The UTC type HQ permalloy dust toroids are ideal for all audio, carrier and supersonic applications. HQA coils have Q over 100 at 5,000 cycles...HQB coils, Q over 200 at 4,000 cycles...HQC coils, Q over 200 at 30 KC...HQD coils, Q over 200 at 60 KC...HQE (miniature) coils, Q over 120 at 10 KC. The toroid dust core provides very low hum pickup...excellent stability with voltage change...negligible inductance change with temperature, etc. Precision adjusted to 1% tolerance. Hermetically sealed.

<table>
<thead>
<tr>
<th>Type No.</th>
<th>Inductance Value</th>
<th>Net Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>HQA-1</td>
<td>5 mhy.</td>
<td>$7.00</td>
</tr>
<tr>
<td>HQA-2</td>
<td>12.5 mhy.</td>
<td>7.00</td>
</tr>
<tr>
<td>HQA-3</td>
<td>20 mhy.</td>
<td>7.90</td>
</tr>
<tr>
<td>HQA-4</td>
<td>30 mhy.</td>
<td>7.50</td>
</tr>
<tr>
<td>HQA-5</td>
<td>50 mhy.</td>
<td>8.00</td>
</tr>
<tr>
<td>HQA-6</td>
<td>80 mhy.</td>
<td>8.00</td>
</tr>
<tr>
<td>HQA-7</td>
<td>125 mhy.</td>
<td>8.00</td>
</tr>
<tr>
<td>HQA-8</td>
<td>200 mhy.</td>
<td>9.00</td>
</tr>
<tr>
<td>HQA-9</td>
<td>300 mhy.</td>
<td>10.00</td>
</tr>
<tr>
<td>HQA-10</td>
<td>5 mhy.</td>
<td>10.00</td>
</tr>
<tr>
<td>HQA-11</td>
<td>12.5 mhy.</td>
<td>10.00</td>
</tr>
<tr>
<td>HQA-12</td>
<td>20 mhy.</td>
<td>9.00</td>
</tr>
<tr>
<td>HQA-13</td>
<td>30 mhy.</td>
<td>8.00</td>
</tr>
<tr>
<td>HQA-14</td>
<td>50 mhy.</td>
<td>7.50</td>
</tr>
<tr>
<td>HQA-15</td>
<td>80 mhy.</td>
<td>7.00</td>
</tr>
</tbody>
</table>

These U.T.C. stock units take care of most common filter applications. The interstage filters, BMI (band pass), HMI (high pass), and LMI (low pass), have a nominal impedance at 10,000 ohms. The line filters, BML (band pass), HML (high pass), and LML (low pass), are intended for use in 500/600 ohm circuits. All units are shielded for low pickup (150 mv/gauss) and are hermetically sealed.

Stock Frequencies

(Numbers after letters are frequency)

| BM-60 | BM-1500 | LM-200 | BM-400 | BM-100 | BM-3000 | LM-500 | BM-1000 |
|------|--------|--------|--------|--------|--------|--------|--------|--------|
| BM-120 | BM-1000 | LM-1000 | BM-200 | BM-400 | BM-1500 | LM-2000 | BM-1000 |
| BM-400 | BM-1500 | LM-500 | BM-1000 | BM-3000 | LM-1000 | BM-1000 | LM-500 |
| BM-100 | BM-3000 | LM-1000 | BM-400 | BM-1500 | LM-2000 | BM-1000 | LM-500 |
| BM-200 | BM-1000 | LM-1000 | BM-400 | BM-1500 | LM-2000 | BM-1000 | LM-500 |
| HM-200 | HM-1000 | HM-1000 | HM-1000 | HM-3000 | HM-1000 | HM-1000 | HM-1000 |
| HM-1000 | HM-3000 | HM-1000 | HM-1000 | HM-3000 | HM-1000 | HM-1000 | HM-1000 |
| HM-2000 | HM-4000 | HM-1000 | HM-1000 | HM-3000 | HM-1000 | HM-1000 | HM-1000 |
When you're part of a communications chain during an emergency, you need tube stamina that will match your own—the ability to "take it" for hours on end. Types like General Electric's 6BQ6-GT are your answer!

Better-built . . . better-tested . . . and more efficient! Because of its high permeance, the 6BQ6-GT develops a substantial plate current (100 ma) with low plate and screen voltages, giving you the ideal all-around tube for small transmitters.

In fact, the 6BQ6-GT will operate at close to full input with plate voltages as low as 100 v. This means that for portable or emergency rigs, a couple of 45-v batteries or an auto-radio power supply will work the tube satisfactorily.

Get complete facts from your G-E tube distributor! Learn the economy price of the efficient, reliable 6BQ6-GT . . . also the low prices of other finely-made G-E tubes, teaming up to offer you premium dependability plus premium value! General Electric Co., Electronics Department, Schenectady 5, N. Y.
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The Collins 75A-2 amateur receiver is not a phone man’s dream and a c-w man’s compromise. Nor vice-versa. It is specifically, separately engineered to give surpassing service to each.

As shipped from the factory, for instance, the selectivity of the 75A-2 is adjusted to 4 kc at 6 db down and about 12 kc at 60 db down (selectivity knob at zero — crystal filter out). With the selectivity knob set at 4, the bandwidth is approximately 200 cycles at 6 db down and 6.5 kc at 60 db down. An excellent balance for intelligibility on phone and sharpness on c-w.

But if a dyed-in-the-wool c-w operator wants still more selectivity, it is a simple matter (explained in the instruction book) to adjust to 2.5 kc at 6 db down and 10.5 kc at 60 db down, with the crystal filter out.

The 75A-2 has a separate front panel controlled c-w noise limiter, designed to accomplish this one purpose in the best way it can be done. It consists of a shunt type circuit, following the first audio amplifier, which acts on both positive and negative portions of the audio cycle and positively cuts off all interfering noises at any level desired. This limiter noticeably decreases nerve fatigue and enables the operator to copy c-w signals which would not be readable without it.

The 75A-2’s highly stable BFO injection is designed for optimum reduction of heterodynes between incoming signals.

For the best in amateur radio, it’s . . .

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11 West 42nd Street, NEW YORK 18 2700 West Olive Avenue, BURBANK
JULY 1951
VOLUME XXXV • NUMBER 7

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July marks the entry of a new class of licensee into the amateur fold ... the Novice. We welcome the Novice as one who takes the first uncertain step into the fascinating world of amateur radio ... with its rich background of comradeship, loyalty, public service and searching experimentation. The transmitter of the Novice operator must have accurate frequency control ... crystal control with its complete dependability. May we suggest that—from the start—you depend on PR's for frequency. They will never let you down ... as old-timers have found out since 1934.

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

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

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

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

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"It Seems to Us..."

WELCOME, NOVICE!

On July 1st there goes into effect for the benefit of you, the newcomer, and for the first time in amateur history, an arrangement drastically revising downward the minimum requirements for entrance into the scientific hobby of amateur radio. To the extent that there has been any change in entrance requirements in past years, the tendency has been to increase the standards (example: upping the code from 10 to 13 words per minute some years ago). The purpose of this apparent reversal in thinking is to attract more persons like you to the field of amateur radio on a one-year apprenticeship during which you can develop your interests and skills to a point where you can meet the present standards and become "full-fledged" hams.

And so, Mr. Prospective Novice, the Commission and the League and the individual League members are all going to have a particular interest in you. We hope that if previously you've been discouraged in the progress of your code practice with oscillator or buzzer, you'll get up at least to the 5-w.p.m. requirement of the Novice license, pass your exam, and continue building up your operating and technical skills in actual on-the-air practice — a scheme of learning while doing. We're going to be watching that progress, and we're going to do everything possible to speed your advancement and to see that the bug bites you so thoroughly that you won't rest a minute until you've gone after the regular ticket.

One of our biggest contributions toward that end is the revision of W1AW's code-practice schedule to include plenty of sessions at the lower speeds useful to the person just starting out. In fact, the 5-w.p.m. speed is directly comparable to what you'll get in the Novice exam. And there are speeds of 7½ and 10 to furnish additional practice, since it's always well to have a little margin in your ability before actually going up for the exam. See "Operating News" in this issue for the complete W1AW code-practice dope.

But that isn't all. You’ll find, too, an increasing amount of material in QST more directly useful to you as a beginner. The magazine's primary responsibility is of course to our amateur members, a philosophy with which you'll surely agree when you become one of the fraternity. Meanwhile, you must expect the average QST technical article to be a bit over your head — just as it was well above ours when we started. But you don't make any progress unless you tackle something that appears over your head at the start — so don't turn the pages too quickly just because something looks a little rough on first inspection. In any event, we'll have suitable material each month right up your alley — simple transmitters such as that described in our last two issues, simple receivers such as those now in the works in our lab and to be described in forthcoming issues, and such additional things as basic workshop practice articles similar to the story in this issue on mechanical design and layout.

Now, we hope you have clear sailing, but if you run into trouble and just can't get something to behave properly, don't forget the ARRL Technical Information Service. Write us concerning any individual technical problem you may have, and chances are that we can put our finger right on the difficulty. And sing out if you have any licensing or regulatory problem. We're here to help all we can.

If you're like most of the rest of us, your primary object in ham radio is communication. Nothing can compare with the thrill of the first QSO, with equipment you have constructed or assembled with your own hands. You'll probably be a bit shaky the first time (yes, we were, too), but you'll find out where the other fellow is located, and how good your signal is coming in at his shack, and maybe you'll make a schedule to talk with him again a subsequent evening. The bug will bite, but good. Maybe you'll want to put up a better antenna, or the present one in a different direction, or redesign the rig to see if you can get a few more watts "soup" out of it (no more than 75 watts input of course!). This combined operating and technical interest will bring you quickly to the point where you'll be ready for a crack at a regular five-year ticket.

One thing you don’t want to overlook is joining a local radio club if there’s one in your vicinity. We hams are a pretty fraternal bunch, as you probably know or have guessed, and there are over 600 clubs affiliated with the League. You'll find members more than willing to give you a hand to help you along.

Yes, OM, come on in — you'll find the water fine.
LICENCE RENEWALS—DON’T WRITE FCC

What with personnel shortages, delay in securing official forms, and the heavy load of renewal applications in 1951, FCC’s amateur licensing branch is swamped and running badly behind for the first time in some years. If you write or wire FCC concerning the whereabouts of your license application, an employee has to spend time looking up the matter and answering you—time which could better be spent in working on the backlog. The plea from FCC is: don’t write us—please be patient—we’re turning out the work as rapidly as we can.

Because of this problem, there have been some instances in which processing of an amateur application for renewal has been delayed beyond expiration date, ordinarily meaning that the license has to cease operation. However, FCC has just ruled that if you have applied for renewal before expiration date but do not have a response from FCC by expiration date, you may continue your regular amateur operation until you do hear from the Commission concerning your application. This applies only to applications for renewal; if your application has additional aspects such as modification for change of address, etc., they are not included; FCC says only that you may continue operating under the privileges specified in the license being renewed.

One moral to this is to get your renewal applications in to FCC at the earliest permissible date—120 days before expiration. Check your ticket now!

144-MC. RECORD BROKEN!!

California—Texas Two-Way Work in June V.H.F. Party

All previous records for two-way work on 144 Mc. were shattered by a wide margin on June 10th. The 2-meter band was open across Southwestern U. S. A. for about two hours, beginning around 5 P.M. PST, W6WSQ, Pasadena, W6ZL, Glendale, and W2PJA/6, Lakewood, California, worked W5AJG, Dallas, and W5QNL, Texarkana, Texas, distances of 1200 to 1400 miles. This is the first 2-meter DX to be worked from California.

On the basis of last-minute information it is not possible to determine what propagation medium was responsible, but presence of high-density sporadic-E ionization over most of the country indicates that this is how the achievement came about. Extremely mountainous intervening terrain would seem to rule out tropospheric propagation.

Details in August QST.

MILITARY MANEUVERS REQUIRE
AMATEUR COÖPERATION

To protect low-power military communications operations in 3700-3800 kc. in connection with maneuvers centering in the Carolinas, amateurs are requested to observe the following conditions during the period August 6th to September 7th:

1. For amateurs in North Carolina, South Carolina, Georgia, Delaware, Maryland, Virginia, West Virginia and the District of Columbia, and in Tennessee east of and including Hamilton, Rhea, Roane, Anderson and Campbell counties: No operation in the band of frequencies 3700-3800 kc. during the period of the maneuvers.

2. For amateurs outside the area defined in (1) above and east of the Mississippi River:
   (a) No special limitations during daylight hours
   (b) No nighttime operation (local sunset to local sunrise) in the band of frequencies 3700-3800 kc. during the period of the maneuvers.

3. For amateurs west of the Mississippi River or outside the continental United States: no special limitations.

The League urges all amateurs in the affected areas to comply strictly with the above request, as a matter of voluntary coöperation.
Building an 813 Transmitter—Modern Style

Simplified TVI Treatment Applied to a 350-Watt Rig for Five Amateur Bands

BY RICHARD M. SMITH,* W1FTX

* Technical Assistant, QST.

The 813 continues to be one of the more popular tubes with those who are looking for a rig in the 250- to 350-watt class. Here’s a constructional article that shows how such a transmitter can be built and operated in harmony with TV.

Contrary to the belief of many, TVI elimination and power reduction do not necessarily go hand in hand. In fact, many have found, to their disappointment, that power reduction alone seldom is of any benefit. If the basic fundamentals of TVI elimination have been overlooked in the design of a transmitter, it doesn’t matter much whether it uses an 807 or a much bigger tube in the final amplifier; interference usually will result in TV localities.

These days, to be TVI-free, a transmitter need not be complex. It is true that many of the rigs described since TV service started have been complicated by the addition of harmonic traps, the use of inductive coupling between all stages, and other harmonic-reducing measures. In spite of their complexity, many of these rigs have used nothing more impressive than an 807 or two in the final amplifier. However, there is no longer reason to assume that low power and complexity are the price every ham must pay to keep peace with TV-viewing neighbors. The basic principles of TVI elimination are effective at much higher power levels than many seem to think, and the measures can be quite simple. The transmitter described here was built to illustrate both of these points. In a majority of cases you need not, go QRP, and you need not have a complicated rig, to lick TVI.

Design Considerations

The complexity that characterizes the design of many earlier TVI-treated rigs is a natural result of the all-out efforts put forth by designers to reduce harmonic output to a bare minimum. In the course of events we found what we now consider to be the fundamentals of TVI elimination, and we also investigated a number of refinements of lesser importance. They have all been covered adequately in the pages of QST in recent months, and need not be rehashed here.

The time has come when we can start to simplify things, concentrating on those points found most important and discarding things of lesser worth. The most important principle in TVI elimination is that of keeping the harmonics under your thumb, where they can be controlled. This calls for good shielding. Without it, you can never be sure of the prime source of your troubles, and your efforts to cure them are scattered through hit-or-miss channels. With good shielding and power-lead filtering, however, you can be sure that the only way harmonics can get from your rig to the TV set is through your antenna system. Then, and only then, can a low-pass filter do its job of keeping the harmonics from getting to the antenna.

There are, of course, other considerations, but confining the harmonics within a shield en-

A 350-watt transmitter is behind this view of the 12½-inch front panel, with adequate shielding and filtering to keep TVI within bounds. The controls, left to right, are the crystal-selector switch, the oscillator tuning condenser, the driver tuning condenser, excitation control, and amplifier-plate tuning condenser. The small knob above the large tuning condenser is for adjustment of the output link.

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Fig. 1 — Schematic diagram of the transmitter. Socket connections for plug-in coils L1 and L2 are shown. For connections to the coil pins, see Fig. 2.

C1, C10, C20, C21, C22 — 0.005μfd. disc ceramic.
C3, C5, C9, C22, C23 — 0.01μfd. disc ceramic.
C6 — 200-μfd. receiving variable (Millen 19200).
C6, C7, C8, C9, C10, C17 — 0.001μfd. disc ceramic.
C8 — 100-μfd. mica, 500 volts d.c. working.
C9 — 100-μfd. receiving variable (Millen 19100).
C10 — 100-μfd. mica, 1000 volts d.c. working.
C11 — 0.001μfd. 1000 volts (Sprague “Hypax”).
C14 — 0.001μfd. mica, 5000 volts d.c. working (Aerovox 1605).
C15 — 100-μfd.-per-section variable, 3000 volts peak (National TMC-100-D).
C16 — Neutralizing condenser; see text.
C18 — 0.001μfd. 5000 volts d.c. (Sprague “Hypax”).
C20 — 0.1 μfd. 250 volts a.c. (Sprague “Hypax”).
R1 — 15,000 ohms, 1/2 watt.
R2 — 330 ohms, 1 watt.
R3 — 33,000 ohms, 1 watt.
R4 — 47,000 ohms, 1 watt.
R5 — 500 ohms, 2 watts.
R6 — 75,000-ohm wire-wound potentialmeter, 7 watts.
R7 — 25,000 ohms, 10 watts, wire-wound.
R8 — 10,000 ohms, 10 watts, wire-wound.
R9 — 100 ohms, 1/2 watt.
R10 — 2500 ohms, 10 watts, wire-wound.
L1 — Oscillator plate coil:—3.5—7 Mc., —10 μh.; 28 turns No. 22 d.g.s. close-wound on 1-inch diam. form.
—7—14 Mc., —2.3 μh.; 10 turns No. 22 d.g.s. spaced to occupy 3/4 inch on 1-inch diam. form.
—Untuned — 250 μh.; 33-ma. r.f. choke (National R-35) mounted inside coil form as shown in Fig. 2.
Forms for above coils are Millen 45005.
L2 — Doubler plate coil:—3.5 Mc., —17 μh.; 23 turns No. 18 d.g.s. close-wound on 1 1/4-inch diam. form.
—7 Mc., —5.2 μh.; 12 turns No. 18 d.g.s. spaced to occupy 1 inch on 1 1/4-inch diam. form.
—14 Mc., —1.8 μh.; 7 turns No. 18 d.g.s. spaced to occupy 1 inch on 1 1/4-inch diam.
—28 Mc., —0.5 μh.; 4 turns No. 18 d.g.s. spaced to occupy 1 inch on 1-inch diam.
Forms for above coils are National XR-5, except 28-Mc. coil which coil uses Millen 45005.
L3 — Amplifier plate coil:
(All are B & W TVL series. Winding data, except inductance, given below are for each half of coil.)
—5.5 Mc., —80 TVL, 43 μh.; 26 turns No. 16, 2 1/4-inch diam. 2 inches long.
—7 Mc., —40 TVL, 15 μh.; 11 turns No. 12, 2 1/4-inch diam., 2 inches long.
—14 Mc., —20 TVL; one turn removed from each side, 4.2 μh.; 4 turns No. 12, 2 1/4-inch diam., 13/4 inches long.
—28 Mc., —10 TVL; one turn removed from each side, 1 ph.; 2 turns No. 6, 2 1/4-inch diam., 13/4 inches long.
L4 — Shielded link, 3 turns (B & W 3538).
J1 — Coupling input jack (Jones S-101-D).
J2 — Coupling output jack (Amphenol 93-1R).
J3 — Closed-circuit jack.
MA1 — 0-100 ma. d.c.
MA2 — 0-50 ma. d.c.
MA3 — 0-500 ma. d.c.
RFC1, RFC2, RFC3 — 2.5-mh. 100-ma. r.f. choke.
RFC4 — 1.4 mh., 500 ma. (Millen 34140).
RFC6 to RFC10 — 0.7-μh. choke (Ohmite Z-50).
S1 — Rotary wafer switch, 2 poles, 5 positions, ceramic.
T1 — 6.3-volt filament transformer, 3 amp. (UTGS-55).
T2 — 10-volt transformer, 5 amp. (Thoradson T21F18).

closure and then filtering the output of the transmitter are the main points. If, in the course of building and operating the transmitter, you can minimize the generation of harmonics in the TV range,1,2 so much the better, but you can't get away from the need for adequate shield-
ing and filtering.

The transmitter shown in the accompanying photographs and diagrams places heavy emphasis on both of these points and ignores completely some of the lesser refinements that have been found to be helpful, but essential only in extreme

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cases. The result is a rig that circuitwise will look familiar to the constructor of the pre-TV era, yet can be operated in harmony with both your neighbors' TV set and your own.

The Circuit

The 813 was selected for the final amplifier because it combines the required power-handling capabilities with low grid-drive requirements and high output capacitance, a desirable situation where TVI is a consideration. Working backward from the 813, a 6V6 was chosen as the driver tube. Of more importance here than the tube type is the circuit arrangement. A potentiometer connected as shown in Fig. 1 is used to obtain close control of the amount of power delivered to the grid of the final amplifier. Nothing is gained by overdriving a tube like the 813 and, in fact, much can be lost, because once a certain level is reached, increased grid drive results only in marked increase in harmonic output with corresponding increase at the fundamental.

The 6V6 is operated as a doubler except when the transmitter is used in the 3.5-Mc. band, where it operates straight through.

The 6V6 is driven by a 6AG7 crystal oscillator in a circuit arrangement that has proved both popular and effective. It permits either 3.5- or 7-Mc. crystals to be used, and its plate circuit can be tuned to either the crystal fundamental or its second harmonic. In addition, one position of the crystal selector switch is used to convert the stage from an oscillator to a doubler so that it can be used to couple a low-level VFO to the transmitter.

One or two other circuit features are worthy of mention. The need for fixed bias for the 813 is eliminated by the use of a 6Y6G in a screen-clamping circuit. This arrangement, as shown in Fig. 1, differs from the usual one in which the screen voltage is supplied through a dropping resistor from the plate supply. Instead, a fixed screen supply is used, and the clamping tube operates through a small resistance to reduce screen voltage when excitation is removed from the 813 grid. This arrangement cannot be used with some other beam tetrodes such as the 4-65A and the 4-250A, because of their screen-grid characteristics, but with the 813 it is a practical power-conserving measure.

Capacity coupling is used between all stages of this transmitter. Admittedly, this is not as effective as inductive coupling in reducing harmonic transfer, but in this transmitter the oscillator and driver stages operate at low power levels, and whatever harmonics do sneak through are of no consequence if the shielding and filtering are good. The resulting reduction in the number of tuned circuits and operating controls seems worth the risk in this case.

Plug-in coils are used in all stages to minimize both cost and complexity. To avoid oscillation in the 6V6 stage when the transmitter is operated in the 3.5-Mc. band, an r.f. choke (instead of the usual coil) is plugged into the plate circuit of the 6AG7 stage. This dodge has been used successfully in many rigs. It is accomplished here by the circuit connections shown in Fig. 2.

The coils used in the plate circuit of the oscillator stage are made so that each covers two adjacent bands. The lower-frequency band of the two is tuned with C3 near maximum capacity, and the higher-frequency band near minimum.

Harmonic filters are inserted in each supply lead to eliminate radiation from the power wiring, and the transfer of harmonics to the antenna by capacity coupling is minimized by use of a shielded swinging-link assembly in the final amplifier. Add to the above a complete shielding job, and the net result is a transmitter which, when used with a low-pass filter and an antenna coupler, will cause little or no interference with TV reception under most circumstances.

Construction

The general construction of the transmitter is shown in the photographs. A standard 10 × 12 × 3-inch steel chassis is used with a 12¼ × 19-inch aluminum rack panel. In the interest of getting good shielding, all paint should be removed from both the panel and the chassis where they touch. Sandpapering after application of paint remover will leave the surfaces bright and clean.

As shown in the rear and bottom views of the transmitter, the chassis is not centered behind the panel, but is mounted so that (when viewed from the rear) the panel extends one inch beyond the right-hand edge of the chassis and six inches beyond the left-hand edge. This reduces the over-all height of the transmitter, making it possible to mount the tank circuit of the final amplifier in "outboard" fashion from one end of the chassis. The condenser is supported by four 1½-inch ceramic stand-off insulators (National GS-5). Two of these rest on the end of the chassis, as shown in the bottom view, and

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Fig. 2 -- Connections for L1, the oscillator plate coil. The arrangement used for operation in all except the 3.5-Mc. band is shown at A. The jumper, which is soldered inside the coil form, connects the coil to tuning condenser C3. In B, used only for 3.5-Mc. operation, the jumper is omitted, which disconnects the tuning condenser from the circuit, and an r.f. choke is substituted as an untuned plate impedance to keep the 6V6 stage stable when operating straight through.

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the other two are bolted to an aluminum bracket 1 1/2 inches high, mounted at the end of the chassis.

The jack bar for the plug-in coils used in the final amplifier is mounted by means of small angle brackets on two of the insulators that support the tuning condenser. Part of one of these brackets is visible in the rear view of the transmitter.

The 813 tube is mounted horizontally at one end of the chassis. Its socket is supported by a 3 3/4-inch-square bracket bolted to the chassis 1 1/4 inches from the rear edge. The paint should be scraped off where the bracket and the chassis touch. Mounting the tube in this position results in a short r.f. lead from the plate cap of the tube to the tank circuit, permits plate, screen, and filament returns to be made to a common ground (the bracket), and allows room behind the socket for the homemade neutralizing condenser, C16, and other parts.

Placement of these parts at the rear of the socket is shown in the rear-view photograph. The tubular condenser mounted horizontally across a portion of the socket is C15, the “Hypox” unit used as screen by-pass. The mounting clamp is unsoldered from the condenser so that its case can be soldered directly to Terminals 1 and 2 of the tube socket. Terminal 1 is one side of the filament, and Terminal 2, which has no circuit connection, is used merely for mechanical support. One of the axial leads of the condenser is then connected to Terminal 3, the screen grid, and the other goes to the screen-supply lead. Note that this arrangement returns the screen-grid by-pass to one side of the filament instead of to chassis ground.

Filament by-pass condensers, C11 and C12, are mounted as close as possible to Terminals 1 and 7 with short ground leads, hence going to the aluminum bracket. The center-tap lead from the filament transformer is connected directly to the beam-forming plate terminal on the socket, where the ground connection is made.

The homemade neutralizing condenser, C15, is made by cutting two strips of copper flash-}

or other metal 3/8 inch wide and 2 inches long. One end of each strip is drilled to pass a 6-32 screw. The end of one strip is then bent so that when the two are mounted on the 1 3/4-inch ceramic stand-off insulators (National GS-1), as shown in the photograph, one will be 1/2 inch above the other, forming the plates of a condenser. Capacity is adjusted by trimming one or both plates to reduce the overlap and by changing the spacing between plates.

Plate by-pass condenser C14 is mounted between the frame of the tuning condenser and a soldering lug bolted to the bracket that supports the 813 socket. The ground connection is made close to the spot where the filament by-pass condensers are returned, and a heavy lead made from 3/8-inch copper strap makes the connection from the “hot” side of C14 to the tuning-condenser frame. The high-voltage lead passes from this junction point through the chassis in a 3/8-inch ceramic bushing (Milco 32109) to RFC1 inside. In addition, the high voltage is applied to the stator of C15 through the center tap of the plate coil, L3. Connection from this point to RFC4 is made through a second 3/8-inch ceramic bushing that is visible in the bottom view.

The layout of the oscillator and driver stages is shown in the bottom view. These stages are “staggered” across the chassis, with the crystal switch and crystal sockets being in the upper left-hand corner near the panel, the 6AG7 oscillator tube 5 1/2 inches behind the panel and 2 1/2 inches in from the edge of the chassis, and the 6V6 tube 1 1/2 inches from the rear and 4 1/2 inches in from the edge. The tuning condensers for these stages are placed alongside the tube sockets, insulated from the chassis by being mounted on polystyrene plates held by small brackets cut from 3/8-inch angle stock. The socket for the 6V6G is mounted near the center of the chassis immediately in front of the tuning condenser of the 6V6 stage and in line with the oscillator tube. Sockets for the small plug-in coils are placed as shown, with the oscillator coil centered 1 1/2 inches behind the 6AG7, and the doubler coil between the 6V6 and the socket.
Bottom view of the transmitter, showing details of the exciter stages, harmonic filters, and the mounting of the large tuning condenser on one end of the chassis.

for the 813. A short lead passes through a grommet-lined hole to make the connection between the coil socket and the 813 grid.

The 10-volt filament transformer, $T_2$, is mounted inside the chassis beneath the 813 so that short secondary leads to the tube socket can pass through a hole in the chassis. These leads are shielded, with the braid grounded both inside the chassis and to the bracket that holds the tube socket. The 6.3-volt transformer, $T_1$, is mounted on the top of the chassis, close to the front panel.

Connection from the shielded swinging link to the coaxial output connector on the rear of the chassis is made through a length of RG-8/U coaxial cable visible in the bottom view. The shielded leads from the link must be “dressed” so that they will not touch any part of the amplifier tank circuit. This is done by passing the leads over the grounded shaft that connects the pivot arm of the link assembly to the control knob on the front panel, then toward the panel, and thence down to a hole in the front right-hand corner of the chassis. The braid is grounded to the top of the chassis, and the two insulated link leads then pass through the grommet-lined hole to make the connection with the coaxial cable. The braid of the cable and one of the link leads are then grounded to the inside of the chassis.

**Power-Lead Filtering**

The harmonic filters in the power leads are mounted inside the chassis as close as possible to the point where the leads leave the chassis. A five-circuit steatite terminal strip (Millen 37305) is used for the low-voltage connections, and a bakelite safety terminal (Millen 37001) for the high voltage. The filter for the high-voltage supply lead comprises $RFC_8$ and $C_{24}$. The by-pass condenser is bolted to the inside of the chassis close to the safety terminal. It is visible in the lower right-hand corner of the chassis in the bottom view. $RFC_8$ is mounted between one of the axial leads of this condenser and a 1-inch ceramic stand-off insulator placed nearby. The filters for the low-voltage supplies are mounted between the terminals of the steatite strip and small tie points bolted to the chassis. $RFC_9$ and $RFC_{10}$ should be mounted at right angles to each other to minimize coupling between them. By-pass condensers $C_{25}$ and $C_{26}$, which complete these filters, are mounted with as short leads as possible between the terminal strip and chassis ground. The 115-volt a.c. leads are filtered by $C_{29}$ and $C_{37}$ with similarly short leads.

The VFO input connector, $J_1$, is mounted on the rear of the chassis alongside the steatite power-terminal strip. A short length of RG-59/U coaxial cable runs from the connector to the crystal switch.

All heater and d.c. wiring within the transmitter is done with shielded wire. Belden No. 8556 wire is used for the heater leads and the d.c. wiring is done with Belden No. 8885. The latter carries a break-down rating of 4000 volts. It is therefore usable even in the high-voltage circuits if reasonable care is taken when making connections so that the insulation is not punctured by stray wisps of the braid or damaged by excessive heat.

**Shielding**

The first step toward completing the shielding is to bolt the panel to the chassis in the position described earlier in this article. Then the remainder of the enclosure can be “built up” from aluminum sheets along the lines shown in the photographs. The method we used is the simplest, requiring no tools more elaborate than a hack saw, a few files, some 1/4-inch hand stock, drills, a 6-32 tap and a good supply of 6-32 machine screws. First, cut to size the various pieces that go to make up the box. The top and bottom plates are 16½ by 9½ inches, the sides 12 by 10 inches, and the rear 17 by 12 inches. A section 2½ by 11½ inches is cut out of the lower right-hand corner of the rear plate to provide clearance for the terminals on the rear of the chassis. In addition, access holes are cut through the rear plate, as shown in the photograph, so that the coils can be changed when the transmitter is installed in a rack or cabinet. The largest of these holes is 4½ inches square, and it is placed 2½ inches in from the left-hand edge. The two smaller holes are
3 by 4 inches, and are placed behind the smaller plug-in coils.

The entire box is held together by lengths of 1/4-inch angle stock which have been drilled and tapped for 6-32 screws. Ventilation holes made with socket punches are cut in the top cover over the tubes. The holes are covered with copper screening to preserve the effectiveness of the shielding.

The access holes in the rear plate must also be covered during operation if the shielding is to be kept tight. This is accomplished by the method shown in the rear view of the assembly. A “door” 153/4 by 71/2 inches is bolted to the rear plate on a length of piano hinge. The hinge is mounted in such fashion that the door rests flat against the rear plate when it is closed, and the door itself is large enough to overlap the access holes by at least 1/2 inch on all sides. A simple tab mounted at the top holds the door closed.

To insure against harmonic leakage through the meter holes in the panel, the meters are enclosed in a shield box built as shown in the rear-view photograph. The meters themselves are mounted on a sheet of 3/4-inch Preswood, 91/4 by 21/2 inches, which fits into the front of the box. The panel is recessed 1/2 inch from the open face so that the meter cases will not touch the copper screening used to shield the 21/4-inch viewing holes in the panel. The entire assembly is bolted against the inside of the panel, with the copper screening sandwiched between the mounting flange and the panel. Here, too, it is necessary to scrape the paint off the panel where the flange contacts it. To make it easier to read the meters, the copper screening is given a thin coat of flat-black paint after assembly. This eliminates the reflected glare that otherwise reduces the transparency of the screen.

Shielded wire connects the meters to the circuits of the transmitter through harmonic filters comprising RFC₉, RFC₇, RFC₅, C₁₈, and C₂₁. No condenser is used in conjunction with RFC₉. The filters are mounted inside the chassis, close to the holes through which the meter leads pass. C₁₉, C₂₂, and C₂₃ are connected directly across the respective meter terminals.

**Adjustment & Operation**

The only critical adjustments needed are to be certain that the small plug-in coils cover the proper ranges, and to neutralize the 813. If the coil specifications set forth in the parts list are followed closely, it will be possible to tune the plate circuit of the 6AG7 to either 3.5 or 7 Mc. with the first coil, and to either 7 or 14 Mc. with the second. Resonance in both the 6AG7 and 6V6 stages is indicated by MA₁, which is connected in the common supply lead. With the desired coils in place, the excitation control set fully clockwise and the key closed, apply plate voltage (between 350 and 400 volts d.c.) to the exciter stages. Turn the oscillator tuning condenser until the meter kicks upward, indicating that the 6V6 stage is being driven. Next, turn the 6V6 plate-tuning condenser until the meter reading dips, indicating that the stage is tuned to resonance. Now, touch up the tuning of the oscillator stage slightly. This readjustment will produce a slight additional reduction in the current indicated. At this point the 6V6 should be driving the 813 stage into grid current, as indicated by MA₂. Depending on the band selected and the plate voltage applied to the exciter stages, grid current will be at least 15 ma. (It will probably run considerably more than this except in the case of 28-Mc. operation.)

Now adjust neutralizing condenser C₁₆ to obtain minimum feed-through of r.f. from the exciter stages to the final-amplifier tank circuit. To do this, couple an indicating wavemeter to the tank circuit, tune the circuit to resonance, and adjust C₁₆ by bending or trimming the plates to obtain minimum indication.

Once the amplifier is neutralized, connect a dummy load to the output circuit. This is best done by connecting an antenna coupler to the swinging link of the amplifier through a
short length of RG-8/U coaxial cable, and then tapping a 250- or 300-watt lamp bulb across a few turns of the coil in the coupler. Apply plate and screen power to the 813, and resonate the tank circuit as indicated by a sharp dip in the current shown by $MA_4$. This should be done quickly, because the off-resonance plate current will exceed 300 ma., dipping to a very low value at resonance. Load the amplifier by adjustment of the antenna tuner and the swinging link until plate current of 200 ma. or slightly more is indicated. Now open the key. If the clamp tube is operating properly, plate current in the 813 stage will drop to about 40 ma., and the current in the first two stages will be about 45 ma. Grid current in the 813 stage under these conditions should be zero. To check for stability of the 813 stage, rotate the plate condenser slowly through its entire range, at the same time watching for any change in plate current, and for any indication of grid current. If a change takes place, or if grid current flows, check with a wavemeter to find the frequency at which the stage is oscillating. If it is near the operating frequency, readjustment of the neutralizing condenser is called for. If oscillation is in the v.h.f. range, the usual cures for such parasitics should be applied.

When certain that the amplifier is stable, the transmitter may be put on the air. A low-pass filter such as that described in the 1951 edition of the Handbook, or one of those available commercially, should be installed in the coaxial line between the transmitter and the antenna coupler in all areas where TV receivers are nearby. If a.m. 'phone operation of the transmitter is desired, a small iron-core choke should be inserted in the screen-grid supply lead as described on page 279 of the 1951 Handbook.

**Performance**

To discover how well this transmitter would perform (with respect to TVI) in a "fringe" area, it was installed at the writer's home, which is 45 miles from the nearest TV station. With a TV receiver installed within 15 feet of the transmitter and tuned to Channel 6, which has a direct harmonic relationship to all of the principal amateur bands below 50 Mc., the following results were obtained:

It was impossible to produce any interference when the transmitter was operated at 3565 kc., even with large portions of the shield enclosure removed. A faint interference pattern was visible when output was at 7010 kc. and the top cover of the shield box was removed. The interference disappeared when the shield cover was merely placed over the box without fastening any of the screws. With the transmitter tuned to 14,050 kc., it was necessary to bolt all members of the shield box together firmly and to reduce grid current in the 813 stage by means of the excitation control to 15 ma. to remove the last traces of interference. Increasing grid current to 20 ma. caused a reappearance of a faint interference pattern, but as pointed out earlier, funda-

mental output does not increase anywhere near as rapidly as harmonic output when grid current is raised beyond certain limits, so there is no point in operating at more than 15 ma. With the transmitter tuned for output at about 28,050 kc., a faint interference pattern was noticed until grid current was reduced to 10 ma. When the frequency was raised to 28,500 kc. the interference pattern became invisible from normal viewing distances, and grid current could be restored to 15 ma. without its reappearance.

In all cases described above, the same antenna was used and a low-pass filter was installed between the transmitter and the antenna coupler. Removal of the filter resulted in marked increase of the interference, but under no circumstances was the interference serious enough to destroy completely the usefulness of the picture.

These results, in a location where even a single (unshielded) 807 rig operating in the 3.5-Mc. band has been known to eradicate Channel 6, are proof enough to the writer that this transmitter has what it takes in spite of the purposeful omission of some of the more complex harmonic-reducing circuitry. The rig is simple both in construction and circuit, yet its harmonic output is low enough to permit interference-free operation to be enjoyed in all but a few isolated weak-signal areas. In such areas more stringent adherence to even the "fine points" of harmonic reduction are called for. We'll wager, however, that there won't be many situations that this rig can't handle.

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7 Subsequently, similar tests were made in the ARRL laboratory with TV sets of several different manufacturers. In all cases harmonic interference was negligible. It was quite apparent, however, that some TV sets are more susceptible to blanketing by the fundamental of an amateur transmitter than others. In such cases, the interference can sometimes be eliminated by installation of a high-pass filter at the input terminals of the TV set. In others, it is necessary to make modifications within the TV receiver to eliminate its response to signals outside of the TV range. Of interest, in this respect, is the experience of Dallas, Texas, amateurs as described in June, 1951, QST.

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**NATIONAL CONVENTION REMINDER**

Well, it won't be long now—July 27, 28 and 29 are the dates, and Seattle the location. See last month's QST for the dope on the program and the special train. And make your reservations now; write John Grubbs, W7RT, 1921 Atlantic St., Seattle 44, Washington. The Committee asks that all licensed YLs planning to attend advise W7LCS, Teddy Nye, 1802 12th Ave., Seattle 22, which will greatly facilitate the arrangements being made by the YL planning group. George Rollins, W3GA, and Ivan Loucks, W3GD, of FCC's staff, will be among those present, as will a delegation of several from ARRL HQ, including President Bailey, W2KH. CU there!
HIGH-C and series-tuned VFO circuits each have their adherents and, of course, there is something to be said for both. However, when a VFO is to be used primarily for 'phone work, drift is probably one of the most important considerations. There are few who will argue that in this respect the series-tuned circuit does not have an advantage. This characteristic was demonstrated to the satisfaction of the writer in actual comparisons with several other types of circuits. Thus it was the choice in building the VFO-f.m. exciter unit shown in the photographs. It was designed as a companion unit for a gang-tuned multiplier-exciters. [To be described in a later article in QST—Ed.]

The circuit diagram is shown in Fig. 1. A 6J5 is used in the oscillator and this is followed by a 6AG7 isolation stage coupled to the cathode of the 6J5. These more substantial tubes replace miniature equivalents tried in an earlier model. The oscillator operates at 3.5 Mc. and the output of the 6AG7 is fixed-tuned to the same band. The plate of the oscillator and the screen of the amplifier are operated from a regulated 150-volt tap on the power-supply output, while the plate of the amplifier and the audio tubes take the full supply voltage.

The modulator is the resistance-variation type.\(^1\) A 6SJ7 speech amplifier drives a 6J5 modulator. The power supply also follows standard practice. A small b.c. replacement-type transformer is entirely adequate for the job. The power is controlled by the double-pole three-position switch, \(S_1\). In one position, the a.c. is turned on and the high-voltage center-tap is switched to a pair of terminals on the power connector. If relay contacts are connected across these terminals, the relay can then be used as a remote high-voltage control. In the third position, the a.c. is still on and the high-voltage center-tap is grounded directly, turning on the high voltage. Thus, with no relay connected across the terminals, or with the relay contacts open, high voltage can be controlled manually by switching between the center and last positions.

Bottom view of the frequency-modulated VFO.

**Construction**

The components, including those for the power supply, are assembled on a 7 × 11 × 2-inch aluminum chassis with an 8 × 10-inch panel. The panel, as well as the box that encloses the oscillator tank circuit, is of \(\frac{1}{2}\)-inch sheet for rigidity. The box measures 4 by 5 by 6 inches and is assembled with the help of short pieces of angle stock. It is fastened securely to the panel and chassis using countersunk flat-head screws in the area of the dial to avoid interference.

Special care should be taken to mount and wire the tank-circuit components as rigidly as possible. Sturdy double-bearing condensers should be employed for the tuning condenser, \(C_1\), and the band-set condenser, \(C_2\). All fixed condensers that may have an effect on frequency, such as the excitation condensers, \(C_3\) and \(C_4\), the grid condenser, \(C_5\), and the coupling condenser, \(C_7\), should be of the zero-drift silvered-mica type.

The shaft of the tuning condenser, \(C_1\), is centered on the panel at a height that will permit mounting the National type N dial above the chassis line. The condenser is mounted on an L-shaped bracket fastened to the back of the panel with flat-head screws. To eliminate the possibility of backlash, no flexible shaft coupling...
is used; the dial hub is connected directly to the condenser shaft.

The band-set condenser is fastened to the outside wall of the box so that it can be adjusted from the side. The coil is wound on a ceramic form found in surplus stocks. A grooved form is preferable, but if such is unobtainable, a National type XR13 form can be used. In this case, the coil can be mounted against the back wall of the box. The two excitation condensers, $C_3$ and $C_4$, are cemented flat against the chassis, between the coil and the tuning condenser. Connections between these condensers and the oscillator-tube socket underneath are made through small feed-through insulators (National type TPB). All connections from the coil to the variable condensers are made with No. 14 wire.

The tubes are lined up along the rear, external to the compartment housing the tank circuit, to isolate the latter from direct tube heat. From right to left in the rear-view photograph are the two modulator tubes, the 6J5 oscillator, the 6AG7 buffer, the VR150 and the 5Y3GT rectifier. The slug-adjusting screw of $L_2$ protrudes between the 6AG7 and the VR tube. The power transformer occupies the otherwise vacant corner of the chassis.

Underneath, the power-supply filter components, including the choke, the electrolytics, the bleeder resistor and the dropping resistor for the VR tube, are to the right. No. 18 solid wire is used for all power circuits because it will stay put when formed against the chassis. A terminal board mounted on spacers against the rear edge of the chassis provides a rigid mounting for most of the small components.

The audio gain, or deviation, control is mounted on a bracket near the left rear corner, close to the 6J5 modulator. The control shaft is extended to the panel. The power-control switch, $S_1$, is placed on the right to balance, and the rear view of the VFO-f.m. unit with the cover removed from the oscillator compartment.

(Continued on page 88)
A Vertical Nonrotating Directional Antenna System

Using Phased Elements for Three-Band Operation

BY JAMES K. CHAPMAN,* W200M

The eternal search for the best antenna system circumstances will permit is one of the most constant problems of the amateur. There are probably as many “best solutions” as there are amateurs, especially when space is restricted. The array described in this article is one man’s answer, at least until a better one comes along. Since my chief interest lies in the 10- and 20-meter bands, I decided first that the system must be directional and give some gain over a doublet at these higher frequencies. In addition, as much of the radiation as possible should be concentrated at low angles. As a further requirement, it should be a thing of “beauty,” even to the neighbors, and cost practically nothing. Needless to say, some compromise had to be made before a satisfactory solution was found. Although emphasis was placed on 10- and 20-meter operation, as mentioned, actually the system in addition will work very well on 6 meters. Thus we have a good three-band system.

In an attempt to discover some new and radical design that would fulfill all of my requirements, I studied the several references shown in the accompanying footnotes.1–5 Despite present-day practices, it appeared that vertical polarization may have some advantages over horizontal, especially when height above ground is limited. One of the references1 has some excellent data showing the comparative results of vertically- and horizontally-polarized 16-meter waves over a 2500-mile path. The horizontal array appears to have a slight advantage, although no sharp line is drawn. One of the tests, in which the height of the horizontal array was varied above ground, indicated that a height of one wavelength above ground was necessary in order to realize the vertical angle for best transmission over the particular path. After examining the vertical patterns6 of both horizontal and vertical systems, I came to the conclusion that a carefully-designed vertical system

5 ARRL Antenna Book.

The phased vertical antenna system installed at W200M. In this arrangement, only one small mast is required.
could be made to perform well without resorting to the tall supporting structures required by an equivalent horizontal antenna.

**Vertical vs Horizontal**

It might be interesting to review the thoughts that led me to the selection of a vertical system. It has been well established that the desired vertical angle for maximum distance on 20 meters is about 15 degrees.\(^1\)\(^2\)\(^5\) Fig. 1 shows the vertical patterns of horizontal and vertical half-wave dipoles located at various heights above ground. It is immediately apparent, by comparison, that to obtain a 15-degree vertical angle with the horizontal antenna, it is necessary to go to one wavelength in height. But at the same time, a large vertical lobe of little usefulness appears at 50 degrees. The vertical dipole has a radiation lobe of 10 degrees in the vertical plane when at a center height of \(\frac{1}{2}\) wavelength. Ten degrees is a little too low for 20 meters, but the pattern shows a rather broad nose, leaving a considerable amount of energy at 15 degrees. Even 20 degrees is still useful if some high-angle work (minimum 20-meter paths) is desired.

If we decide on a 20-meter (32-foot) vertical dipole, it can be set up with one end almost on the ground and yet a very good vertical pattern will result. This same vertical antenna will work well on 10 because the energy is now concentrated at about 9 degrees. The spurious lobe at 60 degrees is reduced by the fact that the antenna, being center-fed, operates on this band as two collinear half-wave elements arranged vertically. The resulting pattern is shown in Fig. 2. If this antenna were in the horizontal plane, it would require a height of nearly 60 feet to achieve the same vertical-angle coverage, rather than the 35 feet over all needed for the vertical system. Although greater ground attenuation is unavoidable in such a system, it seems to me that this is greatly outweighed by the advantages of simpler antenna structure, the nearly ideal vertical angle, and the relative freedom from useless high-angle radiation.

After making the decision to go to vertical polarization, many forms were considered. The final selection was the bidirectional end-fire, or “SJIK” arrangement. In order to get coverage in all directions and still not have to rotate the elements mechanically, I decided to use three fixed verticals placed as shown in Fig. 3. The three vertical elements are spaced equidistant at the corners of an equilateral triangle. A separate line is used to feed each element at the center. By connecting any two elements 180 degrees out of phase, it is possible to get a “figure-eight” pattern. Fig. 4 shows, on one center, the three patterns obtainable in the horizontal, illustrating the complete coverage. The maximum signal-strength variation around the complete 180 degrees is about 1 db.

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*Fig. 1* — A comparison of the vertical patterns for horizontal and vertical dipoles for various heights above ground. Dotted lines indicate approximate ground-loss effects.

*Fig. 2* — Vertical pattern of two-section SJIK vertically-polarized antenna, center \(\frac{1}{2}\) wavelength above ground.
experienced with the material. Dead-soft tubing was used because it was readily available. This was a bad mistake. Three days after the antenna was erected, Syracuse was struck by strong winds with gusts up to 65 miles per hour. The top 8 feet of the tubing, being unsupported, bent at an angle of about 20 degrees and stayed there. It was straightened immediately, but to no avail. The next day it was subjected to further buffeting, this time with gusts up to 75 miles per hour. That did it. The tops all sheared off. I expected to replace the elements eventually, but had no idea that "eventually" would be one short week. The upper portion of the elements are now steel whips of the kind used for automobile transmitting antennas. These are 7 feet long, extended at the base to 12 feet by a length of ¾-inch aluminum rod. This new arrangement has since withstood gusts up to 95 m.p.h. with no resulting damage.

Employing an element length of 25½ feet allows the use of the system on 14 Mc. where 25 feet is a slightly foreshortened half wavelength, and at 50 Mc. where each element, being center-fed, will be two ¾ wavelengths in phase. Needless to say, both 21 and 28 Mc. fall very satisfactorily between these limiting conditions. Gain is probably slightly less than 4 db. at the lowest frequency and slightly greater than 6 db. at the highest. Incidentally, either one element alone, or all three in parallel, can be used on 3.5 and 7 Mc. in an emergency although the tuning is pretty sharp.

Feeding

The tuning equipment is shown in the schematic of Fig. 5. It is a resonant device with suitable switching to change the feeder connections and to select coil taps for the various frequency bands. The input is introduced by means of a variable-coupling loop constructed of coaxial cable in order to get electrostatic shielding between the transmitter and the antenna system. All three feeder lines are carefully cut to the

Construction

The photograph shows the completed structure at W200M. Originally all the elements were of ¾-inch aluminum tubing, 12 feet long, spaced 18 inches in the middle, giving an over-all element length of 25½ feet. There was nothing wrong with the design, but some difficulty was
same length so that they may be connected in any combination of pairs and still present the same impedance to the matching unit. The feeder system is resonant; therefore the tuning elements can be connected in parallel or series, depending on the feeder length used.

Results during a year’s experience with this antenna at W20OM have been very gratifying.

HAMFEST CALENDAR

CALIFORNIA — Saturday, July 7th, at Wieland Garden, San Jose — annual hamfest of the Santa Clara County Amateur Radio Assn., Inc. Barbecue dinner, entertainment, and the usual good time will be provided. Tickets, $3.00, available from Tress, "Pop" Nelson, 550 Minnesota, San Jose, Calif.


ILLINOIS — Sunday, July 15th, at Weldon Springs State Park (4 miles east of Clinton, just off Ill. Rt. 10 or U. S. 51) — 15th annual picnic sponsored by the Central Illinois Amateur Radio Assn. Bring the whole family, a basket lunch, and a usable piece of gear for the grab bag. Auction sale of radio gear. No admission charge — free soft drinks. "Free for all — all for free!"

ILLINOIS — Sunday, August 12th, at Frankfort Park (on U. S. Rte. 45, 1/2 mile north of U. S. 30) — 17th annual picnic of the Hamfesters Radio Club. The friendliest get-together in the West — see any who has attended the other sixteen! Tickets may be purchased in advance from W. Roberts, W9HOV, 7921 Woodlawn Ave., Chicago 19, Ill., at $1.00 each.

INDIANA — Sunday, July 15th, at Mound State Park, near Anderson — annual state hamfest of the Indiana Radio Club Council. Pack up the family and have them meet the gang. Particulars available from Peggy Coulter, W9UJ, RFD 2, Box 302, Muncie, Ind.

WYOMING — Saturday and Sunday, July 14th and 15th, at Sourdough Youth Camp in the Big Horn Mountains, above Buffalo — Wyoming state hamfest. Camping, fishing, hamming, including high-altitude 2-meter tests. Get details from SCM A. D. Gaddis, W7HNI, P. O. Box 786, Gillette, Wyo.

HQ STAFF OPENING

Wanted for WIAW post, to replace an employee entering military service — an amateur with constructional and maintenance experience and the ability to set a good example when on the air. Apply in writing for details and application form. Mention ARRL organization-operating background, if any, age, amateur and other radio experience. Address all correspondence to F. E. Handy, ARRL Headquarters.

SWITCH TO SAFETY!
HAPPENINGS OF THE MONTH

HANDY NEW VICE-PRESIDENT

Francis E. Handy, WIBDI, Communications Manager of ARRL, with over 26 years service to the amateur fraternity, has been named a Vice-President of the League by the Board of Directors. Such action was contemplated at the 1951 annual meeting in May, and confirmed by mail vote among the directors subject to approval of the new charter — which has now been accomplished.

"FEH" needs no introduction to the operating and organization-minded person in amateur radio, and very little to anyone else who has ever pushed a bug or breathed into a mike. It is his over-all responsibility to set ARRL policy in operating matters, to see that contests are set up and run properly, to nurture traffic systems and networks, to decide on rules for ARRL operating and achievement awards and oversee their issuance, to supervise the HQ station W1AW, to promote the public-service activities of amateur radio particularly through emergency preparation and planning, to . . . well, we could go on and on but we think you get the idea.

When he came to League Headquarters in 1925 to take over the administration of the Communications Department and its field organization, Ed Handy brought with him a wealth of the kind of experience the job required. First licensed in 1919 as 1BDI, he had spent the intervening years building and operating an amateur station that had an enviable performance record. A description of 1BDI-1XAH, Orono, Maine, appearing in July 1924 QST, starts out with this sentence: “This station is an example of what a poor location with a poor antenna can do when the man behind the key knows what he is doing and makes the best of circumstances.” Always a balanced amateur, he worked plenty of DX, handled traffic, participated in ARRL field organization work, but without letting his hobby interfere with other duties. Most of his earlier amateur accomplishments were attained while he was an E.E., and one with a high scholastic standing, at the University of Maine. After receiving his degree in 1924, Westinghouse called him to work in its Pittsburgh laboratories. Industry was not to hold this bright young lad for long, however. The outstanding performance of 1BDI had already come to the attention of Hi-ram Percy Maxim and when Traffic Manager Fred Schnell left on the historic cruise with the Navy to demonstrate short waves, Ed was brought to HQ.

One of the more notable of Ed’s accomplishments while connected with the Headquarters was the writing, practically single-handed, of the first edition of The Radio Amateur’s Handbook in 1926. Often known to the brethren as “Handy’s Handy Handbook,” it is still called by that same even after tremendous growth in popularity and size of the work has caused it to become a major publication task in which the whole Headquarters staff now participates.

When World War II came along, Uncle Sam took advantage of Ed Handy’s ability and experience in communications. He was commissioned an officer and went on active duty at the Directorate of Communications, Headquarters Army Air Forces, in Washington during 1942. His later military assignments took him all over the United States, to North Africa and the European Theater. During the war he was as conscientious a worker as he had always been at League HQ and came out of military service with the rank of colonel and the Legion of Merit.

Always an active amateur, Ed Handy scarcely misses a day without several contacts entered in the WIBDI log. His mobile set-up, identified by the license plate “ARRL,” is a familiar sight along Connecticut highways and byways where he is often spotted pounding brass on 80 and 40 meters or talking with the gang on 2 meters. He keeps regular skeds with his son Dick, W1RZP, who became a licensed amateur with no particular urging on the part of his dad. W1BDI is active in the Connecticut phone and e.w. nets and can always be counted upon to show up in CD Parties, LO-nites, the Sweepstakes, V. H. F. Parties and other League activities.

AMATEUR RULES CHANGES

Early in May FCC took action to bring our rules into line with its new regulations governing antenna structures near airports. Antennas already in existence (before February 15, 1951) are not affected. Any new structure, or change in present structure, involving a pole or mast or
other support more than 1 foot in height for each 200 feet the station location is from the nearest airport, requires the filing of FCC Form 401-A, revised (copies obtainable from your district FCC office). For example, if you are exactly one-half mile airborne from the nearest airport (2640 feet) you can put up a mast 13.2 feet (actually, up to 14 feet) high without any problem; if you are two miles airborne, your mast can be 53 feet high before you are covered by the new regs. A general exemption is made in the case of certain antenna structures of limited height, however — regardless of the distance from an airport, you are not covered by the new rules if your antenna is 20 feet or less in height, or if your mast or other support is mounted on a house or garage or other existing man-made structure so as not to increase the overall height of the existing structure by 20 feet. The new additions to our rules, effective immediately, are:

§ 12.9 Antenna structure defined. — The term “antenna structure” includes the radiating system and its supporting structures.

§ 12.10 Aircraft landing area defined. — An aircraft landing area means any locality, either on land or water, including airports and intermediate landing fields, which is used, or approved for use, for landing and take-off of aircraft whether or not facilities are provided for the shelter, servicing, or repair of aircraft, or for the receiving or discharging of passengers or cargo.

§ 12.60 Limitation on antenna structures. — (a) No new antenna structure shall be erected for use by any station in the Amateur Radio Service, and no change shall be made in any existing antenna structure used or intended to be used by any station in the Amateur Radio Service so as to increase its overall height above ground level, without prior approval by the Commission, in any case when either (1) the antenna structure proposed to be erected will exceed an overall height of 170 feet above ground level, except in the case where the antenna is mounted on top of an existing man-made structure and does not increase the overall height of such man-made structure by more than 20 feet, or (2) the antenna structure proposed to be erected will exceed an overall height of one foot above the established elevation of any landing area for each 200 feet of distance, or fraction thereof, from the nearest boundary of such landing area, except in the case where the antenna structure does not exceed 20 feet above the ground or is mounted on top of an existing man-made structure or natural formation and does not increase the overall height of such man-made structure or natural formation by more than 20 feet as a result of such mounting. Application for Commission approval, when such approval is required, shall be submitted on FCC Form No. 401-A, in triplicate.

(b) In cases where FCC Form No. 401-A is required to be filed, further details as to whether an aeromedical study and/or obstruction marking may be required, and specifications for obstruction marking is required, may be obtained from Part 17, "Rules Concerning the Construction, Marking, and Lighting of Antennas Towers and Supporting Structures”. Information regarding requirements as to inspection of obstruction marking, recording of information regarding such inspection, and maintenance of antenna structures is also contained in Part 17.

Also in May the Commission made final, to become effective June 30th, its "editorial" changes in certain of the amateur rules to bring them in conformity with present practice; the text is precisely that as printed on page 45 of May QST.

NOVICE CALL SIGNS

FCC has long indicated that amateur call signs for Novice Class licensees would be distinctive, and has now announced its system for assigning such calls. In the continental U. S. A., calls will be issued in exactly the same manner as regular ones, and from the same alphabetical series, except the prefix will be WN instead of plain W (with the later possibility, if calls are exhausted, of issuing KN Novice prefixes instead of plain K for regular licensees). If the Novice graduates to a higher grade of license during the year, his call becomes a regular one simply by FCC dropping the N. If he does not so qualify within the year, however, the call will not be held for his use in the event he does make the grade later.

In the possessons, W will replace the K as the the first letter of the prefix in Novice calls, with the second letter still indicating the particular area. For example, a Novice in Hawaii might become WH6CBA, and one in Puerto Rico, WP4VB; if and when each graduates into a regular ticket, the calls become KH6CBA and KP4VB, respectively.

EXAMINATION SCHEDULE

The Federal Communications Commission will give amateur examinations during the second half of 1951 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. 5th.

Amarillo, Tex.: Oct. 2nd.

Anchorage, Alaska, 52 Federal Bldg.: By appointment.

Atlanta, Ga., 411 Federal Annex: Tuesday and Friday at 8:30 A.M.

Bakersfield, Calif.: Sometime in Aug.

Baltimore 2, Md., 508 Old Town Bank Bldg.: Monday through Friday. When code test required, between 8:30 A.M. and 9:30 A.M.

Bangor, Me.: Sometime in Oct.

Beaumont, Tex., 329 P.O. Bldg.: Thursday and by appointment.

Birmingham, Ala.: Sept. 6th and Dec. 12th.

Boise, Idaho: Sometime in Oct.

Boston, Mass., 1600 Customhouse: Monday through Friday; 8:30 A.M.

Buffalo, N. Y., 329 P.O. Bldg.: Thursday.

Butte, Mont.: Sept. 13th.

Charleston, W. Va.: Sometime in Sept. and Dec.

Chicago, 1809 U.S. Customhouse: Friday.

Cincinnati, Ohio: Sometime in Aug. and Nov.

Cleveland, Ohio: Sometime in Sept. and Dec.

Columbus, Ohio: Sometime in July and Oct.

Corpus Christi, Tex.: Sept. 13th and Dec. 13th.

Dallas, Tex., 500 U. S. Terminal Annex Bldg.: Monday thru Friday.

Davenport, Iowa: Sometime in July and Oct.

Denver, Colo., 521 New Customhouse: 1st and 2nd Thursdays and by appointment.

Des Moines, Iowa: July 12th and Oct. 11th.

Detroit, Mich., 1209 Federal Bldg.: Wednesday and Friday.

El Paso, Tex.: Oct. 9th.

Ft. Wayne, Ind.: Sometime in Aug. and Nov.

Fresno, Calif.: Sept. 19th and Dec. 19th.
Hartford, Conn.: Sometime in Sept.
Hilo, T. H.: Oct. 9th.
Honolulu, T. H., 609 Stangenwald Bldg.: Monday, 8:30 A.M.
Houston, Tex., 324 U. S. Appraisers Stores Bldg.: Tues.
and Fri.
Indianapolis, Ind.: Sometime in Aug. and Nov.
Jackson, Miss.: Sept. 12th and Dec. 12th.
Juneau, Alaska, 8 Shaftuck Bldg.: By appointment.
Kansas City, Mo., 2900 Fidelity Bldg.: Friday, 8:30 A.M.,
also by appointment.
Knoxville, Tenn.: Sept. 19th and Dec. 19th.
Las Vegas, Nevada: Sometime in Oct.
Little Rock, Ark.: July 11th and Oct. 10th.
Los Angeles, 530 Federal Bldg.: Wednesday, 1:00 P.M. and
3:00 P.M.
Louisville, Ky.: Sometime in Nov.
Manchester, N. H.: Sometime in Nov.
Memphis, Tenn.: July 13th and Oct. 5th.
Miami, Fla., 312 Federal Bldg.: Monday and Thursday.
Milwaukee, Wisc.: Sometime in July and Oct.
Minneapolis, Minn., 240 U. S. Courthouse and Customhouse:
Wednesday and by appointment.
Nashville, Tenn.: Aug. 8th and Nov. 7th.
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, 748 Federal Bldg.: Monday through Friday.
Norfolk, Va., 402 Federal Bldg.: Monday through Friday,
except Friday only when code test required.
Oklahoma City, Okla.: July 19-20 and Oct. 18-19.
Omaha, Nebr.: July 19th and Oct. 18th.
Philadelphia, 1005 U. S. Customhouse: Monday through
Friday.
Phoenix, Ariz.: Sometime in July and Oct.
Pittsburgh: Sometime in Aug. and Nov.
Portland, Me.: Sometime in Oct.
Portland, Ore., 307 Fitzpatrick Bldg.: Friday, 8:30 A.M.
Rapid City, S. D.: July 20th.
Roanoke, Va.: Oct. 6th.
St. Louis, Mo.: Aug. 9th and Nov. 15th.
St. Paul, Minn., 206 Federal Courts Bldg.: Friday.
Salt Lake City, Utah: Sept. 15th and Dec. 15th.
San Antonio, Tex.: Aug. 9th and Nov. 8th.
San Diego, 15-C U. S. Customhouse: By appointment.
San Francisco, 323-A Customhouse: Monday and Friday,
8:35 A.M. Also Advanced Class Monday through Friday.
San Juan, P. R., 325 Federal Bldg.: Thursday, and Monday
through Friday at 8:30 A.M. if no code test required.
Savannah, Ga., 214 P.O. Bldg.: By appointment.
Seattle, 808 Federal Office Bldg.: Friday.
Spokane, Wash.: Sept. 11th.
Syracuse, N. Y.: Sometime in July and Oct.
Tallahassee, Fla.: July 14th.
Tampa, Fla., 410 P.O. Bldg.: By appointment.
Tucson, Ariz.: Sometime in Oct.
Wash., D. C., 415 22nd St., N. W.: Monday through Friday,
8:30 A.M.
Wichita, Kan.: Sept. 8th.
Wilmington, Pa.: Sometime in Sept. and Dec.

The ARRL Board of Directors and League officials at the annual meeting of the Board in Hartford on May 11th. Seated around the table, I. to r.: Director Hill, Southwestern; Director Dosland, Dakota; Director Middleton, West Gulf; Director Canfield, Delta; Director Griggs, Southwestern; Director Hughes, Pacific; Vice-President Groves; Director Roberts, Northwestern; Director Keyes, Midwest; Communications Manager Handy; General Counsel Segal; President Bailey; Secretary Budlong; Senior Asst. Secretary Huoton; Treasurer Houghton; Canadian General Manager Reid; Director Noble, New England; Director Matejka, Rocky Mountain; Director Bragg, Great Lakes; Director Marriner, Central; Director Johnston, Hudson; Director Martin, Atlantic; Director Jacobs, Roanoke, Rear, I. to r.: Technical Director Grammer; Quayle B. Smith, of the General Counsel's Office; Alternate Director Joos, Southwestern; Alternate Director Weingarten, Northwestern; Alternate Director Baker, New England; Assistant Secretary Baldwin.

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MINUTES OF 1951 ANNUAL MEETING OF THE BOARD OF DIRECTORS, AMERICAN RADIO RELAY LEAGUE
May 11-12, 1951

1) Pursuant to due notice and the requirements of the By-Laws, the Board of Directors of the American Radio Relay League, Inc., met in regular annual session at the Hartford Club, Hartford, Connecticut, on May 11, 1951. The meeting was called to order at 9:42 a.m., EDST, with President W. F. Farnady in the Chair and the following other directors present:

Wayland M. Groves, Vice-President
Alexander Reid, Canadian General Manager
John H. Brabb, Great Lakes Division
Vic L. Doel, Southwestern Division
Goodwin L. Doel, Dakati Division
John R. Griggs, Southwestern Division
Lamar Hill, Southeastern Division
Kenneth E. Hughes, Pacific Division
Woodrow H. Jarnot, Northeastern Division
Joseph M. Johnston, Hudson Division
Alvin G. Keyes, Midwest Division
Wesley M. Merriner, Central Division
Walter Bradley Martin, Atlantic Division
Franklin K. Matlack, Rocky Mountain Division
A. David Middleton, West Gulf Division
Perry C. Noble, New England Division
R. Rec Roberts, Northwestern Division

Also in attendance, at the invitation of the Board as non-participants, were W. S. Horgan, Alternate Director Frank L. Baker, Southwestern Division Alternate Director Walter R. Joos and Northwestern Division Alternate Director Karl W. Weingarten. There were also present the Secretary, Burdlong, Communications Manager Francis E. Handy, Treasurer David H. Houghton, Technical Director George Grammer, Assistant Secretaries Richard L. Baldwin and John Huntont, General Counsel Paul Scott, and Quelby B. Smith of the office. The meeting was opened and briefly addressed by the Chair.

2) On motion of Mr. Doel, unanimously VOTED that the minutes of the 1950 annual meeting of the Board of Directors are approved in the form in which they were issued by the Secretary.

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

4) On motion of Mr. Middleton, unanimously VOTED that the Board, having examined its mail action in authorizing the furnishing of affiliated club lists in certain instances, now ratifies this action and decides to take the affairs position as of February 1, 1952.

5) On motion of Mr. Johnston, unanimously VOTED that all acts performed and all things done by the Executive Committees since the last annual meeting of the Board, and by the Board, shall be ratified and confirmed by the Board as the motions of the Board.

6) On the reception of reports of committees: Upon the request of Mr. Reid, after discussion and without objection, the report of the Finance Committee goes over to preclude consideration of the appropriation for expense of this meeting, Mr. Noble stated the report of the Planning Committee had been mailed to all Directors. Mr. Roberts reported briefly for the Committee to Study Standing Committees, Mr. Griggs reported briefly for the Membership and Publications Committee. Mr. Doel moved to suspend the regular order of business and proceed to adoption of the report of the Membership and Publications Committee and there was no objection, so the motion was lost.

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

At this point, supplementary oral reports were rendered by the officers of the League.

9) On motion of Mr. Johnston, VOTED, 13 votes in favor to 2 opposed, that the Secretary and General Counsel be instructed to petition the Federal Communications Commission to change the present system of two-letter calls to a system which permits a person who was an amateur 25 years ago and has been licensed 15 years immediately preceding his application to be eligible for a two-letter call on approval.

10) Moved, by Mr. Keyes, that it is the sense of this meeting that the Secretary be instructed to request FCC to open to narrow-band frequency and phase modulation all amateur frequencies available for telephony. Moved, by Mr. Brabb, that the motion be amended to instruct the Secretary to conduct a poll in QST on this subject; but there was no second, so the motion to amend was lost. Moved, by Mr. Johnston, that the motion be amended to request that the proposed amendment be presented to the amateur再去 ad

11) The Board was in recess from 11:20 a.m. until 11:28 a.m.

12) On motion of Mr. Noble, VOTED that it is the policy of this Board that whenever possible motions shall be submitted to the Secretary sufficiently in advance of each Board Meeting so that publicity can be given in QST, thus permitting membership comments to the individual Directors.

13) Moved, by Mr. Noble, that the YLRL be extended the privilege of having one page in each issue of QST provided that the YLRL meets the requirements of League associated radio clubs, i.e., at least 15% of its members must be licensed amateurs and at least 30% of its members must be League members. Moving, by Mr. Roberts, to amend the motion to give authority to the Editor of QST to use his discretion in the editing and amount of space to be given to the new feature. Moved, by Mr. Griggs, to further amend to state that the column shall be written by a YL operator supplied by the YLRL. But, on motion of Mr. Doel, it was VOTED to lay the matter, including the original motion and all the proposed amendments, on the table. On motion jointly of Messrs. Doel and Noble, VOTED that the Editor of QST be instructed to have prepared (by a qualified licensed female amateur) a monthly column devoted to YL amateurs and their interests, said column to be included in QST not later than January, 1952, and said column to be paid an amount commensurate with other current QST columns.

14) Moved, by Mr. Roberts, that the Secretary be instructed to file with the FCC a request that the amateur rules be amended to provide that all amateur Advanced Class licenses issued prior to March 1, 1951, shall automatically become Amateur Extra Class at the time that the Amateur Extra Class becomes available. Motion of Mr. Doel, VOTED to lay the matter on the table.

15) The Board was in recess from 12:15 p.m. to 1:53 p.m.

16) Moved, by Mr. Hughes, that By-Law 6(a) be amended by deleting from the Southwestern Division the county of Mono and adding Mono County under the Pacific Division. The yeses and nays being ordered, the question was decided in the affirmative. Whole number of votes cast, 10; necessary for adoption, 10; yeses, 10; nays, 0. All the Directors voted in the affirmative except the President and Vice-President, who abstained as required. So the By-Law is amended for the purpose of this amendment.

17) On motion of Mr. Jacobs, after discussion, unanimously VOTED that the Secretary of the League, upon request, furnish a Director a card copy pertaining to each member of his Division who fails to renew membership prior to expiration thereof.

18) Moved, by Mr. Hill, to direct the secretary to request of the appropriate agency that the 3.5- and 14-Mc. 'phone subbands in the Canal Zone, Puerto Rico and the Virgin Islands be extended to correspond to those now in effect in Canada. After discussion, moved, by Mr. Brabb, to amend the motion to authorize U. S. domestic mobile operation similarly; but there was no second, so the motion to amend was lost. On motion of Mr. Martin, VOTED to amend the motion to refer the same to the Planning Committee for its study and report to the Board. The question then being on the motion as amended, the same was unanimously ADOPTED.
band be eliminated as a multiplier in the annual DX contest; but there was no second, so the motion was lost.

20) Moved, by Mr. Griggs, that the Board do hereby instruct the Secretary to request of the Federal Communications Commission a policy whereby a license for the FCC will acknowledge receipt of license applications immediately upon receipt of same, by postal card, but, after discussion, the motion was rejected.

21) Moved, by Mr. Griggs, unanimously VOTED to adopt the following: BE IT RESOLVED that the Board of Directors do hereby commend Walter E. Bradley for his untiring efforts as technical consultant to League members.

22) Moved, by Mr. Middleton, that the ARRL, through its League Committee, undertake a program of educational work on TVI by means of a nation-wide educational program directed at TV manufacturers, TV installers, servicemen and repairmen, and TV set users; such a program to be implemented in the form of a series of programs, TVI seminars, workshops, and seminars, directed at the general public, as well as the various groups, together with TV films, radio scripts, newspaper publicity, and other media that will assist said program to be carried to all TV users and builders, with a view at reducing TVI complaints against radio amateurs. Moved, by Mr. Brabb, to amend the motion to the extent that any League employee who does not follow this policy be summarily required to submit his resignation; but there was no second, so the motion to amend was lost. Moved, by Mr. Martin, to strike out the word "summarily" in the following: in view of the present action being taken by the headquarters staff, that the headquarters staff continue their present TVI elimination work at the maximum capacity. Moved, by Mr. Brabb, that the motion to amend be substituted for the following: that the League carry on through QST an open and aggressive campaign to combat TVI caused by improperly designed TV sets; but there was no second, so the motion to amend the amendment was lost. The question then being on Mr. Martin's motion to amend, the same was rejected. There followed an extended discussion of the matter, in which every member in the room participated. Moved, by Mr. Dooland, to amend the motion by striking out the text and substituting the following:

BE IT RESOLVED: The Board takes cognizance of the widespread misunderstanding of the television viewing public throughout the country concerning the causes of interference to television reception and the misleading character of much of the blame hereforth and now being falsely ascribed to amateur stations.

Accordingly, the Board expresses the approval of the work heretofore performed by the headquarters staff; and further directs the staff to expand and extend its program in an aggressive and cooperative manner to further reduce the amount of television interference and improve in television receiver design and other remedial measures may eliminate controversy between amateurs and the television viewing public.

The Board further recommends to the attention of the various specific boards suggested by each Director at the present meeting.

Moved, by Mr. Brabb, to amend the motion by deleting in the second paragraph the word "by the headquarters staff"; but there was no second, so the motion to amend was lost. The question then being on the amendment proposed by Mr. Dooland, the same was unanimously VOTED. During the course of the above action, the Board was in recess from 3:18 P.M. to 3:26 P.M.

23) The Board was in recess from 5:14 P.M. to 6:23 P.M.

24) Moved, by Mr. Middleton, that the Editor of QST be instructed to include in QST, at least quarterly, a section consisting of the equivalent of not less than two full columns of informative TVI data, modern and up to date authentic TVI-proofing procedures, TVI bibliography and the latest tips on what clubs and individuals can and should do when TVI exists, by Mr. Hill, to provide that such space be taken from space normally occupied by station activity reports; but there was no second, so the motion to amend was lost. The question then being on the original motion, and the 20 votes being ordered upon request, it was decided in the affirmative: Whole number of votes cast, 17; necessary for adoption, 9; yeas, 16; nays, 1. Every director voted in favor except Mr. Hill, who voted opposed, and the President, who abstained. So the proposal was VOTED.

25) Moved, by Mr. Middleton, that the Secretary and the Headquarters staff be instructed to organize and to carry out a genuine and intensive program to prevent both the Novice and Technician Class of licensees and to provide this program with adequate and comprehensive enthusiasm together with full coverage in QST, and that the program be augmented by the preparation of booklets outlining the full story of ham radio from a hobby standpoint, as viewed from the Novice standpoint, said booklet to be prepared for wide distribution to all types of youth organizations, veterans groups, schools and wherever such material would in any way stimulate and publicize a policy of ham radio stations. But, unanimous consent being given, the motion was withdrawn to be presented later in the meeting.

26) Moved, by Mr. Middleton, that this Board take prompt action to locate QST's VHF Editor, Ed Tilton, and to vest in Ed Tilton full authority and the responsibility, and to furnish him with adequate personnel and ARRL publication space, to properly organize and to administer the ARRL VHF-UHF program; said Manager Tilton shall be responsible and report to the ARRL Board of Directors; but, after discussion, the motion was rejected.

27) Moved, by Mr. Middleton, that the Secretary-Editor be instructed to provide additional full time editorial and technical personnel whose sole duties will be to prepare material to be used in QST and perhaps other technical publications other than QST or other monthly periodicals, in order to enhance QST by permitting the Headquarters staff to devote their full efforts and energies to it; but there was no second, so the motion was lost.

28) Moved, by Mr. Middleton, that the Editor of QST be instructed to make payment, upon acceptance, for solicited or unsolicited QST or other ARRL publications material (paid at current time rate of five cents per word and $5.00 per photograph used, with a maximum of $50 per article for textual material). After discussion, the yeas and nays being ordered upon request, the question was decided in the negative: Whole number of votes cast, 17; necessary for adoption, 9; yeas, 3; nays, 14. Those who voted in the affirmative were Messrs. Griggs, Jacobs and Middleton. Every other director voted opposed, except the President, who abstained. So the motion was lost.

29) On motion of Mr. Middleton, VOTED, 10 votes in favor to 4 opposed, that the Editor of QST be instructed to include in QST, and other ARRL publications, appropriate references or footnotes to articles in contemporary publications (such as CQ and Radio News) when such references would be of benefit to the ARRL publication reader.

30) Moved, by Mr. Middleton, that the Editor of QST be instructed to return the character of the "Amateur" covering space-advertised products and place it in such and every issue of QST; but there was no second, so the motion was lost.

31) The Board was in recess for dinner from 6:23 P.M. to 8:10 P.M.

32) Moved, by Mr. Middleton, that the ARRL Technical Director be instructed to investigate or have investigated the technical accuracy of all claims made by manufacturer-advertisers (other than Ham Aide) and that ARRL publications space be denied to unsatisfactory products or products where claims are misleading or untruthful in the spirit as well as the letter of the intent; but there was no second, so the motion was lost.

33) Moved, by Mr. Middleton, that the Secretary of the ARRL publish in QST, at least yearly, a statement of the number of Full ARRL members in the U.S. and possessions, together with a statement of the number of Associate members in the U.S. and possessions as given by the FCC data. The yeas and nays being ordered upon request, the question was decided in the negative: Whole number of votes cast, 17; necessary for adoption, 9; yeas, 16; nays, 1. Every director voted in favor except Mr. Hill, who voted opposed, and the President, who abstained. So the proposal was rejected.

34) At this point, the Secretary reported to the Board the results of his study, directed by the Board at its 1950 meet-
ing, of the feasibility of establishing a so-called technical scholarship to be awarded, moved by Mr. Middleton, that the ARRL sponsor a "Technical Scholarship" which will lead to a year's paid employment at ARRL Headquarters in the ARRL laboratory, for an amateur who has not yet reached his 21st birthday, and who in the decision of the judges (to be selected by the Board of Directors) has most clearly demonstrated his inherent ability, interest and enthusiasm toward the hobby of amateur radio, through his all-round amateur performance for the year 1951, such "Technical Scholarship" to be a continuing affair with yearly awards and job-offers made to the winners; but the motion was rejected.

35) Mr. Canfield read the report of the Committee to study the question of Creation of Three Standing Committees, and upon his motion the Board ADOPTED the following resolution:

BE IT RESOLVED, that there be created, and by adoption of this resolution there is created, a permanent committee to be known as the "Policy and Review Committee," with the following requirements as to membership and duties:

1. The committee shall be composed of five directors automatically becoming committee members as their term comes alphabetically by divisions.
2. The first committee shall be composed of the directors from the first five ARRL divisions numbered in alphabetical order, and thereafter members shall be replaced in even numbered calendar years and three members replaced in odd numbered calendar years. The new members shall be those next in line by alphabetical designation of divisions. Terms shall be considered as running between regular annual board meetings, regular terms being two years more or less depending on date of board meetings.
3. No member shall hold office more than two consecutive terms, and a lapse of one year (board meeting to board meeting) shall elapse before any reappointment of member may be made.
4. Vacancies in the committee shall be filled by appointment by the president for unexpired term only of disqualified directors, from list of eligible directors not holding membership on the committee.
5. Duties and responsibilities of the "Policy and Review Committee" and other qualifications and procedures shall be fixed by the board of directors, and until modified or amended by majority vote of the directors, shall conform to the suggested duties and procedures outlined in report of committee recommending creation of the "Policy and Review Committee."

36) On motion of Mr. Canfield, after discussion, VOTED that this Board of Directors adopt the policy of making appropriations for Directors' administrative expenses for the year in which the appropriations are authorized, and that such appropriations be made from the net operating revenues of the year for which appropriated, and appropriations made at the Board Meeting shall date back to the first of the year. During the course of the above action the Board was in recess from 12:36 P.M. until 1:36 P.M.

37) On motion of Mr. Canfield, unanimously VOTED, after discussion, to adopt the following resolution:

BE IT RESOLVED, that the General Manager be, and hereby is, a statement of estimated revenues and expenses and submit to the members of the Board 30 days before the annual meeting of the Board, with a revised estimate, if necessary, to be submitted at the Board Meetings.

38) Moved, by Mr. Brabb, that every copy of QST placed on newstand sale contain a tear-out application for membership. After discussion, moved, by Mr. Marriner, to amend the tear-out to include the membership and newstand issues of QST; but the motion to amend was rejected. On motion of Mr. Canfield, VOTED to amend the motion to provide that such a card be included beginning with the earliest practicable issue and thereafter included in every other issue for 12 months. The question then being on the motion as amended, the same was ADOPTED.

39) On motion of Mr. Brabb, unanimously VOTED that the Communications Department investigate the feasibility of issuing its various certificates of appointment and merit in uniform dimensions as will fit standard size picture frames.

40) Moved, by Mr. Brabb, that the League press for immediate ratification of the treaty permitting mobiles to use the frequency spectrum of 1800 to 2650 kc but, unanimous consent being given, the question was deferred for consideration with the report of the Planning Committee.

41) The Board recessed at 9:35 P.M., under order to reassemble at 9:30 A.M. on the morrow. The Board reassembled at the same place on May 12, 1951, and was called to order by the Chair at 9:45 A.M., with all directors and other persons hereinbefore mentioned in attendance.

42) At the request of Director Canfield, the Chair read the "President's Box" items appearing in the September and November 1927 issues of QST, entitled "The Reason Why" and "Representative Government" respectively, by Hiram Percy Maxim.

43) On motion of Mr. Brabb, unanimously VOTED at 9:54 A.M. that the Board does now resolve itself into a Committee of the Whole. The Chair appointed himself Chairman of the Committee of the Whole. The Board, sitting as a Committee of the Whole, was in recess for luncheon from 12:36 P.M. until 1:36 P.M. The Committee reconvened at 1:36 P.M. and Mr. Bailey, as Chairman of the Committee, laid before the Board the report of the Committee. On motion of Mr. Doniel, VOTED to adopt the following resolution:

WHEREAS, there has existed for many years a warm and cordial relationship between the amateur of the United States and those of Canada;

WHEREAS, this relationship is a further demonstration of the unique relation in international affairs which exists between the peoples of Canada and the United States of America; and,

WHEREAS, there has existed for many years a practical working understanding between United States and Canadian amateurs whereby the 'phone sub-allocations of the 80-160 kc band have been made and maintained free of charge at less than 60 kc, additional to the United States sub-allocations in the 75- and 20-meter bands; and,

WHEREAS, the Board of Directors of the ARRL recognizes fully the right of Canadian amateurs to request of their Government any 'phone sub-allocations they may desire; and,

WHEREAS, the practical working understanding referred to above appears to have been successful in practice;

NOW, THEREFORE, BE IT RESOLVED by the United States members of the Board of Directors of the ARRL that they appeal to their Canadian brother-members, through the Canadian General Manager, their elected representative, to institute appropriate procedures to request the Canadian regulatory authority to modify the radio-telephone sub-allocations in conformity to the principles long heretofore outstanding and described in this resolution.

Every director voted in favor of the motion except the Canadian General Manager and the President, who abstained.

44) Moved, by Mr. Brabb, to amend paragraph 10 of Article IV of Constitution to read as follows: There shall be an Executive Committee consisting of the officers of the League and two directors who shall be duly elected at any regular board meeting by a majority of the directors of the League. This committee shall act in the place of the Board of Directors during the intervals between meetings of the Board. Any action taken under this section shall be promptly reported to the Board and shall be subject to approval of the Board at its next subsequent meeting. After
discussion, the years and nays being ordered, the question was decided in the negative. Whole number of votes cast: 16; necessary for adoption, 11; yeas: 3; nays: 13. Messers. Brabb, Griggs and Middleton voted in the affirmative. Every other director voted in the negative except the President and Vice-President, who abstained as required, so the proposal to amend was rejected. Messrs. Doedel, Hill, Keyes, Mariner and Roberts requested that it be noted in the minutes the reason for their negative vote was their belief that the expenses under the proposal is inconsistent with the benefits which might be derived.

47) At this point, Mr. Canfield reported briefly for the Finance Committee.

48) On motion of Mr. Doedel, VOTED that this Board continue in session until all business to come before it shall have been disposed of.

49) On motion of Mr. Keyes, VOTED that the Secretary be and hereby is instructed to pay directly or reimburse division directors for their necessary travel and subsistence expenses incurred by them in attending the 1951 Board Meeting, and pay all other necessary expenses of such meeting, the total of such expenses to be a charge against in 1951 net operating income, the total amount authorized to be paid not to exceed six thousand dollars ($6,000).

50) On motion of Mr. Canfield, unanimously VOTED that the Secretary be and hereby is instructed to restore to current account all expenses for travel and subsistence purposes of all directors, at its its 1950 regular meeting to cover administrative expenses of directors for the year 1951, and to provide for payment of 1951 administrative expenses of directors, the Secretary is authorized and instructed to reimburse division directors for actual expenses incurred by them at the proper administration of ARRLL affairs in their respective divisions but not to exceed amounts as listed herein:

<table>
<thead>
<tr>
<th>Division Director</th>
<th>Amount</th>
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<tbody>
<tr>
<td>Canadian General Manager</td>
<td>$350</td>
</tr>
<tr>
<td>Atlantic Division Director</td>
<td>$400</td>
</tr>
<tr>
<td>Central Division Director</td>
<td>$750</td>
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<tr>
<td>Dakota Division Director</td>
<td>$500</td>
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<tr>
<td>Delta Division Director</td>
<td>$500</td>
</tr>
<tr>
<td>Great Lakes Division Director</td>
<td>$500</td>
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<tr>
<td>Midwest Division Director</td>
<td>$750</td>
</tr>
<tr>
<td>New England Division Director</td>
<td>$300</td>
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<tr>
<td>Northwestern Division Director</td>
<td>$500</td>
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<tr>
<td>Pacific Division Director</td>
<td>$500</td>
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<tr>
<td>Reano Division Director</td>
<td>$500</td>
</tr>
<tr>
<td>Rocky Mountain Division Director</td>
<td>$300</td>
</tr>
<tr>
<td>Southeastern Division Director</td>
<td>$200</td>
</tr>
<tr>
<td>Southwestern Division Director</td>
<td>$300</td>
</tr>
<tr>
<td>West Gulf Division Director</td>
<td>$500</td>
</tr>
</tbody>
</table>

Actual administrative expenses paid by the Secretary in accordance with this motion shall be a charge against net operating income for 1951.

51) On motion of Mr. Canfield, unanimously VOTED that the Secretary be and hereby is instructed to restore to current account, but not exceeding the amount authorized by the Board at its 1950 regular meeting for the expenses of the Planning and Finance Committee, that the Secretary be and hereby is instructed to reimburse and pay expenses of the Planning Committee for the year 1951 not to exceed the sum of two thousand dollars ($2,000) and the Finance Committee not to exceed the sum of two hundred dollars ($200) and the Policy and Rules Committee not to exceed the sum of one hundred dollars ($100) and that such actual expenses shall be a charge against net operating income for 1951.

52) On motion of Mr. Canfield, VOTED, that the Secretary be and hereby is instructed to restore to surplus the unexpended remainder, as of December 31, 1950, of the amounts appropriated by the Board at its 1950 regular meeting to cover expenses for travel of SCM and QSL Managers; and that the Secretary be and hereby is instructed to pay directly or reimburse division directors, at the rate of 75c per mile or actual rail or bus fare, Section Communications Managers and QSL Managers of the League, applicable within the continental limits of the United States and Canadian Parliament for the year 1951, as follows: (1) SCM to attend one official ARRL Convention within their respective Divisions. (2) Within ARRL Sections in the continental limits, SCM to attend in their own Section, in addition to the above mentioned and to make five major Section organization meetings per year, to include hamfests only if sponsors schedule an ARRL Section organization meeting. (3) QSL Managers of the League to attend one official ARRL Convention within their respective call area, provided that, where such convention is more than 500 miles from the QSL Manager's residence, reimbursement for travel expense, as provided below, shall not be for more than a total round trip of 1,000 miles. A designated Full Member may be authorized and subsequently reimbursed under these provisions to represent the SCM and speak for him at meetings (1) or (2) as above, provided the SCM has the advance concurrence of the Director of Communications and the Communications Manager and gives written approval to such substitution. In the case of newly-elected SCMs, if five meetings for their Section have already been reimbursed, they may, on written request to the Director of Communications, attend specific proposed additional (but not more than three such) Section organization meetings. That reimbursement be made in the above at the rate of 75c per mile or actual cost of personal transportation be used. In (1) and (3) expenses may include one night's hotel accommodation at actual cost but not to exceed four dollars ($4.00) and the convention registration fee. All allowances for expenses shall be subject to approval by the Communications Manager, and any excess misappropriation, or QSLs distributed, etc., by the individual attending the meeting. The total amount covered by this motion shall not exceed three thousand dollars ($3,000). Such actual expenses shall be a charge against net operating income for 1951.

53) On motion of Mr. Canfield, VOTED, that the Secretary be and hereby is instructed to restore to surplus the unexpended remainder, as of December 31, 1950, of the amounts appropriated by the Board at its 1950 regular meeting for travel expenses of Section Emergency Coordinators throughout their respective sections in the United States and Canada, and that the Secretary be and hereby is instructed to pay directly or reimburse division directors, at the rate of 75c per mile or actual rail or bus fare, section Emergency Coordinators to a maximum of ten trips each per year per section, throughout their respective sections and Canadian territory only, for the purpose of close contact with Emergency Coordinators and through meetings, selling clubs and individuals on the necessity for Emergency Corps work, and contacting duly constituted civil defense officials, relief and appropriate local agencies, subject to submission and approval of a full report to the Communications Manager; if one BOC replaces another and the section quota of trips has been exhausted by his predecessor, he may with a written request to the Communications Manager and the Communications Manager request advance approval of subsequent reimbursement for specific travel (but not more than five trips) under the provisions above. The amounts authorized by the Board at its 1950 meeting shall be not to exceed five thousand dollars ($5,000). Such actual travel expense shall be a charge against net operating income for 1951.

54) On motion of Mr. Canfield, VOTED, that in case the actual expenditures against appropriations authorized for the Board meeting of 1951, administration expenses of Division Directors for the year 1951, expenses of Committees for the year 1951, expenses of SCM and QSL Managers for the year 1951, and expenses of Section Emergency Coordinators for the year 1951, exceed the net operating income for the year 1951, the Secretary is instructed and authorized to charge the deficiency to surplus.

55) The bylaws, as amended, were ordered read a second time, and referred to the Standing Committee on Bylaws and Rules, with Mr. Doedel and Mr. Keyes as a minority, and the Communications Manager, seconded by Mr. Doedel, that the Board adjourn on the second reading of the bylaws, adjourned at 2:30 p.m.

56) Moved, by Mr. Doedel, that hereafter it be the sense of the Board that all authorizations for expenditures made by the Board after net operating income shall not exceed the amount of net operating income; but there was no second, so the motion was lost.

57) On motion of Mr. Johnston, unanimously VOTED that there is hereby appropriated from the surplus of the League the sum of $500 to be paid to Mr. Doedel, the Pacific Division Director during the year 1950 beyond the amount of the Pacific Division administrative appropriation for that year.

58) Turning now to the report and recommendations of the Planning Committee: Moved, by Mr. Noble, that the League's Secretary be instructed to request the Federal Communications Commission to establish 3750-3800 kc.
for A3 emission as an Advanced Class mobile sub-allocation (by "mobile" in this is meant "automobile") — either in motor vehicles on public highways and roads with the (mobile) automobile and without external power supply). On motion of Mr. Marriner, VOTED, 9 votes in favor to 6 opposed, to amend the motion to open this band both to Advanced and General Class amateur. After discussion, the question being on the motion as amended, the same was rejected; Messrs. Brabb, Hill, Johnston, Marriner and Middleton asked to be recorded as voting in favor of the motion. After further discussion, it being apparent that the majority was opposed to the proposed portion of Mr. Casfield, VOTED, 9 votes in favor to 6 opposed, to lay the matter on the table; Messrs. Johnston and Marriner requested to be recorded as opposed to tabling.

On motion of Mr. Middleton, after discussion, unanimously VOTED that the League's Secretary continue his efforts to get expansion of frequency privileges in the 160-meter band and to get whatever modifications of area are possible to enlarge night-time operation on the frequencies 7250-7300 kc; Mr. Reid requested to be recorded as not voting.

61) On motion of Mr. Griggs, unanimously VOTED that the League's Secretary take the Planning Committee to study the possibility of petitioning the Federal Communications Commission for the allocation of A3 emission on the 7-Mc. band.

62) On motion of Mr. Griggs, unanimously VOTED that the Planning Committee is hereby requested to examine the possibility of requesting the Federal Communications Commission for the allocation of those portions of the 1800-2000 kc, band presently available to amateurs for the operation of audio-frequency-shift keying so as to encourage the expansion of radiotelegraphy operation by amateurs.

63) The Board was in recess from 4:24 P.M. to 4:31 P.M.

64) On motion of Mr. Dosland, VOTED, 12 votes in favor to 7 opposed, to take from the table the letter of Mr. Casfield, a request to the Federal Communications Commission to establish an A3 mobile sub-allocation in the 3.5-Mc. band. Mr. Dosland moved the adoption of the original motion, as amended, but, on motion of Mr. Jacobs, after discussion, VOTED, 10 votes in favor to 6 opposed, to refer the matter back to the Planning Committee for further study.

65) On motion of Mr. Noble, unanimously VOTED, at 4:41 P.M., that the Board does now resolve itself into a Committee of the Whole. The Chair appointed himself Chairman of the Committee of the Whole, and at the request of the Board directed that all Headquarters officers and personnel retire from the meeting. The Committee rose at 7:21 P.M. in accord with the request of the Chair, Headquarters staff personnel rejoined the meeting, Mr. Bailey, as Chairman of the Committee, laid before the Board the report of the Committee recommending the adoption of the proposed new charter prepared by the League's General Counsel at the direction of the Constitution Revision Committee.

66) On motion of Mr. Roberts, unanimously VOTED that the salary of Communications Manager T. E. Handy be increased ten per cent, the limit permitted by the Wage Stabilization Board.

67) Moved, by Mr. Dosland, that the President and the Secretary of the League, on behalf of the Board of Directors and the members of the American Radio Relay League, Inc., execute and file with the Secretary of State of the State of Connecticut the amended articles of association of the American Radio Relay League now before the Board, such amended articles being in words following:

AMENDED 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 I:
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, Cyrus E. Tuthill and Lawrence A. Jervis. The affairs of the corporation have since that time been successively administered by a Board of Directors selected by the membership; and the present Directors, subscribers 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 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 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. Badlona 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 no 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:

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

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...

(Continued on page 80)
Military-to-Amateur Operation

Special QSL cards, acknowledging Armed Forces Day contacts with the headquarters radio stations of the United States Army, Navy and Air Force, have been mailed to more than 700 amateur radio operators in the United States. The three military stations — WAR, NSS and AIR — were on the air just outside the amateur bands for a six-hour period on May 19th as part of a military-to-amateur test. Amateur stations, calling from within the limits of their own bands, exchanged call letters and signal reports with the No. 1 headquarters stations of the three military services. Many stations were still "in line" waiting their turn to contact the military stations when the six-hour period ended.

Military coordinators of the amateur radio program for Armed Forces Day expressed their appreciation for the courteous cooperation received from amateurs who participated. A few instances were reported of amateurs moving over onto the military frequencies but a quick warning brought prompt action in all cases. It is hoped that next year additional operating time can be made available in order to accommodate more amateurs.

Receiving Competition

As this was written, final results of the Armed Forces Day Receiving Competition were not available; entries still were coming in. More than 500 already had been received, representing all sections of the U. S. and several maritime and overseas listeners.

Winners in the 25-w.p.m. copying contest will receive Certificates of Merit, attesting to their code-copying proficiency. Each certificate bears the signature of the Secretary of Defense, the Honorable George C. Marshall.

Judges for this event, representing all three services, are:

Army — Captain Lester A. Peterson, chief of MARS.
Air Force — Captain Charles C. Mack, chief of MARS.
Navy — Captain R. R. Hay and Commander E. L. Battey, Naval Reserve Liaison Section, Naval Communications Division.

A complete list of winners in the Receiving Competition will be published in this department as soon as all entries are received and thoroughly checked.

Two-Meter Teletypewriter Demonstration Successful

As a local project in Washington, personnel of the MARS Headquarters constructed and operated a two-meter radioteletypewriter station at the national Armed Forces Day exhibition at Bolling Air Force Base.

Personal message traffic from visitors at the Armed Forces show was transmitted via the two-meter teletype link across the Potomac river to the Pentagon Building where it was promptly relayed by means of MARS Headquarters station facilities.

Chief credit for the demonstration belongs to Army and Air Force enlisted personnel who coordinated their efforts under the supervision of T/Sgt. Harry Simms (AF4HBD-W4HBD), chief operator at AIR-K4USA. A big assist was provided by radioteletypewriter enthusiasts among the amateur fraternity. Washington and Richmond, Va., amateurs loaned crystals, helped test equipment on the air, and furnished valuable advice in the construction and conversion processes.

The MARS display at the Armed Forces Day show in Washington, D. C., May 19th. The two-meter radioteletypewriter station at the extreme left handled more than 500 messages from visitors. Messages were filed and transmitted across the Potomac river to the MARS Headquarters stations in the Pentagon for relay.
A Bandswitching V.H.F. Converter and Harmonic Checker

Converting a Surplus TV Tuner for Use on 220, 144, 50 and 28 Mc.

BY EDWARD P. TILTON, WIHDQ

- Man bites dog — hams use surplus TV tuners to monitor civil defense frequencies. Yes, here's real headline news: a complete-with-tubes 4-band v.h.f. converter for less than twenty dollars. And it's a sensitive harmonic indicator for any eight TV channels to boot!

There is something about receiver construction that usually stops the average ham. He will take on the job of building a kilowatt transmitter, complete with VFO and modulator, but the mere mention of receiver work sends him running for cover. The project outlined here is, however, simple enough for almost anyone. The result, a bandswitching converter for 220, 144, 50 and 28 Mc., and a choice of eight TV channels, for as little as $20.00, is a value not often equaled in these days of rocketing prices.

The basis for this bargain is the availability of large numbers of TV front-end units at surplus prices. Even if purchased new, these bandswitching front ends, usually supplied complete with tubes, can be had for less than the parts for a homebuilt unit would cost. The idea of converting them for v.h.f. ham band coverage was the brain child of Myron S. Friedman, W1WIS, of Dale, Connecticut, Inc., Admiral TV distributors of New Haven. The turret unit, the "Standard TV Tuner," used by Admiral and several other manufacturers, requires only the connection of filament and plate supply and a coaxial cable for the i.f. output to make it a converter for the TV channels.

Even in this form the gadget can be extremely useful for a ham in a television area. As a converter used ahead of a communications receiver capable of tuning around 21 Mc., it covers all the TV channels, providing a sensitive check on transmitter harmonics that may cause TVI.

Sensitivity is far better than that of most of the devices normally used for harmonic checks around a transmitter, and you can check the strength of your harmonic against any TV signals in your locality, thus getting a good idea of what you are up against in the way of a TVI-elimination problem. If it turns out that your harmonics are 40 db. or more below the TV signal (better check the S-meter calibration!) you can breathe easy. If the difference is less than this figure you have some shielding and filtering to do, though where the signal falls in the TV channel will have a lot to do with the severity of the interference.

It is seldom necessary to monitor all 12 channels, so unused ranges of the tuner can be modified to cover several ham bands from 28 Mc. up. Except for the 10-meter coils, all those used in the conversion described here were made by altering some of the unused inductances. Replacement coils are available from TV distributors, so experimental work can be done without the fear of ruining an irreplacable unit. Coil assemblies slip in and out readily, so the original twelve sets can be retained for TVI work, if needed, and additional coil sets obtained for conversion to ham band use.

The converted tuner is an Admiral type 94C18-4, probably the best bet for the job, if you can find one. An earlier model, Type 94C8-2 or 94A8-2, is a similar design, the later model having an improved contact design in the coil turret. The numbers given are Admiral designations; they may be different for other set manufacturers. Either model uses a 6J6 mixer-oscillator, and a pentode r.f. amplifier that can be a 6AG5 (used in the older models), a 6BC5, or a 6CB6. A 6AK5 may also be used, but the risk of oscillation troubles is greater.

The coil turret is in two sections, the forward one containing the oscillator, mixer grid, and r.f. plate windings, and the other the antenna coupling and r.f. grid circuit coils. The turret is cylindrical in form, and so arranged that lead inductance is practically nil. Thus it is possible to hit 225 Mc. with appreciable coil inductance, and reasonably good performance. The oscillator

A 4-band v.h.f. converter made from a Standard TV Tuner. An earlier model of the tuner is shown at the right.

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winding has a small brass slug, the setting of which can be changed to line up the various bands to the same spot on the dial. Fine tuning is done with a bakelite rotor that is moved between the plate side of the oscillator and ground. It is designated as C111 on the diagram, Fig. 1. Small padders are provided for the r.f. grid circuit, C102, the r.f. plate circuit, C104 the mixer grid, C107, and the oscillator, C110. An adjustable slug tunes the I.F. output winding, L105. There is only one set of these adjustments, however, so the coils must be tailored to work with the same trimmer settings on all ranges. All r.f. circuits are broad-banded by resistive loading, so adjustment is not at all critical.

Conversion Procedure

It is suggested that the tuner be hooked up and checked on the TV channels before making any modifications. In this way one can become familiar with the operation of the unit before attempting to change any of the tuning ranges. The late-model tuner (94C18-4) has three leads coming through a grommeted hole near the I.F. output coil. A white lead is the a.v.c. connection to the I.F. amplifier. This can be grounded to the chassis, as a.v.c. will not be required for converter service. A white lead with black tracer is the hot filament lead, and a white-white-red is the B-plus. The older model (94C8-2 or 94A8-2) has a green tracer lead for the a.v.c. White is ground and the other leads are similar to the newer type. The older models have two I.F. output connections, for receivers that used separate sound and video I.F. amplifiers. The circuits of the two units are otherwise practically identical, and the procedure for utilizing them is similar. The I.F. output is taken off at a lug on the side of the chassis near the power leads. A coaxial cable, preferably not more than about two feet long, is connected to this lug, and the outer conductor grounded to the chassis. Connect up the power leads, run the coaxial line to the antenna terminals of a receiver capable of tuning from about 20 to 24 Mc., and you're ready to receive TV signals or transmitter harmonics. Operation of the fine tuning and the bandswitch will be easier if some knobs are provided. Drill a 3/8-inch hole in a large knob for the fine tuning, and use any small knob with a 1/4-inch shaft hole for the bandswitch.

If your receiver tunes only to 18 Mc., you have one more job: padding the I.F. output winding so that it will resonate at that frequency or lower. This is a desirable step in any event, as the performance of most receivers is somewhat better as you move down from 21 to 16 or 17 Mc. It also helps to prevent mixer oscillation on 28 Mc. The change was made in the converter shown by mounting a 30-µfd. ceramic padder inside the tuner chassis, adjacent to L105, and connecting it in parallel with C112. It is adjusted through a small hole drilled in the top surface of the tuner.
Now let's try the ham bands. Table I gives complete specifications for all the ham-band coils, so they can be made up from scratch, if one wishes to save the coil sets for the particular ranges that were used in our conversion process. We can start with 50 Mc., as that is the easiest to get working correctly, if the Channel 2 coil set is converted for this band. The oscillator winding, L102C, can be used by removing the brass slug and adding two turns to the inside end of the winding. If the slug is used for adjustment purposes at least two more turns should be added. It is recommended that the slug be removed, and the turns spread apart or squeezed together as required. Add two turns to the adjacent end of the mixer grid winding, L102B, and to the outside end of the r.f. plate coil, L108A. Add four turns to each end of the r.f. grid coil, L101B, leaving the primary, L101A, without change. With the coils altered in this manner, or a new set made according to the information in Table I, it should be possible to hear 50-Mc. signals if there is local activity.

Alignment can be done without the aid of signals, if necessary, so long as some source of calibration is available. This can be a crystal-oscillator harmonic, the radiation from a receiver oscillator, a signal generator, or any other signal source by which a known frequency close to 50 Mc. can be established. Set the receiver so that 50 Mc. is tuned in with the fine tuning near the maximum setting, then peak the i.f. adjustment (the stud in L103, or the ceramic padder mentioned earlier) for maximum noise. Adjust the trimmers C107, 104 and 102 for maximum noise, and the converter is ready for 50-Mc. work. If any of the trimmers peak near their maximum or minimum settings it will be necessary to adjust the coil inductances accordingly, to bring the peak near the middle of the trimmer tuning range. Bear in mind that these trimmers will affect all coil ranges, so the coils in each must be tailored to allow the trimmers to be set at the same position for all. The trimmer adjustments are very handy in the initial phases of the coil.

 Amateur band coils for the converted TV tuner. The three windings on each of the four sets at the left are, left to right, oscillator, mixer grid, and r.f. plate. The two-winding coils, right, are for the r.f. grid and antenna coupling circuits. In order of frequency, reading up from the bottom row, they are for 25, 50, 144, and 220 Mc.

Apply the plate voltage (100 to 150 volts) and tune the receiver for maximum noise. The actual intermediate frequency used is not critical; wherever the noise peaks may be used, provided that there is about two megacycles of tuning range on either side. If a signal generator is available, the tuning range on the various channels can be checked. This will vary with the setting of the oscillator padder, C110. In tuners we've tested it has been about 700 kc. on Channel 2, increasing to about 1000 kc. on Channel 6. The high-band tuning range starts at about 2000 kc. on Channel 7 and increases gradually to 3000 kc. or more on Channel 13. This may be augmented, of course, by tuning the receiver over the required range. If you are interested in performance checks, 0.5 microvolt or less should give a 10-db. signal-to-noise ratio on the low channels, and about 2 microvolts will do the same on the high channels.

<table>
<thead>
<tr>
<th>Antenna, L101A</th>
<th>28 Mc.</th>
<th>60 Mc.</th>
<th>144 Mc.</th>
<th>220 Mc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 t. No. 26 d.s.c. center-tapped. Wind over L101B.</td>
<td>28 t. No. 26 d.s.c. or add 4 t. to each end of Channel 7.</td>
<td>3 t. No. 26 d.s.c. interwound in L101B, center-tapped, or Channel 7 with no change.</td>
<td>5 t. No. 26 d.s.c. or add 2 turns to outside end of Channel 7.</td>
<td>8 t. No. 22 e. 3/16 inch long. or add 1 t. each end of Channel 7.</td>
</tr>
<tr>
<td>R.F. Grid, L101B</td>
<td>No. 30 d.s.c., 1/4 inch long.</td>
<td>19 t. No. 26 d.s.c. or add 2 turns to outside end of Channel 2.</td>
<td>5 t. No. 22 e. 1/4 inch long. or add 1 turn to Channel 7.</td>
<td>4 t. No. 22 e, 3/16 inch dia., 1-inch long.</td>
</tr>
<tr>
<td>R.F. Plate, L108A</td>
<td>No. 32 e., 1/4 inch long.</td>
<td>15 t. No. 26 d.s.c. or add 2 turns to Channel 2.</td>
<td>5 t. No. 22 e, 1/4 inch long, or add 1 turn to Channel 7.</td>
<td>2 t. No. 22 e, 3/16 inch dia., or remove 1 turn from Channel 13.</td>
</tr>
<tr>
<td>Mixer Grid, L101B</td>
<td>No. 32 e., 1/4 inch long. with slug.</td>
<td>14 t. No. 26 d.s.c. or add 2 turns to Channel 2.</td>
<td>5 t. No. 22 e, 1/4 inch long, or add 1 turn to Channel 7.</td>
<td>1 1/2 t. No. 22 e, 3/16 inch dia., or remove 1/2 turn from Channel 13, with slug.</td>
</tr>
</tbody>
</table>

July 1951
Bottom view of the converter, showing the tuner turret with several sets of coils removed.

The Completed Converter

For the purpose of adjustment, no mechanical work other than that previously mentioned need be done, but a convenient and smooth-working converter can be made by mounting the tuner in a chassis and equipping it with a suitable dial and knob. We also added a voltage regulator, antenna terminals, and detachable coaxial and power cables, as seen in the photographs. The dial was made by taking apart a National type O dial, adding a white card the size of the dial plate, between it and the knob. The calibration was marked on the card in pencil and then inked in with India ink. The knob was drilled for the \( \frac{3}{8} \)-inch fine tuning shaft, and an area at the center was recessed on a lathe to take a small bar knob that acts as a bandswitch position indicator. The lathe operation is a finishing touch for appearance only, and is not necessary if no lathe is available. The fine tuning and bandswitch shafts need only be cut to a suitable length to take care of almost any knob combination.

The chassis is 5 by 7 by 2 inches, with the top surface cut out to permit mounting the tuner.

![Diagram of TV tuner components](image)

**Fig. 2** — Top view sketch of the TV tuner, showing the location of the various adjustments.

Angle brackets were made from the piece of sheet aluminum cut from the top of the chassis. These are screwed to the sides of the tuner about 1\( \frac{1}{2} \) inches down from the top. The front panel is about 4\( \frac{3}{4} \) by 5 inches in size. The VR-105 socket is at the back of the chassis, and antenna terminals and coaxial- and power-cable connectors are mounted in any convenient place on the rear wall.

Performance

As the converter employs a pentode r.f. stage, its performance does not approach the ultimate in low noise figures for the frequencies covered. It is quite good, however; at least the equal of

(Continued on page 100)
United States Naval Reserve

Special Consideration for Radio Operators

The Bureau of Naval Personnel has announced a revision of the conditions under which radio license holders may enlist in the Naval Reserve. Applicants for enlistment in Class V3 of the Naval Reserve, who hold radio licenses issued by the Federal Communications Commission, may be enlisted in accordance with Col. 2 of the following table. At any time following enlistment in the rate indicated in Col. 2, personnel may be examined and, when found to be qualified, may be advanced to the rate shown in Col. 3. These provisions apply only to Class V3. They do not apply to other volunteer classes of the Naval Reserve; nor are they applicable to the Organized Reserve or to personnel in active military service.

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>License Held</td>
<td>Rate in Which Enlisted</td>
<td>Authorized Rate When Qualified</td>
</tr>
<tr>
<td>Radio Telegraph-Commercial</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st Class</td>
<td>Seaman</td>
<td>Radioman, second class</td>
</tr>
<tr>
<td>2nd Class</td>
<td>Seaman</td>
<td>Radioman, second class</td>
</tr>
<tr>
<td>3rd Class</td>
<td>Seaman</td>
<td>Radioman, third class</td>
</tr>
<tr>
<td>Radio Telegraph-Amateur</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amateur Extra Class</td>
<td>Seaman</td>
<td>Radioman, second class</td>
</tr>
<tr>
<td>Advanced Class or Class A</td>
<td>Seaman</td>
<td>Radioman, third class</td>
</tr>
<tr>
<td>General Class or Class B</td>
<td>Seaman</td>
<td>Radioman, third class</td>
</tr>
<tr>
<td>Conditional Class or Class C</td>
<td>Apprentice</td>
<td>Seaman</td>
</tr>
</tbody>
</table>

Electronics Training for Enlistees in Regular Navy

Applicants for enlistment in the Regular Navy who wish to be sent to a technical or operational electronics school may apply for the “Electronics Field” Program. Applicants accepted for this program will be assured an opportunity of being sent to one of the service schools listed below, but not to a particular school:

**Technical**
- Electronics Technician
- Fire Control Technician
- Interior Communications Technician
- Teleman

**Operational**
- Radioman
- Sonarman
- Radarman
- Communications Technician

By passing an Electronic Technician Selection Test and being accepted for the Electronic Technician Training Program, an applicant may assure himself of attending the electronic technician school.

Further details on these programs may be obtained from your nearest U.S. Navy recruiting office.

Here & There

Add to list of amateurs in active military service: W6UWL/YKL (USMC) and W6YLD (USNR). . . . After an absence of 20 years, Captain R. R. Hay, USN, Naval Reserve liaison officer, Naval Communications Division, has returned to the ham bands as W4LW in Arlington, Va. Dick originally held WJIC in Massachusetts, and was a charter member of the U.S. Naval Academy Amateur Radio Club—W3ADO. . . . Amateur radio activity at the Naval Academy is at an all-time high, with the following midshipmen operating W3ADO: W2PFT, W2UZD, W3NII, W3NTT, W6KTH, W6KNG, W8FOK, W8YNZ, W8FFH, W8RJN, W8ACZ, and W8CNR.

Volunteer Electronics Company 11-26 (K3NB), Santa Maria, Calif., won the 1951 “Outstanding Unit Award” for the best electronics unit in the Eleventh Naval District. This outstanding organization is commanded by Lieutenant Richard Clare.

Recent shifts in Naval Reserve Electronics Program personnel affect the following amateurs: Cmdr. H. D. Gibson (W7NSE) moves from Seattle to Fourth Naval District Headquarters, Philadelphia. . . . Cmdr. W. B. Martin (W3QY), who has been stationed at Philadelphia for several years, returns to inactive duty, effective July 1st. Lt. Cmdr. R. B. Gromman (W3QLY) leaves New York to take

(Continued on page 98)

July 1951
How To Lay Out a Transmitter

The Elements of Radio Design

BY BYRON GOODMAN,* W1DX

A problem that confronts practically every amateur at one or more times during his career is that of laying out and wiring a piece of equipment. It may involve taking a circuit from a book or magazine and translating it into the finished article, or it may revolve around a minor modification or substitution in a piece of gear that has been described rather completely. The amateur would like to know what liberties he can take with the original design without letting himself in for a pack of trouble. Frankly, that depends upon how much radio theory and practice he knows, and the only way he can get the necessary background is through reading and actual construction. As with most hobbies, the more experience one has the less likely he is to run into trouble.

This business of layout and design couldn't possibly be covered completely in a single article, or in a single book for that matter. Among other things, a layout may depend upon the parts on hand, the allowable space for the unit, whether or not it is to match or tie in with other units, and the designer's personal preferences and prejudices. But certain basic considerations are involved in almost any piece of radio gear, and we will try to point out some of them in this article. We intend to do it by taking a simple transmitter as a concrete example and following it through, step by step. The same principles will apply to any piece of equipment, however.

*Assistant Technical Editor, QST.

Modifying a Transmitter

Let us suppose, for example, that we have looked through a number of books and magazines for the design of a simple transmitter that we can use in the 80- and 40-meter bands. After looking them all over, we keep coming back to the transmitter described in the April, 1950, issue of QST. Two views of it are repeated here, and the wiring diagram is shown in Fig. 1. We plan to use a 6L6 in the final, but we note with satisfaction that a 6V6 or 6F6 can be substituted, if we ever have to.

We like everything about the design except that it doesn't provide for crystal switching, a feature we would like to incorporate for two reasons: quick QSY, and a handy storage space for our crystals.

The Circuit

Looking in the Handbook and back issues of QST at rigs where crystals are switched, we note that both sides of the crystal are switched wherever both sides of the crystal are "hot" (one side not grounded), so we plan to do the same thing. A catalog shows that rotary double-pole switches can be had with up to 11 positions, and that would be one limit to our design. Octal tube sockets can be used as sockets for two crystals each, or we can use a number of the special crystal sockets that are available. We decide that four or six crystals on the chassis at any time will give us enough choice of frequencies, so we plan to use two or three octal sockets for the crystals, whichever fits better into the layout. We decide on octal sockets over the special ones.
The Layout

The next problem, of course, is how to fit the switch and crystal sockets on the chassis. Looking at the top view in the photograph, the first thing that comes to mind is that we could mount the switch on the left-hand side of the chassis at the rear, leaving the rest of the construction as before, with the exception of the switch and the extra crystal sockets. The switch knob would project out the side and could be reached easily in most cases, but we might not be able to see the switch position to check which crystal is in the circuit. So let’s consider some other possibilities.

Looking at the photographs, we are struck by the symmetry of the front-panel view and the apparent lack of it in the top view. Symmetry or balance of parts on a chassis is not important from an electrical standpoint, but it often makes a unit look more finished or “engineered,” so let’s see what the possibilities are of making the top view pretty without spoiling anything. The first idea that comes to mind is that sketched in Fig. 3. By putting the key jack at the rear of the chassis, we can mount the crystal switch in the hole originally provided for the key jack, thus keeping practically the same panel layout. The crystal sockets will mount under the meter. This looks like a rather neat arrangement, until we start to consider some of the r.f. leads. The plate

Fig. 2 — Necessary modification of Fig. 1 for crystal switching. S1 is a two-pole wafer switch.

because of the price differential and the fact that we aren’t trying to crowd everything into the minimum possible space.

Our revised diagram, therefore, will be the same as in Fig. 1 except for a crystal switch, the detail of which is shown in Fig. 2.

Two views of the two-tube transmitter as originally described in QST.
circuit of the 6L6 amplifier — plate to C10 to C12 to ground to C7 to cathode — should be made reasonably short if we can, and this particular arrangement would work against us. We could consider the plate circuit as plate to C10 to L4 to ground to C7 to cathode, and this would be a fairly short path, but most hams get into the habit of thinking of it the first way, which is the right way on the higher frequencies. Actually, 3.5 and 7 Mc. are relatively low frequencies where we don’t have to pay too much attention to r.f. lead lengths, but it is a good habit to think about them always, and they are an important consideration where TVI is involved. By keeping the r.f. leads short, particularly those that carry high r.f. currents, we will minimize the possibilities for harmonic radiation from the transmitter.

Not liking the lead lengths involved in the layout of Fig. 3, let’s look at some other possibilities. The arrangement in Fig. 4 is certainly feasible. The switch would be mounted near the rear of the chassis and driven by an extension shaft to the front panel. This shaft would pass directly under the tube sockets and might make wiring a little difficult, but that’s not too much of a problem. The 6L6 socket is now brought closer to the tuning condenser, and that makes us a lot happier.

We still haven’t made up our mind, but let’s think a little about tube-socket positioning. We have kept the two sockets together in Figs. 3 and 4 because it seems very logical — there are no tuned circuits between them to take up space, and in any capacity-coupled stages the current return is through the chassis. It is good practice to make this return path as short as possible. Keeping the sockets close together will accomplish this for us. By sketching the tube-socket pin positions and rotating the sketches, it becomes obvious that, in Fig. 4, the best arrangement is to position the socket keys as shown and make C13 the left-hand condenser, since this makes most of the r.f. leads short.

But before we freeze this design, let’s just see what some other possibilities might be. Absolute symmetry of the panel is not essential — good balance of dials and meters will give just as pleasing an appearance. With this thought in mind, it occurs to us that we could lay out the panel as shown in Fig. 5B, which more or less dictates a chassis arrangement as shown in Fig. 5A. This doesn’t look too bad — the r.f. leads will fall in place properly, and we won’t need that extension shaft on the crystal switch. While it is true that we have lost the symmetry of the chassis that originally started us on all this doodling, we have come up with a design that might be worth while. We check it further by cutting out paper patterns to represent the dials, meter and crystal-switch knob, and juggle them around on a paper rectangle that represents the panel. The first thing we see is that by moving the left-hand tuning knob a little to the right of center we have better balance than as originally planned in Fig. 5B. This doesn’t hurt the chassis arrangement in any way, of course. We could have used the dials themselves, instead of the paper dummies, but the meter can best be represented by paper because the meter itself won’t lie flat on anything being used to represent the panel. In this revised arrangement, coils L2 and L4 are mounted at right angles to each other, so we don’t have to

(Continued on page 100)
Keying the BC-696

Good Break-in Operation and Only One Antenna

BY HOLLAND M. CARTER,* W4ADE

Being away from the big rig, it was desired to operate portable 'phone and c.w. with a BC-696 and at the same time enjoy the good features of the behemoth back home. Keying was the first thought. But where to put an elaborate tube keyer on that little chassis? Not one more piece of equipment was wanted — the idea being to keep the rig compact and portable, yet preserve its good points of the calibration crystal and ease of tuning. And what about the relays in the BC-696? They operate on d.c. — leading to the problem of power for them. Any a.c. relays were out — too big and too expensive. One of two answers had to be chosen: either provide a d.c. supply for the relays and the 'T-17-D microphone, operating the filaments on a.c., or provide a d.c. supply for all three needs. The latter was decided upon, principally because of ease in changing to batteries for emergency operation.

Judicious shopping provided a nice d.c. supply at nominal cost. Included were a 15-volt 5-ampere transformer, a 12.5-volt bridge selenium rectifier, and a 6000-µfd. 18-volt filter condenser. The transformer consumed about 50 per cent of the cost, and was a necessity, anyway. The d.c. supply requirement can be met through the use of surplus or used trickle chargers, or by combining surplus dry rectifier with a transformer from the junk box. The filter condenser is not a necessity, but provides a little better regulation if you can get it. A recent article in the January, 1951, issue of Popular Science, page 211, is most enlightening on changes in selenium rectifiers; the ARRL Handbook is also indispensable. There are still plenty of good bargains in these rectifiers on the surplus market.

The BC-696 has two relays already on it, both for 24-28 volt d.c. operation. Rewiring the heaters for 12.5 volts was easy, since they only require being connected in parallel. The antenna relay coils are in series, so it is obvious they will work in parallel on 12.5 volts. The little d.p.s.t. relay on the side of the chassis controls the oscillator plate voltage and the 1625 cathodes. It was removed and its coil replaced with a spare coil from an extra antenna-type relay. This done, both relays operate nicely on 12.5 volts, and draw a total of 0.26 ampere. If no spare antenna relay is available, remove the control-relay coil winding and replace it with a full winding of No. 32 enameled wire.

So far, so good. Now — how to hold the oscillator plate voltage on and the antenna relay closed, with a delay arrangement such as the tube keyers have? The first requirement is a low-current relay that will operate from small condenser charges through a limiting resistor, to hold it on for a short time. Almost any relay with a coil resistance around 15,000 ohms and an operating current of 4 to 8 ma. will do. You might even scrounge a couple from the telephone company! In our case, being unable to procure one with d.p.s.t. contacts, two small Sigma low-current (a.p.d.t.) relays were used. One of these fits between the oscillator and eye tubes on the back of the chassis, and the other fits underneath the chassis at the back. A 20-µfd. 450-volt electrolytic condenser, three 1-watt resistors, a 0.1-megohm potentiometer and a 5-prong relay socket were also needed. The relay mounted underneath had its shield can and plug removed first and then was mounted with two screws directly to the chassis back.

Referring to the circuit in Fig. 1, it will be noted that one set of points ("B" of Rµ) keys the 1625 cathodes and the "A" set keys the time delay net. The manual key or 'phone switch is inserted in the ground lead of this relay's coils as it comes out of the supply socket on the back of the chassis. This relay will take moderate code speeds nicely. A 0.2-µfd. 400-volt paper condenser.

* Smoaks, S. C.

The reworked BC-696 of W4ADE, complete with modulator and antenna tuning unit. The knob at the left rear of the transmitter controls the "hold-in" time of the keying circuit. The receiving antenna terminal can be seen in the upper right-hand corner of the transmitter.
is shunted from the 1625 cathodes to ground, as close as possible to the sockets, to provide r.f. return. W4ADE has an auxiliary on-off switch on the front of the transmitter, a phone-operation switch wired to the T-17-D, and the key jack in parallel with both of these. Any one switch will operate the entire rig. Microphone current is also controlled by the button on the T-17-D.

It will be noted that the 300-volt supply is fed directly from "A" on R1 to the junction of R1 and R3, where the current divides, a part of it actuating R2 and R3 (or one d.p.s.t. relay if you have it), and a part of the current going through limiting resistor R1 to C1 and R3 and R4. Here, R1 performs the important functions of limiting the charging current to C1, so that R2 and R3 will get enough current to close immediately and allow C1 to charge at the same time. Remember that an uncharged condenser in a d.c. circuit acts as a direct short during a current surge. This must be prevented to minimize delay in closing R2 and R3. During this process R3 and R4 take very little current to ground. R3 and R4 determine the discharge of C1 and hence the holding time of R2 and R3. Without them the charge of C1 would have to leak off through R3, R4 and the relay coils, a resistance that is not so easily adjusted. In the circuit as shown, the adjustment of time delay is a simple matter of adjusting R4. Current through R4 and R3 will hold them closed until the minimum actuating voltage point is reached as the charge on C1 leaks off. The delay time is about one half second with R4 set at minimum, and about two seconds with R4 at maximum. Any small potentiometer will work here, since the current through it is quite low.

What measure of control is possible with this arrangement? The R5 contacts control the 300-volt supply to the oscillator plate, and the R6 contacts control the 12.5 volts to the antenna relay. We control the transmitter by time-delay control of these two relays. Note that the 300 volts for the oscillator plate does not go through R1 but is run directly from the incoming supply line. If you substitute other type relays, keep them at a maximum operating current of 8 ma., and adjust R2 so that the total resistance of this leg is 40,000 ohms. For positive operation, be sure that the relay contacts are clean.

Consider the sequence of operation:
1) Manual key or switch is depressed, closing R1.
2) Immediately R2 and R3 are energized and close.
3) A. Antenna relay closes to "transmit" position.
   B. Oscillator plate gets applied voltage and starts oscillating.
4) Amplifier cathodes are grounded, and transmitter operates.
5) Condenser C1 charges, beginning as R1 closes.
6) Transmitter is keyed through R1 and the 1625 cathodes. This continues as long as delay time is not exceeded, and keying or switching is in progress.

When operating is stopped:
1) R1 opens, removing the charging current from C1 and actuating current from R2 and R3. The 1625 cathodes are disconnected.
2) R2 and R3 hold on for the time period determined by the setting of R4, the oscillator remaining on and antenna relay closed, until the stored voltage in C1 is exhausted below minimum operating point for R2 and R3.
3) R2 and R3 open, stopping oscillator and opening antenna relay to the receiving position.

During the keying or switching process, C1 is kept full by recurrent charging as the rig is keyed.

Good workmanship and a little care are all that are necessary to put the small parts under the transmitter — you don’t have to be a watchmaker. The marker crystal connections were taken out separately to pin jacks on back of the chassis. Many articles have been written about the circuit and changes in the Command-series transmitters, so a discussion of that is avoided here.

Calculations on the delay net give 7.5 ma. through the low-current relays, which is
7) Cut off a ¼-inch piece of No. 12 tinned solid copper wire. Bend it at ¼ inch from each end to form the shape of a crank. Solder into the coax fitting, and mount the contact spring as shown in B of Fig. 2.

8) Use RG-59/U coax cable to take out the receiving lead as desired. A car-type radio antenna jack and plug are suggested.

There is no need to remove the transmitter antenna loading coil permanently unless you so desire. A short piece of RG-59/U is used to connect the final tank link to the antenna relay contacts. Otherwise, no changes are made in the transmitter.

The total cost of the control system itself was $3.00. The d.c. supply was considered a necessity, since it was needed also for microphone voltage, and the rig was arranged for auxiliary 12-volt operation. This makes emergency operation a natural. The T-17-D supply is filtered through a small choke and a 25-µfd, 25-volt condenser from a BC-375B transmitter. Any small filter choke capable of 75 ma. or more will do as a substitute. A 200-ohm wire-wound potentiometer provides for adjustment of the microphone current, which runs about 50 ma. here.

Break-in is excellent with this system on both 'phone and c.w. The cost is extremely low — the keying characteristic excellent. It's easy to install — and you can sit back with pipe or cigar and operate away without breaking an arm or your back throwing switches. Oh, yes — it applies to almost any kind of rig if you have the requirements.

Antenna Relay

To permit the use of a common antenna, the following changes must be made in the antenna relay:

1) Remove the contacting spring from its supporting arm, then remove the arm permanently from the antenna coil support.

2) Remove the antenna binding post and parts — and save them.

3) Remove the other silver post just under the binding post — save it.

4) Measure ¾ inch from the center of the binding-post hole toward the left edge, facing the front of the rig. Mark this point and keep it level with the center of the binding-post hole. Drill and enlarge at this point to fit an Amphenol 83-1R chassis receptacle. Install the receptacle.

5) Using the binding-post insulators, remount one silver post with a machine screw as shown in A of Fig. 2.

6) Ream out the former grounding-post hole under the binding-post hole, to fit a pair of insulating washers. Mount this post with the washers.

Silent Keys

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

W1FX, Norman E. German, Windsor, Vt.
W2GK, Russell D. Valentine, Bayside, L. I., N. Y.
W4CFF, Charles H. Grant, Atlanta, Ga.
W4JG, D·J. Walker, Atlanta, Ga.
W5AHJ, James M. Morris, Victoria, Texas
W8VZJ, John A. Howell, Detroit, Mich.
W9AIA, Oscar D. Harchowin, Racine, Wis.
W9CMU, W. A. Pleasner, Rockford, Ill.
W9QYO, Carl R. McKelberg, Aurora, Ill.
W9GWV, Bendix J. Stedman, Clinton, Iowa
W9RGR, John D. Stock, St. Louis, Mo.
G3DLB, Philip H. Draycott, Katoji Ask, Liverpool
G8IWT, P. G. Whinfrey, Woodhouse, Sheffield
G8MZE, A. J. Marriott, Sutton-in-Ashfield, Nottingham
ex-KA1QG, George L. Richard, Manila
VK4AR, George S. Hamilton, Toowong, Queensland
VK4ER, Eric H. Reilly, Ladley, Queensland
VK4WA, W. J. Goldsworthy, Rockhampton, Queensland
VU2DM, Dr. N. S. Subba Rao, Waltair, South India

July 1951
DX-pedition to Guadeloupe

Putting a Rare French West Indies Prefix on the DX Map

BY WALTER WOOTER RICHARD, CM9AA

Being enthusiastic DX chasers, my wife Lily (CM2AC) and I decided last year that it would be an enjoyable experience to operate as rare DX. After studying a map and the Countries List, we settled on Monaco and Andorra as being tempting possibilities. Permission to operate from Monaco came with a minimum of difficulty. Unfortunately, inquiries revealed that the Andorra picture was not as favorable.

We were all ready to leave for Europe and 3A2-land when the unexpected turn of world events made a change of plans desirable. Our disappointment was short-lived, however. While rag-chewing with Charlie Mellen, W1FH, he suggested, "Why not go to Guadeloupe, a rare DX spot right near your back door? Chuck Bolvin, W4LVV, of Pan American Airways, has been down there for a couple of days and can give you all the information necessary." I immediately got a message off to W4LVV who obligingly sent us all the pertinent dope.

After three months of correspondence with the Directeur of Postes-Telegraphes-Telephones of Guadeloupe, we received a letter on April 6th stating that our call would be in the bracket FG7XA-XZ but that we must give our address at Guadeloupe before a license could be issued.

Lily and I promptly gave consideration to the equipment, antennas, spares, tools, etc., which would be needed. For a transmitter, we decided on our homebuilt 50-watt rig consisting of a 6L6 oscillator-807 final, 6AC7 speech-p-p. 6L6s modulator. Accessories included 14 crystals, a Lysee miniature ECO, and folded-dipole antennas for 10, 20 and 40. A Hallcrafters SX-71 receiver was selected because of its performance and light weight. In all, we had 178 pounds of excess baggage.

Transportation to Guadeloupe was the next problem to be met. We contacted Pan American Airways in Havana and Miami and all details were ironed out quickly. Thanks to Ernie Foss, W4LTP, our PAA Clipper was to be most enjoyable. He also saw to it that our gear received special handling.

We left Havana on April 8th, stopping over at Miami for a couple of days to pick up spares. On the 11th we took the flight to San Juan, P. R., where we remained overnight, and then continued the next morning via St. Thomas, St. Croix and Antigua to Pointe-a-Pitre, Guadeloupe, where we arrived at 1450 Atlantic Time. We were met at the airport by the Pan American officials, Jacques Buncel, Andre Latil and Bob Epeleun, who had received advance word of our expedition. Not being in possession of the final licenses, our equipment was held by the customs authorities. As it was too late to drive the 60 kilometers to Basse-Terre, the capital, we went sightseeing. We stopped overnight at Pointe-a-Pitre's Hotel Dilligenti, a modern three-story building.

The next day Jacques and Bob drove us the 60 kilometers to Basse-Terre. This trip took us over three hours because of the winding roads through the mountain passes. We could not help but be impressed by the tropical beauty of the island, especially its waving tall ferns, flowering plants, roaring cataracts, and small crystal streams. The natives were extremely hospitable.

Upon arrival at the capital we met M. Binois, Directeur of P.T.T., who was most helpful and cordial. He issued us the call FG7XA and wished us luck. We returned to Pointe-a-Pitre too late to get our gear out of customs so we traveled onward a short distance to a little village called Gosier, overlooking the ocean. Here we found "Le Pergola," the best restaurant on the island. During an excellent dinner fortified with white and red wine and champagne, we mentioned to M. Mario Petreluzzi, owner and manager, that it would be perfect if we could rent the attractive little cottage we had noticed about 500 feet away. He immediately got in touch with the owner who put the house at our disposal, free of charge, for as long as we remained on the island.

*Av# 2da, entre Paseo del Rio y, Real del Sur, Country Club Park, Marianao, Havana, Cuba.

The FG7XA "shack" and view out to sea.
CM2AC and CM9AA literally "burn the midnight oil" to keep FG7XA on the air around the clock.

The following morning, April 14th, we were able to take our ham gear out of customs. We lost no time in returning to our oceanside shack where FG7XA was promptly set up. Our first contact was on 20-meter phone, with W6BGU. Needless to say, from then on the QRM was terrific!

Conditions on the island made operating very difficult. Line voltage ran from 67 to 100 volts, and at least once every 24 hours the power would go off without warning. These failures would last anywhere from one to fourteen hours. M. Petrella, seeing the fix we were in, generously offered the loan of the 3½-kw. generator which he used for his restaurant. Since this unit was firmly seated in a cement foundation about 350 feet from our transmitter, we solved the problem by using wire from a 1000-foot spool of No. 20 which was among our supplies (wire was not available on the island). This arrangement gave us an emergency power source of 95 volts, 50-62 cycles, for our station. Water had to be added to the generator every 30 minutes, so when we were using it we had to QRX to refill, to the consternation of the many hams standing by.

We found it necessary to operate the transmitter outside its cabinet because of overheating. As a result, countless tropical insects succeeded in shorting out condensers, adding capacitance, changing the frequency of the ECO, etc. On one occasion a lizard entered the push-to-talk relay and was cooked, leaving an odor that DDT plus Chanel No. 5 could not eliminate. We were in dire need of screening, which was unprociable.

We operated around the clock. I took the 0100-0700 watch plus certain daylight ones. Lily took all the other watches, although Dick Bennett, an American engineer who works for Texasco, aided us at times. Incidentally, Dick is now a prospective American ham and contemplates taking the exam in Puerto Rico.

Twenty was our favorite band — both phone and c.w. — and it was there that we worked most of the gang. Forty was a disappointment; we had hoped of working at least 500 stations on this band but had to settle for 200. Ten meters was open to the States, South America, Europe, Africa and Asia for about six hours on five days, but even there results were not up to expectations. We tried eight for a number of nights but the best we could do was work 15 KP4s and VP1QW (KP4DV very kindly sent us a folded dipole via PAA to help performance on this band, but to no avail).

The final tally of our operation shows 1400 stations worked on phone and 746 on c.w. A total of 110 countries was worked to assure DXCC, and WAC was made eight times on phone and twelve times on c.w. Montana, Utah, Idaho and Wyoming were not heard, spoiling our chances of making WAS.

The bad operating practices of a number of stations could hardly go unnoticed from our vantage point. Though we stated definitely on regular occasions that we would not answer anyone calling on our frequency, many of the phone gang persisted in calling zero beat for as long as five minutes at a time. On c.w., we had a difficult time receiving reports from the stations being worked because of operators who rudely called us before we had finished our contact. Then there were the stations who called us blind without even knowing our frequency. And, despite our pleas, there was another group who worked us every day just to swap reports and seek reassurances on QSLs.

Speaking of QSLs, a photographic FG7XA card will be sent to all stations worked, upon receipt of a card. The cards will go forward via the various ARRL bureaus and those of the foreign amateur societies.

Lily and I wish to thank our many friends, new-found and old, whose assistance and advice helped make our sojourn in FG7 a long-to-be-remembered one.

220-MC. RESTRICTION

Because of some special experimental work being conducted by the Army at White Sands proving ground, New Mexico, lately greatly accelerated by the requirements of national defense, FCC has found it necessary to withdraw the 220-225 Mc. band from normal amateur use between the hours of 5 A.M. to 6 P.M. local time Monday through Friday in an area bounded by parallels 31°53' and 33°24' north, and longitudes 105°40' and 106°40' west. This is roughly the western half of Otero County, the eastern portion of Dona Ana (except El Paso) and the southeastern tip of Socorro County, all in New Mexico.

There is no restriction on the use of the band after 6 P.M. until 5 A.M. and no restriction whatever on Saturdays and Sundays. In the event of civil defense emergency, the restriction does not apply for such amateur stations as may be authorized; special arrangements for civil defense drills during the restricted hours may be made by mutual agreement between the FCC Engineer-in-Charge at Dallas and the Area Frequency Coordinator at White Sands.
"Why can't we get more activity on 6 meters?" This question is often asked by fellows who do all or a major part of their hamming on the 50-Mc. band. Well, why can't we? Is it because a large percentage of the ham fraternity do not appreciate what this band has to offer? We think so, and refuse to believe that hamming on 6, and getting a bang out of it, requires a special type of amateur.

Let's look at three typical hams. If they can be put in categories (can any ham?) they are, respectively, a low-power enthusiast, a rag-chewer-experimenter, and a DX hound. The first has been on 6 for a year, with less than 5 watts input to a single 6J6 final. His rig uses a 200-volt receiver-type power supply; causes no TVI, no BCI. Physically it is little more than a good-sized handful. At this writing he's up to 12 states worked, and confident that several more will be added this summer. Just the other day he worked a Missouri station, for that fellow's first Connecticut contact on 6, and he's worked more than 100 miles on ground wave from an ordinary residential location. He could go on higher power tomorrow, if he wished, but doesn't find it necessary. There's still a lot to be done on 5 watts, and it's fun trying.

Our second typical ham doesn't care if he never works more than 100 miles. DX leaves him cold, but he loves to tinker with circuits, and his favorite pastime is a long ragchew with another fellow who looks at ham radio in the same light. He's even put a single-sideband rig on 6, just to prove that it could be done, and he has a couple of ironies on s.s.b. on 75, with whom he works crossband to 6. He finds the ideal medium for the kind of contacts he most enjoys, and his only complaint is that there are not enough fellows on the band most of the time.

The third man got into hamming back in the early '30s, for the express purpose of working on 56 Mc., and he devoted three years of intensive effort to that band before trying another amateur frequency. For 18 years he's never been off 5 or its 6-meter successor. He likes the reliable ground-wave range that 6 offers the year around, and gets a lot of pleasure out of the friendly chats that are possible even under the worst conditions. But it's when the band is hot that he's really in his element.

Nothing pleases him more than digging out some nice double-hop signal when the band is apparently dead. When W7JRG answered his c.w. CQ at 11:10 p.m. May 24th he could have been more pleased only if it had been Montanas or Utah, the two states he needs for 50-Mc. W6AS. Raising VE5NC a few nights later was at least as much a thrill for him as would have been his 100th country on 10. His first W6, back in 1939; the European and South American openings at the peak of the sunspot cycle, 1946-9; catching Nevada in 1950, or running for those last two states when double hop appears in 1951—all these are, for him, the thrill of the highest order.

These typical hams are, in the order described, W1DJV, W1PNB and W1HDQ. Their diverse reasons for liking 50-Mc. work can be matched by hams in all call areas who work 6 regularly, and get a lot of fun out of it. Old-timers like W1DJ, W4MS or W6OB; fellows like W9ZPZ, who summed it up the other night with, "I wouldn't swap this band for all the others put together!!"

How about you? Maybe you'd like it, too!

May in Retrospect

The month of May lost no time in getting the v.h.f. DX season properly under way. The very first night brought a widespread aurora opening to the Northeast, a sporadic-E skip opening to the Southwest, and a fine tropospheric opening to the South. The 50-Mc. DX then sagged for a while, but the last ten days or so brought the month to a close in a blaze of glory.

The aurora of May last was apparently one of the best ever since 1945. Beginning in late afternoon and running through about 9 p.m. EST, it provided innumerable DX contacts on both 6 and 2. One of the better 2-meter lines is that of W4AO, Falls Church, Va., who worked W6 BCN IZY, W2s SEF ACY, W8MON, W8UX, W8H EHJ FJB LJR 8UV, and V8A1B. Heard were W1HDQ, W2 PAU, W3NK, W3KB, W8JC, W9UC. Ross noted, along with several other observers, that maximum signals came with the beam somewhere west of north, even for W1 and 2.

As in previous large-scale aurora openings, this one demonstrated the need for greater use of the frequencies above 144.5 Mc. Low-end crowding is not troublesome when only a few signals are coming through, but it can

144-Mc. Work Across the Gulf

Signals had been heard across the Gulf of Mexico on 144 Mc. before. It was well known that conditions were favorable for v.h.f. work between Florida and Texas during the summer months, but stations had never been on the air in the right places, with the right equipment, at the right time to break down this long path.

To correct this condition, W4LAW, Tampa, Fla., and W5ONB, Victoria, Texas, arranged to make nightly tries at 9:30 p.m. EST, beginning in late May. Other stations at both ends, and in between, were invited to take part. First success came on May 29th when W4LAW heard W5DCV and W5BTP, of Austin, Texas, 950 miles, on May 29th. The following night two-way contact was made with W5ONB by W4LAW and W4HAD, 900 miles. W3EM and W5MXJ of New Orleans were also worked, and the signals of W4LAW were heard at many points in Texas, and by W6JTI, Jackson, Miss.

* V.H.F. Editor, QST.
be a limiting factor on the DX possibilities of a widely-observed aurora. More Ws and 9s, for instance, could make contact if they would move up out of the low-end mass of W2a, 3s, and 8s, and look for other things doing likewise. There was evidence of mild aurora on the nights of the 2nd and 3rd, and in the afternoon of the 25th, sandwiched in between two sporadic-E breaks, a short aurora period provided a few more 6-meter contacts for VE1s, VE5s, and the never-failing W1PFWW. The latter shares were with VE5SLT who is never missing an aurora opportunity. Located in Bangor, Maine, too far north for many contacts with more 6-meter conscious areas to the south, this fellow is always on the job when there is aurora DX to be worked.

There was a bright auroral display between 8 and 10 p.m. EST, extending to overhead at Middleboro, Mass., but W1UYZ observed no auroral propagation on 144 Mc. during these hours. Jack did work W4AO and two Ws in the late afternoon, however. This emphasizes the point that the brilliance of the visible display is not necessarily an indication of its v.h.f. DX possibilities. Many of our best aurora opportunities come in the last daylight hours, and some of the bright overhead evening displays seem to do us little good.

While the gang in the Northeast and Middle West were enjoying the aura of the lst, the 2-meter band was serving up different fare for the Ws in Arkansas, Louisiana, and Texas. W6VX, Little Rock, reports that his first DX of the season was W5DSC, Houston, some 400 miles to the west-southwest. W5ML and W5DBX, in Northwestern Louisiana and W5AQS in Palmers, Texas, were worked with perfect signals early one way and perfect signals at the stations in Texas. No actual miles away, were the loudest ever heard on 2 in Little Rock.

The 2-meter pipeline down the Atlantic Seaboard opened for its summer business on May 14th, with stations all along the line from Cape Cod to South Carolina taking advantage of the chance to renew acquaintances.

Two-way communication on 144 Mc. across the Gulf of Mexico? Could be; signals have been heard each way by a couple of contacts, and now there aren't any signals in the v.h.f. range are heard all the way from Jacksonville to San Antonio. W4LAW and W4GFE of Tampa and St. Petersburg, Fla., are running nightly skeds with several Texas stations, and it appears only a matter of time before this hop is made two-way. On the night of May 29th, W4LAW heard WScDY in Austin, about 400 miles, from 9:50 to 11 p.m. EST, and W5BDT, also of Austin, for a short time around 10 p.m. W4LAW aims north from 9 to 9:30, and west from 9:30 to 10, nightly, in an effort to work 2-meter DX outside the state of Texas.

In years of working DX on 5 and 6, we've come to take the ordinary single-hop stuff pretty much in our stride. It's lots of fun, and it provides a fine opportunity for 6-meter men around the country to compare notes and swap yarns. But it's the double hop that really raises the temperature of the long-time 50-Mc. enthusiast.

There are so many imponderables that scouting double-hop DX maps of skill and luck in the best DX tradition. Formerly considered a great rarity, probably because our equipment was not capable of making the most of the opportunities it affords, double hop (1000 miles and farther) is now worked much more often than we once thought possible. In the closing week of May, for example, there was double hop on six out of seven consecutive days.

During the evening of May 29th there was sporadic-E and sporadic-H in the latter part of the evening, with some contacts being made on the short hop. Little was heard in the morning, though a good signal on W4LYG, a single hop, was heard in Sheridan, Wyo., W7JRG being heard in Tennessee, Indiana, Illinois, Wisconsin, Michigan and Texas, all within single-hop range. There was a short burst from a California station on 10.6 Mc., but without any propagation for over two hours of observation, so Ken stayed with it, watching the band closely for weak signals. This paid off, for at 8:10 p.m. he was able to catch W1HDQ, as your conductor made his before-retiring check of the band at 11:10 p.m. EST. W1HDQ was in late Texas, Fla., and was heard in the 20's and 30's. W7JRG was heard also, between 10:10 and 10:20 EST, by W4LYG and W4CQY, while he was working W1HDQ and W4JEO.

Double hop was again early in the afternoon of the 26th. South Texas Ws OUT GYP and CXC were working Tennessee, South Carolina and Mississippi, and breaking through at intervals in W1. The single hop they were working was inaudible here, except for one condition that places some shadow of doubt on the complete authenticity of the Hop, "double hop."

The following evening the northern part of the Middle West was being heard by Ws 1s and 2s, so the sharps were on the watch for double hop from farther out. It came briefly at 10 p.m. EST, in the form of W5GNO, a signal that was heard by everyone in the Boston area for about an hour. His appearance in Western New England was confined to a matter of five minutes or so, showing how selective double hop can be. The night of the 30th was another big one all across the eastern part of the country, but as so often happens in the early part of the season, there was only a snatch of dou-
Interior view of the 50-Mc. mobile converter designed by W4MUR. Being fixed-tuned, it can be mounted anywhere near to the car broadcast receiver with which it is used. The case is a 2 × 4 × 4-inch utility box.

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

Oak Ridge, Tenn. — While most civil emergency communication is being done on 10 or 2 meters, a number of groups are making good use of 50 Mc. In the Atomic City, for instance, the Oak Ridge Radio Operators are using a net frequency of 50.7 Mc. for drills conducted regularly each Tuesday and Friday at 7 p.m. EST. Both mobile and fixed stations participate, communication with mobiles having been maintained successfully out to 30 miles or so. Even in the hilly terrain of Eastern Tennessee, the distances normally encountered in emergency work are covered with ease.

For transmitting, the Oak Ridge stations are using over-tune oscillator rigs with 6J6s or 12AD7s driving a variety of final stages up to 815 finals with inputs up to 35 watts. The receiving end in most installations is handled by an extremely simple single-tube converter designed by W4MUR, working into a car broadcast receiver. The claim is made that the converter, shown in the accompanying diagram and photograph, is the ultimate in design, but it does the job with a minimum of cost and complication.

A 6J6 mixer-oscillator with fixed-tuned circuits works into the car receiver as a tunable if. Sufficient coverage is available in this way to tune either of the two civil defense band segments, if the oscillator is set for one or the other. Tuning the car broadcast set after repositioning the car also allows coverage of the low part of the 50-Mc. band, where most of the regular activity is at present concentrated. With 19 of these units in use or under construction, and eight mobile stations already in service, the Oak Ridge gang are making quite a dent in the 6-meter band in Eastern Tennessee.

Dayton, Ohio — The Dayton Amateur Radio Emergency Corps, faced with the need for some 50 complete stations, mobile and fixed, for operation on 144 Mc., has organized a community project for their construction on a mass-production basis.

Transmitter design was standardized on the all-6J6 job described in QST for March, 1950, adapting the circuit for 8-Mc. crystals, and the layout to suit parts that were available locally. Individual parts stocks were pooled, and all local distributors canvassed for assistance in securing the necessary additional material. The emergency nature of the project was stressed and the required parts were soon made available. Assembly-line techniques were employed, and the quota of rigs is now nearing completion.

Receivers are now under consideration, with simple superhet's of the resistance-coupled or superregenerative type getting the nod. Something less than the ultimate in sensitivity may well do the job here, as the accent is on simplicity, low cost and reliability. Fully described plans for such a project can be obtained from the EC for the area, WSZFO.

Pensacola, Fla. — What 6 can be like for a W4 in just an ordinary opening is shown by the list of stations worked by WAMS on the night of May 20th. Hearing the V50RD beacon coming through at 7:57 p.m. EST, Eddie called CQ (Continued on page 108)

QST for
How:

Or should it be “How Not” this month?

Anyway, twenty appeared lush with intriguing signals as “Tetrode Bill” O’Hassensepfeffer warmed up the filaments of his push-pull-parallel 1625s. But, as so often happens these days, by the time he was ready for action a few moments later the band was practically flat. “Fru,” said Bill, running the gains of his preselectors to the thermal level; he was going to give it a try, nevertheless.

And what should appear on approximately 14,000,001 kc. but the fast, fading c.w. of that new ZD7 he had been stalking for weeks! The fellow was busy battyng off QSOs like W4KFC in the first hour of a Sweepstakes. “This,” thought our hero, “is where little Willie collects number eighty-eight of his soon-to-be total of 250 countries!”

Tetrode Bill might have gotten him, all right. The skip was just right for Cranium Hollow and St. Helena. But W5-oink-oink, unfortunately, raised him first and W5-oink-oink was not one to be perturbed by the fact that the ZD7’s operating time was of inestimable value to others in the chase.

Word from the ZD7 testifying that his QTH was okay in the call book was insufficient for this meticulous fellow; he insisted upon the full address even down to the operator’s middle initial. Tetrode Bill, who could copy the W5’s hollow scatter wave, breathed a sigh of relief at the conclusion of this exchange as undoubtedly did a few dozen other sufferers. But this was just the beginning.

W5-oink-oink proceeded to run some antenna tests (which he could have done with any ZS) and after about four QRP’s he settled on using the combination that was one-half an estimated S-point better than the others. Thereupon he commenced to quiz the ZD7 as to the present whereabouts of old ZD7XXX who happened to be the only one of W5-oink-oink’s five ZD7 QSOs not to QSL. Also, did he know an old buddy there who also worked for the CCC?

Bill bore up well under the strain though his fingers drummed themselves to the bone. After all, at 35 w.p.m. this couldn’t go on much longer and, besides, a few competitors with less time available might drop out of the pack. (He should have sensed that more were joining by the minute.) Eighteen minutes later W5-oink-oink was heard to say, “DON’T WANT TO HOLD U BUT NW PSE LISSEN FER MY QRP FONE ON . . .” and off he went, taking the hypnotized DX station with him.

We leave Tetrode Bill busily winding coils for eighty meters and oiling up the mill for some traffic work . . .

What:

General conditions may not be as favorable as during many past years but it is apparent from the mailbag that some shrewd operating and ultramodern equipment performance is tending to cancel out this dismal fact. On twenty, W3YS raised a new beam and plenty of choke stuff on all continents. A cross section of Lee’s list by continents, starting with Asia: KR6S CP (075) EK (036) FG (043), HZ1 AB (075) IZ1 (020) 1JD (025), JA3 2FM (020) ZGA (029) 2TQ (122) 2XE (072) 3AD (049) 3AG (016) 3AH (042) 5DN (090) 7SS (036) SOT (058), V80s 1DB (075) 6CB (051), ZC50D (046), 4X4G DF (018) DK (085). Oceania: V2E 1NL (015) 9CB (045), VR2AA (038), DUL1 DO (070) JI (116), KJ6AP (057), KZMAB (083), K66s AAH (054) HU (038), ZM6AK (016), ZK1AB (032), Africa: ZD8s DYM (037) TBS (015), QO5V (080), VQ4HP (062), CT3AN (045), EASBD (034), 3SAB (050), Europe: EA6AP (035), CT2BO (001), G8SOU (102), G3ZUB (010), PFQVFC (088), SV8AB (090), ZB2L (044), ZC4K (070), 9SA4R (031). Americas: HJ3L (040), GY7XQ (015), CPE5K (000) . . . . another juicy selection turned up on the right side of W9HUB’s tally: SU1AD (012), 9S6X/AR (020), CR7AC (067), W2BT (020), VTI2F (034), IT1SEM (077), EASAP (087), CT3AD (068), F8ADA (012), CN2AA (1080), YVSB (106), JA3 2KW (012) 7WH (018), EASBE (070), UA1AEK (063) 1NR (064) JMI (002) 3KTB (006), UC5S (106), 5DQ (047), UPI2KBC (054), UR3KEA (062), CIAB (075), V8s 1DU (054) 6AC (032) 7NX (050), VU3CQ (050), 4X4s BX (020) RE (005), and ZD5B (017). Van incurred the XYL’s wrath through a lengthy chat with Georgette of YV5EB when he should have been shopping for ice cream . . . . . . . Also working some of those previously listed, W5FXX adds ZB3JJ (045) at 0500 CST, M3AB (080) 0500, VP5SB of the Caymans (075 474), U1BN (018) 0430, I5F7A on Reunion (020) and ZD5P (000) 2245. On Jim’s want list remain FL5AB (030) 0500, KW6G (030) 0500, UC2KAB (068), VP8AP (030), U8CC (015), and VTI2C (010). WD5ML tells W5FXN of working a T9KAA.

* DX Editor, QST. Please mail reports of DX activity to WSBRD’s home QTH: 1517 Fargo Ave., Chicago 26, Ill.
Much of the exotic stuff on forty has migrated back to 14 Mc, apparently, and so have many of the hunters. 250 watts and a vertical folded dipole assisted W9HU to dig up C91A DA (0500) DJ8J (018), XV6AO (035) and ZSILS (015) and then some. While W9FID and W9MLW salted away an FK8SAZ (065) QSO to W6QXW’s crystal-bound S07 raised many a grumble in Oceanic parts (PK8EU plus KVE2U) while W7OHX/6 has been hearing people like YS1Q, ZD4AB, OAAJ, VR2AA, FK3AB and Z85FY.

Forty-four 3.5-Mc. Me. countries have been collected by W9ZAT and this is a dandy West Coast total. Some customers for Del’s ground-plane hook-up on eighty have been VP5FR, VP4TV, VP4LZ, VP7N7, T2FZ, ZM6AK, YN1AA and VP8SJ. Heard but not raised were HZ1KE, F4AIY, TANGU, K6EAN, VQ7LK, HC2EU, ZD4AB, CT1SQ, SP1JF, HBB6U, PA8LR, DL95H and DDAJL. W9ZAT notes regretfully that quite a few juicy ones he hears go QRT just before conditions peak in W6. At the other end of the continent, V91DJ still finds the pond crossable. Many Europeans were working including E1M, PA8Z0, PA8XYZ (there’s a call!), OZ7BO and several others, all in the bottom 20-ke. portion of the band.

If you haven’t read so elsewhere, you 80-meter dier-in-the-woods will be interested in learning that the IARU is now endorsing WACs for eighty. They’re not exactly plentiful, either.

On ten, the password of the faithful is L/M/FT, or “Lord, Save Me From Twenty.” Still holding steady in an avalanche of practically no DX signals is the Japanese two-some, W2ZVS and W2AEZ. Using ‘phone, of course, the former managed contacts with FG7X, ZS5, QG6CG, QG6NX, MZ2AM, CS9EQ, ZS5BA, H9RKS, HR1L, VP5CS and many ZS-proper. Annexed by W2AEZ via the same medium were 3V8BA, 3Z2DDY, 3Z2AX and the same FG7X.

Where:

With new KB9S calls about to become active a reminder may be in order to the effect that all Swan Island stations, should they be QSL’d to Swan Island, West Indies, via Tampa, Florida. We understand that the TRAC of Tangier will forward cards to stations using the CN2 Tangier Zone prefix.

C3AB Box 22, Taichung, Formosa
C3UK Jack Sun, P. O. Box 419, Taipei, Formosa
CN2AA (QSL via R1KAA)
C4AAH Pinheiro Sal Island, Cape Verde Islands
E9AG Box 313, Malilla, Spanish Morocco

3.5-Mc. WAC Endorsement Announced

Endorsements for working all continents on 3.5 Mc. and will now be issued to qualified applicants for the WAC certificate by the International Amateur Radio Union through ARL Headquarters. New applicants for the WAC award desiring the 3.5-Mc. endorsement must submit six QSL cards confirming two-way contact with the continental areas of Asia, Africa, Europe, North America, Oceania and South America. These cards must clearly indicate that the exchange was made on 3.5 Mc. By the time this article appeared, the 3.5-Mc. endorsement cards indicate all of the contacts were on ‘phone (W4YWJ) will receive a certificate endorsed for radiotelephone as well. Present holders of WAC certificates may receive new cards indicating contact with 3.5-Mc. endorsement, which is in the form of a sticker. IARU member societies will certify 3.5-Mc. applications to Headquarters for QSL’s and applications directly to ARL together with 10 International Reply Coupons (50¢ U. S. funds), the fee required by IARU rules.
It was a happy occasion when Col. Fred J. Elser, TAC3GU, recently returned to duty in the States, visited Arrl Hq, with the cards for his Dxcc award. Looking over as Secretary A. I. Budlong, W1BUD, presents Colonel Elser (left center foreground) with his certificate are Hq, Dxcc members of the Tx Jc, Ike Dp Icp VG Ws and Ts. Colonel Elser has held a number of calls during his ham career, among the best known being p33A, (Philippines) which he signed 25 years ago. He is now W4Cgv.

July 1951
HARMONIC GENERATOR FOR CALIBRATION WORK

It is often difficult to hear the high-order harmonics of a signal generator when doing calibration work in a frequency range that is far removed from the fundamental frequency of the oscillator. In such cases a simple harmonic generator, such as that shown in Fig. 1, can be used to provide a stronger "signal" in the desired range. A 1N34 crystal diode is used to rectify some of the output of the signal generator. The rectification generates harmonics throughout the spectrum.

An arrangement such as this would be of great help in calibrating the 6- to 10-kc. range of the BuStan test oscillator described on page 31 of QST for January, 1951. — Russell O. Deck, Jr., DL4OM, W9JTV

TUNING AID FOR SCREEN-MODULATED AMPLIFIERS

The heavy loading required for linear operation of a screen-grid-modulated amplifier usually makes it difficult to observe any "dip" in plate current when the plate tank condenser is tuned to resonance. The simple addition of a resistor and a switch, as shown in Fig. 2, makes it possible to obtain a good dip, thus permitting easy adjustment.

When tuning up, the switch is opened. This raises the screen voltage applied to the amplifier, which in turn results in more plate current. It is then easy to observe the dip at resonance. In addition, some means for making the speech amplifier inoperative should be incorporated so that no audio will appear on the clamer tube grid during tuning procedures. Once the amplifier is tuned properly, the switch is closed, returning the circuit to normal. — Jerry Colten, W9CZI/S

HOME-BREWED SLUG-TUNED COIL FORMS

Any enterprising amateur can make his own slug-tuned coil forms for about 15 cents each. Compared with the cost of commercially-available forms, the saving makes the effort worth while. As shown in Fig. 3, the form itself is made from a 2-inch length of plastic tubing. If you are lucky you may be able to locate some polystyrene tubing of the desired diameter but other similar material will do. Powdered-iron slugs, which come with a 6-32 screw molded into them, can be bought for a dime each in the surplus market.

To mount the slug in the form, heat a hex nut with a soldering iron, and then press one end of the tubing down on it. If enough heat is used, the nut will sink into the plastic with ease, and will be held fast when the plastic cools. A small 6-32 nut is then used to lock the slug in position.

(Continued on page 106)

Fig. 1 — Simple harmonic-generator circuit using a 1N34 crystal diode to provide high-frequency harmonics from a signal generator operating in the audio range.

Fig. 2 — By adding a 250-ohm cathode bias resistor to the clamer tube, plate current to the final amplifier is increased to make the dip in plate current more pronounced during tune-up.

Fig. 3 — Method of home construction of slug-tuned coil forms from plastic tubing, hex nuts, and inexpensive powdered-iron slugs.
SUH?

Editor, QST:

I have just received from the Radio Commission my renewed Amateur Radio License. I object to the indignity I have suffered. According to the terms of the surrender accepted by Gen. A. Lincoln no punitive measures was to be drawn up against us Southern gentlemen involuntarily demobilized from our military command. On this here license hereonver there is some fine print on its backside which is entitled “Conditions of Grant.” I would just like to know how Genorl Grant is making conditions like these. It isn’t so much the conditions themselves but we object to having General Grant cut in on our operations. Next he will be wanting to impose a tax on working DX. Will you please investigate this here matter and if necessary refer it to the Pres. himself. I don’t think General Grant is supposed to have anything to do with ham radio, leastways not here in the South.

—Col. Ward Bushman, W4QI
Formerly Communications Officer.
Confederate Signal Corps

GOOD & MAD

Editor, QST:

I received a letter today from the “G & M” Equipment Company which made my blood boil. They offered to purchase surplus equipment now in the possession of amateurs — Ed.] I don’t know if there is anything you can do about it, but I would like to see something published to warn unsuspecting amateurs, and to prevent the spread of rumors. Apparently this letter was mailed to all hams on the West Coast at their call book address.

They imply that the hams will probably be put off the air this spring because of a war, so hams should sell their equipment — “Cash-in while you can and do your bit at the same time.”

Their statement that our allies urgently need our equipment also runs me the wrong way. If such a need was as urgent as they say, I am sure the League would make a public announcement and have a drive to collect the equipment. It certainly would not be left to one unheard-of company to take care of the matter.

To top it off, they request that you charge them as low a price as possible for your equipment (so that they can make as much profit as possible), and close the letter with the statement, “There is no profit in war.” How appealing.

—Robert W. Hayes, W6AAM/GXMG

QST

911 Green St., West Palm Beach, Fla.

Editor, QST:

Congratulations on another fine business QST! I got a big jolt out of reading the “letters to the editor” concerning the article “Numerology and Amateur Radio.” Ha, ha! April fool never die.

—Beverley Casender, W4CKB

Editor, QST:

My weekly meat ration of approximately 10g worth I freely donate to the initials G.G. His articles on screen modulation are classics in lucidity and exposition. Technical Topics are technically the tops.

When I read of some of the W hams beefing about the cost of QST, I see red. Once a month I have to do battle to obtain a copy and all I can say is that the effort is worth it. As you know, it costs a darned sight more here than it does in the States.

Finally, may I say that QST has been directly responsible for many G stations still being on the air by virtue of your also excellent articles on TVI suppression.

—John H., Williams, QSWXP

5326 Glasgow Court, Los Angeles 45, Calif.

DX CONTEST

Editor, QST:

A word of thanks and appreciation for our wonderful magazine, despite some letters you print to the contrary. As long as I can scrape up $4 a year, as long as I am an active ham, and as long as QST maintains its present character, I for one will be a devoted and appreciative reader.

NUTS TO THE CRANKS!

—Edgar K. Hill, W6VMQ

WELCOME, NOVICE!

1087 Ashmount Ave., Oakland 10, Calif.

Editor, QST:

Congratulate the fine one-tube transmitter in the May issue of QST. . . . As soon as I get my Novice ticket, I’ll write and tell you how she runs.

—George Ingram

1838 Washenaw, Ann Arbor, Mich.

Editor, QST:

Tonight I listened to WIAW’s slow-speed code practice for the first time. It’s wonderful! I got all of the 5-w.p.m., 90% of the 75-w.p.m., and about 75% of the 10-w.p.m. transmissions. In addition, I took it all down on my tape recorder so as to be able to play it back for a check on my copy and for further practice. Believe me, I will be with you every night from now on. . . .

—Jerome S. Miller

716 West 1st St., El Dorado, Kans.

Editor, QST:

I think QST should be congratulated on its FB article entitled “Welcome, Novice License Candidates” which appeared in Operating News of April QST. It gives the would-be hams like me a “lift.” I am fifteen years old, and I hope to pass the FCC ex-

(Continued on page 106)

July 1951 53
Advice to the Novice. Here we are... July, and the stage is all set for many of us to ask FCC to give us the questions, and follow through by presenting us with our Novice Class amateur ticket. If you have followed W1AW's practice and read the material, pages 42-45, June QST, on the FCC questions that may be asked, this first license should be no problem. Next to get the "One-Tuber" or other transmitter on the air and start communicating with other Novices and Old Timers in the 3700-3750 kc. frequencies.

By practical ham operation several periods a week from our own station in this band we can do most to advance our code speed and absorb the procedure know-how of the many experienced operators who work consistently in this band. Eighty meters offers a lot of fine QSOs at good distances as well as new states, traffic-exchange possibilities, and rag-chewing galore, in which we can tell about our stations and find out about others. To some extent our amateur life is what we make it. Let us give honest RST (signal) reports and hope to receive the same. It is recommended that we Novices operate regularly with our new crystal-controlled rig on the 80-meter band but at the same time we do this let's keep an ear on the progressively higher speeds of practice material sent from W1AW. The whole thought behind the Novice License is that, in a brief twelve months, the fun of engaging in operating will automatically advance our code to levels of 13 w.p.m. and higher. We must in that period (which will pass all too soon) graduate upward to hold a full-fledged General Class amateur ticket! With this goal in mind you and I are not going to be diverted unduly to other aspects of Novice work. Attractive though these may be, if they prejudice the big push to get our operator license that carries the privilege of using all the amateur bands, they are not for us.

We are not required, by any means, to wait twelve months to take the FCC examination for the General Class Amateur License if we can qualify earlier. For most fun and progress in communications technique we first get fixed up with Novice privileges as quickly as possible. We then keep operating and studying for the ticket that lets us work all bands.

The League has an Operating Aid that is available without charge to holders of Novice or Technician Amateur Licenses. You will want it as soon as you are on the air. It is a printed Signal Reporting Scale in a form convenient for posting in your operating position. For your ready reference this will be gladly forwarded to you without charge as soon as you get that new license. Send a radio message or postal card to ARRL giving your Novice call and address: ask for the ARRL Operating Aid card which gives the RST Signal Reporting Scale for station posting.

W1AW Summer Schedule... Earlier Practice Transmissions. Elsewhere in these columns you will find the full W1AW Summer Operating Schedule. In the "general periods" the station is open for a call from any individual amateur on the frequency indicated. By changing as of July 1st to operate on Daylight Saving Time, all the bulletin and practice transmissions will be received one hour earlier than you may have been accustomed to receiving them during June.

W1AW is continuing to transmit an hour of code practice nightly, simultaneously on 8877, 3555, 7215, 14,100 kc., 52 and 146 Mc. All code students should take advantage of the early and late bulletin transmission periods in addition to the designated practice times. Four days a week are now devoted to the slow-speed program. Effective July 1st the highest speed transmitted in this bracket will be 13 (instead of 15) w.p.m. You can submit 10-w.p.m. copy made on designated once-a-month Qualifying Runs for official ARRL certification of this speed. On the three other weekdays, 15-35 w.p.m. tapes are sent as practice for those working for the higher ARRL Code Proficiency Awards, available after the monthly qualifying run. It is recommended that all going up for FCC examinations at 13 w.p.m. make sure they can copy the 15 w.p.m. transmissions! Many an operator has failed (by two or three words) of doing his best in a test because of nervousness when taking the exams.

Table: W1AW Time Practice Speeds Starts:

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<thead>
<tr>
<th>Days</th>
<th>W1AW</th>
<th>Time Practice</th>
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<tbody>
<tr>
<td>Sat., Sun.</td>
<td>6, 7,25,10,20</td>
<td>Sat. 12 AM EDST;</td>
</tr>
<tr>
<td>Mon., Wed.</td>
<td>15, 25, 20</td>
<td>Sun., Tues., Wed., 7 AM EDST</td>
</tr>
<tr>
<td>Fri.</td>
<td>30, 35</td>
<td>Thurs., 9:30 AM EDST</td>
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<td></td>
<td></td>
<td>Fri., 8:30 AM EDST</td>
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Register in the AREC for Civil Defense. ARRL is solidly behind the plans going forward for our participation in civil defense communications work under the RACES regulations, for which the prospective provisions were discussed in Apr. '51 QST, p. 7. The new official FCDA
advisory booklet, “Control Centers,” illustrates the pattern for wire and radio stand-by communications at community level. This explains that the Radio Amateur Civil Emergency Service will provide mobile radio units and stations working in the ear-marked frequency segments as required. Stand-by radio service is diagrammed for use between control centers, district warden command posts, reconnaissance cars, etc. ARRL SECs and ECs have more detailed information based on this FCDA Advisory Bulletin as received from ARRL. Every licensed amateur who has not already done so is requested to register with the nearest ARRL Emergency Coordinator. This is the best way to permit all amateurs and amateur service groups to be listed into official civil defense plans and any natural disaster emergency communication requirement. Let us build the Amateur Radio Emergency Corps to the greatest strength possible. Each individual registered in ARRC may be acquainted by his EC with official FCDA information. It is planned to follow FCDA and RACES developments as closely as possible in EC-SEC ARRL bulletins on FCDA communication plans as these become available.

Summer Nets. The organized method of general traffic exchange between all ARRL sections (National Traffic System) will continue to operate insofar as feasible for summer work as noted under Traffic Topics, this issue. Section Nets are in few cases discontinuing, and in many cases continuing to the extent traffic volume requires and operator support is available. (This may be the time your section net needs your assistance most, so report as often as you can. Drop a line to ARRL for the Net Directory if you wish net-frequency information.) Except for a couple of vacation weeks, there remains the same pleasure in traffic operating that inspires activity at other seasons and many of us will report to NCS at customary hours even where a net has put up the vacation sign. GI traffic through NTS channels will continue to be routed via PAN; also by K4USA-K4AF, the Presidio (S.F.) and MARS connections. May we remind netters, ‘phone or c.w., to be especially punctual during summer operations. Some networks will finish work in a shorter period when traffic volume is low so it is important to be right on time to pick up the traffic for one’s own station as outlet or to put some on the net!

CD Parties: C.W., July 21st-22nd; ‘Phone, Aug. 11th-12th. The ARRL appointment family will get together these dates for the quarterly radio tests. Report forms for the separate ‘phone and c.w. periods will be in the mail to all appointment holders about the time this QST is in your hands. To avoid conflict of dates with the National Convention (Seattle), July 27th-28th-29th, and LO-Nite, Aug. 4th, the ‘phone activity has been scheduled for Aug. 11th-12th. Appointees home or vacationing can look in on one or both summer radio parties for some snappy and pleasurable c.w. and ‘phone operating. Full members of ARRL without present appointment identification are invited to drop a postal card or radiogram to Headquarters for Operating an Amateur Radio Station which gives the appointment qualifications observed by SCMs in making appointment. Confirmed traffic handlers and those with good ‘phone stations are invited to contact SCMs about ORS or OPS appointment, respectively.

Hope your work in the ARRL FD just completed made it the “best ever.” Don’t forget to get a full measure of fun and use from those portable and mobile amateur rigs during this vacation season, BCNU at Seattle!  — F. E. H.

MEET THE SCMS

Kentucky’s new SCM, Ira W. Lyle, Jr., W4KKG, has been in the amateur game since 1925, obtaining his first license in December, 1929. In addition to his present call he has held the calls W9DKD and W9EKG, and in 1933-35 was chief operator of the University of Kentucky station, W9JL.

An all-around ham, he likes to work DX, participate in ARRL contests, handle traffic, report into nite, rag-chew, experiment, build and rebuild, and help new hams get started on the air. He has held appointments as OHS, OBS, and OES and is a member of the Swedish Sending Amateurs, S8-1748, the Greater Cincinnati Amateur Radio Council, and the Amateur Radio Transmitting Society (Louisville), of which he is a past-president and a present member of the board of directors. He earned a Public Service certificate for his emergency traffic-handling during the big freeze of February, 1951, and also did noteworthy work in the 1937 Ohio River flood.

When his new home was constructed, SCM Lyle had a room built especially for the shack which houses a Collins 310B driving a pair of 4-125As at 1 kw, on all bands, and YHF-152A converter and SX-25 receiver. Antennas in regular use are rotary beams for 10 and 20, doublet on 40 and 80 meters.

Formerly supervisor of mobile radiotelephone repair and installation, he is now division plant maintenance supervisor for the Southern Bell Tel. & Tel. Co. His favorite sports are football and basketball; his secondary hobby is in his home and garden at Harmonic Acres.

<table>
<thead>
<tr>
<th>A.R.R.L. ACTIVITIES CALENDAR</th>
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<tbody>
<tr>
<td>July 13th: CP Qualifying Run — W60WP</td>
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<tr>
<td>July 19th: CP Qualifying Run — W1AW, W8TQD</td>
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<tr>
<td>July 21st-22nd: CD QSO Party (c.w.)</td>
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<td>Aug. 9th: CP Qualifying Run — W60WP</td>
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<td>Aug. 11th-12th: CD QSO Party (phone)</td>
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<td>Aug. 20th: CP Qualifying Run — W1AW, W8TQD</td>
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<td>Sept. 8th: CP Qualifying Run — W60WP</td>
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<td>Sept. 14th: CP Qualifying Run — W1AW, W8TQD</td>
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<td>Sept. 22nd-23rd: V.H.F. Contest</td>
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<td>Oct. 7th: CP Qualifying Run — W60WP</td>
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<tr>
<td>Oct. 13th: Simulated Emergency Test</td>
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<td>Oct. 17th: CP Qualifying Run — W1AW, W8TQD</td>
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<td>Oct. 26th-21st: CD QSO Party (c.w.)</td>
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<tr>
<td>Oct. 27th-28th: CD QSO Party (phone)</td>
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<td>Nov. 5th: CP Qualifying Run — W60WP</td>
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<tr>
<td>Nov. 20th: CP Qualifying Run — W1AW, W8TQD</td>
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<tr>
<td>Nov. 17th-18th, 24th-25th: Sweepstakes Contest</td>
</tr>
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</table>

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With the AREC

Someone recently asked us if the League was behind civil defense. A surprising inquiry indeed! What was even more surprising was the fact that this person was an active League official and long-time AREC organizer. When we expressed our amazement at his inquiry, he replied that we knew we were behind civil defense, but that we had never said so in so many words, and he thought such an expression was needed.

We have always been an exponent of the old adage that “Actions speak louder than words.” True, ARRL has never officially declared that it is supporting the civil defense effort communications-wise. All we have done is to be instrumental in setting aside frequencies for civil defense use by amateurs in six amateur bands (see inset facing p. 32, Feb. 1951 QST), write editorials on the subject (see p. 71, Apr. 1951 QST, p. 61, Mar. QST), write bulletins to ARRL officials and appointees on the subject, maintain contact by telephone and in person with FCCA and FCC officials in Washington to follow the progress (and report to EOCs) of the Radio Amateurs Civil Emergency Service. This is not to mention the voluminous correspondence and attendance at other civil defense meetings and drills, such as those which our Communications Manager visited on a recent field trip.

It is hard to understand why anyone should doubt that ARRL is in support of civil defense communications, but if anyone does — forget it. Civil defense communications is not only the primary job, these days, of the AREC, but of the radio-amateur fraternity as a whole. Civil defense communication as a whole automatically embraces the AREC as one of the civilian agencies which can be of service — and the AREC recognizes civil defense as its primary function, but it is our responsibility in those days of tension. The two are not identical, but they do overlap to a considerable extent, and more so as we move closer to world conflict.

Your registration in AREC will give you maximum opportunity to participate in and get behind the support your ARRL is giving the civil defense communications effort, whether you are a League member or not.

On April 5th a group of St. Paul and Minneapolis hams were rag-chewing on 10-meter "phone, when suddenly W9QOM on a fast bug appeared on the frequency to say that W9BBY was requesting mobile radio communications at Mankato and St. Peter to aid in patrolling the flood area. W9JET alerted the Minneapolis group, and W9FQD U.S. St. Paul gang, and the next day W9AJS BOL DWA MWC OWX PID SJK SMT SUZ UYJ YBM and YLZ left to render assistance.

NCS was set up at the armory at Mankato on 10- and 75-meter "phone, using the call W9JGU. The 10-meter rig was converted on the spot from stand-by police equipment, and the 75-meter rig belonged to the Minneapolis Radio Club. At St. Peter, 10 miles north of Mankato, W9S BVH DWA DWRHK NJZ PAL QYJ RAG and SUZ operated a similar set-up at the armory there, together with their mobile rigs. State Guard amphibious ducks operated in the flooded area between the two towns. Two 10-meter pack sets were installed in the ducks to provide communication with the base stations and with the various mobiles who were acting as auxiliary police cars accompanied by auxiliary police.

The police and gas company set up their base stations adjacent to the 10- and 75-meter station at the armory so that all activities were coordinated in the same room.

After the situation was under control a broadcast from plans to ground an over the flooded area over a local broadcast station. Ham pack sets were used to provide this communication. The need for assistance from the hams was terminated about 5 P.M. that day. Also reported active were W9S ABD—ANY, WBR GUS GES JR M TQ, LVG MJZ OGU OPA ORJ OWX PAQ PDA FRT PRT TEL UGG UMD YFB VFB VER and ZME.

APPARIS APPROXIMATELY forty-five minutes after the crash of an airliner near Fort Wayne, Ind., on April 28th, E9C W9EBO was active from his mobile rig. Within a few minutes a number of units were under way to the crash location and other units held in town for reserve. At this same time a fixed station was put into action as a net control station, with two fixed stations to help him. As soon as the first mobile unit arrived on the scene messages began to flow back to Fort Wayne and to other units on the way out. During the evening approximately fifty messages were handled. The Fort Wayne Radio Club's 2-kw. generator provided light to the wreckage. Our group was released at 0345 when the investigation was closed for the night.

The mobile group went into action again from 1810 to 0048 Monday night April 30th to assist the CAP. This same service was provided again on May 1st, from 1800 to 2330.

Samples of the type of traffic by our group were the procurement of boots for the rescue workers, securing floodlights, messages for the radio-amateur operators, and procurement of electric lanterns and messages for deputy sheriffs. The mobile groups also helped obtain vehicles to carry the dead from the wreckage to the road.

Our mobile net was put into operation last year and this was the first actual emergency for which we provided communication. Although we had several practice maneuvers, we learned very much during this ordeal. Those who took part: W9S ABD—ANY, WBR GUS GES JR M TQ, LVG MJZ OGU OPA ORJ OWX PAQ PDA FRT PRT TEL UGG UMD YFB VFB VER and ZME.

COOPERATION WITH U. S. WEATHER BUREAU FLOOD FORECASTING SERVICE

A plan calling for cooperation of amateur radio communications with U. S. Weather Bureau observers in eighty-five River Districts is being made nationwide. The plan follows a pattern which has been tested and become well-established in the Ohio, Susquehanna, and Potomac River Valley areas.

The proven operational features developed in these areas have been incorporated in a "Manual of Operations," which will serve as a guide to the establishment of similar facilities in other U. S. River Districts. The U. S. Weather Bureau hereby invites serious consideration by every active amateur to participation in this program.

One of the functions of the Bureau is to issue flood warnings to the public. To accomplish this service there are 85 River Districts, with a Weather Bureau Office in each designated as River District Office, which means that in

This picture was taken just after a successful crossing of a half-mile-long stretch of flooded and undermined highway, to deliver a 10-meter pack set which was badly needed at Mankato, Minn., for use in patrol work on an amphibious "duck." Shown grouped around the pack set from left to right are W9S HKF, SUZ and YBM. Standing at the rear of the mobile station wagon is W9AJS. (Photo by W9BSMT)

QST for
addition to the general weather service, river information and flood forecasts are also provided by that office. Certain large basins have River Forecast Centers where forecasts for the entire basin are formulated and furnished to River District Offices. In order to facilitate the formulation of river forecasts a network of substation exists in each River District. These are manned by observers who observe amounts of fallen precipitation and the height of the water in river channels, which they report to River District Offices. Normally, this is done by telephone, telegraph, or mail. When a flood or other natural disaster strikes and accurate information is most needed, normal means of communication are likely to be disrupted. Using the field, the field observer will receive emergency communications link to look to in such times would save much time in the issuance of the warnings. Both life and property are at stake in many of these critical situations. The framework of the League organization provides the way to such a program on a permanently effective basis. Procedure is for Weather Bureau River District Office personnel to call upon the SCM in the section most nearly matching the geographical location of the River District. The SCM may then request an agent a Retail Emergency Coordinator to work with designated Weather Bureau personnel in that area. Such a Coordinator will interpret for Weather Bureau personnel the potentialities of the situation in the particular watershed. Assistance in organizing and operating any net will be provided by the Bureau's district office. Procedures and suggestions contained in the "Manual of Operations" developed by the Washington River District and the Potomac-Harper's Valley will be available to the Coordinator through the official in charge of the River District Office, all of whom are being alerted for this program.

Existing amateur nets in many cases form an immediately available source of the coverage desired. It is sincerely hoped that these nets will add to their routines the relatively small amount of additional procedure necessary to provide uniform handling of emergency Weather Bureau traffic involved in this plan. Where traffic handling nets are operating, the only problem involved is the establishment of a recognized line of contact between the amateur and the Weather Bureau Field Observer to insure the latter's cooperation.

You'll be hearing more about this program. Let's hear from you when the time comes. — W5FPQ, REC, PRVH — Bennett Swanam, USWB

CODE-PREFICIENCY AWARDS

Have you received an ARRL Code Proficiency Certificate yet? Twice each month special transmissions are made to encourage you to send in the application for the award. The next qualifying run from W1AW/W5TQD will be made on July 19th at 2130 EDT. Identical texts will be sent simultaneously by automatic transmitters. Frequencies of transmission from W1AW will be 1867, 2355, 1210, 1410, 28,000, 12,000, and 146,000 kc. W5TQD will transmit at 2354 kc. The next qualifying run from W60WP only will be transmitted on July 13th at 2100 PST on 3590 and 7248 kc.

Any person may apply; neither ARRL membership nor an amateur license is required. Send copies of all qualifying runs to ARRL for grading, stating the call of the station you copied. If you qualify at one of the five speeds transmitted, 10 through 25 w.p.m., you will receive a certificate. If your initial qualification is for a speed below 25 w.p.m., you may try later for endorsement stickers.

Code-practice transmissions are made from W1AW each evening, Monday through Friday, at 2130 EDT. References to texts used on several of the transmissions are given below. These may provide you with some starting point to get sending practice up to your own key and buzzer and attempt to send in step with W1AW.

Date

Subject of Practice Text from May QST

July 3rd: D.S.C. Radiotelephony, p. 11
July 6th: The Novice One-Tuner, p. 18
July 9th: A Linear Best-Frequency Oscillator, p. 26
July 11th: The Monitors — Model 1961, p. 29
July 14th: The Nipper, p. 32
July 20th: A Civil Defense Portable, p. 35
July 23rd: The C.W. Man's "Selectofject," p. 54
July 30th: A Planned Station, p. 58
July 31st: Chasing the Tennessee Valley Indians, p. 65

BRIEFS

In connection with the Bristol Festival of Britain celebrations, an amateur station will be set up at the "Our Way of Life" exhibition at the Memorial Gardens, Herne Bay, Bristol, from July 7th to 21st. The call GY/A will be used on 1.7, 3.5, 7 and 14 Mc. Operation will be almost exclusively on phone. Members of the Bristol Group of R5GB will man the station. In addition to general contacts, they will endeavor to work as many amateur stations as possible in the various "Bristols of the U.S." Special Festival of Britain QSL cards will be sent to all stations worked. A cordial welcome is extended to visitors, especially hams from the U. S. and Canada, and QSL cards brought to confirm personal QSOs at the exhibition will be greatly appreciated by the committee in charge of operations at GY/A.

SS Correction: The score of WSAJW, 42,043 points, was inadvertently credited to W8NOH in the list of call area leaders published on page 63 of May QST. We hasten to credit WSAJW with the highest 'phone score entered by participants in the WS area, and offer our sincere apologies for the error.

DX CENTURY CLUB AWARDS

HONOR ROLL

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W3SHGW .... 236 W5ENV .... 229 W5BGB .... 224
W5FR .... 231 G2FL .... 228 W5CPY .... 233
W6TXX .... 227

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LUBAJ .... 196 PY2EK .... 190 W0XK .... 190
W4QERR .... 185 W9GSW .... 189 W1JX .... 177
WBDI .... 181

From April 15 to May 15, 1951, DXCC certificates and endorsements based on postcard contacts with 100 or more countries have been issued to the amateurs listed below:

NEW MEMBERS

TASCYU .... 135 G0DDX .... 106 GAUP .... 101
F3AH .... 122 ZL1RD .... 105 W5QPM .... 101
W5IUE .... 122 VZ2PV .... 105 V5EIK .... 101
W5DPO .... 120 V5A .... 105 SM3ARG .... 100
DL7AB .... 119 DL7CU .... 103 ON4PA .... 100
ON3S .... 113 K5GWC .... 102 W5JQ .... 100
ON3MG .... 113 G5MDHE .... 101

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W5GR1 .... 222 W1MB .... 160 SM5WJ .... 123
G6RH .... 230 W6CIS .... 160 EA2CR .... 122
L1OBD .... 312 W2RC .... 143 OZ3Y .... 122
W5CYG .... 120 PY3E .... 143 W5RWN .... 121
C3AGR .... 210 W5GP .... 140 CP4X .... 121
KH2A .... 201 ZE2AG .... 140 W6NAG .... 121
GSX .... 201 W6NTR .... 139 W2ATE .... 120
VRK5G .... 194 ZL3R .... 138 W6ABS .... 120
W5HRF .... 194 W6NJR .... 138 W5BGO .... 119
W6UCX .... 190 W5SJ .... 136 V5GZ .... 117
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W3X .... 174 VE4O .... 130 W5W .... 117
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G6H .... 160 WSAKX .... 140 W5ANF .... 120
W1MB .... 160 IM14 .... 130 W7G .... 117
W3BBW .... 160 W2XZ .... 130 F5K .... 117
W5RF .... 160 ZL4Q .... 132 CM8A .... 111
ZL2HY .... 160 W5KT .... 122 W5G7H .... 110

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BRASS POUNDERS LEAGUE

Winners of BPL Certificates for April traffic:

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<th>Call</th>
<th>Orig.</th>
<th>Recd.</th>
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The following made the BPL for 100 or more originationplus-deliveries:

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

TRAFFIC TOPICS

GI traffic has come to be quite an important problem in traffic-handling circles these days. In addition to its obvious morale-building qualities, it is responsible for getting many new amateurs into the traffic game, and along with the influx of GI traffic has also come a number of special nets and schedules to handle this traffic. W7CZY, W7IOQ and W6CE at one time had special schedules with JA and KG stations to handle it via the National Traffic System, and these arrangements still exist. You can put your GI traffic into your NTS net; TLP has means of handling GI traffic, also, but we have no details on this. Down on the 20-meter phone band W6H0QX runs a daily schedule with J4ZM (14,205 kc., 1100 and 1000 CST) for handling of this type of traffic which is then relayed east through K5WAC and W9HLL. There are doubtless other special schedules which have been set up which we don't know about. How about letting us in on them?

In the other direction, we have long needed a reliable outlet for traffic originating out of GI Germany. D-ASV handled some such traffic, then disappeared. Others have made "stabs" at it, but somehow or other never stuck to it for very long. MARS can handle some traffic to out-of-state places such as the above-mentioned and Canal Zone, Puerto Rico, Alaska, Hawaii, etc., and quite often amateurs route their traffic this way. But we ought to be able to do it by ham radio on ham frequencies. But it is often not possible for out-of-state stations to report into NTS or other regular Stateside amateur nets, and special schedules are usually the only answer. Anyone having or making such special schedules would do well to inform the manager of his local section and/or NTS regional net so that traffic could be properly routed without a lot of delay trying to find out who could take care of such traffic. Let's get organized, follows, and let each man know what the other is doing.

If you will take a look at the BPL this month, you will notice that a slight change has been made in the way back totals are shown; we are listing them separately so that they will not compete with totals for the proper month. There was some question as to whether we should list them at all, but the proponents of better listing feel that more's the worse for worse — essentially in view of the fact that late reporting is sometimes the fault of the SCM rather than the individual reporter. Another reason for late appearance in the BPL is that the breakdown of traffic as received is sometimes obviously incorrect and has to be corrected by the reporter or SCM before it can appear.

If individual traffickers will report their traffic to their SCM promptly on the first of each month, and report it right, it will help your SCM, help us, and help you to see that your efforts are properly credited at the proper time. In counting traffic totals, note particularly that, unlike the old system, a single message can be counted only once in any one category. Origination and relay messages are those sent by radio from your station. Received points are counted for all messages received by radio. Delivered points are counted for all messages delivered, not by radio but by mail, telephone or in person — and you cannot claim a point for delivery of a message addressed to yourself or a member of your immediate household. See Operating an Amateur Radio Station for complete details. If you're a League member, we'll supply you with a copy of this booklet free.

National Traffic System. Most of the NTS's 11 regional nets and all 3 area nets have announced plans for continuing operation throughout the summer months. This is a most encouraging development, and we hope that those which have not yet made summer plans will have done so by the time this appears in print.

April reports were received from eight NTS regional and area nets. Here are the traffic figures:

<table>
<thead>
<tr>
<th>Net</th>
<th>Sessions</th>
<th>TFC</th>
<th>High</th>
<th>Low</th>
<th>Average</th>
<th>Consistent</th>
</tr>
</thead>
<tbody>
<tr>
<td>QIN (Ind.)</td>
<td>47</td>
<td>817</td>
<td>46</td>
<td>17</td>
<td></td>
<td></td>
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<tr>
<td>2RN</td>
<td>21</td>
<td>258</td>
<td>38</td>
<td>5</td>
<td>13</td>
<td>NTS</td>
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<tr>
<td>RBN</td>
<td>41</td>
<td>496</td>
<td>24</td>
<td>1</td>
<td>7</td>
<td>Idaho</td>
</tr>
<tr>
<td>8RN</td>
<td>21</td>
<td>40</td>
<td>6</td>
<td>2</td>
<td>100</td>
<td>Ohio</td>
</tr>
<tr>
<td>TEN</td>
<td>21</td>
<td>918</td>
<td>12</td>
<td>43</td>
<td>57</td>
<td>Minn., Nebr., Tn.</td>
</tr>
<tr>
<td>TRN</td>
<td>40</td>
<td>45</td>
<td>9</td>
<td>0</td>
<td>100</td>
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</tr>
<tr>
<td>1AN</td>
<td>21</td>
<td>939</td>
<td>74</td>
<td>24</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>PAN</td>
<td>21</td>
<td>881</td>
<td>111</td>
<td>13</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

NTS is handling the share of the GI traffic coming from the west (i.e., the East). Note (above) that some special schedules are also being set up for the Pacific. It is our feeling that handling all it can, the special schedules are all to the good. But let's make sure that NTS is doing its share (or more) of this vital work.


Second Regional Net (2RN): W2PRE says 2RN will operate during the summer, on its present schedule, which is Mon.-Fri., at 1845 EST, 3610 kc, except Tues. RUF QEP VNJ and Z1 have been awarded certificates.

Third Regional Net (3RN): Time changed to one hour earlier beginning April 30th; both sessions are still being conducted. 3RN is now operating at 1845 and 2050 EST, Friday through Sunday.

Fourth Regional Net (4RN): 4RN is now operating one session per night. Monday through Friday, at 2030 EST on 3050. W4AIR hopes to keep going all summer, and hang the QSN — let's give him some support, eh?

Fifth Regional Net (5RN): Negotiations are still going on for a new net manager. Meanwhile, we hear nothing of RN5 operations or plans for the summer.

Seventh Regional Net (7RN): Transfer of operation is needed from Wyoming, Saskatchewan, Alberta and Alaska. Is there anyone interested in putting those sections on the map, NTS-wise? 7RN now operates at 1815 and 2030 PST, Mon.-Sat., on 3075 kc, and hopes to continue this schedule through the summer months.
Eighth Regional Net (8RH): Starting June 1st, 8RH will operate only one session, 2300 EST, Mon.-Fri., 3300 kc.

Ninth Regional Net (9RH): W4BAZ has resigned because of the pressure of other activities. No one has been chosen to succeed him yet, but W4BAZ indicates that most of the 9RH participants are anxious to continue operation during the summer, so a new manager will be appointed soon.

Tenth Regional Net (TEN): W8SCA says they are still experiencing QRM from Canadian 'phones and are considering operating no higher than 5500 kc.

Thirteenth Regional Net (TRN): Although most of the region covered by TRN stays on standard time, the net is moving its operation one hour earlier, to 1845 and 2300 EST. Monday through Friday on 5990 kc. This is an "interim" schedule, with summer plans still to be completed. VE1OM now has a TRN certificate.

Eastern Area Net (EAN): W2CIL changed his mind about resigning and intends to carry on as EAN manager. The net now operates at 1330 EST, Mon.-Fri., on 3700 kc. The winter season just past has been one of the worst in the books for erratic conditions. EAN certificates are hard to come by, but those issued really mean something.

Pacific Area Net (PAN): PAN now operates on 7207.5 kc. Mon. through Fri. at 1930 PST, and expects to be on that schedule until fall. W8ZJQ is still doing most of the NCSing, with W6ZWL and W8AYT alternating for him Tuesday and Thursday nights respectively. He needs more help in this respect. How about it, you West Coasters?

W1A W1A SUMMER SCHEDULE
(July 1 through August 31, 1951)

(All times given are Eastern Daylight Saving Time)

Operating-Visiting Hours:*
Monday through Friday: 1300-0100 (following day)
Saturday: 0000-0200 (Sunday)
Sunday: 1500-2200

* Exceptions: On week days from July 5th through August 7th the station will not open until 1900, to provide for attendants' vacations. W1A will be closed from 0100 July 4th to 1000 July 5th in observance of the Independence Day holiday. A mimeographed local map showing how to get from main state highways (or from Hq. office) to W1AY will be sent to amateurs advising their intention to visit the station.

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

Frequencies:
C.W.: 1887, 3555, 7120, 14,100, 52,000, 146,000 kc.
Phone: 1887, 3555, 14,280, 52,000, 146,000 kc.

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

WIAW GENERAL-CONTACT SCHEDULE
(In Effect July 1 to Aug. 31, 1951)

W1A, W1AYC welcomes calls from any amateur station. Starting July 1st, W1A will listen for calls in accordance with the following time-frequency chart.

<table>
<thead>
<tr>
<th>Time (EDST)</th>
<th>Sunday</th>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
</tr>
</thead>
<tbody>
<tr>
<td>0000-0600*</td>
<td>3555</td>
<td>3555</td>
<td>28/29 M</td>
<td>28/29 M</td>
<td>28/29 M</td>
<td>28/29 M</td>
</tr>
<tr>
<td>0600-1200**</td>
<td>7120</td>
<td>7120</td>
<td>14,100</td>
<td>14,100</td>
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<td>1200-1800</td>
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<td>1800-2400</td>
<td>887</td>
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<td>14,100</td>
<td>14,100</td>
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<td>14,100</td>
</tr>
<tr>
<td>2400-0600*</td>
<td>3555</td>
<td>3555</td>
<td>14,100</td>
<td>14,100</td>
<td>14,100</td>
<td>14,100</td>
</tr>
</tbody>
</table>

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

WAO operation will usually be conducted on 29,000-kc. 'phone, but 28,000-kc. c.w. will be used if activity is present on the c.w. portion of the band. In the event of no activity on this band, W1A will conduct general contacts on either 14,100 or 14,280 kc. instead.
**ATLANTIC DIVISION**

**EASTERN PENNSYLVANIA** — SCM, Jerry Mathis, WR9BG. The W9BG memorial station is nearing completion, according to SCM Mathis. Officers of the Carpenters Radio Club are SNZ, pres.; FRP, vice-pres.; AIW, secretary. The new antenna setup was recently completed. The club meets at the White Horse Tavern on the fourth Thursday of each month. The station is equipped with a 144-Mc. mobile. The first contact was made by WM3BL, John Coleman, on 144-Mc. mobile units. The PAC of RC will provide communications for the Delaware River speedboat race again this year. Many of the contacts were made by the ARPC stations with gasoline-powered generators for emergency use. President Mathis is looking for volunteers with traffic and phone patches. C3JH has a new IHO-60 and a rebuilt beam. His first contact was with VT1AF. Good start! By the way, all communications relative to ARPC should be addressed to IBE, our SEC. Traffic: W3UCL 2750, BIP 299, AXA 98, GIA 27, CAU 9.

**MID-ATLANTIC-LAWARE-KENT COUNTY OF CONNECTICUT** — SCM, James W. John, WS0MN — On May 4th the Capitol Suburban Radio Club enjoyed a talk on antennas by ANZ, intel. The Roanoke Amateur Radio Assn. installed officers and featured a social session on April 15th. E0UG presented a talk on a 10-meter cover for his 144-Mc. mobile. E0JSS met at the April 27th meeting. Your SCM visited the Baltimore Amateur Radio Communications Society on April 16th, when Mr. Richard L. Skidmore, Jr., of the Ballistics Research Laboratory, Aberdeen Proving Grounds, presented an interesting talk on "Phases of Electronic Computers of Interest to Ham." Second Army Hamfest (conferences) was held on May 6th at Fort George G. Meade, Md. The agenda included "MARX Frequency Allocations," and "Organization of Local Civil Defense Net." Officers of the Connecticut Representative for civil defense in the District of Columbia, explained the Defense Communications District of the Washington Radio Club and Washington Mobile Club at their second meetings in April. Newly-elected officers of the Washington ARC, pres.; NPW, secre- tet.; FTS, sec.-treas. The club membership now totals 45 active mobile units and 6 fixed control stations. The commission is the day-to-day emergency plan for operation until the civil defense coordination is functioning. Primary coverage points are the hospital, police, and fire stations. A member of the club was out for the annual spring outing to the Skyland Drive where NPW worked C3K, formerly 3CG, for an FE QSO. NOL and PGQ received FCC inspections as a result of TVI. High-pass filters eliminated the interference, MO demonstrated to the satisfaction of all concerned that his powerful 20-watt power was not causing TVI to 17 sets in a nearby apartment house. Activity on 420 Mc. is increasing in the section. AIW is usually monitoring 144 Mc. to establish contact on 440 Mc. Paw has a 40-foot windmill tower at the highest point in the District of Columbia. LZY is trying out a new 12- and 3-meter beams. In addition, his station is powered by a new 25-watt power supply for the generator. COX is QRT until he is established in his new QTH. W6CC is mobile with a new home-built power supply and receiver, GZHF has been transferred to Illinois. LGA passed his Class A examination, P. B. Longley, formerly 18FL, has been appointed communication coordinator for Montgomery County, Md., civil defense. LSX is back on 7 Mc. after repairing the high-voltage supply. N1 has initiated contact on the PWT. MXX’s operating frequency is 29,040 kc. After 26 years on the air as an amateur FWP, whose first call was 9FZU, is beginning to feel his age. TID Net on 3650 kc. will continue to operate during the summer on a three-day-perweek schedule, Mon., Wed., and Fri. at 7:30 P.M. E8T. Daytime activities will be repeated Wednesday. Traffic: W3UJ 522, L2M 254, ECP 170, AKB 117, FWP 87, BWT 32, MCD 24, NNX 12, ONB 12, ZEL 6, LSX 3, 11 2.

**SOUTHERN NEW JERSEY** — SCM, Dr. Luther M. McKelvie, W2A0G — RFU, formerly 3CGM, states that he is endeavoring to acquire the Greater Camden Radio Assn. and select all former operators for service. SCM, ORS, has moved to his new QTH, 8 Lawrence Ave., Barrington. Congratulations to DVARA for a very successful "CQ Timer's Day" Radio Show. W2YK has had several contacts on the QTH affair. AJU’s new QTH is Shore Road, Palermo. He is building a 120-Mc. rig. K2BG had 77 contacts during the last CDX meeting. FX3W has made a 144-Mc. rig in his brand-new car. BLR, AI and UKE are keeping 160 meters alive in and around Ocean City. ZW2 is high frequency traffic contact. W2YX 206, ZI 143, ORS 61, KB2G 48, W2RG 40, ASG 9, H2NY 19, W5WN 116, KB2G 48, H2NY 116, W2RG 40, ASG 9. SEC: SJ, ORS, RL, RL: RUF. For the past few years, there has been much talk in connection with the idea of having a mobile radio station call, similar to the one in York County, visiting towns and communities. It is now in operation. SCM, ORS, has a mobile radio station. Plates with amateur station calls inscribed thereon. We learn that OPS has contacted Representative Richard Knauf, who also is a member of the Motor Vehicle Committee, regarding this matter. Mr. Knauf has agreed to sponsor such a bill at the next meeting of the Legislature, and he suggests that that committee might want to present a joint letter to the joint committee representing such a bill. It is hoped that some time this spring the committee will meet and discuss this timely topic. Address your letters to Representative Richard H. Knauf, 50 Court St., Binghamton, N. Y. Your local newspaper can advise you the name and address of your local representative. Last, but certainly not least, a reminder for all clubs and individuals to participate in the 1960 Fire Prevention Week. There is a special Radio Day to be observed, "Pass the Mic Day," and a special key shown in February QST with success. LMC, AMI, ACCS.

**CENTRAL DIVISION**

**ILLINOIS** — SCM, Lloyd E. Hopkins, W6EVJ — PK reports he is back on 50 and 144 Mc. DX on 50 Mc. included W2, 3, 4, 8, and 9. K60P, FRU, and QRM, key shown in February QST with success. LMC, AMI, ACCS.

(Continued on page 69)
Speech clipping is nothing very new. Wartime research at the Harvard Psycho-acoustic Lab. correlated most of the facts, which seem to apply to both radio communication through noise and the design of hearing aids.

Many hams have always had clipping—as, for instance, that speech amplifier that always "got out" so well, that had so much "pick-up." What fewer hams have is the knowledge to design such a system "on purpose." The clipping mechanism can be grid current in a push-pull transformer-coupled "class AB" modulator, or a selenium or copper oxide instrument rectifier, or a pair of diodes, or the circuit shown below. All will work well provided (1) there is no "recovery" effect after a heavy overload, (2) the low frequency response in stages preceding the clipper is very poor (as clipping makes a voice sound more bassy) and (3) that the low frequency response in stages following the clipper is very good.

The easy way to satisfy (1) is to use the circuit shown, or most other published clipper circuits. In overdriven "class A" stages transformer-coupling is likely to be suitable, while resistance coupled inputs keep a charge after a slug of grid current has been drawn. To satisfy (2) use at least one coupling circuit having an RC product of under 0.0003 seconds. The circuit shown has something suitable. Condition (3) is not so important by ear, but a little investigation with a cathode-ray 'scope will show why it is worth while. The square tops of the clipped waves begin to sag in the later stages, and with very poor l.f. response the square waves turn into sawteeth. Thus the level must be turned down to keep the tips of the sawteeth below 100%, and a small reduction in useful sideband power results. However, the loss here is on the order of 6 db, while the advantage from clipping will be on the order of 10 to 20 decibels. Thus it still will pay to use the clipper.

For work on 50 mc and below, a clipper should be followed by a suitable low-pass filter. A single π section filter with nominal cutoff at 3500 cps will reduce adjacent-channel splatter beyond the objectionable point; neither a large nor an expensive unit is needed. The circuit shown will do fine into any single class-A grid.

HENRY CROSS — W1OOP
and Miami from 144-Mc. airborne mobile. TQ reports signals down on his daylight 144-Mc. schedules. ERW, Elk Grove, Calif., reports on 144-Mc. VHF, 40, 80, 160 meters, 2100 UTC. Lake Wabun 45, geographical soapbox, 70 cm, 30 cm, W0S5U, 205, 40, 80, 160 meters, 1440 UTC.

MIAMI - (AP) - Federal Aviation Administration is expected to take action today against a Miami-based company that allegedly operated a radio station without a license. The FAA said it was aware of complaints from neighboring residents about the noise levels created by the station, which operates on 144.025 MHz.

DETAILED CONTENTS

DAKOTA DIVISION

NORTH DAKOTA - SCD, Lawrence C. Strandene, W0JY - KRC reports that the 100-meter net comprises at least 30 stations and activity has been very good during the period. Most of them are located in North Dakota, but other states are represented.

SOUTH DAKOTA - Acting SMC, J. W. Sinkriter, W0JSN, EBB, Hillside, Rapid City, S.D. - A 144-Mc. net has been established in Rapid City. The net meets at various times and locations, and new stations are always welcome.

MINNESOTA - SMC, Charles M. Bose, WHM0X - Asst. SMC, Jean Walker, 9KEY, SEC. BOL: RM, Gary Sobel, W0PAF, St. Paul, Minn. - The 144-Mc. net is being conducted in the Twin Cities area.

ARIZONA - SMC, Dr. John L. Stockton, W5DRW - Asst. SMC, G. L. Black, K7BK, Sedona, Ariz. - The Little Rock Radio Club in Sedona is planning a picnic and an ARRL affiliated club and has been holding picnics on a local level. WVG's 1st. Jr. operator arrived April 6th - a boy and WVG, 160 meters, 2100 UTC, 144.025 MHz.

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DETAILED CONTENTS
FEDERAL BUILDING

AMATEUR RADIO EXAMS
2ND FLOOR
9 A.M. TODAY

DON'T WORRY!

See Page 111
ing summer traffic. WSONL 32, LUX 28, EA 15, OCX 10, FRN 10, JYX 5, JRX 5, JYX 5.

MISSISSIPPI — SCM, Norman B. Feenham, W5HJS — POF, SMD, and JHS have been made honorary members of the Mississippi AARON Chapter, AFB, Montgomery, Ala. On April 9th, the SCRM checked into the Ten-Meter Net, aeromarine radio. He was 11,000 feet over the AFB at the time and had a signal with 20 watts. SNR, who works 7 Mc, will be remembered by the old-timers as 4CUG at Montgomery. W5NQ is an older W5AB, and has an S9 signal with 20 watts. SNR, who works 7 Mc, will be remembered by the old-timers as 4CUG at Montgomery.

On the other hand, DX was 30-31 KHz on the Ten-Meter Net, QRE, Chattanooga, Tenn., was 30-31 KHz on the Ten-Meter Net, and DNV was seriously injured in a motorcycle accident, FVQ and 3SM are very popular in Isle Royale, Mich., at the present time. QRE is now in their new QTH, and KBQ is active in the National Aeronautic Association, Kitchener, Ont. Kitchener, Ont. KBQ is active.

QRE's new QTH is Turner AFB. The Meridian Club has purchased a 3-ke, gasoline-driven generator. DNV has purchased a new 80-MHz generator in 3SM.

In Dixie, SCR, whose call is K8HLE, is an old-timer at the local Hobbie Show with an eye toward educating the public as to the amateur's place in emergency service and civil defense. Messages were accepted to servicemen and dispersed on 4 and 28 Mc under the calls 01M and PEQ. Non-members: AY, FL, and TVY as RKF, and FWB, who has been an active member of the Ten-Meter Net for years. K8HLE's call is DX, and, as DX is an old-timer on the Ten-Meter Net, he is a good contact in that part of the world. DX's call is K8HLE.

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Build the smallest rig in your club for mobile or civil defense work . . . with Centralab Printed Electronic Circuits

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Save space, weight and number of components needed

Printed electronic circuits are partial or complete electronic circuits, including all necessary components, printed on and fired to small ceramic wafers and brought out to convenient mechanical leads.

These and other printed circuit plates are now stock items.

AMPEC — Two or three stage audio amplifiers . . . includes all components. Tubes and control extra. Amazing, trouble-free performance.

FILPEC — Balanced diode filter. Comprises 2 capacitors and one resistor on plate only 17/32” x 9/32” x 7/64” thick. Two convenient leads.

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You'll find Centralab Printed Electronic Circuits the smallest, most interesting components you've ever worked with. They literally take the third dimension out of circuitry and reduce necessary soldering to a minimum. Their outstanding performance and durability have been proven by their phenomenal growth in use by manufacturers of hearing aids as well as AM, FM and TV. Write Centralab direct for detailed information or see your jobber.
THESE ACTIVE AMATEURS WILL TELL YOU...

FEATUE FOR FEATURE
THE VIKING 1 IS TOPS!

The JOHNSON VIKING 1 TRANSMITTER
(Available in kit form only)

Other Outstanding Features of the VIKING 1

- 115 Watts CW, 100 Watts AM Phone OUTPUT!
- Front Panel Bandswitching, No Plug-in coils!
- Ten Position Xtal Switch for Rapid QSY!
- Provision for Optional VFO Input!
- Pi-section Output Stage. Loads many antennas without external couplers!
- Continuous Tuning Final Tank!
- All Stages Metered!
- Two Complete Power Supplies!
- 160, 80, 40, 20, 15 and 11-10 Meter Operation!

The VIKING 1 is furnished unassembled but complete in every detail including wiring harness, drilled and punched chassis and panel and all parts. Instructions are carefully detailed, profusely illustrated. Novice or old-timer alike can assemble and get brilliant performance from the VIKING 1.

Tubes required — RF tubes: 6AU6, 6AQ5, 4D32. AF tubes: 6AU6, 6AU6, PP807’s. Rectifiers: 6AL5, 5Z4, parallel 5R4’s.

Prove to yourself, the VIKING 1 is everything you have wanted in a transmitter. Own a “commercial in appearance,” “commercial in performance” JOHNSON VIKING 1.

VIKING 1 Transmitter Kit. (less tubes, crystals, mike and key), Amateur Net Only $209.50

VALUE? Yes! Says Mr. Larry Pyle, W6AGE, Chappell, Neb., “...probably the best buy on the market...”

PERFORMANCE? Yes! Says Mr. Paul Magnuson, W7MYA, Portland, Ore., “...it sure is performing like a charm for me...”

DEPENDABILITY? Yes! Says Mr. B. R. Fowler, W4RRH, Morgantown, N. C., “...on 160...I get Q5 S9 plus reports up in W2, W3, W4, W5, W6 and W9... antenna about 7 feet in the air...”

FLEXIBILITY? Yes! Says Mr. Roy T. Morris, W4FXW, Somerville, Tenn., “...reason I bought a Viking 1 is it has more power and flexibility than any other set...for same amount of money...”

EASY ASSEMBLY? Yes! Says Mr. F. J. Flynn, W5DRZ, Palos Verdes, Calif., “...my wife [was] capable of completely assembling the transmitter from...information contained in the kit. She has NO experience in such assembly work...”

EASILY de-TVI’d? Yes! Says Mr. Rudolph Bartz, W9QHH, Peoria, Ill., “...Congratulations on the Viking 1...de-TVI’d with a simple antenna coupler and low pass filter...”

TOP ENGINEERING? Yes! Says Mr. D. K. Ruth, W3SWX, Pittsburgh, Pa., “...My congratulations for a most excellently engineered job...”

ALL AROUND SATISFACTION? Yes! Says Wm. I. Neely, W5EB/4, 1st Lt., Inf., Ft. Jackson, S. C., “...the VIKING 1...is everything you say it is...”

AND

Yes! Says Mr. T. M. Thorson, W9GGR, Bismarck, N. D., “...I get very good reports and results with the rig...”

Above are excerpts from a few of many unsolicited letters from pleased VIKING 1 owners. These letters are on file at E. F. JOHNSON CO. and are reprinted by permission.
World's toughest transformers

"Sealed-in-Steel"
New Equipment Transformers

Preferred!

The inside story tells why!

The proof of toughness is on the inside—the actual proof that demonstrates why CHICAGO Transformers are preferred by engineers, why they fully meet the express requirements of today's tubes and circuits. Here are the "inside facts" of CHICAGO "Sealed-in-Steel" design:

1. Exclusive one-piece drawn-steel case, unsurpassed for strength, moisture-resistance, better electrostatic and magnetic shielding, mounting ease, and streamlined appearance.

2. Uniformly-wound precision coil structures—cooler operation and better electrostatic shielding in power units—minimum leakage, optimum coupling in audio units.

3. Core of high-grade non-aging silicon steel brought to high efficiency by scientific heat-treating in CHICAGO'S own annealing ovens.

4. Core and coil vacuum-impregnated with varnish. Final high-temperature baking achieves a perfectly impregnated coil and core locked against vibration.

5. All internal free space is filled by special, moisture-resistant compound. Prevents corrosion and helps maintain far cooler operation than in conventional air-surrounded mountings.

6. Checked by quality controls at every stage of manufacture, rigidly inspected, "torture-chamber" tested to insure long, dependable life in actual service.

Available in three versatile constructions:

H-Type. Steel base cover deep-seal soldered into case. Terminals hermetically sealed. Ceramic bushings. Stud-mounted unit. MEETS MIL-T-27 SPECS

S-Type. Steel base cover fitted with phenolic terminal board. Convenient numbered solder lug terminals. Flange-mounted unit. C-Type. With 10" color-coded stripped and tinned leads brought out through fibrous base cover. Flange-mounted unit.

Send for "new equipment line" catalog

Get the full details on CHICAGO'S new equipment line—the famous Sealed-in-Steel line that offers advanced engineering design to fit today's circuits. Write for your FREE catalog today—or get a copy from your distributor.

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3501 ADDISON STREET • CHICAGO 18, ILLINOIS
on May 6th, SET received third-degree burns on his right hand while working on his 32V2-2 transmitter. Don't forget,
folks, to "Switch to Safety" while working on the rig. The Tri-County Amateur Radio Club is sponsoring the Annual VHF Day at AARC State Contest Saturday, Sept. 16th, in Brattleboro. Officers of the Tri-
County Amateur Radio Club are FBS, operator; V, vice-
president; R, president; and RWP, act-
mer. The Club meets the 1st Monday of each month.
MKM and SIO have super antennas on 14 Me, COI, B, call...

NORTHERN DIVISION

PAHOA — SCM, Alan K. Ross, W7WU — Blackfoot: LQ4 is back at Blackfoot working the first trick for the U.P. RA and checking into the Gem Net when time permits. Hayden is still set up for their Class A station. Burley: EC HAB reports 5 AREC members, with

MONTANA — SCM, Edward G. Brown, WTRKJ — Public Radio in Great Falls says D.E.M. is being monitored all the time. PDE is a new call in Missoula. COH has caught up with his farming and is back on the air frequently. Many calls from Missoula area to take their examinations. Among these after a Class A ticket was OOT, Mr. Vern Phillips. NEG is taking the case to the Head of State, with only 95 to the Long Island, 100 to the National Park Service, for the

HAWEI — SCM, John R. Sanders, KPKRF — OR, RA, and YV6A AG are to receive 14-Mc receivers to come into the Island in March. ABQ/AFN handles many 28-Mc phone patches for the Pacific Islands and Marshall Islands mobiles. The 38-Mc mobiles from the Marshall Islands are considered different DXI by those engaged in this area.

Hawai'i — SCM, Ken W. Smith, K1WTF — There are still many 14-Mc xTtras on the air. Shorty, jr., WB7VZ SEC; JU, ECOs: HI, JMV, WKO, KBO, MBQ, TJQ, VO, and ZT, RM: PST, OPS: JNQ. Nevada State frequencies are 3650, 7225, 282500. John bought a ranch near Searchlight. NWU has now Collins 310B-3 transmitter. NRU is building a 100-meter portable for Boy Scout summer camp. The 10-Mc portable has been worked over and in the 100th county and says "Now to collect the cards! H1". OZV is the newest ham in the Sparks Area. He's on 7 Mc. with 250 watts. He is running at 4 Mc. with 500 watts. He is running "Dixie" on small and has built a 14-Mc beam. In the Valley of Fire. EEF is installing microwave gear on top of Mt. Rose. KLS is now nexxy of the Reno Club. LEO is going to call 500 watts to 10 Mc. and is building a modulator for 3.5 Mc. 7 Mc. is now in Las Vegas. OBW has new receiver. 3DK/7 is now in Las Vegas. QTH clerk is 2900. QTH claims his is the

PACIFIC DIVISION

SANTA CLARAS VALLEY — SCM, Ken M. Courin, W6LZL — Local clubs are working overtime to get all the activity planned for the summer months. AEV has been appointed SEC for the section. TFJ had to return as SEC because business commitments were too heavy but he has kept his EC appointment. At the April SCCRCA meeting moV gave a very informative talk on carrier current systems. FTG reports 144-Mc rigs are under construction and he is very pleased with their progress. He also is moving to a new QTH. CMY is now on 10 and 14 Mc. All reports indicate that the SCCRCA is now a 144-Mc. beam. He plans to work about 250 watts input. The SCCRCA is going ahead with plans for a 7 mc. discharge station. 5DK/7 is now 7D9X 238, IC 75, YHM 67, M1NG 2.

BOULDER CITY — SCM, Mosace R. Green, W8TI — AST, SEC, OY, BQ, Shorty, jr., W7BZ SEC; JU, ECOs: BJ, JMV, WKO, KBO, MBQ, TJQ, VO, and ZT, RM: PST, OPS: JNQ. Nevada State frequencies are 3650, 7225, 282500. John bought a ranch near Searchlight. NWU has now Collins 310B-3 transmitter. NRU is building a 100-meter portable for Boy Scout summer camp. The 10-Mc portable has been worked over and in the 100th county and says "Now to collect the cards! H1". OZV is the newest ham in the Sparks Area. He's on 7 Mc. with 250 watts. He is running at 4 Mc. with 500 watts. He is running "Dixie" on small and has built a 14-Mc beam. In the Valley of Fire. EEF is installing microwave gear on top of Mt. Rose. KLS is now nexxy of the Reno Club. LEO is going to call 500 watts to 10 Mc. and is building a modulator for 3.5 Mc. 7 Mc. is now in Las Vegas. OBW has new receiver. 3DK/7 is now in Las Vegas. QTH clerk is 2900. QTH claims his is the

Continued on page 72
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with the double-duty
dependability of

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Vibrapack*

Emergency-wise operators have found Mallory
Vibrapack vibrator-operated power supplies to be
the best all-around emergency power supplies avail-
able when disaster strikes. There are several good
reasons why experienced operators have found this to be true... reasons which clubs
and individuals contemplating the construction of emergency communication equipment
will want to consider carefully.

Mallory Vibrapack vibrator-operated power supplies, unlike other types of supplies,
can be operated as "double-duty" units, supplying both receiver and transmitter without
special precautions. Since they are quiet electrically, as well as mechanically, they may
be mounted directly adjacent to sensitive equipment with little fear of interaction. They
are light and compact to make the whole equipment easily transported when conditions
make movement necessary.

Operation of Vibrapack emergency equipment can be had wherever automobiles, trucks,
buses, boats, or even airplanes are situated. The 6 volt wet-cell battery commonly
found in pleasure cars, or its multiple cell cousin, the 12, 24, or 32 volt battery used in
trucks, airplanes, boats, and farm light systems, can be used to operate the 6 volt
Vibrapack. When commercial power lines are down and AC service is disrupted, the
wet-cell battery becomes the best and easiest obtained source of power for operating
equipment. This is a point which cannot be overlooked when planning a really
practical emergency equipment layout.

Ease of servicing must be considered, too. Obviously, emergency equipment must be
simple, rugged and easily repaired without special tools and parts. Vibrapack power
supplies meet this requirement completely, because they are built entirely of electronic
parts with which most amateurs are familiar.

Continuous operation ordinarily encountered during emergency communication requires
efficient conservation of power available. Vibrapacks operate at high efficiency in com-
parison to other types of supplies, thus permitting a greater amount of satisfactory
communication before batteries must be replaced.

In addition, with 7 models of Mallory Vibrapacks available, supplying voltages from
125 to 400 and power from 15 to 60 watts, a unit may be selected which most nearly
answers the power requirement of the emergency transmitter-receiver. With power-
wasting voltage dividers and dropping resistors eliminated, the overall efficiency of the
equipment can be improved substantially.

Prior consideration of these points in detail will go a long way toward assuring reliable
and really helpful emergency communication when unexpected disaster strikes your
community. Your Mallory Distributor will be pleased to give you more information
about Mallory Vibrapack vibrator-operated power supplies, or if we can be of service
in making a recommendation, communicate with us at Box 1558, Indianapolis 6, Indiana.


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INDIANAPOLIS 6 INDIANA

MALLORY
a good start under the sponsorship of LXE of the Napa City Engineering Dept. JTH is becoming interested in a.m.b. and 144 Mc. QFJ finished his final new and now is cleared for use. Y.T. Central Alaska might be the main traffic with Japan, JZJ comes through again with an FB traffic total. QXN keeps on rolling. NGC has new three- element W5M. It is now working 300 now for 260. He is then the Sacramento section but his last report to me was lost so we go on record now with a traffic total of 2109 for December. Week ending 4.30. QFJ is QSLing 63NT from his car. KPO’s wife now is DTS with a Class A ticket. April 15th found the SARG gang hard at work on a Headquarters in the area. They are up on Mondays, 7.30 p.m., 29.6-Mc. f.m., with CBX as head man; Wednesdays 8.00 p.m., 3791-kc. e.m. with FRX at the controls and 13-kc. QYX at the QSL. QLJ is the QSL. QVX is the man of the hour. BB, the University of California Foundation Boys, is on an expansion trip with many new members in the group. QVX is building a new station, rotary with five automatic transmitters for all bands. Mr. Phillip H. Ellis is the secretary. He is CQing 6-Mc. QSLs are coming in daily. MIECO and Net reports that rumors are like rabbits and rumors multiply, too. The gang will hold a get-together at Coyote June 30th. All new members, who are interested, are invited. Review Convention in Seattle on July 27 and 28. A gala time has been arranged so get in touch with 7RT for all the information.

RAILWAY DIVISION

SAN FRANCISCO — SCM, R.F. Czekowski, W6ATO, phone: JU 5069, SEC: NL, Phone: 711, 5-6677, Eureka, Calif.: QXO, Tootie, to NAQ and XYL on the new YL. KTU has a new three-element close-spaced beam. New calls in Eureka are KXH and LATH. The most recent was a QSL from KDQ for his work by the amateur. QSO was a disaster drill that he is going out for an amateur ticket himself. QLX has two N.E. B.B. and a used elmer to go. BOY has TVI trouble licked as much as it ever will be in a fringe area. CTI is working hard to complete his new rig. KQF is an old-timer on the West Coast going 40 years. RFJ is working QSL for radio. 1DY is getting interested again after selling his TV business. IQK hopes to become active again. The ERC is building another station out in former KQX’s location but many had to be turned away. Traffic: (Apr.) W6JJ 1098, XCN 210, YD1 81, NGC 75, T5 6, ES 1 (Dec.) W6JJ 1098, W6JJ 1098.

ROANOKE DIVISION

NORTH CAROLINA — SCM, Herman P., WADCO — SEC: ZG, PAM: DLR, QM: AR. The INC gang had another big Field Day at High Rock Lake; with the Greenville gang on the shores of the same lake at another location. PZQ, an old-timer, had a nice rig for his car. ARK is doing a fine job with his NCS News. A very nice report was received from CQX, A. Divita, USMC, who is 2FX, now operating 480 in the Point Point. Joe got his Class B in January and was elected a member of the North Carolina Radio Auditing on "E," Evans, Carolina Area: SEC: BY, phone: BA 1-6357. Asst. SEC: JCF, phone: 711-3289. Mr. and Mrs. M. and Mrs. G. Humphries, now an MARS Director, sign for AFFTA from Evans, Wash, 8WZV has immi- grated from Colorado to Williams, Calif., where he is a dis- patcher. He has two N.E. B.B. and a used elmer to go. "Bust" for the near future — free to members only. Any San Francisco amateur interested in volunteering to operate on a particular occasion at the station of a friend, or for a few hours or more per week, please contact the SCM, Telephone number above and address on page 6, QSL. A 30-second presidents message. Only 13 in 1965. An LC club, has the unique honor of being bought for new clubs each year for Field Day. Why? — Or is it in both the same field? The Radio Club meets the fourth Friday at the American Legion Hall, 1414 Taraval St. The High Frequency Ama- teurs meet at the American Legion Hall on the fourth Thursday of the month. The Red Cross Building, 22 E. 15 Ave. All are welcome to either club. MARA Area: SEC: KNZ, Bob Longley and J. S. Sharpe are studying for their tickets. KNZ has a 38-ft. sailboat. Ernest Van also has finished 90-tf. vertical. TLL, JZT, OEI, LUM, and MZ2 are working 100 meters. KM2A has a phone line installed and is using it as an auxiliary keying. BCM is working all bands. The Marin Radio Amateurs Club meets the second Monday of each month at the Marin Radio Club, 222 10th St., San Rafael, Santa Rosa Area: SEC: JEN. DTV ably represented the Sonoma County Radio Ama- teurs at the ARRL Pacific Division Directors’ Board Meet- ing in Seattle. A considerable attention in this area. GORE, WOR, and DTV are quite active. GQJ is the only station operating traffic — the traffic totals of any others will be reported in October. The Marin Radio Club meets the first Wednesday in the Tap Room of the Grace Brewery. Brewery on Second St., west of the Freeway, San Rafael. Traffic: W6FF 253, JCG 29, HGN 29, ATO 8.

SACRAMENTO VALLEY — Acting SCM, Willie van de Graaf, W6TGA, now is in Area 121. W6TTA was active in Area 122, Central Area, 6000; Central Area, 62ZV; SEC: KME. Eqs: Met, Sacramento, BKV; Walnut Grove, AZY; Dovota and Soma "Phone Scouts." Central Area: SEC, HBM: Roseville, GPP, GJS, VBI, OBS: AP, BTY, PAM: ZYV, OBS: PIV, GHB, OOA: ZYV, YNM, BTY, GY, YPS: JDN, NTS: Sec. Emergency (city) AUC.

NCS, Sac. Valley Net; JEQ, NCS. Mother Lodg, UNF NCS, Tall Pine, YNN XNCS, Northern Area: JDN is active on MARS. QJF is mobile on 3.8 Mc. EXP moved to Susan- ois and the new OCO is working the area for CREE for Chico State Pioneer Day parade. GHE moved to Sacra- mento. AUY has improved signal with two half-waves in service on 160 now for 260. He is then the Sacramento section but his last report to me was lost so we go on record now with a traffic total of 2109 for December. Week ending 4.30. QFJ is QSLing 63NT from his car. KPO’s wife now is DTS with a Class A ticket. April 15th found the SARG gang hard at work on a Headquarters in the area. They are up on Mondays, 7.30 p.m., 29.6-Mc. f.m., with CBX as head man; Wednesdays 8.00 p.m., 3791-kc. e.m. with FRX at the controls and 13-kc. QYX at the QSL. QLJ is the QSL. QVX is the man of the hour. BB, the University of California Foundation Boys, is on an expansion trip with many new members in the group. QVX is building a new station, rotary with five automatic transmitters for all bands. Mr. Phillip H. Ellis is the secretary. He is CQing 6-Mc. QSLs are coming in daily. MIECO and Net reports that rumors are like rabbits and rumors multiply, too. The gang will hold a get-together at Coyote June 30th. All new members, who are interested, are invited. Review Convention in Seattle on July 27 and 28. A gala time has been arranged so get in touch with 7RT for all the information.
CONTACT-FINGER STOCK
A silver-plated, spring alloy, pre-formed finger stock especially suited for making connections to coaxially constructed tubes. It is also an ideal means of providing good adjustable component circuit continuity such as shorting bars etc., and in functioning as an electrical "weather strip" when TVI proofing access doors of equipment cabinets. The stock is available in widths of 17/32", 31/32" and 1-7/16".
Price $1.65 to $2.00 per foot.

HEAT DISSIPATING CONNECTORS
Eimac type HR heat dissipating connectors are designed to provide an efficient method of heat transfer from the tube elements and seals to the air. They also facilitate electrical connection to the plate or grid leads of the most popular types of transmitting tubes. All types of HR connectors are machined from solid dural rod and are supplied with the necessary machine screws for use.

Popular Sizes, Price $.60 to $.80 each.

AIR-SYSTEM SOCKETS
These are designed primarily to simplify and increase the efficiency of cooling Eimac 4-400A, 4-1000A and 4X150A tetrodes. However, the 4-400A socket can be used, if desired, without modification with 4-125A and 4-250A tetrodes. The sockets are supplied with the necessary mounting screws, clips, and a pyrex glass chimney. The 4X150A socket, in addition, incorporates a built-in screen to cathode by-pass capacitor.

Price $16.00 to $22.50 each.

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Your instrumentation is strictly modern in design and construction with Triplet Meters. You can have sizes 2" to 7" in a wide variety of case shapes and mounting arrangements, A.C., D.C., R.F., Rectifier or Dynamometer. Molded and metal cases, rear illumination, and other special features are available. For precision and economy virtually every meter part is made in Triplet plants under rigid humidity and dust control. Every meter represents the refinements gained in half a century of meter experience. Keep your panels up-to-the-minute with Triplet Meters — famous the world over for quality, accuracy, and dependability.

and 28 Mc. WG enjoyed his first 'phone CD Party since 1941. NAD keeps active on 3.6 Mc. with 60 watts and a clamp type modulator while constructing new rig. W1HG has a new HG-129X. K4AIR has added a new BC-610 to the station equipment. FV lost his modulator power supply in the Virginia QSO Party. PXA is interested in ORS cooperation. Qualifying for VFN certificates are HIN, W9S, WQJ, Z1A, KLL, LVA, M1K, MLK, OML, OYP, P4C, and K5J. SKT is the station of the new founder of the University of Virginia Radio Club, officers of which are NAC, pro.; NIX, vice-pres.; NKE, treas.; and 10K/L, secretary. RYD is a new ham at NJ. VJ8L played host and entertained a substantial number of Virginia hams at the VFN picnic held May 30th at his Palafox, Va., farm. QSL is requested on G-700. Under our operation, we hear that QRO is in CBN-land. NV is circulating petitions preparatory to requesting legislative action providing for call letters on the new 210 Mc. for Virginia hams. Drop a line to NV at 1117 Cambridge Cres., Norfolk, for petition forms. SED, 6X8MT, graces the ether from his new QTH in Falls Church, where he and ARRL Secretary 1BD have reported on VFN for discussions of timely ham topics with the VFN membership. LIM has gotten as far as laying the foundation of his new 1000A final OSS is enounced in his new country QTH near Burke. PV, CFV, MWL, KSV, and K9T lead the VFN gang in the number of reports received for the 50-51 season, while VFN leaders are FV, CVO, 8J8, G9X, 1YI, 1A1, and JAQ. Traffic: KA1RR 480, W9P 160, QDX 119, JAQ 87, NAD 61, PWX 60, KFC 47, LAK 24, NV 28, CFV 26, MUP 24, K5F 17, UYJ 16, WG 6.

WEST VIRGINIA — SCM, Donald B. Morris, W6JIM. The Tri-City ARC of Dunbar has subscribed to the Braille Edition of QST, to be donated through ARRL. RKV discussed n.s.h. at the last Club meeting and 10 members attended the Beckley Hamfest. P7T qualifies for Class I OO by his recent accurate work. The MARR operated SP at the Fairmont Hobby Show, handling more than 200 messages. AUI again hits BPL and was an outstanding traffic station the past season. AIIW, at Bluefield, is a new member in the State, active on 14 and 2 Mc. DCS and DWA are editors of the Princeton Amateur Radio Club's bulletin, PARA. 4ZC is new ORS working on 3.5-Mc. c.w., with power raised to 125 watts. The PARA's code class now has ten new members. YPR finally snagged 48 cards for WAT, Virginia being the tough one. DTY visited B7L, WOZ, and 8J after completing a successful season on the W. Va. 'phone net, along with MCR, State PAM. A good bet for Wayne County is FID on 3.5-Mc. 'phone. It looks like an expedition will be necessary to get a station on Monroe and Wirt Counties, BWD, P7T, UH7, WCT, AJU, and GIN keep the Stonewall Jackson Club humongous. V6Z, W8AUJ 510, BYT 411, DFC 43, BWK 9, GCZ 6, P7T 6, JM 5.

ROCKY MOUNTAIN DIVISION

COLORADO — SCM, M. W. Mitchell, W6I169; SEC: 1HFQ, Asst. SEC. PGX, RMIA; Z0G and L1Z. YOJ made BPL again! TV is new EC in Colorado Springs. He says he is not getting the civil defense set-up under way yet. ZOJ still is requesting help with NCS on PAN. It is becoming more and more evident that many amateurs in Colorado are living in the past as far as the civil defense is concerned. There seems to be very little interest in civil defense, but those who do realize the importance are having considerable difficulty in getting the thing organized. It's time you stop dreaming, fellows, and get down to business and realize the importance of civil defense. It is very serious and insurance. We need an EC in every community in Colorado but at the present time only about 8 per cent of the State is represented by ECs. YOU will be needed badly in case of emergency, but if you are not trained for it then when it hits you will be a hindrance, rather than a help. Let's get in there and pitch! NOW IS THE TIME! TOMORROW MAY BE TOO LATE! Traffic: W8JO 1824, KQH 36, LZY 26, IA 16, DYS 2, TYP 3.

UTAH — SCM, Leonard F. Zimmerman, W7SP. The only report we received this month was from UTM, says he would have made BPL if he hadn't had to put in a week of swing shift. The UAM has changed its meeting place to Room 105, M.S. Bldg., U. of U. Campus. Meetings are held the second Wednesday of the month at 7 p.m. QAA has a new jr. operator, OOK final, and has moved to her new QTH. It is rumored that BSE is dividing his time between square-dancing and ham radio. OSV is on 144 Mc. JOE has a 75-25 but says he doesn't know what he is doing. KUX is rebuilding both the shack and the transmitter. Has anyone seen JP9's new invisible wireless beam? UAR is holding "Operation Field Day" like last year again this year. NUZ is going to Ft. Sill for the summer, but will be back by September. Traffic: W8A4G 176, W9MY 9, K7KX 976.

WYOMING — SCM, A. D. Gedeon, WH7N1; TJ is building de luxe ham receiver, JDR now is KG6AEE on Guam and wants Wyoming QSOs on 14-Mc. phone. DJ, Acting EC, is getting an PB start in the job. ZA1F is working FB on 14 Mc. considering the antennas! GOH won't help JW get the guys out of his new rig. EV1F is rigging up 864 portable phone with a.c. generator. JGS is guided.

(Continued on page 76)
"by far the best I have ever used!"

...that's what they say about the

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- The clear call of the Cardax gets positive voice recognition ... and more QSO's. It's the first and only high level cardioid crystal microphone with Dual Frequency Response ... gives you high fidelity for clear channel or rising characteristic for *extra crisp* speech signals that cut through QRM.

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**Electro-Voice**

MICROPHONES  PHONO PICKUPS  HI-FI SPEAKERS

404 CARROLL STREET, BUCHANAN, MICHIGAN

to his antenna rotor. JRC and HNI had eight contacts on
144 Mc. AEC is busy at his lake cabin. ABO and AMU are
operating their bags with prx-2, prx-1, and black bananas.
KUB was elected president of the Shy-Wy Club.
Traffic: W7GSQ 12, NOU 4, EYH 2, GS 2, HLA 2, HNN 2.

SOUTHEASTERN DIVISION

A LABAMA — SCM, Lewis C. Garrett, W4LEN — New
appointments: JBD as AEC; HFP, DEZ, and PUZ as
PAMs. OPH and GCZ are on 3.8 Mc. From Mobile,
NQL is treasurer of the Mobile Club. The Mobile Club
this year provides the only communication for the Deep Sea
Fishing Rodeo. This year they plan to use 50 and 144 Mc.
FVJF now is on 3.8 Mc. From Birmingham, AIC is
making QSOs via tape recording to Hank Miller. V5EX
is rehuddling with 4-1255C. GLR has new kw. on 14 and 28
Mc. DTMY made DXUC on both phones and e.w. All BL
members are getting on the same frequency for
cd. NQK has a new home and 3.8-Mc. antenna. PTU is
moving to Waoo, Tex. K4KCI now is operating K4KCI
in AENP. FVT is back on 3.5 Mc. FPU station is
WX5U. SQM is new call from Decatur. FPU has a new
call from Talladega. EMU has a WX5U, and NQK is
callign on 3.8 Mc. From Mobile, CYL is de-TV95 3456, 1KX,
RE 5 AENP, has an FPW. CWUL is in AENP. FFWZ
is the Gator Net on 7900 kc. going full
swinging. The following stations reported in, April: CKQK,
KRF, JXW, OCG, DES, JWQ, QM, MTT, GCWUS,
QG, IE, FWF, IM, SAT, OCH, QNB, RYS, ACH, 9JK,
GGIR, 8SRF, 4AJ, and VEJIA. Other members are
KFR, RYS, PZT, PMN, and JY7. Deland; WS ddx on
QSP direct to K1HPA on 3.8 Mc. phone. Also heard
calling from Deland were W7 and W2. Fort Lauderdale: LM
reports the following: TH9T, AT9K, on 38-Mc., mobile
callsign EBF. ABU, APO, NFR, EHH, RUM, and IM, Jacksonville;
JXW, 12, HWA, GZJ, BOE, and BNB were active in JANS Field
plane. SOX is a new ham in Jacksonville. A year and a
last, a traffic report from one of the Jacksonville
station, JW9, of the Gator Net, Oakland: OCG has moved back to
Gladstone. Punta Gorda: Flower, in good shape, has
been doing well with the Palmetto Net this past season.
Although handicapped by lack of good coverage in the state,
Ed did a splendid job. He still needs a few facilities for
WAC on 3.5 Mc. General: I have been informed that ama-
teur weather stations reports will be handled this year by
the Duarte Radio Club. In addition, reports are being
invited into the net. KWA, at Coral Gables, reports he can
handle traffic on 7 Mc. during the midday, Isis
and JIC keep the schedules. CK9B, at West Palm Beach,
says the Rebel Radio Club really is proud to place third in the
SSC 1953. JY7, reports that the Rebel Club Club is doing
and members in order to put Florida on the contest map
and finish ahead of the powerful Frankfort and Potosne Valley
Contest. JY7 is on 28-Mc., mobile. Also heard
was heard on 28 Mc. FHP is being well heard on 3.8 Mc.
old-timer heard from RAA has his 32V-30. PFD is
building 50-Mc. converter. DHP has increased code speed.
JY7 now is Class A. PFL has the 908. The
Tri-State Hamfest, MS has a Wellman converter under
construction for 144 and 50 Mc. VR keeps up his FB work
on 7 Mc. JY7 has been knocking off the DX. KGQ is heard
on 14 Mc. QP put in a welcome appearance. LRC is going
back in the Navy, MDD does a wonderful job at frequency
measuring. PFL is in Egin Field Area. GCZ was heard
28-Mc., short skip, ÂXP still clings to 7 Mc, and TT^, OCZ
was home on a short beam. GCZ has a FB three-sheet
packing. OKD is still working on the 28-Mc.
IOM is inter
stested in 144 Mc. MUX is going full blast on 7 Mc. NOX
is 14-Mc., a.w. regularly.

GEORGIA — SCM, James P. Born, Jr., W4ZBD — The
amateurs in Carrollton have organized a new club, the
Carrollton Amateur Radio Club. Officers of the club
are: LOR, pres.; GDD, 1st vice-pres.; RYU, 2nd vice-
pres.; and PJ, secy.-treas. Code and technical classes for the
trackers and Scouts and other members are being held regularly,
the Club. It is with deep regret that we must report the
passing of CPT and FJR, of Atlanta. OTG has moved to
Lutz, Fla. R1XK is in the hospital. R11 has a new beam.
SLH and SOV are new hams in Atlanta. HZG has a new beam.
Sl11 and SOV are new hams in Atlanta. HZG has a new beam.
GMF is in the hospital with a broken ankle. The
Atlanta Radio Club, at its April meeting, unanimously
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The **Aptitude-Tested** LINE
reorganized the Mason Amateur Radio Club and elected
the following officers: FD, pres.; JMW, vice-pres.; PET,
treas.; KPC, secy. Traffic: KAWR 660, W4FBH 56,
ZD 55, LYU 29, MTS 10.

WEST INDIES — SCM, W. Werner, KP4DJ — SEC:
ES, BI, CI, ES, FJ, and GN are 3-8-Mc. mobile in Ponce.
DV, DL, CU, FF, and EQ are 3-8-Mc. mobile in St. John.
While JA and OK are installing 3-8-Mc. KP4D, at
Red Cross Headquarters, will guard 29.1 Mc., as well as
3599 and 3025 kc. during emergencies. DJ was appointed
trustee of KP4D by the ARRC directors. The AREC
3095-ke. net handled CAP traffic from San Juan to Ponce
for the Air Service there. KV4A has joined the SEC.
Model 11-10, net. GH reports into the 3595-ke. net. AZ has
14-Mc. triple-train beam at his new shack. HU, IT, and
JG transferred to W4-Land. The BASIC elected SE, and
model 11-10, net. NH reports into the 3595-ke. net. AZ has
14-Mc. three-element beam at his new shack. HU, IT, and
JG transferred to W4-Land. The BASIC elected SE, and

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SOUTHWESTERN DIVISION

LOS ANGELES — SCM, Samuel A. Greenlee, WE6SR —
SEC: KSX, RMs; CMN, DDE, FYW, LDR. I will do
my utmost to justify the confidence you implicit when you
elected me to be your SCM. Now, more than ever, the
SCM must constantly work for the promotion of all-out
activity in ALL classes of ham radio. WE MUST KEEP
OPERATING — or lose forever the chance we have
now. There is ample proof that we are needed, and
wanted. Our help has been solicited by governmental and
military agencies. It is a sad commentary on the resource-
fulness of the ham that so many of us have given in to TVI.
TVI can be licked and is being licked! Let's clean up our
act and KEEP OPERATING! Thanks for the swell
flow of reports. KVY, GYE, SG, CRU, KH4, and BHG
made the BPL. CMN thanks the clubs and individuals who
have helped with SD/6 Hobby Station Club. He plans six-
month's rest and rebuild period. COG is going back to
W4-Land for a few months. KFY is doing a lot of
controlling G-1 traffic from JA and KG6. BG carries a
heavy schedule as OBS, OBS, and OBS. KWG, ex-2YD,
is a new member of our OBS of a new
YJ, RN, RY, KG, Welcome, Betty, VIM our ex-SCM, writes
from W5-Land of QRM from new YJ, Jr. operator. He will
be on the air soon. IOX, YBO, YBO, YBO, and ZBO
are joining the Air Force. Apollo, Phoenix, The Pomona H, S, Radio teams,
public radio with permanent servicing to a local hospital.
IDM is back on 28 Mc. GUM is on 3.5 Mc. HCC has a
towel-throwing half-kw. ZBO has a classed new mikes boom.
Social note: ZGY says he survived Army life so far so
now it's wedding bells. (What a man!) Thanks, etc.

CANAL ZONE — SCM, Everett Kimmel, K3ZAV —
Attention ex-KGHz: QSL Manager PC is cleaning files cluttered
with old QSLs for ex-KGHz, and says you can have them
if you mail your current address NOW. The
CZARA demonstration station, K3ZKZ, operated by
RAI and a KZ3 group at a recent out-of-town church fair, accepted
no traffic yet the spot contact made for listeners created
more favorable opinion for ham radio than would have been
achieved by a basketful of rubber-stamp messages. CG,
before the net frequency, transmits the ARRL bulletin on o.c.
just before Monday night AREC drill and reports it by
very well during drill period. TB flew in from KP4-Land — an
FCC examiner for a one-day stand at Albukroo AFB — just
so KZ3A could take the exams and get FCC tickets. Class
HI 100, is working for Class I rating. WD worked MP
for his 138th KZ5 contact.

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home or commercial use. Thousands now in use in
foreign countries for important applications and now
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with crystal mike PLUS all the features of the Bandmaster Sr.

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APS-50—Delivers 425 V at
275 ma. and 6.3 V at 4 amps.
May be mounted on rack
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for Portable operation.
Delivers 300 Volts, 250 ma.
For 6 volt
For 12 volt
operation
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VHF Antennas for Civil Defense

For 100 to 250 Megacycles

With amateur mobile in CD limited to 28 mc. upwards, local emergency coordinators now plan extensive use of the 6, 2 and 1 1/4 meter bands. Mobile operations at these frequencies are working out surprisingly well, too, with excellent coverage using relatively low mobile power. Recognizing the need for inexpensive VHF antennas, Premax offers two new car-top designs. One requires only a single 1/2" hole for mounting and the other utilizes a suction cup mounting, requiring no holes, yet being always available for service.

A new low-cost ground plane (can be isoplanes) antenna is also available for fixed station use.

High-tempered spring-wire whips are used throughout and are mounted on ceramic feed-thrus in the ground-plane and permanent car-top models.

Write for bulletin or see your jobber 73,
T. STEWART, W2TB

WEST GULF DIVISION

NORTHERN TEXAS — SCM, William A. Green, W5JK, Asst. SCM, Joseph G. Buch, S5CU, SEC: AAO, RMs: GZU and LSN, PAM: IQW. QQ0, appointment was made to LDN who is back on the air with 250 watts. QDF is the proud possessor of an A-1 Operator cert. with the help of master QRT because of college work. Congratulations to SQW in overcoming the handicap of blindness to obtain his ticket. The Wichita Falls ARC elected N. C. GOVERN, pres.; G. AVA, vice-pres.; and H. E. LEE, secy.-treas. The East Texas ARC, under the direction of RHC and TPJ, put on a fine show at the East Texas antique show in Overton, Springs, at which OIS and IXY were successful in finding the hidden transmitters. At Lubbock the South Plains ARC, with QJD and QF, put on a fine show at the annual fair. Among the licensees are OAI, a ham and DXer, who recently secured his ticket. Summer static is with us again but thanks to IQW and GZU and their gang much traffic is still moving; in fact the Northern Texas nets now seem to be a clearing house for the Southwest. MTL is reorganizing his station for 150 watts on all bands. MARS activity is steadily increasing with IQW, GWS, and AARU leading the way. SPR is back on the air with 30 mc. SNN is on 30 mc. with 24Gs and a 50-H. beam, while K6F runs a pair of 80s. Traffic: (Apr.) W5J1N, 11151; G5Q, 970; PR9, 1495; IQW, 1484; BKB, 159; ARK, 155; LBS, 95; QDF, 353. (June) IQW, 12. GQO, (Mar.) W5AR, 180.

ORALEMO — SCM, Frank E. Fisher, W5AHT/AST — SEC: AGM, RM: FOQ, PAM: ATJ. Oklahoma County holds two ARC drills this week. EHC worked several mobiles on DAYN/5 from his mobile rig on 3.9 mc. KSNR finds time for traffic in spite of the Navy and college work. OLZ will remain active during the summer. FOQ and MRA are taking a big chunk of the relay load. OPMN now has a short mid-week session at noon; a fine idea for emergency preparedness. BIE did a nice job with his mobile in assisting police in search for a kidnapped girl and her escort. OQM, SEK, and HEL, together with PA, PRB, CUH, W5P, JPT, and 8UV/DM, assisted in this relay. OEQ is a busy man these days with a new business and trying to push Amateur License Plate Legislation through the state legislature. OWG, R5D, and KOB have been very active in this work. LCN has a new job which keeps him bustling to make the Net. Harry has worked hard as NQS as well as his other net duties. GZM has moved to Ardmore and is on 3.5 Mc. (Continued on page 88)
ALLIED for peak service!
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S-77 Special AC-DC Value. Here's versatile communications quality at low cost. Covers 540 kc to 44 mc continuously for all AM broadcast and amateur and foreign short wave. Controls: main tuning and bandspread dials, noise limiter, AVC, BFO on-off, BFO pitch; RF gain, volume, AM-CW switch, Tone-AC on-off, Standby-Receive. Built-in PM speaker and headphone jack. In steel cabinet, 18 1/4 x 8 1/4 x 11 1/2". For 105-125 volts DC or 50-60 cycles AC. Complete with tubes. Shpg. wt., 29 lbs. 97-747. S-77 Receiver. Only. $99.95 down, $7.51 monthly for 12 mos.


S-76 New Double-Conversion Receiver. Amazing selectivity at moderate cost! Exclusive 5-position, 50-locatable second IF, providing 500 cycle band width at 6 db down, 3 kc at 60 db down, and 3 broad selectivity positions. Covers 538-1,650 kc, 1,720-4,800 kc, 4,6-13.5 mc, 12,34-35 mc. Full electri-cal bandspread: built-in 414° "S" meter; tuned RF; BFO; ANL; tone control; Steel cabinet, 18 1/4 x 9 x 9 1/4". For 115 volts, 50-60 cycles AC. Complete with all tubes. Shpg. wt., 40 lbs. 97-746. S-76, less speaker. Only $169.50 down, $25.43 down, $12.73 monthly for 12 mos. S-76, with R-46 speaker, 70 lbs. Net $189.45.

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CITY . STATE . ZIP .

and O.LZ. Boyce has been on the air for 14 years and has never owned a modulator. FNG has new Lyco excitation. All members of Armaids now own 2 obl 45s on 38 kHz. OKX has been using a 400-watt rig using p.p. 814a.

Canadian Maritime Division

MARITIME — SCM, A. M. Crowell, VE1DQ — SEC for QSL mails and QSLs, please.

Maritime Division

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Maritime Division

MARITIME — SCM, A. M. Crowell, VE1DQ — SEC for QSL mails and QSLs, please.
It has been proven that the Two-Meter (144 to 150MC) Communications Equipment is the most dependable and reliable equipment for Civilian Defense use. Through simulated bomb attacks, floods, fires and other disasters which disrupt normal communications, it has been found that emergency communications go forward with remarkable ease in your town or city, and from town-to-town and city-to-city, through the use of this equipment.

We, here at HARVEY, have all the equipment and parts that you may need, whether for installation or construction, of an emergency communications station for operation on any of the designated bands...fixed station, mobile or portable. We also have complete packaged units for installation in autos, homes, public buildings, bomb shelters, etc. We can custom build equipment to fit your individual requirements.

We carry stocks of the nation’s foremost brands...transmitters, tubes, receivers, speakers, transformers, AC power supplies for fixed stations, mobile power supplies for 6v or 12v operations, gas engine operated generators for 6v or 110v AC, antennas, meters, noise-cancellation and standard microphones (carbon, dynamic and crystal), etc.

Crystal Controlled Transmitter
Designed for stable, trouble-free operation in the 144-150 mc bands. Coupled to any co-ax fed 2 Meter antenna. Uses any power supply providing 300v at 200 ma. Screw-driver adjusted tuning controls. 7 tubes. Components and tubes are standard for replacement ease. Co-ax connectors, 5 1/2 x 9 1/2 x 5 1/2 in., with universal mounting flanges. Prices are less power supply.

Transmitter...
Wired and tested...
$74.95
Transmitter...
In kit form...
$49.95
Also Ideal For CAP

Superhet Receiver
An excellent 10 tube receiver, sensitive, stable, selective. Highly efficient with precision vernier tuning over 144-150 mc. Exceptional signal-to-noise ratio. Minimalized power requirements with total battery drain only 22 watts. Matching cabinet, same size as transmitter, with universal mounting flanges. Jones plug and co-ax connectors. Prices are less power supply and speaker.

Receiver...
Wired and tested...
$94.95
Receiver...
In kit form, uses Oscillator of Receiver
For external local oscillator, mounting kit less oscillator, add to above...
$5.00

Gonset Converters
3-30 Gonset Converter, 10-11 Gonset Converter, 20 Meter Gonset Converters...
75 Meter Gonset Converter, Shopping weight each, 4 1/2 lbs...
Gonset Tri-Band Converter...
Model B Noise Clipper...
Universal Steering Post...

Gonset Converters...
$44.75
$47.00
$9.25
$3.90
$3.90
$3.90

NEW GONSET TWO - METER CONVERTER: superhetodyne...same size and appearance as Tri-Band Converter and FM Tuner...
$44.50

HARVEY is headquartered for these famous Emergency Receivers. High quality emergency band FM receivers for application ANYWHERE you are you can HEAR police raids, fire alarms, bus dispatchers, railroad communications, ships at sea, etc.

PoliciaLARM
Mobile FM Receiver 152
Model M-101 covers 152 mc to 162 mc Band...
$72.50
Model M-51 covers 30 to 50 mc's...
$44.95

MunicipoRadio
For Home or Fixed Location
Model PR-34 for 30 to 50 mc band...
$44.95 complete.
Model PR-8 for 152 to 162 mc band...
$44.95 complete with 14" whip indoor antenna.

MUNICIPALITIES AND EMERGENCY SERVICES are invited to consult us on any of their emergency radio communications equipment problems. Six members of our staff are fully qualified and licensed operators. Their services are available to you. No obligation, of course.

Telephone: Luxemburg 2-1500

VISIT HARVEY’S AUDITORIUM—Come in and visit our new Sound Department.

NOTE: In view of the rapidly changing price situation in both complete units and components we wish to emphasize that all prices are subject to change without notice, and are Net, F.O.B., N. Y. C.
first and only YL in AFARS. She has deserted 14-Mc phone for 3.5-Mc, w.r. YR and YC joined the RCAF, MK got his WAVE, WAC, and WAS during April. AJ has been appointed Flight Leader in AFARS. Transferring VE2FPQ, MK 92, AAK 64, XV 57, OM 42, AAL 23, ZO 16, PB 15, YO 13, AL 11, KI 11, JO 10, JS 10, KG 10, RF 7, ABG 6, AS 5, DS 5, ABS 4.

ONTARIO DIVISION

ONTARIO — SCM, C. Eric Forquhar, VE3JIA — Asst. SCM, w.r. G. Williott, 3BUR, Asst. SCM. SCM phone, E. Kimble, 3NQ, 28RQ. The Ottawa Amateur Radio Club, at its May meeting, heard a most interesting talk on modulation techniques delivered by George Davis, 28RQ, Ottawa Area EC. Included in the organization of the AREC. Also in Ottawa, under the auspices of the Ottawa Valley Amateur Radio Society of the AFARS, a well-attended banquet was held in April to the 50th Anniversary of the formation of the AFARS as the Ottawa Amateur Radio Society. The banquet was held at the Queen City Club as the outstanding amateur of the year. BQP is heard on 144 Mc. The Quinte Amateur Radio Club, a member of ARRL, held its last meeting of the season at the Oxford Cafe, A25, NN, and BVH are active on 50 Mc. AVZ was present with the Paul Zevak Memorial Award as the outstanding amateur in the Ottawa Area. BHM is heard on 3.5 Mc. Up Windway way the Frontier Radio Assn. is whirring into shape as one of the finest amateur stations to be found anywhere. The Association’s May issue of the newsletter is a worthwhile reading and should be of value to all AREC members. Ontario amateurs were saddened to hear of the passing of William Y. Stinson, of Toronto, one of the original members of the Wireless Assn. of Ontario. Transf.: (Apr.) VE7HA 122, BUR 118, AVX 60, ATR 66, ZAM 69, 32K 45, 35 G 35, VWY 35, BM 2, BMG 31, BV 30, DD 29, PTZ 25, BRN 17, BPE 17, TO 16, PH 13, WE 11, DJD 8, LF 8, VD 4, DLP 3, D1 3, (Mar.) VEBQH 74, D1Q 31, TO 1.

QUEBEC DIVISION

QUEBEC — SCM, Gordon A. Lynn, VE2GJ — BB reports a fatality off of GAG and member of the CBG sometime reported he was causing BCI. CG is moving to a new house and is GRT for the present. VE2EEL, from Valcartier, Que., appears to be in good shape and was a visitor to MARC April meeting. CGQ is now fully battery-equipped for receiving and transmitting at home. RFQ is rebuilding a lab and has been working on the installation of a 1-kw. alternator panel. The panel is capable of generating 1000 watts of power. A portable unit, St. John’s Radio Club, had a booth at the St. John’s Industrial and Commercial Exhibition, which was held from May 26th to April 15th. The club station, AFZ, was operated from the booth. VE reports conditions on 14 Mc. to the North Country extremely poor with a hard work of traffic. VE3VJ, last November his XYL, Phyllis, received a message from the North for an address in Vancouver which was forwarded by mail and the last week of April an air mail letter was received from Bangkok, Siam, dated April 12th, expressing thanks for the message and enclosing a reply which was duly transmitted. Reports were very scarce this month. Once again, let’s hear from you. Transf.: (Apr.) VE2BB 61, GI 11, IO 9, (Mar.) VE2BB 123.

VANALTA DIVISION

ALBERTA — SCM, Sidney T. Jones, VE6AM — LZ plans microwave experiments in the near future. EO is installing antenna and preparing radio room in new City Hall for amateur civil defense and emergency headquarters. EM was presented with a lifetime membership certificate in the Northern Alberta Radio Club on his retirement from C.C.R. after forty-three years service. The Ladies Auxiliary, local club staged a very amusing skit at a recent social evening. EM is going great guns on 14-Mc mobile. OG has great plans for a wide-spaced 14-Mc beam, AREC really paid off recently in getting food to Medicine Hat. Operation "WETHAT" was a success, reports EC Nelson. Nice going, going, MG plans to attend summer school this year. OC reports the operation of AREC in the Peace River country is progressing. Look for them Sundays about noon on 3.6 Mc. Don’t forget the Alberta Dinner at Edmonton September 1 and 2. Make your reservations early!! Address Secretary, Northern Alberta Radio Club, Edmonton. Transf.: VE9DRE 30G, EO 6, MG 5. (Continued on page 89)
Newark! Foremost distributor of electronics equipment...

* FOR THE AMATEUR AND INDUSTRIAL USER

Newark Now Offers the Widest Selection in the Industry Through Their Comprehensive 160-page Catalog

The Most Complete Catalog in the industry! Coming at a time when lines and prices are stabilizing, this catalog will be enthusiastically welcomed by Amateurs and industrial concerns. All of the latest developments in electronics have been incorporated, and only current, readily available items are listed. Newark's catalog is the first to feature such outstanding new Amateur equipment as the Gonset FM communications tuners (97F105 for 30-40 mc, 97F106 for 40-50 mc, 97F107 for 88-108 mc, 97F108 for 152-162 mc—each...$59.50), and the famous Eldico line, including the model TR-75 TVI-Proof Transmitter (97F154...$59.95) and the 2-meter superhet for fixed or mobile operation (97F150...$94.95).

The World's Largest Stock of radio, television and electronics supplies is Newark's trademark. Only tested products of nationally-known manufacturers are carried, and wherever possible, complete lines are listed, making it faster and more convenient to order from Newark.

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BRITISH COLUMBIA — SCM, Ernest Savage, VE7FB
— Your new SEC is DJQ, 6950 Balsam Street, Vancouver. Thanks for the hard work in making this Province emergency-minded and for the very active nets and meetings of the Amateur Radio Emergency Corps and of the Amateur Radio Club of Vancouver, also for your fine support. We welcome ALP, ALU, ARS, ANC, and XM all in the area of Kimberly and Cranbrook. We are working 144 Mc. and have a very good QSO. AC worked VE7AK. The Vancouver ARC held its annual tube hunt at Capilano Canyon with great success. From there the members were conveyed by mobiles to the home of APM. The same Sunday, Tom was on Little Mountain testing its gear for Rapid City. The VARC arranged things and said that the biggest collection of mobiles in one spot so far for Vancouver was away back in wintering in Southern U.S.A. Who is coming in the National ARRL Convention in Seattle? We want to form a convoy from the border at the Pacific Highway, Route 99, and really let the Ws know who is who. Please get in your reservations for the Convention and for the hotels to John Grubbe or me immediately. Trailing: VE7XZ 60, AOQ 24, AC 26, ZF 7.

PRAIRIE DIVISION

MANITOBA — SCM, A. W. Morley, VE4AM — PAM: FA. My apologies to the BARCH. Through a misunderstanding its news has been published twice.

The Club was active on Field Day and the AREC is wrapping up the season. How about an EC for Brandon? CB has seen Solec-O-Ject working fine. Bob got a new rig 40 watts on 75-meter phone and promptly worked himself a ZL. JT has his pilot's license. SQC is working out on 14-Mc. phone and c.w. with an 810 to a folded dipole. MP has mobile rig working on 14 Mc. and a new ham, has a 540 and uses a 1A0/XR30 on 14-Mc. c.w. LC is trying in preparation for 75-meter phone. GQ made a nice trip to Montreal. EJ is using clamping tube modulation on 75 meters. VY is heard on 14-Mc. 'phone. The Dauphin Hamfest is scheduled for the Labor Day weekend in September. More details can be had from PA, who assures me it will be better than ever. How about more news this month? Don't let the summer months slow us down.

SASKATCHEWAN — SCM, Harold R. Horn, VE6SHR
— JV received 120 DXCC stickers and has 37 zones to his credit. HJ transferred to another station. DOC, going to St. Albert, moves to GQ. JO moved to Saskatoon and is mobile on 75-meter 'phone, along with 85E and AN. JF has a 144-Mc. rig working along with his 50-Mc. rig. CJ is on 50 Mc. with 18 watts to an 832, and a three-element beam. JH has been transferred to VE8-Land, BZ, Rosetown Area EC, reports 14 members reporting into the Sunday trials on 3740 kc. at 11 a.m. DD has new three-element 28-Mc. beam. UQ puts a nice signal on 75 meters, using 813 clamp tube modulated. JZ is a new call at Watson. SAQ visited the Saskatoon gang. XYL, Mary, passed her amateur exam. FY is building a hand-switching VFO crystal rig with a pair of 807s in the final. OB bought a new mask and suffered mobile antics when the hi-wire tests came. RM, Moose Jaw EC, put on a demonstration for the local amateurs using 144-Mc. and 220-Mc. mount whip. DR deserted 75 meters for 14 Mc. and DX. Trailing: (Apr.) VE6RH 33, GL 19, MA 18, VP 8, LL 7, PJ 7, TA 7, NO 5, DB 4, DL 4, GL 2, GN 2, UF 9, UA 1, UC/M 1. (Mar.) VE7E 38, DS 19, MA 10, LF 8, FQ 5, GL 4.

Strays

Foreign amateurs wishing to send cards to ARRL for awards are often puzzled by the different rates of exchange, and are usually reluctant to trust their QSLs to the mails unless they can be confident of registered mail service both ways. For the benefit of these amateurs, the following one-way postal rate information is offered:

- 100 DXCC cards...70¢ U. S. currency (14 IRC)
- 48 WAS cards...30¢ U. S. currency (3 IRC)
- 6 WAC cards...10¢ U. S. currency (1 IRC)

(One IRC should be included for each 5 additional cards.)

The above figures cover first-class postage and registry fees. Return postage remittance may be made by International Reply Coupons, International Money Order, U. S. stamps, or U. S. currency.
Yes, you save and save plenty with a "SURPRISE" Allowance on your used (factory-built) communication equipment. Here's all you do. Simply choose your new National. Tell us what you have to trade. We'll do the rest. Wire, write, phone or use the handy coupon today!

NC-183
Shpg. wt. 65 lbs.
Only $279.00
Less speaker
Speaker in matching cabinet, as shown.
Only $16.00.
What do you have to trade?

NEW HRO-50-T1
Shpg. Wt. 88 lbs. Less speaker.
Only $383.50

HRO-50-T.............. Only $359.00
Shpg. Wt. 88 lbs.

SW-54
Shpg. wt. 10 lbs. Only $49.95
Buy at an amazing saving. Trade used equipment now.

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FREE! New 164-page catalog. Features all the latest and best in ham gear, radio equipment and electronic supplies for home, workshop, schools and industry.

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☐ Mail my Free copy of new 164-page Walter Ashe Catalog.

Name ____________________________
Address __________________________
City ____________________________ Zone ________ State ________
Phone Man’s V.F.O.
(Continued from page 19)

microphone connector is mounted under the dial, at the center. A coax output connector is placed at the rear, near the 6AG7, and there is also a four-contact connector for the a.c. line and a control relay if one is used.

The unit is designed to fit into a standard 8 × 7 × 12-inch utility box. Rows of half-inch holes are punched along the three sides, near the top, to provide for ventilation.

Adjustment

The first step in adjustment of the VFO is setting $R_{13}$. The tap should be set at the point of maximum resistance that will permit the VR tube to start reliably when the power is turned on. If, after subsequent adjustment of the 6AG7 output circuit, the VR tube fails to ignite, the resistor tap should be readjusted downward to a lower resistance.

For 80-meter phone work, set $C_1$ at minimum and adjust $C_5$ (with a screwdriver through one of the oscillator holes) until the oscillator signal is heard at 4000 kc. Then $C_1$ should cover the range down to about 3750 kc. To work the low end of 80 and the 40-, 20- and 10-meter bands, set $C_1$ at maximum capacitance and adjust $C_2$ until the signal is heard at 3500 kc. The 11-meter band can be covered by setting $C_2$ to about 3850 kc., instead of 3500 kc. If $L_2$ is resonated at about 3750 kc., it should not require further adjustment for satisfactory operation over any of the above-mentioned ranges. When the oscillator unit is connected to the exciter through a length of coaxial cable, it will be necessary to readjust the slug of $L_2$ to compensate for the added capacitance of the cable.

When it is desired to use the unit with a.m., the deviation control can be backed all the way off, or a switch can be provided to ground the grid of the 6J5 or open the plate-voltage line.

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Happenings
(Continued from page 31)

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 among 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 precisely the form of the text of the proposal 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.
(Continued on page 94.)
LYSCO TRANSMASTER
35 watt transmitter exiter for 10 to 160 meters. Break in keying illuminated dial. PA plate meter. Modulation tie-in, grid meter jack and built-in power supply. 6AG7 OSC, 6AG7 Buffer, 807 P.A., VR150 and 3U4G rectifier. 115V AC, 60 cycles. Output low impedance 50 ohm type. Complete with tubes in black wrinkle finish cabinet. 17"L X 9½" H X 11"D.
Model 600 TV1 Suppressed $143.95
Model 500 Standard $131.95

LYSCO MOBILE OR FIXED V.F.O.
Model 381—contains three 6AK5’s Oscillator Doubler-Buffer. 145-300 ohm lead. Doubler supplies plenty of drive to replace 3.5 Mc. or 7 Mc. crystal. Rectifier reading illuminated clock dial. Size 4 X 4½ X 5. Operates on 200 to 400V D.C. @ 25 MA.
Price $26.95
Model 381R—15" coaxial cable with remote tuned circuit to plug into crystal socket; calibrated for 40-20-10 meters. Output 40 meters.
Complete $33.95

LYSCO DIPMASTER
Grid dip meter. Range 3.4 to 160 Mc. Also can be used as absorption meter, phone monitor, signal generator, range 3.4 to 300 Mc., and field strength meter. With 5 plug in coils. 955 tube. 115V AC/DC only. Power requirements 15 watts. 115V AC/DC. 3½" X 9½" X 3½". Finished in black wrinkle box.
Model D-11 $39.95

National HRO-7 Blank Cabinets 19¾" W X 10¾" H X 10¾" D. Finished in gray baked enamel. Has hinged door in top. A real special at...
$6.00

POWER TRANSFORMER
P-2950-115V. pri. Sec. 400-0-400 @ 200 MA. 5V. @ 3 amps. 6.3V. @ 5 amp...
$8.23

UNIVERSAL MODULATION TRANSFORMER A-3106
Pri. 2000-2000 @ 220MA P/side
Sec. 2000-2000 @ 220/440MA P/side
125 watts...
$13.23

SCOPE TRANSFORMER. Merit P-3171
Pri. 115V. A.C. Sec. 2500V. @ 5MA with 2.5V @ 2 amps. 6.3 or 2.5V. @ 3 amps...
$8.23

MERIT HI FIDELITY
OUTPUT TRANSFORMERS $10.58
Response 30-20,000 CPS. 20 watts.
A-3100 Pri. Imped. 5,000, 3000 C.T. Sec. 4-8-16 ohms.
A-3101 Pri. Imped. 10,000, 6600 C.T. Sec. 4-8-16 ohms

MERIT FILAMENT TRANSFORMERS 115V. Pri.
P-3042 2.5V. C.T. @ 10 amp. 10,000V. Insul. $3.67
P-2943 5V. C.T. @ 20 amp. 2,500V. Insul. $6.47
P-3074 6.3V. C.T. @ 1.2 amp. 3,500V. Insul. $2.12
P-3146 10V. C.T. @ 10 amp. 3,000V. Insul. $5.88
P-2959 12.6V. C.T. @ 2 amp. 2,500V. Insul. $2.64
P-2962 25.2V. C.T. @ 1 amp. 2,500V. Insul. $2.64
P-2963 36.2V. C.T. @ 7 amp. 2,500V. Insul. $5.88

HIGH VOLTAGE PLATE TRANSFORMER
Merit P-4062 115V. Pri. Sec. 2500-0-2500 @ 300MA
2385-0-2385
Completely shielded...
$47.04

SUPERIOR POWERSTATS
Smooth efficient voltage control. 0 to 135V.
Type 20 (illustrated 3 amp)...
$12.50
116 for table mtg 7.5 amp...
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1106 15 amp...
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1106 45 amp...
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Also available for 220 volt input. Write for descriptive literature.

REPLACEMENT POWER TRANSFORMER
for 630 Type TV Chassis. Merit P-3061...
$16.17

4 VOLT D.C. Input 110V. A.C. Output VIBRATOR Supply 40 watts. Will fit into any car cigar lighter socket...
$9.95

HAFF WAVE RECTIFIER TRANSFORMER P-3045
Pri. 115V A.C. Sec. 120V. @ 50 MA with 6.3V-1.5 amp. filament winding...
$2.73

We have 2,500 lbs. of assorted Hook-Up Wire. All colors. All sold by the pound, per lb. $0.60

HAMS ATTENTION. Now in stock. 1,000KC crystal standards in DC-30 holders. Guaranteed. Perfect. New...
$2.45

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New York City 7
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 1952 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 a prerequisite 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 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.

The yeas and nays being ordered, the question was decided in the affirmative: Whole number of votes cast, 16; necessary for adoption, 14; yeas, 16; nays, 0. Every Director voted in the affirmative except the President and Vice-President who abstained, as required. So the amended Articles of Association were ADOPTED.

69 Moved, by Mr. Dosland, to adopt the following resolutions:

(Continued on page 89)
STEINBERG'S

SUPER SPECIALS

THESE PRICES ARE LOW!

100—$25
BC-345 JACK BOX
3 1/8" x 3 1/8" x 1 1/8" aluminum, 2 standard open-circuit jacks, 3-position switch, 6-contact banana plugs and jacks... .30¢

100—$25
BC-1366 JACK BOX
4 1/8" x 3 1/8" x 2 1/8" aluminum, 1 standard open-circuit jack, 1 3-position mouth jack, 150,000 ohm volume control, 5-position switch, 11-contact banana plugs and jacks... .30¢

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BC-213 JACK BOX
5 1/8" x 2 3/4" x 2 1/8" aluminum, 1 standard open-circuit jack, 1 3-position mouth jack, 150,000 ohm volume control, 4-position switch, 8-contact banana plugs and jacks... .30¢

CONDENSER SPECIAL
75 mmf. 4250 peak voltage, ceramic button insulation, adjustable spacing, straight-line capacity, precision construction, 3 1/2" long, 1 3/4" wide, shaft 3/8" x 3/8", adjustable tension, double-bearing... .89¢

GRID BIAS CONTROL
2500 ohm, 25 watt Clarostat potentiometer, perfect grid-bias control for panel mounting, excellent heavy-duty P.A. speaker volume control, TV focus control, worth $5.00 list, brand new... .69¢

FILTER CHOKES
8 Henry 225 Ma., 100 ohm DC resistance, 2 1/4" high, 3/4" wide, 3/4" mtg. centers... .149¢
8 Henry 100 Ma., 100 ohm DC resistance, 2 1/4" high, 3/4" wide, 3/4" mtg. centers... .95¢
15 Henry, 30 Ma., 150 ohm DC resistance, 3/4" high, 3/4" wide, 3/4" mtg. centers... .59¢

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¢

MINIMUM ORDER $2.00.
Send 20% deposit with COD orders. Please include sufficient postage or instruct us to ship by Express Collect. Overpayments will be refunded by check.

HEAVY DUTY CASTERS
Build your own dolly, or mount your heavy equipment on these fine heavy-duty casters. Double composition wheels, free-turning ball bearing swivel, finest construction, quiet operation. 1 1/2" wheel diameter, mounting plate centers 3" x 1 1/2", over-all height 2 1/4"... .52¢
Set of 4—$1.98

8/8/8 MFD.
500 V. D.C.
Triple 8 mfd. 500 working volt D.C., oil-filled condenser, common negative, solder terminals, hermetically sealed, 5" x 3 3/8" x 2 3/4". A-one-time buy... .1.95

LIMITED QUANTITIES
Coll cords, 3-conductor, rubber, 8" extended... .95¢
24-volt 1/2 Amp, filament transformer... .129¢
Butterfly condenser, small, 4-22 mmf... .80¢
APC type condenser, with shaft, 15 mmf... .25¢
3-pole, 3-position waver rotary switch... .30¢
Amphenol 4-prong steatite socket with plate... .15¢
Johnson actal steatite waver socket... .17¢
Patch cord, 5 ft. 2-cond, rubber, with PL-55... .32¢
Hand key, black cradle, tear shaped... .95¢
Sangamo F2L mlca, 0015, 5000 volt... .125¢
50 Mfd. 330 V. A.C. flash-camera condenser... .5.95
110 V. A.C. relay, 30-Amp contacts, SPST plus SPDT... .5.95
110 V. A.C. phone motor, add small fan as cooler... .1.20

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Your order will receive my personal attention and will be shipped the same day your order is received. We distribute all top-flight amateur lines... let us know what you need.

75, Jim Burnett, W8WHE
RESOLUTION NUMBER 1

Whereas Article 7 of the Amended Articles of Association of the American Radio Relay League, Incorporated, provides, "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," and,

Whereas F. E. Handy, Communications Manager of the American Radio Relay League, has for many years served as a member of the Executive Committee of the League with great faithfulness and ability; and his counsel and participation have been of great value.

Now, therefore, be it

Resolved that in order to take advantage of the manifest ability of the said F. E. Handy and of his experience acquired in his capacity as Communications Manager of the American Radio Relay League, he, the said F. E. Handy, is hereby designated and appointed a member of the Executive Committee to serve as such until the convening of the next annual meeting of the Board of Directors.

RESOLUTION NUMBER 2

Whereas the Board of Directors of the American Radio Relay League has this day adopted an amendment to its Articles of Association under the laws of the State of Connecticut which amendment substitutes a new set of Articles for those herefore prevailing, and,

Whereas the Board of Directors has also this day adopted a new set of By-Laws governing the organization and administration of the American Radio Relay League and has repealed the Constitution and By-Laws heretofore prevailing, and,

Whereas the Board of Directors is in the interests of making the fullest possible use of the experience and abilities of Francis E. Handy, who has for many years served as Communications Manager of the American Radio Relay League to the great satisfaction of the Board of Directors and of the members, and,

Whereas it is the desire of the Board to continue to avail itself of such services and to preserve the authority and importance of the work and leadership of the said F. E. Handy, and

Whereas the Board has this day designated the said F. E. Handy as a member of the Executive Committee,

Now, therefore, be it

Resolved that the said F. E. Handy is designated as Communications Manager to serve until the annual meeting of the Board of Directors to be held in 1952, and be it

Further resolved that the Executive Committee is instructed to prepare rules and regulations for the government of the Communications Department of the League and the organisation of that Department, such rules and regulations to be of a nature similar to the By-Laws and to the constitutional provisions now prevailing for that Department, and be it

Further resolved that such rules and regulations when adopted and published by the Executive Committee shall have the force and effect of By-Laws of the League, and be it

Further resolved that the Executive Committee shall publish such rules and regulations in pamphlet form, such pamphlet to include also all of the provisions of a regulatory character necessary to effect the policies and system described in the current publication of the American Radio Relay League entitled "Operating an Amateur Radio Station", and be it

Further resolved that upon the publication of the foregoing pamphlet the said F. E. Handy as Communications Manager shall be authorised as necessary from time to time to amend and revise the regulatory provisions therein contained. The amendments and revisions by him made shall be effective as of the date of their publication in "OST".

RESOLUTION NUMBER 3

Whereas Article 7 of the Amended Articles of Association of the American Radio Relay League, Incorporated, provides, "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," and,

Whereas David Houghton, Treasurer of the American Radio Relay League, has for many years served as a member of the Executive Committee of the League with great faithfulness and ability; and his counsel and participation have been of great value.

(Continued on page 94)
NEW! SW-54
Brilliant new superhet covering 540 kc — 30 mc, with
built-in speaker, bandspread, heterodyne circuit.
AC/DC, 12BE6, 12BA6, 12AV6, 50C5, 35Z5 tubes. Tops for
voice, music, code. Only 11 x
7 x 7
SW-54 .......... $49.95
ORDER BY MAIL,
ORDER TODAY!

NEW! NC-125
9-tube superhet for hams and
SWL's, covers 550 kc — 35 mc
in 4 bands. Calibrated elec-
trical bandspread for all bands.
Select-O-ject filter cir-
cuit. Less speaker. Phono input.
NC-125S 6" Speaker .... $143.10
NC-125TS 6" Speaker .... 11.00

FAMOUS NC-183
14 tubes plus VR-150, 5U4G.
Covers 540 kc — 31 mc, plus
48-56 mc. Phono input and
push-pull 8 watt audio. Two
tuned RF stages, 5 bands;
bandspread. Speaker extra.
NC-183 ............ $279.00
NC-183TS 10" Speaker.. 16.00

GREAT HRO-50
50-430 kc, 480 kc — 35 mc;
supplied with AA, B, C, D
coils, 13 tubes. 8 watt p-p output
within 1 db 50-15,000 at
phono output. Many accessories
available. Speaker extra.
HRO-50 $359.00
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SESSIONS CLOCK TURNS RADIOS,
APPLIANCES ON OR ON-OFF!
Convert your radio into an alarm-clock radio,
or operate air-conditioners, lamps, TV, mix-
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Polished gold-colored metal rims (round or
square) with raised numerals; red sweep
second, AC operation; Ul approved; kitten
quiet; guaranteed. TWO TYPES: W26 —
on" only; W31 "on" or "off" — sleep
switch enables independent shut-off from
0-90 minutes. Both available round or square.
Price includes mounting hardware (and
matching bezel) for round only).
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W26 Square "On" only 5.50
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Model 905 Wood Case* 2.50*
*For round models only; has metal back

LAST CALL FOR NC-57!
NATIONAL has temporarily halted pro-
duction of the NC-57 receiver
and all others except the 4 sets
above and the HFS due to short-
age of parts. Radio Shack is for-
tunate to still have in stock A VERY
LIMITED NUMBER OF NC-57's
for immediate delivery. After they're
gone there will be NO MORE! A
superhet with one tuned RF stage.
NC-57 covers 540 kc to 55 mc in
5 bands and has a built-in PM
speaker. AC circuit with 7 tubes plus
rectifier, featuring: CW cut-off, switch-
selected CW, MVC, AVC, ANL; tone
control; electrical bandspread on all
bands. Tuners BC, SW, ham, police,
fire, ship-shore. Order today!
NC-57 ............... $99.50
$24.95 down, while they last!
ORDER TODAY BY MAIL
NOW, THEREFORE, BE IT

RESOLVED THAT in order to take advantage of the manifest ability of the said David Houghton and of his experience acquired in his capacity as Treasurer of the American Radio Relay League, he, the said David Houghton, is hereby nominated and appointed a member of the Executive Committee to serve as such until the convening of the next annual meeting of the Board of Directors.

RESOLUTION NUMBER 5

WHEREAS the Board of Directors has from time to time promulgated rules and orders for its own government, for that of the Communications Department, the headquarters office and other persons and groups coming under its jurisdiction, and
WHEREAS the policies thus established in the form of "standing orders" are to some extent inconsistent, to some extent difficult of interpretation, and are not codified, and
WHEREAS the Board of Directors has this day by various resolutions, Articles of Association, By-Laws and Rules and Regulations codified and enacted the basic provisions for the government of the American Radio Relay League including such of the policies heretofore contained in "standing orders" as are still felt desirable,
NOW, THEREFORE, BE IT

RESOLVED that "The standing orders of the Board of Directors of the American Radio Relay League, Incorporated, revised to April 1, 1949," as summarized in the ten mimeographed pages mentioned in Secretary's Letter No. 809 of June 21, 1949, be and they hereby are repealed.

The yeas and nays being ordered, the question was decided in the affirmative: Whole number of votes cast, 16; necessary for adoption, 16; yeas, 16; nays, 0. Every Director voted in the affirmative except the President and Vice-President, who abstained as required. So the resolutions were ADOPTED.

69) On motion of Mr. Dooland, unanimously VOTED that in the event it is necessary to take any affirmative step to put resolution #1 to #3, inclusive, and #5 into operation, any reference to new By-Laws contained in those resolutions shall be deemed suspended until such time as the Board shall have had an opportunity to review the present By-Laws; and, further, that insofar as they are not inconsistent with the charter today adopted the present Constitution and By-Laws shall for the time being remain in full force and effect.

70) On motion of Mr. Dooland, VOTED to refer to the Constitution Revision Committee for further study its proposals for amended By-Laws, for Rules and Regulations Concerning Affiliated Societies, for Rules and Regulations Concerning ARRL Conventions, and for Rules and Regulations of the Communications Department.

71) On motion of Mr. Canfield, unanimously VOTED that during the period between January 1, 1952 and the 1953 meeting of the Board, the Secretary be authorized to pay usual necessary operating expenses, and expenses against usual authorizations, in no greater amount than one third of 1951 authorized appropriations.

72) Turning now to the recommendations in the report of the Publications and Membership Committee: Moved, by Mr. Middleton, that the ARRL Secretary and Headquarters staff be instructed to immediately organize and conduct a new members drive and contest with suitable equipment prizes for both club and individual contest winners. Such equipment prizes to be purchased from manufacturers using a fund of ($--$) expressly authorized for this purpose by this motion. On motion of Mr. Griggs, VOTED to amend the motion by striking out the last sentence and substituting therefor the following: That the Board of Directors direct the Secretary to undertake an intensive campaign for increased League membership at once; Mr. Middleton requested that he be recorded as voting opposed. The question then being on the motion as amended, the same was unanimously ADOPTED. During the course of the above action, the Board was in recess from 8:20 p.m. to 8:28 p.m.

73) On motion of Mr. Middleton, unanimously VOTED that the following radio clubs whose applications for affiliation all meet both 51% requirements of the Board and which clubs' applications have been formally endorsed by the appropriate Division Director, be now affiliated with the American Radio Relay League:

North Peninsula Electronics Club, S. San Francisco, Calif.,
Eglin Amateur Radio Society, . . . . . Eglin AFB, Florida

(Continued on page 96)
Phenomenal trade-in allowances!

In Exchange for One of the New National QUALITY RECEIVERS

HENRY offers you out of this world trade-in allowances on your used communication equipment in exchange for one of the new National Quality Receivers. Plus such advantages as quicker delivery, easier terms, more generous trade-ins, a 10-day free trial and 90-day free service. Write, wire, phone or visit either store today!

National HRO-50—employs 3 stages of i.f. and 12 permeability-tuned i.f. circuits (4 per stage), in addition to the crystal filter. Plus all the features of the world-famous HRO-50.

ONLY $383.50

National NC-183—a new improved model better than ever. From 2-stage r.f. to push-pull high fidelity audio output, the NC-183 incorporates every wanted feature of a fine receiver. Tunes .54 to 31 Mcs. continuous plus 48 to 56 Mcs. Uses 16 tubes.

ONLY $279.00

National NC-125—a moderately-priced receiver covering 550 kcs. to 36 Mcs. in 4 bands. Separate r.f. and audio gain controls. Volt. reg., stabilized oscillator.

ONLY $149.50

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"WORLD'S LARGEST DISTRIBUTORS OF SHORT WAVE RECEIVERS"
No other mast matches Trylon for ease of erection, safety, durability—ease of change or adjustment!

SAFE—EASY TO CLIMB
Made of sturdy steel rods hot dipped galvanized for durability—double-welded for safety. Climb it like a ladder! Comes in 10-foot sections for heights to 60 ft. Costs no more than a pole installed. Handles 10-meter beams, rhombics, doubles, etc. Weighs only 2 lbs. per foot.

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WIND TURBINE CO
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LETTERINE MODEL 240

This beautiful transmitter originally sold for $86. Buy it direct from our factory for only $79.95, complete with mobile connections and instructions for TVI reduction. Even if you already have a transmitter of your own, this rig makes an excellent standby. You can’t afford to miss this opportunity!

The 240 is a complete 40 watt Phone-T-W rig, working all bands from 160 to 10 meters; complete with 18 x 14 x 80 cabinet, self-contained power supply, meter, tubes, crystal and coils for 40 meters. Tube line-up 6V6 oct., 707 final, 6F7 MIke amp, 6N7 phase inverter, 2 QLX mod., SWCQ rect. — weight 30 lbs. — 90 day guarantee. PRICE $79.95

$25 deposit with order — the balance C.O.D.

For 80, 20 and 10 meters, $2.91 per set. Coils for 160 meters $3.60. Equipped for CAP 2374 Kc. — $84.95

ANCHORAGE AMATEUR RADIO CLUB
LIMA AREA AMATEUR RADIO CLUB
OKLAHOMA AMATEUR RADIO CLUB
DUNBAR, W. VA.
THE LAMMERS AMATEUR RADIO CLUB
LAMESA, TEXAS
SOUTH PLAINS AMATEUR RADIO CLUB
LUBBOCK, TEXAS
TRI-CITY RADIO COUNCIL
NEW LONDON, CONN.
THE FIFTY CLUB OF CALIFORNIA
LOS ANGELES, CALIF.

74) On motion of Mr. Middleton, after discussion, unanimously VOTED that the Secretary and the Headquarters staff be instructed to organize and to carry out a genuine and intensive program to promote both the Novice and Technician Class of licensees; and on further motion of Mr. Middleton, VOTED, 10 against 5, to oppose the amendment to the motion to provide this program with adequate and comprehensive enthusiasm together with full coverage in QST, and that the program be augmented by an especially prepared booklet outlining the full story of ham radio from a hobby standpoint, as viewed from the Novice standpoint, said booklet to be prepared for wide distribution to all types of youth organizations, veterans groups, schools, and wherever such material would in any way stimulate the growth of the Novice movement.

75) Moved, by Mr. Middleton, that the ARRL Secretary be instructed to immediately seek a revision of the Novice frequency assignment in order to secure for the Novice their full 60 kc. without interference from U.S.A. or Canada, to be accompanied by an amateur telephone signall; but after discussion and consideration, unanimous consent being given, Mr. Middleton withdrew the motion.

76) Moved, by Mr. Griggs, that the Board instruct the Secretary to establish a new and elaborated method of processing renewals of membership at once; but, after discussion, the motion was rejected.

77) On motion of Mr. Griggs, after discussion, unanimously VOTED that it is the sense of this Board that the recommendation of the Procedures and Membership Committee Report be generally utilized as a guide in the membership campaign by the Secretary of the League.

78) Moved, by Mr. Griggs, that full membership privileges be granted the holders of Technician Class licenses; but, after discussion, it being apparent that such privileges are already provided for, and unanimous consent being given, Mr. Griggs withdrew his motion.

79) On motion of Mr. Griggs, unanimously VOTED that the Board authorize the continuance of the Publications and Membership Committee as an advisory body for one year for the purpose of establishing and maintaining liaison with the League's Secretary and the Headquarters staff during the period of the membership campaign.

80) Moved, by Mr. Griggs, that the Board hereby instruct the Secretary to request of the Federal Communications Commission a change in rules permitting members to conduct operations for periods of six months instead of the present four months upon the usual proper notification to the nearest FCC Regional office of the area in which operation is planned; but, after discussion, the motion was rejected.

81) On motion of Mr. Griggs, unanimously VOTED that the Board hereby instruct the Secretary to investigate ways, means, costs and desirability of providing elective officers of the League with accident insurance paid by the League. Such insurance to be applicable only in those instances where such officers are traveling on missions in behalf of the League.

82) On motion of Mr. Hill, unanimously VOTED that the Board hereby expresses its deep appreciation for the services being performed in the name of amateur radio and the League by the Section Emergency Coordinators, Emergency Coordinators, and members of Emergency Radio Nets.

83) On motion of Mr. Keys, unanimously VOTED that, pursuant to the terms of the Trust Agreement under the Pension Fund, the following persons are appointed to serve as a Pension Committee from this date until the next annual meeting of the Board: Arthur L. Budlong, Geoge Grammer, David H. Housh, etc.

84) On motion of Mr. Johnston, the following resolution was unanimously ADOPTED: Whereas, the district managers of the ARRL QSL Bureau system have continued to

(Continued on page 98)
Ham's Paradise!

COMPLETE NOVICE 80 MTR TRANSMITTING STATION KIT

1-TRANSMITTER KIT.................$15.95
(as described in May QST)

2-POWER SUPPLY KIT (for above).....9.95
(see June QST)

3-ANTENNA KIT (80 MTRS)...........2.95

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ALL THREE KITS.....................$25.95

All kits are available separately at prices indicated beside each kit. Complete instructions with each kit.

HEART OF THE BC-221 FREQUENCY METER

The VFO sub-assembly, used in BC-221. Fully wired and mounted on sturdy aluminum sub-chassis ready to in- stall. Brand new—original packing—Very Special...$4.49

New Shipment - New Low Price

0-1 D.C. MILLIAMMETER

Perfect for Mobile, Requires 1" Hole, Flange mounting. Completely enclosed, satin aluminum finish.

WHILE THEY LAST

ACTUAL SIZE Only $4.74

Flash! Flash! Flash!

Just Received—Leece-Neville Mobile Alternator System Complete with Alternator, Regulator, and Stock 60 Amps. at 6 Volts D.C. $49.95

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600-500-0-500-600, 250 ma., 117v Pri. $8.34
1500-1250-0-1250-1500, 300 ma., 117v ...$27.94
5.0 V.C.T. 2000v ins., 10 amp., 117v Pri. $4.24
6.5 V.C.T. 2000v ins., 6 amp., 117v Pri. $4.16
10. V.C.T. 2500v ins., 12 amp., 117v Pri. $14.52
12.6 V.C.T. 2000v ins., 3 amp., 117v Pri. $3.99
8 henries 2000 v ins., 50 ma., 300 DC Res. $1.29
8 henries 3000v ins., 100 ma., 100 DC Res. $3.75
8 henries 5000v ins., 400 ma., 60 DC Res. $11.49
5-15 henries 5000v ins., 350 ma., 100 DC Res. $7.20

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Brand New + In original sealed cartons • At a fantastically low price • Very latest type model 100-16 • Worth $46.00.

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Niagara Radio Supply Corp.

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97
serve their fellow amateurs faithfully, giving voluntarily of many hours of their time in the interests of amateur radio, RESOLVED, that this Board expresses its deep appreciation for their excellent work, that this action be reported in QST, and that a letter expressing the thanks of the Board be sent by the Secretary to each QST Manager.

87) At this point, at 10:13 p.m., upon request of the Board, the Chair directed that all Headquarters staff personnel retire from the meeting; at 10:36 p.m., at the request of the Board, the Chair requested that they rejoin the meeting.

88) On motion of Mr. Johnston a rising vote of appreciation was extended to President George W. Bailey on the occasion of his completion of twenty years of service on the ARRL Board of Directors. [Applause]

89) On motion of Mr. Noble, unanimously VOTED that the salary of General Manager Arthur L. Budlong be raised ten per cent; Mr. Braib requested that he be recorded as opposed to any salary increase and Messrs. Middleton and Griggs requested they be recorded as voting opposed to the motion; Mr. Hill requested that he be recorded as voting in favor and wishing that the increase could have been greater.

90) On motion of Mr. Noble, unanimously VOTED that the Secretary be and hereby is instructed to restore to surplus the unexpended remainder, as of December 31, 1950, of the appropriations made by the Board at its 1950 regular meeting for the expenses of the Constitution Revision Committee; and that the Secretary be and hereby is instructed to reimburse and pay expenses of the Constitution Revision Committee for the year 1951 not to exceed the sum of two thousand dollars ($2,000) and that such actual expenses shall be a charge against net operating income for 1951.

91) At this point General Manager Budlong briefly expressed his thanks to the Board. [Applause]

92) With the permission of the Chair, Mr. Roberts read a telegram from the Chairman of the National Convention Committee inviting Directors to attend the National Convention to be held in Seattle this summer.

93) Moved, by Mr. Johnston, that the next regular meeting of the Board be held in San Diego, Calif., on February 22, 1952; but, after discussion, on motion of Mr. Martin, VOTED to lay the matter on the table.

94) Whereupon, on motion of Mr. Reid, the Board adjourned sine die at 11:20 p.m.

95) (In the course of its deliberations the Board also discussed, without formal action, the forthcoming Extraordinary Administrative Radio Conference, civil defense frequency allocations, and the editorial content of QST, analysis of membership and licensed amateur trends, membership solicitation methods of newly-licensed amateurs and a special membership for Novice Class amateurs. Time in session, as a Board: 14 hours, 34 minutes. As a Committee of the Whole: 5 hours, 6 minutes. Total time in session: 19 hours, 40 minutes. Total expenditures authorized: $21,842.50.)

A. L. BUDLONG
Secretary

U.S.N.R.

(Continued from page 87)

up duties at Eleventh Naval District Headquarters, San Diego. ... Cmdr. Stephen J. Hopkins (W4LCW), formerly of Fifth Naval District Headquarters, Norfolk, becomes Naval Reserve Inspector-Instructor at Reading, Penna. ... Lieut. Cmdr. F. K. Knight (W4BIE) reports to Sixth Naval District Headquarters, Charleston, S. C. He was former commander of the U.S.S. Altoona 6-11, Eagle Lake, Fla. ... Cmdr. J. M. McCoy (W5OM) and Lt. Cmdr. J. J. Zammit (W5HFP) leave Eighth and District Headquarters, New Orleans, while Cmdr. T. C. Pipes (W5PLQ) reports to that office. Cmdr. McCoy is assigned to Twelfth Naval District Headquarters, San Francisco. Lt. Cmdr. Zandt, referred to duty overseas, leave Ninth District Headquarters, Great Lakes, for overseas duty.
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NEW WRL 400-A GLOBE KING TRANSMITTER
HIGH POWER—MORE WATTS PER DOLLAR
Our newest model with increased power—400 watts Phone, 425 watts CW. Incorporates some of the latest TVI protective features. Efficient performance on all bands—10 to 160 on phone and CW. Provisions for ECO. Complete with tubes, meters, and one set of coils. Low Down Payments.

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WRL 150 WATT GLOBE CHAMPION TRANSMITTER
MORE WATTS PER DOLLAR

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FREE 1951 WRL CATALOG
For mobile or fixed station. Spiral binding. Duplex up to 30 MHz. Contains all FCC required info. Log will accommodate 100 stations. Front and back covers show "Q" elements, phonetic alphabet, and amateur international prefixes. 25¢

GUARDIAN 10 METER BEAM
Plumber's delight! 3 element beam quickly assembled; furnished with Gamma mount. Extremely light; all aluminum construction; grounded antenna; very low priced. Furnished less mast and lead. Full instructions furnished.
Narrow spaced .......... $15.95
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GUARANTEED CRYSTALS IN HOLDERS Type FT-243
160 METER
1.8 to 1.825 1.875 to 1.9 1.9 to 1.925 1.925 to 2.0 $1.25 ea.
80-40 METER
3.5 to 4.0 7.0 to 7.4 98¢ ea.

Please slate frequency. We will come as close as possible. No refunds or exchanges.

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Please send me:
□ Radio Map □ Globe King Info
□ Globe Champion Info □ Log
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Name ____________________________
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City __________________ State ____________
any commercial bandswitching converter we've seen, and it gives more frequency coverage. It has been thoroughly tested, both in the ARRL lab and in actual on-the-air operation in the writer's station. Just as it stands, it does a creditable job on all bands, 220 through 28 Mc. If one desires the best reception that is possible by amateur techniques, a low-noise preamplifier may be used for the frequencies where such performance is required. Lab readings given below will give the prospective user an idea of what can be expected in the way of performance. Without the a.v.c. off, a 30-per cent modulated signal gave a 10-db. signal-to-noise ratio with the following input levels: 29 Mc. — 0.55 microvolt, 51 Mc. — 0.3 microvolt, 146 Mc. — 2.9 microvolts, 220 Mc. — 2.2 microvolts. These figures compare favorably to those obtained with all but the best v.h.f. converter designs.

Particularly for coverage of a segment of a band, as in civil defense work, the operation of the converter is more than adequate. For the money it cost, it is the year's outstanding bargain!

Laying Out a Transmitter

(Continued from page 40)

worry about inadvertent inductive coupling — most of it will be through the line between $L_2$ and $L_a$.

Finally, we keep checking back and forth between the two designs of Figs. 4 and 5, to see if we can find any points of superiority or inferiority that we have overlooked. Do we have room for the fixed condensers, resistors and r.f. chokes? We check this by laying out the parts as they will be mounted, and lay in the smaller components. We find that this won't be any problem in this case. However, we never neglect to check because we know that this is where many designs go haywire — the big components are located and then the smaller ones are crowded in haphazardly, messing up the wiring and making the unit resemble some cousin to a rat's nest, once removed. In the Fig. 5 design, we check the clearance between the crystal sockets and the meter, so that we don't get caught with an arrangement that won't let us plug in the crystals after everything is assembled.

Personally, the writer would settle for the design in Fig. 5, because the electrical design is a little more to his personal preference and the extension shaft for the crystal switch is eliminated, but we have a bunch that as many as not would prefer the design in Fig. 4. In any event, we have demonstrated a few of the considerations that are involved in laying out a piece of gear. The same principles would apply, of course, to a more complicated unit. The higher one goes in frequency, the more critical the design might become, because we would then have to be more careful about lead lengths and capacities. With
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more tuned circuits, and where several stages were operating on the same frequency, we would have to consider shielding and other devices for reducing over-all feed-back.

In the near future we will describe how this or any other “paper” design could be transferred to the chassis and how the chassis would be laid out and worked.

50 Mc.
(Continued from page 48)

and all of VE3 came back to him. In rapid succession he worked VE3s AET DDO AH AZV AIB AXT BTO DHP ADD BOW and BAP. Then the scene shifted to W5 and 9, bringing in W5s RQI FJB PK and W5s SQU RQF YF and RFW, the band closing at 10:40. No, there just isn’t anybody on 6 of Eddie had a similar experience on April 29th, when his first opening of the season netted him 29 contacts in W1, 2, 3, 4, 8, and VE3.

Or take the case of his fellow townsman, W4FQW. Here’s a fellow who really hit the jackpot. Harold got on the first time on May 29th, making a few contacts and getting the

(Continued on page 106)

50 WASHM.

Standings as of May 25th

W2ZJ......48 W5VY......47 W9ZHB......48
W8RJ......48 W5GQN......47 W9QVY......48
W9CJS......48 W9JTI......44 W9QHY......47
W6AJC......48 W9SON......44 W9PK......47
W9ZHL......48 W9ML......44 W9ZVF......47
W9QCA*......48 W9JLY......48 W9ALU......46
W9ODB......48 W9JME......43 W9QKM......46
W9CLES......46 W9JWS......42 W9QPM......45
W9HDQ......46 W9NNJ......41 W9UNS......42
W9CIGY......45 W9SFSC......41
W9ILL......44 W9HLD......40 W9QIN......47
W9BKL......43 W9HEZ......38 W9ZDW......47
W9IMS......43 W9SFV......38 W9QFM......47
W9HLS......51 W9WNN......48 W9RNI......47
W9HEO......40 W9UXN......47 W9PKX......47
W9RLO......45 W9UWX......40 W9RLO......45
W9BYM......45 W9TJM......40 W9FRS......43
W9IDZ......43 W9TFM......40 W9HFS......43
W92AMJ......42 W9THEA......47 W9HNV......42
W92MEU......42 W9TBEA......37 W9MVG......41
W9GVY......40 W9TBDX......45 W9PLI......41
W9QVH......38 W9TWDY......45
W9PHJ......37 W9JTRG......42 W9ANV......32
W9OHJ......45 W9JPA......40 W9OZQ......32
W93KMX......41 W9TIV......40 W9QYI......31
W9JVY......38 W9TCAJ......40 W9COT......26
W9FBR......45 W9TFM......40 W9EGB......36
W94FM......44 W9ACD......35
W9QKN......42 W9NNQ......42
W9FWM......42 W9YLYS......41
W94MS......40 W9CMS......41
W94CPZ......39 W9LHL......38
W94XCO......39 W9SRW......37
W94BEN......35 W9UD......37
W94PNR......35 W9WSE......36

* Formerly W9NTJ.

Calls in boldface are holders of special 50-Mc.
WAB certificates listed in order of award numbers.
Others are based on unverified reports.

102
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leaver at once. The following day, his first full day on 6, he worked 17 different stations in 16 states, 8 call areas, and VE3!

**Reading, Mass.**—Here’s one of the strangest 50-Mc. DX reports to come out our way in a long time. At 7:45 p.m. on the night of May 4th, WIAWA heard US8CO on S5.5 Mc, again on May 6th and a few times on the 7th. It is said that the DX is from the west Indies and may yet become a well-established DX station. US8CO, better known to the 6-meter gang as HC29W, will soon be back to Havana, Cuba, for an extended stay. Steve will take along gear and will do his best to keep the potential for v.h.f. DX of this part of the world fully exploited.

Here’s another interesting v.h.f. DX possibility: WA9RP and W1PVI are planning a DX-pedition to St. Pierre, to operate as WP8AG and WP8AH, in the middle of August. They would like to try the v.h.f. bands, if possible. Details have not been arranged as yet, but when and if it is positive v.h.f. gear will be taken along announcement will be made in this department, or via ARRL Bulletin on W1AW and OBS stations.

**The World Above 420 Mc.**

There is only one thing wrong with promoting activity on 430 Mc. and higher bands, and that is who move up to the higher bands always seem to come from 6 or 2 Mc. Efforts are still needed to keep things going at full speed. One of the most recent converts of this sort is none other than W9ZEB, Zearing, Ill., who has long been a mainstay of activity on 6 and 2. He has a crystal-controlled receiver and a portable loop antenna, an AX-9K9S in the final, feeding a 16-element array. With this set-up he is working regularly with W9MRI, Coleta, Ill., who is similarly equipped.

The two stations are separated by 55 miles. Observation of 2-meter conditions thus far has indicated that 144 and 430 are not necessarily similar. In fact, it has been noted that 2-meter signals are up the 420-Mc. ones are below normal. The path is worked consistently, but during fog or heavy rain the 420-Mc. signals are extremely weak.

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**How’s DX?**

(Continued from page 51)

from well-traveled W6SAI. — From W6AM we learn the revised list of So. Calif. DX Club officers to be: WQCQ, Board Chairman; W6AM, Pres.; W6KPC, V. Pres.; W6ADP, Treas.; W6SGY, DX Ed.; W6AQA, Secy.; W6BXL, Cor. Secy. and Director. — Your mosquito-bite swaddles and poison-ivy patches should be under control by this writing but if you’re a gitteron you can still get into another Field Day this 4th. This year the DX Contest will be held during the first week of July and a special objective of the HQ station, SM3XX, will be the contacting of W DXers. SM3XX will be out in the rough at Ascot near Sundsvall and a 24-hour session on 20, 40 and 80 meters is anticipated.

A specially-printed QSL will be available, written in SM3AXA. — CNREG would like to find out just how simply VHF really is. He wants to put a one-watt transmitter on the air, 160 meters from some hitherto inactive remote country. (We’ll wager Charlie would be copying Steve’s receiver oscillator before he set up the rig.) — The OARL (Okinawa) is holding a heap of cards for former holders of K80 and J0 calls. These will be forwarded upon receipt of their present addresses and old call signs and this info should be sent to the Okinawa Amateur Radio League, APO 331, PM, San Francisco, Calif. Correspondent K708EK has called the cards W7MRX, W8KOE and J6TU. — CR18A writes to state that his activity ceased as of June, 1950, and he therefore cannot reply to QSLs pertaining to claimed contacts after this date. — VK4PR is nearing 150 confirmed and wants to pass that mark before applying for DXCC. They, says the way, were worked without resource to beams. Jim’s station and gear is in Sydney, is hard at work studying for her own license. VK4PR regrets to inform us of the passing of several in the Queensland ham ranks this month. RV, RC and WA — EK1DX/EK1LM writes of the support of six VOA engineers in the Tangier Zone using a “Community rig” on 20 and 40 meters. The group plans to form a club in the near future. The British boys are also accumulating quite a representation in the Zone as may be ascertained.

(Continued on page 108)
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by inspection of the "Where" section ....... W4CY has nicknamed W1R8S of the DXCC desk "Kefauver" after having his C92 entry scratched from his tally. This speaks of a W4 lawn-party shindig in the shade of W4BPD's rhombics ....... Phil Bates figures it may interest some to know that W91FA is now G5BBJ; ex-ZC1CL is GW9HCL; ST7NU/MT2QH, G5HCY; MD11, G8DV; ex-ET7Z, G6HR; ex-V87PF, G6EB; ex-V87PF, G6EB; ex-ZC1BF, G6CBF; ex-V90H returned to the Tight Little Island and left four V90 buddies to hold the Aden citadel. V90AA is quite active, V90AO is rebuilding, while V185 AU and AF are active but not on that list, W7VY (ex-V83MD) is now DL4GM and looks forward to visiting the States this summer ....... From HC2UJ: "Bud Divine was halfway to Cocos Island when his fuel line broke and he lost most of his oil. In addition, he had headwinds which did not allow him any progress, and finally he began to have trouble with the rig. This was the last straw and he headed for the handiest port which happened to be Esmeraldas, Ecuador. From there he has left for Qalapagos where he will settle down permanently and operate as HC5GK on ten and twenty 'phone.' Thus, bad breaks kept T9GRC off the air but there are still a few DXers drooling for those IJC8 QSOs about to come off ...... Notes from the So. Calif. DX Club's Bulletin: ZK3AA will leave Nuea for a State visit after a stop in New Zealand. A Chilean amateur is rumored to be heading for some Easter Island activity ........ The No. Calif. DX Club's DXer lists six members over the 200-contracted mark (W6A AM DZK MEX MVQ and MN) and eight constituents hold 'phone DXCC memberships (W6 AM AED IKQ JTH NIG TT UVX and UX). A total of 42 fellows in the club have accomplished DXCC. The line voltage out there must be up 15 volts when this outfit is in assembly!

Jeeves considered himself quite sharp on Field Day this year. He refused to bite on the wire-stretcher gag, turned up his nose at the suggested emptying of grid-leak pans and ignored our "CQ DX DE IM4U" sent with the frequemcy. But we really got a rise from him with a three-toned auto horn placed under his chair and hooked to his sideswiper.

**Hints & Kinks**

(Continued from page 68)

An alternate arrangement that permits the form to be mounted from the adjustment end is also shown. A little "research" through the junk box will probably bring to light a supply of this type of threaded insert. Otherwise, the form must be mounted from the bottom, as shown in the sketch. — Lawrence F. Caccamo, W6NMN

**Correspondence**

(Continued from page 68)

amination which is required at the present. If I don't make it, I will go ahead and take the Novice license examination, because I really want to become a ham in the worst way. — Bill Bidwell

[Editor's Note: See the article entitled "How To Pass the Novice Examination," page 42, June QST.]

**QTH?**

1716 Monte Vista Ave., Ft. Myers, Fla.

Editor, QST:

Have you ever looked over the 'phone bands to see if the skip were right for a certain state, to deliver an important message or to work that last state for your WAS? Well, if you have, you have found the fellow who calls CQ for five minutes before signing his call and then he doesn't give his location.

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— Louis E. Person, W4PGJ
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