator plate was cut out, and the front-end rotor plate removed, leaving a split-stator condenser with 4 plates on each stator and 8 on the rotor. The two screen terminals on each socket are strapped together, and connection to the stators is made with copper strap. Symmetry and low inductance are extremely important here.

The screen circuit also includes two solenoid-type r.f. chokes connected directly to the screen terminals. These are under $C_6$ and do not show in the photograph. Their common connection is by-passed, and a small filter choke is inserted in the screen-voltage lead for modulation purposes. The screen variable capacitor is driven through two universal-joint couplings to bring the drive shaft and knob out to a position that provides a balanced front panel appearance.

At first the amplifier was operated with resistor bias only, but this had certain disadvantages. There was a tendency to hum around the operating frequency during stand-by periods, and there was no means of cutting off the final plate and screen current when excitation was removed. Fixed bias is provided without the use of batteries or an external bias supply by inserting a voltage-regulator tube in series with the grid leak and by-passing the tube with a low-leakage capacitor. When the gas tube fires with application of excitation, $C_1$ charges. Removing the excitation stops.
the current flow through the VR tube and leaves the charge in $C_2$ applied to the 4-125A grids. This is sufficient to cut off the plate and screen current until the capacitor discharges. The length of the cut-off period depends on the leakage characteristics of $C_2$ and associated wiring. With an ordinary 0.25-uf, paper tubular, there is no plate and screen current for a minute or more. A 1-uf, transmitting-type condenser kept the amplifier cut off for several minutes. Some experimentation with $C_2$ may be necessary, and there must be very low d.c. leakage losses in the entire grid-to-ground circuit. An external bias source of 90 volts or more may, of course, be substituted.

The construction of the final plate circuit is obvious from the top-view photograph. The tuning device, $C_3$, is made from parts of a standard neutralizing capacitor (Millen 15011) mounted on 4-inch ceramic stand-offs (National GS-4) in the center of the chassis. The lead screw on the adjustable plate is extended by means of a short length of 1/4-inch diameter brass rod soldered to its end, and this is connected through an insulating coupling and a polystyrene rod to a knob on the front panel. This tuning arrangement provides no logging scale or reset indicator of any sort, but it results in a very worthwhile improvement in tank-circuit efficiency over conventional tuning methods.

The copper tubing tank circuit is mounted in place by means of strips of aluminum wrapped around the lines and fastened to the top of the stand-offs. Connection to the tube plates is made with 3/4-inch-wide copper straps that are bolted to the plate lines. No solder is used anywhere in this plate line assembly; the heat dissipated at the tube end of the line would be sufficient to melt soldered connections. The heat-dissipating connectors for the 4-125A plates were cut down to four fins high to reduce plate lead length. Just beyond the stand-off insulators and $C_3$ the plate lines are bent to a vertical position around a radius of about one inch, the bottom of the line ending about a half inch above the chassis. Here an adjustable strap of flashing copper is wrapped around the lines, and an r.f. choke is connected through a lug to a feed-through bushing carrying the high-voltage d.c.

Details of the antenna coupling loop are visible in the top view. The pick-up loop is made adjustable by mounting it through a polystyrene rod that can be rotated from the front panel. This rod passes through a shaft bearing and a tension adjusting device (National SB and Millen 10061) mounted on a small aluminum bracket.

Note that a short length of rod is fastened at the top of the loop, so that no adjustment of the coupling will allow it to come in contact with the line electrically.

Adjustment and Operation

This rig contains its own filament transformer so only plate and screen supplies are external. These should be capable of furnishing 250 volts at 75 ma. for the tripler, 400 volts at 200 ma. for the driver, 300 to 400 volts at 75 ma. for the final screens, and 1000 to 2000 volts at 400 ma. for the amplifier plates. The screens of the final and the driver plates may be run from the same supply, though a more flexible set-up is possible if the voltage applied to the final screens is adjustable separately.

The tripler should be tuned up first. Plug a low-range milliammeter in the tripler grid current jack, $J_1$, and apply grid drive through a coaxial cable and $J_4$. Adjust the spacing between the two halves of the grid coil, $L_2$, and the position of $L_1$ for maximum grid current. This should be 1 to 2 ma. Transfer the meter to the grid jack, $J_3$, and apply plate voltage through $R_3$, tuning $C_1$ for maximum grid current, which should be between 3 and 5 ma. The inductance of $L_3$ should be adjusted so that the low end of the band is reached with $C_1$ set somewhere between the mid-point and the maximum end of its range. Total plate-screen current to the 5763s need not be more than about 50 ma.

Next, tune $C_2$ through resonance and note whether the grid current changes. Should it dip down at resonance the stage will require neutralization.

This is unlikely with the 9903, however, as this tube is so designed as to be inherently neutralized at frequencies around 150 Mc. Next, plug a 200-ohm meter into $J_3$, or connect one externally in series with the plate-screen supply, as shown in Fig. 1, and apply plate voltage, preferably with a lamp load coupled to $L_4$. If the stage is working correctly, it should be possible to light a 40-watt lamp to full brilliance. Check for self-oscillation by removing excitation briefly. To protect the 9903, it might be well to make these initial tests at 250 volts or so, increasing to 400 to 500 volts only when the stage is found to be working correctly.

Next, couple the output from the driver stage to the grid circuit of the final, by means of a coaxial cable and $L_5$ and $L_6$. The latter should be the same general shape as $L_7$, and mounted inside or just above it, with about 1/8-inch separation. The resonant frequency of the grid circuit can be changed slightly by altering the shape of the grid inductance. Squeezing the sides together raises the frequency; making the tank more nearly round lowers it. When the circuit is properly resonated, it should be possible to develop 25 to 30 ma. grid current, measured in series with the VR tube and ground (MAX in Fig. 1). The setting of the screen-to-ground capacitor, $C_5$, will affect the grid current, but it may be set approximately to the proper point by adjusting it for maximum grid current with the plate voltage off. The total plate and screen current to the 9903 should be 175 to 200 ma. When the coupling loops at both ends of the coax have been adjusted so as to give maximum grid current, adjust the turn spacing of $L_4$ so that its tuning capacitance will be the same as that of $C_1$. The two condensers may then be ganged by means of flexible couplings and an insulating shaft.
Now we are ready to adjust the final stage. Connect a 100-watt lamp at the output terminals and apply about 500 volts to the final plates and 200 or less to the screens, metering both circuits as shown in the schematic diagram. Adjust $C_9$ for maximum output, watching the grid and plate meters. Move the setting of the screen adjustment in small steps until maximum output, minimum plate current, and maximum grid current all occur at the same setting of the plate tuning. This is the screen adjustment at which the amplifier will operate most stably. Neutralization can also be done by running the amplifier without excitation, adjusting $C_9$ until there is no evidence of oscillation, but this gives a broader indication than the first method.

Should it be impossible to achieve complete stability by the screen adjustment alone, it may be necessary to add grid-plate capacitance by mounting stiff wires or tabs on the feed-through bushings. In our amplifier, the capacitance added by the feed-through rods alone was just about the right amount, however. This is not the conventional cross-over neutralization, but rather additional grid-plate capacitance. The amount of capacitance added is adjusted in the same way as for triode neutralizing circuits of the crossover type.

Once the amplifier is stabilized at low voltages, we proceed to final checks at normal plate and screen operating conditions. A suitable load for high-power tests is something of a problem, as no lamp combination represents a load that simulates an antenna system at this frequency. A four-lamp load can be made, however, by connecting three or four 100-watt lamps in parallel. Lamps larger than the 100-watt variety are useless for load purposes, as they tend to develop filament hot spots and burn out before reaching anything like normal brilliance.

A method of varying the screen voltage continuously is extremely useful at this juncture, as the final tubes can be made to draw any desired plate current by suitable variation of the screen voltage. Adjusting a tetrode amplifier is a more complex process than with triodes, and the screen is the critical element. Screen dissipation should be watched closely to see that it does not run much over 20 watts in plate-modulated service or 30 watts on c.w., and it is strongly recommended that a screen-current meter be made a permanent part of the metering system. Efficient operation is possible over a range of 800 to 2500 volts on the plates; the efficiency running better than 50 per cent in our measurements. Power was measured with a u.h.f., wattmeter, so the figures represented the power that can be delivered to an antenna transmission line. Lab tests were made at up to 900 watts input.

The tetrode amplifier with separate screen voltage supply should never be operated without load, or with no plate voltage applied. Screen dissipation is certain to be excessive with plate voltage removed. Here we must throw out one of our most cherished indications of amplifier efficiency, the unloaded plate-current dip at resonance. To operate a rig like this without load is to invite tube failure, soon.

Tests with the lamp load should be monitored for freedom from modulation. With some types of chokes for $L_{19}$, there may be a tendency to oscillation at some audible frequency. Should this develop, it can be damped by loading the choke slightly with a resistor, as shown by $R_5$ in Fig. 1. The highest value of resistance that will stop the oscillation should be used, if any is necessary. Substituting another choke is a better method. It should have a minimum of 5 henrys inductance, but a wide variety of small filter chokes may be satisfactory.

In prolonged tests in the Headquarters Lab, and on the air at W1HDQ, this transmitter has demonstrated its ability to run smoothly at the manufacturer's maximum ratings for the frequency, 600 watts input on 'phone and 750 to (Continued on page 119)
The Siamese Paddle

A Key To Key the Keyer

BY MYRON HEXTER,* W9FKC

Almost anyone who has built an electronic keyer has gone through the experience of discovering, usually after completing the electronic part, that the control mechanism—the switch, or key—can be much more of a problem. A glance at the circuit of one of these devices fails to show why an old hacksaw blade wouldn’t do the trick. But this is far from the truth. Positive and reliable control requires a considerable degree of mechanical refinement, as attested by the fact that a ham will often chop up a twenty-dollar bug to get the few essential parts he needs. Satisfactory homemade substitutes require greater than an ordinary amount of skill with tools.

However, I recently discovered that there is a very simple solution to the problem. A pair of ordinary inexpensive straight keys can be made into a de luxe keyer control in less than an hour, if you don’t insist on trimming it up. It not only supplies a good wobble-free mechanism, but it also provides for convenient adjustment of tension and contact spacing, satisfying the most finicky operator.

As the photograph shows, it is simply a matter of mounting the two keys back to back in a vertical position. The keys shown in the photographs are Type J-38, selling in surplus for as low as 85 cents each, although almost any other type can be adapted. The J-38s are particularly suitable because they come mounted on bakelite bases, one of which can be put to use since most electronic-keyer circuits require insulation for all three terminals of the control.

Construction

First remove the two keys from their bases, strip one of the bases of the remaining hardware and remove the shorting levers from both keys. It may be necessary to lift the key arm out of its bearings to get at the screw holding the lever. Now place the keys on edge, with their bottoms facing, and clamp them together with a 6-32 machine screw through the upper mounting-screw hole. Using another 6-32 screw through the lower mounting hole, fasten a 1-inch hardware-store angle piece on each side with the legs extending outward. (The brass-plated pieces usually found in hardware stores, but less often in dime stores, make a much neater job than the common iron variety.) Make sure that the strap connecting the stationary key contact to its terminal doesn’t short against the angle piece.

The front end of the assembly is supported on 11/4-inch hardware-store angle pieces. One leg of each of the two pieces is shortened by cutting it off about midway between the two holes. One of these angle pieces is then fastened to the lower terminal of each key, using the terminal cap screw through the top hole in the longer leg of the angle piece. The short legs should point inward.

One of the J-38 bakelite bases is then marked and drilled to fit the holes in the feet of the mounting angles. The key should be placed with the feet approximately centered on the base. The holes should be well countersunk underneath so that flat-head mounting screws do not protrude.

(Continued on page 114)

By simply mounting two standard keys back to back in this fashion you can have a de luxe control for an electronic keyer in less time than it takes to tell about it.

* Box 73, Ravinia, Ill.
A Phase-Angle Detector for R.F. Transmission Lines

Easily-Constructed Device for Checking Matching and Line Operation

BY G. ROBERT MEZGER,* W2BLL

- Here is another of the many devices that are becoming of greater importance to the amateur as the problems of TVI and of getting the most out of complicated present-day transmitters increase. This simple device not only will tell much about how your transmission line is terminated, but it will do it while the transmitter is operating under full power and as the frequency is shifted.

The Amateur owes a little thanks, at least, to the TVI problem; for, like so many things that we are doing these days, the work which led to the story of this little phase-angle detector was undertaken simply out of the necessity for it while attacking the greater problem of TVI. To get a low-pass filter working properly in the output circuit of a transmitter, the filter must be inserted in a transmission line that is "flat." And to get a flat line one of the two conditions necessary to describe fully the termination is the requirement that it have unity power factor. Or to put it in other words, the load seen by the line must be purely resistive, with no reactive component. The magnitude of the impedance that is necessary to terminate a transmission line properly is not discussed here, although it is planned finally to build a device that will detect both magnitude and phase angle. It is hoped that such work, if successful, will make this article just an interim report.

The arrangement of equipment at W2BLL is typical. The output stage of the transmitter feeds a length of nominal 50-ohm RG-8/U cable that feeds the antenna tuner. The antenna is a simple 66-foot dipole, fed at the center with feeders 33 feet long, and it is presently used for the 3.5-, 7-, and 14-Mc. bands. The antenna tuner is the usual link-fed parallel-resonant circuit with the antenna feeders tapped on the coil at a point hoped to be the proper one to reflect 50 ohms of pure resistance at the output terminal of the coaxial line feeding the tuner.

A partial solution to the problem has been achieved by utilizing some of the work described in a Naval Research Laboratory Report written by V. True.1 In connection with its basic subject, NRL Report 3755 describes two devices for making measurements on radio-frequency transmis-

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Although it is easily fitted into a miniature box, the phase-angle detector is a highly useful device for antenna circuit adjustment and s.w.r. monitoring -- and can be left permanently in the line with transmitters up to the legal power limit.
the voltage induced in \( L_t \) will increase with frequency. It may be difficult, therefore, to employ the same detector circuit for operation on both 1.8 Mc. and 28 Mc., but the device described here operates satisfactorily over the range from 3.5 Mc. through 14.4 Mc. Fig. 4 is a plot of the typical operation of the device described here when operated at a frequency of 7200 kc. This plot clearly shows some unbalance, a condition that yet remains to be corrected.

**Construction**

The circuit of the phase-angle detector used in these experiments is shown in Fig. 5. Since shielding between the r.f. and other circuit components would be desirable, the device can be constructed by using two RCA "channel-lock" aluminum boxes of the smallest available size, 4 by 2½ by 1¾ inches in size. The channels of the two boxes should be fastened together along their 4 by 2½-inch dimensions using the junction of \( C_1 \), \( R_t \), and \( D_t \) as one fastening and using \( C_4 \), a feed-through capacitor, as the other fastening. The "top" box should contain the input and output connectors for the coaxial cable, \( L_t \), \( L_s \), \( D_t \), \( D_s \), \( C_2 \), and \( R_t \). The lower box should contain \( R_t \), \( R_s \), \( C_4 \), \( C_5 \), and \( L_s \).

\( L_t \) is nothing more than the inductance of a straight piece of No. 12 copper wire extending through the box from one coaxial terminal to the other. The capacitor \( C_t \) is the stray capacitance between \( L_t \) and \( L_s \).

Inductor \( L_s \) is wound, with No. 22 d.c.c. wire, on a rectangular wooden form two inches long by 1½ inch high. It is a five-turn center-tapped coil, and it seems to give adequate sensitivity, even at low powers and at low frequencies. Fewer turns could be used for high power and for higher frequencies, but as the number of turns is decreased it becomes more difficult to locate the center tap physically in the exact electrical center of the circuit. \( L_t \) and \( L_s \) are so oriented that the straight wire, \( L_t \), lies in the plane of the rectangular coil \( L_s \).

**Fig. 2** — Relations between secondary voltage and voltage and current of transmission line.
Circuit constants given are for use with Type 1N34 crystals. If Types 1N38 or 1N67 are used, $R_1$ and $R_3$ may be increased to approximately 0.3 megohm, thereby increasing the sensitivity of the circuit.

It is obvious that resistor $R_3$ causes a loss in output voltage from the phase-angle detector. It has been used only because of the advantage of small physical size. A 2.5-mh. r.f. choke would be preferable.

Because the output signal developed by the phase-angle detector is developed in a high-impedance circuit, the indicator of that signal must be either a sensitive microammeter or a high-impedance vacuum-tube voltmeter. If a microammeter is used, a zero-center instrument with a range of 100-0-100 microamperes probably will be satisfactory. The work described here has been done using an ordinary vacuum-tube voltmeter on its lowest range with the zero adjustment turned to make it operate as a zero-center instrument.

**Operation**

In the brief period of time so far available for experimenting with the phase-angle detector, it has been used here only at the antenna-tuner end of the coaxial feed line between the transmitter and the tuner. Thus, it has been employed only in a position chosen to tell us what may be the phase angle of the load seen by the coaxial cable at its termination or, conversely, something of the nature of the load reflected to the termination of the coaxial line by the antenna, through the antenna tuner. This information, of course, has helped give answers to such questions as whether the antenna tuner is tuning out all the reactance of the antenna system, and whether the reflected impedance of the antenna is inductive or capacitive.

A little experience with the phase-angle detector has shown that if, after a thorough check of wiring, the detector fails to indicate a null when the antenna tuner acts as though the antenna were properly tuned, then it is most likely that the antenna tuner is not tuning out all the reactance of the antenna. This difficulty has occurred a number of times, using this little detector. In each case it has been corrected by changing taps on the antenna tuner, changing the length of the antenna feed line, or both. This manifestation of the effect of improper matching between antenna and transmitter causes us to consider the phase-angle detector a pseudo-s.w.r. indicator. It is true that when the s.w.r. is unity the phase-angle detector will indicate a null; but it is not necessarily true that when the phase-angle detector indicates a null the s.w.r. is unity. Rather, the phase-angle detector simply shows that the reactance reflected back from the antenna, through the antenna tuner to the feed line from the transmitter, is either present, capacitively or inductively, or is zero. It says nothing about the magnitude of the resistance that the feed line from the transmitter sees when a null is indicated by the phase-angle detector. That is, the phase-angle detector will show when the impedance seen by the feed line from the transmitter has been changed from the general expression $R \pm jX$ to the form $R + jX$, but it will tell nothing about the magnitude of $R$. This in itself is useful information when attacking the s.w.r. problem, but it is not the complete answer.

**Conclusion**

In spite of the limitations mentioned in the foregoing paragraph, the phase-angle detector can be usefully employed, in many cases, as a monitor of the s.w.r. If the antenna tuner and its associated load, the antenna, are first matched to the link coil feeding it from the output of the coaxial transmission line so that the line is terminated

![Plot of typical output of device of Fig. 5 at a frequency of 7200 kc.](image-url)
properly, by using an s.w.r. bridge, and if the phase-angle detector is installed at the input end of the line, then the phase-angle detector does tell when the s.w.r. is unity or when it departs therefrom. A mismatch of any sort at the antenna tuner will cause the input impedance of the line to have a reactive component. The one exception to this case is when the load is still resistive and the line is an exact multiple of 1/4 wave in electrical length; this length easily can be avoided. So, after a preliminary matching, the phase-angle detector becomes an s.w.r. monitor, or serves to indicate adjustments at the antenna tuner, as after changing frequency, that will bring the s.w.r. back to a minimum.

The phase-angle detector has proved itself to be a very useful little gadget for tuning a transmitter and the antenna that goes with it. It has, for example, shown that maximum power output is not necessarily the point where final-amplifier-plate current is maximum and everything seems to be "in tune." It has shown the proper amount of coupling to employ with movable-link coils to obtain good power transfer with minimum coupling. It has helped to locate the reason, in specific cases, why tuning capacitors are over because of high standing waves. Because its output potential changes polarity with phase angle, it will identify the reactance present, so that one easily can determine whether the load is capacitive or inductive. And if, after adjusting the load to eliminate reactance, the output voltage of only one-half of the circuit is read, the voltage is an index of output power. In another article² Walt Knoop describes another ingenious and interesting application of this circuit, in this case as the detecting device for an automatic antenna tuner.

It is obvious that the work and the results mentioned here are rather sketchy. That is because we have been playing with this little gadget for only a very short time; but in this brief period, it has proved so useful and helpful that it seemed more desirable to write a short report describing the basic device, even if the work is only partially completed, rather than wait the long time necessary for more complete exploitation of the possibilities of this circuit.


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Silent Keys

It is with deep regret that we record the passing of these amateurs:

W2JGM, Clayton B. Leggall, Singerlindia, N. Y.
W2NFQ, Mario A. Bierus, Brooklyn, N. Y.
W2RF, Louis G. Fosant, New York, N. Y.
W2SM, David Nebotobsky, Trenton, N. J.
W2YP, Abe Haas, Mt. Vernon, N. Y.
W4DSY, Robert J. Dawson Jr., Charlotte, N. C.
W4DU, Orville R. Coe, Jacksonville, Fla.
W6MRT, Dr. J. Van Bree, San Diego, Calif.
W8SLT, Edna McGeorge, Los Angeles, Calif.
ex-W7AA, George M. Ohl, New York, N. Y.
W7QJK, Merle A. Cook, Boulder City, Nev.
W7ITT, H. O. George, Tuscon, Ariz.
ex-0AHM, Fred O. Groves, Quincy, Ill.
W9FFV, William A. Markland, Lawrenceburg, Ind.
W9NR, George P. Stab, Chicago, Ill.
W9GN, Dr. J. Wilson Rogers, Geneva, Ill.
W6APQ, John N. Reuben, Kewask, Iowa.
W9QXL, Albert P. Smith, Holyoke, Colo.
W9YKX, William A. Copeland, Woodbine, Iowa.
G5Q, R. Frank Speake, Wolverhampton, Staffordshire.
HISFA, F. A. Saabia, Ciudad Trujillo
ZL4AP, T. E. Neville, Monrovia, Tokyo

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Notes:

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- 20
Getting the Most Into Your Antenna

A Simple Explanation of the Fundamentals Involved

BY RICHARD M. SMITH,* WI7TX

• A frequent stumbling block is the problem of getting the power generated by the transmitter into the antenna. This, the first of two articles on the subject, gives the Novice the basic fundamentals he needs to solve his coupling problems. A subsequent article will describe the construction and use of the antenna couplers he needs to make use of the principles he can learn here.

Antennas and antenna coupling are not "mysterious" subjects. They only seem that way to the Novice because he finds it more difficult to know when he is doing the right thing than in other phases of the hobby. He can tell, for example, when his transmitter is working properly merely by watching the plate milliammeter and listening to the tone of the signal in his receiver. But what does he do when the meter shows him that "everything is working right" but he still doesn't get any answers to his calls? Is his location poor, conditions bad, or what? Admittedly these factors may exist, but in more cases the trouble is that the power just isn't getting into the antenna.

With a half-way efficient transmitter, a mediocre location, and anything but a complete "washout" of radio conditions you'll "get out" if you get the power into the antenna. If you don't, the best transmitter, the best location, and the best antenna in the world won't help you. It is important, therefore, to pay close attention to the antenna coupling system in your station. It can mean the difference between failure and success.

Some Fundamentals

It is easy to get power into an antenna, if the right kind of coupling device is connected to the feed line at the right point. Before you can understand this and thereby learn what to do to make your antenna and its feed line work properly, there are a few basic fundamentals of antenna operation that must be learned. We won't go into all of the theory involved, but will state the more important considerations that must be kept in mind. For more detailed discussion of the theoretical aspects, you can refer to the A.R.R.L. Antenna Book.

First of all, the easiest way to get power into your antenna is to start out with an antenna system that is resonant. Coupling problems are then much simpler. When we say "system," we mean all of the wire involved, from the antenna coupler out to the end of the line. To be resonant, the antenna system must be cut to a length determined by the frequency or wavelength at which it is to operate. A wire is resonant when its length is exactly equal to one half wavelength (or any multiple thereof) at the frequency of operation. Exact figures, in feet and inches, can be computed from simple formulas contained in both the Antenna Book and The Radio Amateur's Handbook. The main point, so far as this discussion is concerned, is that it is easiest to couple to a resonant antenna system, and to be resonant it must be cut to the correct length.

The next important point concerns the way current and voltage are distributed on an antenna. Again skipping the theory that can be obtained elsewhere, Fig. 1 shows the current distri-

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Fig. 1 — Current distribution in three different types of antennas. Note the way the current patterns repeat themselves, but in the opposite polarity, throughout alternate half waves. The dimensions shown are those computed for half-wave antennas operating at 3725 kc., the center of the present Novice assignment in the 3.5-Mc. amateur band.
bution on three different antenna systems. In sketch A, a random-length wire is shown. Assume for a moment that power is applied to the end of the wire from the transmitter. Current flows down the wire, but when it reaches the end insulator, it must stop. This is the key to all of the various current distribution diagrams that you will encounter in reading about antennas, and it is often overlooked by newcomers. A current minimum, or null, always occurs at the end of the wire, simply because it has to. Based on this fact, drawing a diagram of the current distribution on any antenna, resonant or not, becomes a simple matter, because it will follow a regular pattern dictated by the length of the wave at the particular frequency involved. The pattern is always as shown in sketch A of Fig. 1, with current being minimum at the far end of the wire, at maximum one quarter wavelength back toward the source, returning to maximum again one half-wavelength from the far end. If the wire is more than one half-wavelength long, current reaches another maximum three quarters of a wavelength from the end, and is back at minimum again a full wavelength from the end.

Note that the second maximum-current point is shown on the opposite side of the line to the first. This is to indicate that the current flows in the opposite direction in this section of the wire, because the polarities change during succeeding half waves (half cycles). If the wire were to be extended several wavelengths more, the same patterns would exist, with the current maxima and minima occurring regularly a quarter-wavelength apart, and with the direction of flow, or polarity, reversing every half-wavelength throughout.

The distribution of voltage on a wire is exactly opposite to the current distribution curve. Maximum voltage points occur at the minimum current points, and minimum voltage points correspond to maximum current points. Actually, it is necessary to think in terms of only one, either current or voltage, because we know that when one is at maximum, the other is at minimum. We choose to talk in terms of current distribution here because it is easier to measure current than voltage at radio frequencies.

The Single-Wire Antenna

As shown in sketch A of Fig. 1, a straight length of wire, whether it be cut to a resonant length or not, can be used as an antenna. Radiation takes place from the entire length of wire, regardless of where it is installed. Thus, if part of the antenna is low to the ground, surrounded by buildings and trees, as it usually is at the transmitter end, a portion of the power radiated is apt to be absorbed by the surrounding objects. It is better to try to design a system in which all of the radiation takes place from a wire that is supported high above the ground, and away from surrounding objects. This requires some means for getting the power up to the antenna in a feed line that will not radiate, but which will deliver the power to the place from which we wish it to be radiated. The same current-distribution characteristics that we’ve been talking about present the solution to this problem. We know that electrical charges of equal intensity and opposite polarity cancel one another. Radiation from a pair of wires, spaced a few inches apart, will be negligible, therefore, if the current in the two wires is equal and opposite. This is called a balanced feed line. How the desired relationship between the currents in the two wires is achieved is shown below.

The Zepp Antenna

In this system, one side of a two-wire feed line is connected directly to one end of a resonant “flat top,” and the other side is left “floating.” (It must be insulated from both the flat top and the supporting wire, or rope, as shown in sketch B of Fig. 1.) In order to understand how we can get a balanced feed line out of this arrangement we must consider the current distribution on the flat top as well as the feeders, because the feeders are actually an extension of the flat top, bent down from the plane of the wire in the flat top. This can be seen by following the dotted lines back up to the straight wire shown at the top of Fig. 1. Note that, if the flat top is exactly a half-wave (or any multiple thereof) long, a current minimum occurs at the point of attachment of the feeders, and another current minimum occurs at point C, one half wavelength down the “live” feeder wire. The current distribution on the “dead” feeder is also shown in the diagram, with a current minimum occurring right where it has to, at the insulated end of the wire. This, of course, results in the correct relationship between currents in the two feeders. We have made them equal by cutting the flat top to the correct length, and they are opposite because of the polarity reversal which exists in adjacent half wavelengths of any piece of wire. (The two feeder wires are joined through the antenna coupler.) Being equal and opposite, the radiation from the feeders will cancel, and all the power will go into the flat top. Thus the Zepp will be able to do a better job of radiating than the single wire described earlier.

If the flat top is not cut to the correct length for the frequency of operation, the feed line currents will not be balanced, and the feeders will radiate some of the power in places where we don’t want it to be dispersed, namely close to the ground near objects which can absorb it, and often close to some neighbor’s broadcast or TV set where it can cause interference. What happens when the flat top is not the right length is shown in Fig. 2. Here the flat top is too short. Starting again at the far end of the wire, there must be a current minimum at the end, with a point of maximum current occurring one quarter wavelength away. The next current minimum occurs not at the junction of the feeders and the flat top, but at a point part way down the “live” feeder, how far down depending on the deficiency in length that has to be made up. Note that the distribution of current on the “dead” feeder is not changed by the fact that the antenna is too short;
LESS THAN \(\frac{1}{4}\) WAVE

(A)

ZEPP - FLAT TOP TOO SHORT.

Fig. 2 — Current distribution in antennas having less than a half wavelength in the "flat-top." In the case of the Zepp, feeder unbalance results. This is not true of the center-fed antenna, making it the best bet for installation where space for a full half-wave is unobtainable.

the current minimum is right where it always has to be — at the end of the wire. Naturally, the current in this set of feeders will be unbalanced, and some of the power will be wasted on the surrounding objects.

The Center-Fed Antenna

Return now to Fig. 1, and look at sketch C, which shows the current distribution in a center-fed half-wave antenna. The feeders are attached at a point of maximum current, resulting in a situation exactly opposite to the case of the Zepp. The current minima on the feed line occur one quarter wavelength away from the point of attachment to the flat top, and both feeder wires must be considered as extensions of the flat top, not just one.

Let's see what happens when a center-fed antenna is too short. The length of the flat top shown in Fig. 2B is somewhat less than a half wave. Current minima must occur at the insulated ends of the wire, as always. Therefore, starting at either end of the antenna, and applying the same principles, we see that the current maxima must occur part way down the feed line, a quarter wavelength from the ends of the wire. Assuming that the two halves of the flat top are equal in length, these points will be opposite each other on the feed line, so the currents in the feeders are balanced, and feeder radiation is minimized.

This explains why the center-fed system is considered better than end feed. The advantage is even greater when you consider what happens when the operating frequency is changed. In the case of the Zepp, the feeder currents are balanced only when the flat top is cut to the right length for the frequency in use. With the center-fed antenna, feeder current remains balanced, regardless of the operating frequency, and regardless of whether the flat top is by itself resonant.

Thus, it is not necessary that you have space for a full half-wave antenna. If you use center feed, and there is sufficient wire in the complete system for it to be resonant, you can have an efficient antenna even though the flat top must be shortened somewhat to fit a city lot.

Coupling to the Antenna System

We've talked about the distribution of current and voltage on antennas and their feed lines solely to indicate why the total length of wire involved is important, and to show the differences encountered in various types of antenna. We said at the start that it is easy to get power into an antenna if the right kind of coupling device is connected at the right place. The right place is either a point of maximum current or minimum current. The farther away from these points you go, the more difficulty you are apt to encounter, and the midway points present a coupling problem that is often beyond the capabilities of the usual antenna coupler.

An important thing to remember is that in figuring feeder lengths, the distance from the far end of the antenna to the coupler is what counts, not the distance to the house, or to the transmitter. The coupler can be installed some distance away from the transmitter, if need be, but the length of the link line that connects it to the transmitter cannot be considered as part of the length of the antenna system when you are drawing current-distribution curves.

The type of coupler to use depends on whether you are going to feed power in at a point of current maximum or minimum. If your antenna system is cut so that the end of the feed line represents a current minimum (voltage maximum), you will need a parallel-tuned coupler. A series-tuned coupler is called for to insert power at a point of maximum current. A third type, the pi-section coupler, is recommended if you are forced by circumstances to use a random-length antenna with power applied at one end. All three types are described in detail in the A.R.E.L. Antenna Book.

Using the antenna coupler is a simple procedure once you have selected the right type, but (Continued on page 116)
A Quadriband Mobile Transmitter

Fifty Watts Under the Dashboard

BY CHARLES J. SCHAUERS, W6QLV

HAVING looked over almost every type of mobile installation, ranging from a 1-kw. rig downward, my ideas had become pretty well crystallized by the time I got around to building one for my own car. For one thing, I wanted to keep the trunk free for the purpose for which it was originally designed. This meant a dashboard job that would operate from a power unit sufficiently reasonable in size to fit under the hood. Therefore, the starting point was the space available under the instrument panel. Measurements showed that a cabinet of approximately 11 by 11 by 8 inches would fit nicely without undue crowding. An enclosure of this size was made by cutting down a standard utility box.

Circuit

Having determined the physical limits, the problem of circuitry was tackled next. The one shown in Fig. 1 was based on the principal requirements that included choice of VFO or crystal, operation in the most-popular mobile bands — 10, 11, 20 and 75 (including the MARS frequencies) — and an input of about 50 watts to the final amplifier with 100 per cent plate-and-screen modulation.

When operating at 75 meters, the plate circuit of the 6AG7 crystal oscillator is tuned. This permits working the 6V6 buffer-doubler (and also the 6AG7 when VFO is used) straight through without danger of oscillation. For the higher frequencies, the plate circuit is fixed-tuned, using iron-slug coil forms. For 14-Mc. operation, frequency is doubled in the plate circuit of the oscillator and doubled again in the 6V6, using crystals in the 3.5-Mc. range. Crystals in the 7-Mc. range are necessary only for 10- and 11-meter output, doubling in both stages.

The VFO, shown only in block form in Fig. 1, is a Lysee 381-R mounted on the chassis at the center of the panel. This VFO gives output on either 50 or 40, selectable by a switch. S1 shifts from crystal to VFO. Since this model VFO is designed for low-impedance output, it was necessary to alter it slightly for high-impedance output by clipping the link coils and making connection directly to the hot end of the circuit. (Lysee also puts out a similar VFO designed for high-impedance output which, of course, would not require this alteration.)

The 807 works straight through on all bands. Excitation can be adjusted to proper value by means of R7, which controls the screen voltage of the 6V6. The output circuit is in the form of a pi-section network. This circuit has worked out very well on all frequencies and no TVI has been experienced operating the rig as close as practicable to a TV antenna. \(C_{19}, C_{20}\) and \(C_{21}\) are...

\[\text{QST for}\

\[\text{The quadriband mobile transmitter installed, showing the panel layout.}\]
fixed condensers augmenting the variable condensers \(C_3\) and \(C_9\). \(RFC_5, RFC_8\) and \(RFC_9\) are v.h.f. parasitic chokes. The milliammeter \(MA_1\) reads 807 grid current, while \(MA_2\) may be switched to read either modulator or final-amplifier plate current.

The audio section consists of a two-stage speech amplifier using a single 12AU7 and a 6L6 Class AB1 modulator. Although sufficient gain is available for a dynamic or crystal microphone, I use a hand microphone fitted with a W.E. F-1 carbon button. Full modulation is
obtained with the gain control backed down near minimum.

A PE-103 dynamotor is used to supply the final amplifier and modulator stages, while a 300-volt 100-ma. vibrator pack supplies all other stages. If the negative side of the battery in your car is grounded, as it is in mine, the polarity of the high-voltage output of the PE-103 can be corrected by reversing the connections to the high-voltage brushes.

Control Circuit

The toggle switch, S7, turns on the filament and the hot side of the car battery to the relays and microphone. It also lights the green indicator lamp, I2. Closing the microphone switch, S5, operates R23. The contacts of R23 operate R31, which I mounted in the VFO unit, closing the VFO plate-voltage circuit and, through connection W, operate the antenna relay, R23, and the power relay, R23, in Fig. 2. The latter starts the dynamotor, turns on the vibrator pack via R41, and lights the red indicator lamp, I1. A second set of contacts on R23 closes the high-voltage circuit to the final amplifier and modulator.

A switch, S1, in Fig. 2, mounted on the dash-board, permits turning on the vibrator pack alone for tuning up the crystal oscillator and doubler. In setting the VFO to frequency, S2 (also added to the VFO unit) must be closed. The VFO can also be used as a b.f.o. in c.w. or s.s.b. reception.

Construction

The important details of construction are shown in the photographs. The chassis measures 10¾ by 10 by 3 inches and, in my case, setting the chassis off center on the panel made installation easier. On top of the chassis the VFO unit is placed against the panel in the center of the chassis. A window is cut in the panel to expose the calibrated dial. The audio tubes and the modulation transformer are lined up along the rear of the chassis. To the left of the VFO are the 75- and 20-meter output coils, L6 and L7, mounted at right angles on stand-off insulators, and the 807 immediately to the rear. The 6V6 is off the right rear corner of the VFO unit. The 6AG7 and its associated plate coils are hidden behind the panel in the space to the right.

Underneath, the bandswitch is at the center. The ceramic wafer at the front, fastened to the panel, is a two-circuit unit carrying the circuits of S3C and S2D. The 10-meter coil, L6, is soldered directly between the switch contact and the stator terminal of C23 to the left in the bottom-view photograph. C13 is the variable to the right. The two remaining bandswitch wafer, S2A and S2B, are of bakelite and are mounted on a bracket which places the sections at almost the exact center of the chassis. S2B is to the rear, with the associated coils, L3, L4 and L5, lined up across the rear. C13 is to the left, mounted on a bracket. S4 is panel-mounted close to the control of the bandswitch. The antenna change-over relay, R23, is mounted against the right-hand edge of the chassis, between the two coaxial connectors, J1 and J2. A short piece of RG-59/U connects the relay contacts to the stator of C23. Small baffle shields are placed between C12 and C22, and between the rear section of the bandswitch and C13.

To the rear of the chassis, behind a shielding barrier, are the microphone and driver transformers and small components of the audio section. The control relay, R23, is mounted to the right on a small stand-off insulator.

On the panel, the two meters are mounted
to either side of the VFO unit. The filament switch, $S_7$, and the green signal lamp, $I_2$, are below the grid-current meter, $M_A$, to the right, while the meter switch, $S_8$, and the red signal lamp, $I_1$, are to the left. The microphone connector and audio gain control are below the red lamp. Below the green lamp to the right are the crystal socket and the crystal-VFO switch, $S_1$. The tuning control for $C_{12}$ is the small knob to the right of the dial for $C_{25}$. The excitation control, $R_7$, is below the filament switch. The toggle switch above the VFO dial is $S_2$ in the VFO unit.

**Adjustment**

Prior to installation, the VFO is tuned up for maximum output, as are the output coils of the crystal oscillator. A grid-dip meter comes in handy for this adjustment. The buffer-doubler is then tuned for maximum 807 grid current and the excitation adjusted by $R_7$ to give an 807 grid current of 3 to 4 milliamperes. In adjusting the coupling to the antenna or transmission line, $C_{22}$ is placed at some setting and then $C_{18}$ is resonated for the usual plate-current dip. If the resulting plate current is too low or too high, $C_{22}$ is adjusted to a different setting, and the circuit re-resonated with $C_{18}$. It should be possible to load the final up to 100 ma. on all bands. I have found it possible to maintain satisfactory loading over a range of about 125 kc. on 75 without readjusting the antenna length or the loading-coil inductance. On this band it is usually necessary to switch in either $C_{29}$ or $C_{31}$ to obtain proper loading.

A small field-strength meter is used for tuning the transmitter for maximum output. This is connected to the regular auto antenna on the cowl and placed on the floor when not in use. The auto antenna is not fully extended. False loading with the pi-section network is avoided in this manner.

The total battery drain with full load to the final runs about 40 amperes, so it is a good idea to keep the motor running while transmitting.

Consistent results have been obtained on 75 up to 300 miles in daylight and stations as far away as 2500 miles have been contacted at night with $S_5$ to "S9-plus-40" reports. Best DX on 20 is Japan, and nearly every station called in reply to a CQ has been raised.

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**Strays**

It was a case of life or death when VQ4CO, Nairobi, and W8LIO of Dorset, Ohio, set an amateur radio chain reaction in motion on the 20-meter 'phone band in mid-May. W4AAM, W4NTZ, W1JCl, W1MB and 5A2TO joined in.

Doctor Gustave H. Hoehn, Seventh-day Adventist missionary-physician, was stricken with polio on May 4th while on duty at Kendu Hospital, 200 miles from Nairobi in Kenya Colony. He continued his work until the 11th when a respiratory paralysis developed. The doctor was quickly transported to a Nairobi hospital where Dr. G. W. Allen, VQ4CO, also a Seventh-day Adventist physician, placed him in a standby "wooden lung." This unit was far from satisfactory and Dr. Hoehn’s situation was perilous.

VQ4CO then succeeded in contacting W8LIO who, aided by W4AAM, got word to Seventh-day Adventist headquarters in Washington.

The next step was volunteered by the Surgeon General’s Office of the Air Force. A special mission was dispatched by air from Frankfurt, Germany, carrying a portable iron lung and a medical team to Nairobi and thence to the U. S. The 8500-mile trip was completed and at last reports Dr. Hoehn was resting comfortably in Children’s Hospital, Boston.
Two-Element Driven Arrays

Adjustable Phasing by a Simplified Method

BY L. A. MOXON,* G6XN

Two-element arrays of the close-spaced parasitic type have achieved a well-deserved popularity in spite of a number of drawbacks, among which are the difficulty of making adjustments after erection; the need for 360-degree rotation, a rather poor front-to-back ratio when adjusted for maximum gain, and the difficulty of making them "multiband." These difficulties can be overcome by driving both elements with a suitable phase difference; although there are no new principles involved it appears that the case for driven vs. parasitic arrays is not widely known. The problem of phasing — which is a simple matter if tackled as described in this article — has in the past given rise to a certain amount of difficulty.

Before developing the system described here the author relied for DX contacts mainly on a fixed four-element beam which, aided by steep-sloping ground, gave very good results over the long route to Australia. However, other directions proved difficult to work. Interest was aroused in the "G8PO antenna" by the large number of VK stations using it, and discussions over the air with G8PO himself, in the person of VK3WU, proved to be the starting point for a detailed theoretical and experimental study of driven two-element arrays.

The G8PO antenna is a two-element driven array with 135-degree phasing and \( \frac{1}{6} \) wave spacing. The front-to-back ratio is infinite in theory and often very nearly so in practice. The theoretical gain is 1 db, less than for a parasitic array and about the same as that of the WSJK antenna. However, the gain is more easily realized since the radiation resistance is nearly four times as high. As the beam is electrically reversible, there is no need to provide more than 180-degree rotation. The phase shift is obtained by having different lengths of feeder to the two elements.

In its original form the G8PO antenna has two main snags; i.e., restriction to single-band operation, and cut-and-try methods of phasing adjustment that do not seem always to lead to equally good results. This is usually due to standing waves on the feeders, and in systems with other than \( \frac{1}{6} \) wavelength spacing the situation is further complicated by the fact that, in general, the impedances of the two elements are not equal, and it is therefore more difficult to adjust the individual element currents to the desired values. A theoretical study shows that the impedance inequality does not arise if the transfer impedance (i.e., from one element into the other) is non-reactive. This happens, very conveniently, at about \( \frac{1}{6} \) wave spacing, and means that if the elements with their feeders are cut individually to exact resonance and connected in parallel through equal values of reactance the currents in the elements are automatically equal.

Fig. 1 shows calculated curves of power gain and front-to-back ratio plotted against phase angle of the currents in the two elements, for equal current amplitudes in both. These curves are applicable to any 2-element \( \frac{1}{6} \)-wave spaced array with driven elements, and it will be noticed that the best gain is obtained with phasing in between that of the WSJK and G8PO systems. The G6XN antenna uses 150° phasing as an optimum compromise between gain and front-to-back ratio. With 150-degree phasing the nominal front-to-back ratio is not as high as with 135-degree phasing; but reference to Fig. 2 shows that the single null directly to the rear (180 degrees on the pattern measured from the optimum direction of radiation) has been replaced by two.

* Oak Tree Cottage, Chase Lane, Haslemere, Surrey, England.
nulls at 132 degrees. The nominal figure is therefore misleading, and if we consider the power received “on the back” averaged over 180 degrees on the assumption of uniform angular distribution of interfering stations, the two values of phasing are found to be about equally good.

**Phase Shifting with Resonant Feeders**

Most readers will be familiar with the WJK antenna, which makes a convenient starting point for explaining the G6XN method of phasing. If the feeders coming from the two dipoles are joined together, with one pair crossed over, and if r.f. energy is applied to the junction, we have in effect the WJK system; the arrangement is perfectly symmetrical, the currents in all elements are equal, and the antenna fires equally in both directions.

Let us assume that each dipole, together with its own half-wave feeder, is exactly resonant. The impedance looking into either set of feeder terminals will then be a pure resistance, as indicated in Fig. 3A, and the resistances will have the same value. Shortening one feeder by a small amount, as in Fig. 3B, is equivalent to putting capacitive reactance in series with resistance and the value of reactance will be dependent upon the amount by which the feeder is shortened. Lengthening the other feeder by the same amount introduces inductive reactance of exactly the same amount, and the resistive component of the input impedance is also exactly the same as in the capacitive case.

Consequently, if we leave the feeders joined together but feed “off center” as shown in Fig. 3C, the system is resonant and the same power is delivered to each dipole. Also, the shortened side is given a phase lead and the current in the lengthened side lags. As a result of this and the crossover in one feeder the system fires in the direction of the side toward which the feeder junction has been moved.

The interaction between the elements depends on the phasing between their currents, and not only affects the radiation resistance but introduces reactances of opposite sign into each element which in turn affects the phasing. Since the impedances of the elements themselves

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**Fig. 3** — Development of the off-center feed method of phasing. The character of the input impedance seen by a transmission line connected to the terminals is shown at the right. As stated in the text, this is based on 3/4-wavelength spacing and exact resonance in each element plus its half-wave feeder.

With 150-degree phasing the radiation resistance of each element is about 10 ohms. The resistance seen by the feed line at the junction of the phasing lines is about 10 ohms, the two reflected resistances being in parallel at this point and stepped up a small amount by the phasing lines. With 180-degree phasing each element has a radiation resistance of about 9 ohms, so that the increase in resistance with 150-degree phasing represents a worthwhile increase in efficiency.
A Practical System

Reversal of the beam requires the main feeder to be attached at the same distance off center on the opposite side. If preferred, the individual feeders may be kept equal in length, and ordinary lumped capacitances and inductances can take the place of the shortenings and lengthenings. These components can be conveniently mounted on a switch for beam reversal. This is the method used at G6XN, shown in Fig. 4, each feeder being a half-wave long.

The system should ordinarily be adjusted at the mid-frequency of the band or part of the band to be used. If there is an inequality in the feeder currents which favors the capacitive side to the same extent regardless of the switch position, both feeders must be shortened (by the same amount) to the extent required to establish equal currents. Alternatively, if the inductive side is favored, the feeders must be lengthened. An adjustment of this type is very likely to be required because end effects make it difficult to calculate the lengths exactly. However, if care has been taken to make the lengths equal it is easy to get them right.

The effect of unequal lengths is best illustrated by an example. Suppose one feeder is resonant (zero reactance) and that the other is too short, giving a capacitive component of 100 ohms. Also suppose that equal and opposite lumped reactances of 50 ohms each are carried by the switch. In one switch position the net reactance of the short feeder is 150 ohms capacitive and the other is 50 ohms inductive; there is a phase difference but the inductive side draws more current. In the other switch position the net reactance of the short feeder is 50 ohms capacitive and the other feeder is also 50 ohms capacitive. The currents are equal but there is no phase shift, so we have the W8JK system. A signal received from the best direction in the first position will therefore be comparable in the second position, so there appears to be no back-to-front ratio. However, the same test on a signal from the opposite direction will indicate at least some back-to-front ratio. The example ignores the interaction between the elements with the change in phasing on operating the switch, but is in good qualitative agreement with what happens in practice if the lengths are not equal.

Once the feeder lengths are correct, the phasing can be adjusted to the desired value by changing L and C, keeping their reactances equal at the mid-frequency. (Equality can be checked by connecting the two together, to form a simple tuned circuit, independently of the feeder system, and making sure that they resonate at the desired frequency.)

Although there is no simple method available for measuring the phase difference, the phasing can be adjusted by the usual field-strength meter, the L/C ratio being adjusted either for maximum forward gain or to put the nulls at the back at

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Fig. 4 — The 14-Mc. system used at G6XN. Each L is 0.25 microhenry and each C is 500 μf. The 28-Mc. addition shown in Fig. 5 is permanently connected at points A and B. An open position on the reversing switch disconnects the 14-Mc. phasing elements and main transmission line when operating on 28 Mc.

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text summary

This is true only if the antennas and the connecting line are exactly resonant. For example, if both feeders are too short, the reactance on the capacitive side is increased and the reactance on the inductive side is reduced; the inductive side therefore draws more current. Conversely, excess current on the capacitive side indicates that the feeders are too long. A 20 per cent inequality of currents will reduce the front-to-back ratio (for the G8PO 135-degree phasing) from infinity to about 16 db., although it causes only a slight reduction of forward gain.

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In this way a phase angle of 150 degrees is obtained by subtracting 30 degrees from the 180 degrees of the W8JK system. As some readers may hasten to point out, one could equally well, in principle, start from 0 degrees (i.e., feeders not crossed over) and add 150 degrees. This is fairly common practice with the G8PO antenna, but with resonant feeders it is quite unworkable except perhaps for spot-frequency working, being too critical. The reason is that in this case the correct feed point is much nearer center than it would be with no interaction, and consequently a very small shift of feed point produces a large phase change.

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affect the standing-wave ratio on the feeders, and the s.w.r. in turn affects the values of reactance and resistance in the input impedance of the feeders, the proper feed point (junction of feeders) will be farther "off center" than would be the case if changing the current phasing caused no mutual effects between the radiating elements. However, at 1/4-wave spacing these effects are practically the same in both elements, so the feeder currents remain equal and the whole system remains resonant, since the phase shifts are equal and opposite.1

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1 In this way a phase angle of 150 degrees is obtained by subtracting 30 degrees from the 180 degrees of the W8JK system. As some readers may hasten to point out, one could equally well, in principle, start from 0 degrees (i.e., feeders not crossed over) and add 150 degrees. This is fairly common practice with the G8PO antenna, but with resonant feeders it is quite unworkable except perhaps for spot-frequency working, being too critical. The reason is that in this case the correct feed point is much nearer center than it would be with no interaction, and consequently a very small shift of feed point produces a large phase change.
the desired angle with respect to the line of fire.

If meters are not available for checking the feeder currents a flashlight lamp connected to two probes can be bridged across an inch or two of each feeder in turn. Due to the low impedance the feeders can be handled without serious disturbance of the current or danger of r.f. burns, up to at least 100 watts input and probably much more. It is assumed, of course, that proper care has been taken to prevent any possibility, however remote, of high voltage appearing on the feeders.

At 100 watts input the current in each feeder is about 1 1/2 amperes and the phasing condensers should be rated to stand rather more than this because the currents may be higher during adjustment. Ordinary receiving-type mica capacitors have been used successfully but are not recommended because, even with the author's 100 watts, the current is well in excess of the rating. The capacity values are not unduly critical and normal tolerances are acceptable.

**Harmonic Operation**

Fig. 5 shows an addition to the system that permits operation on 28 Mc. Since on this frequency the spacing of the two elements in wavelengths is doubled, equal feeder currents are obtained only with unequal values of the phasing reactances for the two sides.

The true center of the system should be determined either by careful measurement of lengths or by making the feeder lengths deliberately too long or too short and adjusting the feed point for current equality; the system is then operating correctly on the principle of the W8JK antenna. A displacement of the feed point will now make the currents unequal, but the lengths can be made correct by the procedure already described. The correct lengths will no longer be exactly resonant and the system as a whole will look reactive, but this can be taken care of by the normal process of matching the main feedline from the transmitter.

A displacement of 6 or 7 inches, as shown in Fig. 5, will be found satisfactory when using a 33-foot long, 8-foot spacing system on 28 Mc., although it is not necessarily the optimum value. The 28-Mc. feeder system has no effect on 14-Mc. operation because it offers a high impedance at a point where the 14-Mc. system has low impedance. When operating on the 28-Mc. band the 14-Mc. feeder is disconnected by means of an open-circuit position on the 14-Mc. beam-reversing switch.

Matching of the transmission line running from the transmitter to the switch is independent of the rest of the system and should be left until last, the matching stubs being adjusted according to standard handbook procedure. Any out-of-balance in this main feeder, such as could be produced for example by one wire running very much closer than the other to some grounded object, must be tracked down and eliminated, since it upsets the relative currents in the resonant feeders and spoils the front-to-back ratio.

**Performance**

As the beam is electrically reversible and has a fairly broad forward lobe, about 140-degree rotation is all that need be provided for reasonable all-around coverage; this means that a very simple control system can be used. At G6XN the two elements are supported from a central cross-arm carrying a pair of control wires and hinged to the top of the mast. To prevent the feeders from fouling the guy wires they are brought in to a sort of "neck" on the mast two or three feet below the cross-arm, and then run out again and down at an angle of about 45 degrees to each other, which appears sufficient to prevent any undesirable interaction between them. The feeders have to be brought together at their bottom ends — i.e., at the switch — so that a diamond pattern is formed. Above the neck the feeders are fairly slack, with plenty of spacers, allowing the system to be rotated through the desired angle without short circuits or appreciable mismatching.

The main support for each element is a 10-foot length of 1 by 2 wood, and there are light bamboo extensions carrying wire elements with no additional insulation. This is not a recommended design but merely an example of what one can get away with; the reader no doubt will have better ideas.

Performance was carefully checked against the fixed beam on 40 Mc mentioned earlier, which itself had been checked against a dipole. Taking the average of a large number of consistent reports the fixed 4-element beam (theoretical gain about 7 db.) was 1 3/4 "S" points up on the dipole, and the antenna described here was 3/4 of an "S" point down on the fixed beam, which is in reasonable agreement with the theory on the basis of 4 wattages.
NEW A.R.R.L. PRESIDENT

Gentlemen, we give you our new president —
Goodwin L. Dosland, W9TSN

"Dos" brings to the presidency considerable background in amateur organizational and League affairs. Coming to Chicago in the mid-thirties from his Moorhead, Minn., home to practice law, W9TSN joined the Tri-Town Radio Club where his abilities became quickly apparent and he was shortly elected to head the club. In this capacity he became a delegate to the Chicago Area Radio Club Council which, similarly recognizing his leadership qualities, promptly elected him its Chairman. He thereupon was chosen to chairman the Council organization which ran the very successful 1938 ARRL National Convention. What followed was only natural — Dosland became the choice of the Central Division for its director in 1940 and again in 1942. He was, incidentally, a candidate for Congress and although defeated made a surprising show of strength in a district normally heavily leaning to the opposite party.

With the coming of war Dos relinquished his ARRL directorship upon call to active duty, where he first set up and ran the Navy's radio operator training school at Miami (Ohio) University and then at several other schools. Later he got overseas assignments on both war fronts as communications officer. Postwar he returned to Moorhead to take over the law practice of his deceased father, and became W9TSN . . . president of the Red River Radio Club and . . . you guessed it . . . director of the Dakota Division in 1948, again in 1950, and again the first of this year.

Our new proxy asks us to relay to all amateurs the following note of thanks:

I take this opportunity to express my sincere appreciation and thanks to the many Amateurs throughout our Country who have been so kind as to send me messages, letters of congratulations, and for their kind offers of assistance.

My only regret is that it is physically impossible for me to answer each of the messages and letters individually, and I sincerely trust that each of you will accept this as a personal message of appreciation to you, from your newly elected president.

I know that we will all work together in harmony and unity for the continuance of the best interests of our League and the furtherance of Ham Radio.

73,
Dos, W9TSN
President, ARLR

CANADIAN RECIPROCITY

For quite some time now there has been hanging fire in Washington a treaty between the governments of Canada and the United States which, among other things, would permit the operation by amateurs of one country in the territory of the other. In mid-May, the U. S. Senate finally having ratified, diplomatic representatives of the two governments met to bring the treaty formally into force. This brings a step nearer the time when we in the U. S. shall be able to operate fixed, portable or mobile in Canada, and when our VE associates will be able to do likewise in our country. It appears now that only minimum additional regulation is required before the privilege becomes a reality — perhaps simply taking the form of specific notification blanks filed with appropriate officials. We'll have all the dope for you when available.

NEW F.C.C. AMATEUR CHIEF

William S. Grenfell, W4GF, on May 19th was appointed Chief, Amateur Branch, Public Safety & Amateur Division, Safety & Special Radio Services Bureau, FCC. Thus he fills the vacancy caused by the recent promotion of Ivan H. Loucks, W3CD, to Assistant Chief of the Industry and Commerce Division in the same bureau. Amateurs everywhere, especially those

ARE YOU LICENSED?

• When joining the League or renewing your membership, it is important that you show whether you have an amateur license, either station or operator. Please state your call and/or the class of operator license held, that we may verify your classification.
who were more intimately aware of Loucks' capable handling of ham affairs, will wish him continued success.

The new amateur branch chief was bitten by the ham bug in 1929 and became W4GF; he got his Amateur Extra First ticket a year later. An EE graduate of Oregon State College, OM Grenfell worked several years for the state highway and police radio system, then in 1940 joined the rapidly-expanding Radio Intelligence Division of FCC. He served on the radar school staff of the Navy, rejoined FCC in 1946 as engineer in the Frequency Allocation & Treaty Division, subsequently becoming assistant chief in the frequency utilization and requirements branch.

W4GF gets around on most of the ham bands from his home in Falls Church, Va., but likes low power; there’s a 6- and 10-meter mobile job of 10 watts, and even the home station runs only 30 watts. He participates in the AREC and the local civil defense net activities.

**EXAMINATION SCHEDULE**

The Federal Communications Commission will give amateur examinations during the second half of 1952 on the following schedule. Remember this list when you need to know when and where examinations will occur. Where exact dates or places are not shown below, information may be obtained, as the date approaches, from the Engineer-in-Charge of the district. Even stated dates are tentative and should be verified from the Engineer as the date approaches. No examinations are given on legal holidays. All examinations begin promptly at 9 A.M. except as noted.

- **Albuquerque, N.M:** Oct. 3rd
- **Amarillo, Texas:** Sept. 30th
- **Anchorage, Alaska:** 52 Federal Bldg.: By appointment
- **Atlanta, Georgia:** 411 Federal Annex: Tuesday and Friday at 8:30 A.M.
- **Bakersfield, Calif.:** Sometime in August
- **Baltimore, Md.:** 508 Old Town Bank Bldg.: Monday through Friday. When code test required, between 8:30 A.M. and 2:30 A.M.
- **Bangor, Maine:** Sometime in October
- **Beaumont, Texas:** 329 P. O. Bldg.: Monday through Friday, except Thursday only when code test required.
- **Birmingham, Ala.:** Sept. 5th and Dec. 4th.
- **Boise, Idaho:** Sometime in October
- **Boston, Mass.:** 1600 Customhouse: Monday through Friday, 8:30 A.M. to 3:30 P.M.
- **Buffalo, N. Y.:** 328 P. O. Bldg.: Thursday
- **Butte, Mont.:** Sept. 18th
- **Charleston, W. Va.:** Sometime in Sept. and Dec.
- **Chicago, Ill.:** 326 U. S. Courthouse: Friday
- **Cincinnati, Ohio:** Sometime in August and November
- **Cleveland, Ohio:** Sometime in September and December
- **Columbia, Ohio:** Sometime in July and October
- **Corpus Christi, Texas:** Sept. 10th and Dec. 3rd
- **Dallas, Texas:** 500 U. S. Terminal Annex Bldg.: Monday through Friday
- **Davenport, Iowa:** Sometime in July and October
- **Denver, Colorado:** 521 New Customhouse: 1st and 2nd Thursdays and by appointment
- **Des Moines, Iowa:** Sometime in July and October
- **Detroit, Michigan:** 1029 Federal Bldg.: Wed. and Fri.
- **El Paso, Texas:** Oct. 7th
- **Fl., Wayn., Ind.:** Sometime in August and November
- **Fresno, Calif.:** Sept. 19th and Dec. 19th
- **Grand Rapids, Mich.:** Sometime in July and October
- **Harford, Conn.:** Sometime in September
- **Hilo, T. H.:** Oct. 7th
- **Honolulu, T. H.:** 502 Federal Bldg.: Monday through Friday, 8:30 A.M.
- **Houston, Texas:** 324 U. S. Appraisers Store Bldg.: Tuesday and Friday
- **Indianapolis, Ind.:** Sometime in August and November
- **Jackson, Miss.:** Sept. 10th and Dec. 10th
- **Jacksonville, Fla.:** Oct. 11th
- **Jamestown, N. D.:** Sept. 8th, 10:00 A.M.
- **Juneau, Alaska:** 6 Shattuck Bldg.: By appointment
- **Kansas City, Mo.:** 3200 Federal Office Bldg.: Friday, 8:30 A.M., and by appointment
- **Knoxville, Tenn.:** Sept. 18th and Dec. 18th
- **Las Vegas, Nev.:** Sometime in October
- **Lihue, Kauai, T. H.:** Oct. 21st
- **Little Rock, Ark.:** July 16th and Oct. 8th
- **Los Angeles, Calif.:** 539 Federal Bldg.: Wednesday, 9 A.M., 1 P.M.
- **Louisville, Ky.:** Sometime in November
- **Manchester, N. H.:** Sometime in November
- **Marquette, Mich.:** Nov. 5th, 10:30 A.M.
- **Memphis, Tenn.:** July 11th and Oct. 10th
- **Miami, Fla.:** 312 Federal Bldg.: Thursday
- **Milwaukee, Wis.:** Sometime in July and October
- **Mobile, Ala.:** 419 U. S. Courthouse and Customhouse: Wednesday and by appointment
- **Nashville, Tenn.:** Aug. 7th and Nov. 6th
- **New Orleans, La.:** 400 Audubon Bldg.: Monday through Friday, except Monday through Wednesday only at 8:30 A.M. when code test required.
- **New York, N. Y.:** 748 Federal Bldg., 611 Washington St.: Monday through Friday
- **Norfolk, Va.:** 402 Federal Bldg.: Monday through Friday, except Friday only when code test required.
- **Oklahoma City, Okla.:** July 17th-18th and Oct. 16th-17th
- **Omaha, Neb.:** Sometime in July and October
- **Philadelphia, Pa.:** 1055 U. S. Customhouse: Mon. thru Fri.
- **Phoenix, Ariz.:** Sometime in July and October
- **Pittsburgh, Penn.:** Sometime in August and November
- **Portland, Maine:** Sometime in October
- **Portland, Ore.:** 307 Fritzpatrick Bldg.: Monday through Friday, when code test required, Friday only—9:30 A.M. for 13 and 20 w.p.m.; 1:00 P.M. for 5 w.p.m.
- **Reno, Nev.:** Oct. 17th
- **Roanoke, Va.:** Oct. 4th
- **St. Louis, Mo.:** Sometime in August and November
- **St. Paul, Minn.:** 203 Federal Courts Bldg.: Friday
- **Salt Lake City, Utah:** Sept. 15th and Dec. 13th
- **San Antonio, Texas:** Aug. 7th and Nov. 6th
- **San Diego, Calif.:** 15-C U. S. Customhouse: By appointment
- **San Francisco, Calif.:** 325 A Customhouse: Advanced Class Monday through Friday; Novice and Technician Classes, Monday, 8:45 A.M.; General and Extra Class, Friday, 8:45 A.M.
- **San Juan, P. R.:** 323 Federal Bldg.: Thursday and Monday through Friday at 8:00 A.M. if no code test required
- **Savannah, Ga.:** 214 P. O. Bldg.: By appointment
- **Schenectady, N. Y.:** Sept. 17th-18th and Dec. 3rd-4th
- **Seattle, Wash.:** 806 Federal Office Bldg.: Friday
- **Sioux Falls, S. D.:** Sept. 10th and Dec. 10th; Novice and Technician, 10:00 A.M. others, 1:00 P.M.
- **Spokane, Wash.:** Sept. 18th
- **Syracuse, N. Y.:** Sometime in July and October
- **Tallahassee, Fla.:** July 12th
- **Tampa, Fla.:** 410 P. O. Bldg.: By appointment
- **Topeka, Kans.:** Sometime in October
- **Tuba City, Okla.:** July 21st-22nd and Oct. 20th-21st
- **Waukegan, Ill.:** Oct. 9th
- **Wash., D. C.:** 415 22nd St., N. W.: Monday through Friday, 8:30 A.M. to 5:30 P.M.
- **Whitby, Ont.:** Sometime in September
- **Williamsport, Penn.:** Sometime in September and October
- **Wilmington, N. C.:** Dec. 6th
- **Winston-Salem, N. C.:** Aug. 2nd and Nov. 1st

**July 1952**

33
MINUTES OF 1952 SPECIAL MEETING OF THE BOARD OF DIRECTORS, AMERICAN RADIO RELAY LEAGUE, May 9-10, 1952

1) Pursuant to due notice, the Board of Directors of The American Radio Relay League, Inc., met in special session at the Hartford Club, Hartford, Conn., on May 9, 1952. The meeting was called to order at 9:30 A.M. EDT with President George W. Bailey in the Chair and the following other directors present:

Wayland M. Groves, First Vice President
John H. Brabb, Great Lakes Division
Goodwin L. Diehl, Dakota Division
John E. Grant, Southwestern Division
Alfred C. Heek, Atlantic Division
Lamar Hill, Southeastern Division
Kenneth E. Hughes, Pacific Division
William H. Jacobs, Roanoke Division
Joseph M. Johnston, Hudson Division
William E. Marriner, Central Division
Franklin K. Matejka, Rocky Mountain Division
A. David Middelton, West Gulf Division
Perce C. Noble, New England Division
Alexander Reid, Canada
R. Rex Roberts, Northwestern Division
William J. Schmidt, Midwest Division
James W. Watkins, Delta Division

Also in attendance, as a member of the Board without vote, was General Manager A. E. Budlong. Also in attendance, at the invitation of the Board as non-participating observer, was New England Division Vice-Director Frank L. Baker. There were also present Vice President Francis E. Handy, Treasurer David H. Houstoun, Technical Director George Grammer, Assistant Secretary Richard L. Baldwin and John Hunton, General Counsel Paul M. Saged and Quayle B. Smith of his office. The meeting was welcomed and briefly addressed by the Chair.

2) On motion of Mr. Brabb, unanimously VOTED that the minutes of the 1951 annual meeting of the Board of Directors are approved in the form in which they were issued by the Secretary with the addition to Item 45 of those minutes of the following statement of purpose for resolving the Board into a Committee of the Whole: That the Board resolve itself into a Committee of the Whole to take under consideration the following matters:

a) a report of the Canadian General Manager on the progress that he has made in securing uniformity in the Canadian "phone" regulations to conform with those of the United States, as requested of the Canadian General Manager in a motion unanimously adopted at the 1946 meeting of the Board;

b) a discussion of the present status of the temporary stewardship of amateur radio activities in Canada contemplated in League By-Laws 28, 29 and 30, with a view of determining whether League activities in Canada can be more directly integrated with the League's divisional organization.

3) On motion of Mr. Brabb, unanimously VOTED that the minutes of the 1952 annual meeting of the Board of Directors are approved in the form in which they were issued by the Secretary.

4) On motion of Mr. Roberts, unanimously VOTED that the annual reports of the officers to the Board of Directors are accepted and the same placed on file.

5) On motion of Mr. Doeland, unanimously VOTED that the Board, having examined its mail action in electing Francis E. Handy as Vice President to serve until May 10, 1952 now ratifies this action and decides to take the aforesaid position as of May 25, 1931.

6) Moved, by Mr. Doeland, that the regular order of business be suspended and that the meeting take up, as Item 4b of the agenda, the ratification and approval of the actions of the Executive Committee during the past year. But, after discussion, during which the General Counsel stated such action is no longer required under the new Charter, with unanimous consent, Mr. Doeland withdrew the motion.

7) On the reception of reports of committees: Without objection, ordered that the report of the Finance Committee goes over for consideration later in the meeting. Mr. Noble reads the report of the Planning Committee; whereupon, on motion of Mr. Johnston, unanimously VOTED to receive the report. There was no report from the Policy and Review Committee. Upon the request of Mr. Noble, without objection, ordered that the report of the Constitution Revision

The ARRL Board of Directors and League officials at the annual meeting of the Board in Hartford on May 9th. Seated around the table, l. to r.: Director Watkins, Delta; Director Griggs, Southwestern; Director Hughes, Pacific; Vice-President Groves; Director Roberts, Northwestern; Director Schmidt, Midwest; Vice-President Handy; Comad Smith; President Bailey; General Manager Budlong; Asst. Secretary Hunton; Treasurer Houstoun; Director Griggs, Southwestern; Director Noble; Director Matejka, Rocky Mountain; Director Brabb, Great Lakes; Director Marriner, Central, Rear, l. to r.: Vice-Director Baker, New England; Technical Director Grammer; Director Doeland, Dakota; Director Middelton, West Gulf; Director Hall, Southeastern; Director Heek, Atlantic; Director Jacobs, Roanoke; Director Johnston, Hudson; Asst. Secretary Baldwin.
Committee goes over for consideration later in the meeting. Mr. Griggs reported briefly for the Membership and Publications Committee, on motion of Mr. Johnston, unanimously VOTED to receive the report.

8) On motion of Mr. Hill, unanimously VOTED that the annual reports of the directors to the Board of Directors are accepted and the same placed on file.

9) At this point, supplementary oral reports were rendered by the officers of the League. During the course of the General Manager's report, he and the General Counsel discussed at length the relationship of the League to the various government agencies in Washington dealing with amateur matters.

10) During the course of the above, the Board was in recess from 11:14 a.m. to 11:24 a.m.

11) On motion of Mr. Dosland, unanimously VOTED that the regular order of business be suspended and that the meeting proceed to take up at this time Item 14 of the agenda, Consideration of recommendations of the Constitution Revision Committee.

12) After discussion, moved, by Mr. Dosland, that the following By-Laws of The American Radio Relay League, Inc., be adopted

The text of the By-Laws appears in a separate article in this issue and is not repeated here. — Ed.

The years and nays being ordered, the question was decided in the affirmative: Whole number of votes cast, 16; necessary for adoption, 11; yeas, 16; nays, 0. All the directors voted in the affirmative, except the President, and First Vice-President, who abstained as required, So the By-Laws were ADOPTED.

13) Moved, by Mr. Noble, to adopt the following resolution: The Board of Directors, having, at its 1951 meeting, effected Amended Articles of Association and having at the present meeting adopted new By-Laws, be it now RESOLVED, that the Constitution and By-Laws of The American Radio Relay League, Inc., as published June 1, 1951, and entitled, "Constitution and By-Laws of The American Radio Relay League, Inc., Revised to June 1, 1951," be and they hereby are repealed, effective July 1, 1952. The years and nays being ordered, the question was decided in the affirmative: Whole number of votes cast, 16; necessary for adoption, 11; yeas, 16; nays, 0. All the directors voted in the affirmative except the President and First Vice-President, who abstained as required. So the resolution was ADOPTED.

14) On motion of Mr. Noble, the following Rules and Regulations Concerning American Radio Relay League Constitutions were unanimously ADOPTED:

The text of the regulations appears along with the Charter and By-Laws in another article in this issue, and is not repeated here. — Ed.

15) On motion of Mr. Noble, the following Rules and Regulations Concerning Affiliated Societies were unanimously ADOPTED:

The text of the regulations appears along with the Charter and By-Laws in another article in this issue, and is not repeated here.

16) Moved, by Mr. Noble, the adoption of the following resolution: Be it RESOLVED that, pursuant to Article 7 of the Amended Articles of Association, F. E. Handy is hereby designated and appointed a member of the Executive Committee to serve as such for the 53-week period ending May 16, 1953, and nays being ordered, the question was decided in the affirmative: Whole number of votes cast, 16; necessary for adoption, 9; yeas, 16; nays, 0. All the directors voted in the affirmative except the President, who abstained as required, and the First Vice-President. So the resolution was ADOPTED.

17) Moved, by Mr. Noble, the adoption of the following resolution: Be it RESOLVED that, pursuant to Article 7 of the Amended Articles of Association, David H. Houghton is hereby designated and appointed a member of the Executive Committee to serve as such for the 53-week period ending May 16, 1953. The years and nays being ordered, the question was decided in the affirmative: Whole number of votes cast, 16; necessary for adoption, 9; yeas, 16; nays, 0. All the directors voted in the affirmative except the President, who abstained as required, and the First Vice-President. So the resolution was ADOPTED.

18) The Board was in recess for luncheon from 12:05 p.m. to 1:30 p.m.

19) On motion of Mr. Jacobs, after discussion, unanimously VOTED that the General Manager is authorized to reimburse SCM's for travel within the limits of the division in which they reside, provided this meeting is called by the director of the division for the purpose of considering League matters, and provided further, that the said trips shall attend not more than one such meeting each calendar year and that said trips shall be considered one of the SCM annual trips otherwise provided for elsewhere by the Board, and provided further that nothing in this authorization shall permit travel into or out of the continental United States as a unit, or Canada as a unit.

20) Moved, by Mr. Jacobs, that By-Law 6, just adopted, be amended to read as follows:

A. Every officer, director and vice-director of the League shall serve and continue in office until his successor shall have been elected and qualified; provided, however, the President shall not succeed himself in office a second time.

The years and nays being ordered, the question was decided in the affirmative: Whole number of votes cast, 16; necessary for adoption, 11; yeas, 16; nays, 0. All the directors voted in the affirmative except the President and First Vice-President, who abstained as required. So the motion to amend was rejected.

21) Moved, by Mr. Matejka, that the Secretary of the League be instructed to request, in the name of the American Radio Relay League, a suballocation in the 7-Megacycle band for PHONE from 7225 to 7300 kc. Moved by Mr. Dosland, that the modify be amended to strike out the frequencies 7225-7300 kc, and substitute therefor 7200-7300 kc. The years and nays being ordered, upon request, the amendment was decided in the affirmative: Whole number of votes cast, 16; necessary for adoption, 9; yeas, 16; nays, 0. All the directors voted in the affirmative except the President, who abstained as required, and the First Vice-President. So the amendment was ADOPTED.

22) Moved, by Mr. Matejka, that the Secretary be instructed to request of the Federal Communications Commission, in the name of the American Radio Relay League, that the 'PHONE sub-band at 3.8 Megacycles be extended to

July 1952

35
read 3750-4000 kc. But, after discussion, unanimous consent being given, Mr. Matejka withdrew his motion.

22) On motion of Mr. Doeland, unanimously VOTED, at 2:25 P.M., that the Board does now resolve itself into a Committee of the Whole in order to consider the entire subject of frequency allocations and suballocations in the amateur bands in the United States. The Chair appointed have been the Chair of the Committee of the Whole. The Board, sitting as a Committee of the Whole, was in recess from 3:37 P.M. to 3:49 P.M. and from 5:37 P.M. to 5:42 P.M. The Committee reconvened at 5:42 P.M. and Mr. Bailey, as Chairman, read the Board the report of the Committee.

24) On motion of Mr. Matejka, unanimously VOTED. Mr. Reid abstaining, that the General Manager is directed to request of the Federal Communications Commission in the name of the American Radio Relay League, that the frequencies 21,250-21,450 be authorized for 'phone operation.

25) On motion of Mr. Matejka, unanimously VOTED. Mr. Reid abstaining, that the General Manager is directed to request of the Federal Communications Commission in the name of the American Radio Relay League, that the possession of Advanced Class license, or higher, be continued as a requirement for 'phone operation in the 3.8- and 14-Mc. subbands.

26) On motion of Mr. Matejka, unanimously VOTED, Mr. Reid abstaining, that the General Manager is directed to request of the Federal Communications Commission in the name of the American Radio Relay League, that the present operating privileges for Novice licenses in the 28.96-Megacycle band be retained.

27) On motion of Mr. Matejka, unanimously VOTED, Mr. Reid abstaining, that the General Manager is directed to request of the Federal Communications Commission in the name of the American Radio Relay League, that issuance of the Advanced Class license be continued after December 31, 1952.

28) On motion of Mr. Matejka, unanimously VOTED, Mr. Reid abstaining, that the General Manager is directed to request of the Federal Communications Commission in the name of the American Radio Relay League, that A-8 emisison be authorized for the frequencies 51-54 Megacycles.

29) On motion of Mr. Matejka, VOTED, 14 votes in favor to 2 opposed, Mr. Reid abstaining, that the General Manager be directed to request of the Federal Communications Commission in the name of the American Radio Relay League that Novice Class license be authorized to operate on the frequencies 28.96-32 Megacycles, A-1 and A-3 emission only.

31) On motion of Mr. Matejka, unanimously VOTED, Mr. Reid abstaining, that the General Manager is directed to request of the Federal Communications Commission in the name of the American Radio Relay League, that Novice Class license be authorized to operate on the frequencies 28.96-32 Megacycles, A-1 and A-3 emission only, for a trial period of one year.

32) On motion of Mr. Matejka, unanimously VOTED. Mr. Reid abstaining, that the General Manager is directed to request of the Federal Communications Commission in the name of the American Radio Relay League, that the amateur rules so that the 'phone authorization in the 28-Megacycle band shall read 28,250-29,700 kc.

33) The Board was in recess for dinner from 6:57 P.M. to 7:51 P.M.

34) Moved, by Mr. Matejka, that the General Manager be directed to request of the Federal Communications Commission in the name of the American Radio Relay League, that the frequency 28.96 Megacycle be amended to read 3750-4000 kc. The yeas and nays being ordered, on request, the question was decided in the negative: Whole number of votes cast, 18; necessary for adoption, 9; yeas, 7; nays, 9. Those voting in the affirmative were Mr. Matejka, Mr. Doeland, Mr. Middleton, Mr. Watkins and Groves; those voting in the negative were Mears, Brabb, Griggs, Heck, Hughes, Jacobs, Johnston, Marriner, Roberts, and Schmidt. The President abjured, as required, and Mr. Reid also abstained. So the motion was rejected.

35) Moved, by Mr. Matejka, that the General Manager is directed to request of the Federal Communications Commission in the name of the American Radio Relay League, that mobile 'phone operation be authorized on the frequencies 3775-3800 kc. Moved, by Mr. Jacobs, to amend the motion so that 'phone is authorized on these frequencies with no reference to mobile. The yeas and nays being ordered, on request, the question on the amendment was decided in the negative: Whole number of votes cast, 18; necessary for adoption, 9; yeas, 14; nays, 4. All the directors voted in the affirmative except Messrs. Griggs and Hughes; the President abstained, as required, and Mr. Reid also abstained. So the motion was adopted.

36) The Board of Directors was informed by Mr. Hill of the death on April 17, 1952 of Dr. Orville Chastain, W4D, of Jacksonville, Florida, a friend to amateur radio and a true friend to the many radio amateurs who had the privilege of his acquaintance or personal contact. Whereupon, on motion of Mr. Hill, the following resolution was unanimously ADOPTED:

RESOLVED: That on behalf of amateur radio the Board expresses its deep regret at the loss of Doctor Chastain, a true leader, a true friend, and a true amateur; that the Board extends its sincere sympathy for Doctor Chastain's family; and that the President of the League is requested to express these sentiments to Doctor Chastain's family and to transmit to them a copy of this resolution.

37) Mr. Middleton read a letter from Mr. C. Permanich, the SCM of Southern Texas, requesting the Director of the Houston Amateur Radio Club and members of the West Gulf Division, that the Board of Directors of the American Radio Relay League authorize a National Convention of the League in Houston in 1953. Whereupon, on motion of Mr. Hill, the following resolution was unanimously ADOPTED:

RESOLVED: That the Board of Directors authorize the Houston Amateur Radio Club to hold an ARRL National Convention in Houston in 1953, subject to the terms of a suitable contract to be executed between the Club and the League, similar in tenor to that for previous National Conventions.

38) Moved, by Mr. Middleton, that the Editor of QST be instructed to publish in QST, in the earliest issue possible, any material forwarded to QST by any ARRL elected official, whenever such material pertains to any phase or phases of Amateur Radio or the ARRL. Such material (not more than 250 words per issue) to be signed with the name and title of the authoring ARRL official. After discussion, on motion of Mr. Doeland, VOTED to amend or a motion, 9; yeas, 14; nays, 2. All the directors voted in the affirmative except Messrs. Griggs and Hughes; the President abstained, as required, and Mr. Reid also abstained. So the motion was unanimously ADOPTED.

39) Moved, by Mr. Middleton, that the ARRL Headquarters Staff publish a nationwide educational program directed to TV manufacturers, servicemen and repairmen, and TV set users, such a program to be implemented by suitable literature together with one beats per minute program. Moved by Mr. Johnston to amend the motion by striking out the text and substituting therefor that the Board commends the management staff of ARRL for the excellent manner in which it has attacked the TV problem; but there was no opportunity to amend. The question was decided in the negative: Whole number of votes cast, 18; necessary for adoption, 9; yeas, 7; nays, 11. Those voting in the affirmative were Mr. Matejka, Mr. Doeland, Mr. Middleton, Mr. Watkins and Groves; those voting in the negative were Mears, Brabb, Griggs, Heck, Hughes, Jacobs, Johnston, Marriner, Roberts, and Schmidt. The President, as required, and Mr. Reid also abstained. So the motion was rejected.

40) On motion of Mr. Middleton, the following reso-

36 QST for
lution was unanimously ADOPTED:

RESOLVED, that the Board of Directors of the American Radio Relay League does hereby express to Mr. Phil Read, W1DBR, its thanks and appreciation for his untiring efforts on behalf of amateur radio in connection with combatting TVI.

41) Moved, by Mr. Middleton, that the ARRL Technical Director be instructed to make (or to secure a qualified testing laboratory) a thorough evaluation of both high-pass and low-pass TVI filters currently available on the commercial market and that this data be published without delay in QST, referring to various filters as "Type A — low-pass three-section M-derived" etc. together with their respective block diagrams. No manufacturer's type or brand name in ARRL publications in this connection." And that this program of investigation and publication of the results be continued in order to acquaint the buying amateurs with the technical facts regarding the relative merits of this type of manufactured units as compared with those ham-built units described in ARRL publications. But there was no second, so the motion was lost.

42) Moved, by Mr. Middleton, that this Board of Directors direct and order that full and complete lists of all affiliated clubs in any and all divisions be furnished to any group of ten (10) or more ARRL members or to any affiliated club upon request, if the request is sent accompanied by a statement that the lists will not be used for commercial purposes. But there was no second, so the motion was lost.

43) Moved, by Mr. Middleton, that the Editor of QST be instructed to print the once familiar and time-honored ARRL trademark covering space advertised products in each issue of QST; but unanimous consent being given Mr. Middleton, with the permission of his second, withdrew the motion.

44) Moved, by Mr. Middleton, that the ARRL sponsor a "Technical Scholarship" which would lead to a year's paid employment in the ARRL Laboratory at Headquarters for an amateur who has not yet reached his twenty-first birthday and who does not graduate in the decision of the judges (to be selected by the Board of Directors), has most clearly demonstrated his inherent ability, interest and enthusiasm towards the technical side of Amateur Radio, through his contribution to Amateur Radio in the year 1952, such "Technical Scholarship" to be a continuing yearly award with job offers made to the winners. On motion of Mr. Doeldal, VOTED to table the motion and refer it to the Planning Committee relative to the cost of such a program.

45) Moved, by Mr. Griggs, that the ARRL Technical Director be instructed to make (or to secure a qualified testing laboratory) an immediate and searching investigation of representative types of TV receivers relative to their capability to reject amateur signals and also to determine their effect on amateur communications, and that the Editor of QST be instructed to supply the results of these unbiased engineering reports to League members upon request. After discussion, moved by Mr. Doeldal to amend the motion to read that the General Manager of the League have the League's technical staff, to the extent practicable, make an investigation of representative types of TV receivers, etc., with the engineering reports referred to be supplied League members upon request, the information to be cleared through the office of the General Counsel. But the motion to amend was rejected, 4 votes in favor to 7 opposed. The question then being on the original motion, the yeas and nays being ordered up, the vote was decided in the negative. Whole number of votes cast, 17; necessary for adoption, 9; yeas, 3; nays, 14. All the directors voted in opposition except Messrs. Griggs, Middleton and Watkins, and the President, who abstained as required. So the motion was rejected.

46) On motion of Mr. Heck, unanimously VOTED that the General Manager of the League is instructed to conduct a continuing survey looking toward expansion of marine mobile facilities.

47) On motion of Mr. Heck, the following resolution was unanimously ADOPTED:

RESOLVED, that the Board of Directors, on behalf of Amateur Radio request its Secretary to convey to the Chairman of the Federal Communications Commission this expression of their appreciation of the meritorious and untiring service of the members of the Field Engineering and Monitoring Bureau of the Commission.

48) On motion of Mr. Marriner, unanimously VOTED that the Technical Editor of QST is commended on the excellence of the technical material appearing in QST during the past year. Mr. Grimmer spoke briefly in appreciation. (Applause)

49) Moved, by Mr. Marriner, that QST should, from time to time, stress the existence of the Ragchewers Club, A-1 Operators Club, etc., and the requirements for them, etc. But there was no second, so the motion was lost.

50) On motion of Mr. Johnston, the following resolution was unanimously ADOPTED:

WHEREAS, on March 21, 1952, Ralph T. Beaudin would have completed twenty-five years of continuous service to the American Radio Relay League, as Assistant Circulation Manager and more recently also as Production Manager, and

WHEREAS, the Board of Directors of the American Radio Relay League is deeply grieved at his sudden passing on February 15, 1952,

Now, therefore, be it RESOLVED, that the Board of Directors, meeting at Hartford, Connecticut, on May 9, 1952, in recognition of Ralph T. Beaudin's untiring efforts on behalf of the League, does hereby express its deep appreciation of his loyality, fidelity and intellectual devotion to the best interests of amateur radio, and expresses its deep sense of loss at his passing.

51) On motion of Mr. Johnston, the following resolution was unanimously ADOPTED:

Whereas the QSL Bureau Managers of the United States and Canada have continued to render valuable service to their fellow amateurs, without material compensation, BE IT RESOLVED that the Board does hereby commend the QSL Bureau Managers for their faithful service.

52) The Board was in recess from 9:37 p.m. to 9:45 p.m.

53) Mr. Roberts' position on the agenda having been reached, he reported to the Board receipt of the following resolution:

RESOLVED, by the sixth National ARRL Convention assembled at Seattle, July 29, 1951 that the ARRL requests of the Federal Communications Commission what should be considered good engineering standards in the reduction of TVI.

On motion of Mr. Doeldal, unanimously VOTED that this resolution be received and filed.

54) On motion of Mr. Jacobs, after discussion, unanimously VOTED that the General Manager be hereby authorized to reimburse division directors for actual expenses incurred by them during the year 1952 in the proper administration of ARRL affairs in their respective divisions up to amounts as follows:

<table>
<thead>
<tr>
<th>Division</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canadian</td>
<td>$350</td>
</tr>
<tr>
<td>Atlantic Division</td>
<td>$600</td>
</tr>
<tr>
<td>Central Division</td>
<td>$800</td>
</tr>
<tr>
<td>Dakota Division</td>
<td>$600</td>
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<tr>
<td>Delta Division</td>
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<tr>
<td>Great Lakes Division</td>
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<tr>
<td>Hudson Division</td>
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<tr>
<td>Midwest Division</td>
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<tr>
<td>New England Division</td>
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</tr>
<tr>
<td>Northwestern Division</td>
<td>$800</td>
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<tr>
<td>Pacific Division</td>
<td>$800</td>
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<tr>
<td>Roanoke Division</td>
<td>$200</td>
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<tr>
<td>Rocky Mountain Division</td>
<td>$400</td>
</tr>
<tr>
<td>Southeastern Division</td>
<td>$800</td>
</tr>
<tr>
<td>Southwestern Division</td>
<td>$800</td>
</tr>
<tr>
<td>West Gulf Division</td>
<td>$1000</td>
</tr>
</tbody>
</table>

55) On motion of Mr. Griggs, unanimously VOTED that the General Manager is hereby authorized to pay expenses for the operation of ARRL committees during the year 1952 but not to exceed the amounts as follows:

<table>
<thead>
<tr>
<th>Committee</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planning Committee</td>
<td>$2000</td>
</tr>
<tr>
<td>Finance Committee</td>
<td>$200</td>
</tr>
</tbody>
</table>

56) On motion of Mr. Roberts, unanimously VOTED
that, to continue the Board policy of reimbursing SCMs and QSL Managers for certain travel via the shortest common route or by air, the General Manager is hereby authorized to pay during the year 1952 a total amount not exceeding three thousand dollars ($3000) under the conditions specified in Minute (52) of the 1951 meeting of the Board.

67) On motion of Mr. Roberta, unanimously VOTED that the Constitution Revision Committee, its work having been completed, is hereby dissolved with the deep appreciation of the Board for the excellent work done in revising the League By-Laws. After discussion, moved, by Mr. Hughes, to amend the motion to specify that such appointments shall be made only in areas where such appointments have not already been made. After further discussion, on motion of Mr. Mateika, by VOTE, to further amend the motion to provide that the Communications Manager is to give consideration to such an appointive position in preparing the Rules and Regulations of the Communications Department. The question then being on the original motion as amended, the same was unanimously ADOPTED.

68) On motion of Mr. Jacobs, the following resolution was unanimously ADOPTED:

RESOLVED, that this Board sincerely appreciates the loyalty of the individual employees of the League at our Headquarters offices and does hereby express our sincere thanks to them for their valuable services to the League and Amateur Radio.

69) Moved, by Mr. Griggs, that a committee of two directors be appointed to study the many questions and requests from clubs and individuals pertaining to contests, etc., conducted by the League and report its recommendations to the General Manager prior to December 31, 1952. For the purpose of financing this committee one thousand dollars is hereby appropriated; monies made available shall be used for the expense incurred by directors only. But, after discussion, the motion was rejected.

70) On motion of Mr. Jacob, unanimously VOTED, 13 votes in favor to 3 opposed, that following the completion of directors' motions, the regular order of business be suspended and item 19 on the agenda, election of officers, be made the next order of business.

71) On motion of Mr. Noble, unanimously VOTED that affiliation is granted to the following societies:

 Texoma Amateur Radio Club, Sherman & Denison, Texas
 Richland Amateur Radio Club, Richland, Washington
 Augusta Emergency Amateur Radio Club, Augusta, Maine
 The Band Hoppers Radio Club, Ferguson, Missouri
 Longhorn Amateur Radio Club, Austin, Texas
 Stonewall Jackson Amateur Radio Club, Inc., Weston, West Virginia
 Florence Amateur Radio Club, Florence, South Carolina
 Calumet High Radio Club, Calumet, Michigan
 Haverford Township Emergency Radio Net, Havertown, Pennsylvania

Minnedosa Amateur Radio Club, Minnedosa, Man., Canada
 Needham Amateur Radio Association, Needham, Massachusetts
 Carrollton Radio Club, Carrollton, Georgia

72) On motion of Mr. Noble, unanimously VOTED that in the event Board action on new draft language comprising the Rules and Regulations of the Communications Department is not completed by the 15th of July, the Communications Manager be guided in conducting SCM elections and other matters by the policies presently effective in old By-Laws 8 to 9.

73) On motion of Mr. Noble, unanimous VOTED that the Board of Directors, to continue to acquaint itself with the current status of field organization and radio operating matters, will continue to expect to receive an annual report on these matters from the Communications Manager.

74) The Board was in recess from 9:30 a.m. to 11:00 a.m.

75) Proceeding now to the election of officials, the Chair then APPOINTED Messrs. Hill and Matejka as tellers.

76) Nominations for President being in order, Mr. Johnston nominated Mr. Bailey. Mr. Griggs nominated Mr. Doolland, Whereupon, on motion of Mr. Brabb, unanimously VOTED that the nominations are closed.

(Continued on page 180)
CONDUCTED BY
ELEANOR WILSON.* W1QON

I
n response to requests, when space permits, we plan to publish the regular operating times and frequencies of YL stations who handle large amounts of traffic and/or who are very active in one way or another on the amateur bands. There are several reasons why it may be of value to know where and when these YL stations operate — to facilitate the exchange of traffic; to work toward WAS/YL; to observe some good operating procedure; or to enjoy a bit of rag-chewing. Most of the YLs who are on extensivly are first-class operators — efficient, courteous, and capable.

We’ll launch the project with information about the following well-known YLs who operate several hours each day (all times EST):

W10AK — Ann Chandler: 3740 kc. — 1815, Mon. thru Fri.; 2350 kc. — 1900, Mon. thru Fri.; 3005 kc. — 1945 and 2130, Mon. thru Fri.


W2BTB — Jeanette Walker: 3845 kc. — 0645 (1) to 1200; 3920 kc. — early afternoons; 3970 kc. — 1700 to 0100 (the next day).


W3CUL — Mae Burks: (Record traffic-handler Mae wrote that a listing of all her schedules and frequencies would consume the YL Department’s space allotment for this issue!)

W3NH1 — Marion Kuntzer: 7120 kc. — 1030; 7280 kc. — 1230; 3610 kc. — 1330; 3620 kc. — 2400.

W3ZIU — Peggy Coultier: 7100–7150 kc. — 0630 to 1630; 3565 kc. — 1700 et c.

In future columns, space permitting again, the regular operating times and frequencies of YL stations will simply be listed without introduction. We don’t mean to overlook anybody, so let us know whom you think should be added to the list.

Keeping Up with the Girls

WNSFOU, Rosemary Parenteau, and WN6FXK, Helen Young, both patients at O’Reilly Veterans Hospital in Springfield, Missouri, would like to hear from other YLs.

(WNSFOU, Rosemary Parenteau, and WN6FXK, Helen Young, both patients at O’Reilly Veterans Hospital in Springfield, Missouri, would like to hear from other YLs."

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

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Pilots Alice Picard, W2WP, left, and Helen Wright, WN1UPZ, shown here with Alice’s Cub, are two of a number of YLs who successfully mix amateur radio and flying. Alice received her ham ticket in 1930 and became one of fewer than 100 YLs in the world. While Helen is a comparatively new YL, she has an extensive background in various radio organizational activities.

July 1952

Here are nine YLs who let the world know that the ten-meter band is open to the Canal Zone. These KZ5 YLs are charter members of the Canal Zone ORMrys, a club recently organized to coordinate and further the KZ5YL activity. Besides DXing on ten, the girls handle traffic and conduct periodic net drills. Seated, l. to r.: Grace, KZ5DG, club secretary; Angie, KZ5AC, president; Lois, KZ5LM, v.p. Standing, l. to r.: Bess, KZ5VN; Dee, KZ5NN; Bess, KZ5BM; Kay, KZ5KA; Carol, KZ5GQ; and Martha, KZ5ML, club activities.

These are members of the newly-formed Ladies Amateur Radio Klub (LARK) of Chicago. The girls meet on the last Thursday of each month, and every Tuesday at 1000 a.m. CST on 29 Mc, they conduct a ten-meter net. Bottom row, l. to r.: Bernice, WN9FVY; Helen, WN9FZO; Grace, W9GME; and WN9SEZ. Top row, l. to r.: Gladys, W9MYC; Chris, W9LOY; Bobby, W9KXU; Helen, W9BCB; and Verona, WN9QYG.

July 1952
ANY of the readers of this column who don't know how to tune in a s.s.b. signal (and we certainly hope there are a few, attracted by the superior quality of the prose!) can get some practice in our own 21-Mc. band. There are some Argentine s.s.b. commercial stations still operating there, in English, and their signals offer excellent opportunities for practice. They run a slight residual carrier. In case you don't know the technique, first center the receiver on the signal by tuning for maximum "kick" of the S meter. Then reduce the r.f. gain, switch off the a.v.c., switch on the b.f.o., run the audio volume at maximum and increase the r.f. gain until you begin to hear the beat against the residual carrier. Slowly tune the b.f.o. control until you have zero beat with the residual carrier, and you will hear the speech. Of course most amateur s.s.b. signals don't use a residual carrier, and when you come to them you have to tune the b.f.o. carefully until the speech is the most understandable. The Argentine signals allow you to demonstrate receiver overload, too, since if you let the r.f. gain run too high in the receiver, you can't possibly clear up the speech. But reducing the r.f. gain to a correct setting will eliminate the overload, just as it will with amateur signals. These signals are usually pretty potent, so when you tune into them with the a.v.c. on and the r.f. gain wide open, you will observe the same receiver-generated "splatit" that has been reported on 75 and 20 on one or two occasions.

In strictly amateur circles, a nice note from W5PWO/4 tells about Tennessee's W4CVM and W4ONX. CVM uses an Edmunds (W1JE0) exciter ending in a pair of 807s that drive a linear 304TL, and ONX uses an Edmuns into a pair of 6L6s driving a pair of 304TLs. W5PWO/4 will be on soon with an Edmuns ending in an 829B. All rigs use voice control.

Here is Bob Ehrlich, W2NJR, of West Orange, N. J., and his neat shack and rig. The rack at the right houses the 833A final and its power supplies, while on the table the left-hand rack carries the exciter and its 807 driver-amplifier, with a BC-348 receiver in the right-hand rack. The table at the rear carries a scope and some 2-meter gear (not s.s.b., yet). Bob is one of the early birds in s.s.b., and submitted that excellent article on linear amplifiers in the May issue.

First s.s.b. maritime-mobile rig we've heard of is operated by Bob Wilson, W9RNL, aboard the SS North American on the Great Lakes. Promised by receiving experiences last year, when s.s.b. was found to be copiable when all 75-meter a.m. signals were completely taken out by QRN, both natural and man-made, W9RNL/MM uses a crystal-filter job involving features from several sources. The filter itself is a single-section lattice a la Weaver-Brown, following a Pierce 6AU6 crystal oscillator and 6AG5 balanced modulator. The speech is 6AU6-6C4-12AU7, the 12AU7 screen-modulating the 6AK5s across 27,000-ohm resistors. Voice control, taken off the 12AU7 plates, consists of a 6AL5 rectifier and 6AG5 control tube that works a 5000-ohm relay. Following the filter a 6AG7 mixer (and 6J6 crystal oscillator) converts to 75 and drives a push-pull 6AG7 output amplifier. The single-lattice filter was found to be adequate for the job when good isolation between input and output circuits is.

This is the gang that did such a splendid job of presenting s.s.b. to the multitudes at the recent R.S.G.B. Exhibition, and the equipment that was displayed and demonstrated. L. to r.; G3BV A, G2NKX, G3CWC, G8RC, G3CIJ, G3PHL, and G3FDG.

QST for
maintained, and it is simple to align when a balanced modulator is used. Look for W9RNL/MM around 3995 this summer.

VEGCN Balanced Modulator

G. O. Kincade, VE6CN in Calgary, sends along the interesting balanced-modulator circuit he uses in his version of the Edmunds exciter. Shown in Fig. 1, it has the additional feature of providing for p.m., just in case one wants to revert to it for some reason. The oscillator circuit starts faster than the original, and it can be "rushed" by tuning, for better alignment with the filter. The filter is first aligned by removing the oscillator crystal, introducing a BC-221 signal across C4, and using the original alignment procedure. Then the oscillator crystal is replaced and the oscillator frequency trimmed by adjusting the trimmer in the primary of T1.

The p.m. is obtained by tuning the secondary of T1 until the voltage fed to the carrier-amplifier tube is 90 degrees different than that applied to the balanced modulator. For p.m., the crystal filter must be out of the circuit, of course, since the p.m. signal is obtained by combining the two sidesbands (less carrier) with a carrier that has been shifted 90 degrees. Checking with a scope, one simply sets the trimmer in the secondary until there is minimum amplitude change on the carrier with modulation. The two circuits of T1 "pull" a little, so the complete adjustment may require several trial runs.

--- R.G.

Strays

B. G. Tuinn, G3CGH, and F. B. Singleton, G3CGM, are consecutive in the Call Book.

"Television was introduced in Denmark last fall and may soon be shut down . . . only 400 sets have been sold so far." -- Chicago Daily News via W9ZMY. Have you applied for your OZ calls yet, fellows?

The article in January QST on pi networks (page 10) mentioned an unpublished paper by Warren B. Bruene, W6TTK, on the general subject of plate tank circuits and antenna coupling. We are glad to report that this paper appeared in the May, 1952, issue of Electronics under the title, "How to Design R.F. Coupling Circuits."

In addition to containing L-network charts and describing their applications in pi-network design, the article discusses conventional tank circuits in both the direct- and inductively-coupled forms. Design charts and equations covering various cases are given, the inductively-coupled circuit being treated in terms of Q and the coefficient of coupling. Information on calculating harmonic suppression also is included.

A limited number of reprints is available, and copies may be obtained by addressing a request to the Collins Radio Company, Cedar Rapids, Iowa.

STAFF VACANCY

ARRL has a vacancy to be filled in its Communications Department staff. This post involves correspondence and responsibility for the handling of DXCC Awards. It's also a job that takes knowledge of and background in the many phases of amateur operating. Experience in League field work, traffic, DX, organizing, also a background of some operating in contests such as the DX Test, Sweepstakes and Field Day is desirable but not specifically a requirement as to how much in a given branch. Essential: age 20-30, personable, appropriate experience, accuracy, skill, typist, ability to keep records and formulate statements or reports from time to time for QST. Starting salary around $3000. Preference given single man. Personal form sent on request. Be sure to attach snapshot of yourself, indicating age, license, experience, jobs held past and present, availability. Any information will be restricted to use in connection with prospective employment.
Antenna-Mast Loading and Guying

Considerations in the Use of Pipe Masts for 10-Meter Beams

BY CHARLES KANDEL, W2VOU

While some amateur antenna masts are installed after careful calculation of the factors involved, the large majority are probably worked out using the "by-guess-and-by-gosh" principle. The author had occasion to work out the stresses and loads for a number of different heights of pipe and tubing supports for 10-meter beams, for a talk before the N. Y. Radio Club, and it was thought that the tabulated results might be of interest to other amateurs who are contemplating similar installations.

All of the designs are based on a simple pipe or tubing mast, guyed three-quarters up the mast by a set of three guy wires or cables arranged 120 degrees apart. There is no advantage in using four guy wires instead of three, because the guys are used primarily to take up wind loads, and with a four-wire guy system there will be times when all of the load is taken by one wire. The same is true, of course, for the three-wire system.

A typical antenna mast is shown in Fig. 1, with the antenna omitted for simplicity. The antenna mast, of course, be included in the calculations, because it represents the major portion of the wind load. The term "counter pull" is a mathematical convenience, the horizontal component of the force acting on the guy wire. The other forces and dimensions are obvious, and are shown to enable one to understand the tables quickly.

Table I shows the forces and stresses that exist in typical installations. Two types of 10-meter beams were included — wide-spaced 4-element beams on 20-foot beams, and close-spaced 3-element beams on 10-foot beams. Elements of 3/4-inch and 5/8-inch diameter were assumed. Calculations are based on a maximum wind force of 40 pounds per square foot (90 m. p. h.). The "combined stress" consists of two factors, the maximum bending moment (usually occurring at the point where the guy wires are tied to the mast) and the compression stress on the mast metal (caused by the vertical component of the guy-wire tension). The "combined stress" does not include any "dead" load, such as the weight of the beam, motor or mast itself, since the combined total of these is insignificant for ordinary installations, even when the dead load total adds up to a few hundred pounds. If the dead load is substantially greater, the amateur should have a structural engineer design the mast, as he should also in any case where the wind resistance of the mast is more than 10 or 15 times the resistance of the beam, since other design factors are involved.

In all cases, it is assumed that all guy wires are made up equally snug with turnbuckles, but not too tight. They should be adjusted seasonally with major temperature changes. Very tight guy wires may cause the mast to be pre-stressed to the point exceeding the maximum wind load. In such a case, when the full wind load is added to the existing stresses in the mast, the combined stresses will cause the mast to buckle and fail.

Table II illustrates how using an antenna with anchorages farther out from the base of the mast will result in reduced guy-wire tension. While everyone knows this intuitively, the actual order of magnitude of the reduction can be readily appreciated by a study of the table.

**Anchoring the Guy Wires**

The above data cover mast installations for a flat area or peaked roof with timber beams into which the lag screws would be driven after drilling...
<table>
<thead>
<tr>
<th></th>
<th>Type of Beam</th>
<th>4-cl.</th>
<th>4-cl.</th>
<th>4-cl.</th>
<th>4-cl.</th>
<th>4-cl.</th>
<th>4-cl.</th>
<th>4-cl.</th>
<th>5-cl.</th>
<th>5-cl.</th>
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<th>6-cl.</th>
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<th>6-cl.</th>
<th>6-cl.</th>
<th>6-cl.</th>
<th>6-cl.</th>
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</tr>
<tr>
<td>2</td>
<td>Boom Dimensions (inches X feet)</td>
<td>2 x 20</td>
<td>2 x 20</td>
<td>2 x 20</td>
<td>2 x 20</td>
<td>2 x 20</td>
<td>2 x 20</td>
<td>2 x 20</td>
<td>11/2 x 10</td>
<td>2 x 20</td>
<td>11/2 x 10</td>
<td>2 x 20</td>
<td>11/2 x 10</td>
<td>2 x 20</td>
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<td>2 x 20</td>
<td>11/2 x 10</td>
<td>2 x 20</td>
<td>11/2 x 10</td>
</tr>
<tr>
<td>3</td>
<td>Beam Wind Load ¹ (pounds)</td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>100</td>
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<td>100</td>
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</tr>
<tr>
<td>4</td>
<td>Mast Wind Load ¹ (pounds)</td>
<td>204</td>
<td>141</td>
<td>140</td>
<td>86</td>
<td>93</td>
<td>53</td>
<td>56</td>
<td>21</td>
<td>12</td>
<td>15</td>
<td>27</td>
<td>6</td>
<td>12</td>
<td>27</td>
<td>6</td>
<td>12</td>
<td>27</td>
<td>6</td>
<td>12</td>
<td>27</td>
</tr>
<tr>
<td>5</td>
<td>½ x ¼ Tubing Mast, ², ³ ¾-in. Wall (in. diam. X feet long)</td>
<td>3 x 20</td>
<td>21/2 x 16</td>
<td>2 x 12</td>
<td>11/2 x 6</td>
<td>11/2 x 9</td>
<td>1 x 21/2</td>
<td>1 x 5</td>
<td>1 x 9</td>
<td>1 x 21/2</td>
<td>1 x 5</td>
<td>1 x 9</td>
<td>1 x 21/2</td>
<td>1 x 5</td>
<td>1 x 9</td>
<td>1 x 21/2</td>
<td>1 x 5</td>
<td>1 x 9</td>
<td>1 x 21/2</td>
<td>1 x 5</td>
<td>1 x 9</td>
</tr>
<tr>
<td>6</td>
<td>Steel Pipe Mast, ² standard weight (nominal diam. X feet long)</td>
<td>3 x 25</td>
<td>21/2 x 21</td>
<td>2 x 16</td>
<td>11/2 x 12</td>
<td>1 x 5</td>
<td>1 x 9</td>
<td>1 x 5</td>
<td>1 x 9</td>
<td>1 x 5</td>
<td>1 x 9</td>
<td>1 x 5</td>
<td>1 x 9</td>
<td>1 x 5</td>
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<td>1 x 9</td>
<td>1 x 5</td>
<td>1 x 9</td>
<td>1 x 5</td>
<td>1 x 9</td>
</tr>
<tr>
<td>7</td>
<td>Guy Point on Mast ⁴ (feet above base)</td>
<td>181/2</td>
<td>151/2</td>
<td>15</td>
<td>12</td>
<td>12</td>
<td>9</td>
<td>9</td>
<td>41/2</td>
<td>61/4</td>
<td>31/2</td>
<td>31/2</td>
<td>11/2</td>
<td>21/2</td>
<td>11/2</td>
<td>21/2</td>
<td>11/2</td>
<td>21/2</td>
<td>11/2</td>
<td>21/2</td>
<td>11/2</td>
</tr>
<tr>
<td>8</td>
<td>Guy Anchorages ⁴ (feet from base)</td>
<td>7</td>
<td>51/2</td>
<td>61/2</td>
<td>41/2</td>
<td>41/2</td>
<td>31/2</td>
<td>31/2</td>
<td>11/2</td>
<td>21/2</td>
<td>11/2</td>
<td>21/2</td>
<td>11/2</td>
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<td>11/2</td>
<td>21/2</td>
<td>11/2</td>
</tr>
<tr>
<td>9</td>
<td>Thrust at Base (pounds)</td>
<td>1125</td>
<td>975</td>
<td>930</td>
<td>864</td>
<td>876</td>
<td>801</td>
<td>810</td>
<td>740</td>
<td>388</td>
<td>740</td>
<td>400</td>
<td>724</td>
<td>375</td>
<td>400</td>
<td>724</td>
<td>375</td>
<td>400</td>
<td>724</td>
<td>375</td>
<td>400</td>
</tr>
<tr>
<td>10</td>
<td>Tension on Each Guy (pounds)</td>
<td>1150</td>
<td>1041</td>
<td>998</td>
<td>911</td>
<td>935</td>
<td>851</td>
<td>800</td>
<td>700</td>
<td>386</td>
<td>790</td>
<td>436</td>
<td>762</td>
<td>400</td>
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<td>762</td>
<td>400</td>
<td>762</td>
</tr>
<tr>
<td>12</td>
<td>Lag-screw Size for Guy Anchor (inches)</td>
<td>7/8 x 6</td>
<td>7/8 x 6</td>
<td>7/8 x 5</td>
<td>7/8 x 5</td>
<td>7/8 x 5</td>
<td>7/8 x 5</td>
<td>7/8 x 5</td>
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<td>7/8 x 5</td>
<td>7/8 x 5</td>
<td>7/8 x 5</td>
</tr>
<tr>
<td>13</td>
<td>Combined Stress on Mast Material (lb. per sq. in.)</td>
<td>30,300</td>
<td>13,400</td>
<td>20,200</td>
<td>18,900</td>
<td>20,200</td>
<td>20,800</td>
<td>24,000</td>
<td>22,800</td>
<td>22,000</td>
<td>24,300</td>
<td>22,000</td>
<td>24,500</td>
<td>24,000</td>
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<td>24,000</td>
<td>24,500</td>
<td>24,000</td>
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</tr>
</tbody>
</table>

¹ Based on 40 lb. per sq. ft. X 0.7 for round tubing, thus 2-inch diam. tubing has a wind load of 40 X 0.7 X 2/12 = 4.7 lb. per linear foot. Double the wind load for square tubing. Thus 2-inch square tubing has a wind load of 40 X 1/12 diagonal of tube = 9.4 lb. per linear foot.

² Mast length not to be increased even with a beam of lower wind resistance, because the permissible slenderness ratio would be exceeded.

³ For wall thickness less than 3/8 inch, use beam having wind load proportionately less than shown on line 8.

⁴ These dimensions may not be reduced without noting their effect upon items in lines 9, 10, 11, 12 and 13.

⁵ Dimensions are for common steel, galvanized. Smaller diameter may be used for high-strength cable.
### TABLE II

Examples of Reduced Guy Tension and Reduced Thrust at Base of Mast Resulting from Use of Beams with Lower Wind Load and/or Use of Wider Guy Anchorage Base

<table>
<thead>
<tr>
<th>Type of Beam</th>
<th>4-el.</th>
<th>5-el.</th>
<th>4-el.</th>
<th>4-el.</th>
<th>5-el.</th>
<th>4-el.</th>
<th>5-el.</th>
<th>4-el.</th>
<th>5-el.</th>
<th>4-el.</th>
<th>5-el.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 Boom Dimensions (inches x feet)</td>
<td>$2 \times 20$</td>
<td>$2 \times 10$</td>
<td>$2 \times 20$</td>
<td>$2 \times 20$</td>
<td>$1\frac{1}{2} \times 10$</td>
<td>$1\frac{1}{2} \times 10$</td>
<td>$1\frac{1}{2} \times 10$</td>
<td>$1\frac{1}{2} \times 10$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 Diam. Elements (inches)</td>
<td>$\frac{3}{4}$</td>
<td>$\frac{3}{4}$</td>
<td>$\frac{3}{4}$</td>
<td>$\frac{3}{4}$</td>
<td>$\frac{5}{8}$</td>
<td>$\frac{5}{8}$</td>
<td>$\frac{5}{8}$</td>
<td>$\frac{5}{8}$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 Beam Wind Load (^1) (pounds)</td>
<td>200</td>
<td>150</td>
<td>200</td>
<td>150</td>
<td>100</td>
<td>150</td>
<td>100</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 Guy Anchorage (^2) (feet from base)</td>
<td>4(\frac{1}{4})</td>
<td>4(\frac{1}{4})</td>
<td>6</td>
<td>8</td>
<td>6</td>
<td>4(\frac{1}{4})</td>
<td>8</td>
<td>6</td>
<td>8</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>6 Counter Pull</td>
<td>329</td>
<td>264</td>
<td>329</td>
<td>264</td>
<td>195</td>
<td>264</td>
<td>195</td>
<td>195</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 Thrust at Base (pounds)</td>
<td>876</td>
<td>672</td>
<td>660</td>
<td>492</td>
<td>528</td>
<td>520</td>
<td>396</td>
<td>390</td>
<td>293</td>
<td>195</td>
<td></td>
</tr>
<tr>
<td>8 Tension on Each Guy (pounds)</td>
<td>935</td>
<td>743</td>
<td>737</td>
<td>590</td>
<td>590</td>
<td>599</td>
<td>475</td>
<td>435</td>
<td>381</td>
<td>276</td>
<td></td>
</tr>
<tr>
<td>9 Reduced Tension, Each Guy Cable (%)</td>
<td>—</td>
<td>30</td>
<td>20</td>
<td>37</td>
<td>37</td>
<td>40</td>
<td>50</td>
<td>50</td>
<td>62</td>
<td>72</td>
<td></td>
</tr>
<tr>
<td>10 Combined Stress on Mast Materials (lb. per sq. in.)</td>
<td>20,200</td>
<td>19,300</td>
<td>18,900</td>
<td>18,900</td>
<td>19,300</td>
<td>18,600</td>
<td>15,600</td>
<td>19,300</td>
<td>15,600</td>
<td>15,600</td>
<td>15,600</td>
</tr>
</tbody>
</table>

\(^1\) Mast for all beams: 3\(\frac{1}{2}\)-inch diam. 24ST tube 16 feet long, \(\frac{1}{4}\)-inch wall, or standard-weight 2-inch steel pipe 16 feet long.

\(^2\) Guys attached to mast 12 feet above base.

An undersized pilot hole and filling it with roofing compound. No lag screw should be placed less than 27 inches from the end of a timber beam when the guy pull is 500 pounds, or 36 inches if the pull is over 500 and less than 1000 pounds. This will insure that the lag screw is in the center of a square large enough to take the strain.

For a mast that is guyed from points on the ground, each guy wire should be anchored to a "deadman" — a galvanized cast steel plate with ribs (available commercially in various sizes) to which a long galvanized eyebolt is attached after the plate has been set in the ground. The recommended procedure for installing a "deadman" is to dig a hole with a vertical side toward the mast and a sloping (45-degree) side away from the mast. The eyebolt is then driven into the undisturbed ground from the mast side at a 45-degree angle down to the bottom of the hole, where the plate can be slid down the sloping side of the hole and into the ground until the eyebolt can be installed and secured with a nut. This puts the eyebolt in undisturbed ground with the plane of the plate at right angles to the line of the bolt. The excavated material should be replaced in batches, and each batch should be tamped firmly in place.

Table III gives the recommended sizes of bolts and plates to be used with various guy-wire pulls. For heavier loading than shown, merely increase the area of the plate and the diameter of the bolt, the length of the bolt and the depth of excavation need not exceed the maximum figures shown.

The table applies to sandy soil with good drainage. Soil consisting of firm clay will stand about 50 per cent more pull, while hardpan (a soil which can be broken up only by the use of a pick or crowbar) will carry 100 per cent more than sandy soil. However, soil that is wet and soggy to a considerable depth most of the time cannot be depended upon to take the full pull, and due allowance must be made for this condition by using a larger plate and a longer eyebolt.

The "deadman" commercially available and widely used by power companies are cast steel (galvanized) about \(\frac{1}{4}\) inch thick, with ribbed stiffeners cast into them. If ordinary steel plate is used, it should be somewhat thicker and prepared conveniently.

### TABLE III

Guy Anchor Data

<table>
<thead>
<tr>
<th>Guy Pull (pounds)</th>
<th>Plate Size (^1) (inches)</th>
<th>Bolt Diam. (inches)</th>
<th>Bolt Length (^1) (inches)</th>
<th>Depth to Plate Hole (inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>500</td>
<td>6 x 6</td>
<td>(\frac{3}{4})</td>
<td>36</td>
<td>25</td>
</tr>
<tr>
<td>800</td>
<td>6 x 6</td>
<td>(\frac{3}{4})</td>
<td>36</td>
<td>25</td>
</tr>
<tr>
<td>1100</td>
<td>6 x 7</td>
<td>(\frac{3}{4})</td>
<td>42</td>
<td>33</td>
</tr>
<tr>
<td>1500</td>
<td>6 x 7</td>
<td>(\frac{3}{4})</td>
<td>48</td>
<td>33</td>
</tr>
<tr>
<td>2300</td>
<td>6 x 8</td>
<td>1</td>
<td>60</td>
<td>42</td>
</tr>
<tr>
<td>3500</td>
<td>6 x 9</td>
<td>(\frac{5}{8})</td>
<td>72</td>
<td>52</td>
</tr>
</tbody>
</table>

\(^1\) Minimum.

\(^2\) Maximum.

(Continued on page 186)
Constructing Safety Interlocks from Standard Parts

BY RONALD L. IVES *

Although interlock switches are recommended on all radio equipment so that when the cabinet door is opened all high-voltage circuits are de-energized, such switches are not readily available, and many of the small commercial models are not in accord with local electrical codes.

![Diagram of Microswitch BZ2-2MN with annotations](image)

Fig. 1 — Microswitch mounting for service as rack-cabinet interlock.

A neat and relatively inexpensive interlock switch that is quite safe and which will pass most electrical inspectors can be constructed easily from a Microswitch and a few standard fittings. Constructional details are sketched in Fig. 1. Because all electrical parts are standard UL or AN fittings, and all fit together without alterations, appearance is quite workmanlike and neat. Mountings for most rack cabinets are quite simple, requiring only straightforward machine work, with no highly-critical dimensions.

Length of spacers, for Par-Metal rack cabinets of the ER-223 series, should be about 1 1/4 inches. The switch is held in place by two 10-32 rack screws through the side of the cabinet. Alternative mountings include a right-angle bracket screwed to the rear frame of the cabinet, and a bracket to support the switch from the rear of a convenient chassis. Best location for the switch is so that the actuating button is operated by the door catch housing when the cabinet door is latched. This eliminates any tendency of the switch to warp the cabinet door.

A satisfactory electrical location for a safety interlock switch is between the main fuse and the main system switch, as in Fig. 2A. If extra safety is desired, the interlock can be used in conjunction with an electrically self-holding relay, as shown in Fig. 2B. This prevents accidental or intentional turning on of the power by manual operation of the interlock. Once the circuit is broken by $S_1$, it is necessary not only to close the interlock, but also to close the “start” or “on” push-button switch before the system is electrically live. Since this requires the use of both hands when the cabinet is open, the chance of shocks is at a minimum.

Whatever circuit is used, some sort of safety interlock should be incorporated in every rack cabinet. Safety measures are much cheaper than funerals!

![Diagram of interlock circuit](image)

Fig. 2 — A — Simple interlock circuit. The switch is simply plugged in series with the a.c. line. B — Circuit using interlock in conjunction with a locking relay. The switches are push-button type. $S_1$ (on) is normally open, while $S_2$ (off) is normally closed.

*5415 Main St., Williamsville 21, N. Y.

July 1952
Simple VFO Construction for the 75-Meter 'Phone Band

BY CHARLES MCDOWELL, * W4JIX

I am not disputing the fact that the more complicated and elaborate VFO units which appear from time to time in QST have their proper place. Too much care cannot be used in the electrical design and construction of the oscillator when its multiples are to be used for operating in the higher-frequency bands. However, many of the refinements featured in such units are unnecessary and disproportionately expensive for the ham who asks only for something with which he can shift frequency in the 75-meter 'phone band. In such a case, simplicity and physical size become more important factors.

In searching about for a simple but reliable circuit, the one shown for the "Coffee-Can" VFO in a previous article appealed strongly to this rock-bound character for several reasons. The circuit, shown in Fig. 1, is simple. It requires relatively few components so that the unit can be made small enough physically to fit, in many instances, on the chassis of an existing rig. A reasonable amount of isolation is provided by the buffer stage. Also, in working 'phone in a crowded band, frequency drift is one of the most important considerations and the Clapp circuit used in the "Coffee Can" excels most others in this respect.

Only two essential changes were made in the original circuit. A 6AG7 was substituted for the 6V6 in the oscillator, more or less as a matter of personal preference, and the tuning range was restricted to cover only slightly more than the 75-meter 'phone band for better bandspread. However, the original full-band coverage can be easily retained, if desired, simply by using a 75-μfd. tuning condenser.

Construction

The parts are assembled in a standard 3 X 4 X 5-inch box. The tubes are mounted externally on top of the box to keep most of the tube heat away from the tuned-circuit components, minimizing drift. All of the components, except the three tuning condensers, C3, C4, and C5, and the coil, L1, are mounted on the underside of the top cover. Thus, most of the wiring and soldering can be done before assembling the box.

The coil is fastened to the side of the box. The tuning condenser, C5, is mounted on the front. The paint is scraped away from around the condenser shaft mounting hole to provide a good ground contact for the condenser rotor. The negative-temp trimmer, C5, and the zero-temp paddler, C4, are mounted directly across the terminals of the tuning condenser. The bottom end of the coil can be connected to the tuning-condenser stator before the top and bottom plates are attached. The connection from the other end
Fig. 1 — Simple VFO circuit.

C\textsubscript{4}, C\textsubscript{2} — 0.001-mfd, silvered mica.
C\textsubscript{5} — 150-\mu\text{f}d. zero-temp ceramic (Centralab TCZ-150).
C\textsubscript{6} — 50-\mu\text{f}d. variable for phone band only (Bud LC-1044); 75-\mu\text{f}d. for entire 3.5-Mc. band (Bud LC-1045).
C\textsubscript{7}, C\textsubscript{8}, C\textsubscript{9} — 0.01-\mu\text{f}d. disk ceramic.
R\textsubscript{1} — 0.1 me. 1/2 watt.
R\textsubscript{2} — 47,000 ohms, 1/2 watt.
L\textsubscript{1} — Approx. 12 mh. — 23 turns No. 16 enam., 1/4-inches diam., close-wound.
RFC\textsubscript{1}, RFC\textsubscript{2} — 2.5-mh. r.f. choke.

of the coil to the junction of C\textsubscript{2} and C\textsubscript{6} is made by leaving the coil lead long enough to reach a 3-terminal lug strip on which C\textsubscript{1} and C\textsubscript{2} are mounted, and soldering the connection while the plate is held about a half inch from its regular position. This procedure was necessary because the large and not so deft hands of the author are not well suited to working in such small quarters. The power leads and the output lead are brought out through grommeted holes in the side or bottom to suit the transmitter layout.

I use a National type AM vernier dial which gives an easily handled tuning rate.

**Adjustment**

The VFO should not be mounted in the transmitter until the frequency range is checked with the bottom plate in place. Shielding affects the inductance of the coil, and if the frequency is set with the bottom plate removed, the frequency will not be the same with the plate in place. It is necessary to set C\textsubscript{6} attach the bottom plate, and then check the frequency limits. If the range is not as desired, remove the plate, readjust C\textsubscript{6}, replace the plate and check again until the right range is obtained. An alternative, of course, would be to mount the trimmer in such a position that the trimmer adjusting screw can be reached through a hole in the side of the box.

**Performance**

This VFO works well at a plate voltage of 100 or less and gives a healthy output at 175 volts. I use it to drive a 2E26 buffer amplifier, the VFO operating from a tap on a voltage divider across the 400-volt supply for the 2E26. Reports from many stations worked show that drift is negligible. Despite the fact that c.w. performance was a secondary consideration, T9 reports are often received when keying the 2E26 in the cathode circuit. Although I have not had occasion to try it, since I do not feel the need for rapid break-in, it seems probable that the oscillator itself could be keyed with reasonably good characteristics.

Most of the components for the simple VFO are assembled on the top cover plate. Only the tuned-circuit components are fastened to the box walls.
A 200-Watter for 160
Compact Construction for Restricted Space

BY ROBERT M. RESCONSON, W1TRF

A few months ago I decided to try the 160-meter band, just to see what it was like. My medium-power 10-meter transmitter was too much of a problem to get down to frequencies that low, so I threw together a haywire-style rig for the trial. After only a few nights of operating, I knew I was there to stay and immediately began to lay plans for an outfit more in keeping with the facts. When the ham shack has to be in the dining room, haywire and unnecessary bulk lives on borrowed time if the XYL has anything to say about it — and she usually does! Aside from the considerations of compactness and appearance, I wanted to run the legal nighttime limit on power, have VFO control and utilize the power supply and modulator from the 10-meter rig. Last, but certainly not least, the unit had to be well shielded for TVI because the activity on 160 is usually at its best during TV hours. All of this, of course, called for much planning and checking. But, in the end, the results were all that could be desired in a transmitter for 160 meters.

Circuit

The circuit I finally decided upon is shown in Fig. 1. A 6AG7 is used in the series-tuned VFO which works on 160. The oscillator plate circuit, which is untuned, is capacity coupled to another 6AG7 in the buffer stage. Cathode bias is supplied to the buffer stage by $R_5$. The buffer screen voltage is taken from the regulated source that supplies the VFO section. The buffer operates straight through and is coupled to the final-amplifier grid by $C_{14}$. An 813 was chosen because of its low drive requirements and its adaptability to a wide range of plate voltages — you can run an input of 200 watts with a plate voltage as low as 1200. The stage is neutralized by means of a simple homemade condenser, $C_{17}$. It will be noticed in Fig. 1 that the conventional neutralizing connection, shown in dotted lines, was not used in this instance. Apparently, stray wiring capacitances are such that the circuit is “over-neutralized,” requiring the introduction of positive, instead of negative, feed-back for neutralization. Therefore, the neutralizing capacitance is directly from grid to plate. It should be borne in mind, however, that the use of different components, or a slightly different layout, may require the conventional connection shown in dotted lines, rather than the one used.

Fixed bias is supplied to the final amplifier by a 50-ma. selenium rectifier and a small filament transformer, $T_2$, working in reverse from the 6.3-volt filament supply. A VR-150 is used to stabilize the biasing voltage. Screen voltage is supplied from the high-voltage source through $R_8$ and $R_9$ to provide a simple means of modulating both plate and screen.

Although the output circuit is designed primarily for 160 meters, reasonable efficiency is possible in doubling to 80 meters in the final when using the 3.5-Mc. tank coil specified in Fig. 1.

Construction

The transmitter is constructed entirely on a standard 10 x 17-inch chassis with a 10 1/2-inch panel. The VFO portion is built on the left-hand side of the chassis and will be described first. The 6AG7 socket is inverted so that the tube extends below the chassis. This method allows all of the wiring on the socket to be enclosed within the shield. $C_5$, $C_4$, $C_8$ and the grid resistor, $R_8$, are all soldered directly to the socket, and the filament by-pass condensers, $C_{23}$ and $C_{24}$, as well as the screen by-pass condenser, $C_7$, are soldered directly to ground from their respective pins. Shielded power wires are brought into the compartment through rubber grommets. The r.f. plate lead to the coupling condenser, $C_8$, is

* In this article, W1TRF describes his 200-watt 160-meter rig. The simple 3-stage circuit includes a built-in VFO and ends up with an 813. While designed primarily for 160, it also perks on 80.

*215 Main St., Rocky Hill, Conn.
made of a short piece of RG/59-U coaxial cable and this also is brought up through the chassis along with the power leads. L1, the VFO coil, is close-wound on a 1-inch Millen form and is mounted on a half-inch cone insulator. The ends of the winding are soldered directly to their connections so that they are held quite rigid. Two half-inch spacers are used to hold the VFO tuning condenser, C9, above the chassis so as to line the shaft up with the drive mechanism of the National SCN dial. The oscillator paddler, C1, and its mounting bracket are bolted firmly to the chassis. A 3 × 4 × 5-inch aluminum utility box is used to cover the VFO circuit. A small opening cut in the front cover allows the tuning dial to turn freely. After all of the leads are brought through to the underside of the chassis, we go on to the buffer stage.

The oscillator plate choke, RFC8, and the buffer grid choke, RFC9, are mounted vertically. The choke terminals are used as tie points for the coupling condenser, C9, and the buffer grid resistor, R8. The buffer tuning condenser, C10, is mounted directly in front of the tube socket on the vertical bracket supplied with the condenser. A B & W 3016 Miniductor, just as it comes in the box, has just about the right inductance for L9.

The 813 socket is mounted directly on the chassis to the right of the buffer-tube socket, with the coupling condenser, C14, placed so that the leads are as short as possible. RFC9, the 813 grid choke, is in front of the tube socket, near the grid-meter shunt. The meter shunting resistors for the buffer plate and the 813 grid circuits are fastened to a pair of two-terminal lug strips. The 813 screen-current shunt is mounted on two small...
cone insulators and is connected with high-voltage insulated wire, since the screen voltage rises to the supply value when the tube is not being driven. All external power leads have v.h.f. filters. The components are placed in the enclosure formed by the aluminum barrier shield running the length of the chassis.

The neutralizing “condenser,” C₁₇, consists of a strip of aluminum about a half inch wide and 2 or 3 inches long, bent at right angles and mounted on a feed-through insulator near the socket grid terminal. The feed-through is connected to the grid terminal and neutralizing is adjusted by altering the length of the strip or by bending it closer to, or farther from, the tube.

The output tank condenser, C₁₈, is mounted above the chassis on half-inch cone insulators. The shaft is connected to the tuning dial through a ceramic-insulated shaft coupling. The jack bar for L₄ is supported on National GS-1 pillar insulators and mounted alongside the tank condenser. Another insulated shaft coupling is used to extend the shaft of the swinging link to the panel. A length of coaxial cable is run from the link assembly to the antenna terminal along the left drop of the chassis.

The shielding barrier is spaced 3 inches from the rear. This enclosure contains all of the a.c. wiring, the line chokes and the bias supply. The high voltage to the final is routed through a feed-through in the shield. L₂ is cemented between two ceramic cones on the other side of the barrier.

**Adjustment**

After turning on the low-voltage supply, the slider on R₄ should be adjusted to the point where the VR tube just stays ignited with the key closed. At resonance, the buffer plate current should be about 22 ma., and screen current approximately 8 ma. This should produce an 813 grid current of 18 or 20 ma. When the key is opened, the buffer plate current should drop to about 12 ma., while the screen current is reduced almost to zero. If there is any variation in buffer plate current as the tank circuit is turned through its range with the key open, a check should be made for parasitic oscillation, as discussed in the ARRL Handbook.

In tuning up the final amplifier, the screen resistor, R₅, should be adjusted to leave about 20,000 ohms in the circuit and quarter or half maximum plate voltage applied. A dummy load should be connected and the output tank tuned to resonance. As the load is adjusted to take current, the plate and screen voltages can be

(Continued on page 180)
Arkansas-Tennessee Tornadoes

Amateurs in "Tornado Alley" Provide Emergency Communication as Twisters Destroy Power and Wire Lines

BY GEORGE HART,* WINJM

Tornadoes are not exactly rarities in the Southern and Midwestern states, but the series of twisters that leapfrogged over Arkansas and western Tennessee, to say nothing of other storms in the surrounding states of Mississippi, Alabama and Missouri, in late March set a record of destructiveness and fury that is unsurpassed in the long tornado history of this area. One cannot be sure whether the various funnels which became apparent on and after March 21st were separate storms in themselves or different visitations of the same over-all clash of warm- and cold-air "fronts" which, combined with other atmospheric conditions, were conducive to the formation of whirling air funnels of terrific speed and strength which cut swathes of destruction through Arkansas and Tennessee.

We amateurs, although not too well versed on the cause of the tornadoes, are certainly aware of their effects in terms of broken communication and power lines coupled with what this means to our emergency establishment. And but for the quick activation of amateur stations in most of the affected areas, the suffering felt by the populace would certainly have been greater and spread over a longer period of time than it was. This is the story of that amateur participation, compiled from the thick sheaf of reports from Emergency Coordinators and participating amateurs which has been received since the incident.

Arkansas

The tornadoes in Arkansas started in the southwestern part of the state with a funnel at the little town of Dierks. This particular twister progressed northeastward, as did they all, and then disappeared. Very shortly afterward, however, additional funnels formed at England, at

Georgetown and at Searcy, each progressing northeastward and finally disappearing after spreading its quota of destruction. Later that night tornadoes struck points in Western Tennessee.

The destruction at Dierks, although great, was only a harbinger of disaster to come upstate. Shortly after the twister struck at 1515 and moved on in the general direction of Little Rock, W5AQF offered to set up a station at Dierks but was told there was no real need, since the town still had communication. It was not until Saturday afternoon, the day after the tornado, that W5AQF was requested to set up a station, which was accomplished on Sunday morning with the aid of W3EGY. Set up at Red Cross Headquarters, the station handled traffic for Western Union and the Red Cross. W5JTR was the Shreveport contact, from which point WU traffic normally comes into Dierks, and outgoing traffic was handled through W5ICS at Fort Smith. Others who assisted included W5E APW, BJH, EA, FPD, JIC, KKM and W9UID. Operation was buttoned up at 1730. Nine messages were received and 21 sent on behalf of the Red Cross.

The biggest and most destructive of the Arkansas tornadoes hit Searcy at 1730 on Friday, March 21st, and passed along to lay waste the small towns of Judsonia and Bald Knob. Six mobiles from Little Rock drove toward the area and for a time maintained contact with Little Rock, but it was not reliable due to skip conditions. W5STV put 100 watts on the air from Searcy and handled 8 or 10 messages, but at daylight it was impossible to reach Little Rock.

A group of five amateurs headed by W5DVI left Little Rock about 2230 Friday night with a 1500-watt a.c. gasoline-driven generator and enough gear to establish a 100-watt station. This station was set up in the Methodist Church, one of the few usable remaining buildings in Judsonia.

* National Emergency Coordinator, ARRL.

The set-up at Judsonia, W5DVI/S. Looking out the window, one can see the roof blown off the parsonage next door to the church in which the station was established. The rig was a Collins exciter driving a pair of 4-125A4s to 500 watts input — the amount of power needed to get through the QRN. James Gudley, a prospective ham, holds the mike while W5DVI and W5OOG prepare messages in proper form for transmission.

July 1952
in which there was no heat, communications or power. Rain and lightning heralded the arrival of this group, and unheard-of QRM marked the initial operation of W5DV1/5.

Within 45 minutes of the time of arrival, W5DV1/5 was on the air, in spite of transmitter difficulties. Contact was established with W5BCZ, and this contact was maintained throughout the night, although relays were necessary at times due to skip. Red Cross and town officials assisted in setting up a routine and priority system for outgoing traffic. Persons wishing to send messages had to file them at a desk set up for that purpose, although medical and Red Cross personnel filed theirs in the radio room for priority handling. The traffic was brought to the radio room six or eight at a time, and the station never got more than 30 minutes behind in its traffic handling.

But the boys had their troubles. In addition to transmitter troubles, there was QRM from n.d. generators (not their own, which was effectively silenced) and ear-splitting QRM. Low power would have been useless, and even the 100 watts they were using was hardly sufficient.

At 1700 the next day three relief operators arrived from Little Rock with new transmitting equipment, and at that time the station was moved to a higher and drier location, since there was a half inch of water on the floor of the original location. Actually, W5DV1/5 was off the air less than ten minutes in changing locations. The only means of communication, this station handled traffic for Red Cross, Western Union, U. S. Post Office, National Guard, Salvation Army, Weather Bureau and the Governor. In the first 24 hours of operation, traffic was sent to the loudest station heard, to be filed with Western Union at that point. After that, amateur channels were used for welfare traffic, both incoming and outgoing, although in many cases it was not possible to get information in answer to incoming inquiries. W5PHP in Searcy was one of the reliable contacts. W5MRD/M and W5BD/M represented Bald Knob until W5KBH was set up.

On Sunday morning (Mar. 23rd) W5DVT's half-kilowatt rig was brought to Judsonia, and this transmitter was used for communication with the outside up to Wednesday at 1900, by which time a temporary switchboard had been installed. The traffic total handled by W5DV1/5 was 422, 277 of which were outgoing. Dr. George Bean, W5DVI, and the group which assisted him have been publicly praised for their services. The people of Judsonia, to say nothing of the various agencies served, will not soon forget that these amateurs supplied the only communication out of and into Judsonia for several days.

The little adjoining town of Bald Knob was also hard hit on Friday. W5RWJ of Jonesboro, upon hearing of the disaster and learning of the need for communications out of Bald Knob, transported his station some 90 miles to Bald Knob, with the assistance of W5MSH. W5RWJ/5 was on the air from the City Hall from 1800 Saturday until 2000 Sunday; they were the only means of communication until Sunday, when wire and telephone service were again available. Some 122 messages were handled for the National Guard and Red Cross on 3885 kc. On Sunday evening W5KBH and W5OCX arrived to relieve W5RWJ and his crew. They operated W5KBH/5 until there was no further need for their services.

One of the most outstanding stations in the Arkansas group was W5PHP of Searcy. This station was the first on the air after the tornado side-wiped Searcy, doing comparatively little damage, and then roared into Judsonia and Bald Knob, and W5PHP was designated by the Red Cross as its collecting point for welfare traffic. He operated for three days continuously, had relief for four hours, and was back on again for another 24-hour shift. W5PHP gained the respect of all who worked with him by his persistence and efficiency under extremely trying conditions. W5QIP, EC for Conway, assisted by W5s STU, ARH, TIE and TID, set up a BC654 station in Searcy about 2345 Friday (Mar. 21st) and another in Judsonia shortly after midnight. Due to the heavy atmospheres which always accompany tornadoes, these low-power units were not too effective, and the Judsonia station was dismantled when W5DVI and his crew arrived on the scene.

Tennessee

The fact that the terrific tornadoes which struck Dyersburg and Henderson, Tenn., followed by only a few hours those which twisted across Arkansas in that same direction lends credence to the probability that they were part of the same disturbance, which later also affected parts of Kentucky and West Virginia and came close to creating panic in some places. But by the time the disturbance which begets tornado conditions got this far north the winds had died down and all that was left was drenching rain.

In their dying throes, the tornadoes that hit Arkansas in the afternoon lashed out in renewed fury that evening at western Tennessee. The first town hit was Moscoe, and then Henderson was all but levelled. Further north Dyersburg felt the force of another twister, killing scores of people, injuring hundreds and wreaking property destruction into the millions of dollars.

In Henderson, RM W4AGC contacted W4EDC immediately after the blow, and the latter went to Jackson to obtain an emergency power supply, which was not available locally. When he returned, it was found that the Jackson Radio Club was setting up facilities in Henderson. Failing to establish contact between W4HXC/M and W4HPO in Jackson, the group put W4EDC/4 on the air about 0515 Saturday (Mar. 22nd). This station operated with fair success until a second emergency generator was put on the air at 1715 Saturday, using the call W4AGC, who immediately called the Tennessee Net on 3835 kc. Within 15 minutes, 25 stations had reported in and the traffic began to flow. W4AGC alone handled over 300 messages through the facilities of the Tennessee c.w. and 'phone nets, the Fifth
and Ninth Regional Nets of NTS, and ARRL Trunk Line J. The session lasted until 0130 March 23rd (Sunday), then was resumed again at 0900 and operated until 2300. W4JU and W4BAQ maintained liaison with Arkansas 'phone and c.w. nets.

W4AKJ, EC at Crockett Mills, reported into the Tennessee Phone Net at 0650 Saturday morning (Mar. 22nd), having heard of the emergency at Dyersburg. Later, having collected some traffic for Dyersburg, he visited that town to deliver it, and visited Western Union, telephone company and the Red Cross to see if any assistance was needed. The need did not seem to be particularly urgent; nevertheless, he contacted W4OFX to see what facilities were available, and after taking inventory they got W4STX to come down from Newbern with a small rig. With low power and transmitter difficulties, however, contact was not satisfactory and most of the traffic was carried from Dyersburg to be originated at W4AKJ, handled mostly through the Tennessee c.w. net on 3635 kc.

Miscellaneous

The emergency nets operating in Arkansas and Tennessee received considerable assistance from other nets outside these two states in facilitating their long haul traffic and conducting traffic relays necessitated by skip conditions, which were especially prevalent on 75 and 80 meters, the two bands most used in the emergency. The Transcontinental Relay Net (TCRN) on 7042 kc. remained in session to assist with traffic to and from the storm area, and a new net was formed on 7090 kc. by W5GBJ, W5DLZ and W5TOE, the latter in Little Rock. Stations in this net would comb the band for traffic and bring it or the stations having it to the 7090 frequency for clearance. The National Calling and Emergency Frequency, 7100, was especially monitored.

W5EBE of Springfield, Mo., cleared a considerable amount of traffic with the Arkansas storm area on 75 and 80, while Trunk Line J (Ninth Regional Net) and the River Forecast Net under W9TT handled much traffic with the tornado-stricken areas in Tennessee by conducting special sessions and maintaining contact with W4AGC, with W9LZI and W4MXW turning in especially noteworthy performances. Approximately 100 messages were handled. The NTS Fifth Regional Net held a special session but was not called upon to assist in traffic relay.

Each amateur group is its own worse critic, and the Arkansas-Tennessee tornado emergency was not unexceptionable in this instance. In spite of this, all agencies, both government and private, which were assisted during the tornado — and there were a lot of them — are singing the praises of the organized radio amateur who makes his time, facilities and sweat available to the public in time of disaster.

In all, several hundred amateurs participated in this emergency, both in the disaster area itself and outside in supporting roles. All are deserving of the highest praise for their efforts. It should be obvious from the above that no particular effort has been made to list the call letters of those who participated, but most reports received included long lists which we have not included for space reasons. To all these, our felicitations for a good job well done. And one last thought — they also served who stood by without transmitting so that those handling emergency traffic could do so that much easier and quicker.

Strays

Coaxial or food-through condensers of the type used in suppressing automotive noises as specified in “Automotive Radio Noise Elimination,” by Brooks H. Short, W9DPI, (April, 1952, QST, p. 17) are now available from Sprague Products Company, North Adams, Mass., and Cornell-Dubilier Corporation, South Plainfield, N. J.

July 1952
ARTICLES OF ASSOCIATION

Be it known that we, the subscribers, do hereby associate ourselves as a body politic and corporate pursuant to the statute laws of the State of Connecticut regulating the formation and organization of corporations without capital stock and the following are our Articles of Association:

Article 1:
The name of our corporation shall be The American Radio Relay League, Incorporated. Our corporation commenced its corporate existence as the American Radio Relay League, Incorporated, when its Articles of Association were approved by the Secretary of the State of Connecticut on January 29, 1915. The original Articles of Association were subscribed by Hiram Percy Maxim, Clarence D. Tusska and Lawrence A. Howard. The affairs of the corporation have since that time been continuously administered by a Board of Directors selected by the membership; and the present Directors, subscribing hereto, are the lawful successors and associates of the incorporators.

Article 2:
The purposes for which our corporation is formed are the following: the promotion of interest in amateur radio communication and experimentation; the relaying of messages by radio without charge; the furtherance of the public welfare; the advancement of the radio art; the fostering and promotion of intercommunication by electronic means for the personal benefit of the members and without pecuniary gain; the fostering of education in the field of electronic communications; the dissemination of knowledge and information by electronic means; the printing and publishing of documents, books, magazines, newspapers and pamphlets necessary or incidental to any of the above purposes. No part of the assets or income of our corporation shall be the property of the members or any of them, but such assets and income shall be devoted exclusively to the purposes herein set forth.

Article 3:
The corporation is located in the town of West Hartford, County of Hartford and State of Connecticut and the address of the principal office is 38 LaSalle Road.

Article 4:
The name of the agent upon whom process may be served is A. L. Budlong and his address is 38 LaSalle Road, West Hartford, Connecticut or upon his successor as Secretary of the Corporation.

Article 5:
The affairs of this corporation shall be governed by a Board consisting of not less than five, nor more than seventeen Directors who shall be elected by the members for terms of two years.

The present Board of Directors and the expiration date of the term of each Director, are:

Alexander Reid, 240 Logan Avenue, St. Lambert, P. Q., January 1, 1952
John H. Brabb, 417 Ford Bldg., Detroit 26, Michigan, January 1, 1952
Victor Canfield, P. O. Box 965, Lake Charles, Louisiana, January 1, 1952
Goodwin L. Dosland, Moorhead, Minnesota, January 1, 1952
John R. Griggs, 10412 Don Pico Rd., RFD 2, Spring Valley, Calif., January 1, 1953
Lamar Hill, 104 Myrtle, Cochran, Georgia, January 1, 1952
Kenneth E. Hughes, 810 W. Orange Avenue, S. San Francisco, Calif., January 1, 1952
William H. Jacobs, Route 6, Raleigh, N. C., January 1, 1953
Joseph M. Johnston, 423 Monmouth Avenue, Bradley Beach, N. J., January 1, 1953
Alvin G. Keyes, 1201 Merchants Nat'l Bank Bldg., Cedar Rapids, La., January 1, 1952
Wesley E. Marriner, 844 North Galena Avenue, Dixon 7, Ill., January 1, 1953
Walter Bradley Martin, 1033 Arbuta Road, Abington, Pa., January 1, 1952
Franklin K. Matejka, P. O. Box 212, Estes Park, Colo., January 1, 1953
A. David Middelton, 9 Kay Road, Tijeras, N. M., January 1, 1953
Percy S. Noble, 37 Broad Street, Westfield, Mass., January 1, 1953
R. Rex Roberts, 837 Park Hill Drive, Billings, Mont., January 1, 1953

Their successors shall be elected by mail vote in accordance with rules and regulations prescribed by the Board of Directors in the By-Laws. Directors may be elected to represent specific geographical areas as may from time to time be prescribed in the By-Laws. The Board shall meet annually during the first quarter of each year at a time and place to be fixed by the President upon at least forty days' notice. Special meetings of the Board shall be called by the President upon written request of at least one-half the membership of the Board as then constituted.

Article 6:
At the time of the election of each Director there shall also be elected a Vice-Director who shall have power of succession to the office of Director as hereinafter prescribed. No person shall be eligible for the office of Vice-Director who does not possess the qualifications herein specified for the office of Director.

Article 7:
During the intervals between meetings of the Board of Directors the affairs of the corporation shall be administered by an Executive Committee consisting of the President, the First Vice-
President, the General Manager and one member of the Board of Directors designated by the Board. The Board of Directors, in its discretion, may also appoint from amongst the officers, directors, or employees of the League not more than three additional members of the Executive Committee to serve for fixed terms between regular meetings of the Board of Directors. The Executive Committee shall meet at the call of the President, but no less often than bi-monthly. The Executive Committee may in its discretion submit for determination or decision by the members of the Board of Directors by mail vote any proposal pending before the Executive Committee. When such submission is made, it shall be made in precise terms embodying the text of a proposed resolution. Such resolution shall be deemed adopted upon the receipt of the affirmative mail votes of at least 60% of the members of the Board. Otherwise, it shall be deemed rejected. Such action shall be binding upon the Executive Committee.

Article 8:
A vacancy in the Board of Directors shall be deemed to occur upon the death, resignation or refusal to act of any Director. Upon the occurrence of such vacancy, the Secretary shall proclaim it and thereafter the duties of the Director shall be assumed by the Vice-Director, and the Vice-Director shall hold the office of Director for the remainder of the term for which he was elected Vice-Director. Should the office of both Director and Vice-Director be vacant, the vacancy shall be filled by appointment of the President.

Article 9:
The officers of the corporation shall be a President, not more than three Vice-Presidents, a Secretary and a Treasurer who shall be elected by the Board of Directors at their meeting in 1932 and biennially thereafter.

Article 10:
The Board of Directors may from time to time adopt By-Laws not inconsistent with these Articles and may alter, amend or repeal such By-Laws.

Article 11:
The membership of the League shall consist of (a) full members who shall be entitled to all rights and privileges of the League and (b) associate members who shall be entitled to all rights and privileges of the League except the right to vote for Directors and Vice-Directors and the right to hold office. The Board of Directors shall by appropriate By-Laws specify the requirements for membership and classes of membership provided, however, that the Board of Directors shall not terminate or reduce the rights of any member except for the lapse or termination of a condition now required as precedent to the exercise of such rights. Nothing herein contained shall preclude the Board of Directors from expelling a member upon good cause shown and after notice and an opportunity to be heard.

Article 12:
No person shall be eligible for the office of Director, Vice-Director or President who has not been a member of the League for at least four years or who does not hold a valid authorization as a radio amateur in accordance with the applicable federal laws and regulations prevailing at the time of his election. No person shall be eligible for the office of Director, Vice-Director or President who is commercially engaged in the manufacture, sale or rental of radio apparatus capable of being used in radio communication, or is commercially engaged in the publication of radio literature intended in whole or in part for consumption by radio amateurs.

Article 13:
The Board of Directors shall employ a General Manager who shall hold office for a term and upon such compensation as the Board and he may agree upon. The General Manager shall manage the affairs of the League under the direction of the Board of Directors. He shall be deemed a member of the Board, but without vote. He shall attend all meetings of the Board. He shall collect all monies due the League and turn them over to the Treasurer. He shall certify the accuracy of bills or vouchers on which money is to be paid and shall draw and countersign all checks. He shall have charge of the books and accounts of the League and shall furnish to the Board of Directors from time to time such statements as may be required. He shall conduct the general correspondence of the League and shall keep full records. He shall be in responsible charge, under the Board of Directors, of all property of the League. He shall, under the general direction of the Board of Directors, employ such personnel as may be necessary for the effective accomplishment of the purposes of the League. He shall be the General Manager of the League publications. He shall prepare and submit to each annual meeting of the Board of Directors a comprehensive report of the progress and status of the affairs of the League. He shall perform such other duties as may be assigned to him by the Board of Directors. His entire time shall be devoted to the affairs of the League. He shall furnish a bond satisfactory to the Board of Directors, the expense of the same to be borne by the League.

• On these pages we reproduce the new Articles of Association of The American Radio Relay League, Inc., adopted by the Board of Directors at its 1951 meeting. On the following pages are the new By-Laws and supplementary regulations just adopted by the Board at its May meeting to become effective July 1, 1952.

July 1952 55
BY-LAWS

Members

1. Pursuant to Article 11 of the Articles of Association, the following membership requirements are established:

(a) To be eligible for full membership an applicant must be a resident of the United States or its possessions or of Canada and must be either:

(1) the holder of either an amateur radio station license or an amateur radio operator's license, issued by the administration of the country of which he is a citizen. Such full membership shall be granted for no longer than one year at a time, and the holding of an amateur radio license must be demonstrated before each renewal for an additional year; provided, however, that if such a full member becomes without amateur radio license during a year for which he has been accepted as a full member, he shall continue to possess the rights of a full member until the expiration of the year; or

(2) a person who has held continuous and unexpired membership in the League since May 15, 1934.

(b) Any person interested in amateur radio shall be eligible to associate membership. Upon attaining possession of an amateur license, an associate member shall be transferred to full membership upon his application therefor, if he is otherwise eligible.

2. Applications for membership shall be submitted to the Executive Committee and a majority vote of this Committee shall elect to membership. The Committee shall not elect any applicant whose character, reputation or conduct would make him, in its opinion, an undesirable member. The Committee may delegate the ministerial function of granting (but not denying) applications for membership to which no question is raised or suggests itself under these By-Laws.

3. The Secretary shall notify members of the expiration of their membership not less than thirty days in advance thereof.

4. The dues of members of any class shall be $4.00 per year in the United States & Possessions, $4.25 in the Dominion of Canada, payable annually in advance.

5. Provided that a full member is without sight, or is the husband or wife, brother or sister, son or daughter, father or mother of another full member living at the same address paying dues at the rate of $4.00 per year in the United States & Possessions or $4.25 in the Dominion of Canada, he may at his request pay dues of $1.00 per year, in advance, but without the right to receive "QST"; said membership to be concurrent with that of the member receiving "QST".

General Provisions as to Officers and Directors

6. Every officer, director and vice-director of the League shall serve and continue in office until his successor shall have been elected and qualified.

7. All officers, directors and vice-directors shall serve without compensation in any form. This shall not preclude the reimbursement, and the League shall reimburse the reasonable and necessary travelling expenses of officers and directors from their homes to the place of meeting of the Board of Directors or of the Executive Committee and return to their homes. This section shall not be construed to prevent the employment, for agreed compensation, of the Secretary, the Treasurer, and any Vice-President other than the first Vice-President, by the League in other capacities.

8. No person shall an officer, director or vice-director of the League unless at the time of his assuming office he is a member of the League.

Directors

9. The members of the Board of Directors shall be the President, the Vice-Presidents, one director from each of the several territorial divisions of the League and the General Manager.

10. The President, the Vice-Presidents and the General Manager shall possess all of the rights and duties of directors save the right to vote, provided, however, that the President shall be required to cast a vote on any matter as to which a tie is found to exist.

11. Without restriction of his rights and duties as prescribed by the Articles of Association, the Canadian Director is requested not to vote on any matter involving recommendations or expressions of attitude concerning the exercise of the power of the Federal Government of the United States of America in the regulation of radio communication, or in matters of purely domestic United States interest.

12. Each director shall keep himself informed as to conditions and activities in his territorial division and as to the needs and desires of the members therein in order that he may faithfully and intelligently represent the true interests of such members. He shall attend all meetings of the Board. At least twenty days prior to each annual meeting of the Board of Directors each director shall file with the Secretary a written report on the status of the affairs of the League in his division, together with a statement of his recommendations as to any actions required for the effective administration of the objectives and affairs of the League.

13. On any date not later than noon of the twentieth day of September of an election year in
any division, nominating petitions signed by ten or more full members of a division and naming a full member of the division as candidate for director, may be filed with the Secretary. The Secretary shall solicit such petitions in the August and September issues of “QST” in each election year by a notice that will show the name of the incumbent.

14. The Executive Committee shall delete the name of any nominee who may be ineligible for election and the name of any who may withdraw by written communication. The remaining names shall be listed on a ballot, in alphabetical order. If there be but one eligible nominee, the Executive Committee shall declare him elected without balloting by the membership. If there be more then one eligible nominee, then during the first week of October the Secretary shall send by mail to every person who on the twentieth day of September of that year was a full member of the League in the divisions in which elections are being held, a ballot listing the candidates for director in his division, and a return envelope, soliciting a vote for one name. The ballot shall contain a copy of By-Laws 13 and 15.

15. The Executive Committee shall appoint a committee of three tellers and shall arrange to have a certified public accountant present to certify the results of the balloting; but any member of the League who shall deliver to the Secretary on or before the first day of October of election year a written petition signed by at least ten full members of a division, stating their desire that he witness the counting by the committee of tellers of the ballots from that division, shall be permitted to do so and shall be accorded reasonable opportunity to satisfy himself of the correctness of the count reported by the committee. Ballots, to be counted, shall reach the Secretary not later than noon of the twentieth day of November of election year. No outer envelopes marked as containing ballots shall be opened until the meeting of the committee of tellers held for the purpose of counting the ballots. The committee of tellers shall meet at the headquarters office of the League as soon thereafter as possible and in the presence of each other shall open the envelopes containing ballots and shall count the vote after first eliminating the ballot of anyone disqualified from voting. They shall forthwith prepare and sign in the name of the Executive Committee a report of the results of the vote, declaring duly elected as new directors the candidate in each division receiving the greatest number of votes therein; and they shall turn over all their records and ballots to the Secretary for presentation at the next annual meeting of the Board of Directors.

16. If there be no eligible nominee, the procedure provided for in By-Laws 13, 14 and 15 shall be repeated three months later and if there again be no eligible nominee, the person then holding the office of director shall continue in office (subject to the provisions of Article 8 of the Articles of Association), until the next regular election established by these By-Laws for the division.

17. Simultaneously with each election for director of any division there shall be held an election for vice-director of that division. All of the provisions of By-Laws 1, 13, 14 and 15 shall be applicable to the election for vice-director. Should it appear that any one person is nominated for the office of director and vice-director, his nomination shall be deemed for director only and his nomination for vice-director shall be void.

18. A director and a vice-director shall be elected in each even-numbered year in each of the following divisions: Central, Hudson, New England, Northwestern, Roanoke, Rocky Mountain, Southwestern and West Gulf. A director shall be elected in each odd-numbered year in each of the following divisions: Atlantic, Canadian, Dakota, Delta, Great Lakes, Midwest, Pacific and Southeastern. The term of each director shall be for two years.

19. The terms of all directors and vice-directors shall begin at noon on the first day of January of the year after that in which they are elected.

20. Meetings of the Board of Directors shall be held at West Hartford at a place to be designated by the President and notified by the Secretary. Meetings may be held at places other than West Hartford provided that specific provision is made therefor by appropriate action of the Board of Directors or of the Executive Committee at least sixty days prior to the date of the meeting.

21. Special meetings of the Board of Directors may consider or act upon only those matters which are set out in the request provided for in Article 5 of the Articles of Association. The call for any such meeting shall specify the matters to be considered.

22. A majority of the members of the Board of Directors or of any committee shall constitute a quorum at any meeting of the Board or committee.

23. Prior to any regular meeting of the Board of Directors, the Secretary, upon consideration of the reports of the officers and directors, shall establish an agenda for the meeting. Proposals for amendment of the agenda or for the deletion or addition of items shall be the first order of business.

24. On questions of order and procedure not otherwise determined by these By-Laws the provisions of the current edition of Robert’s Rules of Order shall prevail.

25. In accordance with the provisions of Article 5 of the Articles of Association and for the purpose of By-Laws 9, 12, 13, 14, 15, 17 and 18, the following territorial divisions are established:

   Atlantic Division, those portions of the states of New York and New Jersey not included in the Hudson Division, the states of Pennsylvania, Maryland and Delaware, and the District of Columbia; Canadian Division, the provinces

July 1962 57
of Nova Scotia, New Brunswick and Prince Edward Island, Ontario, Quebec, Saskatchewan, Manitoba, Alberta, British Columbia, and Newfoundland, Labrador, the Northwest Territories and the Yukon Territory; Central Division, the states of Illinois, Indiana and Wisconsin; Dakota Division, the states of Minnesota, North Dakota and South Dakota; Delta Division, the states of Louisiana, Mississippi, Arkansas and Tennessee; Great Lakes Division, the states of Kentucky, Michigan and Ohio; Hudson Division, the counties of New York, Bronx, Richmond, Kings, Queens, Nassau, Suffolk, Westchester, Rockland, Putnam, Orange, Ulster, Dutchess, Columbia, Green, Albany, Rensselaer and Schenectady of the state of New York, and the counties of Bergen, Passaic, Morris, Essex, Union, Middlesex, Monmouth, Hudson and Ocean of the state of New Jersey; Midwest Division, the states of Nebraska, Iowa, Kansas and Missouri; New England Division, the states of Maine, New Hampshire, Vermont, Massachusetts, Rhode Island and Connecticut; Northwestern Division, the states of Washington, Oregon, Montana and Idaho, and the Territory of Alaska; Pacific Division, that portion of the state of California not included in the Northwestern Division, the state of Nevada, the Territory of Hawaii and the United States Possessions in the Pacific; Roanoke Division, the states of Virginia, West Virginia, North Carolina and South Carolina; Rocky Mountain Division, the states of Colorado, Wyoming and Utah; Southeastern Division, the states of Georgia, Florida and Alabama, the United States Possessions in the Caribbean, and the Canal Zone; Southwestern Division, the counties of Imperial, Inyo, Los Angeles, Orange, Riverside, San Bernardino, San Diego, San Luis Obispo, Santa Barbara and Ventura of the state of California, and the state of Arizona; West Gulf Division, the states of Texas, Oklahoma and New Mexico.

28. The Secretary shall record the proceedings of all meetings of the Board and of the Executive Committee. He shall promptly furnish copies of the minutes of these meetings to all officers and members of the Board and publish them in "QST". He shall be responsible for the maintenance of the corporate status of the League and the filing of all reports and certificates which may be required of the League under the corporation laws of the State of Connecticut. He shall be the archivist of the League and for the performance of his such duties may call upon the General Manager for such clerical and stenographic assistance as he may require. To the extent that may from time to time be required by law, he shall act as agent for the service of process, but only while present in the State of Connecticut, and he is not authorized to accept service of process elsewhere.

29. The Treasurer shall be the recipient of all monies of the League and shall deposit the same in the name of the League in a depository specified by the Board of Directors. He shall sign checks drawn by the General Manager in payment of obligations known by him to be proper and authorized. He shall make a report at the annual session of the Board of Directors and shall attend meetings of the Board. He shall furnish bond satisfactory to the Board, the expense of such bond to be borne by the League. He shall be ex officio a member of the Finance Committee provided for in By-Law 30 and shall, on consultation with and subject to the general supervision of the Finance Committee, invest and reinvest the surplus funds of the League in securities of the variety in which a life insurance company is authorized by law to invest.

Standing Committees

30. The following standing committees are established:

Finance Committee
Planning Committee

31. Each such committee shall consist of three members, one of whom shall be specifically designated as Chairman. Appointments shall be made by the President during annual meetings of the Board of Directors and shall be for a term of one year. Standing committees shall make written annual reports at least thirty days prior to each annual meeting of the Board of Directors.

32. The Finance Committee shall act as advisor to and supervisor of the Treasurer in regard to the investment of the League's funds. The Chairman of the Finance Committee may direct from time to time that the business of the committee may be transacted by mail.

33. The Planning Committee shall act as a reference body to which the Board may from time to time by resolution refer problems requiring special study, planning and recommendation. Any such resolution of reference shall describe with particularity the problem to be studied, the
general character of the investigation required and the scope of the report desired.

**Official Publication**

34. There shall be an official publication maintained by the League, in the form of a monthly magazine, the name of which shall be "QST". A copy of this magazine shall be supplied each month to every member of the League in good standing. The general management of this magazine shall be in the hands of the General Manager. The policy of the magazine shall be determined by the Board of Directors.

**Amendments**

35. These By-Laws may be amended by a three-quarters vote of the directors present at any meeting; or (provided due notice of the proposed amendment shall have been submitted to every director at least thirty days in advance), they may be amended by a two-thirds vote.

36. Without changing their import, the Secretary may from time to time, on notice to the members of the Board of Directors, renumber these By-Laws so as to serve the purpose of ready reference.

37. The present By-Laws shall become effective July 1, 1952.

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**RULES AND REGULATIONS CONCERNING AMERICAN RADIO RELAY LEAGUE CONVENTIONS**

1. An American Radio Relay League convention is defined as a meeting of persons interested in amateur radio, of any regular American Radio Relay League Division or of any State or Province therein, when such meeting has been authorized and is conducted as hereinafter provided.

2. Neither the name of the American Radio Relay League, nor the initials thereof, nor its emblem, shall be used in connection with any meeting or convention, or in the advertising thereof, save as above defined.

3. Before such a convention is held, the parties desiring to conduct the same shall obtain the approval of the director of the division in which the convention is to be held, by an application setting forth the place and date of the proposed convention, the territory to be embraced, the particular purpose to be served thereby, the clubs, associations or groups who propose to sponsor it, and the names and addresses of the officers chosen to conduct it. When the director is satisfied that the approval of such convention will be in the best interests of the League, he shall submit the application to the Executive Committee for its formal approval. Upon such final approval the headquarters shall notify the chairman or secretary of the convention group. The management, program and financial plans of every such convention shall be subject to the approval of the director of the division in which the convention is to be held.

4. Notwithstanding the foregoing provisions the Board of Directors may, at any meeting, authorize or direct, upon such terms as it may prescribe, the holding, as a National Convention, of a meeting of persons interested in amateur radio from throughout the operating territory of the League.

5. The General Manager, with the approval of the Executive Committee, is also authorized to provide (upon the request of the directors affected), for the holding of a State Convention designed for amateurs residing in any state which lies partly in each of two divisions.

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**RULES AND REGULATIONS CONCERNING AFFILIATED SOCIETIES**

1. It shall be the policy of the League to affiliate with itself local non-commercial amateur radio societies of kindred aims and purposes with a view to forming a homogeneous organization for unity of action in matters affecting amateur welfare.

2. Any such society which suitably expresses its sympathy with and allegiance to the aims and policies of the League in accordance with regulations determined by the Communications Manager with the approval of the Executive Committee, and which upon investigation is found to be worthy and well qualified, may be declared duly and truly affiliated with the League by the Communications Manager with the approval of the Executive Committee and a certificate shall thereupon be issued the society in token thereof. The Executive Committee shall have the authority to refuse affiliation to any society if in its opinion such affiliation would be harmful to the best interests of the League.

3. The affiliation of any society may be terminated and its charter recalled by the Executive Committee at any time for any cause deemed prejudicial to the best interests of the League.

4. At least 51% of the voting members of an affiliated society must be full members of the League.

5. At least 51% of the members of an affiliated society must be licensed radio amateurs.

6. The Communications Manager shall be (Continued on page 188)
Most of us of pre-World-War-II days' operation can recall the fine QSOs on 160 meters, but since the war very little activity has been noticed. The 160-meter band has extremely good possibilities and promises a great deal of enjoyment and experimentation. The author has been operating mobile on 75-meter 'phone since two days after the go-ahead signal for mobile operation on all bands and, like many other hams, has had an immense amount of enjoyment and opportunity for experimentation with the low-frequency antenna systems required for mobile operation.

Daylight operation on 75 is quite limited with the average mobile installation of about 20 watts, and, after reference to various textbooks, the reasons for the limited signals are readily understood. Attenuation of the ground signal in the 2- to 4-Mc. region is quite pronounced. For instance, tests were conducted on both bands, with a given output of 20 watts on 'phone. The receiving end indicated the following signal levels: on 3980 kc., the signal was 1500 microvolts at approximately 7 miles from the transmitter, and on 1920 kc., the signal was 10,000 microvolts at 7 miles from the transmitter. This experimentation was conducted at various times and under various conditions, but good engineering practice was used and the above figures were compiled as an average of the findings. Near the salt water or any areas of exceptionally moist and good ground such as marshes, etc., the over-all gain was much more pronounced. But over average terrain these were the readings. It should also be brought out at this time that the antenna used on 160 was the same home-brew antenna that had been grid-dipped to 3965 kc., complete with capacity hat. Even though the antenna was not resonant on the 160-meter band, the antenna loaded in fine style by adding a variable series inductance.

Although fine communication on 75 mobile 'phone has been experienced in the daylight hours, it was the complete kaput of contacts in the evening that prompted this look into the possibilities of 160 mobile.

About a year ago the rig was placed on 160 and, for a receiver, the low-frequency end of the ear's broadcast receiver was modified by removing a few turns from the oscillator coil and then repressing the receiver at about 1900 kc. For normal broadcast reception the receiver with the extra-good ham antenna is fine, and this little receiver, a cheap auto radio in comparison to existing types on today's market, has turned out to be very excellent, and a good number of mobile QSOs have been realized on the 160-meter band.

Two facts have been mentally recorded while operating on 160 that make the band ideal for mobile and in some respects superior to 75 meters. Excellent contacts of about twice the distance for ground wave have been noticed on 160- over 75-meter operation, and a QSO in the evening is excellent on 160 whereas on 75 it's kaput because of the gallons of r.f. in the air.

The two reasons for good operation on 160 that have just been brought out are fine, but of course all is not gold that glitters, and the disadvantages to be encountered are as follows: The QSOs obtainable on 160 mobile are reduced, of course, because of the limited activity on the band. So let's get on the 160 mobile and fixed band. There's a well of enjoyment here, and already about 25 stations active in this area.

—R. A. Roberge, W6OZS

July 1927

... Boyd Phelan, 2EB, and Technical Editor Robert Kruse "formally opened" the amateur 54-meter band with gear brought to the Hudson Division Convention.

... E. M. Guyer and O. C. Austin, 9AKR, recount their investigation into 5-meter techniques. Both are constructing new gear for operation at one meter and lower.

... Chester W. Rice discusses phenomena associated with short-wave transmission and reception and explains the "skip" effect in a detailed analysis.

... Row A. Hull's "Some Light on Transmitter Tuning" features a handy "Growler" monitor built into a completely-shielded container of the hardware-store variety.

... "A Constant-Frequency Transmitter," by W. H. Hoffman, 9ER-9XIR, contends that crystal control is not the only approach to signal stability.

... To minimize transients, a wave is interrupted by varying the capacities of coupling condensers in the novel keying system of A. G. Shafter, 3ACF.

... A laboratory instrument capable of measuring capacity, power factor, resistance and inductance is the subject of an article by J. Katzenman.

... An "SS2 holder" is among new available equipment, marketed by Radio Engineering Labs of New York City to facilitate use of this popular tube.

... Amateurs cooperated with the Army and Navy in Atlantic Coast maneuvers wherein a Black Force mounted an attack by sea on a defending Blue Force.

... Putnam Balfinland, Wilkins Arctic, University of Michigan Greenland, Borden-Field Arctic and Marshall-Field Alaska expeditions are utilizing amateur radio.

... Enthusiasm for Twenty runs high as reports continue to pour in concerning amazing low-power daylight DX contacts made throughout the world.

... Outstanding amateur stations pictured and described are those of Edward G. Raser, 321, Trenton, N. J., and H. G. Pearce, 6DDO, Los Angeles, Calif.
CONDUCTED BY E. P. TILTON, * WHHDQ

It was just a year ago that FCC touched off an unprecedented march on its examining rooms by opening up for business on the Novice and Technician classes of license. We don't have complete figures for the year, of course, but present licensing rates make it certain that well over 12,000 new hams will have been brought into our hobby through these new licensing avenues alone, when the June and July figures are in.

We need only listen above 3700 kc. to see what all this has meant to occupancy of the 50-meter band. That 50-kc. Novice segment is literally boiling with signals, around the clock. The effects on the world above 50 Mc. are less obvious, but perhaps no less important. Two-meter operators in or near our more densely-populated regions have seen a marked change in operating habits and occupancy already, and the effects are still on the increase. Where there was universal complaint over lack of activity a year ago, today we find use of the 2-meter band approaching the saturation point in some spots, and almost everywhere there is more doing on 2 than at any time since the simple modulated oscillator and superregenerative receiver went out of style some years ago.

Most noteworthy is the reversal of the trend toward low-end crowding. No longer is it necessary to be in the bottom 500 kc. of the band to get contacts. We're tuning the whole band again, and the 145-Mc., low end of the Novice assignment is responsible for it.

As will be seen from the minutes of the recent ARRL Board Meeting, printed elsewhere in this issue, our Directors have petitioned FCC to open 51 to 53 Mc. to Novice use. If FCC acts favorably on this request, we may expect a similar expansion in utilization of that band. All of us agree that 6 could stand it. There has been a growing tendency on the part of 6-meter men to become DX hunters exclusively, making use of the band only when it is open, or expected to be. There is regular use of the band here and there, but the total occupancy is all too small a percentage of what the band is capable of accommodating. DX hunting on 6 is fun, and our efforts in that line have resulted in some noteworthy contributions to the store of wave-propagation knowledge, but the band should not live by DX alone. It is too useful a chunk of spectrum for local communication to be allowed to lie almost unused for nine months in the year.

The most frequently voiced objection to Novice operation on the v.h.f. bands runs something like this: "Sure, that's all well and good to promote activity on the v.h.f. bands, but how is the Novice going to build up his code speed to the General Class level if he yaks away his first year on 'phone?" This line of reasoning ignores the fact that thousands of beginners have made the grade in years gone by without having c.w. operating experience. They learned the code by listening, and by practice with others who were learning.

Which brings up a possible use of the v.h.f. bands that has yet to be fully exploited — the formation of Novice nets for code-practice purposes. Surely the swapping of formulas, in the manner of the usual 50-meter QSO, is not the ideal form of code practice. An hour's work each evening with A2 e.mission, showing the rag with nearby associates on 6, 2, or 1½ would do a lot more good. It would be more fun, too, in view of the congestion of the Novice segment of the 3.5-Mc. band. Some of us who have been around a few years could stand the code practice, too. When do we start?

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

The May issue of QST had not been out long before we heard about a couple of errors in the tabulation of scores for the V.H.F. Sweepstakes. We did W6GGC dirt by listing his score as 34 instead of 340. Get up from 9th to 4th place in the Santa Clara Valley Section listing. Worse yet, we transposed two figures in the score of W2DLO, listing him as having 846 points instead of the 864 he actually rolled up. What's so important about 18 points, do we hear someone ask? Well, there hangs a tale, for that slight change put W2BNX (850) just a hair above W2DLO, and we listed him as winner in the Lane Success Radio Club standing. This didn't sit too well, as W2BNX was the fellow who promoted the club members into tuning in for the contest! We're really sorry, boys; we do try to check contest scores carefully, but things like these happen once in a while.

Would anybody like to work Chile on 50 Mc.? It's never been done from this country, despite valiant efforts in that direction by CEIAH. Now the fellow all 6-meter men knew so well as H220T is going to have a try at it. Steve, W6BR, ex-W6DNN—H220T—CO2JF, is soon to leave for an assignment that will keep him some time in a likely location in Northern Chile. Though the solar cycle offers little chance for Pt DX, Steve will be taking gear for 2 and 6 meters, as well as for 10, 15, and 20. Is it an amateur axiom that we never know what we can or cannot work until we try, and many paths have been worked when available facts made it seem useless to try. One thing's sure — if 6-meter DX can be worked from Northern Chile, the man who made 6-meter history in Ecuador and Cuba is the fellow to do it! And we know that CEIAH will be glad to have some company on 6 and 2 meters.

DX of another sort, but hardly less desired by 6-meter men who need Nebraska for 50-Mc. WAS, should be available from June 20th to July 12th, when W9EET/S will be operating in Lincoln, Neb. The rig will run at least 50 watts, and Gordon hopes to have a beam up. Frequency will be 50 Mc.

Up to the end of May, the 50-Mc. DX season was well below par, but all hands are hoping at this writing that this is only a matter of delayed action. There is difference of opinion as to the relation, if any, between the sunspot cycle and index of sporadic-E conditions for 6-meter work. Some feel an inverse correlation, while others feel that $5$ is more prevalent in years of high sunspot number. We are passing through

July 1952
2-Meter Standings

<table>
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<tr>
<th>Call</th>
<th>States</th>
<th>Areas</th>
<th>Miles</th>
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<tr>
<td>W5ABN</td>
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</table>

Degree East to 170 West, or 75 degrees longitude, and extended over 38 degrees latitude, from 5 to 45 south. (U.S. Canadian activity covers 58 degrees longitude and 24 latitude) From VK6 to ZL1 and 2 to 2500 miles, yet the VKOs were in solid for hours. If June 30th is as good here, most of the VKs and VE's will be well satisfied.

Ever notice how few fellows you hear making use of the opportunities for v.h.f. DX that a good aurora opening affords? W2ORI. Lockport, N. Y., says that the 2-meter aurora gang would make a good club - you hear the same calls time after time, often identified as "AAA" but there aren't enough members, particularly in certain states, like Maine, New Hampshire, Vermont, Rhode Island, and Delaware, for instance. There is at least some 2-meter activity in the Aurora stations, doesn't anyone there have a horizontal array, or know the code?

In watching for aurora members of the "club" overlook few bets. They watch their TV screens, or have their friends and enemies do so and let them know when those streaks appear. (This one is particularly good if you have to aim north or south for your TV reception, and are at least 35 or 40 miles from a low-band station.) They monitor WWV for the propagation warnings at 1945 and 44:45 hours past the hour. They get the advance news from W1AW regularly. They watch for vaday signals on 75, or the shortwave broadcast bands. They know that better than average signals on 10, with the band staying open for DX later than usual in the evening. Anyhow, they have their ideas. And we don't just aim north in looking for aurora signals. Some openings, including the widespread one of May 26th, brought in signs best with beams here in the East almost west, while W4EMN, Adams, Iowa, says that his reception is usually best at about NNE.

The boys who work the aurora for all it's worth think it one of the most intriging angles in the whole v.h.f. game. We feel that the fellows who don't go in for it are missing something. What's more, they are passing up a chance to help in a scientific study. Are you contributing reports for the Cornell University Aurora Project? If not, we invite you to send for reporting forms now, and join in the fun. A card to the writers will start things on the move.

W2NLH, Oak Tree, N. J., reports aurora DX on 144 Mc, five nights in a row, beginning with April 29th. The May 3rd session was the best, with W4UXC, Pt. Wayne, Ind., reaching SS on peaks, and W2EHX, McLean, Ill., working, extended Jim's best 2-meter DX to 795 miles.

Nowhere is "what's going on" at the local level better reported than in the hundreds of radio club papers. You find them everywhere, and they run all the way from single-page mimeos to beautifully-printed jobs gotten out by some of the larger radio-club councils. Most of the outfits producing them are ARRL-affiliated clubs, so many of them pass across our decks here at RT周年. The formula is that the writer is that, in the last few months, almost every club bulletin we've seen has at least some v.h.f. news, and not a few of them devote a good portion of their space to it.

In QRM (Puget Sound Council of Amateur Radio Clubs) we find a list of 45 2-meter stations active in Longview and Portland, Oregon, and Seattle and Tacoma, Wash., contributed by WTXPR. He reports that the V76 activity is now all horizontal, and there are stations on every night looking for more business. Activity gets underway as early as 6 p.m. Olympia, Wash., got its first shot of 420-Mc. interest recently as the result of operation on that band by W7's KNV, HHP, and CMX.

Working on 2 around Philadelphia must be unhealthy these days. Now we understand, from W2QED, that W2PAU is having a session in the hospital. Don't be long, Brownie, this is the wrong time of year for good v.h.f. men to be out of circulation.

One of the elaborate o.d. communications set-ups for 2-meter work we've heard of is the Orange County station of the Zone 3 New York State Civil Defense System, described by W2FCQ. Located 1350 feet above sea level about 10 miles from Middletown, N. Y., his coverage covers the seven counties of Zone 3, and other points in Eastern New York, New England, Northern New Jersey, and Eastern Pennsylvania with ease. There is emergency power for operating two 2-meter transmitters, with a choice of high-gain or coaxial antennas. Operation is on 145.6 and 144.6 Mc.

Doings on 220 and 420

Until recently, the 220-Mc. band has been something of an orphan, with most of the experimenters skipping over it.

62
from 144 to 420 Mc. The Technician Class license is resulting in some signs of life on 229, however. It is somewhat easier to get equipment working efficiently on the lower frequency, and the band is working out nicely for local ragchewing. According to W2IQR, each Sunday morning at 11 finds around a dozen stations on 220 in the New York area. These include W2ZDA, 1SO, M8X, BQQ, EQ, J8S, BO, 6RN, Q0QX, K0N, LWN, BZZ, H1W, J8Q, and WGG. W2IQR also operates from a summer location on the North Shore of Long Island, near Huntington, from which point he has worked as far as High Point, N. J., some 90 miles distant. He would like to be arranged with several stations with W8s, particularly the group known to be working on 220 in the Boston area. He has a crystal-controlled rig with an 829B final on 220.5 Mc. A 12-element vertical array is used.

On 240-120 MHz prospects are bright for the hot summer season yet. Not only are many more stations ready to go, but the quality of much of the equipment is vastly improved over that used in former years, particularly in the receiver department. Here are some of the better set-ups: W1C1US, Waltham, Mass., 9NOS triple-amplifier on 432.38 Mc.; 24-element horizontal array, crystal-mixer converter with BRSO; W1HDF, Elmswood, Conn., 9003 triple-amplifier on 430.1 Mc., 16-element horizontal array, crystal-controlled converter (described in June QST); W1HDO, Castor, Conn., 9003 triple-amplifier on 432.6 Mc., 21-element horizontal array, crystal-controlled converter. W1BDD, Monroe, Conn., low-power crystal control on 435.4 Mc., 16-element horizontal, or vertical, or crystal-mixer converter. W2EHL, Collingswood, N. J., an 8000 tripler, 40-element array, AFS-13 converter ahead of 2-meter receiver. W2QSD, Seaforth, N. J., 9003 tripler-amplifier, 433.5 Mc., 32-element horizontal array; 84-J r.f. converter into 2-meter receiver. W3R7KQ, Wilmington, Del., 9003 tripler-amplifier, W3B8V, Salisbury, Md., same. W5KFM, Baltimore, Md., 9003 tripler on 433.5 Mc., 16-element horizontal with screen rectifier, converted taxi receiver with 64-J r.f. amplifier; W22HH, Zeeland, and W9MBJ, Coletta, Ill., 9003 triplers, 430.6 and 434 Mc., both with crystal-controlled converters and 16-element horizontal arrays. There is considerable 430-Mc. activity around Toronto and Hamilton, Ontario, according to VESEAB, writing in the Markham Journal. He says that the local (Hamilton) record is held by VE2AQQ, the first to work W2ORI, Luckport, N. Y., VEUSAL is the first Hamilton station to use crystal control on 420. Other VE8s now on 420 include A19, AOX, D1N, and BNQ. W2FSF, Lewiston, N. Y., is also on and working across the lake.

W4THK, Colliver, Tenn., has a 9003 tripler, and indoor 16-element array, and a crystal-mixer converter ahead of his HFS-183 line-up. He is working cardhod with W4BYN in Memphis, who replies on 144 Mc. Paul had a memorable call with his first 9003 that might well serve as a warning to other users of this tube. The 9005 is built with only the glass seals at the top of the envelope supporting the plate. This design results in low output capacitance, making the tube real outstanding for operation on 420 Mc., but it also makes it break very easily. The tube will stand normal usage OK, but don't put any strain on these plate pins. Use very flexible ribbon for plate leads, and be careful not to hit the pins in handling.

OES Notes

W3NNY, Colwyn, Pa., would like to know of someone nearby who could help him in getting set up for on-cost operation on 144 Mc.

A request in this space for skeds on 6 by W4FLW, Dresden, Tenn., has brought replies. He is now checking regularly with W4JAG, Princeton, Ky., 75 miles to the northeast.

Phasing the "Twin-Five"—Correction

An error was made in the drawing of the 5-over-5 array on page 56 of the June issue. As shown, the two sections of the array are out of phase. Where the off-center matching is used, the phasing must be transposed. Additional work is being done on this design, and details will be given in a later issue.

and W4JT, Rome, Ga., a 265-mile hop to the southeast. During the summer Harry monitors the 50-Mc. band and makes calls on 7 7:30 A.M., 11 A.M. to 1 P.M., 5 to 5:30 P.M., and 9:30 to 10 P.M., regularly.

W6CFL, Los Angeles, wonders why is that superregens for 420 Mc. and up exhibit such variable performance. He has one for 420 that works perfectly, while another that appears to be a duplicate seems to be almost useless. When you get the answer to that one, Tuck, let us know. We've wondered the same thing since our first experience back on 3 in the early 30's.

W8RKC, Hudson, Ohio, reports that activity on 2 in the Akron area is increasing steadily, with at least 6 Novice calls heard regularly. Around Cleveland there is interest in 220, with W3NYI, North Olmstead, on 220.7 Mc. and W3WJG, Cleveland, on 222.3. Ralph suggests a buzzer with a quartz-wave antenna as a noise source for receiver adjustments. He has been able to hear the buzzer on a superregenerative receiver for 420 Mc. He and others in the area would like to acquire some B59 AR 9G plug-in receivers; condition not important, so long as the coaxial tube elements are in usable condition.

W8GSY, Selma, Ind., reports considerable increase in number of 2-meter stations. A net operates on 146.85 Mc. each Monday at 6 P.M.

A trouble frequently encountered with crystal-controlled converters is the leaking through of signals on the intermedium frequency. W9KQA, Springfield, Ill., solved this

(Continued on page 110)
Tennessee Tornado

A tornado struck Henderson, Tennessee, on the night of March 21-22, 1952. At the request of the ARRL Emergency Coordinator, W4GEE, the Naval Reserve Training Center at Jackson, Tennessee, furnished TCS radio equipment and a gas-driven generator for a radio station at the Henderson County High School. This station served the Red Cross headquarters and the Red Cross emergency hospital which had been established in the high school. A circuit was set up between the high school and the city's central emergency radio station. Operators from the Naval Reserve Training Center and from Naval Reserve Organized Surface Division 6-78 were assisted by W4STB.

Iowa Flood

During the recent flood in the Des Moines and Council Bluffs, Iowa, area, G. F. Binnell, RMNC, USNR, W3RHR/5, traveled approximately 500 miles from Eureka Springs, Arkansas, to assist in the flood emergency. Binnell arrived at the emergency control center at Council Bluffs, Iowa, on Tuesday, April 16, 1952, and brought with him Navy TCS equipment from Naval Reserve Organized Electronics Company 8-4 of Eureka Springs. A former resident of Iowa, W3RHR/5 was welcomed with outstretched arms.

Code Practice

The Naval Reserve master control station at Seattle, Washington, NFD, transmits on the following training schedule, Monday through Thursday of each week:

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<thead>
<tr>
<th>Pacific Standard Time</th>
<th>Speed</th>
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<tbody>
<tr>
<td>1900-2000</td>
<td>10 w.p.m.</td>
</tr>
<tr>
<td>2000-2100</td>
<td>14 w.p.m.</td>
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<tr>
<td>2100-2200</td>
<td>18 w.p.m.</td>
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</tbody>
</table>

All transmissions are made on 5395 kc. and 434 kc., keyed simultaneously.

Here and There

Chief Radioman George A. Lewis, W5LNV, USNR, of the 5th Naval District Headquarters radio station NDF, has passed the examination for amateur Extra Class license.

Doris L. Nash, RMSN, USNR(W), a member of Organized Surface Division 8-88, Naval Reserve Training Center, Galveston, Texas, recently passed the FCC examination for an amateur license.

A. P. Partridge, W1BWR; Frederick Best, W1BIO; and Zina Corliss, W1RJD, are taking an active part in amateur and reserve activities at the Naval Reserve Training Center, Augusta, Maine.

Philip Roy Kennedy, W9AKF, and Richard M. Mays, W9AJY, are reservists located in the Indianapolis, Indiana, area.

J. R. Yost, W4DNE, is a member of the Charleston Naval Shipyard Radio Club, Charleston, S. C.

Charles P. Robart, jr., W3Z3EY, of Pleasantville, N. J., is now in active service in the Navy.

Lt. Comdr. E. W. Zimmerman, USNR (W4DMP), is now assigned to duty with the Electronics Division of the Bureau of Ships, Washington, D. C.

Richard R. Kerns, E1T3, USNR (W5OUR), is now on active duty.

T. M. McGauley, PHG2, USNR, of the Naval Receiving Station, Washington, D. C., recently passed the FCC examination for a Novice Class amateur license. McGauley is an active member of the Hobby Shop Amateur Radio Club (W3SWN).

Recap — DX Contest High Claimed C.W. Scores

Last month’s c.w. scores Preview for the 18th ARRL International DX Competition was incomplete through inadvertent omission of some of the high claimed tallies. We present below a more inclusive tabulation which will convey a clearer picture of claimed results. Apparently conditions weren’t quite so bad as they were painted! Following are top W/VE totals (station, score, multipliers and contacts):

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<th>Station</th>
<th>Score</th>
<th>Multipliers</th>
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<td>134,505</td>
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<td>W6E3G</td>
<td>124,505</td>
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<tr>
<td>W2C7D</td>
<td>137,485</td>
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<tr>
<td>W5LCP</td>
<td>136,385</td>
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<tr>
<td>W3B3H</td>
<td>120,585</td>
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<tr>
<td>W6L1D</td>
<td>119,323</td>
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<tr>
<td>W6E5Y</td>
<td>118,954</td>
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<tr>
<td>W1NLF</td>
<td>114,840</td>
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<tr>
<td>W6DAB</td>
<td>109,970</td>
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High claimed scores outside W/VE:

<table>
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<tr>
<th>Station</th>
<th>Score</th>
<th>Multipliers</th>
<th>Contacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>K4A4A</td>
<td>541,820</td>
<td>205</td>
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</tr>
<tr>
<td>K4GAF</td>
<td>518,833</td>
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<tr>
<td>K2U8J</td>
<td>331,918</td>
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<td>K3L6X</td>
<td>275,724</td>
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<td>VP5NM</td>
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<td>C0LBC</td>
<td>177,054</td>
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<td>K5L4K</td>
<td>169,443</td>
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<td>K3L6G</td>
<td>151,732</td>
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<td>K6LPM</td>
<td>129,831</td>
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<tr>
<td>C0B5X</td>
<td>100,732</td>
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<tr>
<td>C0L5X</td>
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<tr>
<td>K4L6J</td>
<td>70,632</td>
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</tbody>
</table>

Other non-W/VE scores over 15,000: K7WC 33,300, FA9Z 32,100, GA1L 31,724, V2CGG 30,102, PA1RX 29,186, DL2DX 25,179, GC4AD 25,117, FFBAG 25,340, OZ4KX 24,544, K7NNX 23,000, K7AJH/K9L 22,903, DL2RO 22,794, HCOS 20,651, GGGN 18,202, PA9K 16,874, CT1AL 16,692, OH9N 16,200, PA6VB 15,500, VK3AH 15,902, OZ7BG 15,387.

All claimed scores will be subject to checking prior to the announcement of final results.

SWITCH TO SAFETY!
CONDUCTED BY ROD NEWKIRK, * WIVMW (EX-W9BRD)

How:

Last month we sorta waxed neuralgic and sedimental about DX doings of yore and present. Jeves thought proper this month to wrap on his turban, haul out his xtal ball and give us a peep at a page of “How’s DX?” circa 1975. We don’t know who’s conducting it, but a few paragraphs look interesting. Let’s peek over our Swami’s shoulder . . .

... WS6AI, HB9AW and ON4QF are off to Neptune with radio gear . . . QSLs are rumored coming through from FA8IH and FM5AD . . . W9FLQ has nuked up double-T/DXCC. WIVMW has almost licked his TVI . . . X1PA and K4VAA converted their W/VE QSL files to microfilm after their shock floors buckled . . . WIDX needs Jupiter for e.g. WAP . . . 453 is the new freq for Archaeus . . .

Then the darned thing QSB. Jeves wiggled the knobs frantically and DX column paragraphs for a 1902 QST momentarily came into view:

... WS6AI and HB9AW sent ON4QF back for another 807 . . . QSLs are rumored coming through from FA8IH and FM5AD . . . W9FY has nuked up double-T/DXCC. WIVMW has almost licked his TVI . . . X1PA and K4VAA bought more land for their QSL files . . . WIDX’s Jupiter QSL was bounced by W1RWS; Jupiterian irk disappears in our atmosphere . . . 453/YV is now y5G0 YU . . .

PING-G-GI Excessive crystal current fractured the quartz sphere. Too bad — there was an interesting article in that issue by W1TS on spacecraft mobile rigs and another on synthesized isonospheres by Larson E. Rapp, jr., W1NIOU.

What:

Short skip makes twenty sound a little more lively those warm days and the night shift is once again getting in some DX lead. It is EA9DC, for instance, doing business with W7VFA almost around the clock, ‘phone and c.w., dishing out firstSalt QSOs to a multitude . . . Another lulu with quite an entourage, ZC2MAC put Cocos Islands QSOs within reach of many while working mainly the low end of 20, c.w. — ZS6D (14,020). It’s a new 75-watt on the air and tells WTPVZ he looks for Ws in the African mornings and evenings . . . Continuing on the c.w. subject, W1QTV became W1QVQ and lost no time in hitting 20; OE13RN, PY3GQ and some Europeans worked first day . . . VE3BXY made away with OK34 BI (020), UD (160), VP5 6CDI (050), 9HH (050) and C246Z (020) . . . Another ex-WN, W21NE knocked off some fast countries on 14, including O613IP and KT1OC . . . W9NN made the grade for WACUE and added M1US, V8SRE, ES1A and ZE4JT to boot . . . ZB2I (057) answered Chas at W1AW and W2EEY ran into K4BA (090) . . . W9E2EY reports QSLs already have hand from VP1A4, YS1FM, VP7NN, YMN4CB, F0SAC, 9SAAX (010) and KW6AR . . . K2SWZ raised ZC2MAC (020) who said he’d be in those islands for some three months. This juicy one runs 85 watts to a long-wire radiator. Wally adds K6C6X on Truk (050), 129 wands and a long wire . . . School work has been hampering W6A1H’s . . .

* DX Editor, QST.
W4GXB has registered W4SVG/FK, raising hares for a week or so. The DX Bulletin and the W5EUC/UCQ account for the A3 activities of C8SA6, D5U (310), D5U 134 (201), 12x (147), W2F (280), JVF (163), EAS 88C (120), 9AR (205), 8A1F (100), G6s GGU (318), KU2C (220), BCSMM (120-309), H8GTC (290), H8S (140), E81MY (155), W8EYG/7K6 (272), W6E2R/7K6E (220), W4X8A (220), 762E9D/26 (120), KGW6 BD (290), B32G (260), M13D (224), MP5AK (120), ODS45 (300), SP9KA (110), ST2GL (250), T3A 2EFA (170), 3AA (315), VKO2B (150), VR2CG (132), VR1A (109), B12 (120), V8S 1AJ (257), 1DS (128), 1ES (304), IAX (357), B12 (120), ZCY (250), 28A (145), 7PG (147), YU2s ARCI (150), ET (324), ZZs 2N (307), SS (270), ST (302), YU3AC (100), ZK1BC (203), ZE8JY (275), ZS2MI (137), Z6BB (318) in the A.M.; C8S AD (337), E12 (304), SFF (327), 8G3 (320), CES 1AC (175), 9AIH, CIPLAI (120), DU0F (152), E4A 8AP (152), 3A4Z (178), 6763 (306), E69A (345), F8SBE (100), F8SCN (350), F8QAI (155), H9S6F (200), H9IDZ (310), IT1H BNB (203), E2X (187), KV4BB (295), M7SAS (300), M8B (210), N2S (182), RS (202), ODSAC (320), OE1S SC (285), USA (313), QSOS (295), PE (1945), VP (215), WW (145), TPS5G (150), VE0VT (300), V9s 2G (150), ZLE 336, 4LP (170), V9s 2D (145), 3CH (335), 3GP (135), 4AA (180), 4AC (100), 4AQ (180), 4BU (167), 4CO (180), SAU (165), SBV (190), SD0 (120), SCB (319), VR2AP (170), Y3BXL (330), YU3AC (190), ZB1GKU (177), ZS2JRN (205), ZF2A (125), D2D (105), 4AK (125), ZATD (923) in the evenings. Note how the VODEs have slipped out of the picture this month.

We find that Uruguay's amateurs have had fifteen available since 1949. Uruguay can now use the band and everyone's U.S. military personnel may be in positions to add more countries to 21-0. After all, the 5Cs and 5As are among this group and are especially on the lookout for W3s. K35S4W says W6AM is the loudest 15-meter signal down his way. Wally has been looking stuff like KC6GQ, CESAX, YQ6CDI, CM9AA, VP4AA, HP1AW, VK4s HR, SN, ZB, PY's 1ADA, 2HT and K8Y6L. Europeans were active but their chief path was to South America.

The only worth a try, OY2Z (7005) told W5RFA theirs was the first W-OY 7-M contact. OY2Z uses 30 watts, a dipole and a 4-tube superhet. Chase of W1A1W hopped on VP9AJ (011) and W2EEY raised KG9FPA (023) who is plenty fast with a fast radio. C81AD and PAB5C were W2LBJs first DX QSOs. W2NTY collected HŽ2MY (025) and heard ODSAB (025) who is ex-ARSB. YU1s IAND, ICX, HKS 1G1E, 4DP, 5CR, KG4AO, CT3AB, YS10, Z39P and sundry PYs were gathered with W0ESQ. Lou had to work nine HHs on 40 before one (1823CL) came through with a QSL. W8YGR has no better luck with HH cards although EI8s 2R and 7A came through promptly. Jack garnered VP2SC (290) in the Windwards, VP3BH (001) in the Cayman, YV6AO (727) who likes WA0, VP0FM (001) and TQ1PZ were buttonholed by W4REZ.

Alaskan Novice W7AOC's 70-watt raised ZL1ADU (3710) for some unusual work on 80. WNA4USQ worked VP1MT (3750) o.w.-to-phone and states that the DX bug really has him cornered. Six W5s have worked at W7AOC. These Novices are really beginning to get around on 80. W4RZ found 'phones HR1BO (3792) and VP3BP available on 80 and v. P72E at 28 watts does well for WP2XZ, who is on 75 and phone. Bob mailed KK6AO, KJ6AR, HP1IO, HC1KV, ZL2CC, PJ35O, CXT7BA, ZSs IJZ, 6DW, WP6CJ and YK4HD. A 3-element close-spaced beam was probably responsible. K35WZ scared up VP9X (ex-VP2XZ) on voice while a c.w. QSO surprised W4REZ by raising PJ5NH.

Nothing much cooking on one-sixty this year of time but the dust is still settling after last season's efforts. W1BR reports that WILY has received SWL cards from Czecho-slovakia and Russia. The OK listener's report concerned '52 activity while the U.S.R.S. card pertained to January, 1951, operation.

Where:

W6XO does it emphasized that he does not handle QSOs, matters for ZE2A4W, who prefers to be on the contrary over a year ago and Ken still gets requests for QSP. So far as we know, the Call Book address for ZK2AA is perfectly okay. Bear in mind the 4X4 QSL bureau has instructions that all 20Q operation is illegal and therefore will not handle cards for stations bearing that prefix.

C8NSFF
Sgt. L. W. Gielder, Hq. 5th Air Div., Box J, APO 118, % Postmaster, New York, N. Y.

D1AZ

E2ADDC
(QSL to E2ASW)

EL2A
Ed Yarborough, Firestone Plantations Co., Harbel, Liberia

FB8BE
Box 89, Tamatave, Madagascar

FB8ZU
(QSL via FB8HS or F9LQ)

F8SAJ
Yves Biaujiat, Box 330, Bambako, F. W. A.

ex-KZ5GT

KS6AA
Art R. Filsheen, Pago Pago, American Samoa

ex-KZ5GT
Gordon T. Henderson, K7LAOS, Shuyak Island, % OA, Kodiak, Alaska

M3R8R
R. Redfeld, Field Stn. 8900-14J, APO 843, % Postmaster, New York, N. Y.

In the patio adjacent to PY2CK's shack are Mrs. W1ZD; John M. Wells, W1ZD; Capt. Fowler, a companion; PY2CK; and Mrs. PY2CK. The W1ZDs were visiting in Brazil and decided to pay a visit to one of the world's ace 'phone DXers.
Inter-American Geodetic Survey, % U. S. Embassy, Lima, Peru
Elias M. Raffoul, P. O. Box 352, Tripoli, Lebanon
Johan Ziska, Box 71, Toshava, Faaroe Islands
Skip Gross, USASC, APO 206, Post
master, New York, N. Y.
John W. Smith, V8BDQ, Box 536, Wingham, Ontario, Canada
Cyril Voleney, Monserrat, Leeward Islands, B.W.I.
Ras Society of Ceylon, Box 907, Colombo, Ceylon
W8OS/KG6 ex-W3ENE (QSL via W3KT)
Y3A7U (QSL via RSGB)
ZC9MAC (QSL via RSGB)
ZC6TNJ, A.A. (QSL via RSGB)
J. R. S. Innes, Box 7, Takoradi, Gold Coast
C. Jordan, P. O. Box 17, Bindura, Southern Rhodesia
W. V. Heluken, P. O. Box 49, Gobabis, South West Africa
Marcel Ardisson, 38 rue Grimaldi, Principale de Monaco
UN Radio, Jamnu, Kashmir, India
UN Radio, Box 66, Tripoli, Tripolitania, Libya
W1S/STX IIE ODM RWS, W2s TXB ZQW, W3RFA, W9s EGG RUI, W9s Y5C, W9s CIY, W9s OAQ and USKAs Old Man credit for their reports on this issue.

Tidbits:
- ZC6UNJ is located in a "No Man's Land" between Israeli and Jordanese outposts. Operator W5LLQ has at his disposal a Tenoco-600 rig running 150 watts, an NC-240D receiver and folded dipoles. He reports regular reception of U.S. networks on 20 phone
- VE3CI, taking another crack at an ARRL DX Test as VE5BP in the Caymans, was assisted ably by VE3HC. A 1-kw generator powered a 32Y-75A combination which managed a total of 924 contacts with 775 stations; 721 QSOs were on 20 meters, 116 on 10 and 77 on 20 — all QSOs phone. VE3DZU was the only station worked on all three bands. V9s OAQ and F8L provided the Ontario boys unlimited hospitality in traditional hain fashion.
- Notes from Lebanon, courtesy W1KE: Their government has informed ITU that amateur operation is now recognized as legal; however, proper notification must go through appropriate channels before we are permitted to resume communication with Lebanese stations. By the way, amateurs in Lebanon now use the QDS label in lieu of ARS. Exams have been held weekly and license fees are approximately thirteen bucks. Operation on 14, 21, 28, 144 and 420 Mc. is permitted. Setting up of a QSL desk in Lebanon upon the formation of a typical national radio society.
- W3PYH and KV4BB are separately contemplating possible rare-DX operating excursions. Some of the DL gang, nationals and DXers alike, have formed an amateur radio club which looks forward to close cooperation with IARU, ARRL and DARC. DL4GJ was elected president, DL3DC vice-president and DL4EA secretary. An excellent spirit of cooperation between Americans and Germans is evident. W3ENE closed down his station at Silver Spring, Md., on January 31st and since April 9th has been active as W3ENK/KG6 with 75 watts on 14 and 7 Mc., c.w. He intends to add 10- and 20-meter 'phone to his repertoire and assure 100-percent QSL. Charles has also held the calls W2AOS and K25CB. "Haven't missed [sending] a QSL in 32 years!"
- W4BBR offered to hire Jeesel if, in addition to his regular duties, he'd keep an eye on W2QEI and fill in at center field on Gino's ball team. (How about my playing fourth base, Boss? I'm always catching it, anyway.
- Jeesel: QSLs for U84AX mailed to W1NWQ

The entire ham population of the Caymans is gathered here. From the left: D. Tylbitts, V5PSB, H. M. Coe, V5PBE; Noel B. Eaton, V5P5B (VE3CI); and A. H. Hilmar, V5P5B. This Cayman quartet assembled during VE3CI's operational excursion to the islands for the '52 ARRL DX Test.

will be acknowledged but the QSL does not verify QSOs unless and until cards are received. USLAX finds this policy expedient in view of the fact that his W QSOs now number into the thousands. .......ON4NC, who still needs Nevada for WAS, would like to know of a way to procure ET3AF, VO2O, VO4L, EQ1RX, EQ2L, VQ5WU and W4F5V/KX6Q QSLs, these stations worked in the period '46 through '49. From K8WNNW we hear that KG6QY (ex-KI6QY and KI6QY/KC6) is putting together a 1000-watt for operation on 40, 20 and 10 meters. On 40 he uses a ground-plane skyhook built around a big bamboo pole. ....... KI6GAFS amazes locals with a QRP pipeline into Europe on 7 Mc. Invisible rob Hobo? ....... Ex-W2MPV is now K2CW, a fact we couldn't seem to get straight in a recent column. ....... Three guys currently on Macquarie Island are VK1RG (VK5RG), VK1EM and VK1RR. Ex-VK1BS is now VE2EZG and says he has received but 128 QSLs from over 400 Ws worked at VK1BS. Bill worked 40 United States and 75 countries and will round out his QSLing 100 per cent. He writes further, "I would advise anyone contacting a VK1 amateur to send the card to the bureau or to a QTH given by the station. Do not send them to the island if ... not sure as to the mail facilities or mail closing dates. ....... Reception is very poor on both islands owing to the high absorption down there." ....... W6NMC is to journey around the world on a freighter and will take along a rig and receiver for possible work on all bands 80 through 10 meters. W6AMS says he may get a shot at CR5, F8S and FL8 operation. ....... Along with a big batch of eagerly waited QSLs, ZM6AE sends word that he's about to fire up his power rig at ZL1FT. ....... Don't think there will be much, if any, ZM6 activity now as ZM6AAC and I were the only ones who took QSL seriously. ....... HEDRDX, DX editor of USKAs Old Man, writes that all cards received for 5AD operation have now been answered. His records indicate that over 40 stations worked did not bother to QSL — the demand for 5AD must be in good part satisfied! Etienne would like to take a spin at 14Mc work but the possibility at present seems remote. ....... ON4QFQ told me all about his [new] projected expedition, but I swore not to tell." said Bob Schoening. A plague on all Ws ending

(Continued on page 188)

It looks as though a big wave could sweep KW6AR's shack right off Wake Island into the Pacific. Ivan has one of the biggest signals to come out of this part of Oceania.

July 1952
SIMPLE CODE-PRACTICE AID

The gadget shown in Fig. 1 is a simple means for using any receiver equipped with a b.f.o. as a code-practice "oscillator." Simply plug $P_1$ into the 'phone jack on the receiver, a key into $J_2$, and the 'phones into $J_1$. Close the key and tune in a steady signal, such as WWV or the carrier of a broadcast station. Open the key and the 'phones go dead, close it and the signal comes through again. From here on, use the unit as you would any oscillator.

![Diagram of code-practice aid](image)

**Fig. 1** — Here's the way one Novice solved the problem of obtaining a code-practice oscillator. $J_1$ and $J_2$ are open-circuit 'phone jacks, and $P_1$ and $P_2$ are ordinary 'phone plugs.

The two jacks and the plug are mounted on a small bracket made of sheet aluminum. The two jacks must be insulated from the bracket. The entire gadget cost me only 95 cents, and was well worth the time it takes to build. — George B. Jeffrey, W9NOXH

CONVENIENT ENTRY "BUSHING" FOR TWIN-LEAD

A one-inch diameter cork can be used to make a weather-tight bushing for the hole through which Twin-Lead enters the shack. Cut a slot deep enough to permit the Twin-Lead to be sandwiched in the cork. Then drill a hole a little smaller than the diameter of the cork. Push the cork in the hole, and it will squeeze the Twin-Lead tightly, holding it securely in place. At the same time the cork successfully plugs the "leak" in your window or wall to keep out the weather.

— K. F. Triggs

ANOTHER CRYSTAL-GRINDING HINT

Previous attempts to change the frequency of a crystal frequently resulted in diminished activity or complete failure to oscillate. The probable cause was that the grinding surface was not perfectly flat. Much of the so-called plate glass does not have a truly flat surface. As an excellent substitute the good old-fashioned razor hone was pressed into service, and since then results have been far better.

When rapid cutting is desired, grinding compound may be used with water in the usual manner. Putting the grinding compound in an old salt shaker and using a medicine dropper to add water when needed eases down the messiness of the operation. For finishing, the hone is used alone with plain water for slower cutting.

The hone used here is of the hard-surfaced type, and measures 3 by 5 1/2 inches. Figure eight strokes utilizing as much of the surface as possible were used. Approximately 500 such strokes moved an 80-meter crystal about 125 kc, depending on the pressure exerted. It is wise, of course, to check results frequently so that you don't overshoot your goal. — Harry H. Henrich, W0XPG

SAFETY INTERLOCK FOR CABINET RACKS

The sketch shown in Fig. 2 is a simple, inexpensive method of making it impossible (or at least difficult) to open a cabinet rack without killing the power first. Terminate all transmitter a.c. supply leads at a male chassis connector in the side of the rack near the back, as shown.

![Diagram of safety interlock](image)

**Fig. 2** — Here's an inexpensive interlock system devised by W2PFJ.

Feed this connector with a convenient length of heavy rubber-covered cord clamped across the door, with a female connector on the end of the cord. Leave only enough excess cord here to make the connection when the door is closed. The rest of the cord should be clamped down the hinged corner of the cabinet, leaving a small loop at the turn so that the door can be operated without undue flexing of the cable. It will then be impossible to open the door without first unplugging the power cord. — R. M. Girdler, W2PFJ
MOBILE

Editor, QST:

Mobile operation is increasing by leaps and bounds, pending specific legislation, why don't all of us become "mobile helpers" by not ruthlessly invading, with our fixed stations of much higher power, those frequencies near the band edges of our phone bands. If we allowed 10 kc. for mobiles at each end of the 75- and 20-meter bands it would serve two purposes. First, hundreds of mobile operators would be perfectly happy. Second, FCC notices for out-of-band operation by fixed stations would be a rarity.

— Glen H. Byars, W0BNF

TVI AND PUBLIC RELATIONS

241-02 86th Road
Bellrose 6, N. Y.

Editor, QST:

... Your timing in contacting the various manufacturers while the TVI groups all over the country were working on the problem was perfect.

What greater reward can the amateur who is making an honest effort to get protection receive than to hear his neighbor say "Well done." And when it comes from one who may have been a little reluctant at first to accept your explanation, it is music to the heart; it makes all the disappointing cases seem worth while.

There are other rewards to be gained in this effort to bring about friendlier relations between the amateur and his neighbor. By getting together and discussing the problem in a sensible manner, we find that they are real people after all — interested in their home, their family and much the same things that we too are interested in. We may never have met them even though they were just around the corner if it were not for TVI. Had we elected to brush him off with some curt technical explanation he would still be our neighbor, but no longer a friendly one. Ours would have been the loss.

In working with the manufacturer, the amateur has much to learn also. We have found them to be most cooperative when approached with a sound business proposition that concerns the future growth of their organization as well as good public relations. Many pleasant associations have been made and a wealth of knowledge gained by cultivating the friendship of the field force sent out to investigate reported cases.

I would like to recommend to all amateurs that they adopt the FCC plan for elimination of TVI and that they first analyze the problem from the TV operator's point of view and then go to work keeping that view ever before them.

— Russell S. Miller, WBDIC

Sec'y, TVI Organization of New York

RAPPORT

42 Parkwood Dr.
E. Syracuse, N. Y.

Editor, QST:

In reference to Larson E. Rapp's perceptive article in April QST, I would like to offer several suggestions toward improvement of the over-all system. In my experience I made numerous changes in the transmitter design but any improvement over the original was not to avail. Mr. Rapp, bless his soul, has touched greatness. I seriously doubt if anyone will overshadow his basic circuits.

As to the suggestions: The receiver adapter circuit is of sound design but I did make minor changes in components. It is not necessary to use a linear taper control for Rs — much better performance will be obtained if a fixed grafter is installed here. The center smok should be grounded. As for the roam, let it float! Much greater sensitivity and improved limiting action can be obtained by using the new improved 1Z22 in place of the present used 1N22. There is a 1C20 on the market at a higher price but the difference in performance does not merit the added cost. If it's a choice between the 1Z22 and the 1C20 I would pick the 1Z22 every time over the 1C20. Why? Gentlemen, it's easier to pronounce!

— John P. Cleary, W6VSP

HOW TO BECOME . . .

226 Clifton Avenue
Staten Island 5, N. Y.

Editor, QST:

Every now and then you'll read an advertisement in QST of a fellow requesting aid from experienced amateurs to help him with theory and the code. Also, during the past six months since I became a ham operator, I have met several persons who desired to be amateurs but gave up because, as they told me, they couldn't get anyone to assist them. Brother, let me tell you something; you don't need any help if you really want to join this great hobby.

I am a middle-aged man with a family and, until a little over a year ago, all I knew about radio was to turn on and off a broadcast receiver. To show you my ignorance of electronics, the first time I looked inside of a receiver I wondered why they used prongs on a tube instead of screwing it in place like a light bulb.

Today I hold both the Novice and Technician tickets and a first-class commercial 'phone ticket. The first day of my vacation I'll be at the FCC office to take the test for the General Class ticket. I feel confident of passing the test because more than a month ago I received my 15-w.p.m. endorsement sticker from the ARRL.

Here is how to do it. Read the Handbook over and over again until you fully understand it. Read it every chance you have, while eating your lunch and riding to work. I must have read each chapter in the Handbook at least a dozen times. The code I must admit was tough for a while. I did get some assistance there from W1AW each night at 9:30 EST but you can get that too. Copy, copy, and copy everything you hear over the air but never more than for an hour at a time. It took me six months because my skull is a little thick in places but you may do it in half the time.

No sir; you don't need help from a licensed amateur if you really wish to become a ham operator and join the greatest gang in the world. I did it and so can you. By the way, I wonder what this u.h.f. is all about.

— Frederick H. Scheufer, W6IPA

MOTORCYCLE RIGS NEEDED

811 S. Union Ave.
Los Angeles, Calif.

Editor, QST:

Civil defense seems to be a popular subject nowadays. Yet the ARRL, which should know better, seems to have neglected publicizing the most important mobile asset of civil defense units — radio-equipped motorcycles.

Motorcycles can navigate rough, rugged country terrain, can cross streams, go over barren alvars of ruined bridges, and go 70 miles on a gallon of gas. Long after autos have been arrested by bogged roads, the cycles will continue to travel, to observe and inform.

How in the world did such a valuable piece of gear get pushed into the background?

Yet, motorcycle radio has problems peculiar to itself which should be discussed in the pages of QST. Let's get hot on it!

— Lee Lamascus, W6JQP

(Continued on page 180)

July 1952

69
Loose Talk and Security. Though some contacts are crosstown, it is well to remember that signals on some frequencies go many thousands of miles when conditions are favorable. Propriety rightly keeps many of our intimate, personal, club, and argumentative matters off the air and in the club and organization meetings where they properly belong. Our amateur sense of responsibility similarly is more important than specific rules of what can and cannot be said. From the national security standpoint, whether key or mike is used, it is important that amateurs avoid discussing any matters that might provide missing information in the picture puzzle which the intelligence services of unfriendly nations are continually working over, to ascertain the state of our national morale, and the state of civilian and military defense preparedness. FCC and ARL/ place high reliance on your discretion and cooperation in such matters. Let there be no loose talk. Keeping on the subject of our own radio technique is a safe course. The following seven Operating Precautions reprinted from an earlier QST may serve as a rough guide when operating:

1) Sign each transmission with your assigned call.
2) Do not permit unlicensed operators to use equipment.
3) Contact no unlicensed stations.
4) Follow each FCC regulation with scrupulous care.
5) Do not discuss any happenings that might have military intelligence or political significance.
6) Limit on-the-air discussions to radio technique and personal matters.
7) Watch for any possible signs of radio activity that do not belong in our bands, strange or surreptitious. Report all such to the Field Engineering and Monitoring Division of the FCC without delay for any necessary study or investigation.

Note that last point especially. We must spare no efforts to keep our amateur radio clean. Perhaps you read with some pride those recent Satevepost articles covering FCC monitoring of radio as illegally employed by gambling and race-track enterprises, and where amateur know-how was the helpful key to the tip-off and successful execution of duty by FCC officers. FCC is cultivating the reputation monitoringwise of always getting its man! It has the tools to work with and law on its side. Should any amateur operator, through approach or tuning the different frequencies run across the track of bookies, gamblers or racketeers generally, and especially those subversive possibilities named in point seven, report the facts appropriately and quietly to the FBI or FCC for instructions, or investigation by them as case may seem to warrant.

On Informative CQs. W6LDJ writes to suggest more use of additional types of informative CQs. Let us record his ideas and ask all of you who feel a need in these directions to give them a try.

<table>
<thead>
<tr>
<th>CQ</th>
<th>To Indicate</th>
</tr>
</thead>
<tbody>
<tr>
<td>CQ RC</td>
<td>Station calling desires ragchew; answer only if so inclined.</td>
</tr>
<tr>
<td>CQ T</td>
<td>Station calling desires to test or experiment, does not want to ragchew. Answer only if so inclined.</td>
</tr>
<tr>
<td>CQ QHR</td>
<td>Station calling desires a series of QHR reports at various points; answer only if you don’t object to short quick signal report exchanges.</td>
</tr>
</tbody>
</table>

"The above is now sometimes accomplished in amateur 'phone work by calling 'CQ for a short check' which may indicate the need for such procedures. Example, one finishes a portable rig wants some checks on the keying or signal strength at a few points — not a long harangue about the weather, handie, etc., which a simple CQ call might bring. Nothing against ragchewing, of course, great in its place when both parties are agreeable."

A Nine-Point Self-Rating System. There’s always high interest in self-rating systems. One applicable to the division of operator activity in amateur radio will be something for you to try on at the same time we add ‘em up! This list was devised by the St. Paul Radio Club and published in its bulletin the Ground Wave to help the SPRC members, then putting the new call letter plates on their cars, to devise ready answers about the why of their license plates, against those who will allege political privilege. The Ground Wave’s suggestion is applicable to each and every amateur. This is that all amateurs run through a nine-point consideration of how we stand in justifying our amateur authorizations, at the same time we enjoy our hobby. The SPRC credits toward a possible 100%: (1) home stations in operating condition, 30%; (2) mobile operation, 20%; (3) emergency-portable equipment, 20%; 5% each for (4) amateur Radio Emergency Corps membership, (5) emergency power supplies, (6) traffic handling and nets, (7) cooperation with civil defense, (8) cooperation with Red Cross, (9) active club training program.

If one’s score is less than 70% we suggest the list be used as a start on widening amateur activities during the coming year. Amateurs with whom we have discussed the list would emphasize that it isn’t just having equipment so much that makes for communications performance, as it is the actual active participation in nets and AREC.
On Using Break-In. Break-in should be a "good operating habit." It if using 'phone we may want to call it "push to talk." Whether for 'phone or c.w. every constructor should consider building the capabilities for full break-in into his station. The traffic man is most often accustomed to using break-in as part of his standard high-grade procedure. W9LQE finds that the rug-chewer could profitably use the same technique to make more pleasant and effective QSOs possible and he writes to that effect.

The operating technique of using break-in is simple. In traffic handling, we break by sending BK, or a series of dashes or a series of dots. When the station being broken stops sending, we know he has heard us breaking, and that we can go ahead with the last word received correctly. C.w. break-in, if working properly, can be used exactly like talking on a telephone, where one person can interrupt the other at will. W9LQE suggests the operator being broken acknowledge with a "BK," pausing to receive any advice on receiving conditions or rate of speed, since adverse conditions may make new instructions to the transmitting operator, by the receiving operator, necessary.

Frequency Observance Important. In recent months reports from several ARRL Official Observers have indicated a possible ignorance or disregard for frequency band limits! The 20-meter 'phone is mentioned most often in observer reports in that connection. Confirming checks made from W1AW disclosed some W-stations with carriers 5 to 35 kc. beyond the 14.2 and 14.3-Mc. points, for example. Of course we amateurs should constantly remember that the individual reputation as well as that of the fraternity for clean operating depends on close adherence to frequency authorizations. FCC monitoring stations are on the job enforcing the rules.

Drifting v.f.o. trouble, some lack of appreciation of the problem may be mixed in with some intentional disregard for the sub-band edge. W9TKX offers some thoughts about the recent dubious frequency observance:

Violators range from fellows who zero beat everyone they call from forces of habit to hard-shelled oldtimers risking a pink ticket to get through the QRM. A W3 was heard remarking toward the end of a round-table with VEs: "Well, I had better not hold it too long, since I am outside the band here." Some 10-meter hams suddenly presented with Advanced Class licenses find the 14-Mc. band too restricted for their "loose" VFOs! Perhaps those "tolerance" questions in the Advanced examination were just figures and formulae to be memorized without conveying a meaning, or too quickly forgotten? An amateur mobile heard on 14.193 was working with a fixed amateur station on this frequency. The latter must have set his frequency without looking at either transmitter or receiver dial. A W2 was logged two days in succession just outside the high end chatting with South African stations.

Quite a few amateurs may be right on the verge of being caught up with the inevitable FCC Monitoring Noticed! With all that has appeared on the stabilization of oscillators, calibration methods, etc., reference to the Handbook and running QST file will give a wealth of information on the evaluation of drift and equipment precaution to be observed. . . .

OOS only send Co-operative Notices to invite an amateur to look into his own situation and responsibility to help him avoid FCC trouble. Such information is for investigation and evaluation, not for purposes of rightness or arguments. The dangers of indiscriminate zero beating, the values (magnitude and direction) of warm-up drift, stand-by drift and frequency changes during high and low power operation, the similar drift in receivers and standards (too few hams make these a part of their stations) should be known and considered by all. The limitations of crystals themselves depending on temperature, holder and circuit capacity and other conditions are things with which every amateur should be familiar. This is an individual responsibility between each amateur and FCC in the final analysis. A system of check-back against WWV is our final word of advice, or else lacking such provisions, we personally should not flirt with the band edges.

P.E.H.

This certificate has been awarded for the year 1952 to each of the clubs listed in the ARRL Affiliated Club Honor Roll that appeared on page 64 of June QST. Issuance was based on membership information obtained from the 1952 Annual Club Information Survey. There will be an additional QST Honor Roll published later this year to include those clubs reporting results of ARRL membership drives being conducted currently. Clubs that qualify for the second 1952 listing will also receive 100% certificates following publication of the Honor Roll.

A.R.R.L. ACTIVITIES CALENDAR

July 12th: CP Qualifying Run — W60WP
July 15th: CP Qualifying Run — W1AW
July 19th-20th: CD QSO Party (c.w.)
July 26th-27th: CD QSO Party (phone)
Aug. 3rd: CP Qualifying Run — W60WP
Aug. 15th: CP Qualifying Run — W1AW
Sept. 5th: CP Qualifying Run — W60WP
Sept. 10th: Frequency Measuring Test
Sept. 16th: CP Qualifying Run — W1AW
Sept. 20th-21st: V.H.F. Contest
Oct. 4th: CP Qualifying Run — W60WP
Oct. 11th: Simulated Emergency Test
Oct. 15th: CP Qualifying Run — W1AW
Oct. 18th: CD QSO Party (c.w.)
Oct. 25th: CD QSO Party (phone)
Nov. 9th: CP Qualifying Run — W60WP
Nov. 13th: CP Qualifying Run — W1AW
Nov. 15th-16th, 22nd-23rd: Sweepstakes Contest

July 1952 71
With the AREC

The lessons learned by amateurs participating in emergency communications are of little value to the fraternity as a whole if they are not publicized. There has never yet (and probably never will be) an emergency in which all AREC operation was so perfect that no implied vices were made concerning improvement "next time." Lessons coming out of recent emergencies will be noted in this column from time to time as a sort of "Hints and Blanks for Emergency Operation," so that progressive local AREC units will have the opportunity to learn through the experiences of others. Here are a few:

1) Operating conditions during or after an emergency are generally anything but favorable, and it is necessary to operate emergency setups with as high power as is obtainable, especially when using 'phone.

2) Noise limiters and clippers on receivers are a definite asset. In addition to the hash filters on your own emergency power source. Noise from generators being used for lighting and other non-communications purposes can be a great drawback unless your own receiving equipment makes provision for suppression of such noises.

3) A pre-prepared antenna on a suitable reel should be kept available for emergency use, since it requires time to erect, erect and load up an antenna in a disaster situation; along with your portable rig, you should have a portable antenna.

4) Our business in an emergency should be to handle the communications which agencies are serving require us to handle; nothing else. However, in exceptional cases it may be necessary for an AREC official to decide which type of message shall receive priority handling. In this connection, we have to divide message traffic into two categories, as to whether they pertain to (a) the general public welfare or (b) the welfare of an individual. Concerning the former, we have to decide which require immediate action, which have a time limit for delivery and action, and which are of a non-urgent nature. Concerning the latter, it should be obvious that outgoing messages containing assurances of safety or notification of death or injury should receive priority over incoming traffic of a "worry" or "agonized" nature. In the final analysis, each emergency has its own peculiar ramifications. We amateurs should avoid having to designate priorities on messages we are given to handle; if we cannot do so, the above may serve as a general guide.

5) Perhaps the greatest lesson learned in all emergencies is the necessity of being more prepared and official contact as a corollary to emergency planning. Most of the difficulty in setting up facilities and getting these facilities used and trusted by agencies needing them is directly traceable to lack of previous contact with or knowledge about them on the part of officials concerned. We should make sure that the things about an emergency situation that irk us communicators are not basically our own fault.

A large area of the City of Swift Current, Sask., was threatened by flood waters in April from the Swift Current Creek. Radio contact had been established between the dam at Duneauan and Swift Current by army units, but this contact was interrupted and amateurs were asked to establish a line immediately. W5EJQG was alerted at 2130 and at 2200 was told to proceed. A spare 100-watt transmitter from W5EJG, powered by a 1500-watt lighting plant, left Swift Current after midnight with W5EJGQ and was on the air in contact with base station W5EJGQ at 0250. An hourly schedule was arranged. The local Department of Transport range station arranged to monitor the emergency transmitter frequency continuously, so we did not have to keep a continuous watch. W5EJGQ was to be the alternate base station. W5EJFQ loaned his 50-watt transmitter as a standby at the dam. W5EJGQ consulted operators, W5EJGQ never missed one schedule from the time of its arrival. April 21st to 1045 April 22nd. Signals from W5EJGQ were reported from the West Coast to Winnipeg, operating on 3770 kc. Wonderful cooperation was extended by all hands in keeping our channel clear, offering equipment and personnel for our assistance, and also maintaining a watch on the frequency.

--- W5EJG, BC Swift Current, Sask.

On the morning of May 11th a tornado hit the little town of Alapaha, in southern Georgia, destroying about 75 per cent of the town. All power and communication systems were out and the water supply was cut off. WVAPF of Dublin was first to learn of the disaster and call in on the frequency of the Georgia Cracker Emergency Net (3995 kc.) to contact W4LXE, net manager. W4LXE alerted the net and set out two mobile units, W4AC and W4MCO. When the mobile units arrived they found the city without communications. City officials used the mobiles and the net to contact the Red Cross office in Atlanta, requesting a water wagon, tents, cots, blankets and food. This was delivered to the American Red Cross in Atlanta and the answer was returned to our mobile units in Alapaha advising that the equipment was on the way. Our mobile units stayed in Alapaha until the telephone circuit was completed and their services were no longer needed.

Stations participating in this emergency were: W4s ACH, B1W, FFB, IAO, IFQ, KLJ, IXX, CEO, MO1, OIL, OTD, PFS, FGE, PFT, FTM, WVAPF (at the mike) SCR, and ZD. The Red Cross Director praised the hands for the fine job they did in handling traffic for him and keeping him informed.

--- W4ZD, SCW Georgia

On November 4, 1961, Rhode Island conducted the first statewide DP test in its history. Incidents prepared beforehand were acted out with local government and volunteer agencies being used to the drill. Certain areas serving Providence were serviced by 10-meter mobile units: W1s KE2E, LZY, OXX, PTF, RAM, RVQ, SGA and SIK. W1MJ handled the control mike for the mobile networks. W1HEF also assisted. The traffic handled by these amateurs sent hundreds of firefighting trucks, ambulances and police into the fight. Numbers assigned to each car greatly speeded up the action. W1TFM was "Control." Frequent use of proper procedure within the time limits required prevented any confusion. Announcements to the effect that the messages were "simulated" were made with each message from the control station.

A 2-meter network was also in operation, embracing all the larger towns surrounding Providence and using equipment furnished by the State. W1s APO, CPV, JND, JP, LCP, and QST for

The AREC groups of the Greater Hartford (Conn.) area got together in a cooperative project to establish this Amateur Radio Civil Defense center at the Alert America exhibit held in the West Hartford Armory in early March. Contact was made with control stations in each of the towns in the 15-town mutual aid area, as well as with the many mobile units in operation in the area. A small traffic of data was also originated. Most operation was on 10-meter 'phone and 80-meter e.w.
MCB GJE PAZ and SKT participated, with BGM at the control nuke.

The 75-meter band took care of our long-haul traffic in compliance with the Ten-State Mutual Aid Plan. Although actual aid was not requested from the other states over the air, informational messages were transmitted to the two adjacent states. This network included W1Q, BBN BYV CFI JJZ JGR KMY OIL OUR PYF SBF and TFR.

W1JFF, EC of Newport and his crew did a wonderful job at working two, ten and seventy-five. The Newport and Middletown networks were credited with being the first to flash the news of a Navy jet crash into a Newport home. Aiding W1JFF were W1S MMX, FXX, W4PAE/1 and W1N TXE and TXL.

Calling apparatus from other states also participated, particularly from Fall River, Mass. In order to recall this apparatus quickly if necessary a separate network was established and coordinated by W1AJP, aided by W1DQ. W1GJW followed the sort traffic wherever they were dispatched to keep in touch with home, W1CRN/1 also aided. In calling the operation a success, the Governor of Rhode Island made special mention of communications. The whole communications undertaking was headed by W1NJR, director of radio for the State Council of Defense, and his assistants W1KKE and W1MJJ who is also Chief of Amateur Radio for CD.

--- W1MJJ, SEC R. I.

Seventeen SECs submitted reports for March activities, an increase of four over February. So the steady climb upward continues. March reports add up to representation of 3150 AREC members. New reporters for March were the N1 of S, N, S, D, W, Mass, and W2. Forty-four SEC monthly reports have been received from 21 different SECs in the first quarter of 1952. We're still not bragging, but the uptrend is most encouraging.

CODE-PREFERENCES AWARDS

Have you received an ARRL Code Proficiency Certificate yet? Twice each month special transmissions are made to enable you to qualify for the award. The next qualifying run from W1AW will be held on July 18th at 2130 EDST. Transmissions will be made simultaneously on 1557, 3553, 7120, 14,100, 28,050, 52,000 and 146,000 ke. The next qualifying run from W6WEP only will be transmitted on July 12th at 2100 EST on 3690 and 7248 ke.

Any person may apply; neither ARRL membership nor an amateur license is required. This copy of all qualifying runs to the 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. These make it possible to check your own practice, look up your own key and buzzer and attempt to send in step with W1AW.

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Date: Subject of Practice Text from May QST
July 2nd: The Truth About the Vertical Antenna, p. 11
July 8th: A 50-Mc. Transmitter-Receiver for Civil Defense Use, p. 17
July 10th: A Car-Mounted 10-Meter Beam, p. 22
July 14th: A Modified Piggy-Backer, p. 27
July 16th: The Wavelength Factor — LI, p. 32
July 22nd: Tools and Tricks, p. 36
July 25th: How To Test and Align a Linear Amplifier, p. 39
July 30th: Tuning Two Meters of the Car Receiver, p. 49
July 31st: Technical Topics, p. 52

BRIEFS

W1NYN was the first Novice to operate Maxim Memorial Station W1AW. While visiting the station he contacted W8KQW on 144 Mc. and W1O2HZC on the Novice-meter band.

"QO, QO, QO," called A/1C Dan Peters of DL4TH. He counted a good band for now and made ready to call CQ, but before he had a chance to do so, he heard a hurried knock at the door. He heard a breathing voice inquire, "Did you call the QO?" It happened that the 1807th AACs Wing's Charge of Quartermasters responded because of a case of RLK in his section, a.c.e. broadcast the same three times before. How would you log that one? — DL4TH/W1O2HZC

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DXCC NOTES

When the first UX12A calls appeared in DXCC applications, ARRL was confronted with the problem of whether to count only VPS confirmations from the Falkland Islands Dependencies or to credit cards from the LU and C67 stations operating in that area as well. Information was obtained from the sources usually approached in DXCC Countries List problems, and it was indicated that the Falkland Islands Dependencies were generally recognized as British-owned. On that basis ARRL has accepted only VPS cards from the South Shetland, South Georgia, South Sandwich, South Orkney, and Falkland Islands, and the portion of the Antarctic continent including Palmer Peninsula. Since this policy was inaugurated, so many inquiries have been received that it was decided to consult our highest authority, the United States Government, and to let our policy be guided by that of our government. We corresponded now having been completed, we have found that no claims of individual countries to the Falkland Islands Dependencies are recognized by the U. S. Government. Therefore, a rule by the ARRL, to be consistent with our government's stand, should provide for the crediting of all confirmations from this area, without regard to prefixes or nationalities of stations. Accordingly, QSLs from LU and C67 amateurs in the Antarctic region, previously rejected, will now be accepted for DX Century Club credit.

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DX CENTURY CLUB AWARDS

HONOR ROLL

W1PHE: 247 W1AM: 234 W1BP: 230
W1EVEW: 242 W1GJW: 231 W1ORL: 229
W1BES: 242 W1QPY: 233 W1EBW: 229
W1YXO: 239 W1BEXA: 231 W1QSK: 229
W1YFR: 238 W12GO: 231 W1SSN: 229
W1PFL: 238 W1PTF: 231 W1BBL: 225
W1RNY: 238 W1SKT: 225

RADIOELECTROPHONE

W1F1H: 316 W1LAC: 313 W1WXJ: 193
W1YCK: 210 W1HGW: 200 W1BXA: 190
W1QEI: 213 W1BWH: 199 W1LUT: 187
W1SWO: 190

From April 15 to May 15, 1953, DXCC certificates and endorsements based on upperwave contacts with 100-or-more countries have been issued to the amateurs listed below.

NEW MEMBERS

GW1EP: 151 ZS1FR: 106 Y28EWS: 101
Y1QGC: 129 SMAEM: 106 W6DMR: 106
W1ZW: 117 DJ3BM: 105 W1TEX: 105
G2CNW: 117 DL1VA: 104 W1PN: 104
W1DMU: 110 PY2DY: 104 W1IPW: 104
Y2MS: 105 GM3DBH: 103 W6DTH: 100
Y2AEB: 105 O1HOA: 103

RADIOELECTROPHONE

W1BLF: 114 BA4CM: 107 W4DSC: 100
GM3DBH: 100

ENDORSEMENTS

PY1UK: 222 W1OSW: 180 Z1AB: 138
PY1AJ: 220 K2ZCP: 170 Q8X: 125
W1XT: 220 W1KRP: 171 W1AFH: 132
W2ZB: 214 G3YF: 170 W1CKB: 131
W1CQ: 211 W1BILF: 165 IS1FC: 130
W1PQ: 211 OFZ: 160 WN1CE: 139
W1QO: 210 ON4GC: 159 W1WO: 127
PY1AHL: 201 W1LY: 143 WE1KC: 119
W1KUC: 200 IU1A: 141 W4OG: 119
W1T: 200 G1KG: 100 EA8HK: 118
G0Q6: 102 GM3DBH: 100
LU7CD: 100 GSKU: 140
G6YTH: 100

RADIOELECTROPHONE

W1AW: 181 ON4PJ: 140 F9PH: 113
W1RQ: 170 IU1A: 140 GM3DBH: 111
W1DRM: 170 W1AVW: 140 GB9D: 110
W1YAT: 168 GM3DBH: 110
W1BEM: 160 W1KUC: 121 G9RM: 110
W1F1K: 150 W1O2HZC: 150 2ZZG: 114

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July 1952 73
BRASS POUNDERS LEAGUE

Winners of BPL Certificates for April traffic:

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<tr>
<td>W6K6Q</td>
<td>5</td>
<td>359</td>
<td>321</td>
<td>174</td>
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<td>W8AJU</td>
<td>11</td>
<td>376</td>
<td>322</td>
<td>25</td>
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<tr>
<td>W7MLJ</td>
<td>10</td>
<td>361</td>
<td>355</td>
<td>6</td>
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<tr>
<td>KS5F8</td>
<td>267</td>
<td>163</td>
<td>137</td>
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<td>W5MWN</td>
<td>257</td>
<td>240</td>
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<td>708</td>
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<td>W5R4O</td>
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<td>53</td>
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<td>W8BRD</td>
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<td>305</td>
<td>294</td>
<td>7</td>
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<td>W9T7</td>
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<td>186</td>
<td>111</td>
<td>7</td>
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<tr>
<td>W8HIJ</td>
<td>37</td>
<td>254</td>
<td>195</td>
<td>146</td>
</tr>
<tr>
<td>W3BID</td>
<td>6</td>
<td>272</td>
<td>245</td>
<td>7</td>
</tr>
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<td>W7PEX</td>
<td>3</td>
<td>282</td>
<td>290</td>
<td>2</td>
</tr>
<tr>
<td>W5MRK</td>
<td>8</td>
<td>257</td>
<td>330</td>
<td>30</td>
</tr>
<tr>
<td>701 Report</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

JAXEY (Mar.) 3540 172 14 158 3884

The following made the BPL for 100 or more originations-
pluses-deductives:

W4FOF 251 W6FOF 125 W5RT 106
W5QVY 214 W2YNJ 123 Late Report
W5VNZ 210 W5VHY 118 W1QKM (Mar.) 148
W7A34 174 W4TRO 118
W5QJP 143 W2AE2 114

A message of 500 or more or 100 or more origi-
 nations-plus-deductives 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

Most amateur nets are open to all comers, and this is
as it should be in view of the voluntary nature of our work.
Some nets which aim at high efficiency and speed have found
it necessary to restrict the QNIs to a certain membership,
and accomplish this objective by "calling the roll" so that
only those stations will report in. There are other nets, also,
which move along at high speed and refuse to slow down for
the casual participant who cannot maintain the pace.
Emily Post probably never participated in a traffic net,
but if she had perhaps she would come up with a set of rules
of conduct similar to the following:

(1) Before reporting into a net in which you are a
stronger, or not a regular participant, first listen to
determine whether the particular net is "closed" or "open," or
somewhere in the middle.

(2) Do not report in unless you have traffic which can
be handled by that net, or unless you have some reason to
believe that you can provide an outlet which they do not
already have.

(3) Wait until you know the call letters of the NCS
before reporting in. Don’t break in and inquire.

(4) Wait for a "break" in the traffic handling before
reporting in. Don’t do so in the middle of a message.

(5) Use their procedure when reporting to their NCS.
If you do not know their procedure, listen until you get
onto it.

(6) When reporting in, indicate your location or what
traffic you can take briefly. Indicate your traffic, if any, in
as brief and concise a fashion as possible. The extent to
which the NCS has to ask you questions is the extent to
which you have failed to report in properly.

(7) Once you are in the net, stay off the air except when
told to transmit by the NCS. If he needs any "help," let
the regular net members do it.

(8) Don’t feel offended if your traffic is not handled
right away. Many nets have a policy of handling traffic to
and from their regular members first, visitors last.

(9) Stay in the net, once you report in, until the NCS
excludes you (QNX).

(10) If you don’t feel like adding by the above, don’t
report into the net in the first place.

National Traffic System. Copies of a new release bearing
the designation CD-24 and entitled The ARRRL National
Traffic System have been mailed out to some 600 amateurs.
This release explains in detail what the NTS is and what it
does. Every NTS participant should have a copy of this
for reference, and anyone interested in NTS participation
is invited to drop us a line or radio message asking for a
copy. The initial mailing consisted of a selected list of net
control and liaison stations, but we suspect that there are
a great many interested amateurs who have not received
this information. While it is not feasible to distribute these
at random on a "throw-away" basis, we do want to make
sure that anyone interested is informed. So if you want a
copy and have not received one, just let us know.

One of the new features of NTS which is now on trial is
the Transcontinental Corps (TCC). At this writing,
applications are beginning to pour into Headquarters in
response to formal invitations to participate which were
mailed out to selected amateurs whose services it was felt
could best be used. There are openings for a maximum of
some 65 amateurs to participate in TCC functions each
week, and all positions are at this writing a long way from
being filled. The principal need is for long-haul stations
which can operate at odd hours, particularly located in the
Mountain or Pacific Time Zones. Each participation need
does not tie you down more often than once a week, again
contrary to the belief and opinion which have been expressed
by many. There are a great many good traffic men who
do not have either the ability or inclination to handle traffic
every night of the week. Here is their opportunity to become
a vital part of NTS in accordance with their limitations.

April reports:

<table>
<thead>
<tr>
<th>Net Sessions</th>
<th>Traffic</th>
<th>High</th>
<th>Low</th>
<th>Average</th>
<th>Consistent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1RN 32</td>
<td>265</td>
<td>68</td>
<td>8.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2RN 44</td>
<td>635</td>
<td>79</td>
<td>14.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3RN 38</td>
<td>360</td>
<td>41</td>
<td>9.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4RN 39</td>
<td>464</td>
<td>32</td>
<td>12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RN5 39</td>
<td>407</td>
<td>41</td>
<td>13.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

QIN 60 1067 64 1 17.0

QST for
Eastern Time Zone, most regional nets and the area nets have continued on Standard Time, but pressure from participants may make it necessary for some to rearrange their operating schedule. Things are rough all over.

**Second Regional Net:** 2RN will have one session only at 1400 EST during the summer months.

*Third Regional Net:* Certificates have been issued to W1Y WKM KUO BSL WC2W and WAHR. 2RN will attempt to continue throughout the summer months on EST. Section net members of the EAA and WPA nets (discontinued for the summer) are invited to participate in 2RN. Section net certificate W4-AKB is the 2RN Manager, although resigning Manager W4ARZ will continue as a 4RN member. W4ARZ's appointment was effective May last.

**Seventh Regional Net:** RN7 has shifted to 2000 EST for its first session, remaining on 3575 for the 2130 EST session. Certificates have been earned by W7s AWG LVU HKA and PKX.

**Eleventh Regional Net:** Ken sent us a copy of his very fine book, 'April Eighth Regional Net News bulletin. The following stations have earned 8RN certificates: W8s BKW FYO RJC and ZLK.

**Ninth Regional Net:** 9RN will remain on OST all summer, six minutes each week. W8Q2B has earned a 9RN certificate. W1PET reports that Eastern net 6W6Z was in the recent Emergency and Traffic Bulletin. Our apologies!

**Twelfth Regional Net:** Manager W8TFQ wants a Manitoba contact by c.w., phone or smoke signals.

**Thirteenth Regional Net:** TRN will remain on EST, but probably on a restricted schedule.

**Eastern Area Net:** WSCSW says that long-haul liaison problems are more a result of conditions than lack of personnel.

---

**MEET THE SCM**

Nebraska 8CM Guy R. Bailey, W6KIP, became interested in ham radio in 1910, obtaining his first license in 1911 with the call W8Q8. He was member and past vice-president of the Ak-Sar-Ben Radio Club and a member of the Council Bluffs Radio Operators Club. For his noteworthy work in the Nebraska blizzards of 1948 and 1949, he was awarded Public Service certificates. He also holds RCO and WAS certificates.

The transmitting tubes are run by W8N5: BC468 VFO-T40-p.b. HK54a final; modulator, 81s with Splatter Chokes and negative peaks are generally less than 275 watts on c.w. or 'phone. Receiver is an NO-173 and the antenna in regular use is a half-wave doublet cut for 3700 kc. Operation is conducted on 40, 75, and 80 meters.

Guy's favorite recreation aside from amateur radio is bowling; his pet sports are baseball and football. A retired blacksmith foreman, SCM Bailey is now employed as a salesman by the N.P. Dodge Corp.

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**APRIL CD QSO PARTIES**

Top score in the c.w. section of the April CD QSO Party was chalked up by W7BSU. Elmer, you will recall, was also high man in the January shindig and deserves a big hand for maintaining his standing against some very keen competition. Section net certificates were taken by W6YW, who showed considerable improvement by climbing from eighth place in the previous party. W4KFC came through with the third highest c.w. score and rates special mention for tallying more contacts than any other participant. In the 'phone party a dark horse, W3AD, showed up in first place with a comfortable lead on the rest of the field. W4NYN and W4PV, regular high scorers in many previous parties, turned in the second and third highest point totals. Listed below are other high claimed scores. The figures following each call indicate the claimed scores, number of contacts and number of ARRL sections worked. Final and complete results will appear in the July CD Bulletin.

---

**C. W.**

W7BSU . . . 152,900-300-50
W7LWO . . . 110,922-214-57
W7KFC . . . 139,260-255-50
W3QFQ . . . 94,335-324-57
W7UJTM . . . 87,618-157-51
W1AW . . . 43,470-183-46
W3NH . . . 79,430-278-57
W3GTH . . . 79,798-179-49
W3JHI . . . 76,850-283-53
W3JLM . . . 71,900-157-50
W2AQT . . . 35,875-175-41
W4KHN . . . 88,239-327-58
W3XUN . . . 65,480-270-48
W4NH . . . 65,456-247-53
W3BIP . . . 65,070-234-54
W2OUC . . . 88,250-226-50
W1QPS . . . 66,750-220-50
W5AEO . . . 66,650-200-55
W53XU . . . 50,100-227-48
W5GECB . . . 54,943-120-47
W5DXE . . . 54,825-208-51
W5WLL . . . 75,123-195-48
W4AFC . . . 52,875-225-47
W2QFG . . . 52,825-210-45

**PHONE**

W3AD . . . 9425-58-29
W4NYN . . . 6370-49-26
W1FZ . . . 2176-94-15
W4PV . . . 300-44-35
W5HE . . . 1310-34-18
W5MX . . . 1570-29-17
W22VW . . . 2776-30-15
W6CHY . . . 2688-18-14
W1OKJ . . . 1400-24-22

**"Blue Dolphin" — W2BZD/MM**

The schooner Blue Dolphin will again cruise in northern waters this summer. Bruce Wald, W2BZD, will operate and has asked for special FCC authorization permitting maritime-mobile work in the lower amateur frequencies. Daily watch will continue June 20th through September 10th with the following: (If no calls are noted in five minutes, alternate frequency will be tried).

<table>
<thead>
<tr>
<th>Mode</th>
<th>Time</th>
<th>CQT</th>
<th>GCT</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-1</td>
<td>1430</td>
<td>0830</td>
<td>1407</td>
<td>(14,107 kc. alt.)</td>
</tr>
<tr>
<td>A-3</td>
<td>2045</td>
<td>1445</td>
<td>14,200</td>
<td>(14,240 kc. alt.)</td>
</tr>
<tr>
<td>A-1</td>
<td>1900</td>
<td>1407</td>
<td>14,107</td>
<td>(14,107 kc. alt.)</td>
</tr>
<tr>
<td>A-1</td>
<td>0100</td>
<td>7005</td>
<td>(7115 kc.)</td>
<td></td>
</tr>
</tbody>
</table>

**NATIONAL CALLING AND EMERGENCY FREQUENCIES**

<table>
<thead>
<tr>
<th>C. W.</th>
<th>PHONE</th>
</tr>
</thead>
<tbody>
<tr>
<td>7100 kc. (day)</td>
<td>3875 kc.</td>
</tr>
<tr>
<td>3550 kc. (night)</td>
<td>14,225 kc.</td>
</tr>
<tr>
<td>14,050 kc.</td>
<td>29,640 kc.</td>
</tr>
<tr>
<td>28,100 kc.</td>
<td></td>
</tr>
</tbody>
</table>

During periods of communications emergency the three 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 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: W2 — 3535, 7015, 14,060; 'phone — 3815, 14,100 kc. 28,250 kc.

---

**July 1952**

75
ATLANTIC DIVISION

EASTERN PENNSYLVANIA — SCM, John H. duBois, WP2Z, of Lancaster, announced the construction of a new amateur radio station for operation on the 15-meter phone band. This station, W2ZAT, is expected to be active soon, and details will be announced in a future bulletin.

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA — SCM, James W. John, W2OMN — The Chesapeake Amateur Radio Club has changed its meeting place to the American Legion Hall, Towson. At its April 14th meeting L. E. Maloney demonstrated "Crystal Grindcr" and on April 28th Jim Gordon, LKX, discussed "FM Transmitters."

NEW JERSEY — SCM, Lloyd L. Gacyne, W2UCV — The Cumberland Radio Association has formed a TVI committee to cover a large portion of the Club area. Full cooperation of all Club members will be necessary for this group to succeed. The published results of the V.H.F. Contest were enthusiastically received by the v.h.f. operators of the SJRA. The Club took first place with a wide margin over its nearest competitor. ZI received the first amateur Extra Class license in the Trevon Area. The April meeting of the Cumberland Radio Club was held in the new club house. A lecture on radar presented by JAY, YR2W is in clivines after his release from the armed forces. Mr. J. Wilson, of Colges Lab., FL, Montmouth, gave an exceptionally lucid talk on the subject. A new lecture on captured North Korean and Russian radio equipment at the April meeting of the SJRA. Various pieces of equipment are on hand for the members to examine.

NEW YORK — SCM, Edward G. Graf, W2SJY — SEC: UTL, RMS: RU6 and COU, PAM: GSS, NYS: 3615 kc, 8 P.M. NYS: 3855 kc, 9 P.M. NYS: 3060 kc, 10 P.M. NYS: 3260 kc, 11 P.M. NYS: 3450 kc, 12 P.M. NYS: 3650 kc. New York SCRM, PTB is home from the hospital and back on 75 meters. RHJ has 150 watts on 7, 14, and 20 kc. and 40 kc. and 3.9 Mc. QTH is mobile on 28 kc. and 40 kc. and 3.9 Mc. A modulation and tri-band. New club rooms have been completed by the Lookport Radio Club. Lightnight and a quilt were needed at the meeting at which the club was held.

HDK has Navy 120 transmitter available for c.d. work. If you are a member of 1A-1P, 6BAA with your QTH in the lower 48 call for listing in the LA-IP. W2ZQ is now up on c.d. GBK has a drill in the air and is on 30 mc.

The Ernie County AREC made a radio at the Baller America C.D. Slow in Buffalo, JKY won an award for his operating at the C.D. Central New York Spring Fair at Watertown. Also operating were JWU, W2QZ and VH. RJL and DNE are on a.b. with ULM exciter.

The Rochester A.D. is now in operation. First A.D. meeting in Binghamton was attended by BGO, BDB, DQJ and OMM. A new VFO was installed in the OMM station. SDA, SDB, SDD, SJY, TQ, UTH, ZLW and WNNWSY, GSS and UTH visited the SCM to talk over and plan activities for W, N.Y., N.G. and D.J. OMM and W2QZ are still active. As OOS, UAD as OOS, GSS as OUS. RFU made BPL on all deliveries and total. COU received W3AS award. BTR is back on the air after being off a few months.

VHF CONTEST RESULTS — SCM, Ernest J. Hinsley, W2KWL — The following have had their appointments cancelled: RH, LS, LGM, QVL, LIW, LQQ, and VA. Please send your monthly reports so that they reach this office before the end of each month. The Fort Necessity Radio Club staged a FAST Galad on June 7th at Udorn, Ilinois. The Upper Ohio Valley Emergency Net now has gone v.h.f. under the watchful eye of RKT/KWH. The 144-Mc. band is humming from 2.8 to 2.9 Mc. and states (all confirmed) on 80 meters. WNHSY, of Kittanning, has 29 stations and wants to get acquainted with the local boys. RS31000, W2U, is in operation. The Steel City Amateur Radio Club, OOB is a new member of the Club. NAX sent out his bandschwing VFO is well. WQK is working single sideband and 160...
Pardon us, but here's a complaint letter that we could not resist publishing.

December 12, 1951

THE NATIONAL COMPANY
MALDEN, MASSACHUSETTS

Gentlemen:

I am writing you about something that has just gone wrong with my HRO. It's a plain HRO, not one of the fancy new ones from the post-war era. It was built by you and purchased new by me in October 1939, and now, after all these years, the filter condenser in the power supply has blown. This is its first really major failure. Two years ago I replaced a couple of resistors and the r.f. gain control because their values had changed more than 10% from recommended circuit design. I still use the old "pot" in another rig.

Incidentally, your advice of a decade or so ago has more than proven its worth. I have forgotten exactly when, but you will remember recommending leaving the heaters on continuously to decrease failure from thermal strains. Except for the few times the set has been moved, this policy has been rigorously followed. The net result has been replacement of only a handful of tubes in more than twelve years. A majority of the original ones are still in there punching.

In these days when reliability is the keynote of modern electronics, it might be well to go back and examine some of the design practices that have stood the test of time. Those in my HRO certainly have.

It is seldom one has a chance to praise a failure. I am happy to register my "complaint" about the filter condenser and at the same time congratulate you on the superb record established by this fine old set.

Sincerely yours,

JAMES M. BREARLEY (W3GZQ)
CENTRAL DIVISION

ILLINOIS — SCM, H. F. Lund, W9QKL — Section Nete: ILEN, 3940 kc.; ILEN, 3915 kc.; SCQ: LZQ. Ass’t SEC: HPG, RM: BUK, PAM: UQT, Ex-KQ5GC is on 20-meter v.v. for the call of the ex-Sudan. MWI, 2A3, and ABN is conducting daily 420-Mc. tests in an attempt to correlate propagation conditions with weather and barometric pressures. Lee says that the 4-meter VFO element "Long John" is just another good Yagi. 144-Mc. is coming to life for IFA but 50 Mc. remains a dead issue. After spring house cleaning the RCC is having its 50-meter operation. PMI is a new one in Erie. A report from QRN, Erie County Emergency Coordinator, shows 26 full members and 4 supporting members. There is a 54-member VHF net here. W3G5E 198, NCD 125, UHJ 64, KUN 30, AER 9. (Mar.) W3G5E 154, AAX 40, AER 14. (Feb.) W3G5E 92.

DAKOTA DIVISION

NORTH DAKOTA — SCM, Everett E. Hill, W8KTV — Grand Forks hams are getting to town on a new club, The Sioux Amateur Radio Assn has been formed with 40 charter members. Officers elected were: HDG, pr. sec.; RGT, vice-red.; OJW, act. mar.; KAB, sec’y, and TB3, treas. The Club will have a permanent shack in the new ND University Engineering Building. Plans are for a 16-watt rig on all bands. Great bids are now being made to own a room and outfit. Need more of the above clubs are to be commended on their excellent work. Clubs should be formed in all the NWS states. They can lend much needed assistance to the newcomers. Mayville is a fine example of assistance with 18 hams there. Your SCM can get wave data on what the clubs are doing. Be sure and affiliate your clubs with ARLR and make use of the aids they have. Traffic: W8WJP 20, GSR 10.

MINNESOTA — SCM, Charles M. Bove, W8XAO — The Mobile Amateur Radio Corps of Hennepin County had 15 minutes on TV. The station was on a 20-meter v.f. while training program. The Williston Amateur Club now has 25 members. BA5 has a training program going out on the air. All of the above clubs are to be commended on their excellent work. Clubs should be formed in all the NWS states. They can lend much needed assistance to the newcomers. Mayville is a fine example of assistance with 18 hams there. Your SCM can get wave data on what the clubs are doing. Be sure and affiliate your clubs with ARLR and make use of the aids they have. Traffic: W8WJPA 20, GSR 10.

DELAWARE DIVISION

ARKANSAS — SCM, Dr. John L. Stockton, W4DRW — The meeting at Eureka Springs was well attended with more than a hundred amateurs making a grand total of 214 present. The section took on a very serious tone. A new VHF club was organized. Kenickington, W3A, is the new VHF club. Approximately 350 were in attendance at the Waukegan Hamfest on April 29th. 1D7V, Ass’t Nettz, was the first to contact the station. W8YF, a WIAW, W2J, WMJAW, and W2TVM on 144 Mc. is trying out new 183D. HHD’s work is living up to the idea of a new mobile rig. OOD’s Ass’t, BEloit, is doing a fine job of running the W4QI and the other mobile rig. OOD’s Ass’t, BEloit, is doing a fine job of running the W4QI and the other mobile rig. OOD’s Ass’t, BEloit, is doing a fine job of running the W4QI and the other mobile rig. OOD’s Ass’t, BEloit, is doing a fine job of running the W4QI and the other mobile rig. OOD’s Ass’t, BEloit, is doing a fine job of running the W4QI and the other mobile rig.
world's toughest transformers
wear these exclusive ONE-PIECE DRAWN-STEEL CASES

New Equipment Transformers

the only complete*, versatile** line with
tough Sealed-in-Steel construction

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reports during my term as SCM. I also would like to urge -call to me to report to the SCM, LUX. He will give me all the cooperation that we possibly can to make his job more pleasant. Also a special thanks to EA, our SEC, who has been invaluable every other call. This is the last of the reports from the Great Lakes Emergency Network. The last one was November, 1978. Thanks to all those who have volunteered their time to keep the network running smoothly. Our next meeting will be held on December 6th, 1978. The meeting will be held at the American Radio Relay League in Princeton, NJ. The Chief Operating Officer, K4JL, recommended by our SCM, LUX, will give his quarterly report on the network. The SCM, LUX, will give an overview of the network and its activities for the past year. The meeting will be open to the public.

BOUCHARA — SCM, Robert E. Barr, W4KIGF — FY3 has had an excellent autumn campaign. He has been working hard to get his GEM OBS mission off the ground. FY3 has also been active on the DXCC countries.

LINDSAY — SCM, Robert E. Barr, W4KIGF — FY3 has been active on the DXCC countries. He has been working hard to get his GEM OBS mission off the ground. FY3 has also been active on the DXCC countries.

K4JL, the SCM, LUX, will give his quarterly report on the network. The meeting will be held at the American Radio Relay League in Princeton, NJ. The Chief Operating Officer, K4JL, recommended by our SCM, LUX, will give his quarterly report on the network. The meeting will be open to the public.
An important message for Amateurs in TV fringe areas

Television interference, particularly in fringe areas, despite the manual work of hams, has continued to keep thousands of us off the air. Reputable television receiver manufacturers have, by and large, improved the design of their sets. But, as rapidly as the art has permitted, television viewers have stretched the range of TV transmitters. Pictures that are far from acceptable in an engineer's laboratory, somehow seem to satisfy TV fans.

TV and TVI

And, there is a large group of accessory manufacturers who have complicated our TVI problem, unwittingly perhaps, by selling television boosters or preamplifiers—some good, many mediocre. We, at Electro-Voice, make television boosters, and are mighty proud of them. They are engineered with the same skill and search for perfection that has been the hallmark of Electro-Voice products for over twenty years. But, as a result, we hams at E-V have contributed our share to the TVI problems by pressing on the frontiers of TV still further... a lot further than the average booster previously made possible!

How We Are Helping

We have tried to make a good product, and it has brought pleasure to thousands of families. Now through E-V, boosters are going to be better than ever... for customers and for hams. Every E-V booster is equipped with an integral high-pass filter where it can do the most good... right at the input of the amplification stage.

The E-V Booster was the first fully automatic, broad-band booster to be marketed. The E-V Tenna-Top Booster is the only broad-band, all-channel, antenna-mounted booster made. All E-V boosters incorporate a lesson learned long ago by amateurs, that high gain without low noise is useless. So, all our boosters have gain plus an extremely low noise factor.

E-V Boosters are going to continue to give a hefty boost to TV signals, but they will work equally hard to keep interference, ham and otherwise, out of the television receiver. Recommend an Electro-Voice booster to your neighbor! You will be doing him a favor and yourself too.

W9IOP

Electro-Voice

404 Carroll Street • Buchanan, Michigan
Export: 13 E. 40th St., New York 16, U.S.A. Cables: Arlab

Model 3010 Super Tenna-Top TV Booster. List...$88.00
Model 3012 Tenna-Top TV Booster. List...$59.50
Model 3000 Super Tune-o-Matic TV Booster. List...$57.50
Model 3002 Tune-o-Matic TV Booster. List...$39.50
More Safety...Less Guesswork
When You Use

PRECISION-TEST EQUIPMENT

Stay On The Air
With "PRECISION"
SERIES 85
AC-DC Circuit Tester
(20,000 Ohms per Volt)
SELF-CONTAINED TO 6000 volts,
60 Megohms, 12 Ampere, +70 DB

A compact, laboratory type, high sensitivity test set indispensable for test and maintenance of modern amateur communication equipment. 20,000 Ohms per Volt D.C. - 1000 Ohms per Volt A.C.

VOLTAGE RANGES: 0-3-12-60-300-1200-6000 A.C. & D.C.
CURRENT RANGES: 0-12-120 microamps; 0-1.2-12-MA D.C.
RESISTANCE RANGES: 0-6000-600K-56 Meg-60 Megohms.
DECIBEL RANGES: From 26 to +70 DB.

Complete with batteries and test leads $39.95

PLUS superior physical features:
- 4½”, 50 micromars, Easy Reading Meter.
- Heavy duty bakelite case 5½ x 7½ x 3½.
- Deep etched, anodized aluminum panel.
- Recessed 6000 volt safety jacks.
- Only two pin jacks for all standard ranges.

LC-1 LEATHER CARRYING CASE-Custom designed, top-grain cowhide case with tool and test lead compartment. $9.50

See Series 85 and other famous "Precision" instruments, on display at leading radio parts and ham equipment distributors. Write for latest catalog.

Precision Apparatus Co., Inc.,
92-27 Horace Harding Blvd., Elmhurst 13, N. Y.

88, LLI 45, PHO 35, WNZAP 17. (Mar.) W2BSN 452, VP 19, HFI 17.
NEW YORK CITY AND LONG ISLAND -- SCM, George V. Cooke, Jr., W2OBU -- ASC, SCM, Harry J. Daniels, 2TUG, SEC: KTY, RM: TUK, PAM: YTB. The Tuscan and Nunsac Clues are setting up clubs around the country to handle traffic for the Ninety-Niners Women's Air Race over the Fourth of July week end. Favorable publicity should be gained from this endeavor. SCM noted that a number of O28Qs and a few local clubs despite heavy TVI to his own set. VHF, VSSN, and WN16MR are the latest operators of K2RD. SCM is now with the New York Radio Club and in the same club AMB, CYK, XE, and ZKJ have received their Extra Class licenses. 11HE has been appointed Brooklyn Alternate EC under EC T. D. Stimson, Borough Coordinator, and the Brooklyn AEC boasts 110 members and held 22 drills during the month. BO will be in W2 and N1 for the summer. As the Call parts of the SEC is becoming active and setting up gear on all bands and using the call 8CTS/2 until its new call has been issued. EC for today is TLP will maintain the old circuits.

Stay On The Air
With "PRECISION"
SERIES 85
AC-DC Circuit Tester
(20,000 Ohms per Volt)
SELF-CONTAINED TO 6000 volts,
60 Megohms, 12 Ampere, +70 DB

A compact, laboratory type, high sensitivity test set indispensable for test and maintenance of modern amateur communication equipment. 20,000 Ohms per Volt D.C. - 1000 Ohms per Volt A.C.

VOLTAGE RANGES: 0-3-12-60-300-1200-6000 A.C. & D.C.
CURRENT RANGES: 0-12-120 microamps; 0-1.2-12-MA D.C.
RESISTANCE RANGES: 0-6000-600K-56 Meg-60 Megohms.
DECIBEL RANGES: From 26 to +70 DB.

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Precision Apparatus Co., Inc.,
92-27 Horace Harding Blvd., Elmhurst 13, N. Y.
WHAT TO LOOK FOR IN A UHF TV CONVERTER

Dear OM:

Many communities are preparing to welcome UHF television for the first time. As a result it is probable that you will be called upon by friends, neighbors, and relatives for technical advice regarding the possibility of using a VHF television receiver for the reception of UHF channels.

For your information, UHF reception is entirely possible from a conventional VHF TV receiver provided a suitable outboard Converter is employed ahead of the set. In such a combination, the original TV receiver functions as an i.f. amplifier, and UHF tuning is accomplished solely by means of the Converter.

Unfortunately, the effectiveness of this arrangement depends almost entirely on the skill with which the Converter was designed and manufactured. It is true that a well-designed Converter will tend to overcome some of the deficiencies of a mediocre TV set. On the other hand, it is just as true that a poorly designed Converter will always produce inferior results no matter how good the TV set might be. In view of this, a very deliberate study of every angle of UHF Converter design is justified before recommending purchase of this or that UHF Converter.

One of the points which must be considered is the tuning range of the unit. Does it provide reception of all UHF channels? Or does it limit the user to a choice of only a few of the available channels?

Does it have antenna pre-selection? (The answer to this question is exceedingly important to the amateur, because of the ever possible TVI as a direct result of poor input selectivity!)

Can it be employed with any conventional VHF TV set? Can it be installed without special tools and by non-technicians?

Is it stable in operation? Is it easily tuned, so that even a child can enjoy UHF television?

Does it have built-in low-noise i.f. pre-amplification to guarantee the best possible signal-to-noise ratio at all times? Is it complete? Does it have its own power supply?

Strictly from an operating standpoint, the size and appearance of a UHF Converter is of little importance. However, it is a well-known fact that recommendations to wives, mothers, daughters, sisters, and aunts must be made in good taste. So, the question of appearance must be considered!

Your analysis of a UHF Converter suitable for unqualified recommendation to associates should result in clear-cut affirmative answers to each of the above. Anything less means that you haven’t examined the characteristics of the Mallory TV101, Inductune® equipped, UHF Converter. The TV101 design definitely includes each of the above. . . plus. Your QSL, letter, or msg. directed to TV101 Bulletin, P. R. Mallory & Co. Inc., Box 1558, Indianapolis 6, Indiana, will get you additional information.

73,

Your Mallory Reporter

P. R. MALLORY & CO. Inc.
P. O. Box 1558 Indianapolis 6, Indiana
10-20, Al,, and Fri., and at 3101 ke. The Kansas 75 Phone Net is functioning on regular schedules handling quite a bit of traffic. Practically all calls have modules reporting in. We also notice new Acti- fying Net Controls, WN8HAV, an ARRL member and also an FCC member, tells us that E7T now has General Class license. The Kansas Valley Emergency Net reports 80 traffic points. The MO, Valley Radio Club was busy during April preparing for Field Day, 1WB and CW, of Atchison, monitored 3.5 and 28 MHz during the flood and handled 16 flood traffic when needed, W3A
to, have a 100-watt slat-band mobile rig to go into Doe’s car. 820 displacement in the final and also in the modulator, SWR, on 75 meters, and GCD, on 10 meters, are now mobiles in Topeka. Members of the KyAC, “Steerling Wheel Net,” of Terre Haute recently drove to Lawrence for breakfast holding their session on route. The boss of the SWN, ECF, is a busy man. One Monday night his chinchilla population increased by 2 and the next night he was the proud papa of a 7-lb. YL jr. operator, and he hasn’t missed an SWN drill. On Apr. 9th the Coldwater Amateur Radio Club held a banquet attended by 50 licensed amateurs. Prizes were won by OCN, for the farthest QTH, KYX, as holder of the oldest ticket, and WN8RHE, as holder of the newest ticket. Traffic: WB5LI 230, N017, FDX 33, PB 15, IC5 5, KX6 4.

MISSOURI — SCM, Clarence L. Arndale, W6WBJ,—
SECC, VRP. The St. Louis Amateur Radio Club met on April 18th and viewed the civil defense film “A Voice Shall Be Heard.” This film has been shown at a number of clubs and is a very fine example of civil defense. One speaker at the April 18th meeting of the HARC was Mr. P. N. Powell, HGR, manager of the Precision Products Company. During the April floods in the Miss. River area, the Kansas City Red Cross Station, RVG, was active for a two-week period. Mobile stations were used at different points along the river and fixed stations frequented were used at relay stations. Stations reported to have participated in this emergency work were AWJ, ECH, CGB, CSH, NDS, CSH, VRP, DNF, ITO, NN, NPS, UDR, FFH, WHX, and KB5FAY, Missouri was well represented at the “beginning” sponsored by Fund, AM, and the Kansas Secretary, Harry Paxton, from Headquarters, gave a fine talk to the gathering. The following additional stations handled traffic during the March Arkansas flood: YQ, DQ, KB5O, BVL, DEQ, JX, LK, RDR, NDS, NXY, and VRP. KBWBD has a Viking I on the air, however a 2C-610 is expected to he in operation soon, QXT and INI are active on 440 ke. UBR has a new jr. operator, BVR, reports the Early Bird Net is off the air until October, KB5FAY makes a nice traffic showing, ZLN is running 500 watts to a BC-610 and makes first traffic report. EBE has rebuilt his new exciter and improved its efficiency. CAX is operating Viking I with Viking VFO, WAP is back on the air. QXO’s No. 1 in the amount of traffic handled during 1061 in Missouri. New appointments: ZBR as EC, FME as OBS, and ICQ as OJS, Traffic: Apr. KB5FAY 225, WR8V 135, GIJ 186, PME 144, QFT 187, KBWBD 175, OYD 47, EBE 40, KIK 11, HUF 11, CAX 16, UKC 10. (Mo) WR9Q 117.

NEBRASKA — SCM, Guy R. Bailey, W6KJP — About 100 amateurs from this and adjacent areas took part in the flood emergency this month and XUW, whose many hours spent organizing and directing their work, is to be commended. AHU is building a new final for his tar, W3QF is putting up a new antenna, G3H is a cub in the merchant marine, CC is building a TV camera, CCY is operating in the 20-meter net. The Al-Stay-in-Radio Club had a party at the 20th. The Club’s e.d. mobile unit was the nucleus of the flood emergency operators. A2J has a new 1RE-50, and L3N is sporting a 1RA-2, B3X is doing a nice job, and is having fun getting back on c.w. after his many years on phone. The c.w. nets are folding up for the season here.

(Continued on page 89)
Any Way You Look At It...

...the Eimac 4-125A is designed for economical, outstanding performance.

Long service, low replacement costs, high output with low driving power and all-around outstanding performance are some of the reasons why Eimac's 4-125A is the most popular 125 watt tetrode. This power tetrode enables the use of simple circuit design and minimizes TVI grief. Through the extremely low grid-plate capacitance of the 4-125A neutralization problems are non-existent in most cases. Two 4-125A's in typical class C telegraphy or FM tone operation, with five watts of driving power, will handle a kilowatt input—or a pair in high level modulated service will take care of 750 watts input. Rated at a maximum plate dissipation of 125 watts, the 4-125A is excellent for use as an oscillator, modulator or amplifier. If you're rebuilding or planning a rig, you'll find the 4-125A a money saving way to get top performance.

TYPICAL OPERATION
(Frequencies below 120 mc.)

Radio Frequency Power Amplifier and Oscillator Class C Telegraphy or FM telephony (key down conditions, one tube)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>D.C. Plate Voltage</td>
<td>2500 volts</td>
</tr>
<tr>
<td>D.C. Screen Voltage</td>
<td>350 volts</td>
</tr>
<tr>
<td>D.C. Grid Voltage</td>
<td>150 volts</td>
</tr>
<tr>
<td>D.C. Plate Current</td>
<td>200 ma.</td>
</tr>
<tr>
<td>Driving Power</td>
<td>3.8 watts</td>
</tr>
<tr>
<td>Plate Power Input</td>
<td>125 watts</td>
</tr>
<tr>
<td>Plate Power Output</td>
<td>375 watts</td>
</tr>
</tbody>
</table>

The 4-125A has the Eimac features of a pyro-vac plate, controlled emission Y3 grid wire, low inductance leads and input-output shielding. Get further information from your Eimac dealer.

EITEL-McCULLOUGH, INC.
San Bruno, California
Export Agents: Frazier & Hansen, 301 Clay St., San Francisco, California
cause of QRN. It is hoped to have many new operators next fall as the Novices find out the fun of handling traffic. JDJ is issuing a fine job as SEC, and put in many hours along with HQQ and BBJ in coming up due dates for the emergency. NYE and UVU, from Fremont, and VPR, from Lincoln, worked long hours away from their regular business. The COM wishes to thank all of those who were active during the emergency, also the many Iowa hams who participated.

Traffic: WJQ 99, CBB 83, LIO 47, AUB 35, BJX 26, QHG 24, JED 10, JQO 7, UFD 7, VPR 6, YMU 6, HXH 4, YSB 4, WEP 2, LRF 1.

NEW ENGLAND DIVISION

CONNECTICUT — SOM, Roger C. Amundsen, WHKF — SEC; LKF, PAM; STU, BM; KYQ, CPN, 3880 kc.; CN, 3840 kc.; CBN, 2960 kc. With the advent of Daylight Saving Time activities has dropped a little and interest in DX has a little of interest has trickled through in the nature of reports. TIE has its new Viking on the air. ODW has been working all bands from his set and is very cooperative from his recent operation. DHO works LO-NITE with his one-half watt crystal rig. EMF reports that UFW has a Class B ticket and has a new operating location. WBIX-56, KOS, still has his old ticket. WOL, still on 176, AW, 54, STU 50, NBP 45, LIG 43, BDI 39, RFJ 27, RB 26, KB 26, BVD 24, KGM 24, GBM 14, ODW 11, NEK 8, RBB 5, DHO 2, M.W.LIG 29.

MAINE — SOM, Orestes B. Brackett, WP1TL — SEC: BDK, BM; LKF. Net frequencies on Christmas Tree Day, 2000 hours, 3596 kc., at 1900 DST, Mon. through Fri. The Sea Gull Net closed for the summer. AUG has been awarded the Extra Class License by virtue of the Master’s entry. Others we know of who have Extra Class licenses are MBJ, BBJ, TO, CBV, PMY, and DJF. New Advanced Class licenses we know of are TIE, PAM, and EMF. Class licenses are UPQ (QSL of LER), UZB, and VYB, a twelve-year-old boy from Belfast. VV has been busy and now is in the mainland trying to get his strength back before returning to Oregon. He reports to work in Bingham, Sea Gull Net certificates were issued to ESR, LN, EBJ, DNB, GLZ, SCU, and GMH. Traffic reports are presumably going to be running through the summer months but we are sure would appreciate anything of importance that come up for the Maine news. The radio club at Woburn is growing, with two new members, Hank Martineau and Ray Small. Apologies to Vernon Burgess, of Caribou, for forgetting the nice report on the Aroostook County Radio Club on page 105.

The last word in a versatile small transmitter for amateur, civilian defense and commercial use. Has built-in three-tube preamplifier for use with crystal mike. PLUS all the features of the Bandmaster Sr. $175.00

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To You,
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In the years that follow
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No matter how good your ham rig, your P.A. system or your tape recorder, you can only get out of it what your mike puts into it. You want a sensitive, wide range mike with flat response, yet you want a mike that is sturdy and trouble-free.

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and 13 — so start to clean up the harmonics in those rigs. See Phil Rand’s TV interference booklet for ways and means, as well as the many excellent articles in the past year or two in QST. The FCC is solidly behind the amateurs in defending him from unwarranted attack by TV viewers. But, above all, train yourself to be DIPLOMATIC for your coming investigations on TVI. Diplomacy in three-quarters of the battle. The Humboldt Amateur Radio Club meets the second and fourth Fridays in the YMCA rooms, rear of Municipal Auditorium, entrance on Humboldt St., Eureka. San Francisco Area: EGF: BYS. Plans for the Pacific Division Convention, to be held July 4th, 5th, and 6th, are complete and an excellent time is promised to all by the sponsoring Central California Radio Council, and Larry Reed, chairman of the event. Pre-registration is $6.00 to June 21st, and registration AFTER that date is $8.00. Send all registrations to Harry Winke, s.s.s., 1235 Masonic Ave., San Francisco. The SRCF meets the fourth Friday at the American Legion Hall, 1641 Taraval St., and the High Frequency Amateur Mobile Society meets the second Friday at 1025 Van Ness Ave. Traffic: W6EMV, ATY 7.

SACRAMENTO VALLEY — Acting SCM, Will van de Kamp, W6CKY — JRY now holds Advanced Class license. PIV reports 2-meter activity on the increase with some DX. Sacramento radio clubs held a joint meeting for Ken Hughes, VRG was visitor in the Chico Area. NYN’s XL for has her own call, OKF. Marysville boosts W6GLX. JDN has good luck with N.M.E. on 629-V-3. The Mt. Shasta Radio Club had rig at the hobby show. AF is having noise limiter troubles. XIO got 1st-place radiotelephone license and a wife. IDC and now is awaiting discharge. The GERG provided radio communications for the Chico State College Pioneer Day Parade. The treasurer of the Sacramento Valley Radio Club is QJ, not QST as recently reported. ILZ has been mobile for a year and got Advanced Class license in October, 1951. Traffic: W6PVY 208, JDN 83, KFO 16.

ROANOKE DIVISION

NORTH CAROLINA — SCM, J. C. Goseler, W4DLS. This month adds another North Carolina name to the list of Silent Keys, that of R. E. Dawson, Jr., DSY, of Charlotte. Bob was known worldwide for his work on the DX bands. Congrats to Katherine, SCs, on winning the VLF-OM Contest. The Asheville Club has reorganized with APM, pres.; MBS, vice-pres.; NG, treasurer; and Eberhas, secy. The Club has an active TVI Committee for the education of the TV locaters and service-men; also classes for Novices and brush-ups for the old-timers. The SCM reports that NCN closed down for the summer May 10th and hopes to see all the old members back fresh in September. The Tar Heel Net will continue throughout the summer months as usual. Let me remind the North Carolina gang to hold weekend gun-bashings a few kc, off 3600 kc, because our many mobiles like to get out on these nice warm ends. One big home-station carrier can snow under all the mobiles. AKA, BDU, and DLX took part in the CW QO Party. BAB and DLX were active in the Phone CD Party. NYN won the last one. IFO, of Sanford, is home from Korea and back on 75 meters. Activity reports received for July were few, but with these new proposals I guess you fellows are too worried to write. Let’s keep the ABRL informed through our Division Director, EVQ, on how we feel about these new proposals so that we don’t come out on the short end of the stick. Traffic: W4AKG 2, TlRLR 198, IMH 135, BAW 58, BDU 42, PIC 40, DLX 16, DLG 15.

SOUTH CAROLINA — SCM, T. Hunter Wood, W4NKL — a club has been formed in Spartanburg with the following officers: CPZ, pres.; NTO, vice-pres.; and Ralph Queen, s.s.s. The club is planning ARRL activities. DAX has worked 64X4K for WAC after 39 years trying. XIO is Class 1 Observer and has a feature article in May CC on mobile rigs. DMX, DX, EDQ, FM, and MCI were appointed QO’s during May. All Amateur Radio Club members should submit application to the SCM for official station appointment. TWXW and TWXW have received their General Class tickets. W4AAL is on 80 meters from Columbia, S.C. SCB has moved to Beaufort, S.C. IAKN was a visitor at the Naval Base Club. Ben Team, W4DX, 1305 Fair St., Camden, S.C., has accepted appointment as Section Director for South Carolina and all ECs should report their activity to the SEC without delay. Traffic: W4ANK 490, THR 115, QGD 75, KM 18, EDQ 8.

VIRGINIA — SCM, H. Edgar Lindauer, WAFF — Word has been passed down that the week-end period beginning 0600 on 11th has been approved for the Richmond Division Convention to be held at Richmond. The place is Hotel Jefferson. There will be plenty of timely technical talks and demonstrations. Financial arrangements for this program will be mailed later but in the meantime make plans to attend. Despite extremely poor conditions on most of the bands the 3rd Annual Virginia QSO Party brought out plenty of aspirants. C.W. was particularly troublesome on 40 meters with skip reigning throughout. (Continued on page 99)
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SNH reports TVI has been defeated after much prolonged agony. Questionnaires for TCC stations are out. Look them over seriously and fill out for immediate return to headquarters if you can qualify. RVG seeks Guantanamo Bay, Cuba, Tues., and Fri. and makes a nice link to the newly-acquired arm to our traffic system permitted by recent FCC-State Dept. Decree. LW operated at Annapolis Naval Academy on Armed Forces Day. SHJ again hits BPL for the third consecutive month, with FOR duplicating his last month's BPL on deliveries. VPRC Telephone Net climax the season operations with its annual picnic and hamfest at the farm of NY near Palmyra. TYI had his first 21-Me, contact with VYAA, JAG and NFX 75-Me mobile was active in Virginia. QSO Party hopping county lines for additional contacts. PWV drove 200 miles to Sky Line to surprise the gang with extra contacts on VFN frequency but couldn't squeeze in. VPRG is laying the ground work for a special mass meeting of all Novice licensees in the area with a view of indoctrination into the various phases of ham radio and the fields of interest that can be enjoyed with courses for handling the General Class. The men sparked the program while KCQ and CCO regret to announce the passing of RTO. Sam was a seaman in the Marines and participated in the first landing on Quasimodo ten years ago. He had been confined to Veteran's Hospital, Dayton, Ark., following an auto accident last February. Traffic: WASHJ 549, FOR 479, FY 129, FF 147, PXA 43, NV 52, SNH 79, CVF 24, NUT 33, IYI 18, OKN 15, RDJ 15, W7IT/7, 12, WRVO 11, HQN 2, LW 2.

WEST VIRGINIA — SCM, John T. Steele, W8SMCR — The Stonewall Jackson AEC exhibited the civil defense film "And a Voice Shall Hear" at its regular club meeting April 19th. Local defense officials and disaster man of the Red Cross were among the visitors. Some surprise was expressed at the preparation of the city on which the film is based but it was well received and interesting. "March of Time" directed the production of the film for the supervision of the American Electric Club. Its first and third Saturday of each month and the members are active locally on 50 Me. WNSJNN, now W8JNJ, got his WAS in the Hallcrafters Contest. AEC again made BPL. YPN has a new Viking. The Trinity Club and KVARA co-sponsored a 10-meter emergency test run Sunday May 4th. Three fixed and six mobile stations were used. Manning the mobiles were LFI, LGB, CLX, QIG, DAR, AT7, and IJM, while the fixed stations were operated by ETF, HZ7, and LAI. Excellent results were reported. Traffic: W8AU 734, BWE 77, YPR 32, FUS 21, GEP 9.

ROCKY MOUNTAIN DIVISION

UTAH — SCM, Floyd L. Hinshaw, W7UTM — Flood Patrol activities precede sending reports this month. It is known that JVA has been Acting Net Control Station for the water patrol of flooded sections of the Salt Lake City Area, and further news will be reported after the emergency passes. UTN has been practically inactive. This month because of work ORM and SCM reports from his office. Traffic: W7UTM 292.

WYOMING — SCM, A. D. Gaddie, W7WNI — The YO Net affords a practical means for handling traffic in Wyoming. Check in on 3625.0 ke. — we need your help. PXK makes BPL. A good job well done. Wally OZK is the new EOC for Cheyenne. GZQ is helping on the AEC. WRX is planning an egging-thrashing contest for the hamfest. W8JPH reports plans for the biggest and best hamfest are in completion. It should be the event of the summer with contests and prizes galore, so don't miss it. Traffic: W7FPPX 527, 7ZFA 88, W7WNI 16, GZ 11.

SOUTHEASTERN DIVISION

LABAMA — SCM, Dr. Arthur W. Woods, W4GJW — ATV and AUP claim first occupancy of the 21-Me band in Alabama at the stroke of 2000 GMT. May 1st. Traffic reports meets ABNP, AENB, and 3 MARS nets in addition to the Tennessee Net. TVI 11 new is using X180 in the final and feeds unusual with coax. DXB meets ABNP reliably. HEP 215 it's 50-50 traffic and racing along at his shack. KNW meets ABNP and AENB regularly. MVM, now in Birmingham, meets ABNP, AENB and R8N, and also MARS net, besides having 4965 in the CD party. Another regular is PPR, who calls in on AENB, AENB, and AENR. RTI reports that W8JSW passed her General Class exam two days ago and receiving her Novice ticket. Traffic: W4IFTP 56, BFM 48, KNW 38, MVM 22, DXB 12, RTI 11, DAD 8, GW 8, PPR 8.

EASTERN FLORIDA — SCM, John W. Hollister, W4FPS — The passing of DJ is recorded here in deepest sympathy. The memorial service for the Doc of the BPL Net is worthy of mention. Recent ARRL appointments: SHG as EC, OVO as EC, AYV as EC, KBE as OA, TRA as ORS and TO, TRP as OBS and TO, TVQ as TO. Here is the Novice net information: TRA and a group of Novice (Continued on page 100)
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have it going! Net call is FNN. WNATYI reports these
Tech. Class calls: UIK, UOZ, WNGTVY, WNU4W,
W4YYPB, WMY4SF, Cliewater. For P&G, W4YYPB, for 72.
D. This was a total of 1204. Groton reports that 504 out of 599 re-
ceived were overseas messages. Coral Gables: TRA, 13
years old, is one of our youngest. Ohio: PJX has been
MOING the K. of K. Net from around the State
such as at JOY and AYX. Florida: The April 7th
Red Cross alert was tops and showed the AREC to
good advantage. New Club officials: MJS, FDR, QBY,
CON, JYF, YJG, ex-UP, and IAC. TVQ is controlled
with a couple of Cs on 21 Mc. Iatch a ZL. JQD got some
nice publicity for Florida and ham radio in the local
press doing a good turn for VE1HKE. Lakeview and
the AREC are having regular drills. Miami: SAT ran
up, 10,800 points in the April CD Party with 5.4 watts.
Outdoors: TVQ reports the N dropped from the form-
over who passed Class B exam: TVQ, TVK, UWE, UHD, UGT,
TDD, TTP, and TBX. TVQ's dad, AWS, passed Extra
Class exam. TVQ built a new rig and an astronomical
winter Garden: SWX says he and TAS, TJU, and SWV
are trying to start a rag-chewer's net on 7250 kc, each
Sunday at 2 p.m. West Palm Beach: Mayor of West
Palm Beach is the mayor of Haverhill. Rebel Club members in
contests: WN4UGD and UGT (now minus the NH) were high
for the area in the CD Party, and glass-arm BRB was high in the
4th call area for phone in the CD Party. Traffic: W2PIU
120, LMT 534, FCT 238, DRD 1, RHM 1, GB 16,
TRU 02, HWA 45, QM 78, EJC 54, ALP 27, FWZ 27,
ISF 15, RW 18, IM 14, NAK 9, BZ 0, TVE 9, DES 8, DSS 11,
DJS 3, NRT 7, TVQ 7, TDD 5, RT 4.

WESTERN FLORIDA — SCJ, Edward J. Collins,
W4MS/8Q — SEC: POQ, EC: FLE. FLE has a new
Fiesta-Class ham ticket. VTI and TMB are on the
Georgia Classic and are awaiting a new 32V-3. 9CGO/3 is in
our midst to a 6-meter man. UGY continues to be the
POQ. FJQ keeps things on 28 Mc. FJQ and
TMM had their ECO reworked by NJB. The EARS Ham-
fest was an FB outing. RKT had the loan-boat sending con-
tact. VMR is building a new rig. N2ZI is DY is likewise
POQ has been mobile in WS-Land. DZQ is looking at
how to do. DAQ wants HRO. WV9L needs DX. AXP
in rebuilding. NYQ is going mobile. MS is searching
for a 20-meter rig and working 6 meters. ISW joins the gang on
30-meter phone. QX is conjecturing on 15 meters. WBD
works 10 meters late at night. NN and AGB are doing an FB
job on 75 meters. Traffic: WAXP 3, MS 2.

GEORGIA — SCM, James F. Born, jr., W4ZD —
the Georgia Cracker Radio Club's Hamfest will be held
August 3rd at Dixon's Lodge on U. S. Highway 80 at Lelita, Ga.,
which is 12 miles from Macon. Tickets may be purchased
contacting NS, the Club's secretary, 120 North Candler Street,
Decatur, Ga. TVN has a new mobile rig on 28
Mc. Also a new 28-4, wide-sped beam. TVO2 now has
his General Class license and a new 28-Mc, mobile trans-
mmitter. GUY has a new 32V-3 Collins. MTS is building a
telephone network for 7 Mc. OSH, our Route Manager, is
doing an FB job with the Brass Pounders Net. The Camp
Gordon Radio Club made all the members of the Amateur
Radio Club of Augusta honorary members of their club.
HYW has returned to the air with a Collins 310B-1 ex-
citer and a 300-watt p.p. 4-65A final on all bands. K4WR
has a new 14-Mc beam. VTA has the new U.S. Naval
federate Signal Corps of Atlanta. EJG is building a 200-
Watt 'phone rig for the South Atlantic c.d. control center.
P41L has returned to Atlanta after a visit to K4P and K4L-
Land. The new call of Kennebucco Radio Club of Mari-
ettas is BBT. PFA has moved from Macon to Atlanta and
has a new 14-W, 28-4e. Phone rig in moving to
Baltimore, Md. The Macon Radio Club has a new call,
BRM; also a new 400-watt all-band phone rig and c.w.
rig. RHC returned to Atlanta fresh from the A11. FHH, MTS, and ZD. Traffic: K4WAR 1403. W4OSB 179,
EJG 45, FJJ 35, RD 29, MTS 20, HYW 6, TVN 6, C.

WEST INDIES — SCM, William Weller, W2HDX —
SEC: ES, CP, a new OBS, will broadcast ARRL bulletin on
3065 kc. Mon., Tue., Wed., Thurs., and Sun., 5 p.m.
ANN. A new 1-watt antenna is being used. FDD, DU, IO, LK, OQ, PD, PW, NL, HZ, F8, LC, and RA
are contacting NCS CY enclosing QSLs. F8OA, K4P4D, installed on the main floor of the Red Cross Build-
ing in San Juan, uses 400 watts on 3922 kc., is NCS for
3925 kc. ARC-SEC nets and soon will operate 23.8 kc., 3925
and 3955 kc., simultaneously using 3-WW emergency power
plant. UU renewed OBS appointment. NO has been ap-
pointed Assistant Director for MARL. ZR is a member of
Old Old-Timers Club. Having been continuously licensed for
49 years. W4MRK now is KP4MR. W4NEW/KP4 or
nephew is KP4retry. W4CYD/KV4 now is K4W4S. K4SCB, and a
new 75 meters. D1V has 10-meter mobile and is adding 200
watts for 20/75 with 12-volt supply in the station wagon.
CP, GN, IO, UX, MQ, PD, and PT joined the AREC.
Traffic: K4PIV 7, DJ 6.

CANAL ZONE — SCM, Everett R. Kimmel, KZ6WA —
an all-YL AREC net held its first meeting in April when
the entire Isthmus in a simulated daytime emergency in
which the OMs were presumed to be away at work. SEC
was NCS to get the mail started, but they gave him a bad
Continued on page 102?}

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New! Hi-Q 10 & 160 Meter Loading Coils

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time right from the beginning when they came back using the proposed and strange-sounding NATO phonetics when they had all taken the trouble to memo- net were, as they called themselves, Kilo Zulu Fivos, Alpha Coco, Bravo Metro, Coco Nectar, Delta Golf, Golf Queen, Kill Alpha, Lima Metro, Metro Lima, and Nectar N. A Net procedure by the YLA was perfect and messages were all in proper ARL. JZ was the first man on 21 Mc. B. A. B. A. and WLR. WLR now is Class B, and the other stations were back in 21-WLand, digging out snowbound trains (they're diesel specialists). KLY is really in the traffic game, FMS is recuperating from a long period of traffic: Break MCAN-4 after 11:00 P.M. (3000 kc.) Extrav! CMN is mobile (phone, etc.) KLS talks how come off frequency, etc... over the NBS, and the QTH book. One for the revolutionaries. Pappy, DTY finally did it! He changed jobs to be on the bands more. OHEL is grand- ular from LL. 8, 9, 10, 11, model new VW stock! LAXL reports WPF has an OT certificate from 1957170 CQ now is mobile all over. KYX gives its traffic line- way, on a dead band. KSL is completely break-up around the LAX emergency nets. PIB finally linked Virus X. A new train man on ECM (con't) gives a new club is starting in WLA. HK got himself a base- man at long last! WNSNNU is coaching a friend for the WSS exam. Besides a jillion others, GYH is licensed for MB 6. The Long Beach Club had a ham-booth at the L. H. Labby Show, with GAK as boothman. Notice DDE lately? The guy is everywhere there is a net, OP says its certainly a pleasure to listen to LSNC since FMG took over; a hot net if there ever was one. FYW reports WNS60XJ is a young's whose operations like an old-timer. LS3 has a new mobile on ECM, and B 146 (send, look) says, YLRC news, per CEE, president: WSV is the proud mom of a new jr. operator, WNS CQV and OZB are mother and daughter. They and DZP, KER, MFP, and NLM were among those at the April meeting. KGB is on 15, as is BTM, who worked the world including a VK on opening day. YXF is in M/M with WYA. KLE reports CQ VHF minds us that CUF made a record score in the SS Contest: two of his "students" have their WV tickets and two are coming up. Thanks to DGT, DHE, BWA, PIB, WOO, and YSK for reports. MU asks "what-happen" to 1077 CQV reports a goodie; He was asked by HQL and BHS to help get a medical prior. He gave him. WAK and Okla., had just been monitoring a W5 on MARS, broke him and then found his QTH as Lawton. The message was a last report of minutes from JA-2 and possible soundings. He lived! KFH (his son, 11, is WNS6LIM) has snappy remote control job. AREC notes per KSS, SEC. He regrets the realization of VMW's new "Hat. They did a grand job. New EC's: SW (Mt. Baldy); NSX (Long Beach); and VCU, back in harness for Glen- Area. He's mighty proud of WRAK. Typical TRC, reports a 8.5 grid. WEJK 3315. KYX 3000. GYH 1720, NCC 900, GMK 6/ 759, GJP 388, DDE/FAE 281, FLO 252, HO 106, BLY 150, HOZ 59, KOY 85, PIB 66, BLY 72, CMN 74, CK 54, GEE 52, OHX 47, LOZ 29, COF 20, FYW 17, KSS 16, PIB 11, DTY 2, DJR 2, WNS6UJ 2.

ARIZONA — SCM, Albert H. Steinbrocher, W7LVR — This is your new SCM's first activities report. PLC has now GP antennas on 10 meters, PZF, daughter of PLV, KFZ, her Adv. C.L.; KOL, YXL of MAE, got her Gen. C.L.; MID got her Ex. C.L.; and NXY got 2nd class "phone license. QRP is in Nicksolley, JCM, MLE, and PSE had good luck in the last CD Party. Tucson expects to have the Madeo W. Powell Memorial Station, GV, in operation in the new Red Center Building in Old Order B. Also, 2 meters are active, on FMX, LYO, LLA, LLD, YV, NNY, NYK, OPA, OXN, and TXM, with DX around the State. Also on 2 meters are HUG, LVR, NYN, and UQF. Anyone on these bands, please report your activities. LSJN and LSK are on 2 meters. We regret the pass- ing of THJ on March 20th. All appointments will remain active, as usual. WOG expiration dates and send endorsement. Additional appointments for RTM, RO, OBS, OES, OPS, and OBS are available to anyone interested. (Continued on page 104)
NEWS FLASH FROM HARRISON HAM HEADQUARTERS

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WEST GULF DIVISION

NORTHERN TEXAS — SCN, William A. Green, W5BKH — Asst. SCM, Joe G. Busch, SCUD, SEC: QOQ, RM: KH8, PAM: I6V, ETARC, under the guidance of W5GA and L6V, entertainers at the Commerce annual picnic. ARK, EC for Fort Worth, had an excellent exhibit at the Fair at the Commerical Club, and the Dallas Arc, thanks to radio WRR for the publicity program. Our SEC met with the Lamas Arc where c.d. plans were worked out with the police and the Chamber of Commerce. Trafic is still holding at a high level with 27 stations setting a record for this section. Super delivery was given by KBD, the closest 12 miles 9 hours behind a message. KXH calls meeting every night at 7700 ke, at 1900 with all hands welcome. OYH is on 3999 ke, with a pair of 4-125As in single sideband, the first in the state. New equipment of interest: TRV has a 75-watt rig, TLW has an all-band 150-watt amplifier and modulator, SQW/VXK has a new call, RPN has that Extra Class station, UXG has a 75-watt contact with his first traffic. Traffic: W6ENQ 1169, BKH 436, PAK 922, ARK 197, IOG 1301, CTY 151, SQW 115, QMB 51, SNX 130, LEZ 90, FOW 48, ARX 151, BKL 40, RMF 2, PFI 26, CWE 28, PBN 26, ASA 25, SGR 20, RHP 15, GRY 14, USS 18, SKQ 119, FYQ 8, OBY 7, UXY 5, WYX 1, OKLAHOMA — SCM, Joe M. Langford, RM: TBP, SEC: AGM, RM: OQO, PAM: GZK and ATJ. The Tulsa Radio Club has a very successful picnic at Claremore Saturday, May 4th, with a total attendance of 56, coming from Kansas for the event. Twenty-one models were in the lake, all the shippin' was on the most part of the models. A new call in the local area, W6JG, is a new resident of Oklahoma City. KLJ is working on new shack. The Easter Pages ran a feature from the Lawton Area was light compared to other years because of the mild weather but was handled in good shape and all cleared by Sunday evening. OZL will meet in form from May 31st until Sept. 2nd when the regular schedule will be resumed. OQO will vacate in California. FMS is back from Korea and at home in Eustis. The Southwestern Amateur Radio Club meets the first Monday of each month at the City Hall in Fredricksburg, Club call is UVX. KLJ is the president, with OQO as his senior vice president. OZL has wrecked SQW's schedules, BDX now is operating single sideband. FOM has 144-Me, antenna and soon will be active on that band. SNW and SQW are engaged in the radio business. OQO has moved to Cherokeee, Traffic: WSMRK 525, ROG 430, FOM 301, WIRJD 532, W6UGK 214, QVW 214, OGU 100, KLA 137, MCA 122, MCB 115, MQO 93, KY 32, FKL 60, GVY 55, CKQ 25, LXX 21, EB 11, HNF 10, SWY 10.

BAY SHORE TEXAS — SCM, Dr. Charles Ferrioglish, W5FF — RN5 meets on 3645 ke Mon. through Fri. at 900 CST, BJA in helping PDE got Class B and A tickets. CVQ is active at U of T. Of 21 classes, one of the most active is "The Emergency Net of Texas, sponsored by the Texas State Guard, is doing nicely at 3128 ke. The Odessa Radio Club not affiliated with ARRL, has been doing work scheduled traffic. OQO now has a 55-watt rig, 2500 ke, on calling commercial service. STV is a new club at T. The Bandit, with FBY-TVI headmaster, OQO, operates from Eustis. QPI operators operating in Conroe. W5STB gets up at 9:30 and goes to work DX, QSO, RTT, and son SIB are one of the most active ham families in East Texas. NBE is active on CERN and HEN and looking for 110-volt 60-cycle emergency plant. HSN now

Send reports and information for this column promptly after the 1st of each month. Traffic: W6ENQ 38, L6V, KMB, W5J8, SAN DIEGO — SCM, Mrs. Ellen White, WBYYM — Asst. SCM: Shelley E. Trotter, 6BA, Richard E. Hubbard, OLU, Thomas H. Wells, BAI, ETARC. SKX, XIK, DEY, and OQO is the largest monthly traffic yet to be submitted to your SCM was run up by H9X, of Camp Pendleton, for a total of 6048, April traffic, and the ARRL, has received their first BRAT certificates for April traffic. New to the new OQO, of Newport Beach. TZB's new harmonic is coming in with low power for attention these days. The Orange County Radio Club's class in Texas, and cosmo is now under with application. L6G has dropped his call and is reporting a 30-meter mobile rig. A new VY in the SD YLRL, W4UDP, is waiting for her new W6 call. Convention plans are being made in the Southwest. The Southern California Division ARRL Convention will be held locally in Balboa Park in October. For further dope, contact convention chairman, XX1. The YLRL Sunday night for its periodic net frequency, net meeting 9:00 p.m. PDT Wednesday nights. GMG is presenting JAWS, M1F, Jais, and hopes to be heard from in San Diego some time during this summer. JAWS is planning construction of a 32 ft. by 18 ft. ham shack in the near future. The section soon will report on its KGC to W4-Land. It's like readers of this column to seriously think of applicants for the post of SCM. My term is up in October, so get going and pick applicants for the post. For details on application, write: W6JQX 5645, BAI 765, ELQ 336, IZD 306, UTC 83.

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104

(Continued on page 106)
“PICON”

There’s a short but potent sentence in the Communications Act of 1934, as amended, which reads:

The [Federal Communications] Commission, if public interest, convenience or necessity will be served thereby, subject to the limitations of this Act, shall grant to any applicant therefor a station license provided for by this Act.

Thus the fate of an application for a new broadcast station, for example, may depend entirely upon the applicant’s ability to demonstrate that his proposed station will operate in the “public interest, convenience or necessity.” The phrase is so often used in Washington that it is sometimes shortened to “picon.”

There is no space on the application form for an amateur station license, you may have noticed, requiring your proof of “picon.”

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M ARITIME — SCM, A. M. Crowell, V3BQ — SEC: FQ, RM; OM: EC, EK. Recent visitors to the Balliar gang were DL1XK and W4SL. The former previously QSO'd OM and was his guest while here en route to Montreal. The latter was the guest of FQ, who is local "Northern Messenger" for all points north "when 14 Mc. is open." SI is the newest 3.8-Mc. mobile, and uses an ATR-5 in his station wagon. Welcome back to EC, who returns after a long illness. We expect to hear VE3EV, ex-CP, soon.

VQ6EP, on soon from Yellowknife, N.W.T., with a VES or fixed portable VES. Activist mobile in this area are BC, DQ, DT, FQ, GL, AW, and VT. J7 now is Official Observer. WL has his QSOs appointment. EK says things are not too good in BDU and DXCC at last but says 1.5 Mc was disallowed. Hi! KM, EC, HT, and LZ handled traffic during the Air Show at H.M.C.S. observer. IC has been quite active on 3.5-Mc. c.w. because of a landlord who has BCI. We hear via the grapevine that OM, our RM, and WL, our OBS, officially opened the 21-Me. band in the VE1 section. To be continued to (April). VQ6EP, 131, 1V 92, MK 57, AL 48, AAK 27, ZQ 23, AB3, ANJ 12, XX 11, HJ 10, DB 9, FR 6, ZM 6, FS 5, AE 4, AN 2, 4L 2. (Mar.) VE1IQ 120.

CANADA

MARITIME DIVISION

ONTARIO — SCM, G. Eric Farquhar, VE3AIA — Now located in Ottawa and looking for 14-Mc. contacts is BL, Telephon, ex-LAC, 5AD, now on the following reporters on the Ontario section net: ATR, BHM, BL, BME, BMG, BOE, BYR, BXX, DGA, DHV, DU.
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B. Knowledge of radio wave propagation, antenna design and construction of antenna.

The required personal qualifications are as follows:
A. Age, over 21 and must be able to pass a thorough physical examination. (B) Indicate a willingness to serve overseas extensively and in any location required.

Current starting salaries for non-supervisory radio operator-technicians range from $1410 to $2385 per annum. Salaries, leave, promotions, employee benefits, transportation and baggage allowances, cost of living differential allowances, etc., are in accordance with current government regulations.

Interested personnel are requested to write a brief application letter to Box 1116, Main Post Office, Washington, D. C. Considerable duplication of effort, will be avoided if the following outline is adhered to:

1. Experience and training.
   a. Number of months radio training and type (college, service school, technical or/and trade school).
   b. Number of years radio experience and type (military, merchant marine, commercial, government).
   c. Amount of this experience in telegraphy and amount in construction or maintenance.
   d. Present telegraph code speed.
   e. Present or past radio licenses, including amateur.
2. Marital status.

If your initial application appears promising, you will be sent further application forms upon which detailed information can be entered.

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DEPT. 7-2 FOR PRICES

EAM, EAU, GI, SQ, and WY. Toronto's simulated emergency test of April, under the capable leadership of WW, was well attended and successful. The Ontario Phone Net on 3765 kc. continues to be a popular outlet. TRN operates on Eastern Standard Time on 3075 kc. A hearty welcome to DXP, a newcomer in Kincardine. VD reports he is almost surrounded by plumber's delight's now. BLY tried out nine meters for a while after the Forward Node party but no DX is heard on AFARS. Though away from home quite a bit, BLY has not had much DX. QV and several others have been active on 50 Mc. QV is heard as 5G9P7 on the Forward Node. Several audiences at meetings of the Hamilton Amateur Radio Club and the North York Club of Toronto in the course of the expedition to the Cayman Islands, BQF tried out 21-Mc. folded dipole. Welcome to Hamilton, 8FB, ex-8FB. 8FB is doing a fine job with code. AB2A and a few others are active in CB. AB2A is a very capable operator and keeps W6 occupied. BGT has returned to AFARS. Home from Florida are DND and WY. HX8 keeps an eye on 21-Mc beam. The QV Club held their last 21-Mc. band. RVJ does a nice job editing the North York Club bulletin. AJR, with her mobile, enjoys Southern Ontario highways. The Ontario Phone Net held its annual dinner on 68th at Queen's Park, Stratford. Keep an ear to the mobile transmissions for details. Direct news from you follows. Would be appreciated. FQ and QV are also expected. QV is ex-VE2AGG and is on 75, 40, and 20 meters. Traffic: (Apr.) VE2AFR 185, BUR 120, BY2J 72, GI 50, EAM 39, JI 38, BMG 35, WY 25, PH 23, EAU 15, BPE 3, DPE 2, UJ 2. (May.) VE2BGR 25, BUS 22, PH 14, VE 6.

QUEBEC DIVISION

QUEBEC—SCM, Gordon A. Lynn, VE2GL — IW, whose usual hang-out is on 40 meters, has been giving 50-meter c.w. a whirl and recently has been heard to DX on that band. CA reports very little traffic and several skeds with the North Country missed because of poor conditions, and claims the first VE2 QSO on 50-Mc. was handled by working VE21L at 12:01 A.M. May 1st, VE2GQ and GI1DZE visited CA. AHY is building the rig with a pair of 813a for 28-Mc. AHY and DJH are in their respective districts. ANC is building a 10-meter rig with an 813, and at present is on all bands and 144-Mc. phone. EJ is building a 10-meter converter so he can participate in c.w. excursions. KG transmits ARRL bulletins each night on 1530 or 28,440 kc. and Sundays and Saturdays on 1350 or 28,550 kc. He has a 50-Mc. beam on top of a 50-Mc. tower with a five-element 144-Mc. beam stacked on the 10-meter beam. Chambly County-Laplacolle reception ARL1A fine, c.w. once in the St. Lambert Fire Station April 29th, with an attendance of 25 out of 35 enrolled members. AJO is quitting h.f. for 420 Mc. and is making good progress on his new receiver. WW has worked 6 countries and NI 10 countries on the new 21-Mc. band. WA claims 101 countries. YN is ex-VE2AGG and is on 75, 40, and 20 meters with 2500 in the final at 200 watts, reactance modulated for the 'phone band. AM8 is on 27-meter phone and is using 3500 watts with a pair of 507s. Traffic: VE2CA 24, GI 14.

VANALTA DIVISION

B.C.—U.COLUMBIA—SCM, Will Moorhouse, VE2UJ — The VARC held a dance which was well attended and many prizes were won. AMF is on in Alberni. Tyee Club news is expected soon. QJ has an excellent traffic total and is quite busy with his net work. AHQ is still awaiting his new tower. AMJ is active but nothing startling; he also is busy giving c.w. practice. AJG is interested in AEC. AHQ is on 70 meters from Victoria. LOB is on 21-Mc. with 350-plus watts finally. US discarded their 831 and went back to 810s at home station, ASA QSYs to 80 meters for skeds on DX. KHJ is now using the VE2AQ Land for DOT. Mobiles in use in B.C. are becoming more active for the summer. DD has been reappointed as SEC for another year. Alberni DARC has been reorganized with 25 members and should produce results. AFO-DD mobiles are having QSOs daily across lunch-tables. Y1D is active on AEC again. A new ham for the lower Fraser Valley is AQH. AQH is back on dry land and running 2 watts. SH finally broke the silence with 15-watt input. PFC has his 1.8 Mc. on 21-Mc. and is switching to 14-Mc. on call. DJH can always be counted on for contact on 375 kc. US again is mobiling in the interior of B.C. Traffic: VE2QC 90, Y1 17, DI1 9, AOI 6, AMJ 3, CX 2.

PRAIRIE DIVISION

SASKATCHEWAN—SCM, Harold H. Horn, V65HR — D SEC: BZ, PAM: JW, RM: TE. Activity has been low this month and so were reports. DZ reports being off the air for quite a few weeks but is now back in operation with quite a number of the boys giving it a try. The Moose Jaw gang, CO, HB, OM, AR, and NO are on every Sunday at 1300, as are the SM on 14-Mc. Yorkton gang also is getting on band. JF reports hearing signals on 50 Mc. but no DX. QL has a four-element rotatable wide-spaced beam and is operating 12-Mc. and is starting on transmitter next. JF now is QO5. LY also is CI4JAS on AFARS. UO has new Commander receiver. The Moose Jaw Club has a station with the call MA. HH got in on LO-NITE but the band was poor.

(Continued on page 110)
SONAR MOBILE Rcvr.
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Complete coverage for 10-11-20-75 meters. 8 tubes, 4.5 watts audio output. Uses 12AT7 RF stage and B.F.O. 12AT7 oscillator mixer (2) 6C66 I.F. stages. 6AL5 2nd detector and noise limiter 6AT6 1st audio 6AQ5 audio output 6B2 voltage regulator 1 Microvolt signal produces 0.5 Watt audio output. A.N.T. and B.F.O. are push-button operated.
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Model 2BR for 10-75 meters, net $54.95
Model 2BRN for 10-75 meters, net $49.95
Model 3BR for 10-20-75 meters, net $64.95
Model 3BRN for 10-20-75 meters, net $59.95
The LN series convertors are identical to the standard 2BR and 3BR convertors, less the noise limiters.

ELMAC-A54
Under-dash Mobile Xmtr.
Measures: 7 1/4" x 7 3/16" x 12" Weights: 14 1/2 lbs.
For Carbon Mike Input:...............Net $139.00
For Dynamic or Crystal Mike, Net $149.00
Power Supply, 110V AC, Net $39.50

FIRST IN THE EAST
THE NEW
BAY MOBILE ANTENNA
West Coast amateurs report terrific success with this 75 meter mobile antenna. Utilizing a new method of center-loading, it has outperformed others in on-the-air comparison tests. Overall length is 9' 3", trimmed, maximum diameter 1 1/2", and it is fully weather-protected by a fiberglass seal over its entire chromed brass base. $19.95

COMPLETE HANDSET SPECIAL
Has a single-button high-output carbon-mike and sensitive earphone with push-to-talk switch, 3-foot, 4-conductor rubber covered cable. Complete with mounting. A Real BUY..................$12.95

SUPERIOR POWERSTATS
Smooth, efficient voltage control. 0-1500 volts output from 115 volt AC line. Models also for 220 volt input. Write for free literature. Models for table and panel mounting.

In Stock for Immediate Delivery

RATNEY Transistors
Type CK716......$18.00

NOTE: In view of the rapidly changing market conditions, all prices shown are subject to change without notice and are Net, F.O.B., New York City.
BUY OF A LIFETIME!
TRIED AND PROVEN THE WORLD OVER

LETTER MODEL 240
TRANSMITTER WITH MOBILE CONNECTIONS AND
A.C. POWER SUPPLY

This outstanding transmitter has been acclaimed a great performer
throughout the world. It is excellent for fixed station
portable or mobile operation. Even if you have a
transmitter of your own you can afford to
miss this wonderful buy, direct from our factory.

The 240 is a 40 watt Phone-C.W. rig for 160 to 10 meters,
complete with: 8 x 14 x 8" cabinet, soft
tuned A.C. power
supply, MOBILE connections, meter, tubes, crystal and coils
for 40 meters, 2 tubes: 6V6 oct., 807 Final, 6G7 crystal
mike
eqmp., 6X7 phase inverter, 2 6L6's mod., 5U4G rect.
Weight
31 lbs. TVI instructions included, 90-day guarantee. Price
$79.95.
$25 deposit with order — balance C.O.D.
80, 20, 10 meter coils $2.01 per set. 160 meter coils $1.60.
Also for CAP, Broadcast, MARS, Marine, State Guard.

LETTER RADIO MFG. CO.
62 Berkeley Street
Valleymere, N. Y.

World Above
(Continued from page 69)

problem by connecting shielded series-tuned traps to ground
from both sides of the antennas pick-up winding on his
60Q7 converter for 144 Mc. They consist of slug-tuned
winding and 100-mfd. fixed condensers, two sets separately
shielded.

W6MBI, Coleta, Ill., sends in an interesting graph of the
signal levels measured in his nightly contacts on 140 Mc.
with W9XBB, with records of barometric pressure, weather
conditions and wind velocity for the same period. All the
high-signal dates show a barometer reading over 30, and still
air or wind of very low velocity. The total signal variation
over this 40-mile path is around 20 db. Crystal-controlled
transmitters and receivers, and 10-element arrays are used
at each end.

Here is news of interest to the v.h.f. fraternity of Southern
California, received too late for inclusion in its proper
spot in this department. The Two Meters and Down Club
of Los Angeles will hold a v.h.f. round-up and picnic on
July 27th at Buena Park. There will be mobile competi-
tions on all bands, and many other events for v.h.f. men
and their families.

This information is from W6MYK, who also included
results of the club's v.h.f. contest for the period ending
April 30th.1 The marathon mileage award was won by
W6AJF, with 12,712 miles. The expedition award went to
W6KIK/6 for his 100-mile work. The new All- California
v.h.f. activity award was won by W6MIF, with 470 con-
tacts. Dave noted out W6AJF, who had 462.

TURN "PRO" WITH
THE "BIG" LEAGUE

... And you'll
bat 1,000!!
YOUR AMATEUR EXPERIENCE MAY
QUALIFY YOU FOR A HIGH-PAYING
ELECTRONICS OR RADIO POSITION
WITH BENIX RADIO.

These jobs open.

- LAB. TECHNICIANS
- TECHNICAL WRITERS
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(Mech. & Elect.)

- ENGINEERING POSITIONS

We have openings in excellent positions which carry engineering
responsibility. If you have a good background of practical experi-
ence, you need not have a degree.

Write, Wire or Phone
MR. E. O. COLE Dept. L

Bendix Radio
DIVISION OF BENIX AVIATION CORPORATION
BALTIMORE 4, MD. Phone: TOWSON 2200
Manufacturers of the World's Finest
Electronic Equipment

"The QRM is getting rough,
But lightning can't strike here!"
Let's contemplate Simp's smoking bones
And shed a mournful tear.

Answer to QUIZ on page 10
your open door to HAM VALUES ... for 31 years

ELDICO
TR75TV
TRANSMITTER KIT
$59.95

MD40P Modulator Kit..........................$44.95
Grid Dip Oscillator Kit.........................29.50

EICO KITS
221K VTVM
$25.95
WIRED
$49.95

511K VOM Kit .................................$14.95
536K Millimeter Kit .........................12.90
P75K HF Probe Kit ..................................3.75
P75 Probe Wired..................................5.95

AMATEUR SPECIALS
Aerovox .05 mf. 7500 VDC oil-filled condenser 75¢

.05 mf 2500 VDC GE oil filled condenser 75¢
.5 mf 600 VDC oil filled bathub Aerovox 25¢
2.0 mf 600 VDC oil filled Micamold 75¢
.006 mf 2500 VDC Mico C-D 10¢

Sprague Koolohm Resistor
120 watt 10,000 ohm — 75¢

Toggle switches SPDT and DPST — 29¢ ea.
RG59U coaxial cable — $4.50 per 100 ft.

GONSET
TRI-BAND CONVERTER
$47.60
10-11, 15, 20 and 75 meters

GONSET
“COMMANDER” MULTI-BAND TRANSMITTER $124.50
Frequency range 1.5 to 54 mc.

New Gonso “Scout” Converters Single band converters for 10-15-20 or 75
meters ...............................................$39.95

Gonso Noise Clipper ................................ 9.25

SPECIAL
110 Volts AC from 6 Volts DC. Torado
Converter Supplies 45 watts 110 VAC
from auto battery .................................$11.20

Lafayette TWO-WAY INTERCOM

Complete 2-way system with tubes (5085,
35W4, 12AT6), cord, plug and
50 feet of hookup wire. For 110V,
AC or DC operation, P24999.. 1795

Complete electronic equipment buying guide
for the radio amateur, experimenter and
service engineer. Drop in for Free Copy

Scotty Says
Get your order in early for the
Gonso “Commander.” Mark
your order to my attention
on this and the Specials for
prompt attention.

DUNCAN SCOTT W2LAI

Free Lafayette Radio Radio Wire Television Inc.
NEW YORK 13, N. Y.
100 SIXTH AVENUE
REctor 2-6600

BOSTON 10, MASS.
110 FEDERAL STREET
HUBbard 2-7850

NEWARK 2, N. J.
24 CENTRAL AVENUE
MArket 2-1661

BRONX 58, N. Y.
562 E. FORDHAM RD.
Fordham 7-8813
144-Mc. Amplifier

(Continued from page 15)

800 watts on c.w. These levels represent a lot more power than we need most of the time on 2, however, so the 4-125As are usually loading along at 200 to 300 watts input, with everything running a comfortable black.

In general, the manufacturer's typical operating conditions may be followed closely with excellent results. There is one slight variation that appears helpful: there is always a tendency for v.h.f. rigs to draw excessive plate current, and we have found it possible to run high values of plate current at relatively low plate voltages effectively with these tubes. They take 600 watts input with a 1500-volt plate supply beautifully, by running the screen voltage somewhat above the typical value of 350. With the heavy plate loading, there is a lower-than-average screen dissipation, and everything runs nicely. Flipping one switch drops the screen voltage to 300 and the final plate voltage to 800. The input with the same loading is then around 200 watts, which still makes an impressive 2-meter signal.

And what about TVI? Well, it varied with different receivers, but there was no r.f. interference that could not be cured readily enough. For test purposes, we have a system whereby a typical "fringe area" signal can be put into the receiver on any channel from 2 through 13, and this rig was operated in conjunction with nine different receivers on each of these channels. There was a very slight pattern on some of the receivers having 21-Mc. i.f. systems, apparently the result of 24-Mc. output from the oscillator stage of the exciter. Receivers having 45-Mc. i.f.s showed a similar pattern from the 48-Mc. stage in the exciter. These patterns had nothing to do with radiation from the final stage, and thus were independent of power or antenna location.

There was image TVI on Channel 2 in one receiver, and the tripler passed some energy on 192 as well as 144 Mc. There was some 192-Mc. pattern from the 48-Mc. exciter stage (4 x 48 Mc.), and it increased as the three stages in the transmitter were turned on individually, causing fairly bad interference in Channel 9. This same sort of thing develops in Channel 10 as the frequency is raised much above the low end of the band. The cure here is the same as for any harmonic trouble, except that it should be easier in this case, the trouble having been caused in the low-level stages. The transmitter is designed so that shielding can be added, and a low-pass filter, details of which will appear in QST at a later date, can then be inserted in the antenna circuit to guard the 192-Mc. radiation.

There was no interference from the 144-Mc. radiation from the transmitter on eight of nine receivers checked on all channels, 2 through 13. We feel safe in saying that, if you have TVI with a 2-meter rig, it is probably the result of trouble in the lower-frequency stages, or it is audio pick-up that is present only with amplitude modulation.
**3-BAND RADIO**

**KARADIO MODEL 80-C**, 3-band mobile receiver for under-dash mounting. Covers broadcast band 540-1650 KC; 2.9-7.5 MC; 4.8-17.5 MC, which includes the 75 and 20 meter bands. 6 tubes: 6BA6 RF, 6BQ5 Mixer, 68A6 IF, 5AT6 demod.—1st Audio, 6AQ5 output, 6X5GT rectifier.

Vibrator power supply mounted in metal case with 6" PM speaker, for fire-wall mounting. 3-ft. plug-in cable included. Receiver only 4¼" high, 6¼" wide, 6" deep. Mounting hardware, complete manual, fused battery lead, included.

Front panel RF gain control, Audio, Band Switch, Tuning.

Here's an excellent mobile receiver at a nice saving. Regular price is $110. We have just 2 to sell at $69.00. Standard 90-day RTMA warranty.

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**8/8/8 MFD. 500 V. D.C.**

Triple 8 mfd. 500 working volt D.C. oil-filled condenser, common negative, solder terminals, hermetically seated, 5" x 3¼" x 2¼". A one-time buy. $1.95

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**PHOSPHOR BRONZE AERIAL**

125 ft. of the finest aerial wire obtainable, 42-strand phosphor-bronze with linen center. Will not stretch, very high tensile strength, diameter approximately same as No. 14 copper, very flexible. Excellent for transmitting or receiving antenna, control cable, guy wire.

Regular list $4.95.

90¢

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**POLARALARM—EMERGENCY MONITORS**

PR-31 (30-50 Mc, FM) 115V, AC-DC. $44.95

PR-8 (152-163 Mc, FM) 115V, AC-DC. $44.95

AR-2 (106-122 Mc, AM) Aircraft band. $49.50

M-51 (30-50 Mc, FM) 6 volt mobile. $72.50

M-101 (152-163 Mc, FM) 6 volt mobile. $72.50

---

**ELMAC-A54**

Under-dash Mobile Xtrntr.

VFO or Crystal control. Direct-reading FVO on all bands—75, 20, 15, 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, 6A8G, 6C4, 12AU7, 2A6G, 807 (Included). • Only 7½" x 7½" x 12", 1/2 lbs.

For carbon mike input ................................................................. $129.00

For Dynamic or crystal mike ...................................................... $149.00

Power Supply, 110 Volt AC ..................................................... $39.50

ELECTRO-VOICE 210 Mobile Carbon Mike ............................... $17.10

ELECTRO-VOICE 600D Mobile Dynamic Mike ............................ $33.10

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**MORROW 3-BAND CONVERTER**

• Single point tuning: high image rejection, birdies negligible
• Automatic Noise Limiter—Built In
• i-Microvolt Sensitivity—All Bands
• Antenna trimmer on front panel
• Beautiful Grey Hammertone Finish
• Low drift, Pre-calibrated Oscillator
• Full Wvth Dist.—Calibration Accuracy 1%
• AVC On Preselector, No Strong Signal Blocking
• I.F. Amp. with 4 Tuned Circuits, Output 1525 Kc.
• Complete with Mounting Hardware, Manual

$64.95

Hi-Q, 20 cell to base load 96" whip ....................................... $8.95

Hi-Q, 75 cell to base load 96" whip ....................................... $7.95

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**MONITOR RADIO 2-meter RECEIVER**

Model AR-3. 110-149 Mc, AM, 115V, AC-DC, 6 tubes, crystal diode. Variable sensitivity, improved squelch, drift compensated, Black plastic cabinet. 10½" x 6½" x 7", 5" PM speaker, W.L. 5 lbs. $49.50

Your order will receive my personal attention and will be shipped the same day order is received. We distribute all top-flight amateur lines...let us know what you need.

73, Julie Burnett, W8WHE

---

**STEINBERGS**

**SUPER SPECIALS**

833 WALNUT STREET • CINCINNATI 2, OHIO
The Siamese Paddle

(Continued from page 16)

The paddles are made of pieces of \( \frac{1}{2} \)-inch polystyrene or lucite sheet, 2\( \frac{1}{4} \) inches long and 1 inch wide. A hole to pass a machine screw that fits the knob hole in the key arm is drilled in each paddle, \( \frac{1}{2} \) inch from one end. Most key knobs have a standard 8-32 thread. The exact manner of mounting the paddles depends on factors to be discussed presently.

If you can locate a piece of \( \frac{1}{2} \)-inch steel or brass, you can add a weighting base with rubber feet like the conventional bug. The base shown is 6 inches long and 3 inches wide. Be sure that the mounting screws on the underside of the bakelite base don’t protrude so as to short on the metal base. If the weighting base is omitted, the key can be screwed or cemented to the operating table. Rubber cement sets quickly and yet permits removal without difficulty. Also, it will not mar the finish of an operating table.

Adjustment

The adjustment of the key depends largely on the personal preferences of the operator. I have mine adjusted so that both sets of contacts cannot be closed simultaneously. However, many of those who are using electronic keyers of the self-completing type find possible many short-cuts in the forming of certain characters and increased ease of handling in other ways if it is possible to close both circuits at once when desired. For instance, closing the dot side while dashes are being sent does not interfere with the sending of dashes. Therefore, when both sides are closed, the change-over from dashes to dots can be accomplished merely by opening the dash side. Actually, it is necessary to open the dot side only for spaces.

As shown in the photograph, the paddles are mounted on the inward sides of the key levers, with the heads of the 8-32 screws also on the inside. With this arrangement, it may be necessary to bend the key levers slightly if it is desired to prevent closing both circuits at the same time. Place a thickness or two of paper between the contacts of each key and press the two paddles together between the thumb and forefinger. Then the levers should be bent slightly so that when the paper is pinched securely between both sets of contacts, the heads of the 8-32 screws are in contact.

After the photograph was made, an arrangement making this adjustment more convenient was found. The paddles were placed on the outer side of the key levers and the screws were reversed with the heads on the outside. A locknut was first run onto each screw. Then the screw was passed through the paddle, threaded into the key lever and then fastened with another locknut on the inside. Now the above adjustment can be made simply by adjusting the screws with a screwdriver and locking with the two nuts. I prefer the wider paddle spacing that results with
Fellows — NOW is the best time to trade for a new receiver or transmitter. Our stocks are complete — our prices are LOW. I'll give you the best deal on your used equipment. WRL gives you • TAILOR-MADE TERMS • LOWER PRICES • LIBERAL TRADE-INS • COMPLETE STOCKS • PERSONALIZED SERVICE. You'll benefit most by dealing with WRL, "One Of The World's Largest Distributors Of Amateur Radio Transmitting Equipment."

We Finance Our Own Paper—No Red Tape—No Delays (Special attention given to foreign orders)

Leo I. Meyerson WØGFQ

"NO TVI with GLOBE KING 400B XMTR!"

Sam Brodsky, W4JZQ, 418 E. Colonial Ave., Elizabeth City, N.C., is an enthusiastic WRL GLOBE KING owner who writes the following unsolicited letter:

"There is no TVI generated from the GLOBE KING 400B which I purchased from you. I can run the XMT at a full 400 watts and the transmitting antenna is only 8 ft. away from the TV antenna with no TVI filter on my TV set or on the XMT; just a brute force filter in the AC line. I get no TVI on my TV set."

Signed, Sam Brodsky, W4JZQ

NEW WRL 400B GLOBE KING XMTR

KIT FORM WIRED-TESTED $475.00 $495.00

WRL 165 WATT GLOBE CHAMPION XMTR

(less accessories)

KIT FORM $329.50 WIRED $349.50

WRL 40 WATT TROTTER XMTR

More Watts Per Dollar

KIT FORM $89.50 WIRED $99.50

NEW ELMAC-A54 UNDER DASH XMTR

Mobile

VFO or Crystal control. Direct-reading. VFO on all bands—75, 20, 11, 10. • Plate modulation • Completely band-switching, tone 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 3-6AGS, 6AR5, 6CA, 12AU7, 2-6L6G, 807. (Included). • Only 7½" x 7½" x 12", 14½ lbs.

For carbon mike input $139.00
For dynamic or crystal mike $149.00
Power Supply, 110 Volt AC $39.50

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For mobile or fixed stations. Spiral binding—turns up—flies flat. Full column log listing all FCC required info. Log will accommodate 1,525 stations. Front and back covers show "Q" signals, phonetic alphabet, and amateur international prefixes. 25¢

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Just right for your control room. Page size: 28" x 36". Contains time zones, amateur zones, monitoring stations. Mail coupon today and............. 25¢

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URGENTLY NEEDED

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Degree in electrical engineering or degree in journalism and several years of practical radio experience.

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DOW CO-AX RELAY
FOR 52 OHM LINE

FEATURES

1. Insertion in 52 ohm co-ax line causes negligible change in s.w.r. up to 100 Mc.
2. Handles power up to 1000 watts.
3. Internal to transmit position it grounds receiver antenna lead. This protects receiver against injury from r.f. and reduces to a minimum the capacity coupling between receiver and relay contacts.
4. Fits standard connectors for RG-8/U co-ax.
5. No chatter. Specially built for “Silent operation”.
6. Externally mounted SPDT switch operated by relay can be used for opening B+ of receiver when transmitting, or for other control purposes.
7. Over-all length 4 1/4”, Over-all width 3”.

NET 115 volt AC (for fixed station) $12.50
PRICES 6 volt DC (for mobile use) 11.50

See your distributor, but if he has not yet stocked Dow Co-ax Relays, order now direct from factory. Send check, money order, or will ship COD. F.o.b. shipping point: Warren, Minn., or Winnipeg and Montreal, Canada.

Dealers: Inquiries invited.

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578 Goulding Street
Winnipeg, Canada

THE DOW-KKEY CO.
2210 Wilson Avenue
Montreal, Canada

this arrangement, although others may prefer the closer spacing when the paddles are on the inside. It will usually be possible to use the screwdriver adjustment, even with the paddles on the inside, although it may be necessary to file the nuts down to fit the space between the key levers.

If simultaneous closing of both sides of the circuit is desired, adjustment is merely a matter of setting the contact spacing, bearing play and spring tension to suit the operator, using the adjusting screws already provided on the keys for these purposes. If you have a light touch, it may be necessary to change the springs to lighter ones, or to cut a turn or two off the existing springs and stretch to fit the space.

In the electronic-keyer circuit, the “arm” connection will be made to one of the terminals connected to the frames of the keys, while the two “side”-contact connections will be made to the terminals connected to the straps leading to the stationary contacts. Depending upon how these two “side” contacts are connected, the keyer can be operated either right-handed or left-handed. Simply reversing these connections reverses the operation.

Getting the Most
Into Your Antenna

(Continued from page 81)

if you try to use a parallel-tuned coupler in circumstances that call for the use of series tuning, you just won’t get maximum performance from your antenna. Selection of the right type involves drawing a sketch of the current distribution on your particular system. This is easier if you get in the habit of thinking in terms of quarter wavelengths at the frequencies you plan to use. For example, a quarter wavelength at 3725 kc. (the center of the present Novice assignment in the 3.5-Mc. band) is 62.9 feet. It is safe to round this off to the nearest whole number, or 63 feet.

You know, then, that in whatever system you choose to erect, the distance between the end of the antenna and the first maximum current point is going to be 63 feet. Measure off the flat top and the feed line, and sketch in the current pattern so that you have a drawing that resembles one of those shown in Fig. 1. Indicate the points at which current maxima and minima occur, and when you have reached the end of the line you will have a pretty good idea of what conditions will be encountered there. For example, in sketch C of Fig. 1, if your feed line has to be short, terminating at points A and D, you will know that parallel feed is required, because the feed point is at (or near) a current minimum. The same applies if the feeders are a half wavelength longer, ending at DD’. If the feeders can be a half-wave long,

(Continued on page 118)

1 This computed from the formula

\[
\frac{1}{f (\text{Mc.})} = \frac{498}{1 \text{ (feet)}}
\]

which appears on page 28 of the A.R.R.L. Antenna Book.
EICO KITS

145K Signal Tracer $19.95
221K V.T.V.M. 25.95
315K Signal Generator (De luxe) 39.95
320K Signal Generator 19.95
322K Signal Generator 23.95
360K Sweep Generator 34.95
400CK Conversion Kit (Push-Pull 5" Scope) 8.95
425K 5" P.P. Scope 44.95
511K Multitester 14.95
526K 1000 ohm per volt Multimeter 13.90
555K 20,000 ohm per volt Multimeter 29.95
625K Tube tester 34.95
950K Resistance Capacitance (Bridge & R.C.I. Comp.) 19.95
1040K Battery eliminator & charger 25.95
1171K Resistance decade 19.95
P75 RF Probe (Xtal type) for VTVM 5.95
P76 RF Probe (Scope) 5.95
HVP-1 Hi-Voltage probe 6.95
Write for circular on wired instruments.

The New Modern Answer to Variable A-C Voltage Control of 50-100-150 Watt Loads
Type 10 POWERSTAT
More efficient than the wasteful, heat-dissipating resistance type controls. Less space is required. Not only is it compact but since it does not produce heat there is no ventilation problem. Ruggedly constructed for long life and dependable service. Easily adapted to any load within its rating. Smooth control is assured by glass smooth commutator surface and advanced winding technique. Conservatively rated with rated output current available at any brush setting. Simple mounting to back-of-panel by means of a single hole. Locked in position by keying arrangement.

INPUT OUTPUT
120 Volts 0-120 Volts
60 Cycles 0-132 Volts 1 Phase 1.25 Amperes
150/165 VA
8.50

Universal Modulation Transformers
Tapped Series-Parallel Cots. Provide a Wide Range of Modulation Ratios

<table>
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<tr>
<th>Type No.</th>
<th>Pri. Impedance</th>
<th>Pri. M.A. Per Side</th>
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<td>A-3104</td>
<td>2000-2000</td>
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<td>2000-2000</td>
<td>2</td>
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<tr>
<td></td>
<td>2000-2000</td>
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<th>Output Tubes</th>
<th>Ohms Impedance</th>
<th>Max. M.A.</th>
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<th>Output Tubes</th>
<th>Ohms Impedance</th>
<th>Max. M.A.</th>
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<td>PP6L6, 607, RK41, HY66, HY61, HY26</td>
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<td>A-3111</td>
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Polystryrene

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<tr>
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Sheet-Clear Masked Both Sides

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<th>Size 12&quot; x 24&quot;</th>
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<tr>
<td>1/16&quot;</td>
<td>$2.50</td>
</tr>
<tr>
<td>3/32&quot;</td>
<td>2.75</td>
</tr>
<tr>
<td>1/8&quot;</td>
<td>3.00</td>
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<tr>
<td>3/16&quot;</td>
<td>3.75</td>
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<tr>
<td>1/4&quot;</td>
<td>4.60</td>
</tr>
<tr>
<td>Larger Thicknesses Up to 1&quot;</td>
<td></td>
</tr>
</tbody>
</table>

Prices on Request

If not rated 25% with order, balance C.O.D. All prices F.O.B. our warehouse New York. No order under $2.00. We ship to any part of the globe.

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ANTENNAS
FOR
THE 10 and 20 METER BANDS
FEATURING
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• ADJUSTABLE SPACING
All these outstanding features WITH
THE SAME HIGH GAIN but at NO
INCREASE IN PRICE

Write for Descriptive Literature
U.H.F. RESONATOR CO.
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with Greenlee Radio Chassis Punches

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... cut accurate holes in chassis for
sockets, plugs, controls, meters,
panel lights, etc. with GREENLEE
Punches. In 1-1/2 minutes or less
make a smooth hole in metal, bakel-
ite or hard rubber up to 1/16" thick.
Easy to operate. Simply turn with
ordinary wrench. Wide range of sizes. Write for details.
Greenlee Tool Co., 1857 Columbia Ave., Rockford, Ill.

points BB', you should expect to use a series-tuned coupler, because the feed point shows a
current maximum. If it works out so that the point
of the feed line is midway between a current maxi-
mum and a current minimum, as shown at points
CC', don't give up the ship; you can still lick
your problem. It is sometimes possible to lengthen
or shorten the feeders to get away from this inter-
mediate point merely by rearranging the route
taken by the feed line on the way into the house.
If this is impossible, you can add length right
inside the operating room by the simple exped-
ient of adding on a few feet of 300-ohm Twin-
Lead. This is not the best way in the world to do it,
but in most cases the power loss in the Twin-
Lead will be negligible when compared with the
benefits obtained by getting better coupling than
you would have been able to obtain without it.
In low-power stations (150 watts or less), the
Twin-Lead is able to stand the strain admirably.
If you prefer to be really efficient about it, refer
to the methods shown in the Antenna Book, but
the Twin-Lead dodge will work almost as well.

In the case of the single-wire antenna shown in
Fig. 1A, the length is of less importance, because
the pi-section coupler can cope with almost any
conditions. It is good to know, however, whether
you are going to have to feed the end of the wire
at a point of high or low current. This can be
determined, of course, by drawing the curves as
in Fig. 1. If the length of the “single-wire” an-
tenna can be made to come out so that it is
resonant at the operating frequency, it will be
much easier to get power into it than if it is a
random length. Resonant or not, it will probably
not do quite as good a job as either the Zep or
the center-fed antenna for the reasons explained
earlier. It is, however, usable in emergency condi-
tions and in locations where the use of something
better is impossible. In most cases, it is advisable
to connect the chassis of a pi-section coupler to
a good external ground. This is especially true in
cases where the antenna must be less than a
quarter wave length long. The ground connection
can be to either a cold water pipe in the house or
a metal rod driven several feet into the ground just
outside the house.

In summary, then, the use of a resonant an-
tenna is suggested, because it is the easiest way to
eliminate coupling problems. While a single-wire
antenna will work, it is not as apt to radiate the
power where it will do the most good. It is better
to put up either a Zep, or a center-fed antenna
with a balanced feed line, and of these two, the
center-fed is by far the most flexible.
A subsequent article, a direct follow-up of this
one, will describe the construction and use of an-
tenna couplers suitable for the Novice, and will
provide the bridge between the fundamentals
discussed here and their practical application.

5 How much Twin-Lead to use depends upon the dif-
ference in length between the end of your feeders and the next
quarter wavelength point. In cutting the required length of
Twin-Lead, multiply the number of feet required to make
up the deficiency by 0.82, to compensate for the difference in
velocity factor between the open-wire line and Twin-Lead.

RECEIVERS
Collins 75 A2 with speaker .............................................. $469.00
Hammarlund HQ-128-X with speaker ................................. 214.00
RME-59 with speaker ................................................. 213.00
National new model NC-183-D with speaker ..................... 285.50
National HPS with power supply ..................................... 295.50
National HRO-5911 with speaker .................................... 235.00
National SW-64 ........................................................... 49.95
Hallicrafters new model SX-73 ....................................... 976.00

Hallicrafters SX-62 less speaker ..................................... $289.50

Hallicrafters SX-71, less speaker .................................. 199.50
Hallicrafters SX-71 portable, less batteries ....................... 169.50
Hallicrafters S-721, marine band portable, less batteries ....... 119.25
Battery pack for Model S-72 ......................................... 4.50
Hallicrafters S-76, less speaker ..................................... 169.50
Hallicrafters S-77A ...................................................... 99.95
Hallicrafters S-80 ........................................................ 49.50
Hallicrafters S-81 ........................................................ 49.50
Hallicrafters S-82 ........................................................ 49.50
Hallicrafters Speakers for models SX-62, SX-71, S-76 ............ 19.95
Battery pack for Model S-72 .......................................... 33.85
Mallory VP-557 Vibropack output 400 VDC @ 150 ma. ........... 33.65

Single button carbon hand MICROPHONES with push-to-talk switch, similar to T-17B. MADE IN ENGLAND. Each ................................ $3.95

BARGAIN SPECIALS
4, 8, & 16 prong ceramic sockets made by Johnson. Each ........ $ .20
3-plate circuit relay, 8000 ohm, DPDT, connect close @ 8 ms. Each ........................................... 1.95

TRANSMITTERS
Johnson Viking Transmitter Kit less tubes, mike or crystal. $299.50
Full Kit of Tubes ...................................................... 39.00
Johnson VFO Kit, less tubes .......................................... 45.75
Kit of Tubes ............................................................. 28.95
Harvey-Wells TSB-50C Bandmaster Senior .......................... 111.50
Harvey-Wells TSB-50D Bandmaster Deluxe ........................ 137.50
Elmac Portable Transmitter Model A-54, uses carbon mike 138.00
Elmac Portable Transmitter Model A-54H, uses crystal or variable mike ........................................ 140.00
Collins Model 3353 Variable TRANSMITTER, crystal ............... 775.00
Lyco Model B-129 Transmitter 10 meter, less tubes ............... 26.95
Lyco Model A-175 Transmitter 10 meter, less tubes ............... 28.95
Lyco Model A-140 Transmitter LAF meter, less tubes ............. 26.95
Lyco Model B-11 VFO, less tubes .................................. 26.95
Lyco Model 401 Modulator, less tubes ............................. 19.95
Elidco 2 meter transmitter kit ..................................... 49.95
wired and tested ................................................. 74.95
Elidco GDO kit, wired and tested ................................ 49.95
wired and tested ................................................. 74.95
Millen 9054 Grid dip oscillator ..................................... 61.00
Morrow Converters, Model 3 BR for 16-45 meters .................. 54.95
Morrow Converters, Model 3 BR for 10-15 meters ................ 42.35
Gonset Model 3002 Tri-band Converter ............................ 47.60
Gonset Model 3002 2 meter Converter ................................ 42.95
Gonset Model 3002 3-30 meter Converter .......................... 44.75
Gonset Steering Post Bracket ...................................... 3.95
Gonset Noise Clipper .................................................. 9.25
Elidco 2 meter Receiver Kit, Complete ............................ 59.65
Elidco 2 meter Receiver Kit, wired and tested ..................... 89.95

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MB70938 Capacity 3-36 mfd., 1000 vac. spacing, .................. 2 1/2 3.75 $ .75
MAF716 Capacity 10-75 mfd., 1000 vac. spacing, ............... 3 1/4 2 1/4 1 1/4 .70
MA60912 Capacity 10 mfd., 1000 vac. spacing, ................... 1 1/4 1 1/4 1 3/4 1 1/4 .35
MA60996 Capacity 25 mfd., per sec., 6200 spacing, butter- ry type .................................................. 1 1/4 1 1/4 1 1/4 .35
Acorn tube sockets made by EF Johnson for 958, 958, etc. tubes. .................................................... .20
2 mfd, 1000 V pyranol cond. ....................................... 2.95
2 mfd, 3000 V pyranol cond. ....................................... 9.40
4 mfd, 3000 V pyranol cond. ....................................... 9.40
220 vac, 110 volt primary sec, 117 volt tapped at 104, 81, 78, 65, 32, 31, 26, 13 @ 40 ma. .................. 1.95
Claroat 50 watt rheostat, 250 ohm ................................ 1.25
DeJarl 50 watt rheostat, 50 ohm .................................. 1.25
DeJarl 50 watt dual 2000 ohm .................................... 1.95

USED EQUIPMENT
Hallicrafters SX-62, with speaker ................................ $175.00
Harvard SX-42, with speaker and kit base ........................ 125.00
Hallicrafters S-72 Portable—LIKE NEW—less batteries ....... 95.00
Hallicrafters S-20R ................................................... 40.00
Bird VC-21 variable frequency oscillator ........................ 35.00
Gonset 2 meter Converter—LIKE NEW ............................ 59.00
RME-69 Receivers with noise clipper and speaker................ 75.00
Hallicrafters SX-43 with speaker—LIKE NEW .................... 100.00
Hammarlund SP-4100X Bandmaster—LIKE NEW .................. 124.00
Harvey-Wells Bandmaster Senior—LIKE NEW .................... 130.00
National NC-260D with speaker .................................... 175.00
Driven Arrays
(Continued from page 51)

db. to an S point. The author's thanks are due to the numerous VQ stations who have cooperated in these tests.

Good DX reports have been obtained from all directions on 14 Mc., although the steep slope of the ground makes it impossible to get the angle of radiation just right for all directions. On 28 Mc. reports from W, VE, ZE, ZS and VQ have been very satisfactory in spite of adverse conditions during most of the tests, but certain other directions have proved difficult apparently because of an unsuitable angle of radiation. In this respect the performance should be neither better nor worse than that of other types of beam, and no difficulty should arise with a normal flat site and a height of 40 or 60 feet.

Happenings
(Continued from page 58)

77) The vote having been taken, the result of the ballot was announced by the tellers as follows:
Whole number of votes cast ........................................... 18
Necessary for election .................................................. 10
For Mr. Bailey ............................................................. 7
For Mr. Dosland ............................................................ 11
Mr. Dosland, having received the majority of the votes cast, was thereupon declared by the tellers to be elected President of the League for a term of two years. The Chair congratulated Mr. Dosland upon his election. (Applause) Mr. Dosland spoke briefly in appreciation. (Applause)

78) On motion of Mr. Groves, a unanimous standing vote of applause was given to Mr. Bailey in appreciation of his services to the Board and the League.

79) Nominations for First Vice President being in order, Mr. Roberts nominated Mr. Groves. Mr. Johnston nominated Mr. Noble. Whereupon, on motion of Mr. Jacobs, unanimously VOTED that the nominations are closed.

80) The vote having been taken, the result of the ballot was announced by the tellers as follows:
Whole number of votes cast ........................................... 18
Necessary for election .................................................. 10
For Mr. Groves ............................................................ 11
For Mr. Noble ............................................................... 7
Mr. Groves, having received the majority of the votes cast, was thereupon declared by the tellers to be re-elected First Vice President of the League for a term of two years. (Applause)

81) Nominations for Vice President being in order, Mr. Noble nominated Mr. Handy. Whereupon, on motion of Mr. Reid, unanimously VOTED that the nominations be closed and that the Secretary be instructed to cast one ballot electing Mr. Handy Vice President of the League for a term of two years.

82) Nominations for Secretary being in order, Mr. Dosland nominated Mr. Budlong. Whereupon, on motion of Mr. Brabb, unanimously VOTED that the nominations be closed and that the Secretary is instructed to cast one ballot electing Mr. Budlong as Secretary of the League for a term of two years.

83) Nominations for Treasurer being in order, Mr. Griego nominated Mr. Houghton. Whereupon, on motion of Mr. Roberts, unanimously VOTED that the nominations are closed and that the Secretary is instructed to cast one ballot electing Mr. Houghton as Treasurer of the League for a term of two years.

84) Mr. Griego reported for the Membership and Publications Committee, following which extensive discussion ensued. On motion of Mr. Roberts, unanimously VOTED that the Board wishes to express its satisfaction to the League's management for its efforts in the membership campaign enunciated as a result of the 1951 Board meeting

(Continued on page 128)
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Newer and better bargains are contemplated, but under a new name—CONCORD RADIO of New York.

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and that it is expected that this campaign will be continued and intensified in all phases in which success has been indicated.

85) During the course of the above action the Chair announced that with the concurrence of the new President-elect, the following committee appointments are made for the coming year:

For the Finance Committee:
Mr. Noble, Chairman
Mr. Hill
Mr. Hughes

For the Planning Committee:
Mr. Brabb, Chairman
Mr. Groves
Mr. Johnston

86) On motion of Mr. Hill, unanimously VOTED, after discussion, that all divisions of the League which exceeded the national average in membership increase during 1961 are commended.

87) On motion of Mr. Watkins, unanimously VOTED that the Membership and Publications Committee be retained for one year to aid and direct the Headquarters staff in implementing and conducting the membership campaign previously authorized by the Board.

88) On motion of Mr. Roberts, unanimously VOTED that, pursuant to the terms of the Trust Agreement under the Pension Plan, the following persons are appointed to serve as a Pension Committee from this date until June 2, 1963: Arthur L. Budlong, George Grammer, David H. Houghton.

89) Moved, by Mr. Brabb, that, pursuant to Article 7 of the Amended Articles of Association, the Board now appoints three directors to the Executive Committee. But, after discussion, with the permission of his second, Mr. Brabb withdrew the motion.

90) On motion of Mr. Brabb, unanimously VOTED the Board now proceeds to the designation of an additional director to the Executive Committee as required under the terms of Article 7 of the Amended Articles of Association. Whereupon, on motion of Mr. Hill, the Board unanimously VOTED to designate Mr. Noble as a member of the Executive Committee.

91) At this point, at 12:40 p.m., upon request of the Board, the Chair directed that all Headquarters staff personnel retire from the meeting; at 1:10 p.m., at the request of the Board, they rejoined the meeting.

92) On motion of Mr. Reid, the following resolution was ADOPTED:

WHEREAS, the position of General Manager of the League has for a period of over five years been a position to which a salary of fifteen thousand dollars ($15,000) per annum was attached; and whereas the Board has from year to year heretofore employed Arthur L. Budlong to fill that position on a temporary salary somewhat less than the position's requirements.

Now, be it RESOLVED, that effective May 1, 1962 the salary to be paid Mr. Budlong is to be that prescribed for the position of General Manager, viz., fifteen thousand dollars ($15,000) per annum.

93) At this point, Mr. Hughes invited directors to attend the Pacific Division Convention which is to be held in San Francisco the weekend of July 4, 1962. Mr. Griggs similarly invited members of the Board and the Headquarters staff to attend the Southwestern Division Convention at San Diego the weekend of October 11, 1962.

94) Whereupon, on motion of Mr. Johnston, the Board adjourned sine die at 1:17 p.m.

95) In the course of its deliberations the Board also discussed, without formal action, 1800-2000 kc. privileges and subdivisions, the Canadian reciprocal licensing treaty, 21-Mc. TVI, mailing of Director Letters to retiring directors, amateur traffic nets, Canadian subdivisions, IARU band planning, engineering standards for amateurs, policy on use of director administrative funds, coordination of TVI committee efforts, ARRL membership and amateur license figures, and the new Novice promotional booklet. Time in session, as a Board: 9 hours, 41 minutes. As a Committee of the Whole: 3 hours, 9 minutes. Total time in session, 12 hours, 44 minutes. Total expenditures authorized, $18,900.

A. L. Budlong
Secretary
Heathkits are completely engineered instruments supplied unassembled. Every kit goes together smoothly and easily. All drilling, punching, and painting has already been done for you.

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Save money by constructing your own. All expensive wiring and assembly costs are completely eliminated.

Detailed construction manual shows clearly where each wire and part goes and tells exactly how to build the kit. Write for free catalog.
YLV News and Views
(Continued from page 59)
operators. Both YLs obtained their tickets through classes held at the hospital. . . . W3RXV and W5RZJ recently received their MARS calls and W81DB regularly operates the MARS station at Wright-Patterson Air Force Base in Dayton. . . . WN4UDQ, Dorothy, is a new Novice in Tennessee, and KZSKA, Catherine, is a new Canal Zone YL. . . . Anita, ex-W8STY and now W4JCR, is living on the highest mountain around Asheville, N. C. She's hoping the elevation will help her contact many of her old YL friends. . . . OM GS3FKE aments that of approximately 7000 amateurs in England, only about 20 are members of the fair sex. . . . W1PJT, member of the Concord Bragg-pounders and custodian of the Worked New Hampshire

Four Canadian YLs who help keep YL activity thriving in VE-land are VE3DEX, Violet (lower left), who concentrates on 80 c.w. and builds most of her own gear; VE3BGC, Marie (lower right), who also likes 80; VE3DTW, Ethel (upper left), who, with the OM, operates 10 and 2 from the Port Weller Lighthouse on Lake Ontario; and VE3DGT, Margaret (upper right), who is at home on all bands from 80 through 10 meters. Certificates, reports that Dottie, WJ3SH (Cornville, Pa.), was the only YL to work all N. H. counties in the WNH QSO Party. . . . The L. A. YLRC gave a dinner for W6WVS, the Club's Publicity Chairman, three weeks before Carol's new son arrived. . . . W5ZL FEA CEY GQZ H1D MWU FJF QVQ ZKD ZYD and WAK7Z attended the Fresno Radio Club's annual hamfest in May. . . . Since receiving her license in 1938, W55SZ has spent most of her operating time on forty. . . . Judy Volpe, age nine, daughter of W1LEL, passed the Novice Class examination and is awaiting her call. . . . W8CGJP, who planned entertainment for XYLs at the "Ham-Vention" sponsored by the Dayton Amateur Radio Assn., reports that the following YLs enjoyed ham doings at the affair: W3UUG, W5PYT GJP HDB HUX HWX JLP RVP and W5JJH JUU and QLH. . . . While touring Europe this spring, W6UXF enjoyed the hospitality of G3ACC, Meg, and G2YLN, Nell. . . . We are sorry to record the passing of W8SLS, Edna McGeorge of Los Gatos, California. Edna was an active YL until the onset of serious illness two years ago.

Miscellany

The YLRL Photograph Album and Club Scrapbook are available for display at YL meetings and gatherings. If either or both books are desired, please write to YLRL Publicity Chairman, W1QON.

Wonder how many YLs have passed the Extra Class exam? We'd like to hear from those who have made the grade. Any "grandmother-class" girls among us?

In response to many requests for the information, we'd like to ask how many teen-age or younger YLs there are in the world over. YLs sixteen or under, do drop us a card, so we'll know who you are and approximately how many of you there are.
MAKE THIS YOUR HOME FOR IMPORTANT WORK UNDER IDEAL CONDITIONS

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- ELECTRONICS ENGINEERS
- FIELD ENGINEERS
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Rated from 25 to 150 watts, they are available in various types including variable center link, fixed center and end-linked models and straight, without link. Write for B & W catalog.

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BARKER & WILLIAMSON, Inc.
237 FAIRFIELD AVE., UPPER DARBY, PA.
Mast Loading and Guying
(Continued from page 44)
a few days in advance by several alternate layers of roofing compound and impregnated burlap or cloth commonly used for roof patching.

Resonances
Any flexible structure is subject to "resonances," which must be classified under "undetermined" factors. The values given in Tables I and II are based on ample factors of safety, and no resonances should be encountered.

Resonances can be damaging, but frequently they can be overcome by various changes that will change the natural frequency — after the source is located — including:
1. Moving guy points on the mast.
2. Damping the vibrations by wrapping the mast with heavy tape at two or three points along its length, or by plugging the ends with wood dowels 1½ to 3 feet long.
3. Cushioning the base of the mast with an 8-by 24-inch crosseted wood block (cypress or redwood preferred), laid over 6 inches of cinders or sand, and grounding the base of the mast electrically with a wire and ground rod.

160-Meter Rig
(Continued from page 50)
increased slowly while checking the stability. For normal operation at maximum legal input, the screen voltage is raised to 350 and the plate

A view of the VFO section with the cover removed. The inverted 6AG7 socket is just to the left of the tuning condenser. RFC1 is to the front of the 6AG7 socket, the shielded wire connected to the choke is the keying lead. The grid coil is mounted on a half-inch cone insulator. The paddle condenser is mounted on a "U"-shaped bracket to the right of the tuning condenser.

voltage to 1200 or 1250. The coupling to the antenna or load can then be adjusted to bring the power input up to 200 watts.

As mentioned previously, the rig works quite
(Continued on page 188)
The NEW GONSET 2-METER TRANSMITTER-RECEIVER

Another GONSET first, answering the need for a complete two meter fixed-portable unit, the new GONSET 2-METER TRANSMITTER-RECEIVER provides an ideal unit for home, mobile and portable use.

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- T.V.I. Proof
- Super-het receiver
- Small size — 8½ x 10½ x 6 deep
- Universal power supply, 110 VAC—6 VDC.
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- Needs only microphone and antenna to go on the air

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- 2" VISUAL ALIGNMENT

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electrical stability. Does not appreciably
alter the "Q" of R-F coils.
• Q-Max is easy to apply, dries quickly,
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flux on tinned surfaces.

In 1, 5 and 55 gallon containers.

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MARLBORO, NEW JERSEY
(MONMOUTH COUNTY)
Telephone: FReehold 8-1880

How's DX?
(Continued from page 67)
in TIKKI... AC8PT, the Maharaj Kumar of Sikking,
fills a 40-meter sesh with 60 wats from a 6LO-507 rig. He
receives with an AR88. Located in The Palace, Gangtok,
the Maharaj writes a enthusiastic letter to W1BDI about
conditions and the like. He looks forward to working W/VEs
on conditions improve... W2TXB's experiences on
the QSL front go like this: "Last year... I sent out 211
QSLs to which 72 did not reply, 33 per cent. I sent 106
direct by air mail or regular mail and 31 failed to reply.
Of 105 sent via QSL bureau, 41 did not reply. I would like
to take off my hat to the W7Es — wonderful! of these and
each one in a different country. I came through with
cards."... VP5RN of Jamaica takes time out every six
weeks, to clean up all QSL deabs. He ships 'em out via
bureaus and all incoming cards are answered. Those interested
in direct replies or replies via air mail must accom-
modate with IRCL... F7AS (W6KEM) accompanied
F7BB to Monaco as A24AQ. The station was on
the air for four days in late April with a 30-watter, an
HRO and a V beam oriented U.S.A.-ward. There was A3
operation on 20 and 40, c.w. on 20, 40 and 80. While con-
ditions for W/VEs were extremely odorous, a long list
of contacts accumulated. Jim remarked on the excellent
welcome and hospitality put forth by 3AE officials.
Andorra is next on F7BB's agenda... GM3ZX re-
ports the bands poor in general and hears that AP2IR
(11IR) will operate from a spot very close to Tibet. Also,
that Q6AFO will operate as Q6AFO immediately if
not sooner. The M16US gang is curious about one W7KTH
"in Antarctica" and 04AAA. [The latter sounds like a
refugee from a tube socket, Bass. — Jeeves].... GM3C8M
was to meet W6s AM and MA at the Prestwick
airport on the first leg of the Wallace European tour
One-hundred-twenty-five EA QSOs (with at least
three for each of the nine EA call areas) will qualify you
for the Esdras Diploma offered by URE. Write the
society for complete details. Twelve Ws have
earned the "Worked Cuba" award sponsored by ARALY.
Seven QSL cards confirming contact with each of the
seven geographical CM/CO call areas (CM1 through CM9,
excluding CM4) will do the trick. "4X4W1X" is the
title of an award presented by IARC of Israel. QSLs
verifying sixteen QSOs with 4X4W on four amateur bands
(Continued on page 150)
When You Plan Your Civil Defense Nets, You'll Get Longer Range with Premax ANTENNAS

Whether it's RACES, the Amateur Net in CD, a mobile job on 75 or 20, or a CAP or Marine fix, you'll find Premax Low-Cost Antennas will give you more range and stronger signals. Convenient, easy to install — just what you need.

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ATTENTION, VIKING 1 OWNERS

Available thru your JOHNSON distributor, the VIKING 1, TVI SUPPRESSION KIT. Included are all the necessary custom made shields, chokes, capacitors and hardware. Simple installation is assured by careful design.

The shield encompassing the transmitter chassis fits inside the standard Viking 1 cabinet without affecting its appearance or operation. Perforated etched aluminum shield panels are formed and punched, ready for assembly. The lid of the shield is removable for ready access to tubes and crystals. Completing the shielding are; an aluminum chassis bottom plate, meter shield and shield for the dial aperture. Assembly is by means of thread cutting screws furnished.

The individual filters consisting of low inductance chokes and ceramic disc capacitors are located as follows: meter leads keying lead, VFO power socket, PA high voltage lead, PA screen and buffer plate supply. Similar filters are provided for the AC line, filaments and for a lead to actuate an antenna relay. Antenna relay terminals are included for those desirous of adding this accessory.

Equipped with the TVI SUPPRESSION KIT, installed in accordance with instructions furnished, a JOHNSON LOW PASS FILTER and an effective ground, it is possible to operate the VIKING 1 transmitter in virtually any location without television interference.

250-20 • Low Pass Filter ........................................... Amateur Net $16.50
250-21 • VIKING 1, TVI Suppression Kit ....................... Amateur Net $24.75

E. F. JOHNSON COMPANY WASECA, MINNESOTA
are required. Write IARC for the pitch in detail. KX6AO (ex-KH6VB-KM6AO) is looking for Novices on 11 meters. Chuck has a BC-610, a 3-element rotary on 10 meters and a Storba on 20. He finds the latter band consistently good in the late Kwalapin evenings.

Some choice results from W5KUC’s West Gulf DX Bulletin: KP4K is ex-2FB of 1912. ZL1HY may put the ZM7 prefix to work on Union Island. W5GRF paid a personal visit to Q2NL. The West Gulf DX Club held a hang-up meeting in Shreveport where an election of officers installed W5KUC president, W5CEW vice-pres, W5UCQ secretary and W5FCN treasurer. Chosen for the club policy committee were W5s ASG EKG ENE KC and MJS, to work with W5KUC and CEW. - “Jules” notes: It’s Rio de Oro for EA88W around September. Lately available are FL8MY, 4W1MY, VR4AF, VR7AB (Nauru), 07A0W and ECQ6QL (Truk). Good luck!

W1RWS pulled the QSL-of-the-Month from his office mailbox. It’s an I1YAK card confirming a 14-Mc. phone QSO with W4OSU.

Correspondence

(Continued from page 69)

NOVICES SPEAK UP

Editor, QST:

I deplore the trend in radio magazines in general that treat the Novice as a rank newcomer to radio theory. Most Novices I am sure are well up on their theory — they just can’t send or copy the code fast enough.

— Jerome S. Miller

Kellogg Star Route

Oakland, Ore.

Editor, QST:

I do not know if this matter has been called to the attention of all radio amateurs or not, but the fact that there are so many high-power transmitters operating in the Novice band of 2700–2750 kc, limits my hobby to the more quiet hours. I am sure that I speak for many Novices running low power that would like to operate when that band is at its best. We all can take QRM in our stride — but I am sure there is a solution to this problem.

— John R. Barrett, W7NPS

PUBLIC SERVICE

e/o U. S. Veterans Hosp.

San Fernando, Calif.

Editor, QST:

With some time on my hands at present I have been trying to assist in my own mind my place in the scramble by various agencies for hams to operate civil defense and/or disaster relief stations.

I hear and read about CAP, MARS, AREC, and here in California the Defense and Security Corps (National Guard Reserve), all trying to recruit hams. Each has a set of assigned frequencies, call letters, procedures and network of stations. In addition, competition seems to exist as to who arrives first or is best organized.

What confuses me is this: Where do I stand? Is the ham to join a quasi-service organization in order to most fully utilize his potentialities or should he affiliate with all and juggle call letters, etc., as he meets with the many varied services.

— Arnold D. Sentergut, W6PSY

[Correction Note: Coordination and cooperation with non-amateur agencies and organizations, especially the military, civil defense and the Red Cross, are of paramount importance. We believe this can best be accomplished necessarily by individual-amateur participation in one to the exclusion of others, but through the medium of the amateur service’s own emergency organization, the Amateur Radio Emergency Corps (AREC), which works with and for all agencies to the degree public need and service require.]}
FOR MOBILE COMMUNICATIONS

Users of FM 2-Way Radio Communications equipment throughout the entire nation, find Polic-Alarm and Monitoradio a welcome innovation to low-cost mobile communications radio.

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6 VOLT MOBILE
M-51 Tuneable 30-50 MC (Illustrated)
M-101 Tuneable 152-163 MC

115 VOLT AC-DC
PR-21 Tuneable 30-50 MC
PR-8 Tuneable 152-163 MC

AIRCRAFT 115 VOLT AC-DC
AR-2 AM Tuneable 108-136 MC
AR-3 AM Tuneable 118-149 MC
(includes the 2-meter Amateur Band)

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131
HAM-ADS

(1) Advertising shall pertain to radio and shall be of nature of interest to radio amateurs or experimenters in the U.S. or the British Commonwealth of Nations.

(2) No display of any character will be accepted, nor can any advertising be placed on the back cover, except those articles or items, as shall be acceptable and agreed upon by the Editors, respectively.

(3) All advertising must be submitted in writing as shown in the first paragraph below, fully identify the ad, and be accompanied by payment. All advertising that is sent in full must accompany copy. No cash or check discount or agency commission will be acknowledged.

(4) Closing date for Hams-Ad is the 25th of the second month preceding the month of publication.

(5) A special rate of 75¢ per word will be applied to advertisements from Federal Communications Commission or its authorized and appointed officials. This rate shall be strictly limited to commercial in nature and is placed and signed by a member of the American Radio Relay League. Thus, advertising of bona fide surplus equipment owner, used and for sale by an individual or apparatus offered for exchange, or advertising information for special equipment, if by a member of the American Radio Relay League, take the 75¢ 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 50¢ rate. Provisions of paragraphs (1), (2) and (3), apply to all advertising in this column regardless of which rate may apply.

(6) Advertisers or sellers who care to be easily located, is requested that addresses or materials be printed. (a) No advertisement may use more than 100 words in any one issue or more than one ad in one issue.

Having made no investigation of the advertisers in the classified sections of this publication, WGCX, cannot be responsible for such integrity or for the grade or character of the products or services advertised.


MOTOROLA used communication equipment bought and sold, 2437 Grande, Times Square, E. FAirview, N. J.

SUBSCRIPTIONS, publications a specialty, Latest Call Books, $2.50. Earl Hunt, Huntington, West Virginia.


5-Eastern 2-meter beams. Riverside Tool Co., Box 87, Riverside, Ill.

WANTED: Your surplus radio receivers, transmitters, ARC-1, ARCI-3. We buy anything. What have you? Allen 150 Carlot Ave., Brooklyn 5, N. Y.

WLS—SWL's Meade W8KXX, 1507 Central Avenue, Kansas City, Kans.

W3HCA—W6QW, W7LW, W6NN. Please write for prices.


OUJS—M3E, Meade W8KXX, 1507 Central Avenue, Kansas City, Kans.

ORJ—SWL at 5,000, W7LM, Little Rock, Miss.


ORL—WANTED: Your attendence at the Mid-American and Dakota Division ARRL Convention, September 5 and 6, 1952. Nicollet Radio, Minneapolis, 1140 E. Lake St.

OSC—LS: Fluorescent OLSs radiant and glowing with quality-control.

ORS—Kromekote three colors and up. Rainbow maps, OLSs, samples rushed. 10c. Uncle Fred, Box 80, Lynd, Pa.

ORS—QSL, and SWL card samples. WISON, Minner, Cannad, N. H.

PICK—phone patch schematics, practical discussion. $1.00. Nichols Ithaca, N. Y.

W4B—Wanted: top prices paid Navy seamen 1G, 1U, 2F, 2G, 2H, and 3C-43, 4C-221, AV-12, A1-AR, AN-AR, and AR-AR.

W5B—WANTED: Top prices paid Navy seamen 1G, 1U, 2F, 2G, 2H, and 3C-43, 4C-221, AV-12, A1-AR, AN-AR, and AR-AR.

W6A—WANTED: Top prices paid Navy seamen 1G, 1U, 2F, 2G, 2H, and 3C-43, 4C-221, AV-12, A1-AR, AN-AR, and AR-AR.

W6A—WANTED: Top prices paid Navy seamen 1G, 1U, 2F, 2G, 2H, and 3C-43, 4C-221, AV-12, A1-AR, AN-AR, and AR-AR.

W6A—Instructive for sale. Almost new 117 VAC: model audio oscillator, variable, 9000, 5000, 2500, 1000, 500, 250, 100, 50, 25, 10, 5, 2, 1 volt, $5.00.

W6A—WANTED: Top prices paid Navy seamen 1G, 1U, 2F, 2G, 2H, and 3C-43, 4C-221, AV-12, A1-AR, AN-AR, and AR-AR.

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The No. 90651
GRID DIP METER
The No. 90651 MILLEN GRID DIP METER is compact and completely self contained. The AC power supply is of the "transformer" type. The drum dial has seven calibrated uniform length scales from 1.5 MC to 300 MC plus an arbitrary scale for use with the 4 additional inductors available to extend the range to 220 kc. Internal terminal strip permits battery operation for antenna measurement.

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CRYSTALS FOR THE CRITICAL

The small, compact H-17 is designated as a military type crystal for its use in mobile units common to the military. Frequency range: 200 kc to 100 mc. Hermetically sealed holders; wire-mounted, silver-plated crystals.

"High Gear" Response to High Power Maintenance!

Dawn or dusk, it doesn't matter. These heroes of the high wires arrive to stop power trouble before it starts. Their "nose for disaster" is in the service truck, in the mobile radio unit which often relies on JK crystals and monitors to keep their assigned radio frequency on the beam!

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SANDWICH 6, ILLINOIS
VERSATILE AND COMPACT

Few instruments will prove so handy in so many ways as this versatile B&W Model 600 Dip Meter. Ideal for lab, production, service, or ham shack use, it provides a quick, accurate means for measuring resonant circuit frequencies, spurious emissions and many other tuned circuit characteristics. Shaped for easy use in today's compact electronic assemblies, highly sensitive and accurately calibrated, it incorporates many features previously found only in higher-priced instruments. You'll find dozens of uses for it as . . .

... A Grid Dip Oscillator for determining resonant frequencies of tank circuits, antennas, feed line systems, and parasitic circuits; aligning filters and traps; peaking coils, neutralizing and tuning xmitters before power is applied.

... An Absorption Wave Meter for accurately identifying the frequency of radiated power from various xmitter stages; locating spurious emissions causing troublesome TVI and BCI, and many similar uses.

... An Auxiliary Signal Generator providing a signal for tracing purposes and for preliminary alignment of receivers, converters, and 1-P stages.

... An R-F Signal Monitor for audible observation of hum, audio quality, and other audible characteristics of radiated power.

... For Capacity, Inductance, and "Q" measurements in conjunction with other components of known value.

A Quality Instrument Priced Within Reach of All

✓ Covers 1.75 to 260 mc. in 5 bands
✓ Adjustable sensitivity control
✓ Handy wedge-shape for easy access in hard-to-get-at places
✓ Size 3" x 3" x 7". Weighs only 2 lbs.
✓ Monitoring jack and B+ OFF switch
✓ Rust-proofed chassis, aluminum case
✓ Built-in power supply for 110 volts A.C.

Sold by B&W distributors throughout U.S.A. and Canada. Data bulletin sent on request.

PRICE $48 net

BARKER & WILLIAMSON, Inc. 237 Fairfield Avenue, Upper Darby, Pa.
Dual Conversion! 12 Tuned I. F. Circuits!
Here now — the HRO Sixty — latest and greatest of a great series! Now, in addition to all the wonderful features of the HRO-50T1, you get dual conversion on all frequencies above 7 mcs. plus 12 permeability-tuned circuits in the 3 456-kcs. I. F. stages! Other new features include current-regulated heaters in the high-frequency oscillator and the 6BE6 mixer. High-frequency oscillator and S-meter amplifier are voltage regulated.

Be sure to see and hear the ultimate — the HRO Sixty!
Why RCA-developed beam power tubes
are best for your transmitter

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.

...for economy—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 (per tube)...and every frequency from 1.8 to 148 Mc.

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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.

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