July 1953
40 Cents
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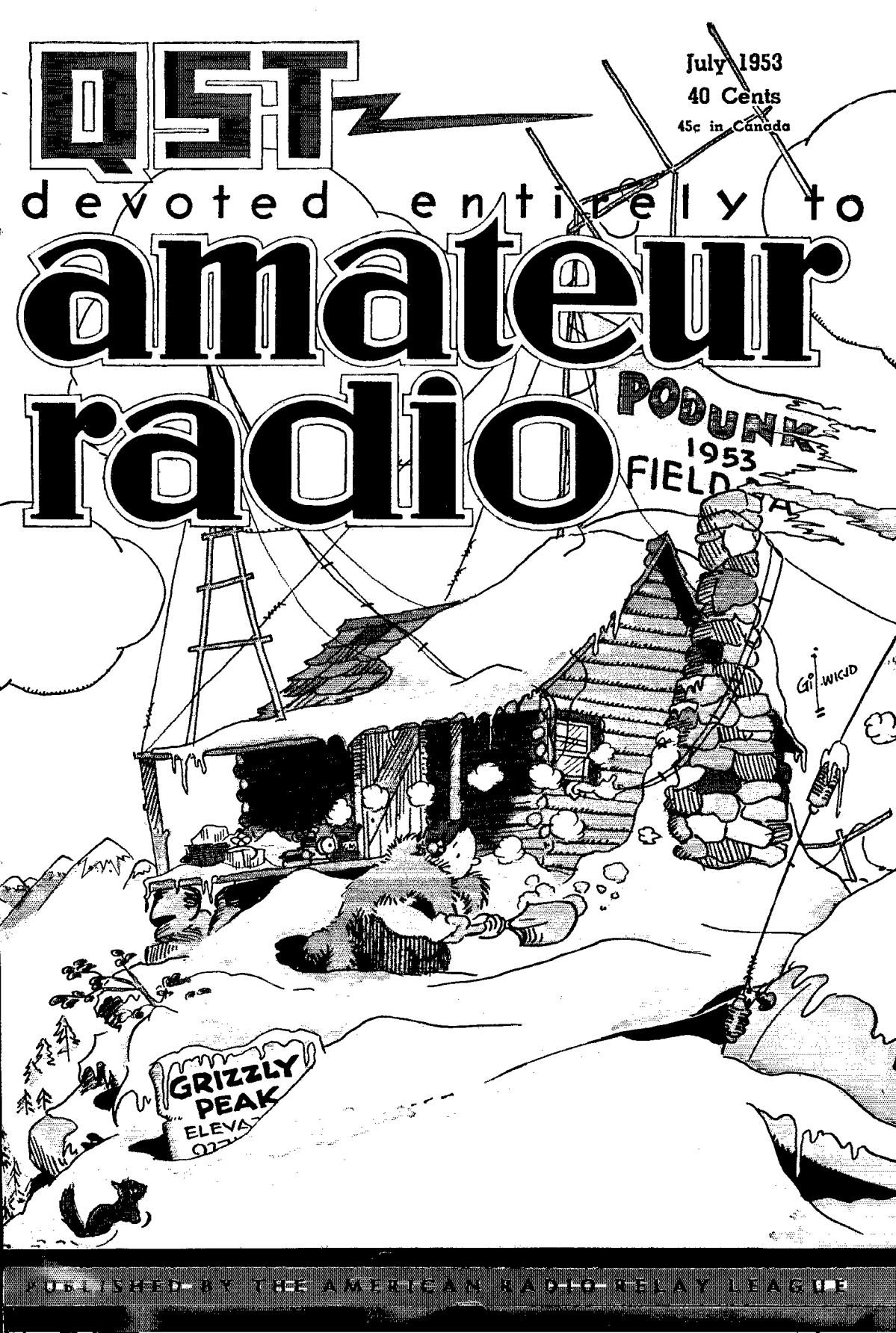
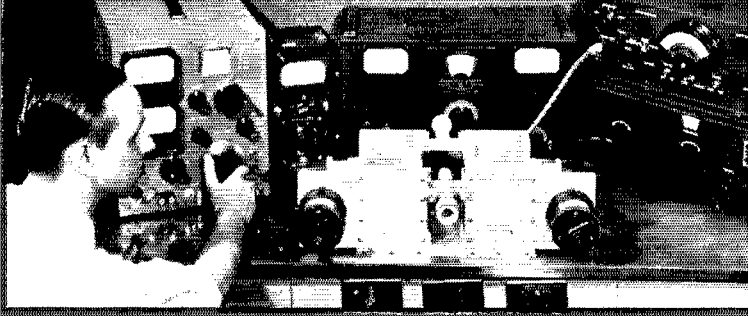
amateur radio

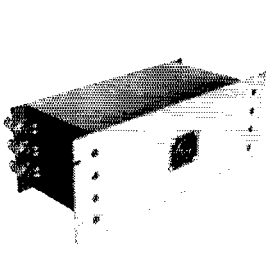


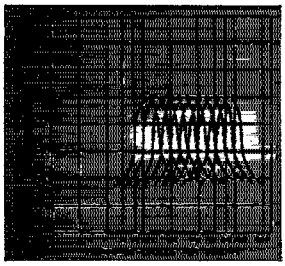
PUBLISHED BY THE AMERICAN RADIO RELAY LEAGUE



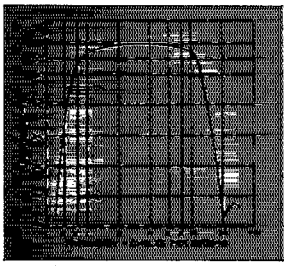
for SPECIALIZED FILTERS

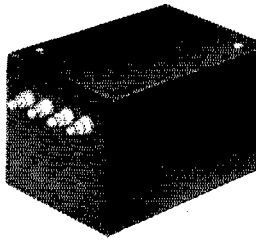
Decades of experience in the design and production of specialized filters have resulted in UTC being a first source for almost all types. Twenty years ago UTC was already the largest user of permalloy dust toroids in the world (exclusive of the telephone system). Present designs include a wide variety of core materials, structures, and winding methods to provide maximum performance in electrical characteristics and stability. Illustrated below are a few of the thousands of special filter designs in present production.



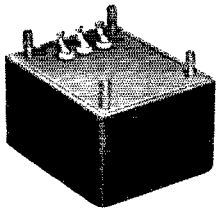


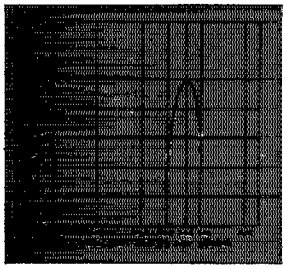
These low frequency band pass filters are held to 1 DB tolerance at the 3 DB crossover . . . 600 ohm . . . 4 filters per 7½" rack panel.



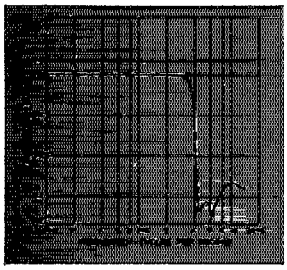


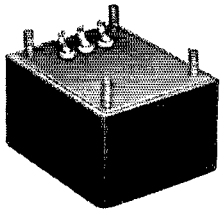
This ultra low frequency filter has a band pass range of one cycle to 10 cycles . . . 50,000 ohms . . . 700 cubic inches.



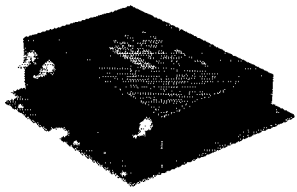


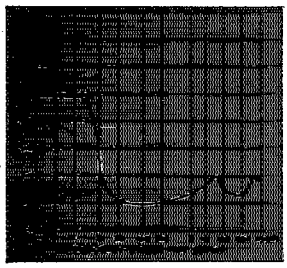
This 600 ohm miniaturized 1 KC band pass filter is housed in a case only 1" x 1¾" x 2½".



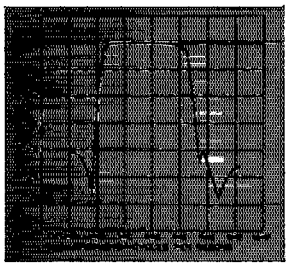


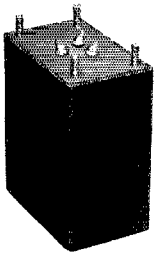
This 600 ohm miniaturized low pass filter is housed in a case only 1" x 1¾" x 2½".





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





This band pass filter is designed for sharp cut-off at both ends of the range . . . 10,000 ohms . . . case dimensions 1⅝" x 2½" x 3¼".

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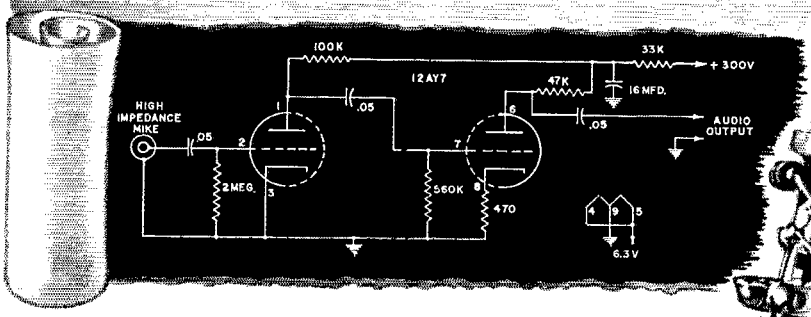
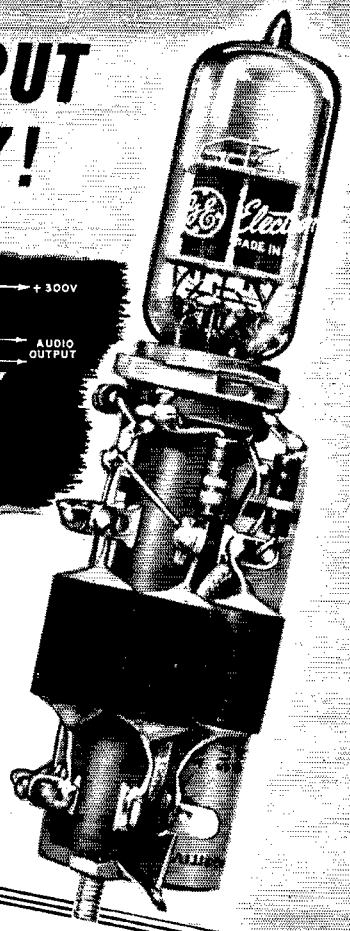
BOOST SPEECH INPUT WITH G.E.'s 12AY7!





This 2-stage amplifier takes up only 1 square inch chassis space!

Here are tube and circuit to help toward that clear, crisp voice transmission you've been seeking. The amplifier is simple to build . . . so small it won't crowd your chassis . . . and what a lift it gives mike-to-transmitter input!

Another good point about this "package" amplifier is the low noise level of the 12AY7. G.E.'s twin triode was specially designed to keep down hiss, hum, and microphonics. Your words suffer a minimum of distortion from audio by-products.

Each tube section has an amplification factor of 40. This means plenty of total gain. And you get the gain with very little increase in your rig's power requirement, for the 12AY7's two stages draw only .3 amp heater current at 6.3 v.

Buy a 12AY7 from your G-E tube distributor! That's your first step in building this compact audio amplifier that gives your voice a BIG assist. *Tube Department, General Electric Co., Schenectady 5, New York.*

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Plan now to nominate your candidate.

● In September, G. E. will announce terms of the 1953 Edison Award for outstanding public service by a radio amateur. Presentation of the Award means acclaim not only for the winner, but for all radio amateurs and their important contribution to safety and welfare. Your support will help establish this national recognition. Get ready now to name the amateur you believe best qualified for the Award!

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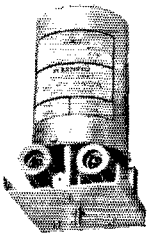
in the KW-1



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- The frequency of the Collins KW-1 is controlled by the highly stable 70E-14 permeability-tuned oscillator; and the frequency is indicated by an accurate, easy-to-read dial.
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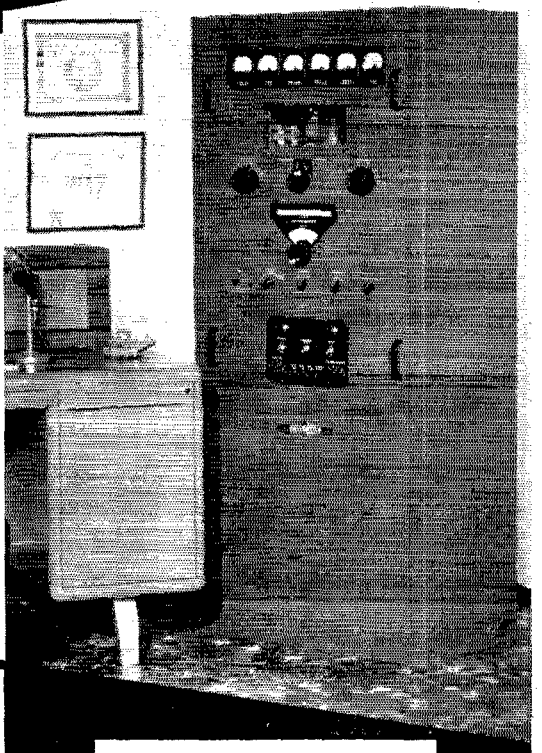
- Phone or CW at the flip of a switch.
- Variable vacuum capacitor for final-amplifier tuning.
- Coaxial RF output to match a 52 ohm line.
- Spurious radiation reduced to a very low value by circuit design, filtering and shielding.



The 35C-2 low pass filter,

an integral part of every KW-1 transmitter, provides an additional 75 db attenuation at television frequencies.

See your Collins distributor today for information on this modern kilowatt transmitter.

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JULY 1953

VOLUME XXXVII • NUMBER 7

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INDEXED BY
INDUSTRIAL ARTS INDEX

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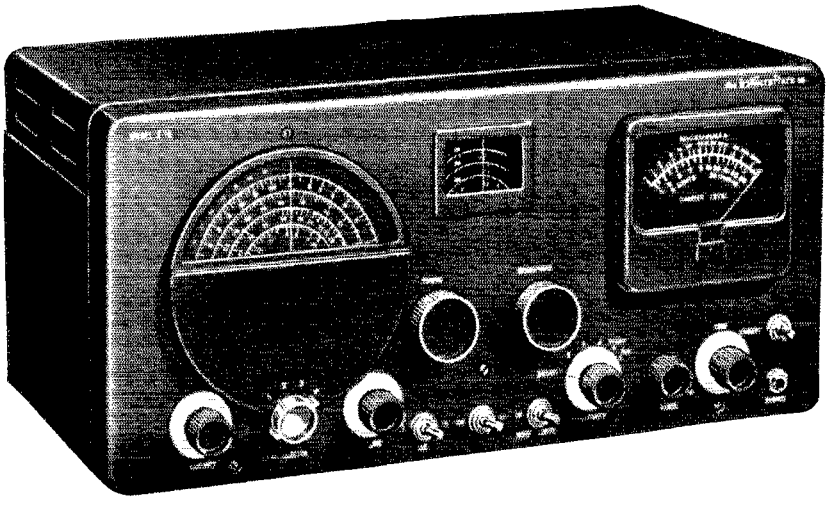
Hallicrafters Model S-76

★ Dual Conversion — no images!

★ Automatic Noise Limiter!

★ Giant "S" Meter — 4" Scale!

★ Temperature Compensation!



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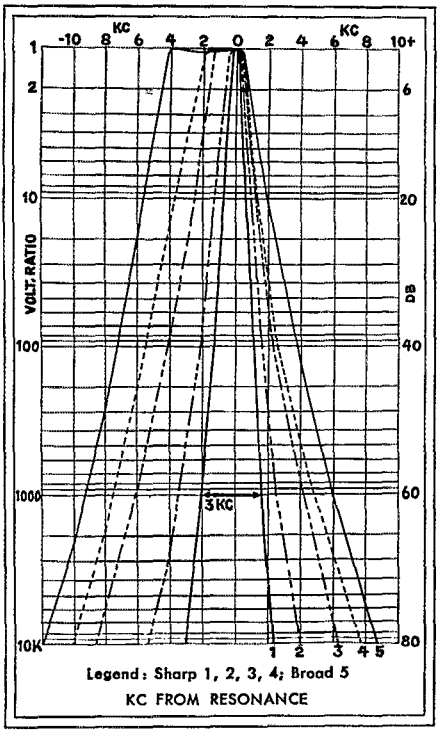
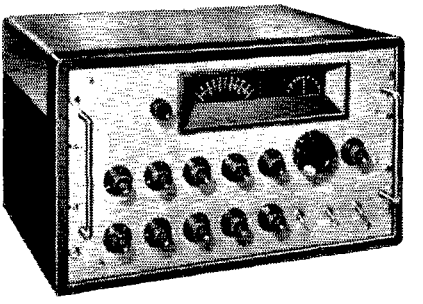
S-76





TVI Suppressed 100 Watter—Model HT-20—Continuous coverage from 1.7 mc to 31 mc. Full band switching. Choice of 10 crystals. Shielded, filtered r-f compartment plus built-in, low-pass 52 (ohm) coaxial line output filter reduces to more than 90 d.b. all responses over 40 mc.
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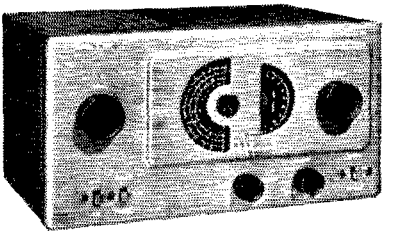

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Reports Invited. All amateurs, especially League members, are invited to report station activities on the first of each month (for preceding month) direct to the SCM, the administrative ARRL official elected by members in each Section. Radio club reports are also desired by SCMs for inclusion in *QST*. **All ARRL Field Organization appointments** are now available to qualified League members. These include ORS, OES, OPS, OO and OBS. Also, where vacancies exist SCMsdesire 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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THE AMERICAN RADIO RELAY LEAGUE, *INC.*,

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

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

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

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

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

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88-31 239 St., Bellerose 26, N. Y.
Vice-Director: Thomas J. Ryan, jr. W2NKD
1082 Anna St., Elizabeth 4, N. J.

Midwest Division

WILLIAM J. SCHMIDT . . . . . WØOZN
306 S. Vassar, Wichita, Kansas
Vice-Director: James E. McKim . . . . . WØMVG
1404 S. Tenth, Salina, Kansas

New England Division

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37 Broad St., Westfield, Mass.
Vice-Director: Frank L. Baker, jr. W1ALP
91 Atlantic St., North Quincy 71, Mass.

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837 Park Hill Drive, Billings, Mont.
Vice-Director: Karl W. Weingarten W7BG
3219 N. 24th St., Tacoma 7, Wash.

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KENNETH E. HUGHES W6CIS
3105 Crest Haven Drive, Sacramento, Calif.
Vice-Director: Richard F. Czelkowitz W6ATO
243 Colon Ave., San Francisco 12, Calif.

Roanoke Division

P. LANIER ANDERSON, JR. W4MWH
428 Maple Lane, Danville, Va.
Vice-Director: Gus M. Browning W4BPD
135 Broughton St., S. E., Orangeburg, S. C.

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CLAUDE M. MAER, JR. . . . . WØIC
740 Lafayette St., Denver, Colo.
Vice-Director:

Southeastern Division

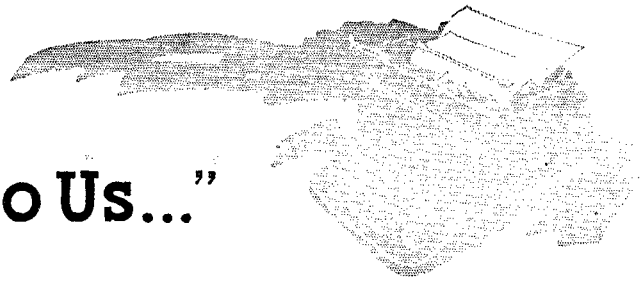
LAMAR HILL W4BOL
104 Myrtle, Cochran, Ga.
Vice-Director: Ernest W. Barr W4GOR
911 Rosemary Ave., SW, Atlanta, Ga.

Southwestern Division

JOHN R. GRIGGS W6KW
3502 Chesapeake Ave., Los Angeles 16, Calif
Vice-Director: Walter R. Joos W6EKM
1315 N. Overhill Drive, Inglewood 3, Calif.

West Gulf Division

A. DAVID MIDDELTON W5CA
9 Kay Road, Tijeras, N. M.
Vice-Director: Carl C. Drumeller W5EHC
5824 N.W. 58th St., Oklahoma City 12, Okla.



"It Seems to Us..."

TVI SCRIPT

For many years the Hq. has had available, for use by amateurs and club groups mindful of public relations responsibilities, such working tools as a sample speech on amateur radio of a type which might be delivered before a local civic club, and a sample broadcast script which can be used as the basis of a 15-minute informative program on our hobby. Both treat the subjects of amateur BCI and TVI, but only briefly. Recently we embarked on an associated project which is now nearing completion (and which we hope will become available about the time you read this): a basic script — complete with slide illustrations — for a 15-minute TV show on television interference.

The script is no monologue telling solely the amateur story. It must be remembered that only a small proportion of the total TV receivers in use ever experience serious interference, and of that only a small percentage is amateur. It deals, rather, with the over-all interference problem so it will have the widest possible attraction for viewers. It is, in fact, based largely on the essential parts of the demonstration put on by ARRL Technical Consultant Philip Rand, W1DBM, for the information of servicemen and the general public. The program discusses interference potentialities of the low-band v.h.f., since it is primarily there where the problem lies.

Although usable by any affiliated club group, the program script will have maximum effectiveness when presented in a city where there is an active TVI Committee, with one or more members of the committee participating. It is proposed as a panel- or interview-type show, with an announcer introducing the feature and then developing the story by questions of his guest or guests (you!). A number of slides will be furnished as part of the package, to be flashed on the screen at keyed appropriate times, to illustrate various types of interference — f.m. receivers, TV receiver oscillators, diathermy, household appliances, and just plain "snow." (How the latter will show up on a receiver in a fringe area with plenty of "snow" of its own, we just don't know at this point!)

This is all by way of a preliminary announcement, so that you can include this additional working tool in your long-range plans. While the scripts themselves will be available immediately to affiliated clubs and TVI Committees on request, we shall have only a limited number of sets of slides and there will therefore be the need to allocate and schedule them. You might sound out your local TV station on the possibility of staging such a presentation, as a public service feature, and talk over the script together with the program director. Once you get tentative acceptance, let us know promptly and we shall put you on the schedule for loan of one of the slide collection sets at the earliest opportunity.

That the proper approach to the solution of TVI difficulties is largely on a community level basis has been well demonstrated by the establishment of FCC's own plan built around local groups. The preparation of this script is another tool the League is providing its membership to assist in that approach.

SUMMER MOBILE

According to the papers, this year will see the greatest vacation travel season ever. We think it a fair guess that such a prediction would also apply to amateur mobile operation this year on summer treks.

Which reminds us to remind you of the reciprocal arrangements instituted last year and now in effect between the governments of Canada and the United States. The full story is in last September's *QST*. No longer will amateur mobile equipment be sealed at the border, providing you carry the license endorsement easily obtained from the regulatory agency of the other country — Department of Transport in Ottawa for operation in VE-land, or FCC in Washington for U. S. mobile authorization. Get your requests for application forms in a few weeks in advance of your trip to allow time for processing.

More reminders: To VEs — be sure to observe U. S. 'phone band limits while in W territory. To Ws — if your trip to Canada will be longer than two days, notify your district engineer of your intended absence before you leave.

Noise Generators—Their Uses and Limitations

Simple Gear for Checking Receiver Performance at 14 Mc. and Higher

BY EDWARD P. TILTON,* W1HDQ

You've just built or bought the latest thing in 2-meter converters and you want to line it up for the best possible weak-signal reception. How do you go about it? The designer says his brain child has a noise figure of 5 db., which should mean that if a signal can be heard in your location with your antenna you will now be able to hear it. But how can you tell?

Chances are you'll wait until there is some activity on the band and then make use of signals to peak the adjustments for maximum response. Or, if you're lucky enough to have access to a good v.h.f. signal generator, you'll probably tune up the new front end with that. Either approach will give you something less than the best your converter can do, however. At least 3 db. worse; possibly much more. Peaking for maximum signal almost never delivers the result you want most, the best possible signal-to-noise ratio.

Perhaps you're not interested in any frequency above 29.7 Mc., and all you ask of a receiver is that it do a good job on 14, 21 or 28 Mc. You're scared stiff at the mere thought of tinkering with the innards of a manufactured receiver. You can afford to buy the best thing on the market, but how can you wade through the advertising claims and get the real story on the front-end performance of commercial jobs you're considering?

Fortunately, there is a simple way to get the right answers to these and other questions that may have a profound effect on your enjoyment of frequencies above 14 Mc., where receiver performance is of major importance. That way is to use a noise generator.

Noise generator principles have been treated frequently in recent years [1, 2, 3] but the technique is still used by no more than a small percentage of all hams. Some prospective users have undoubtedly been frightened off by the high-sounding technical language that usually accompanies receiver discussions. Others may have given up when they found out that the tube recommended for noise generator service was a special diode, relatively expensive and often hard to come by

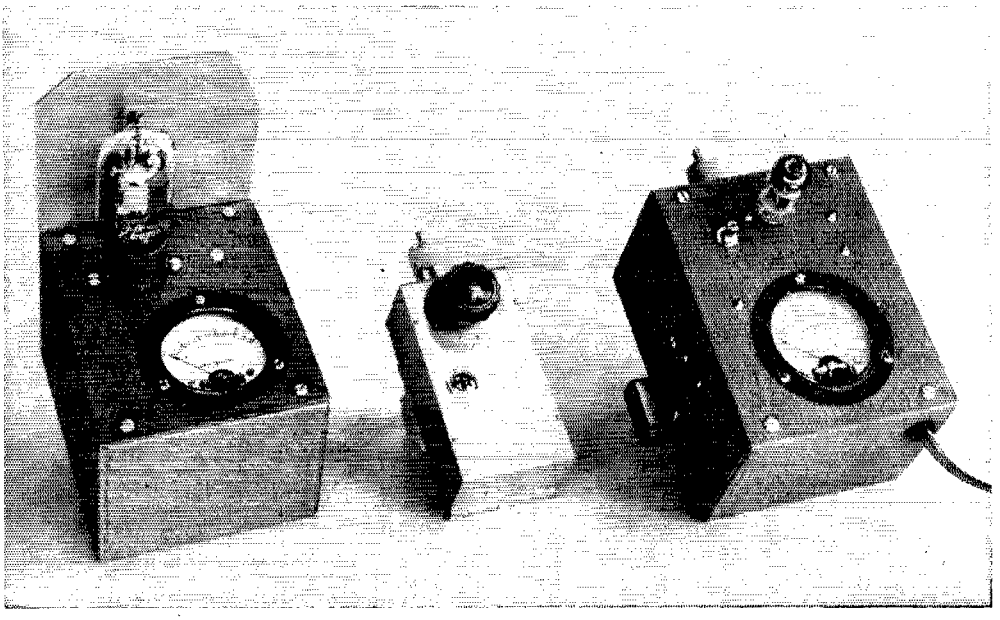
* V.H.F. Editor, *QST*.

[1] Goodman, "How Sensitive Is Your Receiver?", *QST*, Sept., 1947, p. 13.

[2] Tilton, "Noise Generator Technique for the V.H.F. Man," *QST*, Aug., 1949, p. 20.

[3] Orr, "The Silicon Crystal Noise Generator," *CQ*, June, 1952, p. 25.

Three noise generators for checking receiver performance. The two larger units are similar except for the vacuum tube used. A 24G with grid and plate tied together for diode operation is used at the left, while the other model has the special Type 5722 noise diode. The small handful between them is a crystal-diode noise generator, complete with self-contained battery.



Still others have built noise generators and been disappointed by the results obtained, particularly above 100 Mc.

The three noise generators shown on the facing page should take care of these and other difficulties. At the right is an improved version of the noise generator described previously[2] in *QST*. The tube is a Sylvania 5722 diode especially designed for this service. A built-in meter and shunts provide diode current ranges of 1, 4 and 15 ma. At the opposite side of the photograph is a similar model, but using a 24G tube with its plate and grid terminals tied together to form a diode. In the middle of the picture is one of the simplest and most useful gadgets you're likely to build in many a day: a crystal-diode noise generator that requires no external apparatus. It is a minor modification of a generator described by W6SAI,[3] and no originality is claimed for it. It is included here primarily so that readers who have not come across this kind of noise generator previously will have information on all the things we're going to talk about available in one place.

How Noise Generators Work

The theory of noise generators will not be repeated here, but we strongly recommend that those meeting the technique for the first time study up on the basic information.[1] The main idea in their use is that noise distributed in a random way across the radio spectrum can tell us many things about receiver performance, provided we can control the amount of noise fed into the receiver under test. An important angle, and one where some types of noise generators fall down, is that we should be able to duplicate results day after day with a reasonable degree of reliability.

In the diode-tube noise generator the flow of plate current produces the noise, a smooth, rushing sound exactly like the tube noise in the receiver itself. Current through the crystal diode has the same result, and about the only difference in the use of the two types of generators lies in the degree to which results obtained can be considered *measurement* rather than mere comparison.

The diode tube is operated in a *temperature-saturated* condition; that is, the plate voltage is set high enough so that no change in plate current occurs when the voltage is raised further. In this state the diode plate current can be controlled by varying the filament temperature, and this is what we do in the two vacuum-tube generators pictured. The a.c. voltage applied to the primary of the filament transformer is varied from near zero to as much as is needed to produce the desired noise output. This is done conveniently with a Variac, or a 25-watt variable resistor may be used. A vernier rheostat is nice for this purpose, though not absolutely necessary.

Almost any thoriated tungsten-filament tube can be used for noise generator service up to 30 Mc., and most of them do well up to 60 Mc. or so. But over 100 Mc. the tube's structure becomes important, and a small tube with short low-inductance leads is a must. A quick-heating filament is important, and it must show uniform emission hour after hour with a given value of filament voltage. This rules out most coated filaments. We've tried the 801A and the 316A, in addition to the types used here, but with indifferent results above 60 Mc. The 24G is the best we've found among the types that were designed for transmitting service, though it is probable that the 15E is equally good. Results with the 24G were satisfactory up to at least 150 Mc. It takes more filament current than the 5722, however, and the latter lends itself better to the compact construction that is necessary for higher frequencies.

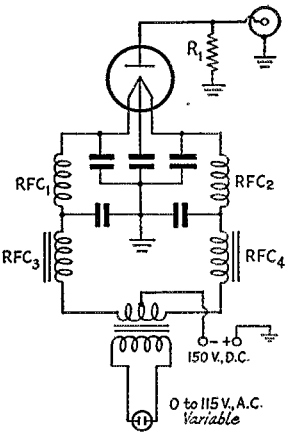


Fig. 1 — Circuit diagram of the vacuum-tube noise generators. Where a 24G is used the plate and grid terminals are strapped together for the diode plate connection, and the filament center tap is omitted. All capacitors are 0.001-μfd. disk ceramics; value not critical.

R_1 — Noninductive ½-watt resistor, value equal to line impedance. See text.

RFC_1, RFC_2 — 10 turns No. 22 enamel, 5/16-inch diam., air-wound. Space turns one diameter.

RFC_3, RFC_4 — 45 turns No. 22 enamel, close-wound on ⅜-inch diam. slug-tuned form; slug centered in winding.

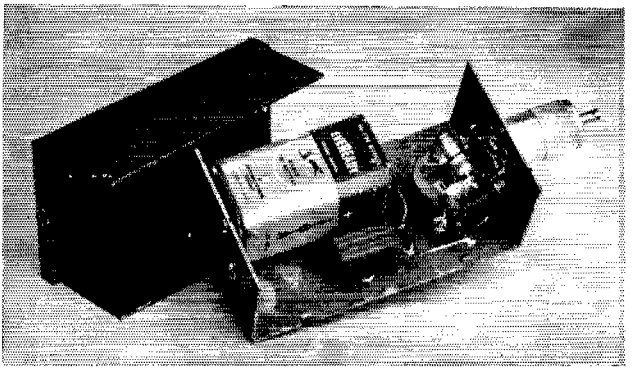
Filament transformer — 6.3 volts, 2 amperes.

With the tube instruments we can actually measure the receiver noise figure. This is done by putting enough noise into the receiver under test to double its noise power output. The diode plate current required to achieve this is then substituted in the formula

$$F = 20\ IR$$

Here F is the receiver noise figure expressed as a power ratio that can be converted to decibels. I is the diode plate current in *amperes*. R is the load resistance, R_1, in Fig. 1.

The lower the diode current required to double the noise power output, the better the noise figure of the receiver. For purposes of adjustment we can use the diode current as a reference, knowing that any change we make that lowers the current for noise power doubling represents a step in the right direction. The noise generator may be used as a signal generator also, for any of the



Test equipment doesn't come much simpler than the crystal-diode noise generator.

alignment adjustments where a signal generator would ordinarily be used, except work involving frequency calibration.

The crystal-diode noise generator is useful for comparisons, but it cannot be used for actual noise-figure *measurement* unless it is checked frequently against a calibrated source. Because it is a completely self-contained unit it is very handy for any number of jobs where use of more bulky or complicated equipment would be difficult or out of the question. It is often difficult to tell, for instance, if a converter for 144 Mc. or higher is actually working at all, if no signals can be heard at the moment. Touch the crystal noise generator to the antenna terminals, flick the switch, and you have an instantaneous check, not only on whether the converter is working, but in a general way how well.

Just listening to the noise output of the receiver is often sufficient for such uses, so no auxiliary apparatus is required. A mere lightweight handful, the crystal-diode noise generator is great to take along in your pocket when visiting other ham shacks. But don't expect to make many friends on the strength of what it will show about the 10-meter performance of some commercial receivers!

Building the Noise Generators

The two generators using vacuum tubes are similar as to circuitry, except for the lack of a filament center tap on the 24G, and the need for tying the grid and plate terminals of the latter tube together to convert it to a diode. We hear that some have used the 24G with grid connection only, but it didn't work well for us that way. In each unit the tube, filament r.f. chokes, by-passes and meter are mounted on the top cover of a 3 × 4 × 5-inch utility box. The filament transformer, meter shunts and range switch are attached to the side walls of the box, and about a foot of 5-wire cable is used to connect the two portions. In this way, changes can be made readily in either part of the generator by removing the top plate. Leads for the a.c. and d.c. are brought out through a grommetted hole.

The only essential mechanical difference in the tube models is that resulting from the single-ended construction of the diode in comparison to the top and side connections that are necessary with the 24G. With the 5722, the output is taken off through a coaxial fitting on the front wall of the box, whereas with the 24G a front panel is needed. In either case the physical arrangement should be such that the lead from the diode plate to the coaxial fitting has as low inductance as possible. A ¼-inch-wide copper strap was used to tie the 24G plate and grid terminals together. A small trimmer will be seen adjacent to the tube socket in the 5722 model. This is to permit the insertion of a tuned circuit across the output terminals, as shown in Fig. 3, to be discussed later.

The r.f. chokes and by-passes in the filament leads prevent the r.f. component of the noise from being radiated by or absorbed in the filament circuit and power supply. It must flow from the diode plate to the receiver under test. The chokes

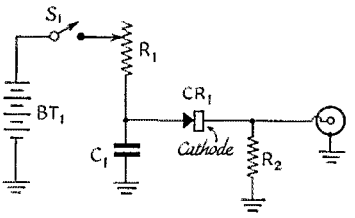


Fig. 2 — Schematic diagram of the crystal-diode noise generator.

R_1 — 50,000-ohm potentiometer, logarithmic taper, or 10,000-ohm regular taper.
R_2 — Noninductive ½-watt resistor, value equal to line impedance. See text.
BT_1 — 6-volt battery, or 4 penlite cells in series.
CR_1 — Silicon crystal diode, 1N21 or 1N23 preferred.
S_1 — S.p.s.t. toggle switch.
Value of by-pass condenser not critical. Use small disk or tubular ceramic, 500 μμfd. or more.

are not particularly critical as to inductance, but they and the by-passes should be connected with short, direct leads. The iron-core construction of RFC_3 and RFC_4 is needed to develop the required inductance with a minimum of resistance. If suitable forms cannot be found, the cores may be wrapped in insulating tape and the chokes wound on this.

The load resistor, R_1, may have a value equal to the line impedance of the antenna system with which the converter is to be used, and the terminals of the generator can be binding posts instead

of a coaxial fitting, if desired. The use of a 50-ohm load resistor and a coaxial output connector is recommended, however, as much of the superiority of these generators over previous models tried here results from this arrangement. In former generators, binding posts were used, with one of them grounded to the case. Resistors of various values to suit individual line impedances were connected across the generator externally. This unbalanced output working into balanced receiver or converter inputs resulted in rather dubious accuracy of any tests involving various lengths and types of lines between the generator and the receiver input. A modification of the noise generator circuit is required for proper operation into balanced inputs directly.

With 50-ohm termination and coaxial output the generator can be connected directly to receivers that have provision for coaxial lines. Where balanced lines are used, a balun can be inserted between the generator and the receiver input. By either method the length of coaxial line becomes uncritical, and it is no longer necessary to have the generator connected directly to the receiver terminals. The 50-ohm termination has another advantage: you can read the ratio directly in terms of the diode plate current. As will be seen when substituting in the formula, page 11, the ratio is the same as the diode current in milliamperes, when 50 ohms is used for R. Just convert the diode current to decibels and there's your noise figure. For mathematical nitwits like the writer this is a red-hot selling point for 50-ohm termination! And this dodge still applies when the generator is connected to the receiver through an impedance-transforming balun or coupling circuit.

The resistor should be noninductive. Any of the small ½-watt carbon resistors will do. Purists can adjust to a precise value by cutting part way through the carbon resistance element with a small rat-tail file.

A UG-176 adapter is used for mounting the 83-1SP coaxial fitting. A hole is drilled in the wall or panel to pass the threaded portion of the adapter, and a washer of flashing copper is soldered to the flange at the end of the adapter to prevent it from slipping through the mounting hole.

The meter has a 1-ma. scale. Shunts made of 10-ohm resistors convert this to 4- and 15-ma. ranges. Shunts can be made readily by winding fine wire on a small resistor, if the use of six 10-ohm resistors for shunts goes against the Scotch instincts of the constructor. The diode plate current being variable makes a handy means for checking the ranges against a meter of known accuracy.

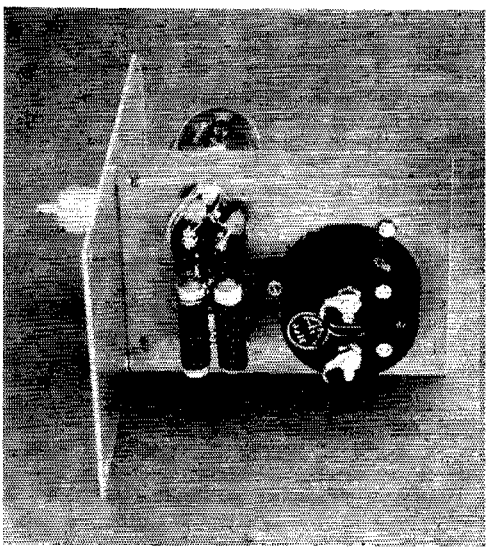
The crystal-diode noise generator is so simple that the photographs and schematic tell just about the whole story of its construction. Radar-type diodes that most of us bought for next to nothing on the surplus market are fine for this application. Silicon diodes like the 1N21, and 1N23 are best. The Raytheon CK710 also works well, and it can stand high currents. Some other germanium diodes like the 1N34 are not suitable.

If the surplus types are used, care should be taken in soldering them in place. We used a National grid clip, Type 8, to connect to the large end (the one toward the coaxial fitting in the schematic) and a Millen 829B plate clip for the small end. The small end was soldered by a light touch with a small iron, but the other end is held in place by the spring tension of the grid clip.

The battery is a small 6-volt unit that happened to be on hand. Four penlite cells connected in series will serve equally well, if care is used to see that they do not short to the case. Lower battery voltages can be used, but the sensitivity of the device is lowered thereby.

A suitable value for the potentiometer, R_1, was the subject of some experiment. As much as 50,000 ohms is needed to cut off the noise where low-noise front ends are being checked, but this results in critical adjustment at the low end of the range, unless a potentiometer having logarithmic taper is used. We had a 10,000-ohm pot with regular taper on hand and used that, though it leaves several decibels of noise at the all-in position. It gives good control of the noise output, however. A 50,000-ohm potentiometer with a logarithmic taper provides fairly easy adjustment and almost complete cut-off.

The case is an ICA channel-lock, 2-piece aluminum box 1⅝ by 2¼ by 4 inches in size, with all the components mounted in the U-shaped member. The coaxial fitting is mounted in a manner similar to those in the tube models. Arrangement of parts is obvious from the photographs. The only important consideration is that r.f. leads be as short as possible. With the limited number of parts and the small box it would be hard to make a long lead! The layout could be simplified still further by using a switch-type potentiometer, but



Bottom view of the 24G noise generator. Auxiliary components are similar to the model using the 5722 noise diode.

it is frequently useful to be able to switch the generator off and on without disturbing the diode current control.

Tricks with the Noise Generator

To use the vacuum-tube noise generators a power supply delivering about 150 volts d.c. is needed. We used the little supply that goes with W1JEQ's grid-dip meter [4] but almost anything, including B batteries, will do. Some means of varying the a.c. voltage applied to the filament transformer is also required. This may be done with a Variac or a 750-ohm 25-watt rheostat.

The generator is then connected to the receiver or converter input. This is a direct connection in the case of receivers having coaxial input. Where balanced input is used the generator is connected through a balun of the impedance-transforming variety, or through an antenna-coupler form of circuit to achieve the same result. An output meter is connected across the 'speaker terminals or plugged into the earphone jack. This can be a test meter having a decibel scale, an output meter calibrated directly in milliwatts, or an a.c. voltmeter.

With the receiver a.v.c., noise limiter and b.f.o. turned off, advance the receiver gain until a convenient reading of noise output is obtained on the output indicating device. Be sure that this noise is receiver noise only, and not external pick-up of ignition or other man-made interference. Now turn on the noise generator and increase the filament voltage slowly until the noise power output of the receiver is doubled. This will show as an increase of 3 db. on a decibel scale, twice the reading on a wattmeter, or a 41 per cent rise on the a.c. voltmeter. Substituting the diode current (in amperes) in the formula given on page 11 gives the noise power ratio (or noise figure) of your receiver compared to that of a theoretically noiseless one. This figure can be converted to decibels by multiplying the common logarithm of F by 10, or by looking it up on the power curve of the db. chart in the data section of the *Handbook*. This noise figure may not be strictly accurate (mostly because of limitations in the output indicating device) but it is close enough for amateur purposes.

With noise generators we've tried heretofore, little or no noise could be heard at 144 Mc. until we resonated the noise generator output as shown

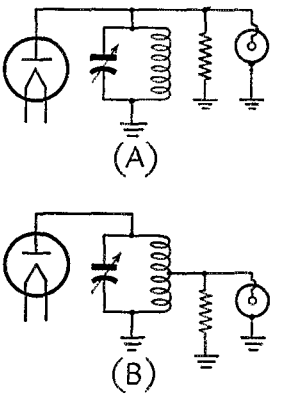


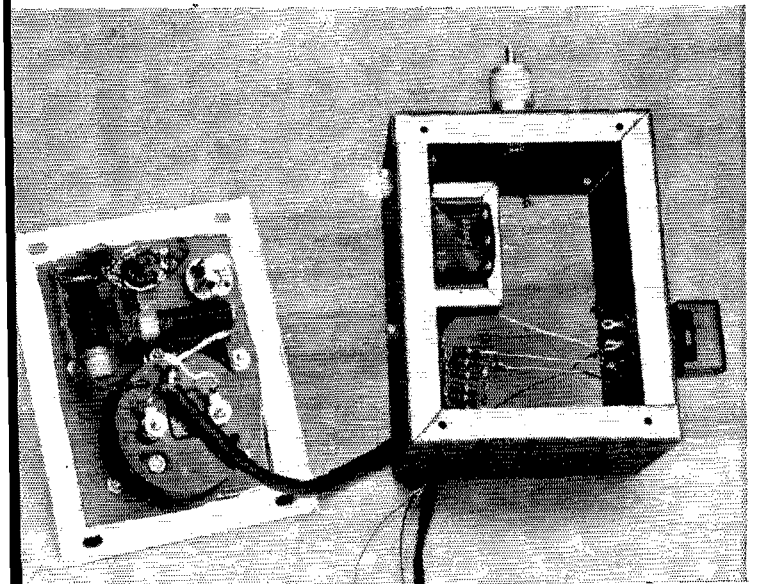
Fig. 3 — Right and wrong ways to resonate the noise generator output. Tapping down on the tuned circuit, shown at B, makes noise figure readings meaningless, and often impossibly low.

in Fig. 3A. This is a legitimate way of peaking up the output, and it may be needed to tune out reactance in the coupling circuit. Provision was made for it in the 5722 generator, but it turned out to be unnecessary, probably because of the better layout of this model and the use of the 50-ohm termination. It may be needed where higher load resistances are used.

In an attempt to increase the noise generator output at 144 Mc. or higher, some users have tapped the noise generator output down on the tuned circuit, as in Fig. 3B. This does increase the output, all right, but it also renders the instrument useless for measuring noise figure. This dodge will give you noise figures that are impossibly low. It can be used to develop noise with tubes that might not otherwise work as noise diodes, but the generator so terminated is good

(*Continued on page 108*)

[4] Chambers, "A Handy Handful," *QST*, March, 1953, p. 29.



Interior view of the noise generator using the 5722 diode. All components except the filament transformer, meter shunts and range switch are mounted on the top plate.

Low-Pressure Modulation Facts

Down-to-Earth Talk About Radiotelephony

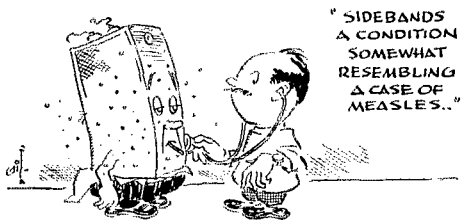
BY HOWARD WRIGHT,* W1PNB

SEVERAL years ago, having built and operated several successful amateur radiotelephone transmitters, I was reasonably satisfied with my knowledge of 'phone principles. After all, they didn't seem too complicated, if one could manage to ignore the inconsistencies that showed up now and then. To the best of my memory, I used to consider modulation from about the following point of view:

"The r.f. section of a transmitter consists of a carrier-generating exciter and a final amplifier that amplifies the carrier and passes it along to the antenna. To use this typical c.w. transmitter for 'phone operation, we merely couple voice power to the final amplifier through a modulation transformer. The voice power is then in series with the power supply to the final. Therefore, the level of the carrier is varied above and below its original value at an audio rate. This is called 'modulating' the carrier and is done to allow the voice signal to be recovered by a receiver."

As I said before, I was quite happy with the above understanding of a 'phone transmitter. I suspect that there are many amateurs who are getting along nicely today on similar ideas.

And then came single sideband! Formerly, I had considered sidebands as a condition somewhat resembling a case of measles, occurring only on unhappily adjusted transmitters. With the



introduction of amateur s.s.b. techniques, we were informed that sidebands are completely normal and honorable properties of all stations. Concerning modulation, as the saying goes, "I didn't know from nothing."

At this point you may suspect that I have become one of those incurable single-sideband enthusiasts. To this thought I happily plead guilty, but don't leave. I'll try to keep the propaganda to a minimum.

This subject of modulation has been well covered in many excellent articles in the past few years. If it hadn't, I would never be here with pen in hand. I am not covering any new ground, but trying to present the material in a form that may be helpful to those who are not on the best of terms with the graphs, formulas, charts, vectors, diagrams, and Greek letters which often enter into various discussions of modulation.

In my estimation there are two main reasons for the lack of a better general understanding of 'phone principles. The first is that, in the hands of a person without much theoretical knowledge, even the best of receivers tends to create a false impression of the true nature of incoming signals. I will cover this more thoroughly at a later time. The second reason seems to be our inability to connect the modulation of a transmitter with the heterodyne process. But there I go, taking for granted that everyone knows what the heterodyne process is. Let's back up several steps.

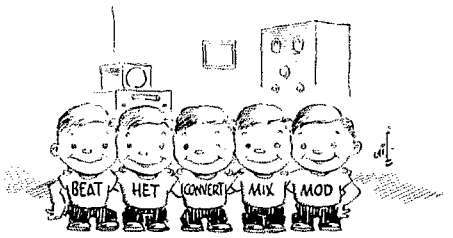
The Language

At some point in our conversion from broadcast listeners to radio amateurs, we discover a complicated electronic jargon. To most of us, this amounts to a new language that must be learned if we are not to be baffled by the simplest of statements. Among the new terms that tend to add most to the confusion of a beginner are: *beat, heterodyne, convert, mix* and *modulate*. The fact that most of us never recognize is that all of these imposing terms mean exactly the same thing. The different words are only used as a matter of convenience, in indicating some general type of circuit.

Now it's not my purpose to try to explain *why* the heterodyne process works. To put it briefly, however, here is *how* it works. Combine any two a.c. signals (regardless of frequency) in a suitable circuit and two new signals will appear that are the sum and difference of the originals. Probably most of us are familiar enough with the operation of modern receivers to let us stop at this definition of the heterodyne process.

At this point, it may seem that I have strayed quite a way from the subject of modulating a final amplifier. Not so! The term "modulate" is included in the interchangeable group of words that includes "mix" and "convert" — necessary processes in your receiver's operation. I hope it is obvious that I am trying to point out that the action of the little converter tube in your receiver is exactly the same as the process taking place in your final during modulation. Of course, there are vast differences of amplitude and frequency in these circuits. Nevertheless, if you can see their basic similarity and actually start thinking of modulation in terms of converting, mixing, heterodyning, beating, or whatever you want to call it, you have nearly won the battle of understanding 'phone principles.

* 55 Sigourney St., Bristol, Conn.



"THEIR BASIC SIMILARITY---"

The Receiver

Think of that pair of tubes in the final of your 'phone transmitter as a mixer. I'll give more details later, but now back to the subject of deceiving receivers.

Before you rise to the defense of your particular high-priced beauty, let me hurry to state that receivers only tell lies to people who don't realize that a receiver, designed for broadcast-band type reception, inherently disguises the true nature of incoming signals. Here is a typical example:

A neophyte tunes his receiver across an unmodulated carrier. The receiver tells him that the carrier is a certain number of kilocycles wide. The neophyte immediately starts a frantic and futile investigation to discover why one carrier is broader than another.

Now let's have a man who has studied receivers tune the same receiver across the same carrier. He also sees that the carrier occupies space on the dial but, knowing that a carrier has no width, he realizes that the carrier is telling him the selectivity, or "bandwidth," of the receiver.

This case of the unmodulated carrier is bad enough, but the receiver is designed to perform a masterpiece of deception in the case of a modulated 'phone signal. It does a perfect job of gathering in the various parts of the signal, eliminating any evidence of the presence of the sidebands theory tells us were transmitted, and combining the sidebands with the carrier in such a way that it appears that the voice is simply superimposed upon the space supposedly occupied by the carrier. So complete is this deception, that it might be compared to the reproduction of a color photograph in a magazine. How would we ever know that, to be reproduced, the picture was broken down into its primary colors, if all we had to go by was the original print and the magazine?

Spectrum Space

Before we finish this business of generating sidebands, there is one very important concept to grasp. No intelligence (modulation) can be transmitted without taking up room in the spectrum. Couple this statement to the previously mentioned fact that a carrier occupies no space and there is only one conclusion to be drawn. The modulation can in no way be "on the carrier." It must consist of appropriate new signals at frequencies "alongside the carrier." If we recall what has been said about heterodyning signals, it takes no genius to see that the voice power from the audio system of a transmitter, when applied to the final amplifier (or mixer) doesn't affect the carrier in any way. It can't. Following the theory of mixing, it combines with the carrier frequency to generate new r.f. signals, both above and below the carrier, which can certainly be considered as riding "alongside the carrier."

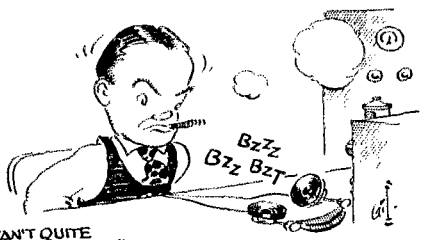
Now is the point where drawing a cute little diagram of carrier and sidebands appears attractive, but let's proceed with just words.

Take the case of an ordinary amateur 'phone transmitter. For the sake of discussion, let's say that the carrier frequency is adjusted to exactly 3900 kc. Now this happens to be a fine transmitter, except for one fact. There isn't enough filtering in the audio power supply. Of course, the result is a signal plagued with 120-cycle hum or, in the words of c.w., "I can't quite give you a T9, OM."

Constantly remembering all we know about mixing, let's take a theoretical look at our hum-modulated signal. The hum voltage of 120 cycles should mix with the 3900-kc. carrier and produce new signals of 3900.120 and 3899.880 kc. In other words, we should now have three separate signals, the strongest being the original, flanked on either side by a "hum side-frequency" 120 cycles away.

Until now, references to receivers may not have seemed too flattering. This, however, had only to do with the listener's lack of ability to interpret what he heard. Now, let's use our receiver to tie down theoretical reasoning to what we actually hear. Simply turn on the receiver's b.f.o. and tune carefully across the hum-modulated signal. Presto! We hear three distinct points of "zero beat." We have three signals. We have exact confirmation of the heterodyne theory of modulation.

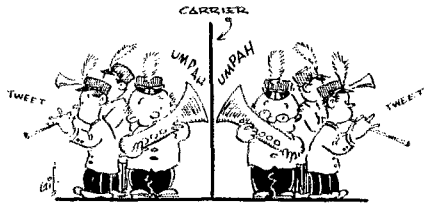
If you're somewhat confused by my use of hum voltage in the above example, don't be. It was simply used in place of "a single audio tone," which is often used in explanations of sideband generation. Of course, hum is a far cry from the actual voice signals we use to modulate our transmitters, but the heterodyne principle remains unchanged, regardless of the type or complexity of the modulating signal. The voice contains a



"I CAN'T QUITE GIVE YOU A T9, OM"

great number of individual frequencies which beat with the carrier. Each resulting new r.f. signal generated still maintains its original audio-frequency relationship with each of its neighbors, even though the whole business has been shifted up into the r.f. part of the spectrum.

Due to the heterodyne action, our complete



"THE LOWEST-PITCHED SOUNDS ARE CLOSE TOGETHER ALONGSIDE THE CARRIER..."

band of audio frequencies is reproduced, not only once, but in exact duplicate on either side of the carrier. Thus we have the sidebands that have been discussed so much in recent years. Considering the original audio frequencies, we might think of the sidebands as being "back-to-back." The lowest-pitched sounds are close together alongside the carrier and the higher ones, progressively removed from each other, cause the complete signal to be twice as wide as the highest tone transmitted.

That's about the story of conventional a.m. If propagation conditions are good and no mishaps (such as interference) befall this complicated group of signals, we are all set to have the receiver perform its magic and restore human-sounding values to the finished product.

S.S.B. Techniques

Now, let's take a look at single-sideband techniques, which have almost completely taken over transoceanic telephone service and are enjoying ever-increasing popularity with radio amateurs. This definitely is not a drop-off point into the mysteries of complicated electronics. If you once manage to grasp a firm understanding of the regular double-sideband signals we have been discussing, single sideband is only a small step away. After all, if we understand the whole of any subject, the study of one of its parts shouldn't be too difficult!

Rather than start directly with s.s.b. transmitters, let's return to the thought of converting in a regular receiver. From one point of view, every superhet is a s.s.b. receiver in two respects. The first, one which seldom needs to be considered, is this: In converting incoming signals down to the intermediate frequency, the new frequency (or sideband) caused by the *difference* between the incoming signal and oscillator is the one that is used. The theory of heterodyning tells us that the *sum* of these frequencies is also present at the output of the converter. This sum frequency is so far removed from the i.f. that it is eliminated by the filtering action of following stages.

The more important reason for considering a receiver as having s.s.b. action concerns "image" reduction. Due to the heterodyne process, if no selectivity precedes the converter, the receiver is sensitive to two frequencies. One is above and the other below the oscillator by an amount equal to the i.f. I believe that most of us are familiar with the drawbacks of having bad r.f. "images" or, in other words, having each signal appear at two points on the tuning dial.

Here is the connection between receiver images and s.s.b. transmitters. The act of adding r.f. selectivity to the front end of a receiver to reduce the image is exactly the same process, in reverse, as adding a selective filter to a double-sideband transmitter to reduce the "image sideband." The only difference is that the receiver is purposely designed so that the image can be reduced by the use of a few simple tuned circuits preceding the converter. In a transmitter, the sidebands produced by modulation (conversion in a receiver) are separated only by a relatively few cycles and are therefore more difficult to divide by filtering methods.

Until recent years, equipment selective enough to separate and suppress one sideband was either nonexistent or very complicated. No doubt the basic advantages of transmitting only one sideband were realized as early as those of having image rejection in a receiver. However, in the case of the transmitter, the power in both sidebands was recoverable by the receiver, plenty of space was available in the spectrum, and no simple and effective way was available to eliminate one of the sidebands. Thus, we have the predominance of a.m. as we know it.

You may have noticed that I have not stressed the "suppressed carrier" part of s.s.b. There is enough material contained in this subject to fill a book, but it is distinctly a separate subject from "single sideband." A very large part of both the superiority of s.s.b. systems and the furor caused by the appearance of s.s.b. signals on receivers tuned for regular operation can be attributed directly to carrier suppression and not to the elimination of one sideband. This, however, is an article on modulation, so let's stick to the sidebands.

Now, if we had to give a definition of single sideband, we could call it the suppression of an "image sideband" for the purpose of reducing to a minimum the frequency band necessary to transmit a given amount of intelligence. Because the filter method is used for reducing the unwanted sideband or "image" in a receiver, we will first consider this method as applying to transmitters.

Filters

A carrier is modulated in the ordinary way, producing identical sidebands on either side of the carrier. These sidebands and the carrier are fed into a very sharp filter which passes one sideband and suppresses the other even though they are very close together. There are *LC* filters, crystal filters, and mechanical filters. They can all be built to do a good job of separating sidebands, but all have the common property of having better selectivity as their design frequency is made lower. This is the reason why practically all filter-type single-sideband transmitters use receiver-type heterodyne methods to convert to the desired band from the lower frequency at which the filter works well.

(Continued on page 110)

A Dot Anticipator for the Electronic Key

A Further Improvement on a Popular Design

BY ROY E. BRANN,* W6DPU

• While W6SRY was working on his "key with a memory" (*QST* for February, 1953), W6DPU was also working independently to improve his own popular design. They both had the same general objective in mind, and "memory" to one is "anticipator" to the other. If you are planning to build an electronic key, or if you are one of the many already using the Brann key, we think you will be interested in this addition that will "hold" dots until just the right time comes along.

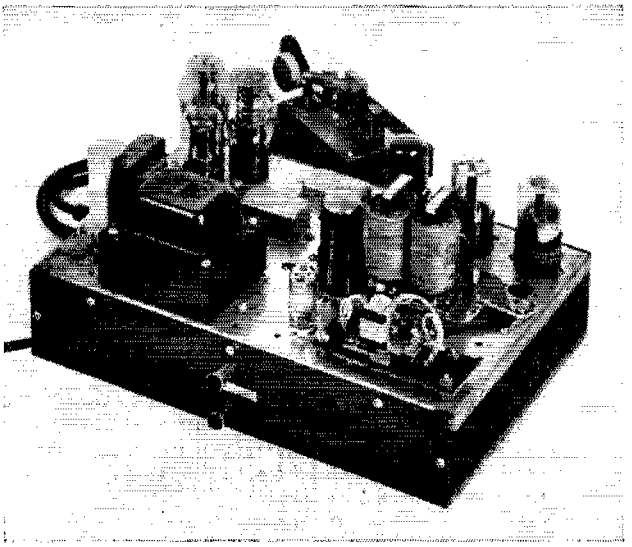
THOSE who enjoy amateur radiotelegraphy sooner or later become interested in using an electronic key. There is quite a variety to choose from, but the most popular today is the self-completing type. One feature common to nearly all self-completing electronic keys is lockout of the key lever contacts during the mark-plus-space interval. This is very desirable, as it prevents clipping a dot, dash, or intraletter space. But it also interferes with the sending of a single dot at the end of a character, as in C, F, G, N, P, R, 9, etc., when an erratic fist strikes the final dot too soon. Also, where the dot occurs between two dashes, as in C, K, Q and Y, the character sometimes comes out with the dot missing — for the same reason as above. This difficulty is particularly troublesome after a QRS. Notice that "C" is listed above twice — once involving the final dot, and again involving the first dot. This is in agreement with the common observation that "C" is the hardest to send.

Self-Training

A good way to train oneself to avoid these troubles is to practice on a non-self-completing electronic key, one make of which (the Mon-Key) has in recent years been widely advertised and sold. This type of practice makes the less proficient operator acutely conscious of his wrist motions — they must be uniformly correct if rhythmic code is to be produced. Then after changing over to the self-completing electronic key, the difficulty mentioned above usually disappears. Another method is to follow the example of Dave Kennedy, W6KYV, who manipulates the self-completing electronic key paddle exactly as though it were a bug key. By striking each dash separately, a rhythm is developed that helps to avoid the premature striking of the single dot within or at the end of a character. In this case, the electronic key justifies its existence by correcting for the human element to produce accurately formed dashes and associated spaces.

With proper training and a good electronic key, the skilled operator can maintain unexcelled transmitter keying — until he becomes fatigued and the deterioration of his sense of timing causes him occasionally to miss the single dot within or terminating a character. Then he begins to wish for an electronic remedy for this difficulty. One

* 2047 Crestlake Ave., South Pasadena, Calif.



The "dot anticipator" added to the Brann key employs the relay and 2D21 shown here in the right foreground of the original model. The relay is fastened to a piece of heavy rubberized fabric to eliminate noise transmission through the chassis. Not shown are the soft leather dust covers for all relays, to minimize noise transmission through the atmosphere and to keep the contacts free of dust.

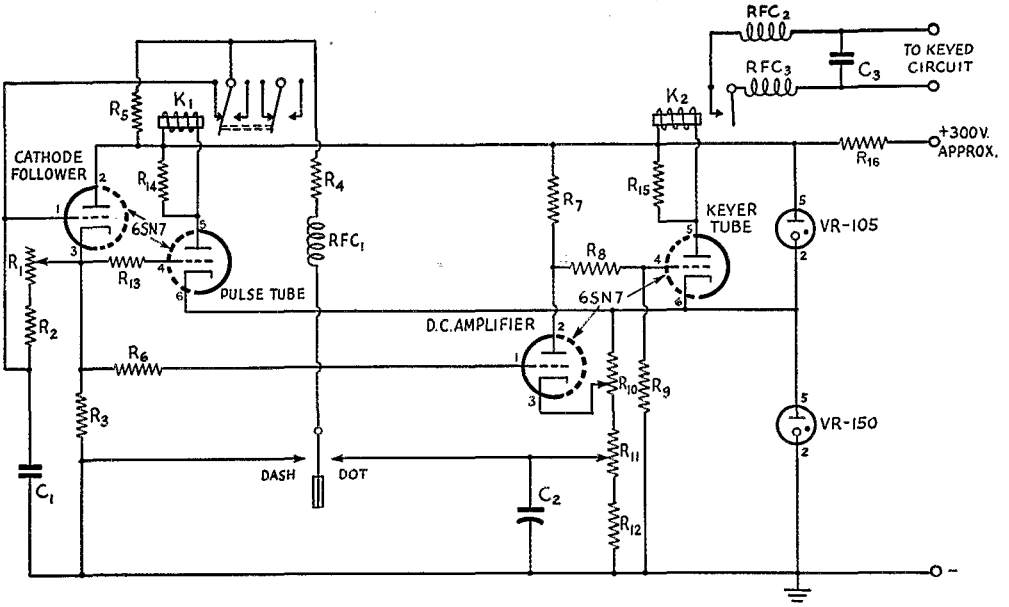


Fig. 1 — The electronic key prior to modification. Relays are shown in quiescent position — power on, just prior to operation of key lever.

C_1 — 0.01-μfd. mica.
C_2 — 1.0-μfd. paper, 200 volts.
C_3 — 0.001 μfd.
R_1 — 2-megohm linear potentiometer.
R_2 — 1.0 megohm.
R_3, R_7, R_{14}, R_{15} — 0.1 megohm.
R_4 — 470 ohms.
R_5 — 4.7 megohms.
R_6, R_9 — 2.2 megohms.
R_8 — 0.82 megohm.
R_{10}, R_{11} — 5000-ohm linear potentiometer, 2 watts.
R_{12} — 10,000 ohms, 2 watts.
R_{13} — 0.47 megohm.
R_{16} — Dropping resistor depending upon supply voltage.
RFC_1, RFC_2, RFC_3 — 2.5-mh. r.f. choke.
K_1, K_2 — Telephone type relay, 8000-ohm coil laminated core.
Tube heaters should be biased to approximately +90 volts (arm of R_{11}).

solution is a "dot anticipator" with an electronic memory that will accept the dot signal during the lockout interval and hold it until the dash-plus-space is completed — then to initiate the dot. In the circuits to be described, the memory device is a 2D21 shield-grid miniature thyratron tube. For a means of triggering the 2D21 during the lockout interval, the double-pole double-throw contact arrangement, which happened to be on our relays, was put to use.

Dot Anticipator

The "dot anticipator" (DTR) is a modification to the electronic key that was described earlier.[1] Fig. 1 shows the schematic diagram prior to modification. Those who are unfamiliar with its operation should refer to the original article. The discussion here will be confined to the modification, which is presented in two schematics, Figs. 2 and 3. These represent two of the possible forms the DTR may take. Fig. 2, which is designed around triode relay tubes, contains one 2D21 and one 6AL5; whereas Fig. 3, which is drawn with screen-grid relay tubes, contains one 2D21 and one relay in the modification. The DTR modifications may be interchanged between the two basic electronic-key schematics, making two more combinations. A fifth form, which won't be described here, uses a twin-triode in a bistable multivibrator circuit and a relay. But basic to all these is the triggering circuit connected to the extra contacts on the pulse relay.

A full appreciation of this triggering circuit is reserved for those whose favorite pastime is chasing electrons. We won't dwell on the subject, except to say that its purpose is to provide a large positive pulse on the grid of the 2D21 thyratron whenever a dot is struck after a dash is initiated. For maximum reliability this pulse should be as large as conveniently possible, which is why RFC_1 has been removed. This choke had for its purpose the minimization of the discharge pulses flowing through the key lever contacts. Maximum pulses are preferable for the DTR, hence RFC_1 is superfluous. For a like reason, the location of R_4 was changed to take it out of the DTR circuit.

Circuit Notes

After ionization the thyratron tube will initiate the next dot when the pulse relay pulls in — either by acting directly through diode D_1, as in Fig. 2, or indirectly through relay K_3, as in Fig. 3. Then the thyratron must be deionized, which is the function of the deionizing capacitor (C_{21} in Fig. 2, C_{31} in Fig. 3). This portion of the circuit is likely to be the most baffling

[1] Brann, "In Search of the Ideal Electronic Key," *QST*, Feb., 1951.

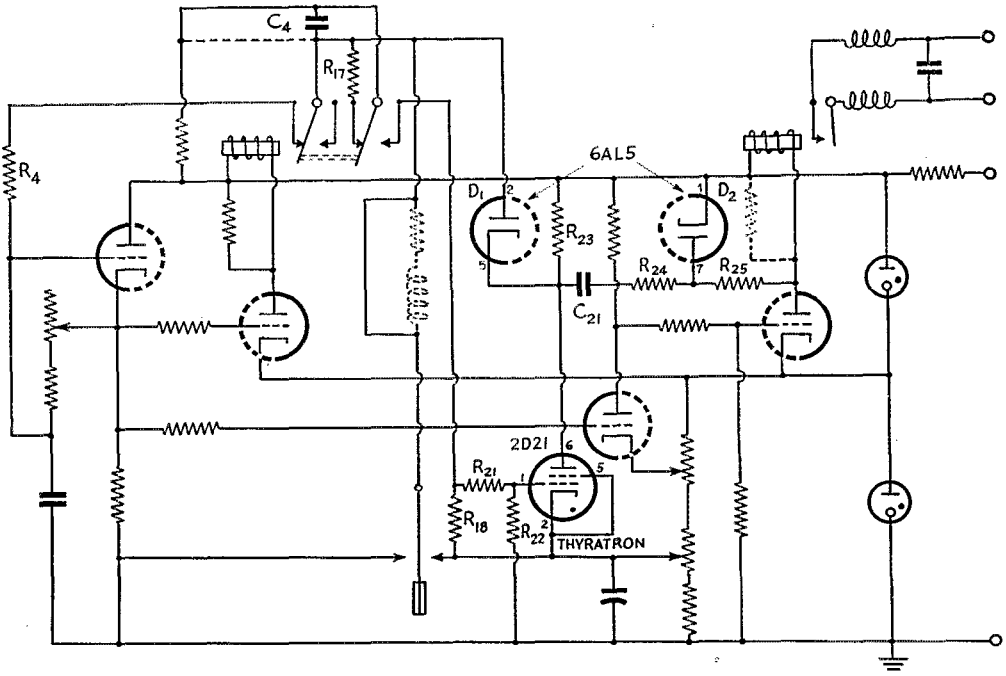


Fig. 2 — Dot anticipator modification that requires no extra relay.

C_4 — 0.01 μfd.
C_{21} — 0.0015 μfd.
R_4, R_{17} — 470 ohms.
R_{18} — 10,000 ohms.
R_{21} — 4.7 megohms.
R_{22} — 22 megohms.
R_{23} — 0.47 megohm.
R_{24} — 15,000 ohms.
R_{25} — 8200 ohms.

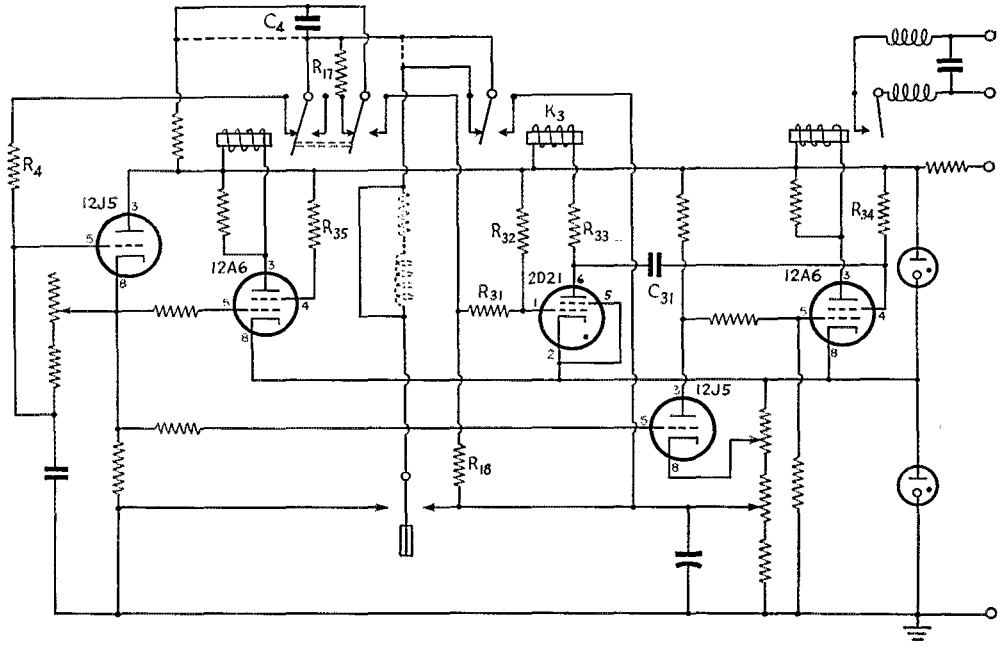


Fig. 3 — Dot anticipator as applied to screen-grid relay tubes, using a third relay.

C_4, C_{31} — 0.01 μfd.
R_4, R_{17} — 470 ohms.
R_{18} — 10,000 ohms.
R_{31} — 1.0 megohm.
R_{32} — 3.3 megohms.
R_{33} — 8200 ohms.
R_{34}, R_{35} — 15,000 ohms.
K_3 — Sigma 4F, 8000-ohm coil (or equivalent).

— incorrectly connected it will even deionize the thyratron too soon. However, this represents no instability — merely insufficient attention to selection and wiring of parts.

Fig. 2 shows C_{21} in series with a resistor, R_{24}, which is necessary to prevent premature deionization of the thyratron tube. Its value is not critical. C_{21} may be increased in value to give a longer duration to the anticipated dot, if this is needed. R_{25}, together with diode D_2, isolates the inductive kick of the keying-relay coil from the high-impedance plate load of the 2D21. R_{25} is given as 8200 ohms; however, the optimum value may be somewhat different, since R_{25} also has the effect of delaying the drop-out of the keying relay. It develops that this is an advantage with triode-driven high-inductance relays, where the low plate resistance of the triode gives a delayed pull-in. The best value for R_{25} is that which gives a constant mark-space ratio as the sending speed is advanced.

In Fig. 3 the thyratron has a low-impedance plate load. This calls for a larger value of deionizing capacitor and *no* series resistor. C_{31} goes to the screen end of the dropping resistor, R_{34}. Any possibility of excessive screen dissipation is eliminated by the dropping resistor, which also provides a convenient purely-resistive driving point for the deionizing capacitor. The screen-grid relay tubes are well worth the extra space and wiring that may be required, because they give the fastest possible relay action. The relay coil time constant is L/R. Hence, if the inductance is large, the high plate resistance at adequate current values of the screen-grid tube helps to maintain a short time constant.

Anyone who wishes to use the relay-type DTR with triode relay tubes should connect the deionizing capacitor C_{31} directly to the keyer plate. And vice versa — if the DTR without relay is to be used with screen-grid relay tubes, C_{21} with series resistor R_{24} should go to the junction of keyer screen and dropping resistor. The 2D21 thyratron requires a ten-second delay after lighting the heater before applying the plate voltage. This makes it advisable that the power supply use an indirectly-heated cathode-type rectifier, such as the 6X5 or 6X4, which will automatically provide the proper time delay.

Trouble Shooting

When the wiring is completed, the electronic key proper is given a thorough check and properly adjusted. Then, after disconnecting the line voltage, the 2D21 is inserted in its socket — also the 6AL5, if used. After turning on the power, set the speed control to about 15 words per minute. Make an "N" as though you were sending 40 w.p.m. You should hear an "N" at the 15-w.p.m. rate. If a "T" is heard, something is wrong. Using a screwdriver, short Pins 5 and 6 of the 2D21 socket. A series of dots should be heard. If not, look for trouble in the 2D21 plate circuit. Check wiring. See that the 6AL5 is lighted — or that K_3 operates properly, with clean contacts. If all was OK on this first test, check operation of the 2D21 by touching to its Pins 1 and 6 the test prods of a 1000-ohms-per-volt meter on the 250-volt range. If the series of dots results, then look for trouble in the triggering circuit. Check connections, values of parts, and adjustment of K_1 contacts. If all is in order and still no action — or, if instead of an "N," a dash followed by a never-ending series of dots results, check the deionizing capacitor and connections; or try using different values.

The DTR of Fig. 2 is a good circuit for those who dislike to use or are unable to obtain the extra relay. However, it gives no protection on single dots within a character. These are far less troublesome than the single final dots; yet, if the utmost in electronic key performance is desired, the circuit of Fig. 3 should be followed. It is possible that these circuits will appeal not so much to the proficient operator as to those inclined to brood over their sending errors. To them, the best advice that can be offered is: Instead of brooding, build. You will be delighted with the improvement in your fist.

Strays

Some 50,000 Boy Scouts are gathering near Santa Ana, California, for their national Jamboree the week of July 17th–23rd, and amateurs in the area have formed the Southwestern Division Amateur Radio Club to set up, in coöperation with BSA Headquarters, a show and traffic station. Operation will be on numerous bands, and it is hoped to have a distinctive -6BSA call.

A message traffic service is being set up, with full assistance by regional nets such as Mission Trail, Golden State, American Legion and MCAN4. The coöperation of amateurs throughout the country is requested to expedite handling and delivery. To save time, numbered-text messages may be used. Here's a chance to make BPL for sure, but more than that to provide the folks at home with word from their sons, and thereby do a good public relations job for amateur radio.

Among more than thirty amateurs operating the Jamboree shack will be Clyde Hendrix, WØHBG, and Ed Christopher, W4MAB, both Scout leaders; even *Boys' Life* editor Harry Harchar, W2GND, may find time from his other duties to get in an operating trick or two. Director John Griggs, W6KW, and assistant director Paul Watts, W6GKC, are coördinating efforts of amateurs in the Southwestern Division to put on a real show and efficient message service for the Scouts.

COMING A.R.R.L. CONVENTIONS

July 10th–12th — National Convention, Houston, Texas
Sept. 5th–6th — Delta Division, New Orleans, La.
Sept. 19th–20th — New York State, Buffalo, N. Y.

Let's Use Neon Bulbs

Neon Bulbs in Applications as Indicators and Oscillators

BY LEWIS G. McCOY,* W1ICP

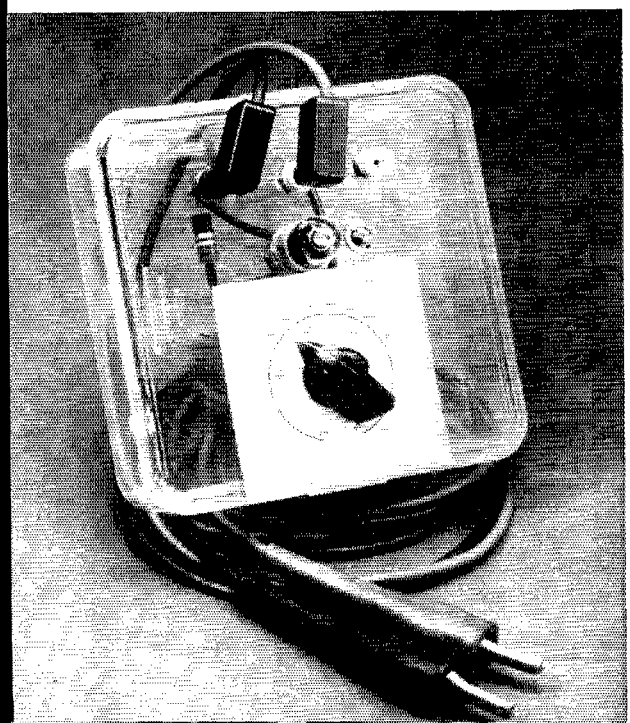
• Many an experienced amateur has a soft spot in his heart for a simple little device called a "neon bulb," and not without reason. This simplest of radio gadgets is as useful as a third hand at a smörg°sbord — W1ICP shows you why.

DURING a recent visit with a newly-licensed ham, we got to discussing his new rig and some of the problems he was encountering while trying to get the "beast" (as he put it!) working properly. The transmitter was a three-stage affair — oscillator, buffer, and final amplifier — with about 100 watts input to the final. Considering it was his first transmitter, he had done an excellent job of layout and wiring. However, every time he turned the rig on, the final plate current would come up to operating level, and then drop back to zero, repeating this condition at about two-second intervals. He had checked and double-checked his wiring but couldn't find a thing wrong with the circuit, and was at a complete loss what to do next. Having put all of his money into parts for the transmitter, he hadn't been able to afford a test meter of the volt-ohm-milliammeter variety. Our problem was then one of finding out what was wrong with the rig with the materials he had available. An inventory of his junk box turned up a small neon bulb and a couple of flashlight bulbs. The neon bulb would serve for checking r.f. circuits while one of the flashlight bulbs wired in series with a loop of wire could be used for checking resonance and power in tunable circuits.[1] His receiver was tuned to the oscillator frequency and a good steady signal from the oscillator could be heard. It was immediately apparent that the trouble in the transmitter was not coming from oscillator stage difficulties.

The neon bulb was then held on the grid of the buffer and the bulb lit up, indicating that r.f. was reaching the buffer. The neon bulb kept a steady glow as long as it was held on the grid and there was none of the on-off characteristics that were showing up in the output of the rig.

The buffer tank circuit was then tuned to resonance using the flashlight loop for an indicator. A check with the neon bulb showed that all parts of the buffer plate circuit seemed to be functioning properly. The neon bulb was then touched to the grid of the final amplifier and it immediately indicated the "on-off" effect that was taking place in the output. When the plate current would rise, the neon bulb would light; when the plate current dropped, the bulb would go out. It was fairly obvious that the trouble was between the grid of the final and the plate of the buffer. The trouble turned out to be the coupling condenser between the buffer plate and the final grid. As soon as the condenser was replaced, the rig worked properly. This was a case where a neon bulb proved to be a very efficient "gimmick" for trouble shooting.

After this experience, the subject of various uses of neon bulbs was discussed with other newcomers to the hobby. It was found that



Top view of the neon bulb voltmeter. The calibrated dial was mounted on a piece of cardboard and then mounted under the shaft nut of R_2.

* Technical Assistant, *QST*.

[1] McCoy, "The Tune-Up Loop," *QST*, Dec., 1952, p. 37.

the majority of these amateurs, and this included hams who have been licensed for a few years, had little or no knowledge of the subject.

There is almost an infinite number of uses for neon bulbs and gaseous voltage regulators in amateur radio, far too many, in fact, to try to list them all in one article. However, some of the more popular uses are well worth bringing to the attention of newcomers.

A neon bulb consists of two electrodes, or plates, separated by a small gap, surrounded by neon gas, and enclosed in a glass envelope. When a voltage of enough magnitude is applied to the electrodes, current will flow and the bulb will light up with a reddish glow. The value of voltage necessary to cause the bulb to light is called the *starting* voltage. One of the outstanding features of neon bulbs and voltage regulator tubes is that the voltage drop across the tube will remain constant over a moderately wide current range. In the case of voltage regulator tubes (VR tubes) this current range is usually from about 5 to 40 ma. There are many applications where a regulated low voltage is needed, and VR tubes are ideal in such cases. Complete details on uses of VR tubes as voltage regulators are given in the voltage stabilization section of *The Radio Amateur's Handbook*.

However, our main interest in this article is not with neon bulbs used as voltage regulators, but some hints and kinks for their uses in other applications.

Code-Practice Oscillator

Because a neon bulb will serve as an oscillator, a very simple code-practice oscillator can be constructed using an NE-2 bulb. As can be seen from Fig. 1, the code-practice oscillator consists of a neon bulb, condenser, resistor, 90-volt d.c. power source, headphones and key. If batteries are used for a power source, the

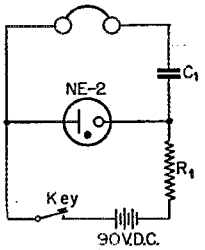


Fig. 1 — Circuit diagram for the code-practice oscillator.

C_1 — 0.002-μfd. paper.
R_1 — 1.5 megohm.

smallest size batteries available will be sufficient for the purpose. The current flow in the oscillator is less than 0.1 ma., so the batteries will last almost as long as their normal shelf life.

If the audio note in the oscillator is not pleasing to your ear, it is possible to increase the frequency of the note by changing C_1 to 0.001 μfd. or less. Increasing the value of C_1 will lower the audio note.

If it is desired to use the oscillator as a keying monitor, the unit should be connected to the key in such a manner so as not to affect the transmitter. This can be accomplished by using a keying relay. It is worth mentioning in passing that a good source for the NE-2 bulbs is discarded fluorescent light starters.

Tone Modulator

Another application for a neon bulb, particularly suited to the Novice interested in 2-meter c.w. work, is a tone modulator. It should be explained before going further that, except for special purposes, tone modulation is only permitted on 11 meters, 6 meters and below. Fig. 2 shows the circuit diagram for this type of modulator. T_1 will be either a plate-to-single-grid or a plate-to-push-pull-grids transformer, depending on the speech amplifier

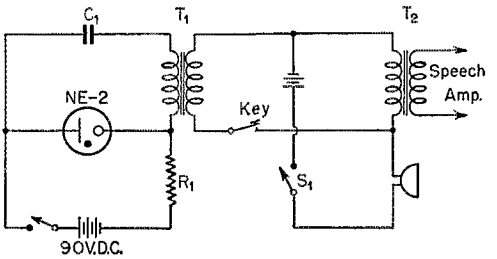


Fig. 2 — Circuit diagram for the tone modulator.
C_1 — 0.002-μfd. paper.
R_1 — 1.5 megohm.
T_1 — Plate-to-line transformer.
T_2 — Microphone transformer.

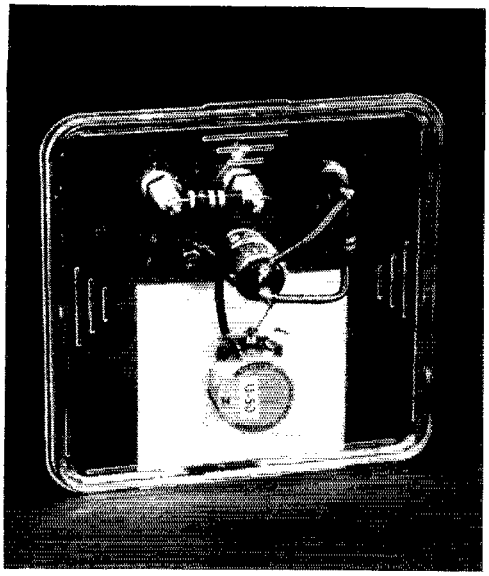
input. As with the code-practice oscillator, the value of C_1 can be changed to obtain a different tone. By installing a switch, S_1, between the key and the microphone input, it is possible to switch the microphone out of the circuit.

R. F. Testing

One of the most handy uses for neon bulbs is that of checking for the presence of r.f. in a circuit. One of the characteristics of neon bulbs is that when they are brought into close proximity with an r.f. field, they will glow. It isn't necessary for the bulb to be connected directly to the circuit for this phenomenon to take place. If the field is strong enough, the neon bulb will light without direct connections. For example, it is possible to hold a small neon tube such as an NE-2 or NE-45 by the glass bulb, with the base touching "hot" portions of an oscillator plate circuit and, if there is r.f. present, the bulb will glow. It is even possible in some cases to have one of the small bulbs glow when touched to the crystal contacts in a crystal oscillator. It is obvious how useful such an indicator would be for checking to see if various circuits in a transmitter are working. By starting at the oscillator and working through the transmitter right up to the output, it can be quickly determined if there is r.f. present at the input and output of each stage.

Testing for Parasitics

Another useful characteristic of neon bulbs when checking r.f. is the color of the neon gas when it glows. At low frequencies, the color is in



Bottom view of the voltmeter showing the placement of parts. No socket was used for the neon bulb. A stiff loop of wire is soldered to the side of the bulb shank and the end of the loop is mounted under a nut and bolt in order to hold the bulb solid. The leads to the base contacts of the neon bulb are soldered directly to the base contacts. Caution should be observed in soldering so that the contacts are not shorted to the bulb shank.

the red spectrum. At very high frequencies, from approximately 50 Mc. and up, the color becomes violet or purple. This is useful in determining the frequency of a parasitic. There are two common types of parasitics that plague hams, low-frequency parasitics, usually between 30 to 1200 kc., and very high-frequency parasitics which are usually between 100 to 200 Mc. The method for this type of testing is simple. When an amplifier is "taking off," or to be more explicit, when there is r.f. output with no excitation from a previous stage, it is quite possible that the cause is due to parasitic oscillation. A neon bulb touched to the output of such a stage will show either a reddish or purplish glow. If it shows red, then one should look for a low-frequency parasitic, while if it shows purple, look for a v.h.f. parasitic. Incidentally, 807 r.f. amplifiers are particularly subject to v.h.f. parasitics. However, a word of caution — be sure that you are using a *neon* bulb for such a check; there are bulbs available that are filled with argon gas and they will glow blue or purple at low frequencies. The designations on argon bulbs are AR, while for neon it is NE. The cause and cure of parasitics is described in detail in *The Radio Amateur's Handbook*.

Neutralizing Indicator

Another handy use for a neon bulb is indicating the need for neutralization of the tank circuit of an amplifier. With the *plate and screen voltages disconnected*, but with the preceding stages running, touch the base of a neon bulb to the plate tank coil and tune the tank condenser through resonance. If the neon bulb lights, it usually means the amplifier needs to be neutralized. With the neon bulb *lit*, adjust the neutralizing condenser until the bulb goes out. Tune the plate tank condenser through resonance again to make sure the bulb stays out. This is a useful test, but it is not the most sensitive neutralizing test there is, particularly for a low-powered transmitter.

Neon bulbs can also be used as indicators for showing r.f. voltage in antenna feeders. When coupled close to antenna feeders, the neon bulb will glow. Maximum brilliance in the neon bulb indicates maximum voltage at the feeders. Keeping an eye on the neon bulb, it becomes a simple matter to tune the transmitter and antenna coupler for maximum output.

Fixed Bias Source

A system for obtaining fixed bias that is used by many hams is shown in Fig. 3. This system eliminates the need for a fixed bias power supply but still provides fixed bias! The neon bulb or VR tube used in the circuit will depend on the grid voltage and current needed to excite the stage being biased. When the grid driving voltage is applied to the stage, the neon bulb is lighted, and a charge is put on the condenser, C_1. When the excitation voltage is removed, or the key is opened, the neon bulb goes out and the voltage charge that remains in the condenser acts to keep the amplifier tube biased. The charge on the condenser has been known to hold protective

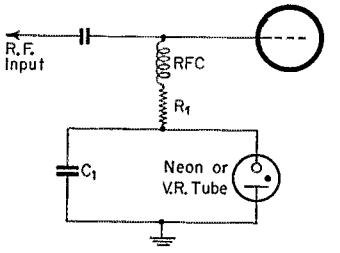


Fig. 3 — Circuit diagram for bias supply.
C_1 — 0.001-μfd. or larger mica or good paper of sufficient voltage rating.
R_1 — Grid resistor to provide operating bias.

bias for as long as 8 hours. Whenever the transmitter is turned on, excitation voltage should be applied to the grid to charge the condenser before turning on the amplifier plate voltage. This is an inexpensive method for obtaining fixed bias and is easy to install.

Receiver Protection

Probably one of the most common uses of neon bulbs is that of protecting receiver inputs from damage by surges of r.f. voltage. With receivers using a two-wire input at the receiver terminals, the best protection is obtained by installing two ¼-watt neon bulbs. One neon bulb is connected with one of its leads to the antenna terminal and the other lead to the chassis and the other bulb is connected in the

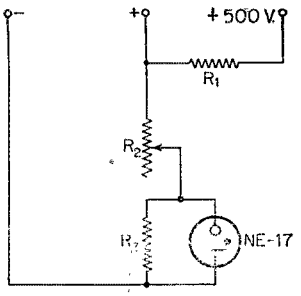


Fig. 4 — Circuit diagram for the neon bulb voltmeter.
R_1 — 0.5 megohm, 1 watt, 5 per cent tolerance (gold band).
R_2 — 0.5 megohm variable (Mallory Midgetrol U-50).
R_3 — 68,000 ohms, ½ watt.

same manner to the other antenna terminal. In the case of a single-wire antenna lead, one neon bulb is connected with one lead to the antenna terminal and the other lead to the chassis. When an r.f. voltage exceeding the starting point of the neon bulb is developed across the antenna terminals, the bulb will ignite. This affords a measure of protection for the receiver input because the r.f. voltage is usually reduced to a point where the receiver can handle it.

TABLE I

The table given below will prove a handy reference source in determining the type of neon bulb needed for a particular application. Base-mounted resistors are supplied with the bulbs and must be removed for all applications described in this article except under "R.F. Testing," "Parasitics," and "Neutralizing."

Bulb No.	*Watts*	*Starting Voltage A.C.*	*Starting Voltage D.C.*	*Series Resistance Ohms*
NE-2	1/25	65	90	External 200,000
NE-51	1/25	65	90	External 200,000
NE-45	¼	65	90	In Base 30,000
NE-48	¼	65	90	External 30,000
NE-57	¼	55	70	In Base 30,000
NE-17	¼	55	70	External 30,000
NE-58	½	65	90	In Base 100,000
NE-30	1	60	85	In Base 7,500
NE-32	1	60	85	External 7,500
NE-56	1	60	85	In Base 33,000
NE-34	2	60	85	In Base 3,500
NE-40	3	60	85	In Base 2,200

An A.C.-D.C. Neon Voltmeter

This last gadget using a neon bulb could truthfully be called the "pièce de résistance" because of its usefulness and low cost. Most newcomers to amateur radio put all their money into their transmitters and receivers and have little of the green stuff left for purchasing test equipment. One of the most important test instruments around the shack is a device called a voltmeter, for measuring a.c. and d.c. voltages. Fig. 4 shows the circuit diagram for a very simple low-cost neon indicator that will measure any a.c. voltage between 100 and 900 volts, and any d.c. voltage between 100 and 1000 volts.

The voltmeter uses an NE-17 neon bulb for an indicator as this particular type has a lower starting voltage than most other types. The lid of a plastic sandwich box was used as a chassis for the voltmeter described here. This

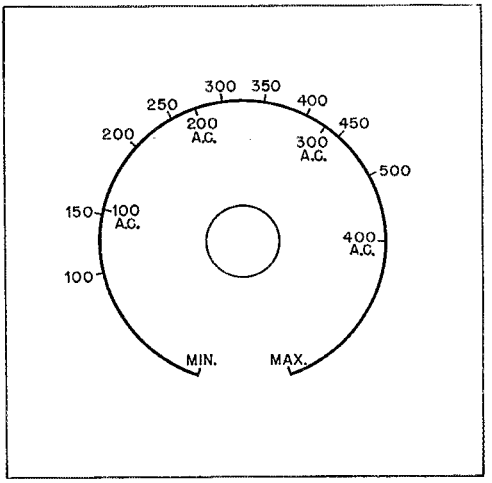


Fig. 5 — Drawing of a dial scale for the neon bulb voltmeter. This scale can be traced on another piece of paper or cut out and mounted on a piece of cardboard and used in the voltmeter construction.

makes an inexpensive mounting and affords excellent insulation. Whatever type of chassis is used in constructing the voltmeter, be sure to allow a 2½-inch square space around the shaft of R_2. This will allow enough space to accommodate the drawing of the calibrated voltmeter dial that is included in this article. The drawing can be traced or cut out and then mounted on a piece of stiff cardboard. Several different NE-17 bulbs were tried in the unit described here and all showed the same starting voltage, so the dial calibrations should hold true for any units that are constructed according to Fig. 4.

The base contact of the NE-17 should be wired so glow appears around the outer electrode when a positive voltage is applied to the positive terminal of the voltmeter. If the inner plate glows first when correct polarity is applied to the positive and negative terminals, the calibrated dial will read higher on all volt-

(*Continued on page 112*)

The loading coil is mounted on the rear apron. The rear whip is supported at the bottom by the coil mounting, and above by a stand-off insulator.

QSYing the 75-Meter Mobile Antenna

A Tuned Loop for Dashboard Control

BY WILLIAM W. VARNEDOE, JR.,* W4TKL

• W4TKL has found that a tuned-loop antenna is a simple solution to the QSY problem in 75-meter mobile work. It gets out, too!

THE center-loaded whip, with various types of capacity hats, has become so common as a mobile antenna that car radiators have almost become a closed subject. There are drawbacks, however, to this type of skywire, the chief of which is its essentially single-frequency loading unless the center loading coil is readjusted. The antenna shown overcomes this objection.

There were two factors which led the author to consider other designs — the above-mentioned QSY problem, and a financial problem. I wanted to build my entire antenna from the scrap box if possible.

In a bull session at the club one night, W4FOG suggested a tuned loop. Since the loop can be tuned with a condenser, mounting this condenser conveniently on the dash would make the system easy to load over the entire band from the operator's position under the wheel. The scrap box was put to work by supplying a 4-foot, ⅜-inch-diameter brass rod which was mounted with a stand-off on the rear-bumper skirt. This rod was tied at its top to the b.c. whip with some No. 14 bare copper wire. A second b.c. whip would have worked as well, but the rod was available and a bit stiffer.

The first circuit to be tried was that shown in Fig. 1. The bottom of the rod at the rear was connected to the tuning condenser and loading coil at the instrument panel by an insulated wire running underneath the car. The antenna took its load nicely, but put out a disappointingly weak signal. So the modification shown in Fig. 2 was used in order to take advantage of the car body as a radiator. The pipe at the rear was grounded to the car body and the loading coil

* 411 Locust St., Huntsville, Alabama.

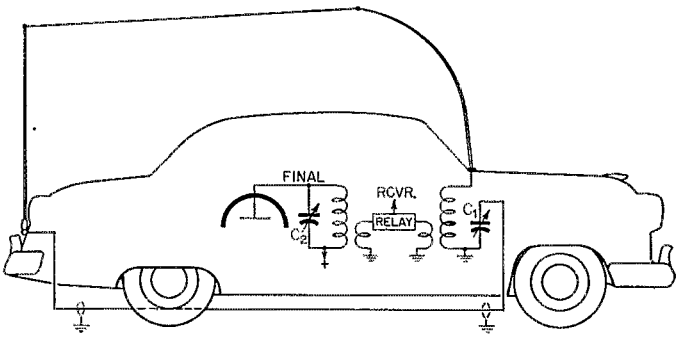


Fig. 1 — The first loop tried was grounded only at the bottom of the loading coil. An insulated wire running underneath the car connected the bottom of the rear whip with the tuning condenser C_1.

was also grounded at the dashboard. This called for mounting the condenser C_1 above ground, and the use of a large plastic knob to avoid body-capacity effects. With this arrangement a neon bulb would light only along the front whip. The final modification, shown in Fig. 3, consisted of moving the main portion of the inductance to the rear. The bottom of the rod at the rear is insulated and the loading coil connected between the bottom end of the rod and chassis. With this circuit the neon bulb would light anywhere on the antenna. The loading coil consists of 16 turns No. 18 wire, 1⅜ inches in diameter, 1 1/16 inches long. I used a threaded ceramic form. The condenser is a 140-$\mu\mu$fd. variable.

After several weeks of operating, the locals tell me that it puts out a signal as strong as the best and better than most mobile rigs. The system will load to a maximum from 2.5 Mc. to 5 Mc. The transmitter in use at W4TKL is a McMurdo-Silver using an 807 in the final in a conventional circuit. A PE-103 supplies about 550 volts, and the transmitter is loaded to about 40 watts throughout the 75-meter band.

In adjusting the antenna, first dip the plate current with the tank condenser. Then peak with C_1, redip with the tank condenser, but do not readjust C_1. A little practice with a neon bulb held at the antenna will give a good idea of how to interpret the plate-meter readings and the settings of the two condensers. Taps on the loading coil will, of course, make the antenna all-band.

The loop is not without its drawbacks. It looks a bit odd — locally it is called the clothesline antenna. But then, a glance at some of the capacity hats in use will make it seem less strange. This antenna has a typical loop pattern, as shown in Fig. 4. However, it will be noticed that there are no real nulls. The scale of Fig. 4 is in db., but the readings themselves are arbitrary, since the receiver making the readings was not calibrated. The receiver was located about 1½ miles away for the check. Few mobile antennas have circular patterns.

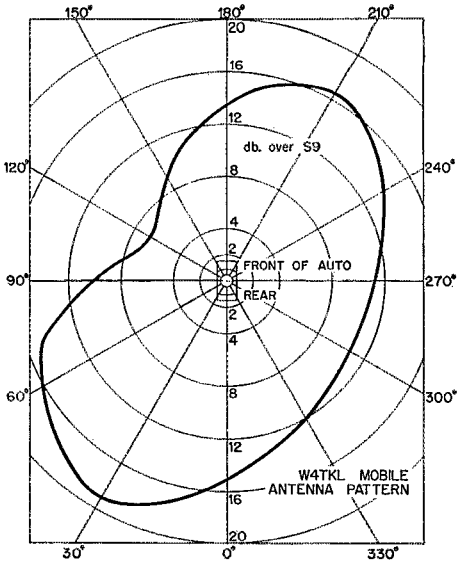


Fig. 4 — Field-strength pattern of the 75-meter mobile loop antenna.

It may be that this system, if raised to the height of most whips, would give even better results. Anyhow, I can only hope these words will stimulate others in this direction, or relieve the fellow who buys a fancy VFO transmitter only to find his center-loaded whip won't load over more than plus or minus 10 kc.

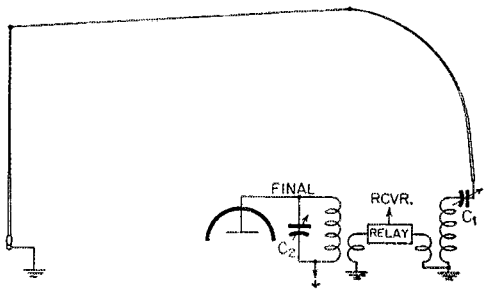


Fig. 3 — In the final arrangement, the loading coil was moved to the rear apron. This eliminated body-capacity effects at C_1 and the neon bulb lighted over the entire length of the antenna.

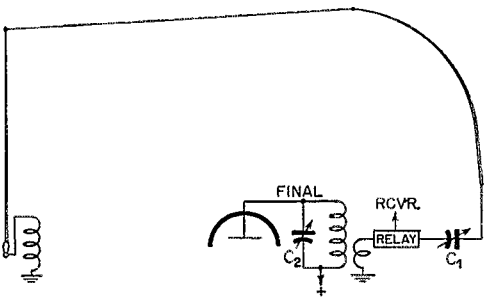


Fig. 2 — With the rear whip grounded and the loading coil up front, the tuning condenser C_1 was "hot," and a neon bulb would light only along the front whip.

Magnetostriction Devices and Mechanical Filters for Radio Frequencies

Part II† — Filter Applications

BY WALTER VAN B. ROBERTS,* W2CHO

• **In the second part of this article, some applications of mechanical resonators are discussed and a general description is given of a mechanical filter suitable for intermediate frequencies.**

Some Uses for Single Mechanical Resonators

The use of a ferrite resonator as a high-Q tank circuit for an oscillator was discussed in the preceding article. An oscillator using a transistor instead of a tube, and requiring only two or three flashlight cells at negligible current drain, makes a compact portable source of known-frequency oscillations of a few hundred kilocycles or less. The frequency decreases less than 0.002 per cent per degree Fahrenheit increase of temperature. A circuit is shown in Fig. 13. Harmonics useful for checking receiver calibration can be heard, at least to 30 Mc., by directly connecting the emitter to the receiver antenna terminal (single-wire connection only).

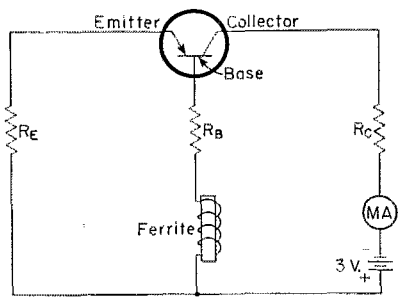


Fig. 13 — Ferrite oscillator using point-contact transistor. Values should be adjustable for best results, although R_C, used to limit the collector current, can be a fixed resistor of 500 ohms. R_B (1000-ohm variable suggested) will not be needed with a good ferrite and transistor. R_E should be approximately 5000 ohms. Two good ferrite shapes are torsion cylinders and concentric-shear disks. As an example of such a disk, a frequency of 273 kc. was obtained with a disk of 25.4 mm. outer diameter and 9.5 mm. inner diameter. The disk is put over the end of a short ferrite core that fills most of the hole, and the coil goes over the middle of the core. Coil inductance is not critical but too much inductance may start electrical oscillations. *MA* is a low-range milliammeter (current about 0.5 ma.)

It has been noted that the association of a ferrite resonator with a coil has the same effect as inserting, in series with the coil, a high-Q parallel-tuned circuit. The impedance of this circuit at resonance is k^2Q times the coil reactance, where k is the coefficient of coupling between the coil and the resonator and Q is the mechanical Q of the resonator. Thus if, for example, $k = 0.05$ and $Q = 2000$, the resonator effectively inserts in the coil a resistance five times as great as its own reactance. Even if k is very small, a noticeable effect is produced. One application of this effect is illustrated in Fig. 14, which shows an i.f. transformer in a receiver equipped with a Magic Eye tuning indicator. A small ferrite ring, permanently biased as previously described, is slipped over the lead to a coil, and tuned to resonate in the radial mode at the center of the i.f. passband. The coupling to the entire tuned circuit is very small because the main part of the coil is not associated with the ring at all, but at resonance the ring inserts about one ohm in series with the coil and this is enough to cause a flick in the Magic Eye, and thus indicate correct tuning. Such an indicator would be useful in a high-fidelity receiver where the shadow of the eye does not change noticeably over a considerable range of tuning.

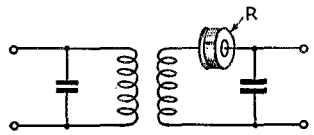


Fig. 14 — Ferrite magnetostrictive ring used as a resonance indicator in an i.f. amplifier.

Perhaps the simplest use of a single ferrite resonator in a filter is to substitute the resonator for the middle circuit of a three-circuit filter, as shown in Fig. 15. The only difficulty here is the necessity for eliminating any appreciable direct coupling between coils by way of the ferrite resonator, which acts as a core common to the two coils. This is done by using a resonator several half waves long and putting a copper tube over the middle part, as shown by the dotted lines. This tube is grounded to ordinary shielding between circuits. The longer the tube and the

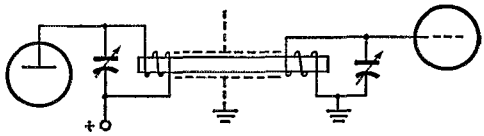


Fig. 15 — Simple filter using a magnetostrictive ferrite rod. Dashed lines indicate how a copper tube may be slipped over the rod to reduce coupling between the coils at the ends

* 155 Hodge Road, Princeton, N. J.

† Part I of this article appeared in June, '53, *QST*.

smaller its diameter, the more effective it is, but if it is made very long the filter band will have to be narrow. This is because the bandwidth varies with the coefficients of coupling between the resonator and the tuned circuits and these coefficients vary inversely with the square root of the number of half waves in the resonator. For example, if a coefficient of 6 per cent is available between a half-wave resonator and its coil, then if we use a four-half-waves-long resonator with a coil on only the end half wave, the coupling between the coil and whole resonator will be only 3 per cent and the bandwidth about 4.2 per cent. The band could easily be made as small as desired by using a very long resonator or by coupling the coils more loosely to its ends, except for the fact that the Q of the coils must be approximately equal to the reciprocal of the bandwidth expressed as a fraction, and this puts a

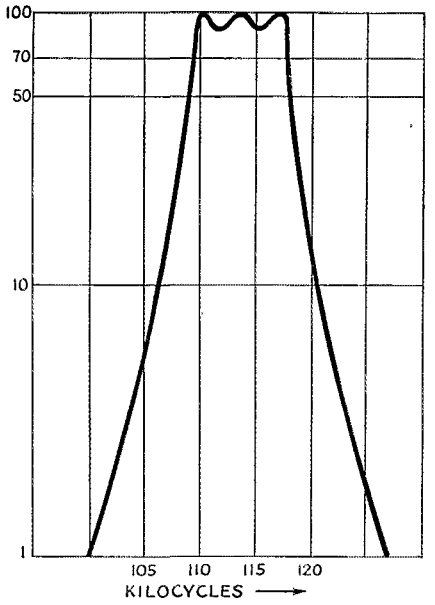


Fig. 16 — Measured resonance curve of a filter constructed as in Fig. 15.

lower limit to bandwidth. For example, if the best Q available is 200, then the narrowest band obtainable will be about ½ per cent. Fortunately, the range of about ½ to 4 per cent bandwidth is sufficient for many purposes.

The theoretical relations between bandwidth, coefficients of coupling, and coil Qs to produce a desired transmission characteristic will be taken up later, but in practice a filter of the sort shown in Fig. 15 can most easily be tuned up by cut-and-try, the couplings, tunings and Qs being varied until a satisfactory filter curve is obtained. As an example, Fig. 16 shows the measured curve of output voltage of a filter employing a torsion ferrite ¼ inch in diameter and three half waves long, and adjusted to give a 1.3 db. peak-to-valley ratio.

Another way to eliminate direct coupling

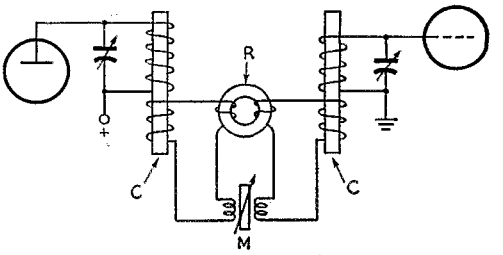


Fig. 17 — Filter using a toroidal ferrite magnetostriction resonator, with separate mutual inductance for bucking out coupling between input and output coils.

between the circuits of a filter using a single ferrite resonator is to buck it out by means of an equal but opposite mutual inductance. This method permits using resonators which are not adapted to the shielding described above. As an example, Fig. 17 shows a ferrite ring resonator and a bucking mutual inductance M which can be adjusted by moving a core or by varying the separation between coils. In this figure R represents a radial-type ferrite resonator, and as it is not practical to wind many turns on such a torus, a few turns only are used in a link circuit coupled to the tuned circuit by a core C which is preferably composed of a nonmagnetostrictive ferrite that gives the coils a high Q. When M is adjusted for accurate balance, the performance is similar to that of Fig. 16, but by a slight unbalance the cut-off can be made steeper on one side of the passband or the other.

It is possible to use another resonator, tuned to a different frequency, to act as the bucking mutual and thus obtain a lattice filter with four-circuit performance. In fact, it is easy to construct a lattice filter with any number of resonators, but in practice the adjustments of such a filter are so complicated that for more than one resonator it is better to use the cascade type of filter to be described later.

Before leaving the subject of filters employing a single ferrite resonator, one more might be

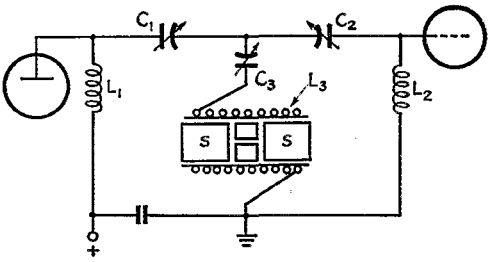


Fig. 18 — Filter with two rejection points, corresponding to m-derived type, employing a ferrite ring magnetostriction resonator. The latter, shown in cross-section, is mounted inside the form on which L_3 is wound and is flanked by nonmagnetostrictive slugs (S) to increase the coupling.

mentioned because it provides rejection points on each side of the passband. Fig. 18 shows the arrangement used in an experimental circuit giving nearly flat response over a band of 6.8 kc.

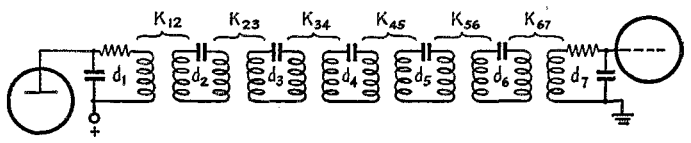


Fig. 19 — Multielement filter consisting of a chain of coupled circuits tuned to the same frequency.

at 455 kc., with rejection points 13.6 kc. apart and about 40 db. down.

In this filter a permanently-magnetized ring of ferrite is used in the torsional mode, its axial length being ground to resonate at 455 kc. This is placed inside a close-fitting coil form on which L_3 is wound, and is flanked by slugs S of inert ferrite which increase the coupling between the resonator and coil L_3. By reference to the equivalent circuit of Fig. 5 it can be seen that this is a filter of the "m-derived" type. It can be systematically tuned as follows: with C_1 and C_2 detuned, there is a sharp response at the frequency of the ferrite. With the input set to this frequency, a jumper is connected between the junction of the three condensers and ground, then circuits C_1L_1 and C_2L_2 are peaked up. (They tune substantially independently since they are coupled only by the small inductance of the jumper.) Next, the jumper is removed and C_3 adjusted until the rejection points are properly located on either side of the passband. The spacing between rejection points, as a fraction of the midband frequency, is the same as the coefficient of coupling (k) between the resonator and L_3. The bandwidth is

$$k\sqrt{\frac{L_3}{L_3+\frac{L_1L_2}{L_1+L_2}}}$$

again as a fraction of midband frequency. Thus, if all three coils are alike, the band is 0.82 k. Note that the ratio of spacing between rejection points to spacing between cut-off frequencies depends only on the inductances. Flatness of transmission in the passband is obtained by adjusting the Qs of coils L_1 and L_2. The Q of coil L_3, however, should be made as high as possible by using large-size Litz wire.

The Use of Ferrites in Multielement Filters

The simplest sort of multielement electrical filter is a chain of coupled circuits as shown in Fig. 19, all circuits being tuned alike.

In this figure the ks represent the coefficients of coupling between adjacent circuits, and as explained before, the coefficient of coupling between any pair of circuits is equal to the fractional difference in frequency between the two response peaks that would be observed if the same two like-tuned, high-Q circuits were used as a two-circuit filter, like an ordinary double-tuned i.f. transformer. In other words, if we want to make $k_{23} = 0.03$, for example, we would remove circuits 2 and 3 and use them as an i.f. transformer, increasing the coupling until the transmission shows twin peaks separated by 0.03 fractional (or 3 per cent) in frequency. The ds represent the dampings of the circuits, and in what follows, d is defined as $1/Q$ for each circuit.

Now, any combination of ks and ds will result in some sort of frequency selective transmission or filter characteristic, but the ks and ds must be chosen in accordance with appropriate equations to produce particular types of filters. Let us start by supposing that the dampings are so small as to be negligible, except those of the end circuits. Also let the desired fractional bandwidth be B. Then if we make the first and last coefficients of coupling each $0.707B$ and the other couplings each $0.5B$ while the damping of each end circuit is made equal to B, the result is what may be called a simple Campbell filter. The only trouble with this filter is that it has "ripples" toward the edges of the passband, although the transmission is quite flat around midband. However, if there are not too many circuits in the filter, the ripples near the edges of the band can be reduced, at the cost of introducing some ripple at midband, by reducing the dampings somewhat from the value given above. Very satisfactory characteristics can be obtained in this manner up to 5 or 6 circuits, but as the number of circuits is increased, the ripple gets worse.

In another type of filter called the Tchybescheff, the ks and ds are so chosen that ripples occur all through the passband, but the peaks are all equal and the valleys are all equal and the peak-to-valley ratio can be made as small as desired by suitable choice of the ks and ds. It might well be asked why then not design the filter for zero ripple? This, in fact, is easily done, and formulas for doing so are given by Dishal [1] both for filters with coupling and damping values symmetrical about the center of the chain of circuits, and for filters with damping at one end

(Continued on page 118)

[1] Dishal, "Alignment and Adjustment of Synchronously Tuned Multiple-Resonant-Circuit Filters," *Proc. I.R.E.*, November, 1951.

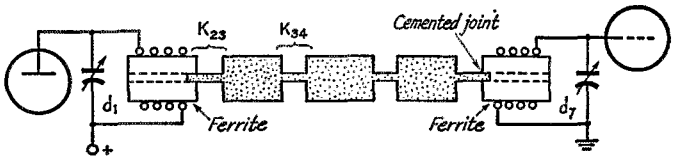


Fig. 20 — Mechanical filter analogous to the electrical circuit of Fig. 19. High-Q mechanical resonators replace the three center circuits of that figure, while the end sections are magnetostrictively coupled to the electrica circuits.

Some Notes on Frequency-Shifting Crystal Oscillators

A Series-Keyed Circuit for Wider Shift

BY MARVIN BERNSTEIN,* W2PAT

• **For the lower frequencies, it may not be possible to obtain a required amount of frequency shift by usual methods. This article discusses the keying of a capacitance in series with the crystal to produce greater shift.**

THE article about a simple radioprinter converter which appeared in the January, 1953, issue of *QST* [1] described a unit which was suitable for use at frequencies where A2 emission is legal. A number of letters have been received which have asked for information concerning the modification of this circuit to operate in the bands recently opened to carrier-frequency shift. It is suggested that the original circuit be built as described and the audio-frequency-shift oscillator output can then be used to provide local copy when transmitting.

A grounded-plate Pierce-type oscillator diagram is shown in Fig. 1. This circuit makes use of a series-keyed variable capacitor to frequency-shift the crystal unit. It has been determined

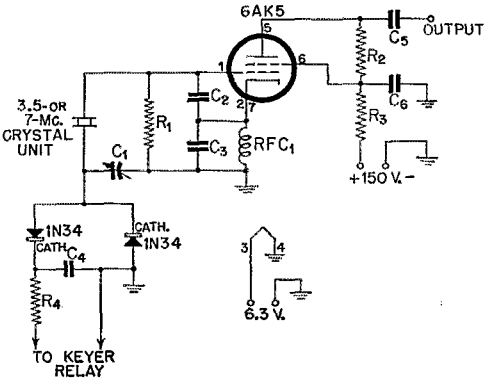


Fig. 1 — Circuit of the series frequency-shift keyer.
C_1 — 100-$\mu\mu$fd. variable.
C_2, C_3 — 56-$\mu\mu$fd. mica.
C_4, C_6 — 0.01-μfd. ceramic.
C_5 — 100-$\mu\mu$fd. mica.
R_1 — 47,000 ohms, ½ watt.
R_2 — 5600 ohms, ½ watt.
R_3, R_4 — 1000 ohms, ½ watt.
RFC_1 — 2.5-mh. r.f. choke.

that this circuit shifts the oscillator frequency by a greater percentage than the usual parallel-keyed capacitor. The load capacitance which appears across the crystal unit is about 30 $\mu\mu$fd. with the d.c. loop closed. With the d.c. loop open, the load capacitance can be varied from about 25 $\mu\mu$fd. to less than 10 $\mu\mu$fd. as C_1 is varied. The greatest percentage of frequency shift occurs at very low values of load capacitance, and the low minimum capacitance results in shifts of as much as 1000 c.p.s. for 0.5 × 0.6-inch AT-cut crystal plates operating at 3.5 Mc. and mounted in the usual small plastic type of holder.

It is suggested that a second relay be wired in series with the polar relay used in the printer. This added relay should be used to reverse-key the crystal oscillator d.c. loop circuit. This will result in the usual condition of allowing the marking carrier frequency to be higher than the spacing frequency. The only adjustment required is to vary C_1 in the marking (keyboard contacts closed) condition for a frequency 850 c.p.s. higher than the spacing frequency. The reversal of operation is caused by the reversed relay-circuit connection, since it is obvious that when the external d.c. loop of the oscillator circuit is closed, the series capacitor is short-circuited and will not affect the frequency when it is varied. When the d.c. circuit is opened, the germanium diodes appear as small capacitors in parallel with the frequency-shift-adjusted capacitor, C_1.[2]

It is possible that some of the lower-frequency crystal units, and especially if they have small quartz blanks or are of the BT cut, will not shift the required 850 c.p.s. In this case it may be necessary to grind the electrode lands down to increase the motional capacitance of the crystal unit. The crystal holder should be disassembled and the metal electrodes removed. The electrodes will be found to have small triangular raised areas at each corner which result in the central section of the electrodes having a small air gap between it and the quartz blank. The raised electrode lands can be lapped down almost flat with the central area, but it is advisable to check the crystal-unit activity from time to time, since, if the electrode clamps the center of the quartz plate, it may fail to oscillate. Only as much of the lands should be removed as required to obtain the 850 cycles of frequency shift. The electrodes are easily lapped, and it has been found that the usual household nonabrasive cleaner is adequate as a grinding compound. A piece of flat glass or metal should be used as the lapping plate.

* 80 Belshaw Ave., Eatontown, N. J.

[1] Bernstein, "An Inexpensive Radioteletype Converter," *QST*, Jan. 1953, p. 44.

[2] Bernstein, "Crystal-Oscillator Frequency-Shift Circuits," *QST*, June, 1952, p. 48.

Remote Control with a 420-Mc. Link

Practical Ideas for Remote Operation Without Wire Circuits

BY KENNETH L. BOWLES,* W2ZGP/MTU, AND ROLF B. DYCE,* W2TTU

• Most of us think of "remote control" in terms of operating a transmitter in the attic from a control position in the basement, or vice versa, but there are cases where direct wire control is impossible or impractical. For these, FCC rules make special provision for true remote control by means of u.h.f. circuits. Here the operators of such a control circuit give us the benefit of their experience in licensing, operating and maintaining an installation involving an 18-mile radio link.

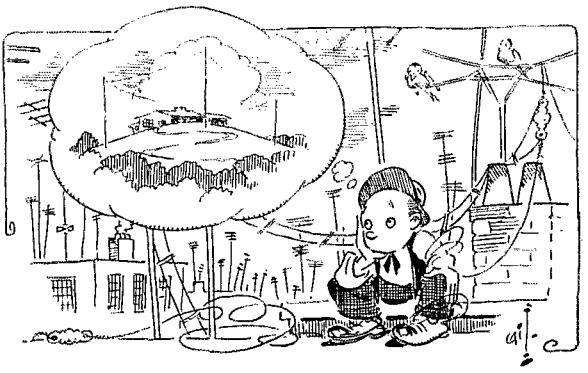
An unfavorable home location is perhaps the greatest single reason why many otherwise interested amateurs stay off the air. Whether it be the v.h.f. enthusiast in a valley, a high-power addict of the 80-meter band in an apartment house, or a 20-10-meter 'phone man in a television area, all are forced to curtail their operating because of environment. Remote control should offer an answer to some who are hampered by such difficulties.

Remote control is defined in Section 12.7 of the FCC Rules Governing Amateur Radio Service as "control of transmitting equipment of an amateur station from an operating position other than one at which the transmitter is in view and immediately accessible." Direct *electrical* or *mechanical* control of equipment located in a place not far from the operating position is specifically exempted from this definition. The purpose of this article is to explain possibilities of true remote control as defined above, in which the transmitter and other equipment, located a distance of several miles from the operation position, are controlled by radio.

Section 12.64(b) of the Rules provides that "Authority for operation of an amateur station with the licensed operator on duty at a specific remote control point in lieu of the remote transmitter location may be granted upon filing an application for a modified station license on FCC form 610 . . . and provided that the following conditions are met: . . ." The first three subparagraphs following are the usual requirements; namely, that the equipment be located on premises controlled by the licensee, that the equipment be inaccessible to unauthorized persons, and that a copy of the license be posted at the transmitting location. Subparagraph 4 requires *continuous monitoring* of the emissions from the remote transmitter. Subparagraph 5 states that "Means shall be provided at the remote control point immediately to suspend radiation of the transmitter when there is any deviation from the terms of the station license or from the Rules." Subparagraph 6 (reproduced below) details the means of application for the remote permit and virtually requires that the planning for the remote station has reached an advanced stage before application is filed.

> 12.64(b), (6) In the event that operation of an amateur transmitter from a remote control point by radio is desired, an application for a modified station license on FCC form No. 610 . . . should be submitted with a letter requesting authority to operate in such a manner stating that the controlling transmitter at the remote location will operate within amateur frequency bands *420 megacycles or higher* and that there will be full compliance with Paragraph 12.64(b) subparagraphs (1) through (5). *Supplemental statements and diagrams should accompany the application* and show how radio remote control will be accomplished and what means will be employed to prevent unauthorized operation of the transmitter by signals other than those of the controlling unit. There should be included complete data on control channels, relays and functions of each, directional antenna design for the transmitter and receiver in the control circuit, and means employed for turning on and off the main transmitter from the remote control location. [Italics are ours.]

* Franklin Hall, Cornell University, Ithaca, N. Y.



The provisions of this last subparagraph should not scare one away.

Planning the Project

Simple equipment can often provide a completely satisfactory remote station as well as comply with the Rules of the Commission. Specifications called for in the application need not include each nut and bolt; for example, in cases where standard equipment, such as a super-heterodyne receiver or a common type of antenna is to be used, a block diagram and brief mention in the text of the application letter should suf-

fice. Careful planning before starting the project is made necessary by the requirements of the Rules, and will save much grief as work progresses. Since commercial equipment built to satisfy the needs of amateur remote control is either nonexistent or of a prohibitive cost, a large parcel of patience and a bent for experimenting and building are also required.

Many considerations will enter into the choosing of a site for the controlling station. Though the Rules allow use of "420 Mc. or higher" the 420–450 Mc. band is the only one presently available which is practical for the control link. For reliable operation a high signal level is required at the control receiver. Over distances of two or three miles in reasonably flat country, or over longer line-of-sight paths, quite simple transmitters and receivers will suffice at 430 Mc. For longer control paths more elaborate and expensive gear may be required.

Location of the equipment in a closed building is extremely desirable to aid in keeping dampness and extreme temperature troubles to a minimum. Availability of the power mains is obviously a major consideration. Buildings setting in high places such as abandoned fire towers might be ideal except that they are frequently a long distance from the nearest power line. Access to the equipment at all times of the year is important for the purpose of making changes and repairs.

The servicing problem becomes much greater as the remote station is made more elaborate. In particular, the more tubes that the equipment contains, the greater will be the possibility of failure of the whole station due to one burned-out filament. The same applies to relay failures, due mostly to dirty contacts.

Certain general procedures can be recommended to minimize servicing. Experts on tube life say that filaments and heaters will last longer if left running all the time (rather than turning them on only when equipment is to be used); that new tubes which have been "aged" for several hundred hours in operation without failure are likely to last almost indefinitely;[1] and that cathodes remain in better shape if at least a small amount of plate current is flowing at all times. Proper filament or heater voltage is very important. This is true of all tubes, especially those handling large amounts of power. Undervoltage may badly reduce emission after a few hours of operation. Overvoltage will, of course, reduce the life of heaters. These considerations and the necessity of receiver stability require that the line voltage be maintained constant to within a few volts. If a high-powered transmitter is contemplated, separate line-voltage regulation for receivers and associated low-power circuits is indicated. In each particular case, experience will reveal other preventive measures.

[1] Certain bright-filament transmitting tubes stand up longer if the filament voltage is reduced slightly during stand-by periods. This can be handled easily by means of a relay that inserts a suitable value of resistance in the filament transformer primary circuit when plate voltage is removed. A 5-volt filament may be dropped to 3.5 to 4 volts in this way, restoring the full voltage when the plate power is applied. —Ed.

The Set-up for W2MTU

For more than a year we have been operating remote station W2MTU on 50 and 144 Mc. in connection with a study of aurora borealis. Description of the station and of the basic control circuits should serve as an example of what can be done in other situations. From the standpoint of the long radio control link, our problem was an extreme case. However, only a few simultaneous control functions were required, whereas two-way work from the remote site would require several control channels for receiving in addition to transmitting.

We were interested in using our station more or less as a "Doppler radar." We wished to receive signals reflected from the aurora and beat them with a portion of the transmitted signal in order to determine the Doppler frequency shift of the reflections. From this frequency shift, the speed of whatever in the aurora was causing the reflections might be inferred. Therefore, in determining the site it was necessary to go far enough from the operating and monitoring station so that the direct signal from the transmitter would not be strong enough to overpower the auroral signal. This meant that we went out as far as possible without losing control on 430 Mc.

An unused one-room frame building located about 18 miles east of the control station was chosen. The site was about perfect for v.h.f., being on top of one of the highest hills in the region. A power line was already installed and we were able to rent the building at a reasonable cost. There was a fireplace and we soon found that a roaring fire was needed to take the chill off the place in winter. (Servicing radio equipment in below-freezing temperatures is not fun!) Unfortunately, driving up to the site was impossible from early December until early May because of snow or mud. Hence, service calls often necessitated hiking a mile over rough ground and lugging a knapsack packed with equipment. High winds and icing conditions made it necessary to anchor all antennas unusually well.

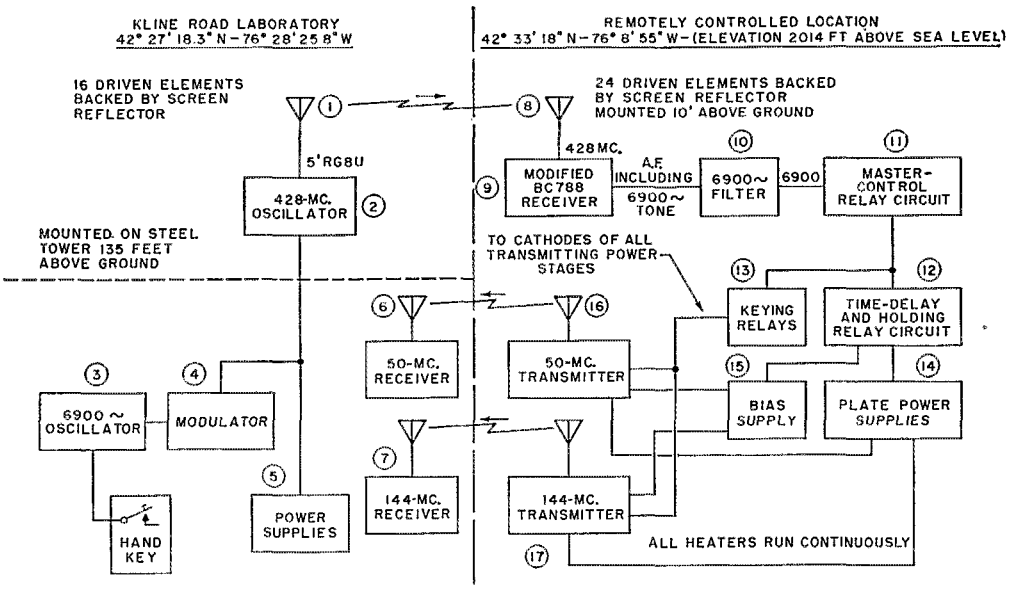


Fig. 1 — Block diagram of the remote-control system used in the operation of W2MTU over an 18-mile 420-Mc. link. This is part of the presentation used in the application made to FCC for the necessary permission. Note that only one channel is shown, in the interest of simplicity.

Topographical maps showed that, while the path of the control signal was over difficult terrain, the only serious obstacle was about a mile from the control point. This was a high point of ground more than a hundred feet above the line-of-sight path. Although large antennas were used, both for transmitting and receiving the control signal, reliable signal strength could not be obtained with the transmitting antenna situated on the roof of our small laboratory building housing the control position. Since a high steel tower was available on the property, we finally mounted our transmitting antenna 135 feet above ground, resulting in a remarkable gain in signal strength. The antenna at the receiving end was simply mounted on the roof of the shack as height above a few wavelengths was unimportant there.

The 430-Mc. transmitter originally employed was a simple push-pull oscillator using 316-A doorknob tubes[2] running at reduced power input of about 30 watts. This was mounted in a weather-proof box and placed in the tower within a few feet of the antenna. Such a high location for the antenna and transmitter is, of course, unusual. Aside from servicing problems presented by height, this transmitter was extremely simple and cheap to build, yet quite satisfactory for the job. At present, a higher-powered crystal-controlled transmitter feeds the antenna from the laboratory through 350 feet of open-wire transmission line.

The control receiver was a converted BC-788 altimeter. These and other similar sets such as the APS-13 are available on the surplus market at a reasonable price and take very little work to convert for use on 430 Mc. Where available, the ASB-7 radar receiver may do even better, as it has a stage of r.f. amplification. Almost any superheterodyne receiver in the 420–450 Mc. range will do the job. It is suggested that a superregenerative receiver not be used, as its performance is difficult to maintain within close limits for months at a time without attention.

[2] Tilton, "A Doorknob Oscillator for 420 Mc.," *QST*, January, 1949, p. 29.

The Control Channels

We wished to provide a variety of control functions in the remote equipment. Since there was no multitude of direct wires to work with, we were limited in the number of channels of information which could be transmitted. The final arrangement involved two channels plus provision for transmission of speech. The first channel utilized a keyed 7000-cycle tone amplitude modulating the 430-Mc. carrier. A sensing device at the receiver responded to the tone and operated a keying relay. A selective audio filter tuned to 7000 c.p.s. greatly improved the noise rejection of this system and also reduced the possibility that other stations or other types of interference might take control. Through a circuit involving delay relays, this keying relay first turned on the high voltage and then keyed the transmitter. The requirement that the tone be present for a full 5 seconds before activation of the power supplies assured that noise pulses or other interference would not put the station on the air. A delay relay held the power on until two minutes after the last transmission of tone.

For the second channel of information we used the carrier of the 430-Mc. control signal. A telephone dial interrupted the carrier briefly a number of times equal to the number dialed. At the receiving end a stepping relay, controlled by the filtered d.c. output of the receiver detector,

translated the number of pulses "dialed up" into a desired circuit combination. This allowed the operator to switch from one transmitter to another, to change transmitter power input, to switch antennas, to change transmitter frequency, to reset circuit breakers, and to change from 'phone to c.w. The stepping relay we used provided 25 possible combinations of which only a few were needed. Switching the carrier off for a few seconds allowed a delay relay to return the stepper relay to the start position. Circuit descriptions and diagrams for this and the other circuits mentioned above appear in the appendix.

Carrier vs. Tone

After several months of operation we realized that the use of the *carrier* for the second control channel was more trouble than it was worth. As anyone who has used v.h.f. receivers knows, it is common for a rushing sound to issue from the 'speaker most of the time. This is because the gain of the set is turned up in order to receive signals which are of the same order of strength as the inherent noise of the receiver. The inherent noise manifests itself in the above control system as a constant d.c. output even when no signal is being received. This constant output can be bucked out by a battery to a certain extent but fluctuations will still occur. Hence, d.c. output due to noise must be accounted for. For reliable operation one must have a carrier sufficiently strong to produce a voltage in the detector several times the maximum noise voltage encountered. When one considers variations in signal strength due to weather conditions along the path, the passage of airplanes in the vicinity, the wetting and icing of antennas, or the instability of receiver gain, it becomes apparent that a formidable signal strength is required. We strongly recommend, therefore, that a controlling system using an audio tone be used in preference to control by the carrier.

A very stable audio oscillator can be constructed without much trouble. The improvement in signal-to-noise ratio available with an audio tone system is mainly dependent on how narrow a filter one is willing to make. Any number of such tones can be used, provided that the audio frequencies chosen are separated sufficiently. The actual frequencies chosen will depend upon two opposing factors. It is difficult to find high-Q coils for low-audio frequencies as they become prohibitively large. However, the upper choice of audio frequency is limited by the response of the modulator in the control transmitter, particularly by the modulation transformer itself. The range under about 3500 c.p.s. can be reserved for speech. Use of f.m. would get around the difficulty and also reduce costs. A further advantage inherent in the audio-tone controlling system is that the narrow audio filter allows wider i.f. bandwidths to be used. In cases where there is trouble with drift of the receiver local oscillator frequency and/or of the control transmitter frequency, a wide i.f. bandwidth will make adjustments both less critical and less frequent. At the same time the audio filter determines the signal-to-noise ratio since it has a bandpass much narrower than the i.f. system. Use of amplitude modulation would

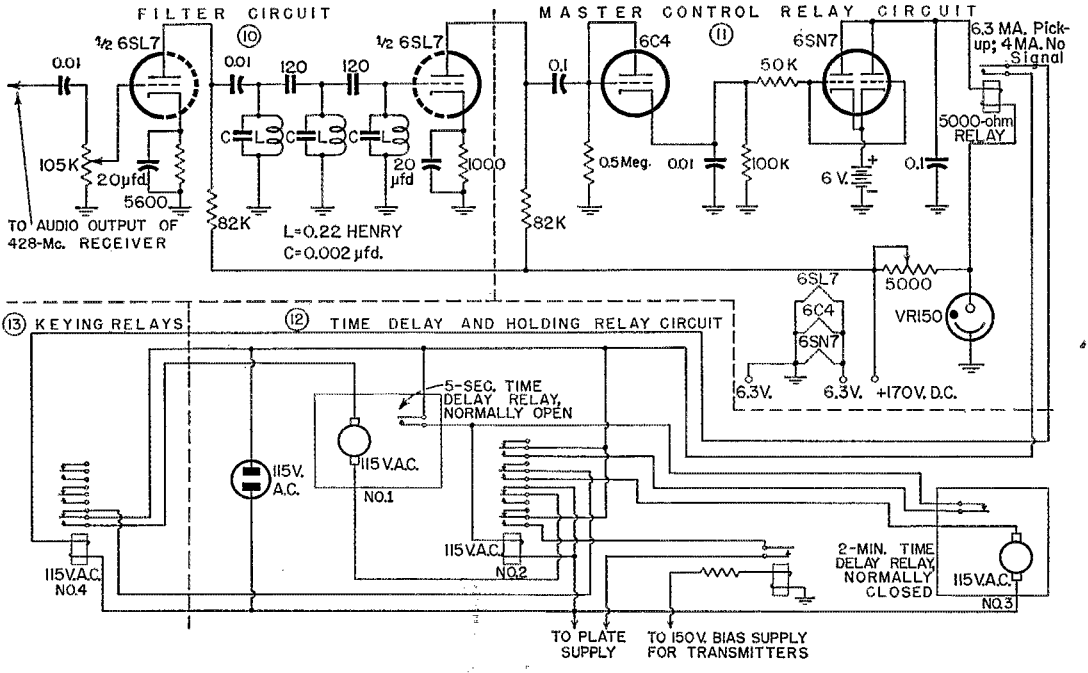


Fig. 2 — Diagram of the special control circuits, also included with the application to FCC. Circled numbers included in each section separated by dashed lines indicate the portions of the over-all system, Fig. 1.

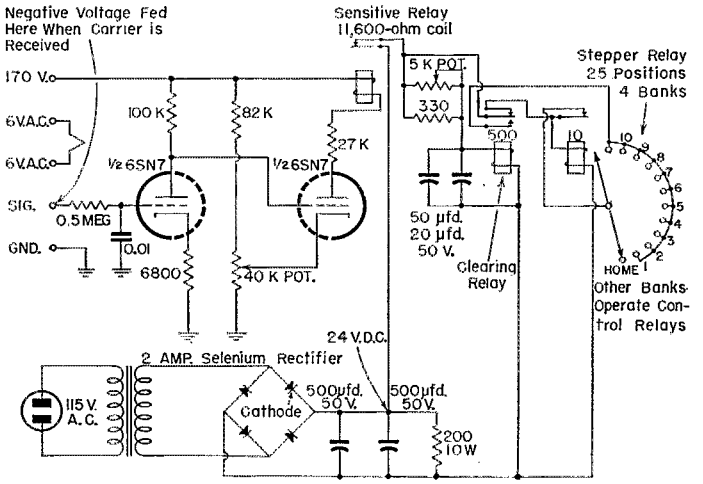


Fig. 3 — Schematic diagram of the remote circuit dialing system.

have an edge over frequency modulation in such a situation as the latter seems to be rather critical of adjustment, usually due to imperfect discriminator characteristics.

The imaginative amateur can think of many embellishments to the system described above. For one thing, no mention has been made of a remotely-controlled receiver to complement the controlled transmitter. A separate channel on, say, 440 Mc. could be used to relay received information back to the operator. Of course, provision would have to be made to identify the transmission on such a channel in keeping with the regulations. Tuning of the receiver could be accomplished by using one or more control channels to operate a tuning motor. A similar system could be used to rotate antennas. So you see the fun in remote control has just begun.

Appendix

The material to follow will serve a dual purpose. It explains the workings of the remote control system as used for W2MTU, and it shows the form of the presentation made to FCC in the application for the remote-control permit.

Fig. 1 is an over-all block diagram of the entire system, showing the control position at the lower left and the remote station at the right. Note that each unit of the complete set-up is given a circled number. In the application supplementary sheets accompanied the drawing, identifying and describing briefly each of these numbered parts. The 428-Mc. oscillator mounted atop the tower, shown in the drawing, was later replaced by a higher-powered crystal-controlled transmitter installed in the control room. This fed an antenna system at the top of the tower through 350 feet of open-wire line.

The diagram of the special control circuits, Fig. 2, was also included in the application. The audio output of the 428-Mc. receiver proceeds from the upper left through a filter unit to the master control relay circuit at the upper right. There it is rectified, filtered into d.c. and applied to a 6SN7. When the sensitive relay in the 6SN7 plate circuit closes, it actuates relay No. 4, starting the synchronous motor of the 5-second delay relay, No. 1. When relay No. 1 closes, it works relay No. 2, which holds itself closed through the contacts of the delay relay No. 3, which then starts to run. Relay No. 1 meantime returns to its normally-open position. Relay No. 3 is running only when No. 4 is open, corresponding to "key up" conditions. With No. 2 closed, the power supplies are operative, so that the transmitters are on the air whenever No. 4 is closed, corresponding to "key down" conditions. If No. 4 is left open (key up) for two minutes, then relay No. 3 will open, causing No. 2 to open, shutting the power supplies down. Note the safety relay, insuring that plate voltage is applied only when proper bias is present.

All the components are standard. The time-delay relays are of the type which utilize a synchronous motor to close or open a microswitch. Coils in the filter should be as high Q as possible. The first 6SL7 amplifier was designed to operate over as linear a range of its characteristics as possible, so that distortion will not cause unwanted signals to have components in the 7000-cycle passband of the filter. Note that the relays are a limitation on the speed of telegraphy.

The sensitive relay should be adjusted to pick up and set down at as nearly the same current as possible. This point should be adjusted sufficiently far from the zero-signal operating point so that noise bursts will not close the relay and cause erratic operation.

Some caution should be used to prevent key clicks from getting back into the control through the receiver. Under unfavorable conditions this can lead to the whole system "taking off" like a buzzer. Clicks can also be caused by the closing of contacts on one relay which closes an inductive load. Sparking can cause trouble not only from the type of feed-back mentioned above, but also may cause the sensitive relay contacts to fuse (a source of considerable consternation when it happens, because the only remedy is to hop in the truck and go there to fix it). A simple remedy

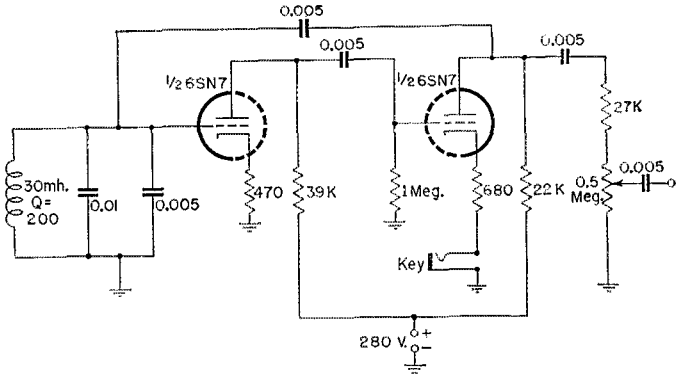


Fig. 4 — Circuit details of the audio oscillator used in the remote-control system.

for this trouble is to connect a 10-watt resistor of about 2000 ohms across the coil causing the sparking.

The circuit used to translate carrier-interrupt pulses into circuit combinations at the remote location is shown in Fig. 3. The d.c. amplifier is designed to work from a diode detector having output of a volt or so. The selenium rectifier supply is the easiest way of getting the 24 volts d.c. required for this particular type of stepper relay. The diagram shows how one band is used to advance the relay to the start or cleared position.

A large amount of vibration was encountered because the stepper clears by going through the remaining steps, so the chassis for this unit was mounted on rubber shock mounts. Movable parts such as screws and potentiometers were fastened down with service cement to prevent them from jarring loose or changing adjustment.

The most convenient way of wiring the stepper contacts is to wire the common terminals of two banks together. At any given position, the two selected contacts, one from each bank, form a closed circuit which is separate from all other circuits. Using these as a switch, it was possible to control external relays with the greatest economy.

The circuit of the tone oscillator which we finally used is shown in Fig. 4. The important part of the circuit is the high-Q frequency-determining grid tank. A coil of standard size can be used and the frequency adjusted to the center frequency of the filter with which it is to be used, by adding small capacitors in the tank circuit until the best response is obtained.

Acknowledgments

A large part of the equipment described herein is the personal property of the authors or of Bill Rust, W2QBZ, who provided it for the term of the experiments. Much moral support and technical assistance has been supplied by other members of the Cornell Ionosphere Project under Dr. H. G. Booker, and by other members of the Cornell Electrical Engineering Research organization. Thanks are due WKRT on whose property the remote equipment has been located.

Silent Keys

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

W1AQH, Edward M. Taylor, Mattapan, Mass.
W1HRZ, L. Thomas Siglin, Edgewood, R. I.
WN1VVM, Ernest H. Baxendale, Whitinsville, Mass.
W2CVV, George M. Brown, No. Tarrytown, N. Y.
WN2MAP, Benjamin S. Flug, Lynbrook, L. I., N. Y.
W4KAK, Allan B. Armistead, Roanoke, Va.
W6ADM-W6DSI, Floyd W. Barnes, Santa Rosa, Calif.
W6DLZ, Philip J. MacLane, Los Angeles, Calif.
W7BMG, Charles W. Aufang, Tacoma, Wash.
W8DGN, Edward C. Gocha, Berkley, Mich.
W9AGX, Harold A. Kenth, Racine, Wis.
W9MOA, John McKinstry, Chicago, Ill.
W9VV, Joseph Fairhall, jr., Danville, Ill.
WØAS, John P. Matthews, Newton, Iowa
WØCFK, Alton D. Danielson, No. St. Paul, Minn.
WØSRE, V. Earl Cox, Brookfield, Mo.
VE3BTE, Rose Hallifax, Hamilton, Ontario
VE7QM, Harold W. McInnes, Vancouver, B. C.

Strays

We regret to record in Silent Keys the sudden passing of George M. Brown, W2CVV, whose by-line over many technical articles is familiar to long-time readers of *QST*.

W2CVV, an electronics engineer for the New York Central Railroad, was killed in a plane crash while engaged in Civil Air Patrol rescue operations concomitant with a Hudson River boating tragedy in which three members of a fishing party also lost their lives.

Here's one sent in by W5KY, Tulsa, Okla.

A and B, each running 130 watts, live one half mile apart. How many kc. should A cover when B is listening? Assume 100 per cent modulation and a first-class receiver.

(*Please turn to page 50 for the answer*)

Happenings of the Month

SPECIAL CALL PRIVILEGES RETAINED

Under present regulations, amateur call signs are issued systematically in the order of receipt of applications, with certain exceptions which we quote:

1) A specific unassigned call sign may be reassigned to the most recent holder thereof; 2) A specific unassigned call sign may be assigned to a previous holder if not under license during the past 5 years; 3) A specific unassigned call sign may be assigned to an amateur organization in memoriam to a deceased member and former holder thereof; 4) A specific call sign may be temporarily assigned to a station connected with an event, or events, of general public interest; 5) An unassigned "two-letter call sign" (a call sign having two letters following the numeral) may be assigned to a previous holder of a two-letter call sign the prefix of which consisted of not more than a single letter.

In August of 1951, as part of a program to rid itself of what was considered non-essential work, the Commission proposed to do away with these special exceptions. The League filed in opposition, pointing out the benefits of such special issuances. The matter lay dormant until last month, when FCC dismissed its proposal. In other words, there will be no change in the rules.

LICENSE PLATES

Delaware, New Mexico and Nebraska are the most recent additions to the lists of states issuing call letter license plates.

Numerous members of the Delaware Amateur Radio Club of Arlington were instrumental in obtaining passage of the Delaware bill, which became law with the affixing of Governor Bogg's signature on May 25th. The new law follows the general form of other states, but we note the amateur may obtain two sets of plates; the extra fee is $5.50 for each set.

The Santa Fe and Pecos Valley Radio Clubs, acting as collection centers for opinions expressed on New Mexico's nets, aided the Attorney General's office in drafting the license plate bill which has been signed by the Governor and which will become law in June. W5s KCW and KWR have received mention as deserving special credit for their close liaison with state officials and their success in solving some rather touchy problems.

In Nebraska, a modified version of the original license plate bill was signed by the Governor on May 9th. This bill provides for call letter plates in addition to, rather than in lieu of, the regular number plates. Nebraska amateurs regard this compromise measure as satisfactory for the present, but intend to sponsor an amendment in the future that would eliminate the necessity for the number tags.

An Oklahoma call letter plate bill has been passed by the House and is now before the Senate.

Bills have been vetoed by the Governors of Maryland and New York. The reasons for rejection have not been indicated, but both states had previously introduced license plate legislation which was not passed.

EXAMINATION SCHEDULE

FCC has published its schedule of amateur examinations for July-August-September. The usual arrangements continue at the district field offices. Below are listed the points to be visited during the third quarter of the year by *traveling* engineers. Where exact dates or places are not shown, information may be obtained, as the date approaches, from the Engineer-in-Charge of the district. All examinations begin promptly at 9 A.M.

Amarillo, Texas: September 29
Birmingham, Ala.: September 11
Butte, Mont.: September 17
Charleston, W. Va.: Sometime in September
Cincinnati, Ohio: Sometime in August.
Cleveland, Ohio: Sometime in September
Columbus, Ohio: Sometime in July
Corpus Christi, Texas: September 10
Davenport, Iowa: Sometime in July
Des Moines, Iowa: Sometime in July
Fort Wayne, Ind.: Sometime in August
Fresno, Calif: September 18
Grand Rapids, Mich.: Sometime in July
Hartford, Conn.: September 8–9
Indianapolis, Ind.: Sometime in August
Jackson, Miss.: September 9
Knoxville, Tenn.: September 24
Little Rock, Ark.: July 15
Memphis, Tenn.: July 17
Milwaukee, Wis.: Sometime in July
Nashville, Tenn.: August 6
Oklahoma City, Okla.: July 16–17
Omaha, Nebr.: Sometime in July
Phoenix, Ariz.: Sometime in July
Pittsburgh, Penna.: Sometime in August
St. Louis, Mo.: Sometime in August
Salt Lake City, Utah: September 18
San Antonio, Texas: August 13
Schenectady, N. Y.: September 16–17
Sioux Falls, S. D.: September 16. Novice & Tech., 10 A.M.; other, 1 P.M.
Spokane, Wash.: September 15
Syracuse, N. Y.: Sometime in July
Tallahassee, Fla.: July 11
Tulsa, Okla.: July 20–21
Wichita, Kans.: Sometime in September
Williamsport, Penna.: Sometime in September
Winston-Salem, N. C.: August 1

MARITIME MOBILE

In May FCC issued a notice of proposed rule making to extend maritime mobile privileges on the high seas to include use of the 21-Mc. band. Comment may be filed by interested parties any time up to August 1st. The essential portions of the notice follow:

. . . Section 12.91(b) of Part 12, "Rules Governing Amateur Radio Service," now provides that portable or mobile amateur radio stations outside the continental limits of the United States, its territories and possessions may be op-

erated only on frequencies in the band 28.0–29.7 Mc, except that within areas under the jurisdiction of a foreign government, operation is controlled by the laws of that government. The Maritime Mobile Amateur Radio Club of Pittsburgh, Pennsylvania has filed a petition with the Commission in which it is requested that Section 12.91(b) be amended to the extent that such stations be allowed, additionally, to operate on frequencies in the band 21,000–21,450 kc. This frequency band is allocated under the Commission's Rules to the Amateur Radio Service and is available to amateurs in the continental limits of the United States, its territories and possessions. The frequency band is also allocated by the Atlantic City Table of Frequency Allocations to the amateur radio service upon a world-wide basis, hence it may be made available for portable and mobile amateur radio stations subject to the limitations presently applicable to such operation in the 28.0–29.7 Mc frequency band. A number of countries throughout the world have also made this band available to their amateur stations. Accordingly, the Commission proposes to amend Section 12.91(b) in the manner suggested.

. . . Any interested person who is of the opinion that the proposed amendment should not be adopted, or should not be adopted in the form set forth, may file with the Commission on or before August 1, 1953, a written statement or brief setting forth his comments. At the same time any person who favors the amendment as set forth may file a statement in support thereof. Comments or briefs in reply to the original comments or briefs may be filed within 15 days from the last day for filing the said original comments or briefs. The Commission will consider all such comments, briefs and statements before taking final action. If any comments are received which appear to warrant the Commission in holding an oral argument before final action is taken, notice of the time and place of such oral argument will be given such interested parties.

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

MINUTES OF 1953 SPECIAL MEETING OF THE BOARD OF DIRECTORS AMERICAN RADIO RELAY LEAGUE
May 8-9, 1953

1) Pursuant to due notice, the Board of Directors of the American Radio Relay League, Inc., met in special session at the Hartford Club, Hartford, Conn., on May 8, 1953. The meeting was called to order at 10:03 a.m. EDST with President Goodwin L. Dosland in the Chair and the following directors present:

P. Lanier Anderson, Roanoke Division
John H. Brabb, Great Lakes Division
George V. Cooke, Jr., Hudson Division
Alfred M. Gowan, Dakota Division
John R. Griggs, Southwestern Division
Alfred C. Heck, Atlantic Division
Lamar Hill, Southeastern Division
Kenneth E. Hughes, Pacific Division
Claude M. Maer, Jr., Rocky Mountain Division
Wesley E. Marriner, Central Division
A. David Middelton, West Gulf Division
Percy C. Noble, New England Division
Alex Reid, Canadian Division
R. Rex Roberts, Northwestern Division
William J. Schmidt, Midwest Division
James W. Watkins, Delta Division

Also in attendance, as members of the Board without vote, were Wayland M. Groves, First Vice President; F. E. Handy, Vice President; A. L. Budlong, General Manager. Also in attendance, at the invitation of the Board as non-participating observer, was New England Division Vice-Director Frank L. Baker. There were also present Treasurer David H. Houghton, Technical Director George Grammer, Assistant Secretaries John Huntoon and John Cann, General Counsel Paul M. Segal and Quayle B. Smith of his office.

2) On the matter of consideration of the agenda for the meeting, on motion of Mr. Heck, unanimously VOTED that Item 9 of the agenda, authorization for various administrative expenses, be advanced to follow Item 7, supplementary oral reports by the officers, provided all such authorizations will be tabled for final action after a listing showing all such proposed expenditures has been furnished to each director with a copy of the estimated revenue for the current year.

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

4) On motion of Mr. Schmidt, unanimously VOTED that the minutes of the 1953 annual meeting of the Board of Directors are approved in the form in which they were issued by the Secretary.

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

6) On the reception of reports of committees: Without objection, ORDERED that the report of the Finance Committee goes over for consideration later in the meeting. Mr. Brabb presented the report of the Planning Committee; whereupon, without objection, the same was ORDERED placed on file, for consideration later in the meeting. Mr. Griggs reported briefly for the Membership and Publications Committee; whereupon, without objection, ORDERED that the same be received and placed on file, for consideration later in the meeting.

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

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

9) At this point, under the provisions of its action in paragraph (2) of these minutes, the Board engaged in lengthy discussion of the administrative expenses of directors for 1953, the authorizations of expenses of committees, certain travel and convention expenses of SCMs and QSL Managers, Section Emergency Coördinators and various administrative expenses for the early part of 1954.

10) Moved, by Mr. Hill, that the Board does now resolve itself into a Committee of the Whole for the purpose of discussing certain parts of the agenda relative to the setting up of certain committees. Moved, by Mr. Heck, to amend the motion to provide that the Board consider the question informally; but after discussion, Mr. Heck withdrew his motion to amend. Moved, by Mr. Brabb, to amend the motion to provide that it be for the purpose of considering all matters on the known agenda; but there was no second, so the motion to amend was lost. At this point, after discussion, with the permission of his second, Mr. Hill withdrew his motion.

11) The Board was in recess from 11:20 a.m. until 11:30 a.m.

12) At this point, unanimous consent being given, Mr. Griggs yielded the floor to Mr. Middelton. On motion of Mr. Middelton, unanimously VOTED at 11:35 a.m., that the Board does now resolve itself into a Committee of the Whole, with the members of the Headquarters staff excluded, in order to consider his motion under paragraph 8(c)(1) and 8(c)(7) of the definitive agenda. 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 12:38 p.m. to 1:58 p.m. The Committee arose at 1:58 p.m. and Mr. Dosland, as Chairman of the Committee, laid before the Board the report of the Committee.

13) On motion of Mr. Roberts, unanimously VOTED to establish a Public Relations Committee of three members of the Board to be appointed by the President.

14) Moved, by Mr. Middelton, that the ARRL General Manager be instructed to make (or to secure from a qualified testing laboratory) a thorough evaluation of the following: (a) Representative types of TV receivers relative to their capability to reject amateur signals and to determine the extent of their radiated interference affecting amateur radio communication; (b) all types of both high-pass and low-pass TVI filters advertised in *QST* to determine their effectiveness and to compare their efficiency with similar equipment described in ARRL publications for amateur construction; (c) all types of so-called TVI-treated transmitters advertised in ARRL publications to determine the accuracy of the manufacturer's claims for his equipment. It is further moved that full engineering data on each of the above tests be made available to any ARRL member upon request. After extended discussion, the yeas and nays being ordered, upon request, the motion was decided in the negative: Whole number of votes cast, 16; necessary for adoption, 9; yeas, 2; nays, 14. All the

directors voted in the negative except Messrs. Griggs and Middelton, who voted in favor. So the motion was rejected.

15) Moved, by Mr. Middelton, that in order to prevent misunderstandings and possible errors in the preparation of permanent minutes the proceedings of all meetings of the ARRL Board of Directors be recorded by manual, mechanical or electronic methods and that a complete verbatim transcript of these proceedings be made available to any Director upon request. On motion of Mr. Brabb, unanimously VOTED to amend the motion by adding the words, "provided that the cost be borne by the director requesting the same." After discussion, the question being on the motion as amended, and the yeas and nays being ordered, upon request, the same was decided in the negative: Whole number of votes cast, 16; necessary for adoption, 9; yeas 4; nays, 12. All the directors voted in the negative except Messrs. Brabb, Griggs, Marriner and Middelton, who voted in favor. So the motion was rejected.

16) Moved, by Mr. Middelton, that ARRL sponsor a "Technical Scholarship" which will lead to a year's paid employment in the ARRL Laboratory at Headquarters 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 technical side of amateur radio, through his contribution to amateur radio in the past year, such "Technical Scholarship" to be a continuing yearly award with job offers made to the winners. RULED, by the Chair, that this matter had previously been referred to the Planning Committee for study as to the cost of such a project and that the matter properly is to be considered under paragraph (10) of the definitive agenda, consideration of recommendations of the Planning Committee.

17) On motion of Mr. Middelton, VOTED, 8 votes in favor to 7 opposed, that ARRL establish a yearly "Merit Award" (consisting of a scroll or plaque) to be presented to an amateur chosen for his outstanding technical contributions to the art of amateur radio communication during his amateur experience. This Award to be administered by a committee (which shall include at least two Directors) and presented either to the amateur to be so honored, or his proxy, at an ARRL function commensurate with the national importance of such an award presentation.

18) Moved, by Mr. Griggs, that the Board does hereby instruct the Secretary to authorize the loan of Technical Department personnel to laboratories engaged in experimental or developmental work for a maximum period of one year without cost to the League other than the continuance of the pension fund for each individual so loaned, the number of such loaned personnel to be limited to one individual per year, so as to aid the League's technical staff to keep fully abreast of modern developments and new techniques and thereby improve the usefulness of these staff members to *QST*, the Handbook and League members in general. After extended discussion, moved, by Mr. Maer, that the motion is amended by striking out the text and substituting therefor the following: That the Board commend the activities of the Headquarters staff in technical matters and urges their continued good work in this field. The question then being on the amendment, and the yeas and nays being ordered, upon request, the amendment was decided in the affirmative: Whole number of votes cast, 16; necessary for adoption, 9; yeas, 14; nays, 2. All the directors voted in the affirmative except Messrs. Griggs and Middelton, who voted opposed. So the amendment was ADOPTED. The question then being on the motion as amended, the same was decided in the affirmative: Whole number of votes cast, 16; necessary for adoption, 9; yeas, 14; nays, 2. All the directors voted in the affirmative except Messrs. Griggs and Middelton, who voted opposed. So the motion, as amended, was ADOPTED.

19) Moved, by Mr. Griggs, that the Board of Directors does hereby authorize the Planning Committee to investigate the feasibility of the League's establishing jointly and with the concurrence of the Federal Communications Commission, a permanent committee to conduct a continuing density of occupancy exhibited in each suballocated portion of the United States amateur frequency bands, and to make recommendations to the Federal Communications Commission periodically at intervals of two years leading to the revision of amateur suballocations in accordance with the committee's findings. But the motion was rejected.

20) Moved, by Mr. Griggs, that the Board of Directors does hereby order and direct the Public Relations Committee to study the feasibility of inaugurating a program of nation-wide publicity via existing press, radio and television channels for the express purpose of providing the general public with a truer perspective of the causes and sources of television interference and presenting the amateur in a more exact and correct evaluation so as to promote public good will toward amateur radio. But, after discussion, on motion of Mr. Heck, VOTED to lay the matter on the table until later in the meeting.

21) Moved, by Mr. Griggs, that the Board of Directors does hereby order and authorize the Editor and Technical Staff of *QST* to inaugurate and publish in *QST* beginning not later than the September 1953 issue, and in all subsequent issues, a section devoted to the critical review of all available and/or new amateur radio equipment appearing on the market, said reviews to represent the realistic, unbiased and unprejudiced views of the Technical Staff as based upon engineering and performance figures obtained through comprehensive tests of the equipment in the *QST* laboratories, including comments as to the adequacy of instruction manuals, circuit diagrams, and parts lists. It is further directed that the Editor of *QST* shall be the final authority in selecting equipment items for test and review, and shall exercise the fullest discretion in the publication thereof. But, on motion of Mr. Heck, VOTED to lay the matter on the table for consideration later in the meeting.

22) The Board was in recess from 3:44 p.m. until 3:55 p.m.

23) Moved, by Mr. Griggs, that the Board does hereby authorize the establishment of a free legal advisory service to League members for such guidance as may be needed in the protection of amateur rights to enjoy the hobby of amateur radio despite restrictive ordinances, such service to be furnished by League members who are also attorneys for a fixed fee not to exceed $600 per annum each, with a maximum of three appointed for greatest geographical accessibility to League members, said fees to be paid by the League as a service to its membership. It is further suggested one such attorney be located in the central part of the United States, and one each on the West Coast and the East Coast. Moved, by Mr. Brabb, that the motion be amended by striking the text and substituting therefor the following: That the League shall invite through *QST* all amateurs who are members of the bar to submit to ARRL Headquarters a resume of current cases from their respective states affecting the rights of radio amateurs in their pursuit of the hobby; and that a summary of these cases, to be prepared under the supervision of the League's General Counsel, shall be made available to members of the League who become involved in litigation as a direct result of operating their radio stations, and to their attorneys. But, after discussion, with the consent of his second, Mr. Brabb withdrew his proposal to amend. Whereupon, the question being on the original motion, the same was rejected.

24) Moved, by Mr. Griggs, to take from the table his motion for a study by the Public Relations Committee of the feasibility of a nation-wide publicity program. But the motion was rejected.

25) On motion of Mr. Heck, VOTED that there be now considered informally the question of the long-range financial plans of the League. Moved, by Mr. Heck, that in view of the present situation as far as surplus is concerned and the present profitable operation that we expend expenditures in terms of salaries and services so that we do not add to the surplus. But there was no second, so the motion was lost.

26) Moved, by Mr. Heck, that it is the sense of this Board that physically handicapped holders of Technician Class license, previously holding a Novice Class license may have the term of the Novice privileges extended at the discretion of the examining FCC engineer if in his opinion the applicant's failure to advance to General Class is due to physical conditions known to him. After discussion, on motion of Mr. Maer, VOTED to amend the motion by striking the entire text and substituting therefor that the Board instruct the Planning Committee to make a thorough study of the problems facing the physically handicapped in enjoying and participating in amateur radio and render a report on this subject to the Executive Committee at the earliest possible time. The question then being on the motion as amended, the same was unanimously ADOPTED.

27) Moved, by Mr. Heck, that the League revise and republish the history of amateur radio, "Two Hundred Meters and Down." On motion of Mr. Brabb, VOTED to amend the motion to read: that there is referred to the Membership and Publications Committee the matter of making a study of the feasibility of republishing "Two Hundred Meters and Down," or a history of the League and amateur radio. The question then being on the motion as amended, the same was unanimously ADOPTED.

28) Without objection, Mr. Marriner read a letter from one of his members on the subject of RACES. Moved, by Mr. Marriner, that the Planning Committee is to investigate whether the RACES situation as far as the amateur is concerned needs to be clarified. After discussion, on motion of Mr. Maer, unanimously VOTED to amend the motion by striking the text and substituting therefor that the Planning Committee is directed to study the overall amateur radio problems which have arisen in the RACES program and to make recommendations to the Board leading to more effective participation by amateurs in RACES activities on local, state and national levels. The question then being on the motion as amended, the same was unanimously ADOPTED.

29) Moved, by Mr. Watkins, that the Thursday evening informal meeting of directors be made an annual affair and that the officers and staff members of the League be invited to the dinner portion of the meeting. After discussion, moved, by Mr. Brabb, to amend the motion to exclude the Headquarters employees but have them available; but there was no second, so the motion to amend was lost. After further discussion, on motion of Mr. Maer, VOTED to amend the motion so that it reads that the Thursday evening informal meeting of directors be made an annual affair and that the officers and staff members of the League be invited. The question then being on the motion as amended, the same as ADOPTED.

30) Moved, by Mr. Brabb, to amend Article 12 of the Articles of Association by inserting between the words "years" and "or" in line 4 of the said Article as set forth in the July 1, 1952 revision of the said Articles of Association the words "immediately preceding the receipt by the Secretary of his petition of nomination." Moved, by Mr. Hughes, that the Article be further amended by inserting after the word "engaged" in line 10 of the same published revision the words "in a policy-forming position." After discussion, RULED, by the Chair, that these motions are out of order because the required notice of intent to amend was not made prior to the meeting and that they be placed on the agenda for the 1954 meeting of the Board.

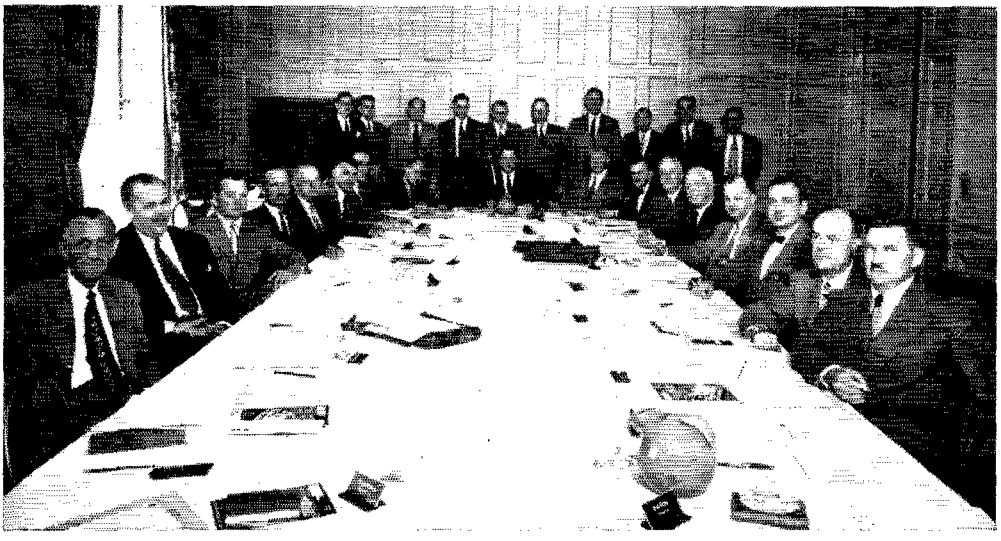
31) Moved, by Mr. Brabb, that Paragraph 4 of the Rules and Regulations Concerning Affiliated Societies be amended to add the words "Provided, however, that regularly organized clubs in secondary schools need only have one voting member who is a Full member of the League." After discussion, on motion of Mr. Heck, VOTED to amend the motion so that it would read "Provided, however, that regularly organized clubs in secondary schools, where the name of the club clearly shows that the club is a branch of that school, need only have one voting member who is a Full member of the League." The question then being on the motion as amended, the same was unanimously ADOPTED.

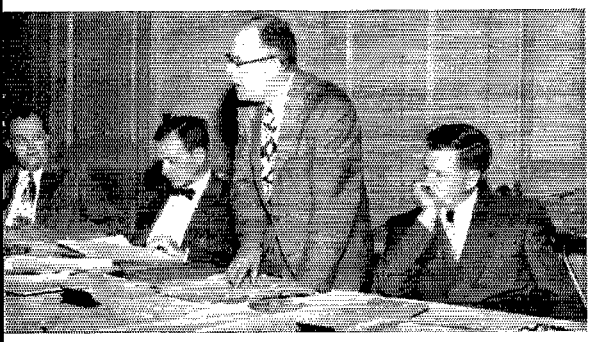
32) Moved, by Mr. Brabb, that the annual statement and balance sheet of the League be published in *QST*; but there was no second, so the motion was lost.

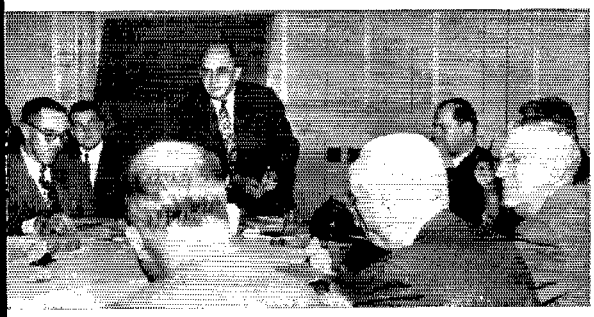
33) On motion of Mr. Brabb, unanimously VOTED, at 5:47 p.m., that the Board does now resolve itself into a Committee of the Whole in order to discuss the conduct of national polls under certain circumstances. The Chair appointed himself Chairman of the Committee of the Whole. The Board, sitting as a Committee of the Whole, was in recess for dinner from 6:24 p.m. until 8:35 p.m. The Committee arose at 8:46 p.m. and Mr. Dosland, as Chairman of the Committee, reported no action or recommendation to the Board by the Committee of the Whole.

34) Moved, by Mr. Brabb, that the Board of Directors does hereby order and direct the Secretary to make available by mail to each League member upon request copies of each brief filed by the League with the Federal Communications Commission upon any rule-making proposal under consideration in sufficient quantities to provide each member so requesting with the requisite number to permit his signing and placing with the Federal Communications Commission an additional filing or filings in support of the League's comments. It is further directed that notification of the availability of such copies be published in each *QST* containing the texts of the subject rule-making proposals and in all subsequent issues of *QST* scheduled for delivery prior to the closing date for filings. After extended discussion, the yeas and nays being ordered, upon request, the

The ARRL Board of Directors and League officials at the meeting of the Board in Hartford on May 8th. Seated around the table, *l.* to *r.*: Director Watkins, Delta; Director Griggs, Southwestern; Director Hughes, Pacific; Vice-President Groves; Director Roberts, Northwestern; Director Schmidt, Midwest; Vice-President Handy; General Counsel Segal; President Dosland; General Manager Budlong; Asst. Secretary Huntoon; Treasurer Houghton; Director Reid, Canada; Director Noble, New England; Director Maer, Rocky Mountain; Director Brabb, Great Lakes; Director Marriner, Central. *Rear, l.* to *r.*: Quayle B. Smith, of the General Counsel's office; Asst. Secretary Cann; Director Middelton, West Gulf; Technical Director Grammer; Director Hill, Southeastern; Director Gowan, Dakota; Director Anderson, Roanoke; Director Cooke, Hudson; Director Heck, Atlantic; Vice-Director Baker, New England.







motion was decided in the negative: Whole number of votes cast, 15; necessary for adoption, 8; yeas, 3; nays, 12. All the directors voted in the negative except Messrs Brabb, Griggs and Middelton, who voted in favor, and Mr. Reid, who abstained. So the motion was rejected.

35) On motion of Mr. Noble, the following resolution was unanimously ADOPTED by rising vote (Applause):

WHEREAS, On April 4, 1928, Paul M. Segal was appointed Gentral Counsel of the American Radio Relay League, and

WHEREAS, in the intervening twenty-five years General Counsel Segal has performed distinguished and meritorious service for the League;

NOW, THEREFORE, BE IT RESOLVED that the Board of Directors of the American Radio Relay League, Inc., meeting in Hartford, Conn., on May 8, 1953, in recognition of Paul M. Segal's service on behalf of the League, does hereby express its deep appreciation for his loyalty, fidelity and intelligent devotion to the best interests of amateur radio.

36) On motion of Mr. Noble, the following resolution was unanimously ADOPTED:

WHEREAS, On February 17, 1953, Cecilia C. Hatch completed twenty-five years of continuous service to the American Radio Relay League, as Circulation Supervisor;

BE IT RESOLVED, that the Board of Directors, meeting in Hartford, Connecticut on May 8, 1953, in recognition of Cecilia C. Hatch's untiring efforts on behalf of the League, does hereby express its deep appreciation of her loyalty, fidelity and intelligent devotion to the best interests of the institution of amateur radio.

37) On motion of Mr. Noble, unanimously VOTED that the approval by the Executive Committee of the new Rules and Regulations of the Communications Department is now further approved by the Board of Directors.

38) On motion of Mr. Noble, unanimously VOTED that the League shall henceforth offer three yearly awards (in the amounts of $300, $200, and $100) to the authors (excluding Headquarters personnel) of the *QST* articles judged by the ARRL Executive Committee to be the best, second-best, and third-best.

39) Moved, by Mr. Noble, that a survey be conducted by means of an unstamped card in the October issue of *QST* carrying the following form: "My preference in operating my amateur station in the following bands, and by the method specified, is in accordance with the percentages I have listed: (provision for indication of phone or c.w. preference by band) . . . All percentages listed should total 100%." But, after extended discussion, on motion of Mr. Brabb, VOTED that the matter be laid on the table.

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

Cedar Valley Amateur Radio Club . . Charles City, Iowa
Hoosier Lakes Radio Club . . . . . Warsaw, Indiana
Vermillion County Amateur Radio Assn. . . . . Danville, Illinois
Sweetwater Amateur Radio Club . . . . Sweetwater, Texas
Northfork Amateur Radio Club . . . . . Sayre, Oklahoma
Morgantown Amateur Radio Club . . Morgantown, W. Va.
Wantagh Radio Club . . . . . Wantagh, New York

41) On motion of Mr. Roberts, VOTED that the special meeting of the Board of Directors for the year 1954 be held at a city other than Hartford, Connecticut.

♦

Some candid shots of the 1953 Board meeting in action. *Top:* Heck addresses the afternoon session, with listeners Cooke, Baker, Anderson, Hill, Gowan and Middelton, plus (backs to camera) Hughes, Griggs, Watkins. *Upper center:* Noble, Maer, Marriner absorb a point from Brabb. *Center:* Counsel Segal explains a legal aspect; around the table are Handy, Cann, President Dosland, Houghton and (backs to camera) Reid, Noble. *Lower center:* Middelton reads a motion; Watkins, Griggs, Hughes contemplate. *Bottom:* Around the table, Vice-President Groves, Roberts, Schmidt, Handy, Segal, President Dosland, with Q. B. Smith of Counsel's office, far corner, hear Grammer clear up a technical angle.

42) On motion of Mr. Roberts, after discussion, VOTED, 10 votes in favor to 6 opposed, that if any special meeting of the Board of Directors is held during the first five months of 1954, then it is the wish of the Board of Directors that such meeting be called for Denver, Colorado.

43) Moved, by Mr. Middelton, that the Board does now adjourn. But the motion was rejected.

44) On motion of Mr. Anderson, the Board unanimously ADOPTED the following resolution:

RESOLVED, That on behalf of amateur radio the Board of Directors of the American Radio Relay League expresses its regret at the demise of W. Treadway Gravely, W3BZ/W4CB, one of the original League directors, always advancing the betterment of the League and amateur radio — a sincere amateur; and

BE IT FURTHER RESOLVED that the President of the League convey these sentiments to Mr. Gravely's family by having forwarded to them a copy of this resolution.

45) On motion of Mr. Maer, unanimously VOTED that the Board expresses its regret over the resignation of former Rocky Mountain Division Director Franklin K. Matejka and wishes him success in his new enterprise.

46) Moved, by Mr. Maer, to amend By-Law 12 by adding after the first sentence therein the following new sentence: "Each director may appoint assistant directors, who shall be members residing in the division, to serve at the pleasure of the director." But, after discussion, with the consent of his second, Mr. Maer withdrew the motion.

47) Moved, by Mr. Maer, that the General Manager cause the expiration of membership in each division to be called to the attention of the director as soon as convenient after expiration. But, after discussion, with the consent of his second, Mr. Maer withdrew the motion.

48) Moved, by Mr. Maer, that the General Manager be requested to prepare a pamphlet for distribution at fairs and expositions to explain in lay language the background of amateur radio. But, after discussion, during which it was brought out that a considerable amount of such material is already available at League Headquarters, Mr. Maer, with the consent of his second, withdrew the motion.

49) On motion of Mr. Brabb, the Board recessed at 10:12 p.m. under order to reassemble at 9:30 a.m. on the morrow. The Board reassembled at the same place on May 9, 1953 and was called to order by the Chair at 9:32 a.m. with all directors and other persons hereinbefore mentioned in attendance, except Mr. Cann.

50) On motion of Mr. Roberts, unanimously VOTED that the General Manager is hereby authorized to reimburse the division directors for actual expenses incurred by them during the year 1953 in the proper administration of ARRL affairs in their respective divisions up to amounts as follows:

Canadian Director	$ 650
Atlantic Division Director	750
Central Division Director	850
Dakota Division Director	600
Delta Division Director	800
Great Lakes Division Director	800
Hudson Division Director	700
Midwest Division Director	800
New England Division Director	400
Northwestern Division Director	800
Pacific Division Director	600
Roanoke Division Director	500
Rocky Mountain Division Director	800
Southeastern Division Director	800
Southwestern Division Director	950
West Gulf Division Director	1000

51) Moved, by Mr. Schmidt, that the General Manager is hereby authorized to pay expenses for the operation of ARRL Committees during the year 1953 but not to exceed the amounts as follows:

Planning Committee	$2000
Finance Committee	200
Membership & Publications	1000

On motion of Mr. Noble, unanimously VOTED to amend the motion to provide $1000 for the Finance Committee. Whereupon, the question being on the motion as amended, the same was unanimously ADOPTED.

52) Moved, by Mr. Brabb, that the General Manager is hereby authorized to reimburse within the continental limits of the United States and Canada only, the Section Communications Managers and QSL Managers of the League, in a total amount not to exceed $6000 for the year 1953, as follows: (1) SCM expenses as provided below to attend one official ARRL Convention within respective Divisions. (2) SCM travel to attend, in addition to the above, within his Section, not more than five major ARRL Section organization meetings per year, to include hamfests only where sponsor schedules an ARRL Section meeting. (3) SCMs to have the option, when invited by their Division Director, to attend one special meeting, held in the Division to consider League matters, travel reimbursement to be in lieu of one of the five Section meetings. (4) QSL Managers of the League to attend one official ARRL Convention within their respective call areas, provided that reimbursement for travel expenses as specified below, shall not be for more than a total round trip of 1,000 miles. In (1) and (4) expenses may include one night's hotel accommodation at cost but not to exceed seven dollars ($7.00) and the convention registration fee. All reimbursement of the travel item in the above shall be for actual rail or bus fare or at the rate of seven and one half cents (7½¢) per mile if personal transportation be used. In any case shortest commonly travelled route must be used. All allowances for expenses shall be subject to approval of a report submitted with the itemized request for reimbursement, covering the representation of ARRL, reporting attendance, meeting discussions, questions, recommendations, or QSLs distributed etc. by the individual attending the meeting. A designated Full Member may be authorized and subsequently reimbursed to represent and speak for the SCM under these provisions at such meetings as (1) or (2) above, provided the SCM has the advance written approval to such substitution, by the Director and the Communications Manager. Also, in the case of a newly-elected or interim-designated SCM, if five meetings for the particular Section have already been reimbursed in the given calendar year, on his advance request to attend specific (but not more than three such) Section organization meetings, he may be duly authorized by such advance written approval. On recommendation of a Director, the Communications Manager may, within the limits of the total authorization provided, authorize additional trips than those provided above. On motion of Mr. Griggs, VOTED to amend the motion by changing the total amount in the first paragraph from $6000 to $5000. The question then being on the motion as amended, the same was unanimously ADOPTED.

53) Moved, by Mr. Watkins, that, to continue the Board policy of reimbursing Section Emergency Coordinators for certain travel, the General Manager is hereby authorized to pay during the year 1953 a total amount not to exceed two thousand five hundred dollars ($2,500) under the conditions specified in minute (58) of the 1952 special meeting of the Board. On motion of Mr. Schmidt, unanimously VOTED to amend the motion by making the total amount available $3,500 instead of $2,500. Whereupon, the question being on the motion as amended, the same was unanimously ADOPTED.

54) On motion of Mr. Roberts, unanimously VOTED, that the General Manager is hereby authorized to pay, during the period between January 1, 1954 and the 1954 meeting of the Board, expenses against usual authorizations for administrative and committee operations, in no greater amounts than 1953 authorized amounts.

55) Turning now to the report of the Planning Committee, on motion of Mr. Middelton unanimously VOTED to take from the table his motion regarding the matter of a "Technical Scholarship." (After discussion, moved, by Mr. Middelton, to amend the motion by substituting for the phrase "Technical Scholarship" the phrase "Technical Award;" but, after discussion, the motion to amend was rejected. The question then being on the original motion, the same was rejected; Mr. Middelton asked to be recorded as voting in favor. At the request of Mr. Brabb, the Chair directed that the minutes should record that this matter was given thorough discussion and found meritorious but not feasible at this time.

56) Mr. Noble reported briefly for the Finance Committee concerning a program for further investment of the surplus funds of the League.

57) Proceeding now to consideration of recommendations of the Membership and Publications Committee, moved, by Mr. Roberts, that a series of 16 mm. black and white films be made showing Headquarters, its personnel, equipment,

daily operations, Board meetings and similar scenes, having a running narrative to be dubbed in, and necessary copies made for circulation through usual channels. After extended discussion, on motion of Mr. Schmidt, VOTED to amend the motion by striking out the text and substituting therefor that the recommendations contained in the report of the Membership and Publications Committee are approved in principle by the Board and that they are referred to the General Manager for such consideration and handling as he deems appropriate. The question then being on the motion as amended, the same was unanimously ADOPTED.

58) Moved, by Mr. Hill, that the Membership and Publications Committee be made one of the standing committees set up under By-Law 30. But, after extended discussion, by unanimous consent, Mr. Hill amended his motion to provide that the Membership and Publications Committee be continued for an additional year; whereupon the same was unanimously ADOPTED.

59) On motion of Mr. Hill, unanimously VOTED that, pursuant to the terms of the Trust Agreement under the Pension Plan the following persons are appointed to serve as the Pension Committee from June 2, 1953 to June 2, 1954: Arthur L. Budlong, George Grammer, David H. Houghton.

60) On motion of Mr. Brabb, the following resolution was unanimously ADOPTED:

Be it RESOLVED that, pursuant to Article 7 of the Articles of Association, R. Rex Roberts is hereby designated and appointed a member of the Executive Committee to serve as such for the period ending May 15, 1954.

61) On motion of Mr. Gowan, the following resolution was unanimously ADOPTED:

Be it RESOLVED that, pursuant to Article 7 of the Articles of Association, F. E. Handy is hereby designated and appointed a member of the Executive Committee to serve as such for the period ending May 15, 1954.

62) On motion of Mr. Gowan, the following resolution was unanimously ADOPTED:

Be it RESOLVED that, pursuant to Article 7 of the Articles of Association, David H. Houghton is hereby designated and appointed a member of the Executive Committee to serve as such for the period ending May 15, 1954.

63) On motion of Mr. Brabb, the following resolution was unanimously ADOPTED:

WHEREAS, the communications experience and tradition of the amateur service in natural disaster and other public service operations and voluntary participation in WERS in World War II have pointed up the capability of the amateur in civil defense; and

WHEREAS, the Federal Communications Commission during the year 1952 has enacted regulations for the Radio Amateur Civil Emergency Service that makes civil defense communications a responsibility of each United States amateur;

BE IT RESOLVED, that the American Radio Relay League adopts the following principles as its guiding policy toward RACES:

(a) Local units or available members of the Amateur Radio Emergency Corps especially should seek and accept appropriate proffered responsibility for implementing RACES at the local level. This includes signing up in civil defense and becoming a part of civil defense (RACES) plans.

(b) Because RACES is an amateur service, "matching funds" specifications for RACES equipment should be separate from and less stringent than specifications applying to equipment to be used in commercial services, as urged by ARRL in the Dec. 1951 FCDA conferences.

(c) Maximum utilization should be made of existing amateur equipment, facilities and skills. These should include consideration of equipments normal to all the amateur bands in which RACES frequencies have been earmarked, and including the RACES segments in the 28–29.7 Mc. amateur band.

(d) Sufficient flexibility in RACES recommendations for frequency use should be provided so that each channel can be used for the purpose most needed in any particular situation, as opposed to nationwide designation of any particular channel for a particular civil defense service such as rescue, engineering, welfare, etc. This does not preclude national planning designed to minimize duplication of channels and QRM.

64) On motion of Mr. Brabb, unanimously VOTED that the Board go on record as commending the Field Engineering and Monitoring Bureau of the Federal Communications Commission for its assistance and cooperation rendered amateurs over the past year.

65) On motion of Mr. Brabb, unanimously VOTED that the Board go on record as expressing its thanks and appreciation for the untiring work and devotion of the Vice-Directors, Assistant Directors, SCMs, SECs, and QSL Managers.

66) On motion of Mr. Heck, after discussion, unanimously VOTED that the General Manager of the League is instructed to conduct a continuing survey looking toward expansion of maritime mobile privileges.

67) Moved, by Mr. Middelton, that the Public Relations Committee be requested to study the relations between the ARRL and all U. S. Governmental agencies concerned with amateur radio so that ARRL may obtain the maximum possible enhancement of the status of the radio amateur. But, after discussion, the motion was rejected.

68) On motion of Mr. Griggs, unanimously VOTED that the Planning Committee undertake the task of writing the necessary revision of the By-Laws to make the Membership and Publications Committee one of the standing committees.

69) On motion of Mr. Griggs, unanimously VOTED to take from the table his motion relative to a nationwide publicity program to provide the general public with information on the causes and sources of television interference. On further motion of Mr. Griggs, unanimously VOTED to amend the motion so that it shall read as follows: That the Board of Directors does hereby order and direct the Public Relations Committee to study the feasibility of inaugurating a program of nationwide publicity via existing press, radio and television channels for the express purpose of providing the general public with a truer perspective of the causes and sources of television interference and presenting the amateur in a more exact and correct evaluation so as to promote public good will toward amateur radio. The question being on the motion as amended, the same was unanimously ADOPTED.

70) On motion of Mr. Griggs, unanimously VOTED to take from the table his motion with respect to the establishment of a section in *QST* devoted to review of amateur apparatus. On further motion of Mr. Griggs, unanimously VOTED to amend the motion so that it shall read as follows: That the Board of Directors does hereby order the Membership and Publications Committee to study the feasibility of publishing in *QST* a section devoted to the critical review of all available and new amateur radio equipment appearing on the market, said reviews to represent engineering and performance figures obtained through comprehensive tests of the equipment in the *QST* laboratories, including comments as to the adequacy of instruction manuals, circuit diagrams, and parts lists. The question being on the motion as amended, the same was unanimously ADOPTED.

71) At this point, the President announced the following committee appointments for the coming year:

Merit Award Committee
Mr. Middelton, Chairman
Mr. Reid
Mr. Budlong

Public Relations Committee
Mr. Dosland, Chairman
Mr. Watkins
Mr. Maer

Membership and Publications Committee
Mr. Griggs, Chairman
Mr. Marriner
Mr. Roberts

Planning Committee
Mr. Brabb, Chairman
Mr. Hughes
Mr. Anderson

Finance Committee
Mr. Noble, Chairman
Mr. Hill
Mr. Heck

72) On motion of Mr. Brabb, unanimously VOTED that the General Manager is hereby authorized to pay

(*Continued on page 118*)

YL NEWS and VIEWS

BY ELEANOR WILSON,* W1QON

Who is a YL and what is an XYL? Confused? Occasionally we have difficulty interpreting how other people interpret these terms, so we'll tell you what we mean when we use 'em.

Originally, the male operator referred to his girl friend sitting by in the radio shack as his "young lady" — abbreviated by the c.w. boys to "YL." A wedding band, it was thought, transformed a YL into an ex-young lady or "XYL." In the early days there were so few women with amateur licenses that the terms referred generally to unlicensed YLs and XYLs.

Today, in this column, "YL" is used to denote *any* licensed feminine amateur radio operator — whether she be nine or ninety, bachelor girl or wedded spouse. "XYL" refers only to the unlicensed wife of a male amateur. These terms are consistently used as defined, even though some may puzzle why girls with multiple harmonics are referred to as YLs and not XYLs.

If you feel these terms are misnomers, you are not alone. Marriage, we blissfully hope, does not make a gal an "ex-young lady." And we all know some YLs who admit to fifty or sixty summers. Literally speaking, both terms are not completely appropriate. Like so many things that "just grew," the terms have stuck with us — or should we say, we are stuck with them, until some better ones are uncovered. True, anything is better than "OW" — perish this thought! "OG" is slightly less painful but rather unimaginative.

So what say, YLs and XYLs, are you happy being so called or can you think of something better?

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

Deep in the heart of Texas there are YLs, too, and some of them were mighty pleased to get together at the Tyler Hamfest in April. There's a "furriner" among them, though — W5VBG slipped over the border from Oklahoma to join the fun. *Left to right:* W5YRT, Maxine; W5LGY, Helen; W5RYX, Lyn; W5PYE, Dot; W5VBG, Dena; W5TKM, Clara; and W5VSN, Maxine. (*Photo by W5TXB*)

YLRL Election Results

Results of the 1953 YLRL election have come in just under the wire of our column deadline. There's only time to list the new officers this month, but look for further information about them and YLRL in the next issue.

President — Margaret Wells, W1BCU

Vice-President — Ruth Siegelman, W2OWL

Secretary-Treasurer — Miriam Blackburn, W3UUG

Publicity Chairman — Barbara Houston, W3OQF

District Chairmen — Ann Chandler, W1OAK; Madeline Greenberg, W2EEO; Loreli Johnston, W3SVY; Anita Bien, W4JCR; Jessie Harton, W5HWK; Lucille Hinkle, W6JMS; Beatrice Austin, W7HHH; Kate Eastman, W8EIR; Eleanor Engebretson, W9SEZ; and Mary Jo Overbeck, WØCXC.

(*Continued on page 122*)

The Third Annual W1 YL Luncheon (Boston, April 11th) was attended by 32 YLs from the six New England states, Maryland and the District of Columbia, making it the largest YL meeting to be held in the first call area to date. First row, seated *l. to r.*: Peg Flanders (awaiting Novice call), W1UFM and W1NAD. Second row, seated: W1s UET UPK SVN UKR QON UPZ BCU RYJ MCW YYM and FTJ. Standing: Jean Golding (awaiting call), W3OQF, W1TUD, W3MSU, W1s UQA SCS RLQ UZR FOF VOS TRE VYH VXC SLQ MWI QJX OAK and HIH. (*Photo by W1UPL*)

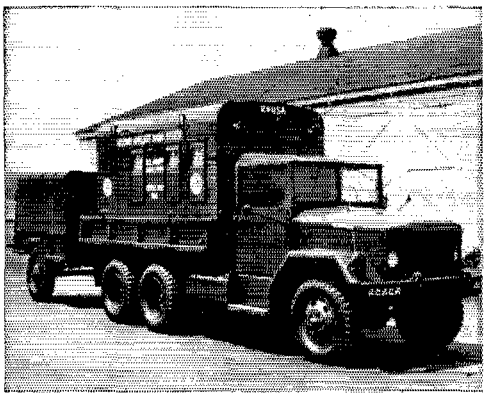
M. A. R. S.

A MARS mobile radio station has been assigned to MARS Headquarters at Washington, D. C., incorporating the latest type military and amateur radio equipment. Plans are that the unit will be given its first road test in July when the Chief, MARS (Army), A3UWI, and operators from station WAR drive to Houston, Texas, for the ARRL National Convention.

Based on military requirements the mobile unit carries transmitting and receiving equipment for operation, using either high or low power, on all MARS frequencies and as K4USA on the 10-, 15-, 20-, 40-, 80- and 160-meter amateur bands.

The Chief, MARS (Air Force) and operators from station AIR plan to accompany a joint MARS display which will be airshipped to Houston for the convention.

Other MARS demonstrations being arranged include a mobile radioteletype circuit, a display of the new 100-word-per-minute teletypewriter



The emergency mobile radio unit for Military Affiliate Radio System (Army) Headquarters, WAR. This station contains high power and low power transmitters and two receivers. It pulls its own emergency power equipment in a special trailer. Two operators can operate from separate positions simultaneously and the unit can be operated while in motion.

equipment in action, and an all-band amateur radio station to be set up at the convention for use of convention delegates and other visitors.

Operating as a portable station with the call sign WAR1, the station was on the air from 10 A.M. to midnight Saturday, and from 12 noon to 5 P.M. on Sunday. Continuous watch was maintained on a short-haul circuit to the Pentagon, using the frequency 20,994 kc. The station checked into various east coast MARS nets with traffic. During the military-to-amateur portion of Armed Forces Day the 4085-kc. voice contacts were made from the mobile unit. During the six-hour period of this test (6 P.M. to midnight) the unit employed call sign WAR.

U. S. N. R.

The District Reserve Electronics Program Officer, Sixth Naval District, has selected Naval Reserve Electronics Company 6-23 of Marianna, Florida, (K4NBO) as the outstanding electronics company in the Eighth Naval District.

Boy Scout Activity

The Naval and Marine Corps Reserve Training Center at Little Rock, Arkansas, (K5NRL) conducts a weekly class for local Boy Scouts in preparation for amateur licenses. The class is held each Thursday from 7 to 10 P.M. and instruction is given in both code and theory. Nine scouts from three troops are enrolled in the class.

Message Service

During the recent Ralph Edwards Fiesta at Truth or Consequences, New Mexico, the Naval Reserve furnished message service via amateur radio. An SCR-299 communication van from the Naval and Marine Corps Reserve Training Center, Albuquerque, (K5NRX) was set up adjacent to the Chamber of Commerce building during the three-day show. Two hundred and seven messages were sent to service personnel in the U. S. and overseas via amateur radio. Easter messages from crippled young patients at a local hospital were forwarded to their parents throughout the state of New Mexico. W5UOC, Nelson A. Daniel, FPC, USNR, stationkeeper, operated from K5NRX and was assisted by other New Mexico amateurs in handling the traffic.

—···—

Once again the Naval Reserve Training Center, Laurel, Mississippi, (K5NAK) assisted by local amateurs, and amateur radio station W9FCF at Wausau, Wisconsin, have teamed up to provide a daily message service via amateur radio. The occasion this time was the visit of Wausau High School students to Laurel as part of a student exchange program. Students were able to exchange messages with their homes in the same manner as was provided the Laurel students visiting Wausau recently. Operators at K5NAK were W5s ECT LWQ and NRU. W9FCF at Wausau was assisted by W9s RLB and VHA.

Code Practice

Amateur Radio Station K6USN of the Twelfth Naval District at Treasure Island, San Francisco, California, now transmits code practice for west coast amateurs every Tuesday and Thursday night on 3590 kc. from 1830 to 1930 PST. Code speeds vary from 5 to 25 w.p.m.

Arrangements for the above schedules were coördinated with the ARRL Section Communications Manager, Ray H. Cornell, W6JZ, of the Pacific Division, East Bay section, who runs similar schedules as listed on page 65.

One Problem in Choosing Test Leads

BY GEORGE S. COHEN,* W8HTI, AND RICHARD W. HESSINGER*

EVERY audio enthusiast, amateur radio operator, and electronic technician finds it necessary at one time or another to make some sort of electrical measurement. Many of these measurements involve d.c. Bully for the man who has only this type of measurement to make. But there are those of us who are not quite so fortunate, for we must make many measurements on a.c. equipment. (This "a.c. equipment" means anything other than d.c., and so involves a.f. and r.f. as well as commercial power frequencies.)

All of these measurements require some type of connecting leads from the energy source to the

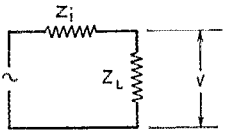


Fig. 1 — The electrical circuit of any generator with an internal impedance Z_i working into a load Z_L. A typical example is a vacuum tube, where Z_i becomes the plate resistance and Z_L the load impedance.

measuring instrument. In the course of making many measurements it was found that a source of difficulty, in one instance, was in finding satisfactory leads for the particular job at hand. Although the measurements of current and voltage present similar, if not identical problems, we will consider voltage only.

Let us consider the generator of Fig. 1 with an internal impedance Z_i. This source is feeding a load with an impedance equal to Z_L. This circuit

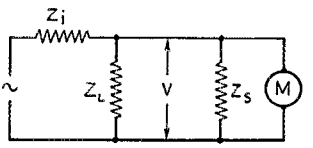


Fig. 2 — Any practical voltmeter can be represented by the meter M and Z_i, the impedance of the meter and its leads. Unless Z_i is considerably higher than Z_L, the indicated voltage will be lower than V.

is very general and, as an aid in visualizing the problem, the generator may be thought of as a voltage-amplifier stage in an audio amplifier where Z_i is the plate resistance of the tube and Z_L is the impedance the tube is working into.

If we assume that the generator is a pentode voltage amplifier and that Z_i is, therefore, of the order of 0.5 megohm and that Z_L is in the vicinity of 0.3 megohm, we will have a specific value of voltage, V, across the load.

Now, as is often required, let us measure the voltage across the load impedance Z_L. This circuit is shown in Fig. 2. M is the meter or measuring instrument and Z_S is the combined impedance of the instrument and its attached leads.

The voltage V that is measured in Fig. 2 will be approximately equal to V of Fig. 1 only if the impedance Z_S is ten or more times greater than Z_L. This happens because the shunting effect of the impedance, Z_S, combines in parallel with Z_L to give a lower resultant value.

As an example, let us suppose that Z_S is equal to Z_L — 0.3 megohm in this case. The parallel combination of Z_S and Z_L would then be equal to 0.15 megohm. Fig. 3 shows that under the original conditions V would be 0.375 times the generated voltage, E_G. With the effect of Z_S the

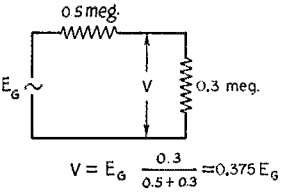


Fig. 3 — When Z_i and Z_L have the values indicated, V = 0.375 E_G.

voltage across the combination would drop to 0.23 times E_G, as in Fig. 4. The difference in voltage is made up by additional drop across the plate resistance of the tube.

Further, if this amplifier were operating at 2 kc. (a reasonable frequency within the range of most audio amplifiers) then the shunt capacity necessary to give Z_S a value of 0.3 megohm would be 265 $\mu\mu$fd.[1]

A value of 265 $\mu\mu$fd. may seem very large and unlikely to be found in an ordinary pair of test leads. Recently, in testing a circuit, we found that our calculations and actual results didn't agree very closely and that started the usual search.

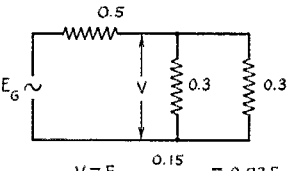


Fig. 4 — If Z_S is equal to Z_L, the indicated value of V will be 0.23 E_G.

The culprit was soon found. A shielded multiconductor cable exhibited a capacity of 225 $\mu\mu$fd. from leads to shield and 128 $\mu\mu$fd. between leads. After this discovery, many leads in the laboratory were measured. One of these was a 4½-foot shielded test lead supplied with an oscilloscope

(Continued on page 116)

* Commonwealth Engineering Co. of Ohio, 1771 Springfield St., Dayton, Ohio.

[1] $C = \frac{1}{2\pi f X_c} = \frac{1}{2 \times 3.1416 \times 2000 \times 300{,}000} = 265 \times 10^{-12}$

If Z_S is all capacitive reactance, as in this case, it will combine with a resistive Z_L of 0.3 megohm to give a resultant 0.21 megohm and not the 0.15 megohm shown in Fig. 4.

Hints and Kinks For the Experimenter

REDUCED OUTPUT FROM THE BC-221-A FREQUENCY METER

PRIOR to a recent modification, the output of a BC-221-A was too great to permit smooth heterodyne action with the receiver tuned to a weak signal. This condition was quickly remedied by lowering the output of the oscillator. A 1-megohm resistor inserted in series with the existing screen-dropping resistor does the trick nicely. One of the 'phone jacks was rewired so that its contacts will shunt the new resistor whenever it is desirable to obtain full output from the meter. A ¼-inch bakelite rod is used to close the jack during full output operation. — *T. D. Koranye, W2SFW*

USING COPPER BRITE FOR CRYSTAL GRINDING

COPPER BRITE, a polishing agent for copper kitchen utensils, works very well as a crystal-grinding compound. It cuts fast enough — but not too fast — is generally available and sells for only eighty-nine cents per 8-ounce bottle. Be sure to keep the stuff out of open cuts because it's got a powerful bite. — *LeRoy G. Riesland, W7LVB*

SIMPLE GROUND-PLANE ANTENNA FOR 28 MC.

RESTRICTED space, army post regulations pertaining to antenna construction and the need for an omnidirectional antenna were all instrumental in the development of the antenna set-up shown in Fig. 1. The strain insulators that support the 100-inch vertical wire are located at the upper and the lower edges of a building and

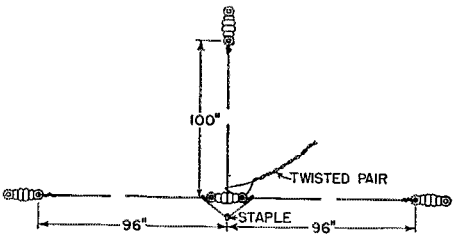


Fig. 1 — The "Gizmo" antenna supported on the side of a building. Coaxial cable may be used for the feed line in place of the twisted pair.

the two 96-inch radial wires run along the base of the wall. The *twisted pair* used to feed the radiator may not provide the best match in the world, but does serve as an economical feed line for an exceedingly economical antenna.

This simple vertical job probably will be more effective for work with 28-Mc. mobiles than will any existing horizontal radiator (except for a rotary beam) that you happen to be using. In my own case, it was observed by W3QHG (mobile with a vertical whip) that my fixed-station signal went from down-in-the-noise to a solid S6 when the regular center-fed horizontal was replaced by the vertical — or as I call it — the "Gizmo" antenna. This test was conducted over a 4-mile path and a second check, 16 miles farther along the line, showed that the Gizmo was still getting out. — *Capt. Albert S. von Trott, W3UIX/3*

HOMEMADE POWER PLUG FOR THE PE-103

SINCE plugs to fit a PE-103 dynamotor seem hard to find, a couple were home-built in the following manner. The pins from an octal tube base are just the right size so a supply was obtained by cracking up a couple of old tubes. These pins have a flange near the base and the end is flared. The flared ends were carefully straightened out with a pair of pliers.

Next, a 1 3/16-inch diameter disk was turned from a piece of Plexiglas a shade over ⅛ inch thick. A hole just slightly smaller in diameter than one of the pins was drilled through the center of the disk. A pin was placed in a vertical position with the flanged end up and the tip resting on the workbench. The plastic disk was rested on the pin with the center hole directly over the end of the pin. With the disk held steady by the left hand, a hot soldering gun was applied to the pin with the right hand until the Plexiglas began to melt. Then the disk was pushed down over the pin to the flange. While the plastic was still soft the pin was pushed into the socket on the PE-103 and allowed to cool in place.

The position of the next pin was then marked simply by sighting through the clear plastic. Another hole was drilled and the next pin was set as before. Each succeeding pin was set the same way and each one was allowed to cool in the socket, thus assuring perfect alignment. The open ends of the pins projecting through the disk were then flared by a light tap with a center punch.

A second Plexiglas disk was then turned with a shoulder cut on the circumference. It was drilled with larger holes to clear the pins and then it was cemented to the back of the plug so that the shoulder formed a groove around the rim.

Finally, a shell from a commercially-built plug was snapped onto the finished assembly and the result was a neat and serviceable plug. — *C. A. Thunen, W6ACT*

Correspondence From Members-

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

W/VE RECIPROCAL OPERATING

740 44th Avenue
Lachine 32, Quebec

Editor, *QST:*

The current activity of the Board of Directors of the Montreal Amateur Radio Club in organizing the Eastern Canada ARRL Convention for next September, combined with the thought that there will almost certainly be activities for mobiles at this and other affairs along our borders, prompts me to suggest a reprinting of the regulations under which Ws may operate in Canada and vice versa.

W applications should be directed to Radio Division, Department of Transport, Ottawa, Canada, and, while I am sure that the Department will do everything possible to expedite permits, it is suggested that applications be made well in advance to avoid possible disappointment should a large number of applications cause delays in processing.

We hope that many of our American friends will take advantage of the opportunity to operate in Canada this summer and assure them of a most sincere welcome.

— *C. C. Dumbrille, VE2BK*

[EDITOR'S NOTE: September, 1952, *QST* contains an article on the reciprocal operating agreement.]

MAY EDITORIAL

49 Prospect Street
Whitinsville, Mass.

Editor, *QST:*

Your editorial in *QST* for May, 1953, brought back old memories!! But — didn't you neglect something?? As I remember, there were *two* symbols in those old days which stood for weapons to combat "rotten operating," namely, the Wouff Hong (which you mentioned) and the Rettysnitch!!

If reference is made to page 5 of "Handy's Handy Handbook," Edition One, 1926, you will find pictures of both of these horrible gadgets! . . . However, how much further back than this one should go to find the origin of the Rettysnitch I cannot say, but it seems from my memory it was talked about long before this. In looking back through many of my old copies of *QST* I have not as yet found the earlier origin or reference. But, just to set the record straight, shouldn't the good old Rettysnitch have its place along with the Wouff Hong when speaking of old traditions and symbols?

Best wishes to ARRL and the crew at Headquarters — and congratulations on a job well done.

— *Jim Saunders, W1BDV*

[EDITOR'S NOTE: Actually, the Rettysnitch showed up in the same article as the Wouff Hong, but The Old Man never glorified it to the same extent, nor did the Board of Directors take official cognizance as it did of the Wouff Hong. Nevertheless, the Rettysnitch is still occupying a place of honor in a Hq. Museum cabinet.]

322 White Street
Waterville, N. Y.

Editor, *QST:*

It was very pleasant to read the editorial in the last issue of *QST* on the Wouff Hong and all it stands for. I think it is time we give a little more thought to the principles which T.O.M. wished all amateurs to live by, and pass along to the newcomers. We have had many of these newcomers enter the field and in many instances I wonder if they have been instilled with these principles. This experience, which I will outline briefly, may be one of the reasons.

Last fall I attended a hamfest and an opportunity to become a member of the ROWH was offered. To say the least, I was greatly disappointed in the initiation, as I had thought here was the chance for these traditions started by T.O.M. to be passed on to new hams in an impressive and serious way. The degree team made their entrance and I discovered that the work was on tape. This left the team with nothing to say except ad lib, which destroyed much of the effectiveness of the teaching. At the conclusion the master of ceremonies stated he had not had time to sign the certificates, that the password could be obtained from the "candidate" who acted as proxy for the initiates. Thus the whole affair became a farce. There was a lack of seriousness in the whole proceedings, the value which such an affair could have was entirely lost. I came home with a blank certificate and without the password. How could a newcomer feel he had joined anything or that there are some things in our ham fraternity about which we are somewhat serious? I, for one, would like to see the ROWH serve the purpose it was intended to serve.

— *M. L. Peterson, W2FMX*

TNX

3108 Winz Ave.
Waco, Texas

Editor, *QST:*

I wish to take this means of thanking the many amateurs who helped me in handling the many ARRL 12-14-7 messages I received following the Waco tornado of May 11, 1953.

Also I would like to praise those amateurs who so graciously QSYd that disaster traffic would have a clear channel, not forgetting those who stood by to QSP the weak and unreadable signals.

Amateurs as a whole are a mighty fine bunch of OMs.

— *C. J. McCauley, sr., W5TVA*

MOON-BOUNCE

9-11 F.D.R. Drive
New York 9, N. Y.

Editor, *QST:*

Who's the guy who says the article on lunar DX was not interesting? Years of work and a lot of money go into it and some ham goes and calls it a "wet mop." The example shows the perseverance and ingenuity all hams display and W3RSF calls it junk. If that's all amateur developments mean to him, he ought to wrap his license up in *QST*, throw it out the window, and sell his rig! . . .

But so much for boring criticisms! What I really had in mind when I wrote this letter was why not re-publish the Rotten Radio series of our beloved Hiram Percy Maxim. An article a month would make some pretty interesting reading.

— *J. Cechony*

338 Willow Street
Johnsonburg, Penna.

Editor, *QST:*

A letter entitled "Slosh!" on page 142 of May *QST* has had me seething for the past two weeks whenever I think about it.

W4AO and W3GKP did a swell job and when ham history is made, I for one do not want it shoved aside for an article on TVI or s.s.b.

— *George W. Singleback, W9UNC*

MR. RAPP TAKE NOTE!

234 Buckingham
San Antonio, Texas

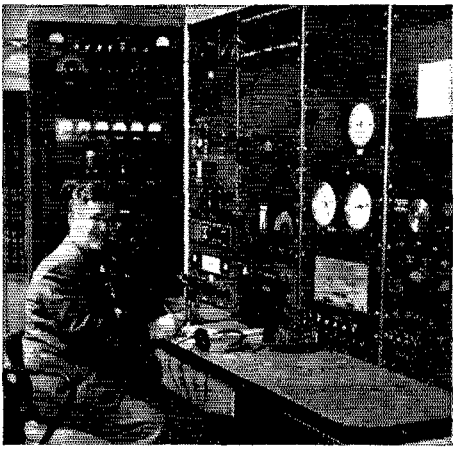
Editor, *QST:*

W3FQB's story "The Man Who Broke the Bank" was very fine, and if it were lacking in any respect the illustrations by "Gil" perfected it.

Larson E. Rapp himself would be hard-pressed to dream up a more promising contribution to the art than the automatic Sweepstakes layout reported by Mr. Montgomery.

— *James R. Fendley, jr., W5MIL*

He Makes What We Hams Use



JOHN WELLS, W1ZD
Harvey-Wells Electronics, Inc.

EVER since John worked French 8AB in 1924, DX has been his major interest. Section winner in the DX contests of 1936, 1947, 1948, WAC in 1936, postwar DXCC — but perhaps the most excitement was back before World War I when he made a coherer-type receiver respond to a spark coil several hundred feet away. John was first president of his school's wireless club, 1BTJ, in 1919, and a reorganizer of the Harvard Wireless Club, 1AF, whose 500 cycle "impact" transmitter gave considerably more joy to the club members than it did to the operators at the Charleston Navy Yard. One of the earliest hams to grind crystals, having started by using pebble quartz lenses obtained in England, John's description of his crystal-controlled rig appeared in *QST* for June, 1926. It was his autogyro that made the trip to the White Mountains for the 5-meter eclipse of the sun tests written up by Ross Hull in the October, 1932, issue. Two summers as a seagoing sparks and one on a Navy destroyer helped John become the good op he is now. W1ZD always welcomes a rag-chew, c.w. or 'phone; look for him on any band from 50 Mc. down.

Strays

As a proper follow-up to the Stray on page 49 of May *QST*, we are pleased to announce that Dad Ogurcak, then WN9UBV, successfully passed his General Class exam and thus evened the score with 11-year-old son Larry, W9UBY.

— *W9ONY, Milwaukee Radio Amateurs' Club*

A.R.R.L. QSL BUREAU

The function of the ARRL QSL Bureau system is to facilitate delivery to amateurs in the United States, its possessions, and Canada of those QSL cards which arrive from amateur stations in other parts of the world. Its operation is made possible by volunteer managers in each W, K, and VE call area. All *you* have to do is send your QSL manager (see list below) a stamped self-addressed envelope about 4¼ by 9½ inches in size, with your name and address in the usual place on the front of the envelope and your call printed in capital letters in the upper left-hand corner. For a list of overseas bureaus see p. 59, June, 1953, *QST*.

W1, K1 — J. R. Baker, jr., W1JOJ, Box 232, Ipswich, Mass.
W2, K2 — H. W. Yahnel, W2SN, Lake Ave., Helmetta, N. J.
W3, K3 — Jesse Bieberman, W3KT, Box 34, Philadelphia 5, Penna.
W4, K4 — Thomas M. Moss, W4HYW, Box 644, Municipal Airport Branch, Atlanta, Ga.
W5, K5 — Oren B. Gambill, W5WI, 2514 N. Garrison, Tulsa 6, Okla.
W6, K6 — Horace R. Greer, W6TI, 414 Fairmount St., Oakland, Calif.
W7, K7 — Mary Ann Tatro, W7FWR, 513 N. Central, Olympia, Wash.
W8, K8 — Norman W. Aiken, W8LJS, 701 East 240th St., Euclid 23, Ohio.
W9, K9 — John F. Schneider, W9CFT, 311 W. Ross Ave., Wausau, Wis.
WØ, KØ — Alva A. Smith, WØDMA, 238 East Main St., Caledonia, Minn.
VE1 — L. J. Fader, VE1FQ, 125 Henry St., Halifax, N. S.
VE2 — Austin A. W. Smith, VE2UW, 6164 Jeanne Mance, Montreal 8, Que.
VE3 — W. Bert Knowles, VE3QB, Lanark, Ont.
VE4 — Len Cuff, VE4LC, 286 Rutland St., St. James, Man.
VE5 — Fred Ward, VE5OP, 899 Connaught Ave., Moose Jaw, Sask
VE6 — W. R. Savage, VE6EO, 329 15th St., North Lethbridge, Alta.
VE7 — H. R. Hough, VE7HR, 1330 Mitchell St., Victoria, B. C.
VE8 — W. L. Geary, VE8AW, Box 534, Whitehorse, Y. T.
KP4 — E. W. Mayer, KP4KD, Box 1061, San Juan, P. R
KZ5 — P. C. Combs, KZ5PC, Box 407, Balboa, C. Z.
KH6 — Andy H. Fuchikami, KH6BA, 2543 Namauu Dr., Honolulu, T. H.
KL7 — Box 73, Douglas, Alaska

Answer to* QUIST QUIZ *on page 37

The question is a trick one, since it can be interpreted two ways. If the question means, "How many kc. should A cover *in the band*?", the answer is "6 to 8 kc." depending upon his voice, the audio response of his transmitter, and the distortion in his transmitter's audio system. With serious distortion in the transmitter and an upper voice limit of 4 kc., appreciable power might exist out to 12 kc. either side of the carrier, resulting in a 24-kc. chunk of the spectrum being used.

But if the question means, "How many kc. will B cover on A's *receiver*?", the answer depends on the characteristics of A's receiver and how he uses it. A highly-selective receiver that is not overloaded (and is run with the a.v.c. turned off) would show what B's signal is actually covering. A less-selective receiver run the same way could give a false indication. An overloaded receiver of any kind would generate spurious signals *in the receiver*, giving the impression that A's signal is unduly broad.

How's DX?

CONDUCTED BY ROD NEWKIRK,* W1VMW

How:

W1WPO tells us it's high time we put on our other hat — the one that goes with a waggling finger — and put a few pointed remarks down in black and white concerning DXCC skulduggeries past, present and future. A shame it is that good *QST* DX space must be used for a subject applying to a most piddling percentage of all DXCC-interested DXers. Yet it does seem necessary to do this periodically in order that that percentage be kept as minute as it is. Therefore will the vast majority please bear with us?

DX Century Club membership is beyond doubt *the* DX operating award in amateur radio. We believe considerable administrative effort is called for if DXCC is to retain such eminence. In line with this reasoning, all applications for the award and its endorsements are scrutinized carefully.

That is to say that QSLs submitted for DXCC accrediting are given rigid inspection. Cards not qualifying because of technicalities — insufficient QSO evidences, dates of QSOs not jibing with dates of declared country-status, etc. — are, without prejudice, simply not accepted. But pasteboards apparently *altered* after originally having been filled out can make a longer story. The same goes for DX confirmations noted to be at certain variance with those usually dispensed by given stations.

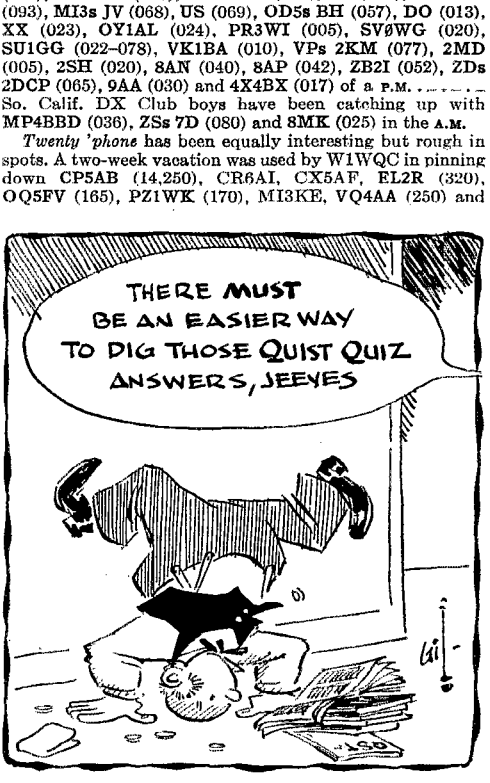
Certainly the risk of permanent DXCC embargo would seem all out of proportion to any advantages that might accrue through fast-but-phony QSLs. We could outline several sad cases in point on this score but prefer to adjourn the subject with, we hope, just enough said.

DXCC members in good standing far and wide should derive additional satisfaction from the fact that nobody slips a "quick and easy" award application past ARRL's Communications Department DXCC desk if vigilance will prevent it.

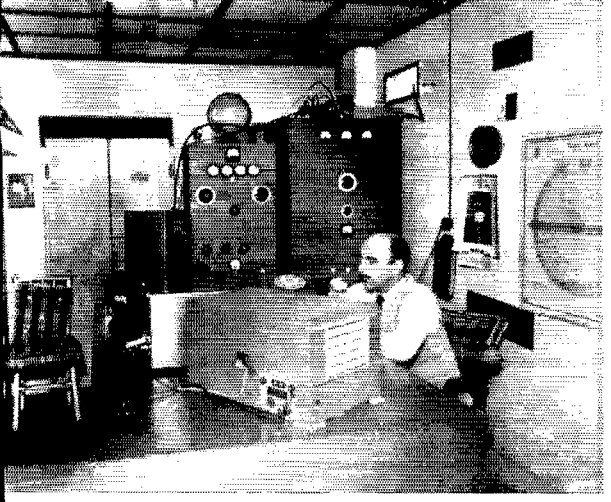
What:

Conditions on *twenty* have been strictly sawtoothish — slow build-ups to good openings and then the roof falls in. On c.w., W4JAT (ex-W8GWL) piled up 78 countries in four months with the help of **CP1BX** (14,095), **CT3AA** (100), **EA9AP** (120), **FF8AG** (050), **HE9LAA** (070), **MI3AT** (130), **ST2AR** (110) and **5A3TZ** (090). John was QRT for five years and says it's great to tackle the weak stuff once more ._._._ The Viking and NC183 at W8PCS collaborated for **SP3AN** (020), **ZB1KA** (010), **ZC4IP** (018), **VK9YY** (095) and several **YUs**. Twenty more QSLs will put Ed over the top ._._._ **KB6AY** (050), **OQ5GU** (045), **OX3UD** (090), **PJ2CB**, **VS9AP** (040), **4X4BX** (025) and a **ZB1** came back to **W9IHN**'s telegraphic beckonings ._._._ **CR7IZ** (060), **ST2GL** (020) and an **HE9** answered **W2CWK** but **VS9AP** and **VS9AS** (065) escaped Jim's clutches ._._._ **KA8AB** (**WØQDC**) scored bull's-eyes on **CR9AF** (062), **CE3FT**, **DU1s AQ** (090), **DO** (057) and **KF3AA** (042). Harry reports Japan-Europe paths productive at intervals ._._._ **M1AB** (075) gave San Marino to **W3VES/1** while **ZC5VS** (076) was quite welcome at **W5FFW**. The North Borneo entry operates almost daily between 1530 and 1700 GCT ._._._ **W8DLZ** got hot for **JA1AD** (082), **KT1UX** (007), **SU2SS** (030), **VP1AA** (010), **ZB1BU** (003) and **9S4AX** (035). Norm would like an assist on **EA8BE**'s QSL ._._._ **W6LRU** reached 181 countries through the assistance of **I1BLF/Trieste** (005), **LB8YB** (008), **VK1s AF** (040), **RL** (070), **VS2DH** (041), **YU3AE** (069) and a **ZC4**; **W6CGQ** clobbered some of the forerunning as well as **SP9KAD** (059) and **4X4RE** (030) ._._._ **VS1FH** (038), **VS2DF** (045), **YU1BQ** and **MF2AG** caught the fancy of **W6GEB**. Despite the inroads of school work, Bill is up to a 104/82 total ._._._ At **W9ESQ** we find contacts listed with **CR5AA**, **VE8s AW MC**, **W5RYF/VE8**, **ZP5AY** (078) and **9S4AR** (090) ._._._ **W2LYO** is bedeviled by his studies but arranges to collect some nice ones, nevertheless: **GC3EBK** (018), **HB1AG/HE**, **LZ1KSA**, **4X4FQ** (052) and one each bearing Trieste, Malta and Saarland labels. Dick finds his 100 watts input ample for plenty of sport ._._._ GCT catches at **YV5FL** are **ZB2B/ZB1** 1830, **FF8AG** 2145, **TF3s AB** 2030 and **SG** 2030 ._._._ **VQs 8AE** and **9MR** have been objects of much attention in the vicinity of 14,100 kc. ._._._ The West Gulf DX Club gang kept busy hearing and/or working **CR9s AH** (066), **AT 0021**) **DUs 1CV** (078), **1DV** (072), **1FC** (020), **1FK** (082), **2CV** (047), **6IV** (050), **FK8AB** (080), **FM7WM** (080), **GD3UB** (065), **KR6s LL** (052), **LQ** (050), **LU4ZO** (002), **LB6XD** (016), **SP2KAC** (048), **SU1SS** (067), **SVØWE** (017), **VK1HM** (065), **VSs 1ER** (070), **1FN** (073), **2DW** (023), **6AE** (063), **6CG** (042), **6CI** (060), **6CJ** (080), **3V8BG** (018), **4X4BN** (055) and **5A1TJ** (006) in the **A.M.**; **CN2CA** (012), **CT3AB** (005), **DU7SV** (006), **FO8AI** (023-060), **FQ8AA** (085), **GC2FZC** (019), **GD3GBG** (085), **HE1C** (039), **HH3DM** (010), **KA9WH** (078), **KX6s AH** (070), **AV** (081), **MD5GO** (093), **MI3s JV** (068), **US** (069), **OD5s BH** (057), **DO** (013), **XX** (023), **OY1AL** (024), **PR3WI** (005), **SVØWG** (020), **SU1GG** (022–078), **VK1BA** (010), **VPs 2KM** (077), **2MD** (005), **2SH** (020), **8AN** (040), **8AP** (042), **ZB2I** (052), **ZDs 2DCP** (065), **9AA** (030) and **4X4BX** (017) of a **P.M.** ._._._ So. Calif. DX Club boys have been catching up with **MP4BBD** (036), **ZSs 7D** (080) and **8MK** (025) in the **A.M.**

Twenty 'phone has been equally interesting but rough in spots. A two-week vacation was used by W1WQC in pinning down **CP5AB** (14,250), **CR6AI**, **CX5AF**, **EL2R** (320), **OQ5FV** (165), **PZ1WK** (170), **MI3KE**, **VQ4AA** (250) and



* DX Editor, *QST*.



ZD1SW (250). This puts Ham on the 82nd rung . . . . **CE3FT** (256), **HK5ER** (305) and **OA6F** (295) are good work from KA8AB's QTH . . . . W9IHN's n.f.m. slipped the noose over **VQ4ERR** (150) and VO6U . . . . **FO8AI** (260), HI8WF, KB6AY, KX6BB, **VSs** 1FK, **2DF** (200), 6CG, VQ5CB, ZK1BG and ZM6AA answered W6YY. **FM7WV** (141), AP2R and **YI2AM** (196) escaped John's ambush . . . . W1WIQ/6 hears **KAs** 2GP (220), **3RR** (214), **7RC** (210), **KJ6FAA** (250), **KM6AX** (215) and **ZK2AA** (170) boiling into San Fernando valley . . . . KL7ZG caught twenty in a rare mood and used the mike on CN8s EO EY FI, DUs 6IV 7SV, EA6AR in the Balearics, HR1KS, KR6s CR IO JL KY LA, OD5AW, VQ4EA, VR2CG, VS6s BE CL, SVØWG of Rhodes, a YI2 and ZK2. Who said conditions are always blotto in Alaska? . . . . **EA8AX** (189), **FO8AD** (180), **KF3AA** (134), OQ5FO, **VK9YY** (070), **VSs** 1ES (307), 1AY (191), **VP2AJ** (185) and San Marino's **9A2A** (300) are 'phones recommended by WGDXC's *DX Bulletin*.

Fifteen 'phone produced much entertainment for W6ZZ. Miles found these voicers going strong: CEs 1BE 6AB, HPs 1PH 3FL, HR1KS, KG4AJ, KH6s ANH AR, KM6BG, KV4BD, KZ5s DG FL GD KA ML NM RM WZ, PJ2s AA AO, PYs 2JU 4AJD 5DW, TI2RC, VKs 2AWU 3AVB 4EL 4TN, XE3BR, ZLs 1HY 1OF 2AFA 2AX 2JB 4BN and ZP5AM. W8BHW and TI2TG tell Miles they're up to 15-meter totals of 83 and 68 countries, respectively. W6ZZ reached an all-band score of 130, with 42 on 21 Mc. . . . . KL7ZG worked Australia on fifteen and is beginning to take the band seriously . . . . Fourteen-year-old W5UUK captured HR1BG, OA4N, VP5EM and an HP3 with his mike while W1AW (W1YYM operating) took the measure of **PJ2AA** (21,075). PJ2AA spoke of a 1-hour 21-Mc. WAC . . . . W1s WPO and WPR tip us off on 'phones **ZD1SW** (340) and **MP4BBD** (078), both good for fast QSLs . . . . W3AYS is up to 67 countries on 15 meters with the help

Located in Laguaira, Venezuela, YV5FL has the Caribbean Sea a few hundred feet to his north and a 9000-foot mountain range three miles to the south. Corny pushes 250 watts into a 2-element rotary on 14 Mc. and also does business on 40 and 15 meters.

What might first strike you as a typographical booboo on page 65 of this issue is nothing of the sort. Jayme de Campos Freixo has at long last pushed his Santos station, PY2CK, past erstwhile radiotelephone (and c.w.-'phone) champion Charlie Mellen, W1FH, and takes over top spot this month in our 'Phone DXCC Honor Roll. Whether or not Jayme can hold his ground remains to be seen but here he is in the act of fighting another verbal skirmish in PY2CK's long A3 offensive.

♦

of A3ers CT1QF, CX1CG, CN8MM, OA4C, ON4HC, PY2AC, VP6CJ and ZP5AC . . . . West Gulfers have their sights on **VR2CG** (200) and **ZS7C** (230-300).

Fifteen c.w. is worth some attention. W6ZZ agrees because of LU3DD, PJ2AJ, TI2TG and VK4EL QSOs . . . . SM7VI, TI8EP and 9S4AX worked W3AYS. So did juicy **ZD9AA** (21,220) . . . . **VP7NM** (011) and VS9AP worked W1AW and KP4KD, respectively. The VS9 was Ev's 197th all-band country and 54th on 21 Mc. . . . . So. Calif. DX Club stalwarts are stalking **FU8AA** (030).

Forty 'phone is as tough a nut to crack as ever. KA8AB dug deep into the fifth layer to log these California brethren: W6s BPZ GAZ KSW RKC UGI and UVD. KAs, of course, still are prohibited use of 7 Mc. for transmitting purposes . . . . Oceanians KH6s AOL AOR and KM6BG show up in W6ZZ's 40-meter 'phone ledger while W8KXC contented himself with KG4AJ . . . . W1WPO nominates **CN8FS** (7180) as a candidate for most potent African A3 signal on forty.

On *forty c.w.* things have been a little better. W8JGU racked up **KC6QY** (7003), TI2PZ, **VP8AP** (7020) and sundry PY/VK chaps . . . . **KW6BB** (7040) and **VP2SH** (7090) succumbed to W6ZOL . . . . W9ESQ grabbed the VP2, VP8 and KW6 already mentioned and knocked off CT1UI, HC1JW, HR1KS, VK6LU and VK9YY as well . . . . KW6BB and several of the PY/VK/ZL gang entered W9QMI's archives . . . . **VK1AF** (7052) of Macquarie and PZ1WX kept W1ORP occupied. The VK1 shows up during the wee, wee hours . . . . W6ZZ took enough time off from 21 Mc. to contact JA1BC and W7PLI/KG6 . . . . LUs 3ZO 4ZO and 5ZO are intermittently available on 40's low edge.

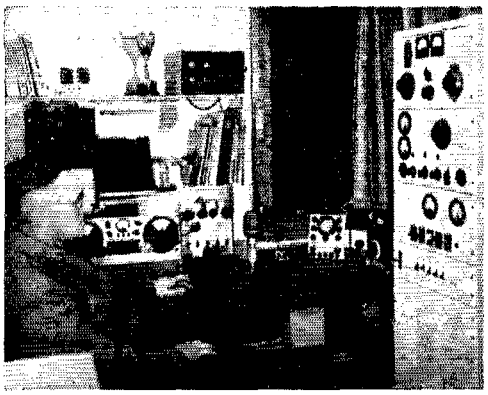
W1ORP's big vertical on *eighty* picked off **HB1AG/HE** (3510) for a neat catch. Ed worked Gs 2HLF 3EGR, CN8EG, PAØXYZ, ZL1s ADU and AJU right up into the noisy season . . . . W2CWK reaches a 63/54 score on 3.5 Mc., including QSOs with EA4CN, FF8AG, VP2KM, YU3BC, YV5DE and ZS3K. Jim does a good job with an 80-meter antenna that is folded to fit limited available skywire space . . . . W6ZAT points up the fact that you birds who got such fancy DX on 3.5 Mc. last year undoubtedly owe W2QHH and W4BRB considerable thanks. Howy and Gene did a lot of painstaking missionary work to convince rare DX that 80 is worth a try.

We don't hear much about *ten 'phone* but W6QHS is happy about the band. Dave needed only ten watts input to work CEs 1AJ 4BX, CX5AF, HCs 1FG 1RT 2OL, KH6AFS, LUs 4AAR 4BJ 9DJR, PJ2CA, VK4HD, VP1GG, ZL2s AX BN MU OJ and ZP5AX.

One-sixty is dormantly recuperating from its DX exertions of last season and this lull is a good time to right a wrong done WØNWX (then W4NNN) 'way back in 1951. March *QST* of that year reported that W1BB and HC1JW ran off with the first U. S. A.-South America 160-meter QSO on record. 'Tweren't so. After some tricky research by ARRL's Communications Department, it is now established that W4NNN QSOd HC1PK on 160 c.w. during 1950's ARRL DX Competition. Until other claimants appear with evidence to the contrary, the W4NNN/HC1PK twosome rates the No. 1 spot with the W1BB/HC1JW effort a very respectable runner-up.

Where:

From now on QSLs for VS2 stations can be sent through the Malayan Amateur Radio Transmitters Society, P.O. Box 600, Penang, Malaya . . . . A short time back DX bands broke out with a rash of Portuguese call signs like CT1CL/434 and CT1TY/442. This mystery broke down under the relentless assaults of DXdom's big fat grapevine. Tail-end numbers on CT calls represent station operation



R. G. Chatfield was knocking off DX as oz2AV long before many of us were dry behind the ears. He's still at it, too — operating ZL2AV at the very same Wellington, N. Z., QTH.

by guest operators who identify themselves by using such assigned serial digits. When you work a station with such a label you'll go over big by sending two QSLs — one for the station's archives and one for the visiting fireman . _ . _ . _ Now let's see what our benevolent sleuths have uncovered in the way of interesting DX addresses:

CR4AD, Sal Island Airport, Cape Verde Islands
DL4SE, M/Sgt Don E. Berger, 7706 AFN Co., APO 757, c/o Postmaster, New York, N. Y.
HB1AG/HE, Helmut Hoschke (DL1AU), P.O. Box 97, Schaan, Liechtenstein
HC4MK, Martin Kohls, Box 2327, Quito, Ecuador
I5CIR, (QSL via I5CIB)
JA3AA, Isogi Shima, 17 Kajiyacho, Otsu, Japan
JA3AB, Daihachi Fujimoto, 339 Shinmachi Shimodachiuri, Kamigyos, Kyoto, Japan
JA3AC, Kusutaka Yuasa, 12-3 Hamoguchi, Higashi Sumiyoshiku, Osaka, Japan
JA5AA, Masao Kume, 544 Oxinohama-cho, Tokushima City, Japan
KF3AA, (QSL via W2PGG)
KT1UX, American Legation, VOA, Tangier, Morocco
M1AB, P.O. Box 72, Ravenna, Italy
MF2AE, Box 5, Trieste, Free Territory of Trieste
OD5XX, (QSL via OD5AB)
PZ1WX, c/o K.L.M., Paramaribo, Surinam
SP3AN, (QSL via PZK)
ST2AR, A. E. Dowdeswell (G4AR), Sudan Airways, P.O. Box 253, Khartoum, Sudan
VK1BA, Lot 48 Blackburn St., Maddington, Perth, W.A., Australia
VK1RL, 15 Monitor Rd., Merrylands, Sydney, N.S.W., Australia
VP2SH, Stanley O. Antrobus, Richmond Hill, Kingstown, St. Vincent, B.W.I.
VQ3BU, Phil Marks, Williamson Diamond Mine, Shinyanga, Tanganyika
VS7MC, (ex-ZC2MAC, QSL via RSGB)
VS9AP, John van Puyenbroek (G2AVP), c/o RAF, Tarshyne, Aden
W2PCJ/VO4, Box 137, APO 864, c/o Postmaster, New York, N. Y.
W4PLF/KG6, (QSL via GRAL)
YS1ZM, C/o American Embassy, San Salvador, El Salvador
ZB1KA, (QSL via RSGB)
ZB2B, (ex-G3IKU/ZB2, QSL via RSGB)
ZC5VS, F. S. Hugh, Box 136, Sandakan, British North Borneo
ZE4JK, C. C. Russell, Plot 17, Caledon, Salisbury, So. Rhodesia
ZE4JL, C. W. Dale, Charlesdale, Service Station, Marandellas, So. Rhodesia
ZE5JK, Mrs. D. V. Honman, Kamativi Tin Mines, Dett, So. Rhodesia
ZE5JS, Miss C. W. Lewthwaite, P.O. Box 118, Que Que, So. Rhodesia
ZE5JU, A. J. Munro, Officers' Mess, RAF, Thornhill, Guelo, So. Rhodesia
ZP6CR, Post Box 3081, San Paulo, Paraguay
4X4BR, Eli Friedman, P.O. Box 831, Haifa, Israel
9S4AR, Kurt Schneider, Box 310, Saarbrucken, Saarland

The DX gang can only derive from these pages what the DX gang contributes. For the preceding rundown you owe W1s ORP RWS WPR, W2s AOS/KG6 CJX CWK ESO VMX/1, W3VES/1, W5ASG, W6s GEB LRU ZOL, W9s CFT ESQ IHN, CE7AA, L. M. Michel, West Gulf DX Club *DX Bulletin* and So. California DX Club *Bulletin* substantial thanks.

Tidbits:

Asia — GM6MD tells us GM3AFG (ex-MP4BAO) will become active in Qatar with a 150-watter. GM6MD will arrange to get you your overdue MP4BAO QSLs if you'll send him full QSO particulars for log check. Full dope is necessary because MP4BAO has received over 200 cards for QSOs that never took place! Guys who go out of their way to help a rare brother tackle QSL chores deserve a huge hand from the entire DX clan . _ . _ . _ W2DX visited W2AOS/KG6 on his way to Taipeh, Formosa, diggings. The former is with RCA — watch out for another C3 customer . _ . _ . _ G5RV's whole family pitched in to fill out and mail 300 ZC2MAC QSLs. W1WPO notes many of them now appearing at his desk for DXCC credits . _ . _ . _ In *FEARL News* we see that five TV stations in Japan — three in Tokyo and one apiece in Osaka and Nagoya — are on the air or being readied for action. Others are contemplated for Kyoto, Kobe, Kokura, Fukuoka and Sapporo areas. Scratch off one spot for TVI retreat! . _ . _ . _ TA3AA emphasizes that QSLs should be sent to him *only* via the "Where" listing in February *QST*.

Africa — In a note to W1NWO, FB8BB passes along ill tidings of a hurricane that put his Madagascar installation out of commission as of January. Mac tells Willard that no other local FB8s are currently operating with any genuine interest in DX work. FB8BB hopes to be back on the air from Tananarive by August, sporting new gear to be shipped from Paris . _ . _ . _ ST2AR (ex-G4AR) of Khartoum likes to QSL and is being widely worked on 20 . _ . _ . _ After three years of Moroccan hamming, CN8EG still needs N. Dak. and Mont. for WAS. Steve thought he'd get good shots at 'em in ARRL's '53 DX Test but not a single QSO with either state showed up among 550 20- and 40-meter contacts. CN8EG has until December to sew up the effort, after which he'll QRT and QSY to new horizons . _ . _ . _ MI3NJ informed W1ATE that the MI3 Eritrean amateur prefix changes to ET2 as of May 31st. With Ethiopia employing ET3 labels, it appears we're in for some fun . _ . _ . _

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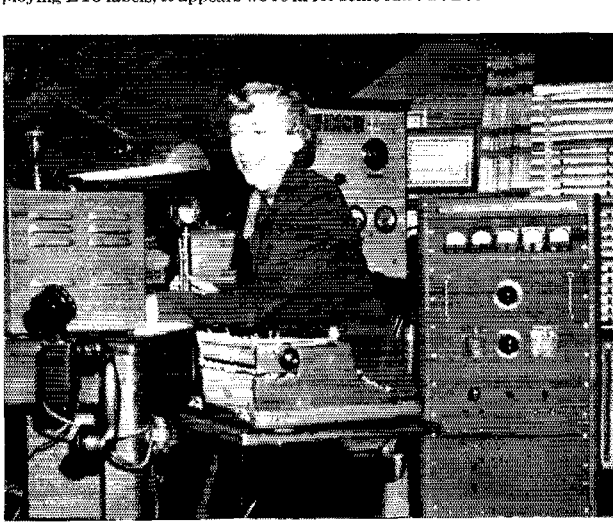


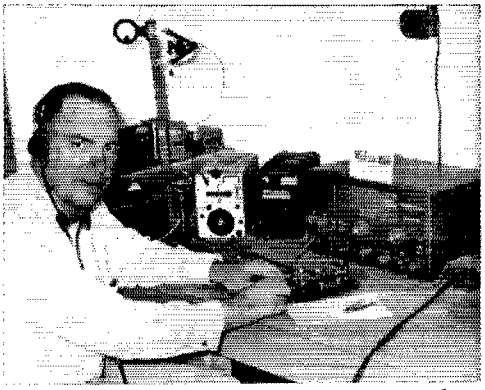
This shot would go equally well on our YL pages but here's a gal who can hold her own with the boys any old time. It's Lou Littlefield, W1MCW, of Cape Elizabeth, Maine. A peek at the DXCC 'Phone Honor Roll will tip you off as to Lou's DX capabilities.

W1MCW's new rig runs a kilowatt to a pair of 4-250As modulated by 304TLs and hits all DX bands. The other job is a 250-watter using 812s in the final, first fired up when Lou was licensed in 1939. She receives with an HQ129X and employs a wide-spaced 3-element beam on 20 meters as well as a 4-element deal on 10.

Lou's log lists 206 countries captured on voice, 198 of them accounted for in her QSL file. W1MCW's 28-Mc. 'phone record alone stands at 168 countries. Looks as though we'll have to rush the burial of a pet clich' — that one about the "DX fraternity."

SU1XZ is curious about one HX1B who gave his QTH as Bouvet Island, Norwegian Antarctica.

Oceania — The KG6 gang keeps Coral Isle Radio Club station KG6AAY quite active on 20 'phone. W2AOS/KG6 reports KG6AEP leaving for the U. S. in favor of a W6 set-up. W2AOS/KG6, himself, is usually found either on 14 or 7 Mc. from 1200 to 1400 GCT, using c.w. for the most part . . . . Another chap who needs N. Dak. for his WAS sheepskin is VK5JE, who was licensed and active as early as 1926 (A2JC). He's still only 44 and shoots golf in the mid-80s . . . . ZL2GS first hit the c.w. airwaves in 1929 but fiddled around with spark gear many years before. Never misses a DX test if he can help it . . . . Chas. H. Freeman, ex-VR2CD-ZL4FH-ZL3AE-ZL1BI, is moving to the vicinity of Honolulu and hopes to hold out long enough to hit the air subsequently with a KH6 call. Meanwhile, he'll get himself a VE label while situated temporarily in Canada and will fire up in Hawaii later as a VE/KG6.



Seventy-five watts input at W2AOS/KG6 stack up well against the high-power competition of the station's many Guamanian ham neighbors. Op and owner is Cmdr. Charles E. Biele, USN, who uses McMurdo-Silver 701, BC459-A and ARC-5 transmitters on 3.5, 7 and 14 Mc., respectively. The receiver is an NC-125 and Windom antennae are preferred. W2AOS/KG6 has plenty of countries in the log, including WACs on 7 and 14 Mc. A strict 100 per cent QSL policy prevails.

Europe — Assisted by HB9AG's good offices, DLs 1AT 1AU and 9PR journeyed to the precipitous principality of Liechtenstein to do a rush business under the cognomen HB1AG/HE. They set up shop on the low rise of Drei Schestern, 2055 meters above sea level, in the town of Schaan and just across the Rhine from Switzerland. A long wire antenna was hoisted and this was used on several bands with a VFO-6AG7-807-807 transmitter. The boys rolled up more than 800 QSOs with approximately 100 countries and their QSLs are already traveling far and wide . . . . The Gothenburg (Sweden) Radioamateur Society announces a "WGSA" certificate award. Aspirants outside Europe may earn the wallpaper by presentation of two Gothenburg QSLs as obtained for QSOs made after December 31, 1952. For other details and a list of Gothenburg SM6s write SM6ID, Göteborgs Sändare Amatörer, Box 609, Gothenburg 6 . . . . GC2CNC gave W1VG details about a world-wide organization of low-power DX enthusiasts — the QRP Research Society — about which any W/K/VE DXers in the 5-watts-or-less category are invited to make inquiry. GC2CNC has worked 18 United States and 33 countries this year while running between 2 and 5 watts input. Monty's two QRP rigs have 6V6 crystal oscillator, 6C5, 6V6 and 6J5 VFO, 6C5, 6V6 line-ups. GC2CNC's antennae are a 2-element 14-Mc. rotary beam and a 520-foot long wire for the lower frequencies. More power to him! [You couldn't resist that, could you Boss? — *Jeeves.*] . . . . U. S. citizens in Iceland can obtain permission to operate MARS circuits there but can do no hamming. Connecticut W1s GTC RTD TKS WJB WJC WLK, WN1s WMZ WOE and WYP are up there manning AJ9AC/TFK . . . . The 160-meter band will no longer be available in Finland. British amateurs lose a chunk of their 160-meter holdings, too, and will henceforth not be heard below 1800 kc. This from G3ABG via KP4KD . . . . To celebrate their 40th anniversary as a club, the Barnsley-and-District Amateur Radio Club will operate all DX bands during the period September 12th through 20th, with the objective of making as many world-wide contacts as possible. Members Gs 2BH 3ABS 3AMG 3DHU 3DOI 3EAE 3FLQ 3GAH 3GKK 3GNK 3GXB 3HTM 3YA 4JJ 5IV 5KM 6LZ 6UF and 8VK will have special Coronation commemorative QSL cards ready to ship out . . . . Finland has eight call areas now and is considering the possibility of adding a ninth. OH2YV writes that OH9 would represent the portion of Finland encompassed by the Arctic Circle. That's where some of the present OH8s hang out . . . . As you probably know by now, old SV5UN is now SVØWG, still on the island of Rhodes. W3CHV, W4VUM and KL7AIF handle the layout. They recently unleashed 1000 SV5UN-SVØWG pasteboards via Greece. Three transmitters are available with inputs of up to 300 watts and they'll be able to keep Rhodes on the ham map for at least another year.

South America — RCA (Argentina) offers a "CAA" certificate — *Certificado Antartico Argentino* — to any amateur who can offer proof of QSO for contact with an LU station located in the Argentine Antarctic. Endorsements are available for additional QSOs/QSLs. For details contact Radio Club of Argentina, Avenida Libertador General San Martin 1850, Buenos Aires . . . . VP3WO works out well with an exciter pieced together from various *Handbook* circuits and is getting a big kick from 7-watt c.w. DXing . . . . Punta Arenas CE7s AA AB AQ and AZ are quite active on all DX 'phone bands. CE7AA knows his way around on c.w., too. Forty meters in wintertime is the big band down that way and our new 7-Mc. 'phone gang should give them some business this W/VE summer. CE7AI is also available on 40 'phone and is located in the difficult-to-work Chilean department of Fireland. "The 10-meter band is absolutely dead and useless," writes CE7AA . . . . By the time this gets around we'll know if CE3AG made it to Easter Island around June 15th after many postponements. QSLs for the CEØAA DXpedition are to go via RCC.

Hereabouts — W9s GVZ NZM and PKW have purchased the late W9LM's location and gear at Itasca, Ill., and keep the W9LM 7-Mc. rotary in good shape. They have W9LM's logs and are prepared to accommodate any station still desiring a W9LM QSL. Hal did a thorough job in that department; very few applicants should show . . . . W8OT gets a bang from QRP DX he's working with a 1440-foot wire suspended at an average height of 5 feet above ground. Sounds like a Texas clothesline . . . . Contrary to a recent column squib, itwas W2PZM who was looking for tracers on VR2BM and MD2PM. Gil is among those who would like to know how to nail down an EA9DC card without going into hock . . . . W4ZAE mentions TCDXC — the Transcontinental DX Club — which now has members in many states . . . . W2VMX/1 finds that OX3UD's last mail was in November of '52. Take it easy on the Greenland gang concerning tardy QSLs. They do their best . . . . W2PCJ/VO4 figures he's the only mobile VO4 and possibly the only mobile VO on 20 meters . . . . VO6N has a new 807s rig perking and is out after the rare stuff with very little time left up there in which to reach the 100-mark . . . . KZ5WZ reports the Canal Zone gang all het up about 15 meters. KZ5s CP FL GD WA and WZ are devising rotaries for serious 21-Mc. work . . . . MARS stations, working just outside amateur bands, are still being mistaken for rare DX. A few MARS prefixes likely to cause confusion are AC4 AC5 and ACØ . . . . From March to June, KF3AA has been operated by W6HIK and W2PGG. Operation has primarily been on twenty 'phone and c.w., although seventy-five meters is much used for local QSOs (VE8s, VOs, etc.). Antennas still in use are a 14-Mc. ground-plane and a 3.8-Mc. doublet buried under eight feet of snow. During the three-month period over 300 stations were worked — mostly 'Ws, of course. W6HIK and W2PGG desire to thank all stations, especially W2LXP, W9NZZ and VE8MC, for handling the heavy traffic load from Fletcher's Ice Island.

—•••—

We see by ZC2MAC's QSL that he used a TVI-proof rig in the Cocos Islands. Come to think of it, Channel Two's microvoltage *must* be pretty feeble out that way.

Strays

Ed Mahaffey, WN4WTI, did a double-take when he found that WN5WTI's name is Mahaffey, too. (No relation.)

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Scotch tape and taut-stretched white thread allow W9BTC to line up his panel decals with eye-pleasing accuracy.

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W6HCI finds that inexpensive double-slug TV-type i.f. coil forms may be halved to provide single-slug forms for compact construction.

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A general revision of the Voice of America's programming schedule has resulted in termination of the VOA Radio Amateur Program series.

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You hear a lot about the message that gets delayed but very little about those that really make time. It took less than 48 hours for one of W3EQK's originations to reach a front-line Marine in Korea.

—•••—

W9YMZ was struck by a Chicago newspaper classified advertisement offering at very reasonable terms an a.m.-f.m. tuner having "audio suction." No doubt the dissatisfied owner's XYL kept the darned thing clogged up all the time.

—•••—

Yale Radio Club took on a stiff workout in April by providing 75-meter liaison communication during the annual Yale–Vassar Beer and Bike Race. Among those participating: W1s RZG URD WXR YU, W2s AFA BMF SIK and SZ.
— *W2BMF*

—•••—

WN6TZU's 8-tube superhet and 60-watt transmitter, both built from circuitry in ARRL's 1951 *Handbook*, were the nucleus of an exhibit that won him junior division first prize in the annual Southern California Science Fair, held at Los Angeles in April. — *WN6TKA*

Ex-W6SXQ's lab tests indicate that the only non-inductive candy bar is the O Henry.

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W4SMU, a Catholic priest, enjoyed a recent QSO with W6SIN.

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"There are a total of 254 countries in the state of Texas," informs an item clipped by W6BAM from the *Santa Ana Register*. To think of all those juicy W5s we've been passing up on 20 meters!

—•••—

W3EQK informs us of a recent 3808-kc. round-table that included stations in *fifteen* W/VE call areas. Each participant reported hearing all other participants with excellent signal strengths.

—•••—

These ballyhooed parakeets of present fad aren't as smart as they're cracked up to be. VE3DQX's bird learned to call CQ all right but still has trouble using the crystal filter.

—•••—

The Mueller Electric Co. (Cleveland) *Clipper* notes that man can hear sounds up to 20,000 cycles per second; a dog up to 35,000 cycles; and a porpoise all the way up to 80,000. With a front end up on 80 kc., we wonder if the latter critter may not have need for a Q5er tucked in somewhere along the line.

—•••—

W1DBM received an urgent appeal from 9S4AT via F9NW on 14 Mc. to locate and procure a special drug for treatment of a dying hospital patient in the Saar. Phil became a whirling dervish and checked by telephone with doctors, hospitals, Red Cross, drug stores, research labs, et al. The American Cancer Society in New York and the National Cancer Foundation gave W1DBM vexing news. The serum he sought was available only at a certain laboratory in France. Back on 20 meters, Phil made contact with DL4PG and had the drug dispatched to the Saar within 24 hours (they seemed like years) of 9S4AT's original plea for assistance.

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Five years were required by W5CF of Fort Worth to assemble this collection of 103 "ditto-call" QSLs. In many cases the necessary contacts were arranged by schedules. Some stations went to considerable lengths to help W5CF's enterprise along because of their ordinarily working only v.h.f., etc. Nine other double- and triple-letter stations missed having their QSLs *in this unique group* because they didn't QSL — yet.

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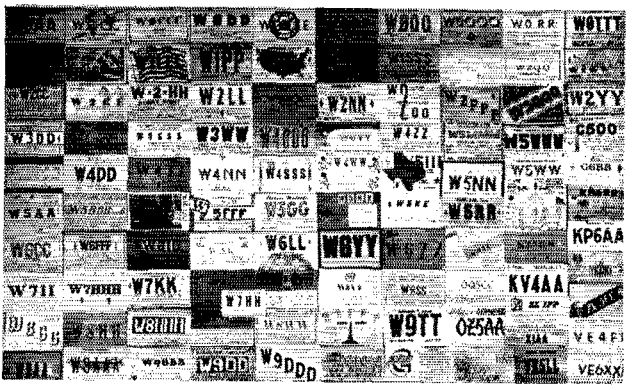


• Technical Topics —

The Role of the Amateur in Propagation Studies

A PAPER of real significance to v.h.f. enthusiasts appears in *Proceedings of the I.R.E.* for May, 1953. Titled "A Review of VHF Ionospheric Propagation," it is the work of M. G. Morgan, W1HDA, Director of Research, Thayer School of Engineering, Dartmouth College. The various means by which a v.h.f. signal can be propagated via the ionosphere to distant points are discussed in detail, and references are provided so that the reader who is interested in any of the phases discussed can find his way quickly to the basic information in that field.

The copious footnotes give some clue to the monumental nature of Morgan's work in the preparation of the paper, a labor in which he was assisted by members of the IRE Subcommittee on Ionospheric Propagation. As chairman of this subcommittee, he had the help of at least two amateurs who are well known to v.h.f. men: Ross Bateman, W4AO, and Ken Bowles, W2ZGP. In the process of its compilation the paper was circulated among interested parties for additions and corrections several times, so that it represents unquestionably the most complete digest of all that is known in this field ever to appear in one place.

A glance through the 67 footnotes will show the importance of amateur observations in the establishment of this basic knowledge of v.h.f. propagation. We hear the opinion expressed occasionally that the day of amateur contributions to scientific knowledge is passed, but here is concrete evidence to the contrary.

Just look at the paper's subheadings: I — Regular F_2 Ionization, II — Sporadic-*E* Ionization, III — Scattering from Regular Ionization, IV — Auroral Ionization, and V — Meteoric Ionization. In four of these five fields amateurs did the first work, and their observations have been valuable in scientific studies. Only in connection with Part III is there no major contribution by amateurs; this because tests with power levels and antenna gains far beyond amateur capabilities were needed to establish the existence of this kind of propagation.

This is not to say that all hams are scientists, or that the vast amount of scientific knowledge that has been amassed in connection with v.h.f. propagation could have been collected by amateur methods alone. Far from it. The value of the amateur often lies in his unscientific approach! He is interested only in what he can do with the bands assigned to him. The day-to-day usefulness of a frequency for carrying a payload is not his concern, so he utilizes types of propagation that may have only nuisance value to other services.

The 50-Mc. man had nothing to gain but thrills in working across the Atlantic via F_2-layer propagation in 1946 and '47. There was no practical value in the communication with South America on 50 Mc. in 1947 to 1950. Aurora DX on 56 Mc. as early as 1938, and more recently on 50 and 144 Mc., is about the most worthless kind of communication anyone could imagine, but it is great fun. It is rivaled in uselessness only by the fluttery stuff we worked during the Giacobini-Zinner meteor shower of 1946. What was perhaps the greatest thrill in all the history of v.h.f. activity, the first sporadic-*E* DX worked back in the middle '30s, netted little other than that kick-of-a-lifetime, and the makings of a 50-Mc. WAS.

The original research done by the late Ross Hull in developing the theory of air-mass boundary bending of v.h.f. waves is one of the rare instances when an amateur has combined science and hamming in propagation study. Most of the rest of us have stuck mainly to the hamming, but in doing so with all the enthusiasm that is characteristic of the true amateur we have turned up much information that has been the first in its field.

Sporadic-*E* skip was worked on 56 Mc. years before scientific studies were made of this phase of *E*-layer activity. Aurora DX, first reported in *QST* and *Radio* in the late '30s, caused some lifting of eyebrows in scientific circles almost at once, but little work was done along these lines until the postwar period. The correlation between magnetic disturbances and high F_2-layer m.u.f. on North-South paths was first observed by amateurs. Villard was interested in meteor effects as an amateur first and a scientist later.

This is all very nice, you may say, but the work is done now. Isn't the possibility of amateur contribution to propagation knowledge ruled out in the future? Hardly! To assume this is to say that everything is known about wave propagation. The fundamental difference in approach between the amateur on the one hand and the commercial organization or the scientist on the other remains, and so long as it does, hams are bound to run onto things that escape others.

Take the matter of correlation between sporadic-*E* ionization and weather. For years hams have used certain weather indications as signs of the imminence of sporadic-*E* DX. Cirrus clouds are a prime example. If we miss a few times, so what? It doesn't cost a thing to try, and we have no professional reputations to worry over if we're wrong. Does sporadic-*E* propagation follow periods of pronounced inversion? Hams have thought so for 15 years. Does it develop over areas of low barometric pressure? What about thunderstorms and E_s? Does the weather/E_s correlation vary with the sunspot cycle? How about the oft-reported coincidence

(Continued on page 116)

The World Above 50 Mc.

CONDUCTED BY E. P. TILTON,* W1HDQ

IN ALL the long history of amateur radio, the next higher band has always seemed tough — and useless. A goodly number among us still remember de-basing tubes in order to get them to oscillate on 5 meters, and we recall the jibes we took from our less experimentally-inclined brethren in the process. Why go to all the trouble, when you couldn't work farther than you could see?

Getting on 2½ was even tougher, when that band became the borderline beyond which only crazy tinkerers could be expected to find anything of interest, and when the band was changed from 112 to 144 Mc., not a few of the rigs simply couldn't make the higher frequency. Yet what is hard about building 2-meter gear today? And it's gear that performs in a way we'd never have believed possible, even on lower bands, just a few years ago.

Step by step, as we have moved progressively higher in frequency, we've found ways to make gear work in first-rate fashion, and when this has been done, we've found each new band to have features that have given it a special appeal. Currently this is happening on 420 Mc., and our progress in this part of the spectrum has a special significance in view of the rapidly-increasing commercial interest in the ultrahigh frequencies.

When we took our first feeble steps into the 420-Mc. band just a few years ago, only the most optimistic and visionary hams were willing to concede that frequencies this high would be useful for anything other than purely local communication. It was intriguing territory for the experimenter, but what good could it possibly be for the communicator? Early work, mostly with converted radar and altimeter gear, tended to confirm suspicions that 420 was good only for paths that could be covered equally well by flashlight or semaphore.

Then the more enthusiastic started to build crystal-controlled transmitters. They weren't so hard to get going after all, and they helped some. At least the signals on 420 began to sound better, though we still lost contact when we tried to go much beyond visual distances. Comparison with the coverage that was possible on 144 indicated that we had a long way to go in the receiver department before 420 could be made to pay off in consistent performance.

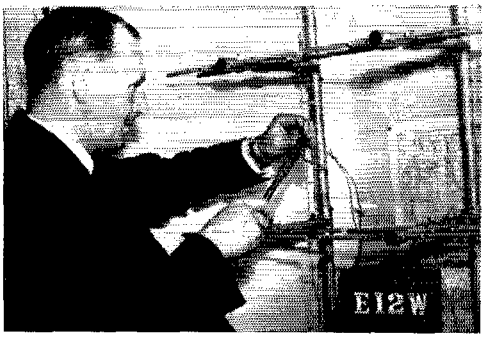
So, on to converters and communications receivers, and out with the 4-megacycle-wide radar jobs and roaring, squealing superregens. Now we began to go someplace, but we were slowed down by the stability problem which reached really acute proportions at this point. Crystal-controlled converters became not just desirable; they were a necessity, if we were going to tune in and hold weak signals with selective receivers.

Now we are collecting a dividend from that arch-enemy, television. To supply the demand for better receiver performance in the u.h.f. range, tube designers have brought out some new numbers that really perform. Designed to deliver the goods up to 900 Mc., they work at 420 better than all but the best tubes of a few years back would do at 144. We've been doing some work along these lines recently, with results that make 420 look a lot more like a ham band than it did heretofore.

Putting a 6AJ4 into a coaxial-line amplifier similar to the ones described in recent editions of the *Handbook*, in place of the 6J4s and pencil triodes used in the earlier models, we've gotten noise figures within 3 db. of those obtainable at 144. Result: improvement in our 420-Mc. receiver performance to the point where distances of 100 miles or more are now spanned solidly, regardless of conditions. This is done with weak signals ordinarily, but the signals are there *all* the time. And when things open up, as they do fairly often, 420-Mc. signal levels rise to tremendous proportions. We're getting our teeth into the 420-Mc. meat these days. If that 420-Mc. record doesn't go beyond 500 miles before the end of 1953, we're going to be very much surprised.

Next stop 1215 Mc. Of course, everyone *knows* that there's a band that never will be good for anything!

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



Harry Wilson, EI2B-EI2W, puts the finishing touches on a 420-Mc. array. Harry is president of the International VHF Society, sponsor of the transatlantic 144-Mc. tests scheduled for July 4th–12th. (*Photo courtesy Irish Times*)

Transatlantic DX on 144 Mc.

The April issue of *DL-QTC*, a German ham publication, carried a straight-faced story of a transatlantic moon-reflection 144-Mc. QSO between DL3QA and W1RFU. All

WØZJB.....48	W4BEN.....35	W8BFQ.....41
WØBJV.....48		W8OJN.....39
WØCJS.....48	W5VY.....48	W8LPD.....37
W5AJG.....48	W5GNQ.....46	
W9ZHL.....48	W5MJD.....46	W9ZHB. 48
W9OCA.....48	W5ONS.....45	W9QUV.....48
W6OB.....48	W5JTI.....44	W9HGE.....47
WØINI.....48	W5ML.....44	W9PK.....47
W1HDQ.....48	W5JLY.....43	W9VZP.....47
	W5JME.....43	W9RQM.....47
W1CLS 46	W5SFW.....43	W9ALU.....47
W1CGY.....46	W5VV.....42	W9UIA.....45
W1LLL.....45	W5FAL.....41	W9UNS.....45
W1HMS.....43	W5FSC.....41	
W1LSN.....42	W6HLD.....40	WØQIN.....47
W1DJ.....40	W5HEZ.....38	WØIZM.....47
	W5LIU.....37	WØNFM.....47
W2AMJ.....46		WØTKX.....47
W2RLV.....45	W6WNN.....48	WØKYF.....47
W2MEU.....45	W6UXN.....47	WØHVW.....45
W2IDZ.....45	W6ANN.....45	WØMVG.....44
W2FHJ.....44	W6TMI.....45	WØJOL.....44
W2GYV.....40	W6IWS.....41	WØTJF.....44
W2QVH.....38	W6OVK.....40	WØJHS.....43
W2ZUW.....35	W6GCG.....35	WØPKD.....43
		WØIPI.....41
W3OJU.....45	W7HEA.....47	
W3NKM.....41	W7ERA.....47	VE3ANY.....42
W3MQU.....39	W7BQX.....47	VE3AET.....38
W3RUE.....37	W7FDJ.....46	VE1QZ.....34
W3OTC.....35	W7DYD.....45	VE1QY.....31
W3FPH.....35	W7JRG.....44	CO6WW.....21
	W7BOC.....42	XE1GE.....19
W4FBH.....46	W7JPA.....42	
W4EQM.....44	W7FIV.....41	Calls in **boldface** are holders of special 50-Mc. WAS certificates listed in order of award numbers. Others are based on unverified reports.
W4QN.....44	W7CAM.....40	
W4FWH.....42	W7ACD.....40	
W4CPZ.....42		
W4FLW.....42	W8NSS.....46	
W4MS.....40	W8NQD.....45	
W4OXC.....40	W8UZ.....45	
W4FNR.....39	W8CMS.....43	
W4IUJ.....38	W8YLS.....41	
	W8RFW.....41	

details were reported meticulously but, unfortunately, those pertaining to the American end of the "contact" were purely imaginary. We don't know enough German to tell whether this was a DL version of the writings of *QST*'s Larson E. Rapp, but appearance of the story in April makes us lean toward this interpretation. At least two other European ham magazines didn't take it that way, however, one of them picking the story up and giving it a two-page editorial treatment. W1RFU feels that he has quite a reputation to live up to now, as a result!

This is not to say that such DX is beyond the realm of possibility. The work of W3GKP and W4AO has demonstrated that signals can be bounced off the moon without exceeding amateur power limitations. The character of the signals they've recorded so far is not such as to offer much encouragement as to the practicability of the lunar path for routine communication, however. It is just possible that the right location and antenna (to make the maximum use of ground reflections) and a favorable break from propagation conditions may combine to make a lunar 2-meter QSO possible over a distance of several thousand miles — but it is not likely to be negotiated with anything but the very best techniques.

Transatlantic 144-Mc. tests that definitely are not of the April Fool variety will be conducted the week of July 4th through 12th. The International V.H.F. Society, sponsors of the tests, send along this final information on the station, EI2W, and its schedule: The transmitter will run about 200 watts on 144.18 Mc., both 'phone and c.w. Antennas will include 24-element and 15-element arrays, horizontally polarized. Several receiving points will be in operation around County Clare and adjoining counties. The station site is the seaside town of Kilkee, on the north side of the Shannon estuary.

Transmissions will begin at 0001 British Summer Time, July 4th, continuing through midnight, July 12th. Each hour will be divided as follows: 0000 to 0010 — station call and a combination of long dashes; 0010 to 0020 — listening for North American calls; 0020 to 0030 — telephony transmission; 0030 to 0040 — listening; 0040 to 0050 — repeat c.w. transmission; 0050 to 0100 — listening. It is hoped that many American stations will participate, confining test transmissions to the listening periods of the Irish station, as outlined above. A desirable test transmission would include a test letter, mainly composed of dashes, plus the station call, sent at frequent intervals.

Having had considerable experience with "reception" of nonexistent signals, we suggest that the details of each operator's transmissions be kept to himself, and not exchanged with operators at the other end of the test path. If you know exactly what to listen for, the ear has a funny way of "hearing" the desired signal, even if we rule out the possibility of anyone trying to pull a fast one! This is a long shot, admittedly, but we never know until we try. So let's give the boys across the pond a run for their money on this effort. If anything is heard either way, please notify ARRL at once.

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

We don't often think of 144 Mc. as being suitable for traffic handling over any considerable distances, but here's a case that demonstrates the utility of the band for traffic work. One day recently, VE3AIB was called upon by a Toronto family to aid them in contacting others of the family who were traveling in New Jersey. A famliy emergency had developed and it was important the travelers be asked to return home at once. All that was known was that they would be in the vicinity of Ocean City, N. J.

A large order for a v.h.f. man? Not in this case, for Les knew that W2ORI, within easy reach across Lake Erie, had a regular sked with W2UK in New Jersey. The word was passed, VE3AIB to W2UK, via W2ORI. W2UK then contacted W2QED, who gave the information to the State Police Barracks in Seabrook. The police contacted their Ocean City station; the travelers were intercepted on the highway, and they were able to return home in time. Thus, by judicious use of 2-meter skeds made for far different purposes, emergency traffic was handled as expeditiously as might have been done on any lower frequency.

That W2ORI–W2UK sked is something for the book, incidentally. It's been going on nightly now for several months, and tests at 0700 and 1200 have been successful, also. There is always some fading on the 275-mile path, but this seems to be worse when tropospheric propagation is good, oddly enough. W2ORI says that his beam directivity is extremely broad on these contacts, the signal from W2UK being received over the whole arc from 75 to 180 degrees, with only a slight drop in level. High power at both ends is an important factor in this work, as W2ORI runs 680 watts and W2UK nearly a kilowatt, both on c.w. W2ORI is putting that power into a pair of 826s!

Work over another "impossible" path, the 240 miles of mountains between W7LEE, Parker, Ariz., and the Los Angeles area, is continuing without a break. Bob's list of W6s worked now includes NLZ NTC CBB EFE MUD PJA CKI ANN WSQ and IBS, the last in San Diego. When Bob is away, his wife takes over, operating as W7YZU. Their third state was added recently when W7JU came on in Boulder City, Nev. They contact W7FGG and W7UPF in Tucson regularly, and hear W7SLO and W7LFX. Most of the Arizona activity is in the first 150 kc. of the band, with horizontal polarization.

W7JUO recently came on 2 in Boulder City, stirred by the results obtained by W7JU. W6PJA reports that W7RCC is coming on at Panguitch, Utah, a 9100-foot elevation, and W7DUJ and W7OBW are doing some listening in Las Vegas, Nev., and will be on with transmitters soon. Another Utah prospect is WØCNM/7 at Moab, reported by WØFKY as being active on both 6 and 2.

Perhaps this one should have been in the YL column. After reading about the transistor transmitter for 144 Mc.

built by K2AH, W3TF of Temple, Pa., tried his hand at duplicating George's tiny design. Using a similar circuit and an 8-Mc. crystal, he got the thing going on 144 Mc. and turned it over to his wife, W3RVU, to see what she could do with it. Verna gave it the first try by calling W3SNM in answer to his CQ. As this was not a prearranged test, all hands were very happy when Chet came back. The distance was about two miles. Later a test was made with W3EW, 35 miles away in Berwyn, Pa. He was able to copy a test message perfectly, establishing a record for transistor DX on 144 Mc.

"Does anybody ever operate on 2 in Vermont?" Our answer to this common query, until recently, has been that there were a few stations active, but that they were so completely surrounded by the Green Mountains that they were not able to work out too well. Vermont's homes are built in the valleys, not on the hilltops, ordinarily.

An exception is W1MMN, who is 1600 feet above sea level, in Orange, north-central Vermont. This is not the top of the country, by any means, but it helps, and George has been doing a fine job of serving up Vermont contacts recently. Up to the middle of May he had worked nearly 40 different stations in 8 states, 5 call areas and VE2. In what is believed to be the first aurora DX from Vermont, W1MMN worked W2NLY on a flash opening May 5th. Then on the 16th, he hooked W2s UK AOC ORI FMX, W3LZD, W4AO, W8s BFQ and WJC between 1955 and 2200. Several upward changes are visible in our 2-meter states-worked box as a result. There should be more soon, as George is active nearly every night. He is on 144,145 and 144,180 kc., 'phone or c.w., with horizontal polarization. He works VE2AOK regularly, and has been instrumental in negotiating their first VE2 contacts for several W1s and 2s. VE2AOK is on 144.6 Mc.

The only other report we have on that May 5th aurora comes from W2AZL, who worked W8BFQ on 144 Mc., but the session of the 16th was one of the best in a long time. Many stations were active, and there was actually an appreciable amount of QRM in the "aurora band" between 144.0 and 144.2. W8FAX, Cleveland, heard the following on 144 Mc.: W1s MMN CCH HDQ, W2s UK ORI NLY AOC OPQ SFK, W3LZD, W4AO, W9s EHX and EGH. He concludes that aurora is a high-power man's game, however, as many calls with his 10-watter availed him nothing.

Your conductor used up some of this one making 220-Mc. tests with W3LZD, Dunmore, Pa., but without result. Ted is seeing aurora effects on Channel 12 regularly, so he feels that 220-Mc. DX should be possible. Has anyone had any luck on 220 during aurora openings? A lot of us would like to hear about it if you have.

The month of May provided the first really good tropospheric sessions of the spring season, and contacts up to 600 miles or so are reported from various sections of the country. The best 2-meter DX so far in 1953 was worked in Tennessee, Oklahoma, Mississippi, Louisiana, Arkansas and Texas in the period May 20th through 22nd. W4HHK, Collierville, Tenn., says that he and W4VVQ and WN4WCB were getting S9-plus signals from W5VY, San Antonio, about 600 miles to the southwest, on the morning of May 21st. W5RCI, Marks, Miss., caught W5HXK, Watonga, Okla., adding state No. 15, to climb to top spot in the W5 section of our 2-meter states-worked listings.

When it seems so easy to work distances like this down to Texas and to the southeast into Alabama, the boys in the Memphis area wonder why they never hear anything from Florida. Pensacola is only about half as far as San Antonio — how about it, W4MS?

The 50-Mc. band was slow in coming to life this spring but scattered E_s openings were reported in most sections of the country. They seem well below the level of years prior to 1952, so it begins to look as if the low state of solar activity has something to do with it. We've had no means of checking the Es–sunspot relationship heretofore, as the last solar minimum occurred during the war years, and on the bottom of the cycle before that we were just beginning to develop v.h.f. interest.

Among the 6-meter faithful to report openings are W5SFW, VE1PQ, W5FXN and W3LFC. W5SFW caught his first 50-Mc. DX of the year on April 24th, 25th and 26th. Phil worked VE4EX, VE5CO, WØBJV, and W9VZP on the 24th–25th, and a whole batch of W8s and 9s on the morning of the 26th. Another morning opening May 17th brought in W9s, and the evening of the same day Phil worked W4s, 8s, 9s and Øs. W5FXN reports reception of Cuban stations near the low edge of the band on May 6th. May 14th was good for the Atlantic seaboard, with scores of stations in W1, 2 and 3 trying for contacts with the all-too-scarce W4s in Florida and Georgia.

The Atlantic Seaboard 2-meter gang had things their own way during May 11th, 12th and 13th. The first really good coastal inversion of the spring season came along with the hot sunny days and cool nights that are typical of fair weather in May. It would be impossible to report all the details of sessions like these, but some idea can be drawn from the report of W1RFU, Wilbraham, Mass., who worked three Virginia W4s and five W3s on the 11th, and worked W4ZBU, Weirwood, Va., three nights in a row. Good during this time, also, was 420; W4VVE heard snatches of

(*Continued on page 118*)

2-METER STANDINGS

Call	States	Areas	Miles	Call	States	Areas	Miles
W1HDQ	18	6	850	W5FBT	6	2	500
W1IZY	16	6	750	W5IRP	6	2	410
W1RFU	15	7	1150	W5FSC	5	2	500
W1MNF	14	5	600	W5DFU	5	2	275
W1BCN	14	5	580				
W1DJK	13	5	520	W6PJA	3	3	1390
W1CTW	12	4	500	W6ZL	2	2	1400
W1KLC	12	4	500	W6WSQ	2	2	1390
W1MMN	8	5	520	W6NLZ	2	2	237
				W6GCG	2	2	210
W2NLY	22	7	1050	W6EXH	2	2	193
W2UK	21	7	1075	W6ZEM/6	1	1	415
W2QED	18	7	1020				
W2AZL	18	7	1050	W7LEE	3	2	240
W2ORI	17	7	830	W7YZU	3	2	240
W2PAU	16	6	740				
W2QNZ	14	5	400	W8WJC	22	7	775
W2SFK	13	6	—	W8BFQ	22	7	775
W2DFV	13	5	350	W8WRN	19	7	670
W2CET	13	5	405	W8WXV	18	8	1200
W2UTH	12	7	880	W8UKS	18	7	720
W2DPB	12	5	500	W8DX	17	7	675
W2FHJ	12	5	—	W8EP	17	7	—
				W8WSE	16	7	830
W3RUE	19	7	760	W8RWW	16	7	500
W3NKM	19	7	660	W8BAX	15	6	655
W3QIK	17	7	820				
W3KWL	16	7	720	W9FVJ	22	7	850
W3LNA	16	7	720	W9EQC	21	8	820
W3FPH	16	7	—	W9BPV	20	7	1000
W3GKP	15	6	650	W9UCH	20	7	750
W3OWW	13	6	600	W9LF	19	—	—
				W9WOK	17	6	600
W4AO	20	7	950	W9MBI	16	7	660
W4HHK	19	6	710	W9BOV	15	6	—
W4JFV	18	7	830	W9ZHL	15	6	—
W4MKJ	16	7	665	W9LEE	14	5	780
W4OXC	14	7	500	W9FAN	13	—	680
W4IKZ	13	5	650	W9UIA	12	7	540
W4JFU	13	5	720	W9GTA	11	5	540
W4CLY	12	5	720	W9JBF	10	5	760
W4JHC	12	5	720	W9DSP	10	4	700
W4OLK	12	5	720				
W4FJ	12	5	700	WØEMS	21	8	1175
W4UMF	12	5	600	WØGUD	20	7	1065
WN4WCB	9	4	650	WØIHD	16	6	725
W4LRR	5	2	900	WØNFM	14	7	660
				WØZJB	12	7	1097
W5RCI	15	4	790	WØINI	12	5	830
W5JTI	14	5	670	WØWGZ	11	5	760
W5QNL	10	5	1400	WØOAC	11	5	725
W5CVW	10	2	1180	WØJHS	9	3	—
W5MWW	9	4	570	WØHXY	9	3	—
W5AJG	9	3	1260				
W5ML	9	3	700	VE3AIB	17	7	850
W5ERD	8	3	570	VE3DIR	14	7	790
W5ABN	8	2	780	VE3BQN	1	7	790
W5VX	7	4	—	VE3BPB	1	6	715
W5VY	7	3	1200	VE3AQG	1	7	800
W5FEK	7	2	580	VE1QY	11	4	900
W5ONS	7	2	950	VE3DER	10		800

C.D. Committee Report

BY ROBERT G. SEYMOUR,* W9WJS

Skonk Hollow, Pa.
January 5, 1953

Joseph J. Poppinboom, President
Skonk Hollow Ham Club
Skonk Hollow, Pa.

Dear Joe:

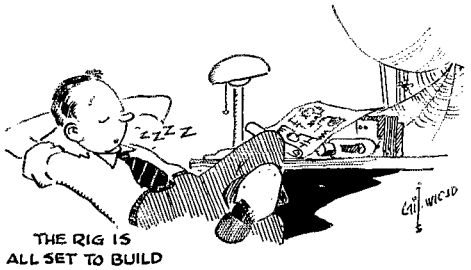
About six months ago you asked me to submit a report on the progress made by my Civilian Defense Committee. At that time of course the progress was nil, since we had only started a few months before, so I had to wait till we had done something before sending you a report. Here is the report of our accomplishments so far.

The coöperation shown by the members of the club has been terrific. As you know, we now have the largest membership ever enjoyed by our club, totaling over thirty members. Besides myself there are three others on the c.d. committee. Including the committee we have six members who have volunteered to undertake forming a c.d. emergency radio team.

The job of designing the equipment and building the pilot models was given to two committee men: the receiver to one and the transmitter to the other. As soon as both were completed they were to collaborate on a power supply. This equipment was to operate on two meters as decided upon at our regular club meeting.

I am happy to say that the receiver man has done wonders in the six months he has been working on it. He has informed me that he already has the audio stages working. Of course, he has done all this under terrific handicap, because he was away on vacation for two weeks immediately following Field Day, and is only now getting rested up from both. I think that I can safely say that within another six months if all goes well he will have the entire receiver working.

Our transmitter man has done almost as good a job. The rig is all set to build. I have seen the



THE RIG IS ALL SET TO BUILD

diagram and I must say that it really looks swell. He has not been able to scrape together a buck and a half for the needed 8-Mc. crystal yet, but once he gets this and a few other parts, and finds a little spare time, he can start the actual construction. We may have to call on the club members to donate some of the parts but only as a last resort because a lot of the fellows might get sore and wouldn't come to meetings if we did this.

• Civil Defense is an important subject among us amateurs these days, and a lot of clubs are taking the initiative in getting organized. All clubs aren't going about it just like this one, but we'll bet this is typical of a lot more than would like to admit it. How about yours?

You may remember that at one of our club meetings the committee suggested the formation of an 80-meter c.w. net to familiarize the boys with net procedure, then when the two-meter net was in operation they could take over without much more additional training. One of the committee members was appointed net control, and he set up a schedule for an hour's drill on the Thursday nights the club was not meeting. Well, we had a terrific turnout the first night. Five stations reported in, and all had a lot of fun practicing net procedure for about five minutes. No one originated any traffic, so the net was closed and a good rag-chew was enjoyed by all far into the night.

On the second drill night only two or three stations reported in. The rest would have been there, but one fellow had to polish the heads on his rack mounting screws, and another had to restring a dial cable on his son's a.c-d.c. radio. After reporting in, the three remaining net members couldn't think of anything to say in a practice message so they got into another good old rag-chew. This was really good practice because they are all pretty good on a bug and tried to see how fast they could send to each other. Anybody listening sure would have been impressed. Naturally, the net discontinued operation during the latter part of the summer, but the net control tells me that the other two members of the net are all set to go again now that cold weather is here.

I was appointed as public relations man to work with other clubs in the area and also to contact the municipal c.d. group and offer our facilities and manpower. I found the presidents of the two other clubs in our area very enthusiastic, and both are planning a c.d. program. As soon as they have something organized they will contact me. This was only a couple of months ago, so it's too early for any developments yet.

I then got in touch with the director of communications for c.d., Mr. Zegg, who is the undertaker, and one of our more prominent citizens. He doesn't know anything about radio and hasn't had much time to set up anything be-

* 567 Elm Grove Drive, Elgin, Ill.

cause he is sometimes called upon to be up at all hours of the day and night and has to squeeze in his extra duties at any odd time he can find. But he is a wonderful guy and doing a swell job.

Of course, since we never did bother about those publicity releases the League sent us, he had never heard of us, but he sure was happy to know that there was an organization such as ours in Skonk Hollow. I explained to him all about how we were prepared to go into action at any time he needed us, and he said if they eventually decided to use radio he would get in touch with me. It seems the local group will coordinate its program with state and federal setups and keep together the nucleus of the project so that in an emergency it would be possible to quickly organize the whole city. Pretty good idea, eh?

So that's where we stand. The committee will continue to work, and in another year or so we will be prepared to meet any emergency.

Respectfully submitted,

O. Y. BOTHER, *Chairman*
C.D. Committee
Skonk Hollow Ham Club

HAMFEST CALENDAR

GEORGIA — Saturday and Sunday, July 25th and 26th, at the Julian Smith Casino at Lake Olmstead, Augusta — a hamfest will be sponsored jointly by the Camp Gordon Radio Club and the Augusta Amateur Radio Club. An informal get-together will be held on the evening of the 25th at the Dutch Motel, midway between Camp Gordon and Augusta. The entire motor court has been turned over to hams for the week end. Food, beverages and entertainment will be plentiful during the entire hamfest, and all hams and their families, are cordially invited. Get your tickets before July 6th and save money. Tickets sell for $3.00 for adults and $2.00 for children. A small late charge will be added to these prices at the gate. Contact W4DJF or W4AAY for reservations.

HAWAII — Saturday, August 15th, at the American-Chinese Club pavilion, 2343 Kapiolani Blvd., Honolulu — the Honolulu Amateur Radio Club will hold an all-day ham convention. There will be contests, panels, demonstrations, activities for the XYL, numerous exhibits, and a steak dinner. Registration begins at 8:00 A.M. Admission is $5.50 in advance. $6.00 at the door. For further information, contact the H.A.R.G., P. O. Box 2868, Honolulu, T. H.

IDAHO — Saturday and Sunday, August 8th and 9th, at Big Springs, 20 miles south of the west entrance to Yellowstone Park — the combined W.I.M.U./C.A.R.S. Hamfest. Registration fee is $1 per licensee or family. Cabins, camp grounds and commercial power are available. Make reservations for cabins early at Big Springs, Mac's Inn, Andrews Cottages or Island Park Lodge. Mobile frequency: 3935 kc. For further details, write to W7OOY, Harlowton, Montana.

ILLINOIS — Sunday, August 9th, at Mance Park, ¼ mile east of Route 45 and ¼ mile south of Route 66 (Stinson Airport) — the 19th Annual Picnic and Airmobile Meet of the Hamfesters Radio Club. The friendliest get-together in the Midwest. Free parking of planes at Stinson Airport but pilots must furnish their own tie-downs. Food, ice cream and beverages available. Treasure Hunt and games for the kiddies. Hammo and Hamfesters Style price-table. Plenty of tables and ample parking space. For tickets write to John J. Ruth, W9GVO, 4460 Oakenwald Ave., Chicago 15, Illinois. Donations $1.50.

ILLINOIS-MISSOURI — Saturday, July 4th, near Granite City, Illinois — the Egyptian Radio Club's free annual Hamboree. Plenty of activities will be provided, including an auction. Refreshments will be available from 9 A.M. to 9 P.M. "Mobile in" on 75 or 10 meters. Follow signs to club located near Illinois approach to Chain of Rocks Bridge on Route 66 north of Granite City.

INDIANA — Sunday, July 12th, at Brookside Park, Indianapolis — the Indiana Radio Club Council will hold its Annual Hoosier Hamfest and Picnic, beginning at 10:00 A.M. There will be games and contests for young and old, mobile judging, and other activities. Plenty of picnic space will be available, with soft drinks on the premises. Registration is $1, with children admitted free. Write to Charles F Reberg, W9MVZ, for additional data.

INDIANA — Sunday, July 19th, at Turkey Run State Park, 35 miles north of Terre Haute — the Annual Turkey Run V.H.F. Picnic. Ed Tilton, V.H.F. Editor of *QST*, will be present. As in previous years, this affair will offer a grand opportunity for fun and fellowship. A buffet style lunch will be served at noon. Further particulars may be obtained from Charles Hoffman, W9ZHL, P. O. Box 186, North Terre Haute.

MARYLAND — Sunday, August 9th, at Triton Beach, Mayo — the Sixth Annual Hamfest-Picnic of the Baltimore Amateur Radio Club will be held. Festivities will begin at 10:00 A.M., and an interesting program has been planned. Liquid refreshments will be on sale, but bring your own picnic basket. W3PSG will be on hand to guide visiting mobiles. From Washington take Route 214 through Capitol Heights to Route 2. From Baltimore take Route 2 through Annapolis, then follow hamfest signs. Tickets are $1 per person (children 50¢), this price including bathing, bath house, locker and use of picnic tables and pavilion. For further data, write to W3JCL, 2208 N. Fulton Ave., Baltimore 17.

MONTANA — Saturday and Sunday, July 18th and 19th, at Lower Two Medicine, Glacier National Park — the Annual Glacier-Waterton International Park Hamfest will be held. Contact T. A. Brink, West Second St., Whitefish, Montana, for details.

OHIO — Sunday, July 26th, at Roundup Lake Park, near Mantua Center — the Cleveland Area Council of Amateur Radio Clubs will sponsor a Basket Picnic for amateurs and their families. Facilities at the park include swimming, boating, and children's play area, in addition to concessions and evening dancing. Entertainment for the whole family has been arranged, beginning at 1:00 P.M. and lasting till dark. The picnic will be held in a reserved section of the park which is on Route 82 about 30 miles ESE of downtown Cleveland. A 10-meter fixed station will be in operation at the site. Registrations are $1, and a complete family may be admitted under a single registration. W8CTZ will provide further information.

PENNSYLVANIA — Sunday, August 2nd, at South Park, Pittsburgh — the Fifteenth Annual Hamfest of the South Hills Brass Pounders and Modulators. A full program has been arranged for all attending this affair, and it is expected that some 2000 amateurs will be on hand from Western Pa., West Va. and Ohio. Write to John Duggan, W3OBO, 1400 Creedmoor Ave., Pittsburgh 26, for info.

WISCONSIN — Sunday, July 26th, at the John Ziemann Park on the River Road in Marinette — a Hamfest and picnic will be held by the M & M Radio Club. Howard W. Lauzer, W8IOS, 1112 20th St., Menominee, Mich., will supply information.

Operating News

F. E. HANDY, W1BDI, Communications Mgr.
R. L. WHITE, W1WPO, Asst. Comm. Mgr., C.W.
PHILLIP SIMMONS, W3VES, Communications Asst.
GEORGE HART, W1NJM, Natl. Emerg. Coördinator
ELLEN WHITE, W1YYM, Asst. Comm. Mgr., 'Phone
LILLIAN M. SALTER, Administrative Aide

National Convention. Houston will be the Mecca for all amateurs who can make it July 10th, 11th and 12th. Program Chairman W5LSE writes that the Saturday morning sessions will cover League operating organization, RACES, AREC, nets, civil defense, etc. All SCMs, SECs, ECs, RMs, PAMs and Station Appointees are urged to turn out at these 0900–1130 Saturday sessions . . . and to attend any special luncheons or breakfasts that may be appropriate, together. The monthly radio party for LOs (League officials) will be this week end for those not able to join us conventioners; all LOs who can are urged to make *personal* LO contacts and friendships *at Houston;* to foster this we'll list in the LO Bulletin a box mention *crediting all LOs shown in the official convention registration* at the National Convention this month.

Don't forget to attend the ARRL meeting Saturday P.M. at 1330, too, and the scads of other subjects and demonstrations you will find on the program when you register. Hope to see you there!

The Emergency Readiness of the Amateur and You. As you read these lines, many of us will have just returned from what may be the biggest and best ARRL Field Day ever. This is our annual June opportunity for testing our emergency equipments. The League is sponsor of this and other radio tests to emphasize to every amateur the know-how for making temporary set-ups and working with emergency power. Field Days develop the priceless special values and know-how of working together with each other coöperatively to render service. Besides a shakedown test of the gear involved, FDs extend the knowledge of procedures and disciplined operation such as required by any group or individual to attain maximum results in public service work. It is as true of the amateur as of firemen or rescue workers, that becoming part of a trained group, dedicated to this purpose, is the best way to be ready for a superlative job when the call to assist arrives! True emergency readiness takes more than a one-day test, valuable though this may be; it requires study and participation in planning and test problems in addition to getting into the FD. Many have found they get more from this group participation than they give; in prestige, communication results and friendships. The invitation and the opportunity are yours.

There's *mobile work* and its fascinations and vacation enjoyment and communication along this emergency-readiness road that you can travel in these summer months. In the fall of each year is another League test, this launched entirely at local levels and often under surprise conditions to make the best community Simulated Emergency Test. Getting registered and staying registered in the *Amateur Radio Emergency Corps* is the best way to be on the inside and take part. Your AREC captain, the Emergency Coördinator, besides providing identity card or annual endorsement, can provide at no cost to you the EMERGENCY RADIO UNIT placard for sets-with-handles or mobiles that equally qualify, and in the latter case *Official Mobile Unit* identity cards too. Seek out your EC and look into this. Inquire of your EC and local Radio Officer in civil defense communications (often the same man) how you may help support necessary communications and if your station may be authorized as part of the Radio Amateur Civil Emergency Service.

Civil Emergency Service Plans Progress. The Radio Amateur Civil Emergency Service is now getting into its stride. As of May 12th *nine* states had received their approved RACES plans, notably: California, Colorado, Connecticut, District of Columbia, Georgia, Kansas, Missouri, Ohio and Rhode Island. There were in all *fifteen* FCC-approved plans, and these involved *fifty* different amateur station (RACES) authorizations under them. It was understood furthermore that the Federal Civil Defense Administration which routes the local-government-approved plans involving RACES to FCC for their action had in all approved 33 plans, two more states (New York and Nebraska) included, and with others pending such as New Jersey, Norfolk, Va., etc. So RACES is looking up!

Extended articles on RACES appeared in March, April and May '53 *QST*'s. Review these to note in detail how RACES planning may be completed. The RACES Radio Officer is the man to contact to inquire about getting *your own Amateur Radio Station* also RACES-approved, so you can fit into the plans and have a communications part under RACES.

Board Meeting Consideration of RACES. Our ARRL Board of Directors took a look at the Radio Amateur Civil Emergency Service during the course of the recent Board meeting. For details see Minutes 28 and 63. The Board asked its Planning Committee to look into the over-all problems. Part of its action by resolution, while couched in general terms, reflected the general wish of amateurs that FCDA itself give closer study, encouragement and recruitment to amateur radio *as it exists,* and can be used in civil defense communications. The Board especially

recognized the new responsibilities devolving on each United States amateur to sign up and participate in RACES as the participation in civil defense that could mean most to the fraternity and the Amateur Service, as well as to the individual himself.

In adopting some principles guiding our ARRL policy toward RACES the Board said: *Local units or available members of the Amateur Radio Emergency Corps especially should seek and accept appropriate proffered responsibility for implementing RACES at the local level. This includes signing up in civil defense and becoming a part of civil defense (RACES) plans.*

The FCC enactment of subpart B of Part 12 (RACES), now almost a year old, places a moral obligation on each of us amateurs to see that we do our part to make this instrument work. An operating credit to our Amateur Service, a patriotic duty fulfilled for our community or state, RACES properly implemented can be a credit and a source of recognition for us in our individual communities, too. It is Public Service work spelled out another way. As reported, the Board took special note of the advent of the new RACES rules. For the Board we commend RACES to your attention as something you *should* get into, not only as a patriotic community matter, but so that by your influence and know-how you can help make it work. It is important that, by your example and suggestions in local-government channels, you assist in shaping RACES to be the most practical and effective facility it can be. One way of looking at all civil defense is self-organization of people to save their own necks; if communities are apathetic, or people fatalists or don't know what kind of world it is we're in, of course there may be no set-up — yet. But where local planners are alert, and the opportunity is given, we owe it to ourselves to do our part through our amateur radio, participating in a joint facility for amateur radio and civil defense communications.

Emergency readiness, as stated above, doesn't flow from scraping things together at the last minute, after the flood has come or the bomb has struck. It comes from getting lined up and signed up in advance and taking part with such groups as AREC and RACES.

— *F. E. H.*

AFFILIATED-CLUB TRAINING AIDS

Affiliated club groups planning fall technical sessions for prospective amateurs would do well to investigate the booking of technical filmstrips to supplement any planned club lectures. Write to the Communications Department for information on filmstrips covering the following topics:

Inductive Reactance, FS3
Capacitive Reactance, FS4
Alternating Currents, FS5
Vacuum Tubes, FS6
R.F. Amplification, FS7
The Electron, FS10
The Triode, FS11
Wire Sizes and Voltage Drop, FS12
Tuning, FS13
Regeneration, FS14
Maintenance of Storage Batteries, FS15
Special-Purpose Vacuum Tubes, FS16

APRIL CD QSO PARTIES

In the c.w. section of the April CD Parties, W4KFC ran up the top score; this was nothing new for Vic, who also reported the most stations and sections worked. Climbing from fourth place in the January get-together, W8NBK took second position. Also improving was W4SHJ, who pulled up from fifth to snare third place. With 7.2–7.3 Mc. available for the first time, competition in the 'phone section was especially lively. Milt, W4NTZ, at the controls of W4HQN, came out on top with 128 contacts — a new record for the April 'phone fray. Two other regular contenders, W8NOH and W4NYN, turned in the second and third highest point totals. Listed below are high claimed scores. The figures following each call indicate the claimed score, number of contacts and number of ARRL sections worked. Final results will appear in the July CD Bulletin.

C.W.

W4KFC	111,100-397-55	WØVBQ	39,750-154-50
W8NBK	88,245-326-53	W4SAT	39,560-167-46
W4SHJ	85,050-308-54	W3LXE	37,620-171-44
W1MX	80,835-310-51	W1CRW	37,400-170-44
W1EOB	66,420-239-54	W3EEB	36,918-171-42
W3BIP	62,220-237-51	W2ZVW	36,285-170-41
W4NH	57,720-222-52	W4KL	34,090-154-47
W6CHV	55,131-127-47	WØPHR	33,000-165-40
W4PYN	51,075-223-45	W1JYH	32,870-167-38
W6CMN *	50,688-128-44	W4JUJ	32,200-133-46
W2IFP	50,600-218-46	W1AQE	32,130-153-42
W4HQN	50,470-199-49	W4UDS	31,500-145-42
W8NOH	49,200-200-48	W8DAE	31,290-142-42
W9MEM	44,850-192-43	W5MRK	31,240-137-44
W4YIP	43,920-192-49	W5DEJ	29,640-145-39
W4UHG	43,870-210-41	W3BFF	29,140-118-48
W2CWK	43,710-180-47	W9QLW/9	27,010-140-37
W9SDK	42,850-183-45	W1NDB	26,775-148-35
W9NH	42,550-179-46	W2LPJ	26,520-151-34
W3VES/1	41,370-190-42	W1LHE	26,455-137-37
W1AYC	41,000-200-41	W7CT	25,900- 75-37
W1AW *	40,020-167-46	W2HWH	25,200-116-42

* Multi-operator station. Score shown is that of highest operator.

'PHONE

W4HQN	26,880-128-42	W4FV	5221- 38-23
W8NOH	19,635-114-33	W3EAN	5160- 43-24
W4NYN	13,120- 82-32	W1CRW	4725- 45-21
W2ZVW	12,480- 71-32	W3LXE	4620- 42-22
W6UGA	10,062- 43-26	W2ILI	4400- 44-20
W9KDV	9455- 61-31	W4JUJ	4200- 33-21
W4LK	9315- 69-29	W1SFE	4085- 43-19
W1MX	7320- 54-24	W2MHE	3960- 44-18
W6CHV	7245- 33-21	WØVBQ	3675- 30-21

BRIEF

The Maine Section winner of the recent Novice Round-up missed listing in the May *QST* report on the contest. WN1WTI, with a very fine score of 901 points on 43 contacts in 17 states (over an operating period of 11 hours), led the Maine Section and received the Section award.

A.R.R.L. ACTIVITIES CALENDAR

July 3rd: CP Qualifying Run — W6OWP
July 14th: CP Qualifying Run — W1AW
July 18th-19th: CD QSO Party (c.w.)
July 25th-26th: CD QSO Party ('phone)
Aug. 1st: CP Qualifying Run — W6OWP
Aug. 12th: CP Qualifying Run — W1AW
Sept. 6th: CP Qualifying Run — W6OWP
Sept. 17th: CP Qualifying Run — W1AW
Sept. 18th: Frequency Measuring Test
Sept. 19th-20th: V.H.F. Contest
Oct. 2nd: CP Qualifying Run — W6OWP
Oct. 3rd-4th: Simulated Emergency Test
Oct. 10th-11th: CD QSO Party (c.w.)
Oct. 16th: CP Qualifying Run — W1AW
Oct. 17th-18th: CD QSO Party ('phone)
Nov. 7th: CP Qualifying Run — W6OWP
Nov. 14th-15th, 21st-22nd: Sweepstakes
Nov. 16th: CP Qualifying Run — W1AW

It is tornado season as we write, and twisters are roaring through the south and midwest. As always, the amateurs are in there doing their part, and as usual we here at Headquarters are getting only part of the story. It is hard, very hard, to piece together a story from a number of reports; but it is almost impossible to do so when all we get are newspaper clippings and lists of calls of amateurs who participated. Neither of these tells us what we need to know to chronicle the event properly in the pages of *QST*. Your newspaper clippings are of interest, of course, and help paint the background of the emergency, but they usually tell a very sketchy tale of the part played by amateurs, and that often garbled through lack of familiarity on the part of reporters with amateur terminology and call letters. Newspaper publicity is a fleeting thing; here today, gone tomorrow. *QST* write-ups represent the chronicle of amateur participation in emergency work, presented from time to time in the amateurs' interest where it will do the most good (e.g., see page 31, Oct., 1952, *QST*). We leave it to you which is the more important.

ARRL cannot send reporters to the scene of an emergency to get first-hand information, as local newspapers and large national magazines may do. Our reporters are *you;* and if we do not get a respectable write-up in *QST*, you are partly to blame for not having helped see to it that all information on amateur participation reached us. Practically every emergency group has at least one individual who has a way with words; he should be enlisted to consolidate information into a write-up for *QST*. At least, send us all information, not only as to who participated, but even more important, *what they did!* If it's well written and brief, chances are we'll reproduce it with few changes; otherwise, we'll rewrite it as required. Just get us the facts.

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Teamwork is the result of drill. Drills and more drills make for smooth operation on any emergency net. Through it you learn characteristics, not only of men but equipment. Comes the emergency and you go smoothly into gear — as a unit. Each man, each piece of equipment fits in the groove. The going is smoother. The unit produces. Lessen drills as perfection is reached. Coast along. Your unit is in readiness for that emergency. — *W4IM, SEC Eastern Fla.*

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During an emergency last winter the Kentucky Corn Crackers Net operated under the title Kentucky Emergency 'Phone Net. In a net discussion after the emergency ended, many members expressed the belief that all nets should not use the term Emergency Net during regular operations, but use the title *only* during a real emergency. If all nets would follow this rule, there would be no difficulty in recognizing when an actual emergency was occurring. — *W4SMU*

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Waco and vicinity had a tough time on May 11th. Our information so far is rather sketchy, but we'll record what we have and supplement it in August *QST* if anything more comes in.

The area was lashed by one of the worst tornadoes in history between 1630 and 1700 on Monday, May 11th, killing over 100 people. Rescue operations which followed were hampered by cold pelting rain for two days which brought flood threats to add to the misery.

Immediately after the tornado struck Waco, W5s ATW BOB DZ and VHF were on the air doing yeoman duty clearing outgoing traffic. The Caravan Club in Dallas dispatched several units to the scene. According to W5PED, for a time the Caravan Club was about the only means of communication with the stricken area.

In the Austin Area, W5s CHU DCS DFY FXN GPQ NFC and TIK were active handling traffic. Most of it was handled by W5DCS, assisted by W5s ANQ and NFC. Many press dispatches indicated they had come "by way of amateur radio, our only source of news from the disaster area. . . ." W5s FMY FZB HJZ JIG LJ and PNP also participated in handling the traffic, plus the South Texas Net, the North Texas Emergency Net and, says W5FXN, "many, many others."

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On the 11th of September, 1952, the city of San Marcos, Texas, and other towns in the vicinity were stricken by floods. A net was organized on 3825 kc. to assist in the rescue of and evacuation of marooned people who were being picked up by the AF helicopters stationed at San Marcos AFB. All landline communications were washed out and the San Marcos Air Force Base had no communications except through the base amateur radio station. K5FEN was set up as the NCS, W4PMG/M was stationed at the telephone office in San Marcos and provided 'phone patch into the 'phone system there. W4PFH/M was sent to the scene of evacuation and furnished very good liaison. A shortage of operators was our only bottle neck but we were assisted by W5LUL who operated K5FEN most of the time. Other operators were W5APM, W2AMA and W5TEP. We had excellent coöperation from all amateur stations in keeping the channel clear and the following stations in surrounding towns and cities checked into the net to handle traffic: W5s SUI QDX OFC KTL QEM NN VRI PTR LJ VRX OSR RYJ DFC, K5s EAX and FSS. — *W4PMG/5*

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On March 5th at 2035, WØFKE, NCS of the S. Dak. 160-Meter Net called the net into emergency operation to assist in locating a missing plane, with the following signing in: W7s TAK PJU RJR PJT, WØs KLD YQR BCO UVL EBO EPI CTZ HVA KAS LAS and DRU. These stations gathered weather reports all along the pilot's proposed route to try to determine the extent of a storm which had developed, to see where the pilot might have landed or turned back, so that the CAP could send out search planes. The Intermountain Net, which meets at 2115 on the same frequency (1905 kc.) cancelled their session and stood by for WØFKE. The net was closed at 2145 although several stations manned the frequency until midnight. The plane crashed northeast of Rapid City, a short distance from a ranchhouse — all four occupants killed.

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Shortly after receiving news of the disastrous tornado at Knox City, Texas, on March 13th, W5VFH/M and W5WPS/M of the Abilene Amateur Radio Club picked up WN5WBM and W5UFP for second operators and headed to Knox City. This mobile team arrived about dark and at once got in contact with local amateurs. W5SXI was trying to contact W5KVB but due to heavy QRM and low power was unable to establish satisfactory communications. W5WPS/M failed on 3950 kc. for the same reason. About 2000, power was restored at W5SXI and he was able to put his 1-kw. rig on the air. W5FQT and W5LOS set up a rig on 10 meters in the American Legion Hall in downtown

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Fifteen amateurs participated in a successful amateur-c.d. demonstration on May 4th, at Shelbyville, Ind. The net operated on 147.3 Mc., the Indiana RACES frequency. Shown in the picture, assisting in operation from K9AAY, are: W9LZI, Indiana SEC; W9PLA; K9AAY; and Zellon Audritsh, Indiana CD Communications Director. (*Photo courtesy Shelbyville News*)

Knox City and used this as a message center. W5VFH/M and W5WPS/M, with WN5WBM and W5UFP helping, handled traffic between the downtown station and W5SXI. They stayed on the scene handling traffic in this manner until 0130 Saturday. W5BKH and W5VRX, in Abilene, received traffic from W5SXI throughout the emergency operation. The following additional stations participated: W5s AAO/M BKH BXY/M HWL/M LWZ RYJ/M SKZ UFP VFH/M VRX and WPS/M. — *W5UFP*

A defective main transformer in the power distribution system for Madison, Wis., blew up in a spectacular explosion on March 14th, plunging the city into darkness. W9UFX/M reported to the main power plant, while W9UGT/M, W9HZS/M and W9MFR/M dispersed to outlying substations, to take the place of telephone installations which were out at all three substations. Although no one was hurt in the explosion, the above amateurs worked for over three hours along with power company officials to restore light to the city. Power company officials estimated it would have taken them twice as long without the amateurs' assistance, and that the consequent losses they incurred were much lessened.

Fourteen SEC reports hit our file for March, two of them (West Virginia and Oklahoma) new for 1953. AREC members numbering 2106 were represented. That makes 20 sections whose SECs have reported so far this year. If any of you ECs or SECs don't know what this reporting business is all about, drop us a line.

CODE-PRACTICE STATIONS

The following is an up-to-date list of all stations transmitting code practice in the ARRL Code-Practice Program. The majority of the stations listed customarily change to Daylight Saving Time during summer months.

W1ACT, Fall River ARC, 57 Richmond Street, Fall River, Mass. 3545 kc., Mon., Wed., Thurs. and Fri. 1900 EST, beginners' speeds.

W1SRB, Al Vesce, 84 North Main Street, Thompsonville, Conn. 29,600 kc., Mon., Wed. and Fri. 1930–2030 EST, beginners' speeds.

W2FSL, Adolph F. Elster, 53 Commercial Avenue, Avenel, N. J. 3675 kc., Sat., Sun. and holidays. 0730–0800 EST, beginners' speeds.

W2GNI, Jim Chupp, 85 West Main Street, Smithtown Branch, N. Y. 1895 kc., Mondays. 2000–2030 EST, beginners' speeds.

W2HEI, William Teso, Mountain Avenue, Hillburn, New York. 3950 kc., Sat. and Sun. 1400–1500 EST, 5–18 w.p.m.

W2NRM, Howard B. Jack, Browns Trailer Court, RFD 6, Lodi, N. J. 1880 kc., Mon. through Fri. 2200 EST, 3–8–15 w.p.m.; Saturdays at 0800 EST, same speeds.

W4IYT, Andrew C. Clark, 41 Lenape Drive, Miami Springs, Fla. 28,700 kc., Mon. through Fri. 2030–2130 EST, beginners' speeds.

W4RUR, E. J. Blatt, 536 16th Avenue So., St. Petersburg, Fla. 28,050 kc., Mon. and Wed. 1900–1950 EST, 6–22 w.p.m.

W6JZ, Ray Cornell, 909 Curtis Street, Albany, Calif. 3590 kc., Mon., Wed. and Fri. 1830 PST, 5–25 w.p.m.; 1920 PST, 35–45 w.p.m.

K6USN, Cmdr. J. M. McCoy, 12th Naval District Reserve Electronics Station, Bldg. 7, Treasure Island, San Francisco, Calif. 3590 kc., Tues. and Thurs. 1830 PST, 5–25 w.p.m.

W7FWD, O. U. Tatro, 513 N. Central, Olympia, Wash. 3646 kc., Mon. through Fri. 1700 PST, 4, 6, 16 and 25 w.p.m.

W9UIN, Joseph H. Kadlec, 1148 Ashland Ave., Evanston, Ill. 7240 kc., Sat. and Sun. 0800–0900 CST, 5–7½ w.p.m.

WØQDF, W. H. Du Bord, 10247 Midland, Overland, Mo. 29,600 kc., Mon. and Wed. 2000–2100 CST, 5, 8, 10 and 13 w.p.m.

CODE-PROFICIENCY PROGRAM

Twice each month special transmissions are made to enable you to qualify for the ARRL Code Proficiency Certificate. The next qualifying run from W1AW will be made on July 14th at 2130 EDST. Identical texts will be sent simultaneously by automatic transmitters on 1885, 3555, 7125, 14,100, 21,020, 52,000 and 146,000 kc. The next qualifying run *from W6OWP only* will be transmitted on July 3rd at 2100 PST on 3590 and 7138 kc.

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

Code-practice transmissions are made from W1AW each evening at 2130 EDST. References to texts used on several of the transmissions are given below. These make it possible to check your copy. For practice purposes, the order of words in each line of *QST* text is reversed during certain of the slow-speed transmissions. To get sending practice, hook up your own key and buzzer and attempt to send in step.

Date	Subject of Practice Text from May *QST*
July 1st:	*An Eight-Band Mobile Transmitter*, p. 11
July 7th:	*TVI Reduction in Strong-Signal Areas*, p. 17
July 9th:	*The Seventh ARRL National Convention*, p. 24
July 16th:	*Another Vacuum-Tube Keyer*, p. 32
July 20th:	*A Single-Control Transmitter-Receiver*, p. 26
July 22nd:	*Multiband Tuning . . .*, p. 33
July 24th:	*A Hand-Carried Portable Rig . . .*, p. 45
July 28th:	*Six Vertical Elements on 21 Mc.*, p. 36
July 30th:	*Multi-Impedance Dipoles*, p. 42

DX CENTURY CLUB AWARDS

HONOR ROLL

W1FH.....253	W6ENV.....242	W3JTC.....237
W8HGW....249	W6AM.....239	W3KT.....237
WØYXO....246	W3GHD.....239	W4BPD.....236
W6VFR.....246	G6ZO.....239	W2AGW....235
G2PL.....246	W6SN.....238	W3CPV.....235
W3BES.....245	W2BXA.....237	PAØUN.....235

RADIOTELEPHONE

PY2CK.....226	W1NWO.....207	W9RBI.....200
W1FH.....225	ZS6BW.....205	W1MCW....198
VQ4ERR....220	W1JCX.....204	SM5KP.....197
XE1AC.....213	W8HGW.....204	

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

NEW MEMBERS

SM5ARP....141	W7FBD.....104	SM7AKG...102
ZL2HP.....123	W4PHJ.....102	W2ESO.....100
LU9CK.....122	W8DUS.....102	W6SQP.....100
W6NKR.....111	DL1EI.....102	W7WH.....100
FA9OW.....108	G3FML.....102	WØAHR....100
W9GWK....105	HB9HZ.....102	

RADIOTELEPHONE

SM5ARP....132	EA4DB.....109	W7MBW....101
CO2OZ.....109	EA3FG.....107	

ENDORSEMENTS

W6SYG.....231	W8DAW.....191	ZL4BO.....131
W8BRA.....231	W7HIA.....173	PY2AJ.....127
W1TW.....230	W5KUJ.....170	DL1YA.....125
W2NSZ.....220	W2LV.....161	VK3YL.....124
VK2DI.....220	ZS2AT.....150	F3FA.....123
W9FID.....215	VP7NM.....142	PAØDA.....122
KV4AA.....212	PY1ADA....140	W9HQF.....120
HB9J.....210	9S4AX.....138	WØDST.....120
4X4RE.....204	W9GYT.....133	W1DSF.....113
W7DL.....202	W3AFU.....132	KG6ABI....111
W6EPZ.....200	K2BU.....131	W2CWK....110
	G3HLS.....131	

RADIOTELEPHONE

G2PL.....190	W7MBX.....160	W4AAW....132
W1MB.....181	G4ZU.....160	GM2DBX...131
W7HIA.....170	W2EOH.....143	G3HLS.....130
EA2CQ.....170	W8DMD.....140	G3COJ.....121

TRAFFIC TOPICS

Seems to us there are an awful lot of traffic men these days who bounce crazily around from net to net, collecting a little traffic here, distributing a little there, like a bunch of butterflies. There is nothing especially wrong about this in principle, but in practice it can make a horrible mess of an otherwise well-run net. If we all did it, we'd just have a hodgepodge without any rhyme or reason; sometimes we think that's where we're headed anyway, because more and more traffic men seem to think that's the way to handle traffic.

Why? Why because so many casuals these days casually pick up messages from a KA, a KL7, a KG6 or a DL4 while they are casually hunting DX on 40 or 20. It sounds kind of important, so they look in their net directory (or *QST*) for a net that covers that part of the country, and clear the message. After it's finished, they decide that was sort of fun, so they go back on 20 again and *look* for such traffic, peddle it here and there, and first thing they know they have become *traffic men* — after a fashion, that is. The DX fraternity are, generally speaking, unexcelled when it comes to operating proficiency, but their knowledge of network procedure and traffic system is something else again, and sometimes they fail to realize that there are quite a few other amateurs who also have traffic to handle.

Most nets welcome visitors, but it is something more than disconcerting to have a complete stranger barge into a well-run net with an utter disregard for or total ignorance of its operating procedure. Many good operators fail to realize that proficiency in code or voice techniques itself is not enough when you are reporting into an organized traffic net. They not only fail to realize it, but have a very definite tendency to pooh-pooh its importance or, even worse, puff themselves up indignantly at any implication that they *could* have something to learn about anything so elementary and childish as message handling.

Wish we could exorcise these satanic influences. About all we can do is repeat our set of maxims for net visitors, to wit:

(1) Listen a while before reporting in, to observe procedure.

(2) *Don't* report in unless you have traffic for the net.

(3) Wait for an invitation to report in by the NCS — don't break in.

(4) When reporting in, indicate your traffic the way it is done in *that* net, whether or not you think that's a good way to do it. Use *their* procedure.

(5) Once you are QNI, keep off the air until the NCS tells you to transmit.

(6) Stay awake, be alert for a call from NCS and respond immediately; don't make him call you two or three times. Also, don't leave the net unless you tell NCS you are so doing.

(7) Don't expect the net to drop everything and handle your traffic first. Wait your turn.

(8) If you don't want to abide by the above, better not QNI in the first place.

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TCRN handled 4340 messages in April, in 30 sessions for an average of 140 per session. Six stations participated.

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National Traffic System. Let us take the opportunity to repeat a remark we have made before: that if each net of NTS would do its complete job and *only* its job, the whole system would prosper. One of the things that seems to be lacking among some of our NTS participants is failure to understand that just as they individually must participate in teamwork to operate a good net, so must the nets engage in teamwork to establish an effective *system*. No NTS net can retreat into its shell and forget about its obligations to other NTS nets; likewise, an NTS net which takes on permanent responsibilities not its normal function will gradually find itself not only losing sight of its original and basic duties, but usurping the duties of other NTS nets; in other words, the tail starts to wag the dog.

We realize that irregularities in the system are often required, and also that quite often the path of least resistance for a piece of traffic is not via NTS net channels but by some more direct (but temporary) route. The troubles that NTS has had are, you might say, its own fault, but the "it" is *you*. The irregularities which we consider necessary are usually not half so necessary as we think, and before we know it the irregularities become *regularities*, and we drift (or are led) further and further away from the system we purportedly are trying to follow.

One prominent NTS organizer recently said: "A weakness in NTS is the . . . assumption that everyone gets the idea, and that full support of means, methods and principles follows. Put me down as believing that the run of NTS people haven't studied the NTS outline at all. Few have even read far enough to form misconceptions." If this is true, it spells apathy — general but very vague allegiance (commonly known as "lip service") to an ideal. NTS is the traffic system of thinking, unprejudiced amateurs. To do it wrong is as bad as, or worse than, not doing it at all. Think it over, fellows.

April reports:

Net	*Sessions*	*Traffic*	*High*	*Average*	*Most Consistent*
1RN	38*	345	33	9.1	W. Mass.
2RN	44	318	15	7.4	NJN
3RN	44	386	41	8.8	E. Pa.
4RN	44	408	23	9.3	Va.
RN6	38	571	41	15.0	BAN
RN7	52	575	49	5.3	Wash.
8RN	31	135	14	4.4	Ohio
9RN**	26	1249	175	48.0	Ind.
TEN	44	1554	76	35.3	
TRN	44	76	12	5.7	Ont.
EAN	22	750	55	34.0	1RN, 2RN, 3RN
CAN	22	870	74	39.5	All
PAN	22	782	90	35.5	RN7
TLCN (Ia.)	22	674	121	30.6	
QKS (Kans.)	22	156	14	7.1	
Q1N (Ind.)	47	937	53	19.8	
Total	562	8826	175	48.0	
Record	568	8826	175	48.0	

* Out of 44 sessions scheduled.
** Includes TLJ traffic.

We ran pretty close to the record (for April-May-June quarter) in all departments in April. Only in total net sessions reported did we lose out to the May, 1952, record of 568. FB, gang!

1RN is running early (1945 EDST) session only in May and June. Business on 3RN picked up in April, as did conditions; all traffic is routed via NTS channels. W6IPW is the

♦

"Rett" Gauthier, W5NG, we are told by W4PL, broke him to ask for a fill for the first time in 19 months, recently — which ought to classify W5NG as one of the best amateur traffic men in the business. Rett is RM for Louisiana, operates in the Crawfish and Hit & Bounce nets, has made BPL on several occasions, holds 35 w.p.m. CP certificate and a public service award from ARRL for work in the Midwest Flood of July, 1951. He runs about 250 watts input to an 813 final on 80 and 40 c.w.

QST for

new RN6 manager. No representation from Montana, Alberta, Saskatchewan or Alaska on RN7; anybody handle traffic up there? Certificates for 9RN have been issued to W4PXX, W4WHC, W9UNJ and W9HLY. TRN having its usual Spring troubles, mainly poor attendance from VE1, with VE1OM carrying the full load.

The Transcontinental Corps is still struggling to fulfill its duties, but there are still a lot of holes and a lot of volunteers needed. If anyone would like to assist in effecting this necessary liaison between the three NTS Area Nets, drop W1NJM a line with full particulars on times you have available.

BRASS POUNDERS LEAGUE

Winners of BPL Certificates for April traffic:

Call	*Orig.*	*Recd.*	*Rel.*	*Del.*	*Total*
KG6FAA	473	3616	3436	180	7705
W3CUL	362	3375	2214	827	6778
W6IAB	66	3153	3071	82	6372
KA7LJ	625	1457	426	1031	3539
W6KYV	152	1246	636	599	2633
W4USA	51	1087	1141	72	2351
KL7AIR	64	1083	1024	58	2229
W9JUJ	16	1142	948	64	2170
K4WAR	154	764	717	47	1682
K3WBB	63	801	719	62	1645
WØBDR	4	755	740	10	1509
KH6AJF	67	663	674	56	1460
W7BA	31	714	684	26	1455
W6YHM	11	697	651	49	1408
W5MN	77	608	298	300	1283
WØCPI	12	630	576	54	1272
WØKHQ	7	626	622	3	1258
KA7RC	305	440	405	35	1185
W8ZGT	11	542	544	5	1102
K6FAL	276	395	322	70	1063
K5FBB	23	500	464	35	1022
W9NZZ	308	353	14	338	1013
WØQXO	2	505	472	33	1012
W4WHC	792	35	2	30	859
W4TAV	15	412	378	18	823
KA2HQ	318	245	104	122	789
W2BO	25	340	265	75	705
W5BKH	8	341	240	109	698
W1SJO	6	341	314	27	688
W6YDK	52	316	226	85	679
W7PGY	22	315	293	22	652
WØJXJ	3	323	301	22	649
W4PJU	8	320	275	45	648
W3WIQ	40	306	275	15	636
W4YIP	19	281	272	61	633
W5TFB	289	22	12	308	631
W7PYV	20	304	290	6	620
W6GYH	8	300	235	65	608
W8AUJ	11	315	259	22	607
KA8AB	112	246	195	51	604
W6NTN	10	299	276	7	592
W2RUF	23	304	173	79	579
W5GZK	5	286	249	36	576
W7CZX	12	276	272	0	560
W4FPC	29	17	480	17	543
WØFUF	12	264	249	15	540
W4EJC	71	161	48	238	518
Late Reports:					
W3CUL (Jan.)	233	1512	1221	291	3257
W3CUL (Mar.)	132	1543	1251	292	3218
W3CUL (Feb.)	31	336	327	72	766
W8ZGT (Mar.)	9	377	350	6	742
K3WBB (Mar.)	69	316	246	56	687

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

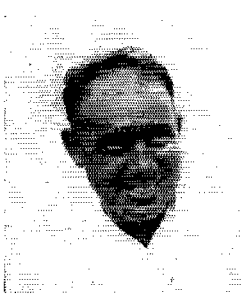
W5TEI 321	W2JOA 156	W6OFJ 107	
W5QHI 274	K4WBG 155	WØUCV 107	
W5PML 244	W2JZX 134	W2EC 103	
W8DAE 212	W4SHJ 117	Late Report:	
W4DRD 181	W9LSK 108	W3CVE (Mar.) 179	

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

MEET THE SCMs

Nelson W. Magner, KZ5NM/W4QBS, who has maintained an interest in amateur radio since 1914, received his present call in 1948. Previously he held the call YS1NM and was second operator at HP1A for a number of years.

KZ5NM's transmitting equipment consists of 811s modulated by 811s, running 250 watts input, while the receiver is an NC183-D and antennas are 14- and 28-Mc. folded dipoles and a rotary array on 28 Mc. In addition, 28-Mc. mobile has been installed in the car and there is available for emergency use a 2.5-kw. gasoline-driven power plant.



Nelson formerly was Emergency Coördinator, and is now Canal Zone SCM. He holds an A-1 Operator certificate, has been issued Public Service certificates for his outstanding work in the Ecuador Earthquake and Bolivia emergency of 1949 as well as the September, 1950, Florida hurricane.

A member and past-president of the recently affiliated Crossroads Amateur Radio Club, of which his XYL, Lois, KZ5LM/W4UPJ, is secretary, SCM Magner is also an active member of the Canal Zone Amateur Radio Association. He is a Panama Canal Co. construction engineer.

CLUB SUMMER SLUMP?

If warm weather is causing a slump in your club's post-Field Day educational/entertainment program, a training-aid item which your program chairman may have overlooked will prove to be helpful. Ten quizzes, with comprehensive answer and discussion sheets, have been prepared by ARRL. A typical report indicates that the quizzes aren't a snap; in fact, "A very crestfallen group it was" is enthusiastic comment when the scores are tallied.

Available upon request from the Communications Department are the following quizzes (with affiliated club requests getting first choice):

Q1, Operating Procedure; *Q2*, DX Operating; *Q3*, Traffic Handling; *Q4*, ARRL Organization and Functions; *Q5*, FCC Regulations; *Q6*, General (questions on various topics); *Q7*, Public Relations and Interference; *Q8*, Technical Radio; *Q9*, TVI; *Q10*, The Novice.

W1AW SUMMER SCHEDULE

(June 1 through September 26, 1953, times EDST)

Operating-Visiting Hours:

Monday through Friday: 1300–0100 (following day).

Saturday: 1900–0230 (Sunday). Sunday: 1500–2230.

A mimeographed local map showing how to get from main highways (or from Hq. office) to W1AW will be sent to amateurs advising their intention to visit the station.

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

Frequencies:

C.W.: 1885, 3555, 7125, 14,100, 21,020, 52,000, 146,000 kc.

'Phone: 1885, 3950, 7255, 14,280, 21,350 kc.; 52,146 Mc.

Times:

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

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

General Operation: Use the chart in May, 1953, *QST*, page 79, for determining times and frequencies for W1AW general contact with any amateur. Note that since the schedule is organized in EDST, the operation between 0000 and 0100 each day will fall in the evening of the previous day in western time zones.

Code-Proficiency Program: Practice transmissions at 15, 20, 25, 30 and 35 w.p.m. on Monday, Wednesday and Friday, and at 5, 7½, 10 and 13 w.p.m. on Sunday, Tuesday, Thursday and Saturday are made on the above-listed frequencies. Code practice starts at 2130 each day. Approximately 10 minutes' practice is given at each speed. On July 14th, instead of the regular code practice, W1AW will transmit a certificate qualifying run.

• All operating amateurs are invited to report to the SCM on the first of each month, covering station activities for the preceding month. Radio Club news is also desired by SCMs for inclusion in these columns. The addresses of all SCMs will be found on page 6.

ATLANTIC DIVISION

EASTERN PENNSYLVANIA — SCM, John H. DuBois, K2CPR — SEC: IGW. RMs: AXA, BIP. PAM: PYF. E. Pa. Nets: 3610, 3850 kc. The Hazelton ARC reports new officers are PSC, pres.; WN3UBC, vice-pres.; R. Wickus, secy.; OHX, treas. The Lancaster Radio Transmitting Society had a good exhibit at the 3rd annual Hobby Show, messages relayed via NOK and 3RN. At the 8th annual LRTS banquet, April 18th 80 persons attended. This club now boasts 12 mobiles and a communications truck for c.d. work. The Phil-Mont Mobile Club has expanded its membership 50 per cent in the last three months. This outfit was mainly responsible for making the recent Philadelphia Gateways c.d. test so successful. The South Philadelphia RC's new officers include NJS, pres.; UAU, vice-pres.; QLZ, secy.; and FZR, treas. The SEC reports additional openings for ECs in Delaware and Lebanon Counties. The Central Pennsylvania C.W. Emergency Net meets at 2030 EDST Tue. on 3507.5 kc. with NOK as NCS and is looking for new members. The Pennsylvania 'Phone Net (PFN) has moved frequency to 3850 kc. and now is rivaling the c.w. net in traffic totals. Traffic exchange between these two nets now gives almost complete coverage for E. Pa. CUL made BPL in February while on a Florida vacation besides attending a hobby exhibit en route! ADE hopes the new local u.h.f. TV station will help present the TVI problem in Harrisburg. EAN replaced three half-wave doublets with a single long wire a la EQA. ELI got his Extra Class, radiotelegraph first-, and radiotelephone second-class tickets at one sitting! NOK now has a ten-element beam on 2 meters and OY is using a Viking II. TBT and UQL are reporting into the Anthracite Net (AN). EU has moved the station to Wapwallopen. Traffic: (Apr.) W3CUL 6778, BIP 158, NOK 127, KAG 118, IGW 115, RSC 91, DUI 74, PDJ 72, GES 70, BFF 46, AD 39, PYF 36, PVY 30, ADE 27, ONA 5. (Mar.) W3CUL 3218. (Feb.) W3CUL 766. (Jan.) W3CUL 3257.

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA — SCM, Arthur W. Plummer, W3EQK — CVE reports TCRN was very busy in March. The USO project, HAM-GRAM, is a success. K4AF and K4USA helped locally. Stations other than TCRN helping were 9JUJ, 5MN, K6FAL, K6EB, and 3PZW. 6KYV, KH6ASE, and KG6FAA have been the main outlets. EEB, QZI, and DNN found new squashed rhombic not working too well. EEB got some new countries on 21 Mc. OLF now is running 250 watts to 813s in the final. KMA has been in bed with virus, which gave him time to write an article for *QST*. LJV is moving to new QTH to get away from auto QRN at present QTH. PZ is learning things about 420 Mc. through directive antennas with circular polarization. He recently renewed commercial telephone and telegraph licenses and also has Amateur Extra Class license. LVJ spent half of April in Connecticut but couldn't make the grade to Headquarters. EQK spent two weeks in Hartford and while there visited W1AW and ARRL Headquarters, and also met 1HPR, whom he first QSOed in 5-way with 1HJB, 2GHL, and 3EOZ Aug. 31, 1934. EEB hooked 7 new countries in April, took down T2FD, and put up 66-ft. vertical center-fed Zepp, 132-ft. center-fed flat-top, and 20-meter beam, and is changing 10-meter elements to work 15. HC reports activity on 2-meter c.w. and 75-meter 'phone in Delaware. UDN is back from Florida and active on 40 meters. ROU took the Extra Class exam. UGF signed up with RACES. K3WBB set up a message center in the lobby of Loew's Century in connection with the movie "Battle Circus." Traffic was handled from W3VON/A3VON, 6 watts, to WBB, who Hammed and Marsed it via Viking I and BC-610, respectively. An interesting and instructive rehearsal of the following civil defense units was held in Baltimore County April 9th: Rescue, Auxiliary Police, Wardens, Radiological, Amateur Radio, Emergency Welfare and Casualty Station of the Medical Service. Gov. Theodore McKeldin dedicated the new Rescue Unit there. GEG gave a very interesting talk on League matters at the Washington Radio Club meeting Apr. 25th. MDD Section Net officially closed down Apr. 30th until mid-September. However, those who wish to may continue to report in, also TCRN on 3590 kc. Ethel Smith, MSU, was guest of honor at the Washington Area YLRL party held at Friendship House Apr. 25th. Barbie Houston, OQF, arranged and presided over the affair. CDQ will try for QSOs with the home gang on 20-meter c.w. while vacationing in Europe. CIC is getting out well with new 40-meter 'phone rig. NL talked at WRC meeting on transmitting and receiving equipment applicable to RACES. The Rock Creek Club installed the following new officers Apr. 10th: OMN, pres.; RXK, senior vice-pres.; FED, junior vice-pres.; FNO, secy.; PZK, treas.; PWB, GA, AIR, and RE, exec. comm. NVL discussed vertical antennas for low-frequency ham bands at the Chesapeake Amateur Club meeting Apr. 13th. RMD works 160-, 80-, 40-meter 'phone and 40- and 80-meter c.w. UQJ moved to York, Pa., with Naval Ordnance. Governor Theodore McKeldin vetoed S.B. #166, the Amateur Call Letter License Plate Bill, on May 6th. Traffic: (Apr.) K3WBB 1645, W3COK 164, QZC 149, UGF 144, ROU 136, JE 100, AKB/BWT 46, ONB 41, RMD 27, HC 23, NNX 16, CQS 15, EQK 12, TPS 10, QOB 8, EEB 6, LVJ 4. (Mar.) K3WBB 687, W3CVE 203, HC 42, EEB 11.

SOUTHERN NEW JERSEY — SCM, Lloyd L. Gainey, W2UCV — OQN had a visit from ex-W2ZFA recently. Johnny is now in W5-Land and active on 40 and 10 meters. ADA is now running a full gallon on 75-meter 'phone and giving SAI some local competition. OSD is putting out a potent signal on 40-meter 'phone with his Viking. The DVRA held an interesting hidden transmitter hunt on 10 meters. First place prize went to QKE, with LSS and CEH placing second and UPS third. Hams at Fort Dix are well represented on all bands under the call of K2WAO using a Viking I, Supreme AF100, BC-610. Receivers are Collins 51J, Hallicrafters S-76, HQ-129X, and as S-27. The Annual Old Timers Night banquet was attended by more than 300 hams and professional radio men. The guest speaker was Hugo Gernsback, of early wireless fame. ZI was general chairman and QOK was toastmaster. ZQ held a WAS Party on 75-meter 'phone the week end of April 17-18-19. The final score showed a total of 39 states worked. At the April meeting of the SJRA members heard a very interesting talk on weather prediction by Henry P. Adams, Meterologist in charge of the Philadelphia Weather Bureau. The attendance figure again passed the 130 mark. Rumor has it the officers of the club are negotiating with the City of Camden for the use of Convention Hall for monthly meetings. Traffic: K2BG 337, W2RG 164, ZVW 151, ZI 33, ASG 28, ZQ 9.

WESTERN NEW YORK — SCM, Edward G. Graf, W2SJV — SEC: UTH. RM: RUF. PAM: GSS. NYS meets on 3615 kc. at 8 and 11 P.M. EDST, NYSS on 3595 kc. at 8 P.M., NYS on 3980 kc. at 6 P.M. daily, and NYS c.d. on 3509.5 and 3993 kc. at 9 A.M. Sun. RZP has been reappointed EC for Delaware County. KBT held its annual auction night. At BARA Old-Timers Nite RFO, SBA, and IRH gave a history and demonstration of gear used in the days before QRM and World War I. HNH, of G. E. Electronics Park, spoke at the RAWNY meeting on TV and TVI using his Dynamic Demonstration Board. HYN is running 50 watts on 2 meters and using a nine-element yagi. WLU is on 2 meters with 100 watts from an 829B modulated with 809s. VEO is a new call on 2 meters. The Rochester Mobile Club met at the QTH of TEX with a full program on technical talks, movies, and slides provided by RDG, ZEL, and TEX. 1TBU now is chief operator at K2FAV, the A.F. Base at Sampson. CBM and JMT have Viking IIs. FMX will be heard from Old Forge during the summer months on 40 and 80 meters. K. Thomas, Disaster Communications Chairman of Syracuse and Onondaga County Chapter of the American Red Cross, was the principal speaker at the afternoon AREC meeting and at the evening banquet at the Rochester Hamfest. The Oswego ARA demonstrated radio-controlled model airplanes on ARRL F.D. RUF made BPL for April. BLP, UTH, QQA, and GUY are trying 40-meter 'phone. PBC is building a new beam after wind damaged his 24-element job. BLP heard DX coming through in his sleep, got up at 1 A.M. and worked HB9MX on 75 meters. BTB addressed

(Continued on page 70)

Here's our page reprinted from QST of May, 1944. We thought you might like to read it again

DANA BACON once remarked to us that most technical articles in *QST* contributed by amateurs start with an apology, as if the writer felt embarrassed at his presumption in putting his thoughts on paper. The opening paragraph reads something like this: "There have been many articles in *QST* in recent months on compact transceivers, but none of them have told how to build a transceiver into a snuff-box. Since many hams have old snuff-boxes lying around we thought somebody might be interested in how we built our new portable rig into a snuff-box here at W1 — at a cost of only $1.19. Hi!"

This is usually followed by a very interesting article. We like that kind of article. We like the author's modesty, and we like the way he writes in plain English. Compare it to the opening paragraph of the high powered author who begins this way: "From a consideration of the work of Snickelfritz [1], Jellybean [2], and Belch [7, 8, 9] it is evident that further investigation is indicated in respect to certain aspects of the installation of transceivers in enclosures of high-Q, and we are justified in concluding that further data should be accumulated on enclosures of this character, as ably pointed out by Whiffletree [14, 15] and Gust [16, 17]." His "enclosure of high-Q" looks just like grandmother's snuff-box, though it has been turned out in a machine-shop and gold plated.

Now, we do not mind the author's little conceits but we do wish he would write the article so we can understand it. He never says "1 watt," he gives it in decibels above a reference level. His magnetization curve for the audio transformer (yes, he has lots of curves) is plotted in "oersteds." We forgot what an oersted was long ago, and we do not care much about knowing now. However, it sounds like hot stuff, so we look up "oersted" in the International Critical Tables and find that it is a unit of reluctance having the dimensions el^{-2}. That is just dandy. We try the ARRL Handbook and draw a blank (apparently George Grammer does not know what an oersted is, either). We finally discover, in the Standard Handbook, that an oersted is a gilbert per centimeter, and Hudson's Manual says that a gilbert per centimeter equals .495 ampere-turns per inch. So he was talking about our old friend ampere-turns all along! Now that that is squared away, where were we?

Well, we were saying that we like the articles in *QST*. They are written by men whose language is as forthright as their thinking. They are written so that even an engineer can understand them.

W. A. READY

the D.A.R., The Women's Professional League, and the Women of Kiwanis on amateur radio. KN2CLB is on 80 and 40 meters. YLM has been appointed EC for Broome County. COU and YRH operated in the lobby of Loew's State Theater in Syracuse during the showing of the movie "Battle Circus" and messages for servicemen in the Pacific Area were accepted and relayed. YIY has the call K2CPI for 2nd QTH atop a hill. CBM is now General Class. At the Rochester DX dinner meeting BGN gave a technical talk, MA demonstrated s.s.b. exciter, and Bob Haner spoke on Lattice Type Filters. VQM's 90-foot tower collapsed after many years of service. KKJ has been appointed as OO, FMX as OES, and KKA and DVE as ORS. PYC has been reappointed as EC. Section Net certificates have been issued to YY and HXG. Traffic: (Apr.) W2RUF 579, GSS 219, HKA 100, OE 59, ZRC 52, K2DG 44, W2SJV 29, JWU 26, IPC 16, DVE 13, MSJ 11, FEB 10, ZHU 6. (Mar.) W2COU 105, OZR 13, QLI 6, OYI 3.

WESTERN PENNSYLVANIA — SCM, R. M. Heck, W3NCD — RMs: GEG, NUG. PAM: AER. Reports from the various groups indicate more work toward emergency preparedness in coöperation with the Red Cross and the Pennsylvania Civil Defense. The Erie amateurs are active in both fields with several mobile units in operation and many more being prepared. QN, Erie County EC, keeps me informed with very fine newspaper clippings of amateur activity in Erie County and of the Radio Assn. of Erie. The *Bucktail Hamster*, a publication of the Bucktail Amateur Radio Club, Emporium, sent me by IIX, keeps me informed of Cameron and McKean County amateur operations. Most activity centers on the Cameron County Net frequency, 3710 kc., with sessions at 8:30 P.M. on Mon. and Wed. This net frequency gives the Novices a chance to join the gang. The McKean County Net continues active on 3525 kc. Sun. A.M., reports LQQ, McKean County EC. The Amateur Transmitters Assn., Pittsburgh, is to be commended on the fine job done in bringing to the Pittsburgh Area the Phil Rand demonstration on TVI. The Pennsylvania Civil Defense held a simulated emergency test in June with communications handled by amateur radio. The test centered on Meadville, Pa., with civil defense teams in the various categories converging on Crawford County in convoys from 8 surrounding Northwestern Pennsylvania counties. Each convoy was kept in communication with the main c.d. headquarters and the operations control center by amateur mobile units, the control from Meadville with the Radio Assn. of Erie emergency communications trailer acting as the traffic control station during the entire drill. This trailer is equipped fully with transmitting and receiving gear on several bands and is placed ready for any emergency in which amateurs might be asked to participate. The RA of Erie also has given the local relief agencies and the State Police lists of amateurs who are Official Mobile Units and are equipped for immediate emergency operation. RM NUG reports WPA traffic for April totaled 179 with the most-consistent attending stations being KUN, LXE, UHN, KNQ, and NUG in that order. Traffic: W3WIQ 636, NRE 436, NCD 206, GEG 128, NUG 74, UHN 62, AAX 43, LXE 34, QPJ 20, SIJ 14, KNQ 10, AEV 5, MIZ 5.

CENTRAL DIVISION

INDIANA — SCM, Clifford C. McGuyer, W9DGA — WUH is a new member of QIN. RBX has his Viking working on all bands. GQM is working for Collins. VGD built a super-regenerative receiver. JJU is back in Hartford City. FZW has new grid-dipper and condenser checker. ZIB is all set for the c.d. 2-meter net. NTA is handling lots of traffic on 'phone. JUJ took third place in the YL/OM Contest and is on 75-meter mobile 'phone. The Kokomo Hamfest is scheduled for Aug. 16th. OZN gave a talk to the Kokomo ARC on the TV camera. NTR has a new antenna. JBQ reports RFN traffic as 59. KLR is doing FB on 2 meters. STW visited ARRL Headquarters. PPS reports his new Viking works fine. JUJ and NZZ lead the traffic reports again with 2170 and 1013 respectively. BKJ has rebuilt. WN9UPK has 40 states for his WN WAS. OAC works 2 meters. ARI has new 32V-3. ARH is a papa again. BDP is spending lots of time on his farm. The Key and Mike ARC of New Albany held a simulated emergency test with the Red Cross and c.d. This group is to be congratulated on its fine work. The Central Division Director, AND, has appointed CLF, MVZ, and DGA as Asst. Directors for East, West, and Southern Indiana. DKR has his receiver back from the factory. RZS will attend the National Jamboree of the Boy Scouts. KPZ lost his emergency equipment in a fire. THM, an Indianapolis fireman, was injured in the line of duty. HWH moved to New Jersey. OVF has a new VFO. PIL is a member of the Indiana State Police. DNQ, JJC, URC, and FZW are on the building committee of IRC. EON is rebuilding. OVF has completed his new shack. GQX is trying out a new type of antenna. PEX is the first YL member of MARC. UB, BCJ, ZIB, and SIQ are on the TVI committee of MARC. NYZ works for Indiana Bell. JUJ reports QIN traffic for March as 667. PWB is a new ORS and is Engineering Supervisor for WKLO TV. MVZ is a papa. Lake County ARC has its application in for a club call. WKN has two 65-foot poles. AST is back on 160 meters. SNF uses a 3057L on 75-meter 'phone. GUX burned out a modulation transformer. The FWRC has obtained a bus to be converted into an emergency mobile unit. KFS donated a rig to FWRC. UC gave a talk to the FWRC on antenna-coupling methods. ENB is a papa. SKQ, UUN, KPM, JRR, DKS, and BRW are active in TVI reduction. TBM is recovering from an illness. AB, EOG, K9FAB, PMT, and ZIB assisted the Red Cross in obtaining blood donations. ZSC is on 75-meter mobile. NDH has 50 watts on 75-meter 'phone. JUN is building a new rig. BKJ reports IFN traffic as 268. QLW is managing the baseball team of Magnavox. RFN certificates were issued to EUC, FZP, PPO, PMV, and MZH. MWM, BBC, UMS, and DGA are interested in TVI reduction in Evansville. Traffic: (Apr.) W9JUJ 2170, NZZ 1013, YWE 260, TT 241, PPS 199, JBQ 171, BKJ 163, NTA 112, QLW 102, RBX 86, FYM 82, CMT 81, DGA 74, EUC 67, LQE 65, TG 65, SWM 59, WBA 58, VNV 52, OLX 45, KDV 35, FZW 32, HLY 25, UMS 23, KLR 22, PWB 22, DOK 21, ZIB 20, DKR 19, KPZ 18, STW 18, RZS 15, ERB 12, LZI 11, BDP 9, NTR 6, NH 4, SKP 4, YVS 4. (Mar.) W9LZI 72, SKP 18.

WISCONSIN — SCM, Reno W. Goetsch, W9RQM — SEC: OVO. PAM: ESJ. RM: IQW. Nets: (WIN) 3625 kc. 7 P.M.; slow speed 6:30 P.M.; (BEN) 3950 kc. 6 P.M. State Mobile and c.d. frequency, 29,620 kc. New appointments: LSK and OOF as OBS, NLH as ORS, OOD as EC for Rock County. Appointment renewals: KZZ and SFL as ORS, UIT as OBS, NLE as OO, AFT as OES and OPS. Easter traffic helped CXY's total to the top spot. UNJ received 9RN certificate and plans increase in power. QLC is going mobile. Congrats to LSK on receiving his Extra Class license. A TBS-50 was bought for ODD by the club, at Marquette U. OPS worked 1AW. Net certificates (BEN) were issued to YYL, ONV, BCY, and NAJ. UCR has his TVI licked. OVO lists the following ECs as having submitted reports for March: NLA, RUF, SZL, AKY, WLZ, TPS, VHA, and GJK. FDX enjoyed his first CD Party. SZL, Racine EC, and assistants KZZ and LXY met with the Racine c.d. officials to formulate plans for RACES. LEE and GFL report poor conditions on 144 Mc. during April. FAN has a new jr. operator. WN9RXS dropped the "N". AFT's XYL is working for her ticket. KXK is using ground plane vertical on 7 Mc. with good results. Using available facilities, Wisconsin ECs and BEN members took part in c.d. practice alert Apr. 24th. ARRL TVI demonstration was held in Milwaukee June 24th. The Wisconsin Council of Clubs conducts a meeting of delegates on 3995 kc. at 9 A.M. on the 2nd and 4th Sun. of each month. IOP was guest speaker at the annual WVRA Hamfest Apr. 18th which was attended by about 360, including approximately 100 mobiles. The following picnic dates have been reported: M & M Club, July 26th at Sturgeon Bay; DCRC, Aug. 9th at Sturgeon Bay; Blackhawk Club, Aug. 16th at Beloit. Traffic: W9CXY 378, UNJ 350, ESJ 322, LSK 322, MQV 144, UCR 120, RTP 61, SFL 32, IQW 31, SAA 30, NLH 25, CFP 24, IFS 20, FUS 19, OVO 18, IBQ 13, WØMBD/9 10, W9SDK 9, VHA 9, ERW 8, RQM 5, FDX 4.

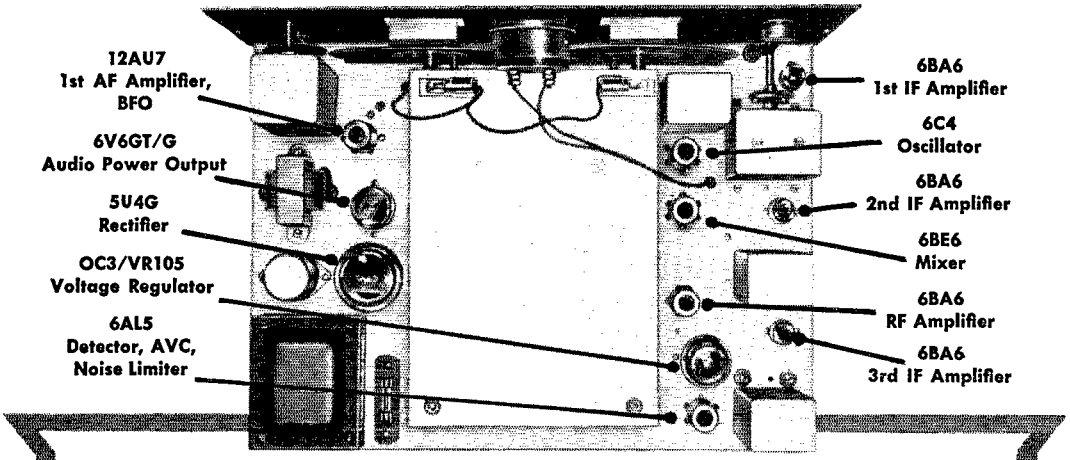
DAKOTA DIVISION

NORTH DAKOTA — SCM, Everett E. Hill, WØVKP — The North Dakota State Hamfest will be held at Jamestown July 12th. All hams should have received an AREC plan. Anyone who didn't, please notify me. SARA had a big party at Mayville May 4th. Please report Field Day plans to me. The SARA has an equipment loan library for members. EBA was home from college for a week. LHB still is handling traffic on c.w. despite poor propagation conditions. KZZ has a new jr. operator (male). Congratulations to GZD and the other officers of the SARA on a swell first year. JNP is back from the Army and working at his old spot. BIH and CPS are on 75-meter 'phone. There is plenty of mobile activity in Fargo now. How about all mobiles registering with the SCM? HNV finished the new rig for SARA Field Day. ZXT has a new layout. Traffic: WØLHB 20, KTZ 14, EBA 5.

SOUTH DAKOTA — SCM, J. W. Sikorski, WJRRN — Asst. SCMs: Earl Shirley, ØYQR, and Martha Shirley, ØZWL. SEC: GCP. RM: OLB. PAM: UVL. DTB has sold his Meissner and operates on 144 Mc. only. The Prairie Dog ARC held its first auction, which was considered very successful. GCP is chairman of the Mitchell ARC TVI committee. OLB received his 35-w.p.m. Code Proficiency endorsement. New calls: WNØNOT, Sioux Falls, and WNØNWK, Deadwood. SMV and LBS are awaiting WAS certificates. Thirty-four stations participated in the State's first c.d. exercise, with UVL as NCS. 7SVP/Ø is stationed at Rapid City AFB, using a Viking II. BQG has been transferred to Sioux City and is commuting via his own plane. The Sioux Falls ARC TVI committee consists of ZIQ, BLZ, PHR, MPQ, HWS, and BQS, in addition to non-hams. It appears that I'm to be SCM for another term. Please don't hesitate to pass along any suggestions or questions to YQR, ZWL, or me. C.w. net (3615 kc.) has suspended for the summer, but net members will monitor regularly and ragchew on that frequency. Traffic: WØOLB 252, KØFCR 35, WØRRN 7, WUU 7, AEN 4, SMV 3.

MINNESOTA — SCM, Charles M. Bove, WØMXC — Asst. SCM: Vince Smythe, ØGGQ. SEC: ZDU. RM: DQL. PAMs: JIE and UCV. According to the State Legislature it

(*Continued on page 78*)



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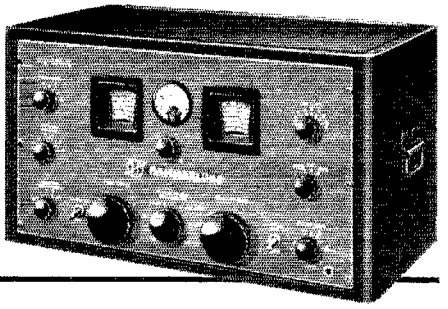


HAMMARLUND

costs the State of Minnesota fourteen cents to make a set of license plates. Bob Coons, ZDU, is on the job now as your Section Emergency Coördinator. Join the Emergency Corps now! Write Bob for your application blank. His address is 15 So. 5 St., Minneapolis, Minn. 6DMJ now is located at Forest Lake and soon will be operating mobile. We now have a few YLs checking into the MSN. They are IRJ, JMI, KGZ, IEI, GXG, and KFN. The last we heard of BGY he was doing very well at the Sanitarium at Nopeming. The Mobile Amateur Radio Corps of Hennepin County now has six mobile rigs on 50.52 Mc. to be used for emergency work. They are OUE, HNS, QIN, JJJ, TKX, and VER. HFY now is running full power to his 6146s with a new exciter. RPT will be off the air for the summer. JNC worked 31 sections in the last CD Party. He also worked KL7AON on 40-meter 'phone. We hear that Nebraska now will have call-letter license plates. Want to be an ORS, OBS, OPS, OO, or OES? If so, write your SCM for application blanks. Full information on these appointments will be found in April 1953 *QST*. Traffic: WØITQ 415, UCV 246, DQL 174, CXM 166, TJA 105, KNR 81, OMC 72, JIE 68, RXL 60, RPT 56, DYD 54, HFY 48, GGQ 40, CID 34, SWB 32, GTX 23, HBE 20, CQY 17, BBY 16, FFU 13, MXC 13, JNC 12, BUO 10, BRA 4.

DELTA DIVISION

ARKANSAS — SCM, Fred E. Ward, W5LUX — Everyone enjoyed the meeting at Eureka Springs, and the meetings are getting larger each time. ØOZN, Midwest Division Director, was on hand, as well as 4FLS, Delta Division Director. We all appreciated the informative talks by the two League officials. ICS located the hidden transmitter. There are many new mobiles these days. NIR has new mobile and MET is running 38 watts to his mobile. DYL is back with us with a new Viking II rig and a swell signal here. VN made a fine showing in the last Frequency Measuring Test. VAN reports a new club has been organized at El Dorado and expects to have a club rig on shortly. RWJ is moving to a new QTH and will be more active now. MRD reports the code practice transmissions have been discontinued and he wishes to thank all the fellows who sent cards and letters. Any station wishing to help with code practice can get the dope from Omer. It's nice to see interest in the nets increasing and I hope to be on more myself. Traffic: K5WBA 173, W5EA 10, VN 6, RWJ 5.

LOUISIANA — SCM, Robert E. Barr, W5GHF — A letter to the SCM recently from that ace traffic-handler from Tennessee, 4PL, reports that on a Hit and Bounce schedule one morning in April NG, Louisiana RM, asked for a fill or repeat in a message transmitted to him. This was the first fill requested by NG in 19 months, although he had averaged 100 or more messages relayed per month. TRQ is beginning to have a few TVI worries. KRX sent in a nine-month report all at once, covering more than 1200 messages in that period. KRX is active on RN5, CAN, PAN, and Gulf Coast Hurricane Nets, and also maintains schedules on TCC. WQX lacks only 5 states toward WAS, using a 6L6 oscillator rig, rock-bound. YSM uses a Viking on 75 meters. VKK is on 75 meters with a small 30-watt rig. UNQ has new 813 rig on 40-meter 'phone and finally has gotten that antenna up from the old 5-foot height. HEJ is recovering from a painful back injury and is able to get on the air again at times. Thanks to WQX for an excellent Baton Rouge report. Monroe and Ouachita Valley ARC were hosts at a jam-up meeting held at the Ouachita Parish Fair Grounds Apr. 26th. Director Jim Watkins, 4FLS; SEC 5GHF; PAM 5CEW; 4th Army MARS director, A5USA, and a number of other League appointees were there. FMO, on behalf of the New Orleans Club, made formal announcement at the meeting of the coming Delta Division Convention to be held in New Orleans in September. This will be the first convention for the Division since 1947, and the first in New Orleans since 1938. Traffic: W5NG 243, KRX 202, GHF 92, TRQ 5.

MISSISSIPPI — SCM, Dr. A. R. Cortese, W5OTD — The Gulfport picnic was a big success, with 587 hams, XYLs, and harmonics attending. TDO is new president of the Jackson Club. WN5WMQ took the General Class exam. UTL has VFO on 75 meters. IHP is rebuilding with 4-125As. KHB is NCS for the Magnolia Net, and has a new Viking mobile rig. VCP has vertical on all bands. WZZ is active on 75 meters. K5FBB made BPL again. JHS has a sked with his son, WN4ZFK. SWQ has daily skeds with his father, Paul, WN5ZCO. Paul won the Elmac at Gulfport! Greenville wants a ham club. The Magnolia Net meets on 3870 kc. at 1:30 Sun. and the Hurricane Net meets on 3935 kc. at 6:15 every evening. Let's have more activity reports, fellows. Traffic: K5FBB 1022, W5JHS 88, KYC 88, UTK 45.

TENNESSEE — SCM, Mark M. Bowelle, W4CXY/WLG — SEC: NJE. RM: AGC. PAM: PFP. The gang has been rocking along with very good attendance on both the 'phone and c.w. nets. We observed some of the gang aiding during the recent wind storms. The Memphis gang is pushing Kingsport for the crown as the most active club in the State. Memphis has 15 to 20 mobiles regularly on the 10-meter net and a new 2-meter f.m. net is in the making. Interest is maintained by covering local events such as the Cancer Drive and the Cotton Carnival Parades. FLW, one of our

(Continued on page 74)

leading v.h.f. men, advises the gang to take a crack at 6 meters this summer. He has an FB sheet of instructions on converting a Howard f.m. tuner into a 6-meter converter that he will furnish if you send him a stamped, self-addressed envelope. SCF, our personal candidate for the traffic man most likely to succeed, now is secondary NCS for DON and beating it out on MARS. The XYL of our SEC, VJX, is keeping a mess of skeds and making the OM hump to keep up with her. UDS got his WAS and pushed his SCM under the table in the last CD Party, but along came his fellow Memphian, YIP, who whopped him for a 47,000-odd total. Speaking of YIP, that gob is going places both in his branch of the service and in hamdom — Lt. Cmdr. and BPL, if you please. Traffic: W4YIP 633, IWV 234, WAX 154, W5GOH/4 109, W4IIB 99, WQW 74, SCF 73, CXY 52, VJX 48, VFL 27, PMR 15, FLW 12, VKE 10, DTI 7, RMJ 6, UDS 6, WGJ 3.

GREAT LAKES DIVISION

KENTUCKY — SCM, Ivan C. Kelly, W4TUT — WHC set an outstanding traffic record from Ft. Campbell. Smitty keeps a box handy for the boys to drop in their traffic and comes up with a wonderful total. MWX is resting up after turning the RM job over to PXX. WZX finished the kw. final. TAV again made BPL. SZL reports no TVI with his new 813. UWA now can give more time to radio — he has a new sheepskin from high school. CDA has gone to Europe. We welcome ZMQ and WN4ZLK. KZF is readying his throat for the SS. UFR and JUI turned in swell OO reports. KKG is mostly fishing. JCN proudly possesses a "boomerang." JPP has gone from Viking I to Viking II. SMU is wiring up a Viking and VFO. K4WBG admits his lazy season is on. BAZ still reports lots of activity. WBD has fine low-power signal from central Kentucky. WN4YOK joined Henderson AREC. The Kentucky 'Phone Net expects to issue net certificates soon. 3945 kc. has been the only 'phone frequency for many years but at present a vote is being taken on whether to move elsewhere, the vote so far being 2 to 1 to move. Thanks for the largest bunch of reports since my election as SCM. NIS ran up three continuous hours and four states on teletype. Eastern Airlines took 40 hams and XYLs of Louisville's ARTS for an hour flight over Louisville. FIN, local manager, made arrangements. Traffic: W4WHC 859, TAV 823, PXX 491, K4WBG 270, W4BAZ 197, MWX 179, SBI 138, WZX 41, JCN 35, UWA 29, JPP 19, KKG 14, SMU 14, RFI 13, KRC 8, WN4ZLK 7, W4CDA 5, URF 4, JUI 3, SZL 2, KZF 1, WBD 1.

MICHIGAN — SCM, Fabian T. McAllister, W8HKT — Asst. SCMs: Bob Cooper, 8AQA; Joe Beljan, 8SCW; Mickey Wills, 8CPB. SEC: GJH. RMs: YKC, UKV, ELW. New appointments: Area EC (Area No. 2) to BQA; Area EC (Area No. 3) to RAE. While all of the results of "Operation Wake-up" have not been received, the information available at this time indicates that the event was highly successful. The link from the Soo into Lansing was right in there pitching; and even though we have not found out exactly what we CAN do we certainly learned a lot more about what we NEED to do. New officers of the Central Michigan Radio Club are: FSZ, pres.; KWO, vice-pres.; CPV, secy.; DSH, treas. DLZ finally got the new 1646 transmitter perking. Sounds like a real rig, Norm. THG got his new center-fed antenna up; COW is using a 40-meter vertical with good results. Speaking of verticals, since reading the May *Quist-Quiz* your SCM has sold his nice big balloons to Surplus Sam again. MGQ has acquired a new Viking and now is cleaning out the shack to make room for it! TQP is having fun with new 10- and 75-meter mobile. DYH reports his license has been renewed. Welcome back, Ken, we've missed you. All highways and beams are pointed to Traverse City for the BR Net Picnic to be held July 19th. Details by separate mail, but let's give the boys a big turnout for this affair. Traffic: (Apr.) W8ZGT 1102, JYJ 342, FLM 148, URM 128, ZLK 126, ILP 124, IQJ 123, GTM 69, ELW 65, IKX 64, NOH 61, COW 46, AQA 30, CPB 28, DLZ 28, KBI 28, QIX 26, FGB 25, NUL 24, HKT 23, WVL 23, FSZ 20, FBV 18, THG 16, FX 15, AUD 11, EGI 10, GJB 10, ZWM 10, AHV 9, GCP 9, TQP 5, PUV 3, MAI 1. (Mar.) W8ZGT 742, JYJ 144, ELW 36, TQP 26, FSZ 19, UKV 17, GJB 14, MGQ 2.

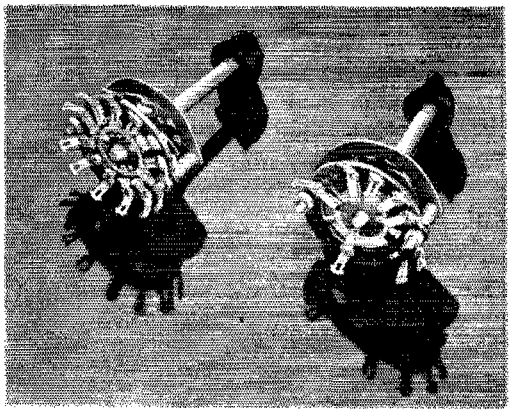
OHIO — SCM, John E. Siringer, W8AJW — Asst. SCMs: C. D. Hall, 8PUN, and J. Erickson, 8DAE. SEC: UPB. PAM: PUN. RMs: DAE and PMJ. The sole BPLer this month was DAE. BN and CRA are new OBS. PM was elevated to OO Class I while DMJ and JAR made OO Class IV and III, respectively. DZD was made OO Class III/IV. HNP and BZD are new OPS. EQN reports that more than 200 Ohio stations and about 50 counties were active in the first Ohio QSO Party. Here are the scores of those who submitted logs: AJW-4140, HOX-2627, IFX-1540, MEI-1350, TLW-1008, IZQ-903, AQ-720, YGR-627, EAR-528, CTZ-515, EQN-378, AL-325, RO-286, HBJ-180, DAE-170, EYE-88, HSM-54. The top five will be awarded certificates. The first WAOC certificate will be presented to EQN. Hamlin owes a vote of thanks to the Canton gang, who operated TTJ/8 from Carroll County during the QSO Party for the express purpose of making this county available to those seeking the WAOC award. Carty, our super SEC, reports that the RACES plan which was submitted to the FCC in

(*Continued on page 76*)

MALLORY HAM BULLETIN

NOW—

Amateurs Can Build Decades Easily, Economically... with New Mallory Decade Switches



A useful addition to the amateur's shelf of test equipment is the common Decade or Substitution Box of standard values of capacitance, resistance, or inductance; yet, many amateurs have continued to overlook this handy gadget because of real or fancied fears regarding its construction. It is believed that the special features of the new Mallory Decade switches 153L and 154L may encourage amateur acceptance of the Decade and its benefits, by eliminating some of these doubts.

In the usual design, a single Decade consists of a rotary switch and 10 close-tolerance capacitors, resistors, or inductors selected to provide standard values of capacitance, resistance, or inductance in a uniform sequence from 1 through 10, where the tenth unit is exactly 10 times the value of the first. Single Decades may be combined for increased flexibility and operating range. For example, only 5 Decades of appropriate ranges used together can provide a total of 99,999 different selections without repetition. Imagination and ingenuity are the only limits to Decade operation.

Obviously, the cost of building a Decade will be directly proportional to the number of close-tolerance components required. Accordingly, any legitimate means for reducing the number of these expensive components should be accepted with enthusiasm.

The new Mallory 153L and 154L Decade switches were designed to do precisely that. By using them it is possible to reduce the number of standard close-tolerance components required for each Decade to just 4, and at no sacrifice of range or flexibility of operation.

These new switches function in an amazing manner, as you will note when you see them at your Mallory Distributor's. They can add and subtract, or select and reject, with remarkable ease. A Mallory 153L Capacitor Decade switch in conjunction with standard capacitors of 1, 2, 3, and 4 mfds combines, selects, and otherwise juggles those "base" values automatically to make available not 4, but 10 values of capacitance (1 through 10) at the turn of a knob. Similarly, the 154L can be used to pull off the same stunt with resistances and inductances.

The construction of these new switches adheres to well-known and accepted Mallory methods for the manufacture of rotary switches. High grade phenolic insulation, silver plated self-wiping contacts, and a corrosion resistant, metal finish assures long-lived dependable service even in daily operation.

Price-wise and quality-wise, Mallory Decade switches now make the construction of amateur Decades entirely feasible. See your Mallory Distributor, today.

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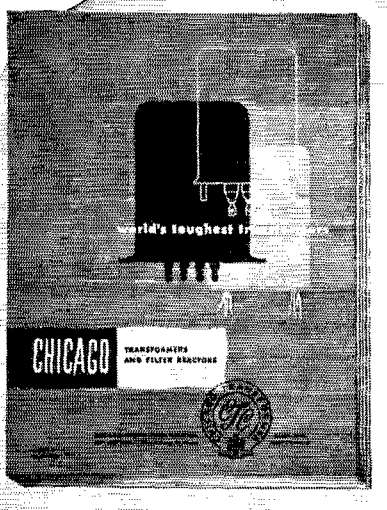
Washington has been approved. ZKD, a smoke-signaler for more than 20 years, recently made his initial A3 contact. JAR now is using an 829-B final. LMB tells us that the 8th call area of TCPN meets as 2030 EDST in connection with the W3 area. DG now is using a T2FD antenna. TLW is rebuilding his final. TZO has reverted to a DX hound. MGC lauds the Collins mechanical filter he is using with this 75A-3. Top scorers in the CACARC 10-meter groundwave contest were SQU, AJW, and ET among the locals, while outside honors were taken by a W3 station followed by OPX and SBB. MWE and PM turned in the best mobile scores. The CACARC Summer Hamfest will be held July 26th at Roundup Lake Park near Mantua Center. Case Tech Radio Club officers are GHO, pres.; 3RJJ, vice-pres.; and MIC, C.E. Received too late for last month's column are facts and figures on the Dayton Hamvention. More than 800 amateurs attended. The R.I.s gave a total of 197 exams, with GQ aiding with the paper work. Numerous interesting talks were heard, including those by 1HDQ, ZQU, SPF (Great Lakes Division Director) and LK, (Emory Lee of the FCC). ACE, general chairman of the Hamvention, sacrificed an opportunity to annex the section title in the DX C.W. Contest while so capably carrying out his assignment. DG did a bang-up job as toastmaster. Toledo's *Shack Gossip* tells us that IEP has become a proud pappy and NIH has acquired a son-in-law. New ARRL affiliated clubs are the Treaty City and Sandusky Valley groups. Your SCM visited the latter organization a few weeks back and discovered an up-and-coming bunch. Four counties were represented at the meeting. The following week he paid the Toledo Club a visit and was greatly impressed with their emergency layout, FO, at Red Cross Headquarters. This gang did creditable work in the 6-City Radio/Rifle matches and in the tornado alert of April 9th. Springfield's *Q5* states that BMC is the Contests Committee Chairman. DAE, BN chief, put out a nice spring bulletin. He has decided to keep the net starting time at 1900 EST. Newly-elected OCARC officers are HFR, pres.; UTP, vice-chairman; WXG, secy.; AL, treas. *Carascope*, out of Columbus, mentions that new members are LFM, LVF, MRD, and RZG. Traffic: (April) W8FYO 405, DAE 391, GDB 322, SRF 183, JAR 176, UPB 160, IFX 121, KNX 116, LMB 96, RO 91, CTZ 60, PMJ 57, AL 52, DG 52, GZ 34, EQN 25, EKA 24, DL 21, AJW 19, TYA 13, QIE 12, AMH 11, NYY 11, RN 11, HNP 8, TIH 8, PUN 7, AQ 6, KIH 6, ET 5, HUX 5, PBX 5, THJ 4, MGW 2. (Mar.) W8KFB 18, MGC 4.

HUDSON DIVISION

EASTERN NEW YORK — SCM, Stephen J. Neason, W2ILI — SEC: RTE. RMs: TYC, KBT. PAMs: IJG, JQI, K2CA. KN2BUI (now K2BUI) and KN2BTT/2 played a full game of chess on 3710 kc. The game lasted for two hours and KN2BTT/2 resigned after 34 moves. NOC and ILI were awarded WNH certificates by the New Hampshire Brass Pounders. MRQ is on 144 Mc. BSH has a new 813 final. Orchids go to George for his work in conducting code classes and for his help in getting BSD, who is a victim of muscular dystrophy, on the air. BSD is the new manager of the Hudson-Mohawk Novice and Training Net. WN2CKO is the editor of the net publication. DVZ has new 829 final on 144 Mc. K2BCU is mobile on 29 Mc. CGT has a new 183-D receiver. HEI is QRL building a new high-power final. RTE, NRY, ZBS, CGT, and K2BAR have new Viking II transmitters. Congrats to CFU, who earned a Section Net certificate for activity on NYSEPN. Newly-elected officers of RVWARS are VDX, pres.; NRD, vice-pres. Those reelected were EWO, secy.; EYG, treas. APJ has a new Gonset communicator. EQD, former SCM, again is active on the traffic nets and will be looking for the old gang. Appointments: DGW as OBS; JFB as OES. Endorsements: AWF, LDS, PIE, PCQ, NVB, AIH, and ILI as ECs; IJG as PAM; GTC as ORS. Your buddy wants to know if you are active. You can let him know by sending in your activity reports. How about some news from the RTTY gang? IFP made WAS and received a certificate for activity on 2RN. The IBM Radio Club received the call K2CXP. LEL is on 3.8 Mc. with a new 32V-3 and has been appointed Asst. EC for Ulster County. Traffic: (Apr.) W2TYC 209, IFP 136, EFU 83, MRQ 57, BNC 55, ILI 54, LRW 47, BSH 37, HEI 30, K2BDJ 26, W2APH 19, IVP 11, CFU 9, AAO 6, EQD 1. (Mar.) W2BNC 28.

NEW YORK CITY AND LONG ISLAND — SCM, George V. Cooke, jr., W2OBU — Asst. SCM, Harry Dannals, 2TUK, SEC: ZAI. RM: VNJ. PAM: YBT. This Month's report was written by TUK as our new Hudson Division Director, OBU, was attending the ARRL Board Meeting. Section Net certificates were issued to AEE, GP, GXC, IVS, IVU, JBQ, JOQ, LEO, LPJ, OJX, and UXY. New appointments: JLR, KJG, RA, and WNW as OO; KJG as OBS; KFV as OPS; and IVU as ORS. SAI reports AREC activity high in all parts of the section. KGN is new EC for Brooklyn, replacing BIV. VKF, Staten Island EC, has 15 mobiles and 7 fixed stations on 10 meters. JSV, Queens EC, reports good activity on 10 and 2 meters. FI and the Nassau EC group participated in four c.d. drills with 54 stations active. Nassau 10-meter AREC is tied in with long-haul traffic nets via LPJ. YBT reports the NYC-LI 'phone net now is on 3980 kc. at 2000, immediately following the NYS

(Continued on page 78)



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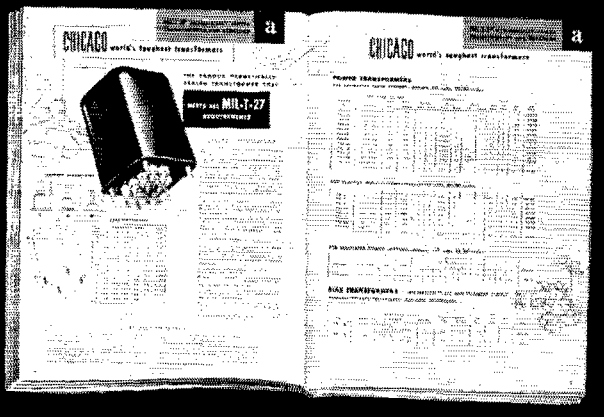

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group on the same frequency. VNJ invaded 40 and 75 meters but keeps the NLI c.w. net active. Look at the traffic totals! MUM received WBE award. WP is getting plenty of air time — flying, not hamming! UCB has new 14-Mc. ground-plane and finds plenty of DX. HMJ is back on 20 meters from new QTH on the Island. OME is on all bands with TBS-50 and 522. OBE soon will be s.s.b. on 75 meters. KEB/KFV again is mobile on 2/10 in the new car. KN2AVB passed Tech. Class exam and is "boning up" for General Class. NTB is working on 7-Mc. WAS. WL and BO are vacationing. JOA and LEO are active on TAN. OJX is QRL with night shift work but takes traffic on 80 meters after midnight. DQ is looking for early birds on 3550 kc. from 5-6 A.M. DIC is working on slides dealing with TVI. These slides will be ready soon and interested clubs are urged to contact the TVI group. K2ANH now is in charge of Lake Success Club code classes. IRK is finishing 500 watter. KJG and DP are on with Viking II rigs. RA likes his new helix beam. JBQ is trying new antennas on 144 Mc. YXK and VZT are rebuilding with new TVI-proofed 813 rigs. DGZ worked 52 countries with long-wire antenna ten feet off the ground. DTL and KN2BOZ, also DKC and K2BBO, are new father-son combinations. LPJ reports a high traffic score with activity on 10 through 80 meters. IDK is QRL school activity. OQI is back from W4-Land with the XYL, KN2BRC. 1NWY/2 is a new station in Bethpage. New members of the U.H.F. Club are NLI and K2BBO. KDO is rebuilding. WRF and K2BQI now are members of the New York Radio Club. K2CMV now has his General Class license. 20-meter mobile activity is booming on Long Island. CLG installed 2-meter rig in his new car. NZZ is the newest Tu-Boro Club member. The Club welcomes visitors. IAG is christening the new car with antenna holes. ZAC now has jr. YL operator. LGK was fishing in rowboat with 'phone and haywire crystal receiver and logged 16 flounders! Now that the summer season is upon us, let's check the rig for the coming fall months. The AREC, c.d., and traffic nets are awaiting your participation. Remember the New York State ARRL Convention, Buffalo, Sept. 19-20. Traffic: W2BO 705, JZX 357, LPJ 288, AEE 276, JOA 272, EC 236, VNJ 212, GP 123, GXC 81, LEO 60, LGK 42, DIC 38, JBQ 28, KFV 18, BQM 15, KEB 14, YBT 12, KJG 8, UXY 8, IDK 4, OGX 4, OJX 3, NTB 2, KN2AVB 2.

NORTHERN NEW JERSEY — SCM, Lloyd H. Manamon, W2VQR — SEC: NKD. RMs: WCL, NKD, CGG. PAM: CCS. CFB is adding 813 to the final for 80-meter c.w. operation, and is revamping his 'phone rig for a crack at 75 meters. K2BCK is building a new antenna farm. NIY has completed well over 500 contacts with Novice stations. DXD reports from India, via CCS, and says he has yet to log a W station but will keep trying. CCS is badly in need of additional stations in Central, Northern, and Southern New Jersey to take traffic on TPCN, 3970 kc., daily at 1900 hours. Henry is doing an excellent job in the TCPN, so let's give him a hand. 8JWK/2 is pushing a pair of 811s in the final on s.s.b. and reports he has completed a portable rig for use at the beach this summer. We wonder how he is going to erect that 75-meter antenna on the crowded beach this summer. K2CXJ, a new ham in Red Bank, will be on the air soon with a pair of 812As. YLS recently passed OPS exam and is proudly displaying the OPS certificate in his shack. Dave tells us he gets QRM from BTG, who operates a half kw. as OBS in the same house. FZY, in charge of construction program, is building 2-meter transmitters and receivers for emergency work. This program is being sponsored by the GSARA. DME is having excellent luck working short skip on 15 meters. He tells us the hams are missing a lot of fun by not taking advantage of the present 15-meter band conditions. The Monmouth County Emergency Net now has 25 regular members reporting in on drill night. CVE, Radio Officer in Area 1, is promoting regular monthly c.d. drills in Bergen and Passaic Counties. The April drill, "Operations Medical," linked the many medical officers throughout the two counties via amateur radio. "Operations Medical" received very favorable comment at a recent state c.d. directors meeting in Trenton. OUS was winner of the Old Timers prize at Old Timers Night held at the Stacey Trent in Trenton. The section is pleased to learn of the rapid recovery of AHX from his recent illness. LIR has his new s.s.b. rig working on 75 meters. Congratulations to NUI on becoming a grandfather for the first time. IIN has new 32V-3 working on all bands. ENM is on 75 meters with a new 813 final. KN2CTL is making good use of the new 40-meter Novice band. BTG is sporting a new mobile rig on 75 meters and is seen daily on Highway 35 keeping the new chest mike busy. K2CTM has new vertical on 80 meters and is working excellent DX. Traffic: W2CUI 193, CCS 174, EAS 130, K2BCK 40, W2HTD 35, HIA 18, CFB 6, NIY 3.

MIDWEST DIVISION

IOWA — SCM, William G. Davis, WØPP — The results of the election of officers for the Iowa 75-'Phone Net put YUA in as NCS and GIM, BSG, IYW, and WLY as alternates. The directors are MBW, BDR, GSH, EFI, IYW, and ZLC. HMM came through with a nice letter and reports great activity with c.d. affairs and classes with the Boy Scouts. QVA reports for the Tall Corn Net. CGY is building a new rig. BDL has moved to Madison, Wis., and

(*Continued on page 80*)

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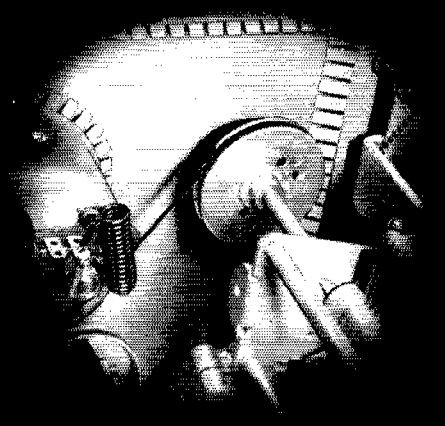

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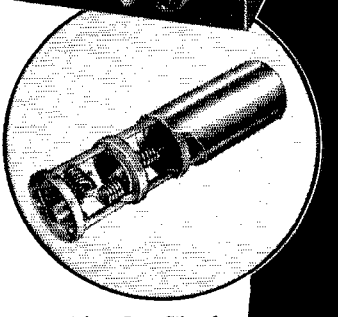

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EEG replaces him on the net. PZO has a new tape recorder to help in handling traffic. The 6th TLCN Party was held at AUL's on May 16th. Dick reported and ATA wrote telling of his having to leave school at Iowa State College and return to his home because of an attack of rheumatic fever. Steve has been in bed for 27 days and reports that he is making good progress toward recovery. There are three new Novices at Newton, including one XYL. WNØNAP took the examination for General Class and believes he made it. YTA reports he'll have to QRT the traffic skeds for summer as work is piling up. BQJ also has to slack off for the same reason. ATA reports that he is having a field day with his Viking II at his bedside. BDR is in a class by himself this month with a traffic count of 1509, his best yet, and with SCA failing to report for the first time in years. Traffic: WØBDR 1509, OZO 195, QVA 191, FSX 96, GXH 93, YTA 88, PZO 67, ERP 50, BQJ 49, BBZ 40, NYX 34, ATA 22, BLH 6.

KANSAS — SCM, Earl N. Johnston, WØICV — SEC: PAH. RM: KXL. PAM: FNS. TIG, of Great Bend, reports the Pawnee Amateur Radio Club meets the 1st Tue. in each month at members' homes. The 25 active members come from over six counties and always have a good turnout. They recently participated in hobby shows in Great Bend and in a demonstration for the Lions Club at Hoisington. ZUX and QNJ went to Colorado Springs via Eads and Pueblo on a visit and worked lots of stations with their mobile en route. LXA, reporting for CKRC, states preparations for the 5th annual hamfest are underway. TSR is moving to California to attend UCLA on a scholarship. ATH and ICS have moved to Albuquerque. BDK has a new all-band Globe King. MBH and LXA have new Babcock mobile transmitters. MUY is running a kw. on 40 meters. KPZ, of Lorraine, has General Class ticket now and is working on a rig with a pair of 807s. EXE has mobile rigs in two cars and is debating which one to put the call-letter license plates on. WEV and TIA, of Gardner, are going in for hi-fi audio and have mobiles on 75 meters. The JARS, of Kansas City, participated in c.d. drill April 26th. The Wichita Club participated in a simulated bombing April 24th. Considerable traffic was handled to nearby cities on 75 meters as well as contact kept with State Headquarters in Topeka via CET, the KVRC station. FUF made BPL. Traffic: (Apr.) WØFUF 540, NIY 353, BLI 217, FSE 144, IFR 72, WMQ 67, CET 33, FEO 33, DEL 30, FDJ 29, YOS 29, FNS 23, GHR 18, BET 17, GZI 15, LIX 11, VBQ 10, AHX 8, ICV 8, EBB 6, JEB 6, BEO 2, QYG 2. (Mar.) WØLIX 7.

MISSOURI — SCM, Clarence L. Arundale, WØGBJ — SEC: VRF. PAMs: AZL and BVL. RMs: OUD and QXO. On April 24th EBE, RCE, BRN, LBM and others were observed participating in "Operation Wakeup." EBE reported that approximately 20 amateurs participated in the operations in his vicinity. On April 11–12th a large number of Missouri hams and XYLs attended the ham gathering at the Crescent Hotel at Eureka Springs, Ark. Much credit is due 5AAE and 5MED for the enjoyable time. ARH has received his postwar DXCC certificate. CXE and NNH report activity light because of illness. KIK is having receiver troubles and ETW is having VFO troubles. KØWBD has been off the air temporarily having license transferred. QXO and QMF lost sky-wires because of the elements. WNØNZI (an XYL) is a new ham at Eldon. WNØMRQ is running 50 watts to an 807. WAP is confined to 40 meters until he acquires an 80-meter antenna. The Early Bird Net handled a total of 584 messages during April. CPI again tops his previous traffic high. GCL is without an antenna after cutting the tree down. The Show-Me Net has changed net frequency to 7160 kc. New AREC members: WØLHY, WNØs LLX, MRL, NNY, and NRB. FNN has 20-meter beam in operation. OUD, like others, had ice troubles during the ice storm. Traffic: (Apr.) WØCPI 1272, QXO 1012, JXJ 649, BVL 465, GAR 243, KØNRS 100, WØEBE 59, ZLN 55, CKQ 53, CFL 50, HUI 40, KIK 40, GBJ 38, OUD 27, KØWBD 27, WØBUL 19, QMF 15, WAP 15, TGG 14, GXZ 10, JHY 5, ETW 4, SPR 4, WNØMRQ 3. (Mar.) WØIQY 47, ETW 10, BUL 9.

NEBRASKA — SCM, Floyd B. Campbell, WØCBH — Asst. SCM, RM, NCS: Thomas S. Boysdon, ØVYX. SEC: JDJ. PAM: EUT. NCS C.W. Net: LJO. BXJ has been doing a little 40-meter c.w. for relaxation from KFOR TV. Congrats to KDW on his first harmonic (it's a boy). From LJO, NCS C.W. Net, comes the following: Average attendance 14, highest single night 17, total on roll 27, total traffic during formal net operation 90. The C.W. Net operation was much more interesting and smoother this year because of the large number of fellows reporting in regularly, in addition to the efficient operation of the various NCSs: LOD, JDJ, RDN, FQB, LJO. RDN and JDJ will monitor 3520 kc. nightly at 7 P.M. CST, as the C.W. Net is being dismissed until Oct. 1st. A few of the fellows contributing to the efficiency of the C.W. Net are SAI, FQB, TQD, KDW, IXL, ZJF, and FSE (Kansas). The Hastings gang operated from the City Building during "Operation Wake-up" with YZI, NPZ, and LJO active on MARS, 75-meter 'phone and 80-meter c.w. LRK has been appointed EC for North Platte and Lincoln County. RYG has been appointed EC for Lincoln

(Continued on page 88)

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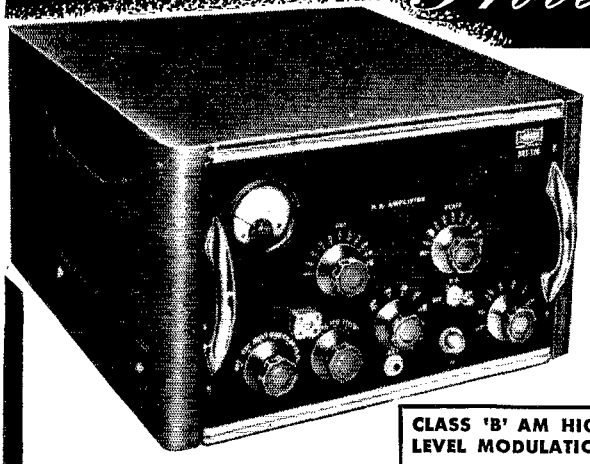

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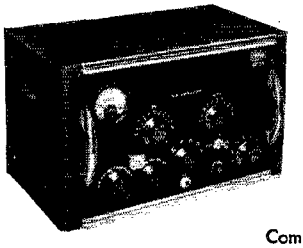

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and Lancaster County. CKZ now has his new Viking II. Traffic: (Apr.) WØRDN 402, JDJ 103, VYX 75, CBH 63, KØWBF 41, WØFSE 32, WR 21, LJO 18, EGQ 17, ZJF 17, GTW 14, SAI 14, HWM 13, ASI 12, QHG 12, MJK 11, KWQ 10, MKP 10, BUR 9, NAA 9, BEA 8, FMW 8, HQQ 8, QOU 8, KØFBD 7, WØHTA 7, FSX 6, KLO 6, MAO 5, THF 5, UVQ 5, ERW 4, IAY 4, JKE 4, ORW 4, ATU 2, FTR 2, JJO 2, NET 2, LEF 1. (Mar.) WØKDW 28, MJK 12.

NEW ENGLAND DIVISION

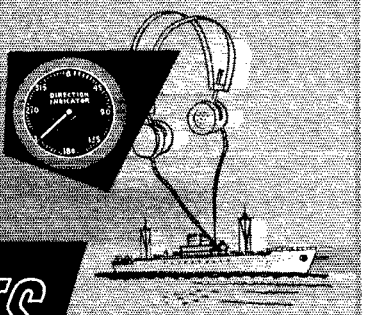
CONNECTICUT — SCM, Roger C. Amundsen, W1HYF — SEC: LKF. PAM: FOB. RM: KYQ. CN-3640, CPN-3880, CEN-29,580 kc. The New London Hamfest held on May 2nd at the Crocker House was a grand success, thanks to the hard work of QV and his gang. PHP has 32V-2 and 75A-2 on 20 meters. VOV sends her first traffic report. BVB is building an 80-meter rig. APA reports that ex-JLN is awaiting new ticket in Lynn, Mass. Gil also is enthusiastic about u.h.f. TV with its lack of TVI. RWD was busy with the radio booth for the County BSA Cavalcade. SJO makes BPL again. UNG is going on 3640 kc. 2VMX left Headquarters June 1st to resume his studies for the priesthood in N.Y.C. SFI has a new XYL and she wants someone to teach her the code. YFG is a new c.d. station in Groton. YEY is a new one at Choate School RC in Wallingford with SWO, UZD, WN1WXB, W2JRH, K2ALI, WN9WLN, and WN9WLW among the members. KYQ with 27 QNI, RFJ with 24, and RRE with 18 lead CN for April. CJD and YU have been back with CN. PNB is on s.s.b. RQJ is working DX on 10 meters. UNG visited KYQ. CTC sends a nice letter from Iceland and reports that WLK, TKX, WN1WMA, WN1WPE, RTD, WJC, and WJB, along with WN1WYP, are all at AJØAC/TFK which, alas, can only work MARS on 14,405 kc. They are itching to get Stateside again to see what hamming is really like. 2BMF, at 1YU, tells a nice story about the Bike Race between Yale and Vassar on April 25th and how 2SIK/1, RZG, 2AFA, 2SZ, WXR (YL operator at U. of Conn.), URD, and YU provided communications. Thanks for the most news yet, gang. Keep it up. Traffic: WISJO 688, AYC 270, KYQ 166, AW 125, CUH 119, RRE 84, FOB 70, BDI 65, HUM 54, HYF 42, LIG 23, RFJ 20, VOV 16, KV 12, QJM 12, BVB 10, PHP 8, UNG 2.

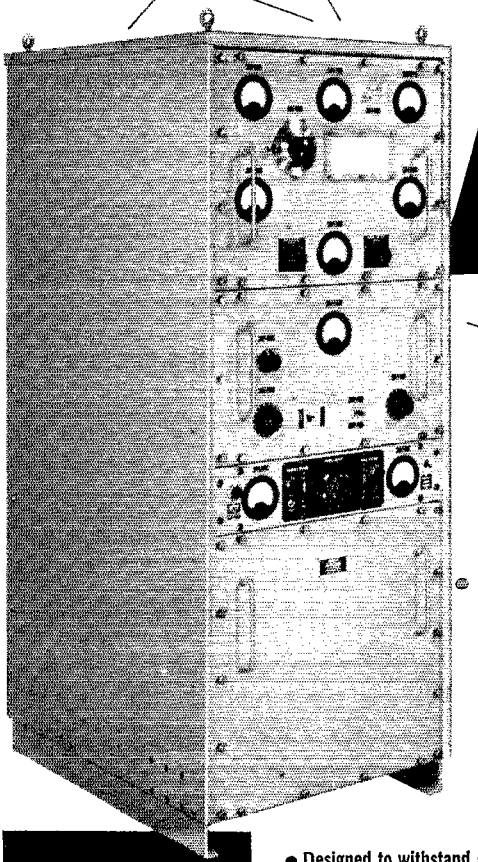
MAINE — SCM, Bernard Seamon, W1AFT — SEC: BYK. PAM: OLQ. RM: LKP. The Pine Tree Net meets on 3596 kc. Mon. through Fri. The Sea Gull Net is off for the summer, as is the C.D. Sun. Net. I deeply appreciate the opportunity of serving you as SCM. With your cooperation I shall try to carry on the excellent work of my predecessors. Here is the hamfest picture as of this time: The PAWA has taken no action and it looks like nothing will be held in Portland this summer. Mrs. Heim has sold beautiful Sunset Lodge at Kezar Lake and the Oxford County hamfest is not expected to be held. BOK will hold his old-fashioned get-together Aug. 16th at Dexter and all hands are looking forward to a grand time. The Androscoggin Radio Club will hold a super-colossal 'fest in Auburn July 11th. Everyone is requested to get tickets in advance for both of the above meetings to avoid disappointment. QEE, the grown-up jr. operator of PTL, is back from his hitch in the Navy and is on 3960 kc. from Old Town. RBD is back on the air after being evacuated from his house during the recent flood. The house to which his antenna was attached disappeared, and Cliff lost all his back lawn: Traffic: W1LKP 235, OHT 87, VV 39, BX 33, EFR 16, BEZ 15, BTY 15, PTL 14, AFT 7, OLQ 7, RJL 7, IXC 2.

EASTERN MASSACHUSETTS — SCM, Frank L. Baker, jr., W1ALP — New appointments: LLY Arlington and VYI Topsfield as ECs; 1KT as ORS. Appointments endorsed: JSM Waltham, HKG Malden, ICU Amesbury, and ALP Quincy as ECs; JSM and PXH as OES; MX, IH, and DMS as ORS; MX, DJ, and GDY as OPS; AYG as OO; IH as OBS; and AWA as PAM for 6 meters. HRF is in the Norfolk County Hospital, Braintree. Send him a card or a letter. UMO and MJQ are on 75 meters, OZ is on 10 meters, JQH is on 2 meters, and JDS is mobile. QMJ's wife is IXO's daughter. YFN is the call of the radio club at Boston Naval Shipyard. VCE and CLS are on 40-meter 'phone. Sorry to have to report the death of AQH. The South Shore Radio Club elected OTZ, pres.; RMK and TUP, vice-pres.; QMJ, secy.; and TZQ, treas. The Norfolk County Radio Assn. held its annual banquet and elected NOV, pres.; GDY, vice-pres.; ALK, secy.; CQN, treas. PLQ writes from Harlingen, Tex., where he is teaching electronics for the Air Force. KL7PDG, ex-1PDG of Norwood, has a three-element beam on 20 meters and is looking for W1s in this section. VPR received certificate for the highest score for this section in the 28-Mc. WAS Contest. There are two Hingham transmitters on 220 Mc. The Quannapowitt Radio Assn. had Mr. Hallenstein, FCC Engineer, at its meeting. The Eastern Mass. Radio Assn. had Mr. Dulac, from CBS-Hytron, give a talk on "Transistors," also BVR, our Director, and CMT spoke at another meeting. CLS spoke at the Wellesley Amateur Radio Society meeting. The Braintree Radio Club held its second annual banquet at Coral Gables, and also gave a demon-

(*Continued on page 84*)

a low frequency HOMING BEACON TRANSMITTER
with VARIABLE OUTPUT (25 TO 400 WATTS)





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- FRONT PANEL CONTROL ADJUSTS CARRIER POWER.
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- FULLY JAN APPROVED.

This outstanding homing beacon transmitter sets new standards for this type of service. Carrier power is adjustable from 25 to 400 watts by a front panel controlled auto-transformer. Pressurized forced air cooling is provided.

The GATES MO-3975 is available with or without remote control. Transmitter can be supplied for 51½ ohm output or a special antenna coupler is available to couple directly to an L or T type antenna. High level voice modulation is employed, incorporating a peak-limiter to prevent over-modulation. A type 36 automatic code keyer operates from a phase-shift type oscillator at 1020 cycles. Versatile, dependable, the GATES MO-3975 represents the most advanced LF homing-beacon transmitter yet developed.

other features

- Designed to withstand Class "B" shock tests and operate in ambient temperatures between —54°C. and +65°C.
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- Fully JAN approved. Built for dependable service under any climatic variations including those encountered in ship-board service.

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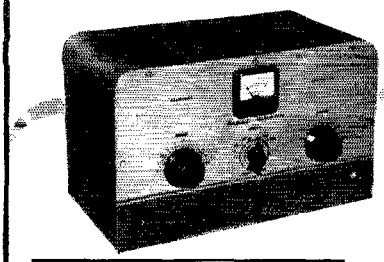
stration before c.d. officials. The T-9 Radio Club held a meeting at KON's new QTH. WN1YBT, a new ham in Woburn with a Globe Scout transmitter and an SX-71 receiver, is on 40 and 80 meters. JSM has a new QTH and is on 2-, 40-, and 80-meter c.w. doing some DXing. VGX, chief operator at SW, Phillips Academy, writes that they are on 80-meter c.w. and 75-meter 'phone. Another active operator there is K2ADV. IH has his Extra Class license. VYI reports the following on the hams in Topsfield: JEL is on 20 meters. TRE is on 20-meter 'phone. MLZ is on 10- and 80-meter c.w. VYH is VYI's XYL. WLW is on 80- and 20-meter c.w. VYI says he is the c.d. director for his town and is active on 10-meter mobile. SMO pulled through his operation in good shape and is ready to operate mobile again. BB, Winthrop EC, reports on the last drill as follows: SBT was NC with 9 stations on. BDU, CMW, DJ, OIR, HFJ, LVA, NMX, PBX, WJZ, and their XYLs helped out. WAG has applied for ORS appointment. WSN, PID, and VUF are on 10 meters. WYK, ex-3PPZ, in Littleton, is on 10- and 75-meter 'phone at home and on 10-meter mobile. SM is putting his 522 on 10 meters. UPZ received a gift of an S-76 receiver and has a Viking II. The Quannapowitt Radio Assn. had Mr. Frank Bramley, of Motorola, as a speaker. MEG sent his OES certificate in for endorsement. The Braintree Radio Club elected QPT, pres.; AUU, vice-pres.; MPT, secy.-treas. JXM, Avon EC, sent his appointment certificate in for endorsement. ORA, Wakefield EC, has appointed CTS as Asst. EC. They have three mobiles and two fixed-station, and took part in Region 5 monthly test. In Sector 5 ALP, MMQ, KWD, THY, ONV, MD, VPR, FWS, and DW were on and in Region 6 ZK, FRZ, and OLP were heard on in the State's monthly drill. Traffic: (Apr.) W1EMG 353, TY 79, AVY 70, LM 52, SW 50, BY 31, UPZ 20, WU 14, WAG 4. (Mar.) W1NUP 174, IH 12, RDV 5, CTR 1. (Feb.) W1IH 10.

WESTERN MASSACHUSETTS — SCM, Roger E. Corey, W1JYH — SEC: KUE. RM: BVR. PAM: RDR. WMN meets at 7 P.M. Mon. through Fri. and WMNS at 8 P.M. Mon., Wed., and Fri., 3560 kc. The HCRC had a gear exhibit and auction with KFV as auctioneer. BVR and JYH spoke at a joint meeting of the WCRA and the CMRA. GJO helped RFU to work his first VE2 on 2 meters. TVJ nearly nosed BVR out of the top spot in traffic this month. More traffic was reported in April than we have had for several years. Nice going. UVI is now on 40 as well as 80 meters. TRB has joined the USAF, and before leaving presented WN1VUT with a diamond ring. The newest licensee in the section is WN1YHU. WEU dropped the "N" from his call. WN1WGG now is a student at W.P.I. majoring in E.E. The above Novice licensees and WN1WWM are all graduates of the radio classes which BDV has been conducting for the past year. WKF has a new Viking II. BVR spoke at Eastern Massachusetts ARA meeting and New London, Conn., hamfest. COI has added two more 35-footers to his forest of antenna poles. YCG is new Class IV OO. RHU renewed his ORS appointment and will be on WMN during his vacation from M.I.T. EFN and JYH took part in the Vermont QSO Party. The CD Parties brought out EOB, MVF, TVJ, JAH, CJK, and JYH on c.w. and CJK and JYH on 'phone. OBU, Lunenburg, is on 10-meter 'phone with a 522 and has a four-element beam. EAX, Fitchburg, modulates his 10-meter rig with audio stage of his receiver. UXK, North Leominster, worked PJ2AG on 10-meter 'phone. EHH sold him the idea of building a converter for 6 meters. Traffic: W1BVR 87, TVJ 82, DVW 56, MNG 51, HRV 32, HRC 19, TAY 13, SPF 12, JYH 11, GVJ 9, RRX 9, RLQ 7, BDV 5, MVF 4, UVI 4, OBQ 1.

NEW HAMPSHIRE — SCM, Carroll A. Currier, W1GMH — SEC: BXU. RM: CRW. PAM: UNV. This month and next are vacation months and I hope you all have the best vacations possible. The Manchester Radio Club has a new SX-71 and a new antenna. If you want to see an ideal layout and work some mobile DX, just take a ride up to the top of Uncanoonuc Mt. 1350 feet above sea level and see the Club's shack. VGX did a good job as chief operator at SW this winter. GDE and QHS have Viking IIs, and are doing a good job with them. BFT has received Certificate No. 82 for WAA. COC says that 10 meters is great when he gets home from work at about 1:00 A.M. The Nashua Mike and Key Club has eleven waiting for their Novice licenses to come through. The Club's new Viking II with ECO is all they can ask for. I heard someone calling CQ Viking on the air the other night. What next? Anyone who is looking for a WNH certificate and needs Coos County, drop JIY a card and make a sked. Traffic: W1GMH 56, POK 56, QJX 41, VGX 31, CDX 30, FZ 4.

RHODE ISLAND — SCM, Merrill D. Randall, W1JBB — SEC: MIJ. RM: BTV. PAM: BFB. RIN meets Mon. through Fri. at 7 P.M. EDST on 3540 kc. R.I. c.d. meets Sun. at 10 EDST on 3993 kc. URA, TWQ, TST, and SJL, all Brown U. amateurs, spotted their mobiles at strategic spots along the Seekonk in order to bring a running account of the "Spring Week-end" crew races, Sat., Apr. 25th. Picked up at the boathouse and piped into the p.a. system, it worked out 4.0. Incidentally, Brown won! A large group of Massachusetts and Rhode Island amateurs visited WCC at Chatham, Mass. All of the operators there are amateurs and gave the delegation a Class A welcome. The many

(*Continued on page 86*)



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6AG7 ..... Oscillator - Multiplier
6L6 ..... Amplifier - Doubler
5U4G ..... Rectifier
105-125 volts AC 50/60 cycles 100 watts
Size — 8½" high x 13⅛" wide x 7" deep

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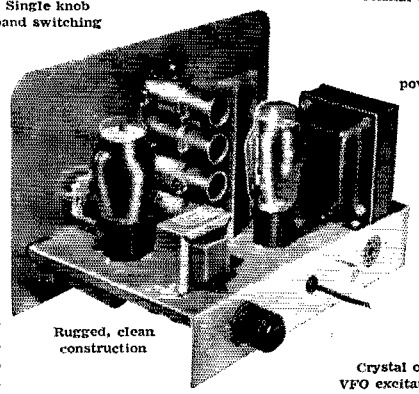
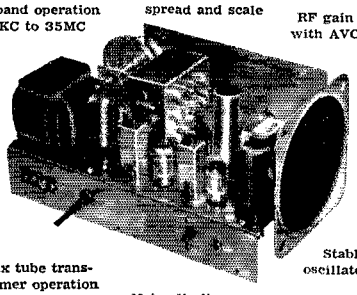
SHIPPING WT. 16 LBS.

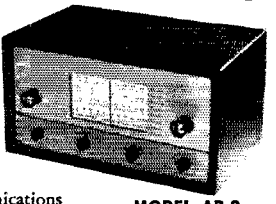
Here is the latest Heathkit addition to the Ham Radio field, the AT-1 Transmitter Kit incorporating many desirable design features at the lowest possible dollar-per-watts price. Panel mounted crystal socket, standby switch, key click filter, AC line filtering, good shielding, etc. VFO or crystal excitation-up to 35 watts input. Built-in power supply provides 425V @ 100MA. Amazingly low kit price includes all circuit components, tubes, cabinet, punched chassis and detailed construction manual. (Crystal not supplied.)



New HEATHKIT COMMUNICATIONS RECEIVER KIT



Range.....535KC to 35MC
12BE6.....Mixer oscillator
12BA6.....IF amplifier
12AV6....Detector - AVC - Audio
12BA6.....BFO oscillator
12A6.....Beam power output
5Y3GT.....Rectifier
105-125 volts AC 50/60 cycles 45 watts



A *new* Heathkit AR-2 Communications Receiver. The ideal companion piece for the AT-1 Transmitter. Electrical band spread scale for tuning and logging convenience. High gain miniature tubes and IF transformers for high sensitivity and good signal to noise ratio. Construct your own Communications Receiver at a very substantial saving. Supplied with all tubes, punched and formed sheet metal parts, speaker, circuit components, and detailed step-by-step construction manual.

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- **Compact one hand operation**
- **Headphone monitoring jack**
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The invaluable instrument for all Hams. Numerous applications such as pre-tuning, neutralization, locating parasitics, correcting TVI, etc. Receiver applications include measuring C, L, and Q of components, determining RF circuit resonant frequencies, etc. Thumbwheel drive for convenient one hand operation. All plug-in coils are wound and calibrated (rack included). Headphone panel jack further extends usefulness to operation as an oscillating detector.

MODEL GD-1A

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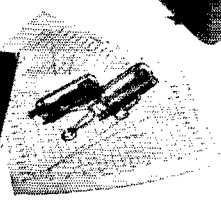
SHIP. WT. 4 LBS.



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friends of OIK extend sympathy on the recent loss of his mother. The recent truck strike certainly fouled up ULG's 1-kw. plans — but he'll make it yet! JFF has finished a combination fixed-mobile 2-meter rig for c.d. and emergency work that is really "sumpin." The NCRC is going to use it for its c.d. program. Traffic: W1BBN 105, TGD 59, QYX 58, IMY 11, OIK 9, BVI 6.

VERMONT — SCM, Raymond N. Flood, W1FPS — SEC: NLO. PAM: AXN. RM: OAK. Asst. RM: TAN. Net frequencies: 3520 c.w., 3860 'phone. Martha Goodyear, UET, is back from Florida. UFZ uses an S-40 receiver and a Lettine 240 transmitter with Lysco VFO. The 2nd Vermont QSO Party went over with a bang. Many more Vermont stations joined in, including quite a few Novices, and a good time was had by all. Scores will appear in the Vermont Bulletin, *Green Mountain Static*. From the grapevine comes news that the University of Vermont will have a ham station on the air next fall. Traffic: W1RNA 169, OAK 83, NDB 52, FPS 35, AVP 32, BJP 15, IT 12, TAN 10, UFZ 1.

NORTHWESTERN DIVISION

ALASKA — SCM, Glen Jefferson, KL7NT — J. M. Walden, KL7BK, has been appointed Emergency Coördinator for the Greater Anchorage Area. PDG, Fairbanks, has a three-element plumber's delight in operation on 20 meters and proudly admits ownership of a shiny new 75A-3. KL7AQH/KL7, Naknek, reports increasing traffic-handling business. The All-Alaska Hamfest is set for Aug. 8–9 and will be held at Paxons Lodge. The program calls for lots of fun and some fine prizes. With a TV station assured, TVI may rise to haunt Anchorage amateurs. In anticipation of this situation, you'd better drag out the dope in your old *QST's* and get the debugging under way. Traffic: (Apr.) KL7AIR 2229. (Mar.) KL7AQH/KL7 85.

MONTANA — SCM, Edward G. Brown, W7KGJ — Section Emergency Coördinator KUH, of Great Falls, has advised of plans for two emergency nets to operate on 3910 and 3980 kc. AYG will be Net Control on 3910 kc. every morning between 7:30 A.M. and 8:00 A.M. There will be no roll call but any station having emergency traffic may break this frequency with either c.w. or 'phone. There is nothing definite on the 3980-kc. net at this writing. Let's all give Walt a real lift on these nets and make them work and if you have any ideas please get in touch with Walt through the net on 3910 kc. FDH has 411-ft. long wire antenna which is doing a good job. Elmer had nearly an hour QSO with KH6EU running 35 watts on 75-meter 'phone. FEE has a new rig with 807 final and Class B compression modulation. LPL reported the Gallatin County Amateur Club had 10 licensed hams and 7 recruits at the last meeting at his QTH. LPL, NBH, and BNU are Morse operators and have pounded lots of brass on the railroad. Please QNI the nets often. Don't forget to send in reports on your activities from time to time and any dope you have of anything going on in your locality. Traffic: W7CT 66, CVQ 52, BNU 14, KGJ 11, FDH 8.

OREGON — SCM, John M. Carroll, W7BUS — Reports from clubs and official stations are arriving in many cases too late to be currently reported. They should show up at this address not later than the second of the month. The Dipsey Net is showing life again. GEJ is being retired from the Coast Guard and will spend most of the coming year in company with AZP and their XYLs touring the U. S. by house trailer. HRV has enough emergency power to supply the neighbors. The Oregon Slow Net now has five sessions a week, Mon. through Fri., at 1830 PST on 3585 kc. OSN for March had 4 sent, 15 received, 4 delivered, 23 total, 12 QNI, 11 NCS. TH is doing a fine job. The Oregonian Amateur Radio Society reports election results as follows: MSS, pres.; RPH, vice-pres.; REU, secy.; Ted Peterson, treas.; QWE, act. mgr.; Don Hansen, Field Day manager. Traffic: W7AJN 82, OSN 41, KTG 10, GDV 7.

WASHINGTON — SCM, Laurence M. Sebring, W7CZY — SEC: BTV. RM: FIX. PAMs: PGY, EHH. SOX/DL4AY spent his furlough in Paris. OE modernized his rig, with built-in dummy antenna and new control circuits. AIB put up a center-fed antenna and installed antenna coupler. JPH assisted RTQ in building a new mobile rig. New members of the Cascade Radio Club are IT, SFL, Harvey Rossiter, and Cole Ellis. Club trustees: JCT, EVI, BYK, PQS, and CZY. The Spokane Radio Club held its annual banquet with 80 in attendance. The YL code contest was won by NLJ's XYL. OM's code contest was a tie between CHU and SBA. FGQ built a Viking to be used for AREC and RACES. Several members are trying the T2FD antenna with good results. The Spokane Club publishes a monthly club bulletin. KT runs 600 watts to a pair of 8000 tubes using a sloping Vee with reflector all over salt water when the tide is in. PGY made BLP the first month as PAM. CO is getting good results with a vertical antenna. In the North Seattle's first hidden transmitter hunt of the season DZR was first, CO second, JPH third, and CBE won the brown ribbon for being last, probably as a result of his talk on mobile loops at the club meeting. BA works mobile DX on the way to the office. MCU is in KC6 with the Coast Guard. EHJ is servicing

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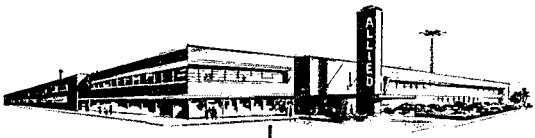

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TV and flying new plane. JJK is working for Boeing. RME and RVD are chasing DX. TGO has BCI with Viking II but no TVI. PHP is stationed in Newfoundland with the USAF. OEB is working DX on 20 meters but is unable to catch up with KF3AA. The Walla Walla local net frequency is 29.6 Mc. GVC works into the Inland Empire Net. The Walla Walla Club is building a RACES station in the county courthouse. HFL has a new Viking. SBA is TVI committee chairman in Spokane and has new 10-meter mobile. GBU is mobile on 75 and 10 meters. PCV was the only mobile to find HCJ on the last Spokane transmitter hunt — too many reflected signals. We regret to have to announce the passing of BMG, of Tacoma. FIX was chosen as winner of the Clif Cavanaugh Award for 1952. Traffic: W7BA 1455, PGY 652, PYV 620, CZX 560, FIX 413, RTQ 150, KCU 128, TH 118, OEB 99, FRU 90, EAU 81, AIB 74, OE 74, BG 71, RXH 51, BLX 50, KT 50, QOU 38, NMT 36, AMC 34, EHH 25, SKT 23, ETO 20, NWP 18, HNA 16, LVB 14, HFL 13, GAT 5.

PACIFIC DIVISION

HAWAII — SCM, John R. Sanders, KH6RU — The Big Convention of Aug. 15th will be held at the Chinese American Club, Honolulu. HARC urges you to plan to be there! Register now! The Honolulu Mobile Club is planning another big treasure hunt, this one to have five clue-stations. Two new traffic nets in the section have been sparked by WØHJO, operating at UL. Known as the Hawaiian Island Net (HIN) it convenes Mon. through Fri. 'Phone, 3945 kc. 7:30 P.M. HST; c.w., 7100 kc., 5:30 P.M. HST. Acting NCS so far are UL, ABR, GP, AFR, AFS, ARL, AVO. Traffickers take note and "jine up." *Far Pacific Area:* With pinpoint navigation the stork found KB6AO on Canton! W5QDF now heads up KG6FAA. KA8AB is using 250TH and auto-key to make BPL now. KA7RC runs 1 kw. to stacked 600-ft. rhombics aimed at SF! BPLers for the month are KG6FAA, KH6AJF, KA7RC, KA2HQ, KA8AB, and KA7LJ. "Way-out" boys, please mail reports as early as possible, you are crowding the deadline! Traffic: KG6FAA 7705, KA7LJ 3539, KH6AJF 1460, KA7RC 1185, KA2HQ 789, KA8AB 604.

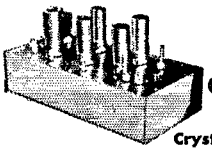
NEVADA — SCM, Ray T. Warner, W7JU — SEC: HJ. ECs: KOA, LGS, NWU, OXX, TJY, VO, and ZT. OPS: JUO. Mary, 13-year-old YL, is heard on QHH on 40-meter 'phone in Reno. CNG, of Carlin, is active on 40-meter 'phone. HJ has completed his Viking II kit and plans to erect his 10-meter beam with rotator shortly. ZT and JU represented Nevada at the recent Fresno Hamfest. NCR, of Las Vegas, has a scratch-box on 2 meters. 2-meter activity is gradually picking up. JUO topped his 10–20 beam with a 24-element horizontally polarized 144-Mc. beam. JU worked LEE, Parker, Ariz., on 144 Mc. Southern California 2-meter hams are switching to horizontal polarization in attempts to QSO Nevada. Southern Nevada hams await the invasion of TV Channel 8 in their area. OXX dismantled his California kw. (W6NY) long seen in the ARRL *Handbook*.

SANTA CLARA VALLEY — SCM, Roy I. Couzin, W6LZL — A new club is now in our midst, the Mountain View Radio Club, and the first organized meeting was held the 4th Fri. of the month which will be the regular meeting night. The meeting place is upstairs in the Police Station in Mountain View. CAZ has the honor of being the first president, PWB is vice-president, UJF is secretary-treasurer, and the directors are FTG, AFY, and CSN. FTG is the Radio Officer. A white elephant auction was held to get the treasury in action and proved to be very successful. The SCCARA had at its meeting live talent supplied by KSJO. Along with the entertainment they had a box social and a good time was had by all. The MBRC had at its meeting a hints and kinks night which proved very interesting and informative. AQR and NVO both are going in for radio-controlled model planes. UKM and QIE built Field Day rigs. GXF is working DX with a telephoto lens; he has a new Leica. The NPEC Field Day and picnic committee met Apr. 22nd. Those present were MMG, GXF, NVO, LPS, and QIE. CAZ is having fun on 7-Mc. 'phone. NTQ is trying out the 144-Mc. band with 832A and eight-element beam. WMM is about to install 144-Mc. gear in his car; he also is having trouble with a.s. exciter. Traffic: W6YHM 1408, OFJ 407, AIT 26, HC 18, CAZ 4, WMM 2.

EAST BAY — SCM, Ray H. Cornell, W6JZ — IPW now is manager of RN6. There is no better traffic man in the business. In the Pacific Area, an advisory staff of Net Managers and prominent traffic men has been set up to study and assist in the coördination of all traffic nets. Concerning RTTY: A concerted effort is being made to establish a calling frequency and a few working frequencies in each band. If the A1 and F1 boys will respect the frequencies thus determined, it will be possible for both to enjoy QRM-free QSOs. Let's get behind this effort. The c.d. drill originally scheduled for June 6th, then June 13th, finally was set for June 20th, Field Day. It is hoped that next year an effort will be made to avoid this conflict or to coördinate the effort into a large scale c.d. exercise. LL will be found these days NCSing MTN nightly on 3854 kc. LRA has been confined to Oak Knoll Naval Hospital because of illness. RDA underwent serious surgery after

(*Continued on page 90*)

HARRISON HAS IT! POPULAR HAM GEAR... *In Stock!*



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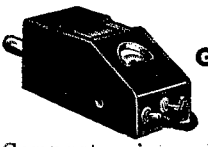
For 2 meter operation, Low noise and high sensitivity: 1 microvolt provides 20 db quieting; 0.1 microvolt input gives signal 6 db over noise level. Highly stable CW or phone. 9 fixed tuning circuits. Power input: 6.3VAC @ 2.4A; 150 to 250VDC @ 38 to 50 ma. **Model CV-2 . . . $42.50**



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Compact and completely self-contained instrument with built-in transformer type AC power supply and **internal terminal board to provide connections for battery operation.** Range 1.7 to 300 mc on seven direct reading bands **$61.50**

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Complete Station for 2 Meters

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Compact receiver-transmitter with built-in speaker and 19" whip antenna. Output 5-7 watts. Tuning eye metering on all stages. Built-in noise limiter. Takes crystal or carbon mike. Crystal control (8 mc xtals). Operates on 110V. AC and 6V. DC. With tubes. Less crystal and mike.

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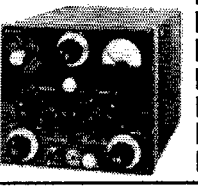
Also available wired and tested



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Multi-band operation: 10 to 160 meters. 10 watts peak output. Voice operated break-in. Switchable SSB, with or without carrier. Double sideband AM, PM and CW break-in. With internal xtal and coils for one band. **Model 10A . . . $159.50**

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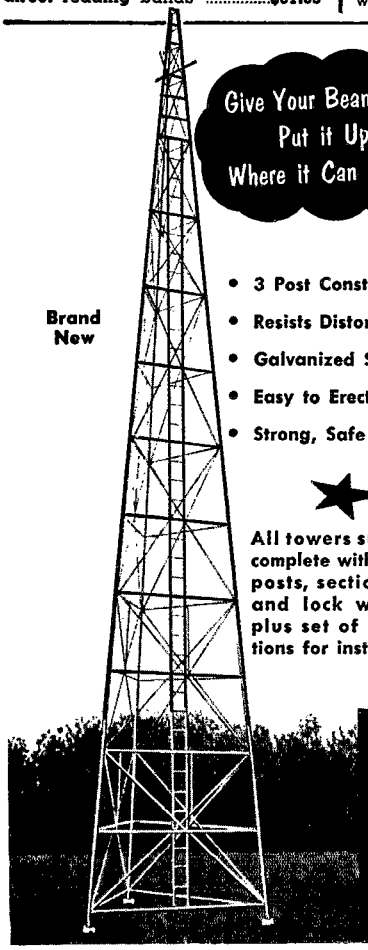
Clear, crisp, voice response. High output. Heavy duty switch for push-to-talk operation. with hook for suspension and bracket for wall mounting, plus cord cable. **102C . . . $16.17**



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completing a Viking II. EBRC had another 2-meter transmitter hunt May 2nd. RLB got lost in the berry patch. K6FAL makes BPL as usual. Wish you 'phone men would send in your monthly traffic count. There still are lots of unfilled Official Phone Station certificates at my QTH. Walt and Rose Buckley, the GGC's, had fun at the Fresno Hamfest. BMY won the mobile contest and received a 75 master coil as a prize. PYH reports for the N.C. DX Club as follows: TI is sporting a new Pontiac. PWR is back from a 2-month stay in W2-Land. A new ham at Elmar Electronics is KN6APB, an avid 80-meter c.w. man. DX conditions are perking up on 20 meters, according to LW. Europe has been open as late as 2300 PST. Some of the gang at Elmar Electronics, DUB. PYH, ZSS, TT, TEB, and WSJ, have formed a softball team. KEK/6 uses one of the local b.c. QTHs for a long-wire antenna. Frank claims S-9 signals for everyone with only a pair of cans and 1N34 hooked to the antenna. MVQ recorded the last C.W. DX Contest and played it back at the last club meeting, thus providing a lot of good-natured fun at the local lads practices and/or mal-practices. All clubs, nets, and individuals are urged to send monthly reports for this column to reach me by the fifth of the month. How about it? Traffic: K6FAL 1063, W6BPC 332, IPW 281, JOH 161, HHX 87, JZ 18, YDI 9.

SAN FRANCISCO — SCM, R. F. Czeikowitz, W6ATO — JU 7-5561. SEC: NL. PL 5-6457. *Eureka Area:* EC: SLX. JTD has taken over as club activities manager for KTV, who was forced to resign because of the press of business. SLX has returned from two weeks duty as communications electrician 1st class with the Sea Bees at Port Hueneme. Amateurs in the Humboldt County Area continue to receive very favorable press releases for their excellent services in all emergencies. The Humboldt Amateur Radio Club meets the 2nd and 4th Fri. in the YMCA rooms, Municipal Auditorium, entrance on "E" St., Eureka. *Mendocino Area:* Our first correspondent from Mendocino County is Hal Marshall, sr., WN6QNC, living at Ukiah. He runs three separate low-powered rigs, and has requested membership in the AREC. We regret to receive from him the report of the death of E. G. Blosser, OSW, of Willits. A newspaper article indicates that OSW was a veteran of World War II and had spent two and a half years in a German concentration camp. *Santa Rosa Area:* EC; LOU. I regret to announce the death of ADM/DSI, a well-known member of the Sonoma County group and a real old-timer with license dating back over thirty years. The Club has requested that ADM be reassigned as the Club station call. Congratulations to the newly-elected officers of the SCRA, who are LOU, pres.; JTR, vice-pres.; OTW, secy.-treas. Many thanks to OTW, JTR, and LOU for the news of the area. John Reinartz, of Eimac, and Robert Brinton, of PGE, were the speakers at the March and April meetings, respectively. The Sonoma County Radio Amateurs meets the 1st Wed. in the Board of Supervisors Room, County Court House, Santa Rosa, Calif. *Marin Area:* EC: KNZ. Tamalpais Club EC: ZUB. The Marin Radio Club meets the 2nd Fri. at the American Legion Hall, Larkspur. The Tamalpais Radio Club meets the 3rd Fri. at 7 Loma Ave., Tiburon, the home of OZC. *San Francisco Area:* EC; BYS. Congratulations to the new Cathay Radio Club, whose officers are OAA, pres.; DWF, vice-pres.; KN6ANY, secy.; LSE, treas; and TRN, trustee. The Club has 32 members and a regular watch-keeping schedule at the Club station, MFI. The transmitters are a Globe King and a 522. The receiver is an HQ-129X. Normal operation is on 75 and 2 meters. Official Observer GQA reports that most out-of-band signals occur between 7400 and 7600, into which segments fall the second harmonics of c.w. stations operating between 3700 and 3800 kc. So watch your harmonics — especially you Novices who operate 3700 to 3750 kc. Traffic-handling seems on the upswing, with six stations reporting in this month. GB reported traffic for both March and April. Congratulations to EJY on winning the 2-meter hidden transmitter hunt at the Fresno Hamfest, using a haywire reflector on his coaxial antenna, made from wire clothes-hanger. Join the Amateur Radio Emergency Corps! Phone NL or BYS. The San Francisco Radio Club meets the 4th Fri. at 71 Lakeshore Plaza, opposite 34th Ave. and Sloat. The HAMS meets the 2nd Fri. at the local Red Cross Bldg., 1625 Van Ness Ave. The Cathay Radio Club meets the 2nd Fri. The San Francisco Naval Shipyard Radio Club meets at the U. S. Naval Shipyard, and admittance is restricted to employees of the Naval establishment. Traffic: (Apr.) W6SWP 154, GB 146, GCV 106, ATO 9, BIP 7, KAH 4. (Mar.) W6GB 103.

SACRAMENTO VALLEY — SCM, Harold L. Lucero, W6JDN — Asst. SCM: Willie van de Camp, 6CKV. OBS: OMR. AVZ. RM: PIV. There are a number of appointments to be made in each part of the section and we would like to hear from the fellows interested. TFC is on MARS and is joining the Mission Trail Net. AVZ will be off for a time while rebuilding. PIV still is on RN6 handling traffic, but is on 2 meters a lot. OMR is active on the Mission Trail and the Tall Pine Nets and has been doing fine as Official Bulletin Station. The new 500-watt rig for the Mt. Shasta Club is being built by FKI, who finds time for the job along with his work and other activities. DDC is doing a bang-up job on 40-meter 'phone and, as he is off work at

(Continued on page 98)

MODEL CONTROL BY RADIO

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THE TRANSMITTER: frequency 27.255 mc, power input 2.75W, includes 3A4 connected as triode, Mc9 xtal of 13,6275 mc, 4-section 30"-10' telescopic antenna, 9x6x5" metal cabinet. Less batteries, wire, solder List $33.50

CAT. NO	TYPE	DESCRIPTION	NET
35-216	RC222T	Xmtr Kit	$21.88
23-535	———	Battery Kit	5.48

THE RECEIVER: a marvel of compact design, built around an RK61 thyratron in a self-quenching super-regen circuit. Mounts on 2⅞" x 1⅛" bakelite strip, overall 1¾" deep. Weighs only 3½ oz. Less batteries, wire, solder. List $26.50.

CAT. NO	TYPE	DESCRIPTION	NET
36-528	RC222R	Receiver Kit	$17.33
23-536	———	Battery Kit	1 67

THE ESCAPEMENT: completely wired radio control escapement unit is an optional addition to the RC222R receiver, pulse type, and included in the low $41.47 total price of the xmtr/rcvr kit List $5.50.

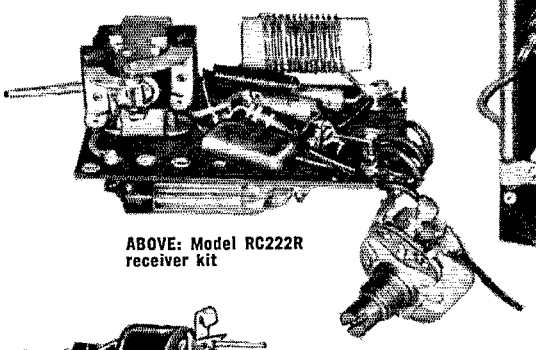
Cat. No. 36-529, Model RCEU .. ..Net $3.60

ONLY $41.47*

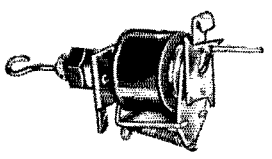
*All three units, batteries extra.

Ship. wt. 4½ lbs. Catalog No. 35A216.

LEFT: Model RC227 27.255mc transmitter kit



ABOVE: Model RC222R receiver kit



LEFT: Model RCEU radio control escapement unit, wired. Optional.

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167 Washington St., Boston 8, Mass.

2400 PST, gets the air to himself in Dunsmuir. CFU reports that his traveling job is keeping him off the air too much. LIY has been doing fine on 40-meter phone. IOM has just received new coax and expects to be on the air from his new home shortly. JDN paid CKV a short visit and met several Chico hams. WN6SYY is a new ham in Red Bluff. FXO is going s.s.b. KTR has moved to Arbuckel. The Golden Empire Radio Club provided radio communication for annual Pioneer Day Parade of Chico State College. QMN reports from England, where he is with the USAF. Reports are starting to come in, gang, but let's have more. I want to thank those who reported. I would like to have the Redding gang drop me a line on their activities.

SAN JOAQUIN VALLEY — Acting SCM, Edward E. Bewley, W6GIW — LLO and myself attended the Pacific Division Director's meeting in San Francisco and as it was the first time either of us had attended a meeting of this type we were quite impressed with the democratic manner in which all proposals were handled. Every delegate represented the true wishes of his group whether or not such wishes were his own. We left the meeting feeling that the Director could accurately represent the majority of members in his division. As for activities, the Fresno Club now as an FB mobile trailer. LTO and his XYL announce a third harmonic, a boy. The Trowel Radio Club now is affiliated with ARRL. FPP is a Navy man now. MGN is proud of his new HRO-60. FKY and BNP are doing an excellent job with *Skip*, the Fresno Club paper. IAZ was an FB NCS on the San Joaquin County Emergency Net during April. WBZ is maritime mobile. SAH is busy with 'phone patch since his write-up in the P.G.&E. paper. EXH and IAZ still are on the air even while watching the new TV set. The TARC TVI committee is working with the City of Turlock on a public education program regarding TVI with very good results so far. Traffic: W6EXH 81, GIW 46.

ROANOKE DIVISION

NORTH CAROLINA — SCM, J. C. Geaslen, W4DLX — Whiteville: RJ reports NTQ, SMA, and WVQ all enjoying 40 while he sweats trying to push his rig into an Indian-proof cage. A clipping from the Whiteville paper relates how RJ sent a hamgram to a G.I. in Germany way ahead of a Red Cross transatlantic phone call. WMZ, Spring Lake, just recently passed his General Class exam. AKC, Gastonia, is the proud owner of a new home-built band-pass exciter, all bands. WN4WXZ, Charlotte, took first place in the North Carolina section and second place in the Roanoke Division in the 1953 Novice Round-up. Congrats, Charles. He now is General Class. I would like to remind all official appointees that only three reporting cards were received by the SCM this month. Let's get those writing arms out of the slings. Traffic: W4AKC 348, RRH 126, BDU 36, SPV 21, K4FDA 20, W4HUW 18, YDY 8, BBZ 5, DLX 5, LWU 4, NAL 4.

SOUTH CAROLINA — SCM, T. Hunter Wood, W4ANK — UTZ is rebuilding a new 813 rig and expects to be on the air soon. NJG is new president of the Greenville Amateur Radio Club and is active on single sideband. TTG is a member of the 75-meter 'phone net and uses a home-brewed VFO. WN4ZEQ is a new ham at Clemson. UFP is back in school after recovering from a case of the measles. FNC is back on the 75-meter 'phone net after a two-year absence. IW is back on the air after a long absence. Congratulations to STH for rating 7th place in the YL-OM Contest. NTD is a member of MARS and has a new 'phone patch. TWW has a new 'phone patch and 75-meter mobile rig. The South Carolina spring hamfest and ARRL meeting was held near Columbia on April 26th with the Roanoke Division Director attending as guest speaker. A large crowd attended and net organization was the principal subject of discussion. The hamfest planning committee is looking for a place to hold the fall meeting and suggestions will be welcomed by EDQ and DX. Traffic: W4ANK 56, W8BDF/4 20, W4JGM 10, UFP 10, FM 8.

VIRGINIA — SCM, H. Edgar Lindauer, W4FF — Many new signals were heard in the 4th Virginia QSO Party. VN will continue through the summer season with sked on 3680 kc. Mon., Wed., and Fri. SHJ will be Net Manager. NCS appointments and a possible change in time to 1830 or 1845 will be announced later. Attendance at the VFN Picnic at Palmyra is expected to reach an all-time high. Virginia began its second year with ham license plates attached to 250 mobile installations. Newcomers with mobile installations can get license plates through NV. MWH and his XYL stopped off in Washington and Northern Virginia en route to the ARRL Board of Directors Meeting. Net certificates were issued to GQL, VMF, VPU, WAB, TEJ, YIA, YKX, 8LGF/4, and 5WXP/4. A total of 1265 VFN stations were QNI during the month with an average of 42 per night. VFN has averaged 19 messages per session for a 574 monthly total representing one-fourth of all traffic handled by Virginia stations in all nets including regional and area. KFC topped all stations in the SS Contest and is the first three-time winner in the country. The PVRC has been confirmed as a club winner and has won its fourth gavel of record. ESK took 'phone honors. FV barely missed making the BPL in total traffic while SHJ was one short on originations. MWH expects to visit all

(Continued on page 94)

NEWARK'S Page of Values!

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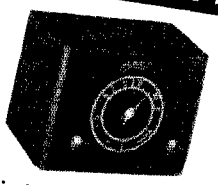

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90G102. BT-1. Metal Cabinet..... **9.95**

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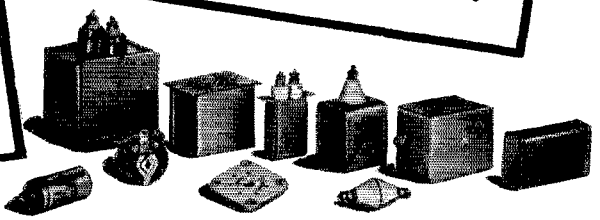

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2 Mfd. 600 VDC. General Electric Pyranol-filled capacitor. Flange type mounting. Ceramic pillar terminals, 10/32" studs. Size, 2x2¾x1". Wt., 1 lb.
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100TH	11.95

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sections of the division to report on happenings at the ARRL Board Meeting held in May. NAD, Virginia's able SEC, conducted an orientation meeting in Northern Virginia's Civil Defense Region and discussed RACES operations throughout the State. Traffic: (Apr.) W4FV 466, SHJ 369, KRR 300, GR 137, UWS 109. HQN 83, KFC 80, PYN 75, RJW 64, NV 63, SNH 60, AKN 52, JAQ 40, RHC 40, FF 39, MWH 35, UHG 34, VUY 27, JAU 22, PWX 20, WAB 20, W3STU/4 18, W5WXP/4 18, W4LNX 16, JZG 12, UD 12, KRX 11, CFV 10, SPE 9, LJE 8, W8LGF/4 8, W4VMA 6, LK 5, GQL 4, IYI 4, WBC 4, KG 3, OWV 2, RCM/4 1. (Mar.) W4PYN 95.

WEST VIRGINIA — SCM, John T. Steele, W8MCR — A display of amateur radio equipment was sponsored by the Mountaineer Amateur Radio Association at the hobby show held in Fairmont. The Stonewall Jackson Amateur Radio Club has organized a TV committee. New members of the 'phone net are BXD, LBT, 4VUA, and 3SWG. KCN, 15 years old and a dyed-in-the-wool ham, already wants to handle traffic. His rig is a BC-696 running 50 watts on 80 and 75 meters; receiver is a BC-348R. HZH bought the gear of QHG and has it de-TVIed. New EC appointee is FUM. DYP and his XYL visited with EVR. John still is having interference trouble and certainly is missed on 75 meters. Net traffic totals for the month are 'phone net 116, c.w. net 77. Traffic: W8AUJ 607, HZA 23, GEP 15, FYD 14, DFC 8, WN8MMF 2.

ROCKY MOUNTAIN DIVISION

COLORADO — SCM, Karl Brueggeman, W6CDX — SEC: AEE. With summer just about here, activity is falling off on 80 meters and is picking up very well on 20 meters. AJL sends a nice letter regarding his traffic work handling 'phone patches from the Far East. The Far East Amateur Radio League members have appointed him an honorary member because of his fine work. The need for more stations in this area to handle their traffic is great since they are completing only about 10 per cent of the demand. Those fellows are a long way from home and a good 'phone patch is worth fifty letters. The openings into the Far East start about 1300 MST on 20 meters; also the certificate that goes with the appointment makes a very interesting addition to the ham shack. YMP is working up a new antenna for the mobile that should be pretty hot. KHQ had the following visitors: QNJ and ZUX from Scott City; LZY from Colorado Springs. The State c.d. drill went off very well and we all learned a lot from it. IC has appointed the following Asst. Directors: OWP, PGX, ANX, and WLN. Claude holds a get-together with the gang on 3980 kc. immediately following the Colorado Emergency 'Phone Net meeting on Sunday mornings to discuss current amateur affairs. FKY is conducting tests on 2 meters with ZJO. FKY also reports that CNM/Ø is active on 6 and 2 meters from Moab, Utah. Traffic: WØKHQ 1258, EKQ 227, YMP 35.

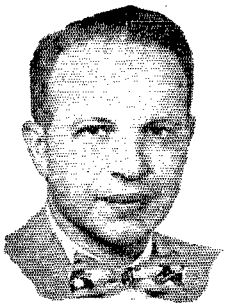
UTAH — SCM, Floyd L. Hinshaw, W7UTM — RNP has a new modulator and is running 25 watts on both 75 and 40 meters. GPN, Ogden EC, and his 29.6-Mc net is getting well organized and Weber County is forging ahead of the other Utah communities in defense preparedness! SED is keeping daily skeds with the FARM Net and the Ogden Emergency Net; he has new mobile for 10, 11, 20, and 75 meters. RRE, RPY, and Novice RQT are busy as usual chasing DX. S.s.b.s.c. is taking root in Utah with JOE, JPN, and QAA all talking out of one side of their mouths. SP and PJS are known to be building. CARS Net members plan a hamfest with the WIMU gang to be held at Big Springs, Idaho, Aug. 8th and 9th. QPE, OAD, OKX, MOY, MGA, JOE, RRH, LKM, KUX, LRP, and SP are heard regularly on the 10-meter round table Mon. nights. OSV has a teletype rig nearly completed. Listen (or should we say look) for him. Traffic: W7UTM 36, SED 13, RCP 4.

WYOMING — Acting SCM, Marion R. Neary, W7KFV — RM: PKX. JDB, the newly-elected SCM, has been transferred to Denver by Telco. JMM operated 3.8-Mc. 'phone at Sheridan Junior College Hobby Show. GOH departed from W7-Land for Albuquerque. FLO is DXing on the TV bands. DXV still is first with his monthly activity report. Cheyenne and vicinity have a roster of 44 stations — just try and find one on the air. It must be TV. KFV is back again as Acting SCM until a new SCM can be selected.

SOUTHEASTERN DIVISION

ALABAMA — SCM, Dr. Arthur W. Woods, W4GJW — MVM, while working in Selma, visited with FGT and GWD. EJZ is on c.w. only, working 3.5 and 7 Mc. KIX coordinated AENB with AENP during two tornado sessions within two weeks. DXB is reworking his transmitter for higher power. RLG continues active: traffic, ragchewing, and c.w. TVM answers into AENB and QIN. UJJ is prexied by 5ONL/4. WN4ZFK skeds W5JHS each morning, using BC-348 and 457. ZJR, in Mobile, is ex-W6HAB and is mostly interested in traffic-handling. Traffic: W4KIX 159, RLG 135, DXB 25, MVM 22, EJZ 12, TVM 12, WN4ZFK 8.

(Continued on page 96)



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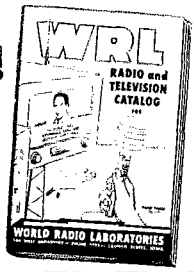

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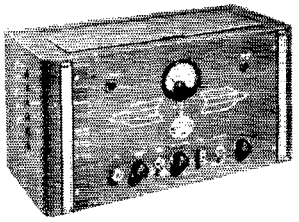

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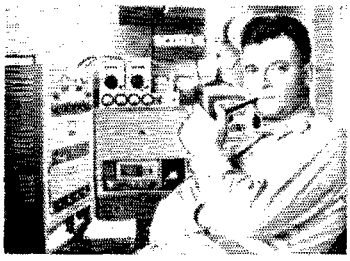

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EASTERN FLORIDA — SCM, John W. Hollister, jr., W4FWZ — Clearwater: New club officers are 2GOA/4, AYX, AYP. Interest in mobiles is increasing. Jacksonville: The call DU has been assigned to JARS. CGY transferred to Cincinnati. 3AKE/4 reports good DX on 21 Mc. using a Viking. The JARS set up downtown for overseas traffic on Armed Forces Day, thanks to UHE. Key West: The club station, ILO, had a hamfest with all the trimmings plus plenty of activity with the Viking. WN4YUQ's XYL now is WN4ZLI. TZS will be on s.s.b. AT uses 32V-3 and WKS has HQ140-X. Sarasota: LMT reports the Florida 'Phone Traffic Net handled 273 in April. He also reports that PJU, in Clewiston, has the Tropical 'Phone Net at 1600 on 3945 kc. Leesburg: QBR reports SXJ is club prexy. QBR is using a Globe Champion. The Lake County 28-Mc. Net is active at 9 A.M. WN4VTL is the daughter of QBR. New Port Richey: RIG is mobile and an AREC member. UMJ was the first General Class licensee to make K of Kc. certificate. Orlando: More than 400 had a big time at the club hamfest. LE joined the Silent Keys. Tampa: 6PWZ/4, ex-4LDM, is at McDill. Whee's XYL is 6PXC, ex-4KZT. Umatilla: AYV (OES) is active on 144 Mc. and is getting up more skywire. Nat reports those on 144 Mc. are MPJ, Eustis; VXZ, Deland; MSP, Daytona; NEE, Orlando. New appointments in Fort Lauderdale: RKX as EC, IM as OBS. AREC: IM's bulletins are keeping you posted so let's get bigger and better. Get ready for the storm season now! Net traffic: C.w. traffic operators are urgently needed. Contact your SCM and let's get lined up NOW. Traffic: W4PJU 648, FPC 543, DRD 328, PZT 175, LMT 151, W6PWZ/4 136, W4QBR 135, WS 64, DDW 47, RWM 31, KJ 30, FWZ 28, ALP 21, SJK 20, TYX 8, IYT 7, VIE 5, SVB 2.

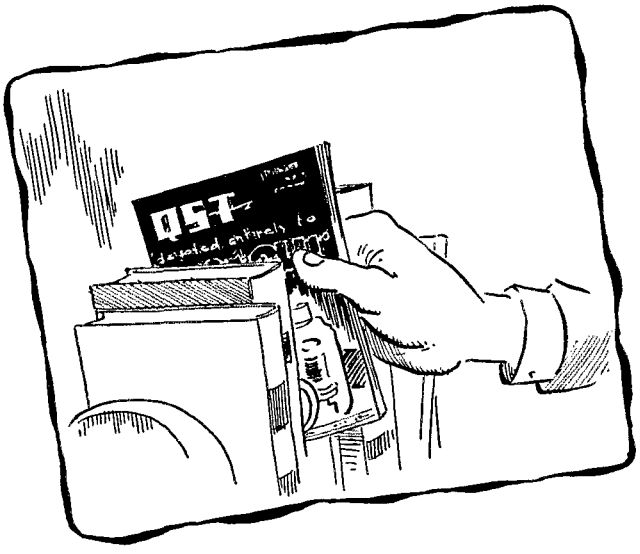
WESTERN FLORIDA — SCM, Edward J. Collins, W4MS/RE — SEC: PIE. The hamfest put on by EARS at Eglin Field was a huge success. We regret to announce that VCB and UTB are leaving the section for Formosa. AXP has been in the hospital. NOX keeps the G.I. traffic moving. QK is trying 2 meters. HIZ monitors 144 Mc. regularly. WN4UYS is on 2 meters. PQW is busy planning hamfests. RZV is going great guns with the Dagwood Net. SZH and PAA are busy with 75 meters. ZGD is doing some FB 'phone patch work for G.I.s with the Saufley Field Club rig. VMV has the rig TVI proof. WN4YRF has a new HQ-129X. MUX has been heard on 20-meter 'phone. FHQ is keeping the old 7-Mc. c.w. skeds on 7-Mc. 'phone. TTM is active on the Southern Bell Net. PTK has the new mobile 75-meter rig going FB. MFY has an FB mobile installation. DAO is Busy calibrating the new VFO. MS is dreaming of an s.s.b. rig. KWM is the big noise on 20 meters over Eglin Field way. UQZ is doing an FB job with the Blount Junior High School Radio Club. KG6ADX's dad is WN4ZPN. YFG, YFH, and WN4YFF have a new HRO-50T1 receiver. ART is nearly 100 per cent 144 Mc. OYR is having rectifier trouble. Traffic: W4RZV 45 MS 8, GQM 4, DAO 2, NOX 2, ZGD 2.

GEORGIA — James P. Born, jr., W4ZD — The Camp Gordon Radio Club and the Augusta Amateur Radio Club will hold a joint hamfest July 25th and 26th at Julian's Casino in Augusta. AAY is chairman of the hamfest committee. Congratulations and thanks to CYC, Muscogee County EC, LXE, Bibb County EC, the Georgia Cracker Net, and the many other hams and nets on the splendid job they did of handling emergency traffic for the Red Cross, newspapers, and others when a tornado hit Columbus and Warner Robins, Ga. At both locations 15 minutes after the tornado struck emergency transmitters and mobile units were in operation on the scene and emergency traffic was being handled. The ECs are to be commended for their FB emergency set-up in these two sections of Georgia. LXL has a new kw. final. PGZ has a new 14-Mc. beam on a 60-foot windmill tower. IMQ has a new Viking II which he is working overtime while laid up with a broken leg. With sorrow we report the sudden passing of George M. Phillips, C.D. Director for the Atlanta Metropolitan Area. Congratulations to EJC, USA, and K4WAR on making BPL this month. If you want a weather report for that picnic, just call FKE. Emergency Coördinators in this section are reminded of their responsibility to make full and regular monthly reports to the SEC. Traffic: W4USA 2351, K4WAR 1682, W4EJC 518, OCG 110, ZD 59, NS 23, MA 22, IMQ 2.

WEST INDIES — SCM, William Werner, KP4DJ — SEC: HZ. PD and TZ are new AREC members. PW and RA received WPR-50 certificates. WP4TQ is the first Novice anywhere to gain WPR-50. MS received WPR-75. AW is on 75 meters. W2YSJ/KP4 is operating mobile in San Juan. MC and OA are eager to participate in Caguas c.d. activities. RC has new HRO and 400-watt 'phone replacing TBS-50. PZ changed the big rig for a Viking. RD has his second Viking. UB has a pet AX9903 replacing 829B. RK is working out FB on all bands with a new 136-foot antenna. TO has new 20-meter three-element beam. AL reports to the net with a 21-year-old microphone. MV reports to the 3559-kc. Net. ZP5CB is taking KP4NT's BC-610 to Honduras. UW built 150-kc. 31-Mc. grid-dipper. KV4BD reported to the 3925-kc. Net requesting AREC membership. KD is the second KP4 to be a member of OOTC. RA, secretary of PRARC, is transferring to U.S.A. All mobiles must organize and select frequency and NCS for

(Continued on page 98)

QST is 1ST



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successful emergency operations; 25 kc. either side of the AREC Net frequency is suggested as maximum variation for whip antennas. ID could listen to both frequencies simultaneously, transmitting to all on 3925 kc. GP is experimenting with modulation and 'phone patches. Traffic: KP4DJ 8, DV 7.

SOUTHWESTERN DIVISION

LOS ANGELES — SCM, Howard C. Bellman, W6YVJ — Asst. SCM: William Coe, W6KWQ. PAM: QR. RMs: FMG (LSN), GJP, and JQB. JQB has resigned as manager of RN6 and has requested terminations as RM. YVJ is Acting SEC. FMG reports as follows: TSO, Merced Falls, and CCO, Rosemead, are new members of LSN. April was a banner month for the net with 317 check-ins and a total traffic handled of 449 during 26 sessions. A first anniversary celebration at the home of FMG was attended by BHG and XYL, CAK and XYL, CMN and XYL, DPL, DDE, CCO, FMG and XYL, GJP and XYL, GYH, IGH, JQB, and XYL, NCA, NTN, OFJ, QIW, FCT, K6EA and XYL, and YVJ. OFJ, DX member, came from Morgan Hill, near Frisco. CMN has been sanctioned as manager of RN6, pending an OK from 1NJM. EBK had OBS and OO appointments endorsed. KYV will be on at least one more year with KG6FAA. GYH has a new HRO-60 and new QTH. GJP is building a new station. MBA 'phone-patched to Guam. BHG reports CK is in the hospital in San Francisco. NCA says that MNN has been drafted. BLY reports for Whittier Radio 50 Club which has 28 members in RACES. CAU forgot to look at the expiration date on his ticket. KJK worked a G.I. in Japan with the G.I.'s parents in the shack. FLW and BWQ are on 2 RTTY. COZ says JMY is mobile on 10 meters. The Tri-County Radio Assn. will hold election next meeting. GQE is with Ontario c.d. CDU says the American Legion Net is on 2 meters at 1915 PDT. PZN wants OBS appointment. AM likes 1550-foot rhombic east. HOH reports the UCLA Club holds code classes 7 times weekly. BMM/6, new OES, has been in the hospital with appendicitis. 9YTV/6, ex-ILN and TCC man, reports in. ZDO has joined ARRL after 25 years. BHG changed his OBS sked to 1900 PST Tue. and Fri. on 3.6 Mc. and 1800 PST. Mon., Tue., Thur., and Fri. on 147.5 Mc. OAY crammed for Coast Guard exams but worked 8 DX stations on 20 and 40 meters from Canada to Aussie-Land. EBK reports ON has BC-696A on 75-meter 'phone. NRY and ON are going on 220 Mc. VXM skeds Arizona Net. GHJ is M.C. of San Dimas Sheriffs' C.D. Net. CWD has kw. on 40. EBK has new final on 75 and 80 meters. YGN is heard on 75-meter 'phone. The Far East Amateur League voted KYV an honorary member. The publication of TCRA, *QRM*, is very good. The MACAN-4 Net met May 3rd. The 2-meter team at PMJ is IHK, MAQ, EYN, WKO, GUE, DBM, VEH, and NGN. MU is on 2 meters. EPL has a new shack. Traffic: (Apr.) W6KYV 2633, GYH 608, NTN 592, CMN 294, LYG 245, GJP 228, FMG 215, MBA 202, BHG 176, YBF 138, JQB 98, HLZ 96, CAK 85, NCA 83, BLY 76, DPL 48, K6EA 25, W6COZ 22, YVJ 19, CDU 16, CBO 13, PZN 12, AM 8. (Mar.) W6FYW 45, CDU 34, K6NBI 16, W6ORI 10, PZN 10, MYG 4. (Feb.) K6NBI 8, W6DTY 4, LB 3, MYG 2, ORI 1.

ARIZONA — SCM, Albert Steinbrecher, W7LVR — Asst. SCMs: Kenneth P. Cole, 7QZH; Dr. John A. Stewart, 7SX. SEC: OIF. RM: JGZ. PAM: KOY. Arizona 'Phone Net: Tue. and Thurs., 7 P.M., 3865 kc. Arizona C.W. Net: Mon., Wed., Fri., 8 P.M., 3515 kc. Phoenix Net: Tue., Thurs., 7 P.M., 29 Mc. Tucson Net: Nightly, 8 P.M., 29 Mc. Tucson 6-Meter Net: Mon., 7 P.M. Arizona MARS: Effective June 1, 1953 the c.w. net will meet at 7 P.M. Tue. on 3497.5 kc., and the 'phone net will meet at 8 P.M. Fri. on 4025 kc. Arizona Restricted-Speed C.W. Net: Mon., Wed., Fri., 8 P.M., 3700 kc. The FCC inspector was in both Phoenix and Tucson and the following received their General Class licenses: RWE, SIY, SSO, and STO. QHE received his 3rd-class telephone license, and also was appointed as OO. NVN was appointed as OES. QZH now is 75-meter mobile with 30 watts. MES also is 75-meter mobile with an Elmac. LVR has finished his kw. using a pair of 4-250s. Your SCM would like to appeal to all appointees and others to please send in station activities reports and new calls issued within the State. Traffic: W7KOY 212, PLM 207, LVR 26.

SAN DIEGO — SCM, Edgar M. Cameron, jr., W6FJH — Asst. SCMs: Thomas H. Wells, 6EWU; Shelley E. Trotter, 6BAM; Richard E. Huddleston, 6DLN. SEC: 6SK. Asst. SECs: WYA, FOP. ECs: DEY, ZLV. RM: MUE. PAM: JPM. Our R.I., UDU, held forth once again at the second "anti-TVI" meeting he has called this year. The section AREC gang held a mighty successful picnic in Escondido's Felicita Park. SK reports 16 regular drills were held in April, and one San Diego County AREC/c.d. drill was held April 19th with 51 stations participating using 2, 10, and 75 meters; 21 communities were covered in the drill. Our new PAM, JPM, was active in getting the El Centro Area boys in on the section coastal nets. We hear Asst. SCM, DLN, at the end of that huge check-in on the Sunday A.M. Section AREC Net at 1000 on 3825 kc. Escondido High School Escohinet, on 3702 kc. is more active than ever these days what with WN6s UKJ and UQF checking in, as is UFE with his HT-9. UFE is the school's first Novice-to-

(*Continued on page 100*)

Bob Henry says

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Hallicrafter S72L $119.95; S72	$ 109.95
Hallicrafter S76 $179.50; S40B	$ 119.95
Hallicrafter SX62 $299.50; SX71	$ 224.50
Hallicrafter HT-20 xmitter	$ 449.50
Hallicrafter TW1000 portable	$ 149.50
National NC88 $119.95; SW54	$ 49.95
National NC183D $369.50; NC125	$ 179.95
National HR060	$ 483.50
Hammarlund HQ140X	$264.50
Johnson Viking II (wired $57.00)	$279.50
Johnson VFO kit (wired $17.00)	$ 42.75
Johnson mobile xmitter kit	$ 99.50
Gonset Commander $124.50; VFO	$ 29.95
Gonset Communicator $199.50; Super-6	$ 52.50
Morrow 5BR $74.95; 3BR	$ 64.95
Elmac A54H $149.00; A54	$143.00
Elmac PMR6A receiver	$134.50
Harvey-Wells TBS50D $137.50; TBS50C	$111.50
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Lysco 600S $189.95; Lysco 600	$143.95
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General Class operator this year. QBN now is OO and OBS. GDG is dimming the neighborhood lights with new half-gallon 813s and is getting S-9 from Singapore and French Morocco. At the monthly meeting of the Palomar gang KVB showed technical films from Headquarters. ZLV was awarded an EC certificate by FJH. BAM worked 12 new countries on 21 Mc. during the DX Tests. Camp Pendleton's outstanding traffic center, IAB, should have 800 watts to an 813 on 40- and 20-meter 'phone soon. YDK is to be congratulated for doing a great job in traffic-handling down at the Marine Corps Recruit Depot. ORD has "flat line" to 10-meter beam now. FCT is active in c.d. in Santa Ana under LQX. NIB is sweating out 10-meter mobile DX. Early in the month he worked VK9GW, KH6AFS, and W4RW/MM, the latter 2100 miles out in the Pacific. DEY is busy rounding up the 2-meter bunch up Santa Ana way. UPP is sporting new mobile rig. RLQ is having success with a new T2FD antenna. Traffic: (Apr.) W6IAB 6372, YDK 679, IZG 112, FCT 20, IAC 20, JPM 9, FJH 6, MUE 5. (Mar.) W6IZG 60.

SANTA BARBARA — SCM, Vincent J. Haggerty, W6IOX — Best regards from ARRL's 73rd section, in swaddling clothes, emerging on the scene representing the counties of Santa Barbara, San Luis Obispo, and Ventura. Radio amateurs of these counties are invited to report monthly to the Santa Barbara SCM, whose address is on page 6 of *QST*. LB is active experimentally and is prexy of the SLO Club. FYW reports from Paso Robles and as RM is anxious to form a c.w. section net on 3.5 Mc. C.w. operators contact him on this. ORW is prexy of the Paso Robles Club. DBY reports from K6NBI, where he is on Naval duty. The Tri-County 'Phone Net operates on 3820 kc. Mon. at 7 P.M., with DLR as NCS. IHD and QIW are active on this net and new members are invited. Active on 7-Mc. 'phone: K6DI, EV, REK, DGN, and AWY. KFM is EC for Santa Barbara. Applicants for the SEC post are solicited. Traffic: W6QIW 83, FYW 44, YCF 34, ORI 28, K6NBI 17, W6LB 4.

WEST GULF DIVISION

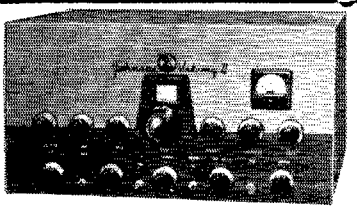
NORTHERN TEXAS — SCM, William J. Gentry, W5GF — Asst. SCM: Thomas B. Craig, 5JQD. SEC: QHI. RM: Open. PAM: IQW. The following YLs attended the Tyler Hamfest: LGY, RYX, TKM, VBG, VSN, and YRT. TKM received her 25-year service pin from the Texas Telephone Co. YRT won a GDO Heathkit as the door prize at the Tyler Hamfest. CVW has a new T2FD skywire and reports good results. TFB had the highest Northern Texas score in the Sweepstakes with 88,605 points. Congratulations, OM. The Dallas Amateur Radio Club call is FC and the Club operates on 20 meters. PED is the new Club secretary. Club meetings are held on the 1st Tue. of each month. UZM is building a new VFO. BKH made the BPL; he will be off the air for some time. TFB made BPL. KSEL, Lubbock, has its entire engineering staff made up of hams: NGX, PTK, PWP, SGD. QHI made BPL. The South Plain Amateur Radio Club has a new Globe Champion. At the Longhorn Council Scout Exhibition held during May, the amateur station exhibit of Explorer Post 7 (under the call of OLG/5) handled 114 messages and was awarded the Top Honor Blue Ribbon for their excellent participation. Traffic: W5BKH 698, TFB 631, QHI 496, PAK 289, ART 126, LEZ 95, RRM 84, VFH 76, ARK 67, DYU 54, VRX 49, CF 37, JQD 32, ASA 26, ISD 11, GF 4.

OKLAHOMA — SCM, Jesse M. Langford, W5GVV — SEC: AGM. RM: MQI. PAMs: SVR and ROZ. The car tag bill has passed the House and is now in the Senate. Two hamfests fell in May, one at Tulsa and one at Lake Lugert. The Waggoner Radio Club has two completely portable stations with independent power supplies and operates on 3.5 and 7 Mc. The Club meets twice each month and invites anyone interested to attend. LWG has a new SX-71 and is building a new transmitter. GZK, TEI, and PML made BPL this month. TEI is leaving the service and will locate in Houston. ZDI is a new ham in Mangum. KY will have a new Viking soon. ADC operated portable while vacationing in Colorado in May. SCX reports several 2-meter openings into Texas and has daily schedules with the Texas gang. With tornado warnings being given every few days all amateurs should check their equipment and be sure they are ready to go if needed. Plans are being made over the State for attending the National Convention at Houston. The Area Center Club at Oklahoma City had an auction. The Caravan Club of Oklahoma is gaining members every day and has plans arranged for each Sunday this summer. Anyone in Oklahoma City interested in joining, contact TFP. Traffic: W5GZK 576, TEI 328, PML 313, SWJ 272, MRK 180, MQI 171, SVR 120, KY 118, MFX 114, TFP 71, OQD 69, OFG 59, TKI 44, ESB 34, GVV 33, EHC 28, RST 16, ADC 9, ITF 8.

SOUTHERN TEXAS — SCM, Dr. Charles Fermaglich, W5FJF — Your SCM now has a very FB assistant and jr. operator, Jay Edward, born May 11th. The Port Arthur ARC is investigating the possibility of expanding the club quarters. The TVI committee reports the successful processing of four complaints. BCF is temporarily off the air — his 813 final is playing tricks. FCD still is working DX on 20 meters with only the exciter. WN5WRE is TVI-proofing

(Continued on page 102)

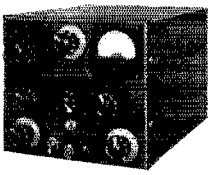
Lafayette for High Voltage BARGAINS!



NEW! JOHNSON VIKING II

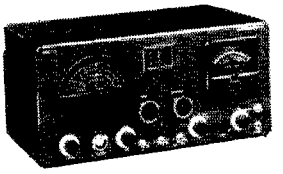
The Johnson Viking II transmitter kit incorporates all the desirable features of its predecessor plus those required for effective TVI suppression. 100 watts output on phone and 130 watts on CW on all bands 160 thru 10 meters. New final amplifier uses parallel 6146 tubes. All parts supplied, including copper plated steel cabinet, chassis, wiring harness, all hardware and tubes. Complete construction test and operation manual also supplied. Viking II Transmitter Kit.....**279.50**

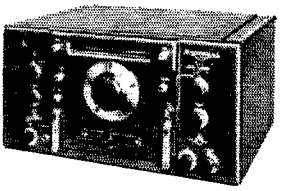
JOHNSON MOBILE TRANSMITTER KIT



New Johnson mobile transmitter kit, a band-switching 4 band rig, 60 watts input, 100% modulated (30 watts on 300 volt supply) 807 final, microphone input—dynamic, crystal or carbon. Crystal or VFO control. Viking Mobile Transmitter Kit (less tubes) **99.50**

LAFAYETTE — HEADQUARTERS FOR COMMUNICATIONS RECEIVERS





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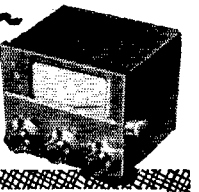
S-38C	49.50	SW 54	49.95
S-40B	119.95	NC 125T	179.95
S-53A	89.95	NC 183D	369.50
SX-62	299.50	HRO 60	483.50
SX-71	224.50	**HAMMERLUND**	
SX-73	975.00	HQ-140	264.00
S-76	179.50		

RME MC-55 5-BAND MOBILE CONVERTER



MC-55 Net $69.50
MC-53, for 2, 6 and 10-11 Meters..... 66.60
MC-57, for 10, 20 and 75 Meters..... 64.50

BRAND NEW!-GUARANTEED!

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Type	Now Only!	Type	Now Only!	Type	Now Only!	Type	Now Only!
1B3GT	99c	6AL5	71c	6SL7GT	97c	12BE6	75c
1R5	79c	6AU6	71c	6SN7GT	85c	12SA7GT	71c
1T4	79c	6AV6	63c	6SQ7GT	63c	12SK7GT	69c
3S4	86c	6BA6	75c	6V6GT	79c	12SQ7GT	63c
5U4G	59c	6BG6G	1.91	6W4GT	75c	35L6GT	69c
5V4G	97c	6J6	99c	6X5GT	59c	35W4	51c
5Y3GT	49c	6K6GT	67c	12AT6	59c	35Z5GT	49c
6AC7	1.22	6SJ7GT	69c	12AU7	95c	50B5	79c
6AG5	88c	6SK7GT	69c	12BA6	75c	50L6GT	67c

Extra 5% discount in quantities of 100 assorted.

UNBELIEVABLE *Price!*

WESTERN ELECTRIC *Hearing Aid*

Reg. Price $185.00 *our price* $24.50

Brand new, in original Western Electric jeweler's case. Supplied with receiver, receiver cord, battery cord and plug (less batteries). Money-back guarantee. **Act now while they last! Uses Burgess XX30E and 8R batteries at $1.55 per set.**

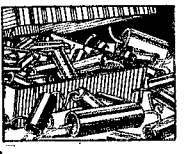
SPECTACULAR VALUE!

PLASTIC BASE RECORDING TAPE

Here is a real buy on 1,200 feet of plastic base recording tape, including 7" reel. Highest quality, optimum performance for thousands of playings. Frequency response 50 to 8,000 cycles. At this price you can't lose.

1,200 ft. Reel..... **1.89**

KIT OF 25 TUBULAR BY-PASS CONDENSERS



An assortment of 25 tubular by-pass condensers made by a leading condenser manufacturer. Top quality, brand new. Consists of the most popular capacities and voltages. A "must" for every serviceman, experimenter, or industrial laboratory, and at a price which will never be lower!

Stock No. KI-14 ..... 89¢

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BRONX, N. Y.	542 E. Fordham Rd.
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BOSTON, MASS.	110 Federal St.

the rig and antenna. UUQ was busy with exams but found time to put up a 40-meter dipole with low-pass filter and TVI is reduced. TFD is building a new VFO using BC-459A. WXJ reports. New Texas Gulf Emergency Net (TGEN) meets Mon. at 7:00 P.M. on 1885 kc. Active stations are BVF, OGG, TOM, VUS, WVI and WXJ. They now conduct simulated emergency tests. The GCARA held a picnic April 19th. TOM recently worked No. 48 and needs only a few more QSLs to make WAS. MN still is working H & B on 7 Mc. JQ still is on 40-meter c.w. with 80 watts to an 829B using a shunt-fed ¼-wave vertical. He has 7 to go for 40-meter c.w. WAS. ITG is building a ½-kw. final using a pair of 4-65As in parallel into a Pi-Net. He now is operating MM aboard the tanker SS *Natalie O. Warren* using an 829B running 125 watts on 10-meter c.w. and 80 watts on 10-meter 'phone. Your SCM attended the East Texas Hamfest and saw a lot of friends and met some new ones. LGY and her friends gave me more chow than I could eat. TPP reports on the Waco Disaster. TPP went to Waco with his 10-meter mobile. VHF, who was Net Control, relayed to PNP and then to AC, which was operated by UFH from Tue. 3 P.M. until 2:30 A.M. Wed. There was one live circuit out of the city and most of the traffic was handled by radio. There were several mobiles in Waco. SCA, in Houston, handled a lot of traffic. The National Convention is coming along FB. Look me up when you get to Houston. Your SCM also is the general chairman. Drop me a line. Traffic: W5MN 1283.

NEW MEXICO — Acting SCM, R. J. Matthias, W5BIW — On the last day before the State Legislature convened the Governor signed Senate Bill No. 136, which provides for call-letter license plates for the amateurs in the State of New Mexico. It will be July or August before they will be available. The amateurs themselves accomplished this. It is believed that approximately 400 amateur radio messages were delivered to the legislators. *CQ-NM*, the State Amateur Radio News Bulletin, which for the past 5 years was edited and published by NXE and RMH, was suspended in October when the Freymans moved to Las Vegas, Nev. The work has been taken over by BIW and DRA, and publication was resumed with the May issue. The Pecos Valley Club worked out a very nice program for the State Picnic held at "Bottomless Lakes" State Park, 8 miles east of Roswell, on May 24th. The day started with registration at 9 A.M., then at 9:30 A.M. a transmitter hunt; 11:30, a mobile unit contest; 12:30, a long break for lunch; 1:15 speakers, including CA, BIW, DRA, and KCW; 2:15, prize drawings; 4:30, kite antenna demonstration; 3:15, swapfest; 4:00 guided tour of KSWS/TV. AKR reports he has spent most of his time with Novices. Traffic: W5NKG 143, VHW 143, JZT 119, ZU 36.

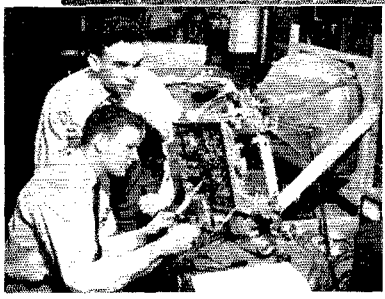
CANADIAN DIVISION

MARITIME — SCM, A. M. Crowell, VE1DQ — SEC: FQ. EC: EK. RM, OM. VO6U, with 157, had the highest traffic total this month. We are having our first official c.d. exercise and the HARC has set up four operating positions at Main Control Center as well as two at Damage Control Center and eleven mobiles and portable/mobiles covering the exercise area. Work parties from the HARC have been busy for weeks readying the gear and a test run has been held for practice. Special credit goes to OM, HC, LY, and WL, who have been whipping the gear in shape as well as doing some operating. Others active are DQ, DB, EK, AW, FQ, NO, LZ, RR, CP, WD, NO, AW, and PT. Auxiliary power will be provided by the HCARC with Kato-lite plant at the Damage Control Center and also at Main Control Center by a 3-kw. Onan plant. The armed services, police, and utilities are all playing important parts in the "Exercise Teamwork," which will include a mock bombing of the city and anti-aircraft action by the local Naval cruisers in the harbor. The Truro Club banquet was a great success. Please hold your late reports for inclusion in next month's report. Traffic: VO6U 157, VE1DW 83, HC 42, AAW 40, VO6B 36, VE1ZM 34, VO6N 26, VE1LY 24, VO6AB 19, VE1ABZ 18, VO6M 14, VE1AAR 12, BL 9, MK 9, UT 4, VO6R 4, VO6T 4.

ONTARIO — SCM, G. Eric Farquhar, VE3IA — The Kitchener-Waterloo Radio Club combines civil defense basic training lectures with regular club meetings. The April meeting of the Hamilton Amateur Radio Club was ably conducted by members of Nortown Radio Club of Toronto upon their annual sojourn to the holders of the Field Day Award since 1952. NG, the president, presented a fine talk based on "The Amateur's Code." GJ conducted a keenly-contested question and answer period. RU delivered a blackboard lecture on one of the Seven Wonders of the World — the Pyramids of the Nile. Congratulations to CI on being named chairman of the Presbytery United Church of Canada for Halton County. Likewise, to AXS on his receiving a scholarship in electrical engineering and to WT on his being elected and installed president of the Chamber of Commerce of the lakeside town, Burlington. It is with sincere regret that we record the passing of Rose Hallifax, BTE. A member of the Hamilton Amateur Radio Club since 1946, she became a licensed amateur in 1947 and was the Club's first YL operator. She was holder of numerous ARRL awards and appointments, including a

Continued on page 104)

ENGINEERS attending the ARRL convention . . .



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25-w.p.m. sticker, of which she was extremely proud, a Public Service certificate for valuable work during the Van Wagner's Beach Flood of 1950, WAC and WAVE certificates. At the time of her passing negotiations were under way toward her becoming a member of the A-1 Operators' Club. To BPE and family may we extend sympathy that is deeper than words. Traffic: (Apr.) VE3ATR 235, CBR 165, BUR 163, WY 134, IA 112, AJR 88, WT 81, NG 72, GI 64, EAM 55, DQA 45, NO 42, AOJ 40, BJV 34, DU 31, VZ 28, PH 18, VD 9, SG 8, AUU 5, BSU 5, DFE 2. (Mar.) VE3WT 77.

QUEBEC — SCM, Gordon A. Lynn, VE2GL — QY has changed his QTH to Woodland but will continue appointment as EC for Chateauguay, Beauharnois, and Napierville Counties. II has moved to a new QTH at Drummondville. CK reports that he still is active. BK renewed ORS appointment and was active in one week end of the DX Contest and also in the BERU c.w. Contest. BE is reported to have acquired a Viking I transmitter and it is fully de-TVIed. KG reports that he is active on 40 and 80 meters with a new rig with VFO and n.f.m. but is using only the 807 part of it so far as the pair of 814s in the final have been taken down to be TVI-proofed. The South Shore AREC Net now meets Tue. at 1900 hours. WK is heard on 75-meter c.w. from Danville. DR keeps skeds week ends with his pals in SM-Land. LO now has an NC-100X receiver and sold his old CSR2 to a budding ham in his town. EC reports from Trois Rivieres that skeds still are maintained with AEM, AGU, AEK, and AOB and some traffic is being handled. CA reports traffic was very low for April because of poor conditions and that Phyl still is taking it easy but she resumed the Far North skeds May 1st. Montreal District ECs are planning a get-together on LO nights on 10 meters with excursions to the other bands. Other CD appointees are invited to look in on these nights. Traffic: (Apr.) VE2CP 16, CA 3, GL 3. (Mar.) VE2CK 20, EC 17, BK 3.

ALBERTA — SCM, Sydney T. Jones, VE6MJ — YM has rebuilt his rig with a view to eliminating TVI. OE reports new AT1 mobile is working FB. EN and FC are new stations on the Alberta 'Phone Net. JJ and SR are sparking a revival of the prewar Breakfast Club. Look for them Sunday mornings on 3.8-Mc. 'phone about 8:30 MST. EH has been taking a very concentrated flying course. CP will move North for the summer months. MJ snagged two new countries in April. Make your plans now to attend the Alberta Hamfest to be held in Edmonton the Saturday and Sunday preceding Labor Day. ZR made a flying trip to Vancouver. Why not join in the Open Forum discussions held each Saturday evening on 3765 kc.? EA and his XYL have returned from a trip across the line. NX has gone in for DX hunting in a big way. XD is much improved after his recent operation. PE and WO are in charge of reservations for the hamfest. Let Jack and Albert know if you plan on being in Edmonton for the Alberta Hamfest Sept. 5th and 6th. Traffic: VE6HM 88, MJ 10.

BRITISH COLUMBIA — SCM, Peter McIntyre, VE7JT — Many thanks to Wilf Moorhouse for all the work he has done in organizing the AREC. He has resigned as SEC in order to spend more time at the hobby. The new SEC is PO, Clarence Ferris, of Victoria, B.C. TF, of New Westminster, is a new RM and AV, of Vancouver, is new OO. AFJ, of Clinton, is Asst. EC for District No. 8 as well as one of the Alternate NCS for the AREC Net, which has QC, of Merritt, again as NCS. His other Alternate NCS is AP. Plans are in the formation stage for a mobile club in Vancouver as more fellows become mobile-minded. The Vancouver Club held a very successful hidden transmitter hunt in April with everybody in favor of calling out the bloodhounds for the next one. The TVI committee of the BCARA now is starting on a program and can be contacted through AV. DX dope can be had from the members of Club 4, who are setting up shop on an antenna farm in Surrey. See TM. As usual trying to get any news from you fellows is like trying to find Utopia. Come on, fellows, lick a stamp and put it on a postcard or letter with some news attached. Traffic: VE7QC 52, DH 7, AC 3.

MANITOBA — SCM, Leonard E. Cuff, VE4LC — It is with deep regret that we report the death of VE4AW on April 6th. At the April meeting of the Amateur Radio League of Manitoba VJ was presented with a Life Membership in the League. Our congratulations to EF and his XYL on the arrival of a daughter and to DJ and his XYL on the arrival of a son. EF, FF, KG, and WS have been endorsed for 'phone operation. EX and DL now may be heard on 75- meter 'phone. 3DW and his XYL were recent visitors to Winnipeg. Our best wishes to EF on his recovery from a recent illness. VE6UV/4 now may be heard on 20 meters from Fort Churchill; he is using a Viking II. VE5TE/4 now is located in Winnipeg, having been transferred here by his firm. W6SSG/VE4 may be heard on 3766 kc. from Clear Lake, where he is recuperating from a recent illness. The Manitoba C.W. Net operates on 3700 kc. at 1945 CST on Mon., Wed., and Fri. Anyone wishing to call in is invited to do so. Don't forget the big hamfest at Dauphin in September. Clubs and ham groups are invited to send along any news items for the column. Traffic: VE4HL 30, ER 18, JM 4.

SASKATCHEWAN — SCM, Harold R. Horn, VE5HR

(Continued on page 106)

LOOK STEINBERGS LOOK

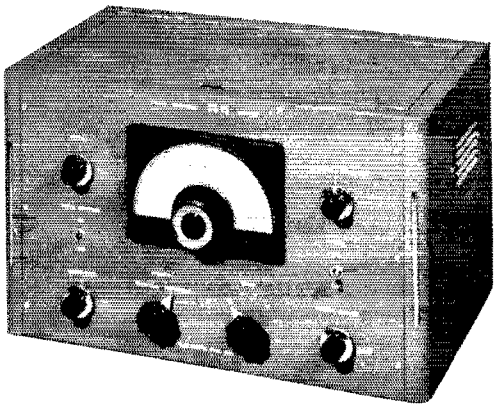
IMMEDIATE DELIVERY

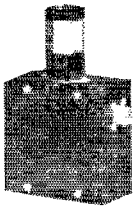
Single Sideband Exciter SS-75

Check these specifications and you'll see why the SS-75 is now the one piece of equipment that places all the advantages of single sideband at your finger tips:

- ★ **Built-in stable VFO, with voltage regulation.**
- ★ **Carrier injection to receiver antenna terminals . . . tune in SSSC signals the same as AM, no other gadgets necessary.**
- ★ **Illuminated VFO tuning dial provides 31 inches of band-spread 3800–4000 KC in 4 bands, with 5 to 1 gear reduction.**
- ★ **Built-in voice control and receiver disabling circuit. Also provides for break-in CW operation.**
- ★ **Specially designed crystal filter network for maximum stability and reliability.**
- ★ **Carrier injection to transmitter available for working single sideband WITH CARRIER, for tune-up adjustments, or CW.**
- ★ **10 watts ouput, with additional 807 socket for up to 100 watt operation with external power supply.**
- ★ **Handsome grey crackle cabinet, chrome trimmed, 20" x 12" x 12". Complete with 12 tubes, including one 807, operating manual.....$245.00**

Frequency conversion mixer for 40–20 meters, rack mtg. 3½" x 19" less power supply..... 75.00





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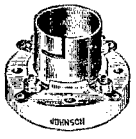
For break-in operation on CW, AM, or SSSC. Use one antenna for transmitting and receiving. It's instantaneous! No moving parts, no power needed to operate. Coax fitting for connections to feeder and receiver. Will handle 1 Kw. With 75 meter plug-in coil.. **$9.95**

Extra coils **$1.75** per band

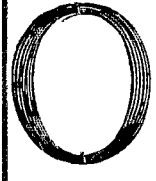


TUBE SOCKETS

For 4-prong tubes 866, 809, 811, 100th etc. Heavy phosphor bronze side wiping contacts, metal shell, white porcelain base. Regular list $1.50, while they last..... **45¢**

Triple 8 mfd. 450 V. electrolytic upright can condenser, separate negatives, all leads insulated from can. Nationally known mfr. Reg. dealer net $2.58.....ONLY **59¢**

10 for **$5.00**



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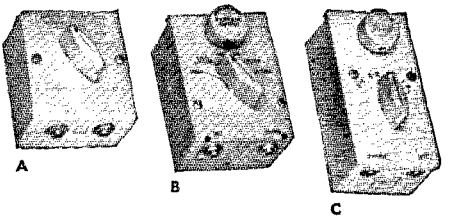
125 ft. of the finest aerial wire obtainable. 42-strand phosphor-bronze with linen center. Will not stretch, very high tensile strength, diameter approximately same as No. 14 copper, very flexible. Excellent for transmitting or receiving antenna, control cable, guy wire. Regular list $4.95..... **90¢**

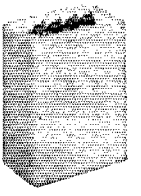
JACK BOXES



(A) BC-345. 3½" x 3½" x 1⅞" aluminum, 2 standard open-circuit jacks, 3-position switch, 6-contact banana plugs and jacks.
(B) BC-1366. 4¼" x 3" x 2½" aluminum, 1 standard open-circuit jack, 1 3-circuit mike jack, 150,000 ohm volume control, 5-positions switch, 11-contact banana plugs and jacks.
(C) BC-213. 5¼" x 2¾" x 2⅛" aluminum, 1 standard open-circuit jack, 1 3-circuit mike jack, 150,000 ohm volume control, 4-position switch, 8-contact banana plugs and jacks.

YOUR CHOICE 30¢

4D32 tubes. Brand new	$19.95
RG8/U coax, 12", standard plug each end	.70
831SP standard coax plug	.60
Coax angle plug	.45
3-conductor Koiled Kord, 6 ft. extended	1.79



8/8/8 MFD. 500 V. D.C.

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73, Jule Burnett W8WHE

— We are sorry to lose TE, who is moving to Winnipeg, as Mac has done a fine job as PAM and net member. We all wish you the best and hope to hear you as VE4 soon. KL now is located at Spalding. SE is new YL at Lac La Ronge. GO has a new Austin car. OC is looking for rare DX when conditions permit. LU has a new exciter and is doing FB. LD is on his yearly trip to W6-Land for Bees. MA, Moose Jaw Club station, has a new Viking transmitter. VM, at Coleville, is heard with a Viking and mobile whip from his trailer. PQ and QL now are mobile on 75 meters. ES also is mobile with TBS-50 de luxe and says it's a new lift to an old ham after 30 years. EW is a new call heard on 10-meter 'phone. FG is heard on c.w. with 1154. LE now has 812s in the final. GR received a promotion and left for Regina as Radio Inspector. DR and HR are DX-chasing on 20 meters. QZ did it again and is to be congratulated on his high score for VE in the SS. UC and his XYL are being congratulated on the arrival of a daughter. Traffic: VE5LU 20, TE 12, HR 9. QL 7, RE 5, DS 4, FG 2, WH 2.

July 1928

. . . ARRL President Maxim writes an editorial message to point up the importance of frequency precision in view of increasing enforcement of off-wave regulations.

. . . In "What Is Amateur Radio Traffic?" League Director and General Counsel Paul M. Segal makes timely legal analysis of the amateur's right to engage in such work.

. . . Gordon G. Macintosh, operator at the Massachusetts Institute of Technology experimental station, writes of Kennelly-Heaviside investigations at 1XV-1XAN.

. . . Ross A. Hull tells an interesting story of experimental goings-on in the capital with "Some Notes on a Visit to the Naval Research Laboratory."

. . . "A 'Phone Transmitter for the Beginner or Advanced Amateur" has its details outlined by R. Wm. Tanner, 8CMU, and uses Type 171 and 210 tubes.

. . . The fifth and last of a series on power supply design is provided by D. E. Replogle and James Millen in their "Notes on Filter Circuit Design."

. . . "Some More About the Family," by A. B. Chamberlain, deals with the testing of telephone circuits through use of commercial techniques applicable amateurwise.

. . . George B. Hart describes "A Superregenerator for Short Waves" and Joseph Fuchs, EAFZ, reports his "Tests on a Method of Voltage-Feeding the Antenna."

. . . "Relays for the Amateur" are the subject of a G. F. Lampkin article, while W. J. Halligan takes up low-voltage rectification in "Filament Supply Progress."

. . . A. E. Teachman, 1IJ, describes "A Resonance Testing Method" and William H. Christie tells of "A Simple High-Frequency Oscillator" that reaches 3.5 meters.

. . . "A Mounting for Space-Wound Coils," is suggested by Guy E. Pigford, 4EC, while Severiano Justi, sb2AB writes "Concerning Amplified Absorption Modulation."

. . . Articles of general interest are provided by Don C. Wallace and Jack Paddon — "Becoming an Operator in 15 Minutes," and "Reducing the Cuss Quotient."

. . . The Communications Department reports a gradual return to good conditions on our ten- and twenty-meter bands and also carries news from yacht *Carnegie*, WSBS.

Strays

Amateurs are invited to visit De Soto, Missouri, during its sequicentennial celebration, June 28th — July 4th. Town officials have designated July 3rd "Amateur Radio Operators' Day" and local amateurs plan to set up a display booth and station for message handling.

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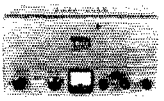

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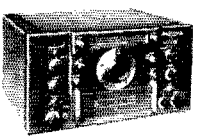

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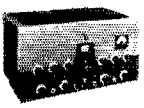

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Hallicrafters S77	(AC DC Version of S40B)	$99.00
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Noise Generators

(Continued from page 14)

only for comparison work. It is thus no better than the crystal-diode type, and it can't compare with the latter for convenience.

Adjustment of antenna coupling is one of the jobs where the noise generator really shines. Whether it be the setting of a tap position on the grid coil of the first r.f. stage, the tuning of the input circuit when an untuned coupling coil is used, finding the proper number of turns for the antenna coupling coil, or setting its position with respect to the grid coil, the noise generator will give you the correct answer at once. Any of these jobs is difficult, at best, by any other method. Make your adjustment for minimum diode current needed to double the noise power, or for maximum difference in noise output when the generator is switched on. Either indication will give the result you're after: optimum signal-to-noise ratio. And it will be obvious thereafter that you've been missing something all these years by tuning up the first stage for maximum signal strength only.

Neutralization of r.f. stages is another tricky job that can be done quickly and easily with the noise generator. Selection of the best tube of a batch is another. Which circuit, or what tube type does the best job in weak-signal reception? The noise generator will tell you at once.

The beauty of it all is that the operation of the noise generator is independent of receiver bandwidth and audio characteristics. If you check the noise figure of a 2-meter converter at 6 db. on one receiver, it will check the same on any other receiver, if the noise generator is used with care, the converter is working as it should, and the same indicating device is used for both checks.

With the noise generator you can demonstrate receiver principles that are hard to understand otherwise. Take the idea that the first stage determines the noise figure of the receiving system. You'd have a hard time proving that with other devices, but it is made obvious with the noise generator. Detune mixer or i.f. stage adjustments so that there is a marked drop in over-all gain. Then check the noise figure again, and you'll find that it has changed not a particle. That is, the noise figure will remain the same if the first stage of the receiver is working properly. If the noise figure is degraded by changes in mixer or i.f. adjustment, you need a better r.f. amplifier!

Want to measure the loss in a length of coaxial line you're thinking of installing in a new antenna system? Do it with the noise generator. Get a maximum noise reading with the generator connected directly to the receiver input, then connect it through the coax and read the difference, if any. No need to take anyone's word for line-loss data at any frequency you can hit with your receiver, when there's a noise generator handy!

Other uses for the noise generator will occur to the fellow who knows his way around with receivers. Measuring stage gain or receiver input

(Continued on page 110)

impedance, setting of the injection level of receivers having no r.f. stage, adjusting interstage coupling circuits to secure a desired bandpass — these are a few of the tasks that are meat for the noise generator enthusiast. Few tools serve so many purposes yet cost so little. Once you've built and used a noise generator you'll wonder how you ever got along without it.

Modulation Facts

(Continued from page 17)

Phasing

The "phasing" method of s.s.b. generation employs theories which certainly seem to belong to people with engineering degrees. However, the theory of filtering is also basically very complicated, but we have been using different types of filters so long that we tend to leave their mystic properties to the experts. Let's describe the phasing system in terms similar to those used for filtering.

Each sideband is broken up into two parts by the use of a few craftily chosen resistors and condensers, a couple of tuned circuits, and a certain amount of adjustment. These parts of each sideband differ from each other only in that the times when any given thing happens are different ("phase shift" to an expert). The four signals thus produced are combined in another tuned circuit so that the parts of one sideband "beat each other's brains out." The parts of the other sideband take an immediate liking to each other and combine to form the signal intelligence to be transmitted.

The phasing method is not limited to low frequencies. It works as well at 50 Mc. as at 50 kc. However, for reasons of operating convenience, the signal is often generated at some point outside the band and heterodyned in.

Before I finish, let me say that the previously mentioned s.s.b. properties of receivers should, in no way, be confused with the general meaning of the term, "selectable-sideband receiver." Such a receiver is actually able to remove the "audio image" from any incoming signal. In plain words, it listens to either sideband and rejects the other. Either phasing or filter methods are used in selectable-sideband reception. In fact, the very parts used in a transmitter can almost always be used in a receiver.

In conclusion, if the above discussion of modulation differs so widely from your ideas on the subject that you tend to become discouraged, remember that not knowing all of the "low-down" on such matters can't stop us in getting a lot of pleasure from amateur radio. However, there isn't any doubt that the mechanics of radio communications are becoming more complicated every day.

If we are to have any chance of keeping up with technical developments, the one thing we can't afford to overlook is this business of mixing — sorry, I meant "modulation!"

Neon Bulbs

(*Continued from page 26*)

ages checked. It should also be pointed out that if a different potentiometer than the Mallory U–50 is used for R_2, an entirely different calibration might be necessary. In such a case, it would be necessary to calibrate a dial using known voltages for check points.

The operation of the neon voltmeter is simple. When an unknown voltage is to be checked, R_2 should be first set at maximum. *Insulated* leads are then connected to the positive and negative sides of the unknown voltage. The knob on R_2 is then very slowly turned toward minimum until the neon bulb lights. At the exact point the bulb glows, the value of the unknown voltage can be observed. *Do not* turn the knob any farther than is necessary to cause the bulb to glow because if excessive current is allowed to flow through the bulb, there is danger the neon bulb will arc and burn out. Always start your check with the knob on R_2 turned to maximum voltage or above the voltage you intend to check. In other words, the same precautions should be observed with this type voltmeter as with any other kind — always use the highest voltage-ranges and check down to an unknown voltage in order to protect the testing device. The "over 500 volts" terminal marked +500 v. in Fig. 4 should be used for checking any potentials above 500 volts. When using this terminal, add 500 volts to whatever reading appears on the dial. If the reading is 150 volts when the 500-volt tap is being used, the voltage being checked would be 650 volts. *And remember,* in testing voltages, treat *all* voltages with the utmost respect. They can be deadlier than an irritated rattlesnake when you become careless.

In conclusion, many additional applications for neon bulbs will become apparent after you use them for a while. If you come across ideas you think the rest of the gang would be interested in, send them along to Hints and Kinks.

Magnetostriction

(*Continued from page 30*)

only. However, such "maximally flat" filters do not cut off nearly so sharply outside the band as do filters which have a little ripple in the band. There is a very great improvement in cut-off when even the slightest trace of ripple is permitted, so that for any ordinary purposes it is desirable to design for the maximum amount of ripple that can be tolerated. The calculation of the *ks* and *ds* to give any chosen amount of ripple with any desired number of circuits can be carried out as described in an earlier Dishal article.[2]

The foregoing circuit theory can now be transferred without alteration to mechanical filters by substituting ferrite resonators for the

(*Continued on page 114*)

[2] Dishal, "Design of Dissipative Band-Pass Filters," *Proc. I.R.E.*, September, 1949.

next-to-end circuits and metal resonators for the circuits in between. The couplings between end circuits and ferrite resonators now become coefficients of magnetostrictive coupling, and mechanical couplings between mechanical resonators replace the electrical couplings of Fig. 19. The resulting filter is then as shown more or less pictorially by Fig. 20.

In this arrangement the end circuits are still electrical but Circuits 2 and 6 have been replaced by ferrite torsion resonators, the couplings between the end circuits and the ferrites still being called k_{12} and k_{67}. The middle resonators which replace circuits 3, 4, and 5 may be of aluminum. The resonators may each be a half wave long, and the coupling necks a quarter wave long, the wavelength being calculated from the velocity of propagation of torsion waves in the material used, and at mid-band frequency. The coefficient of coupling between similar torsion half-wave resonators is approximately $\frac{2}{\pi}$ times the fourth power of the ratio of the neck diameter to the resonator diameter, so that it can easily be made quite small. The process of design is, in principle:

1) Calculate the ks and ds required to produce the desired filter characteristic. For this use Dishal's formulae, or for a simple Campbell type filter use the values given above.

2) Calculate resonator and neck dimensions that will give the required coefficients of coupling.

3) Build the filter.

4) Tune it up and adjust the end circuit dampings and couplings.

It should be noted that these steps are all that are required "in principle." Actually, accurate tuning of the mechanical resonators is likely to be extremely difficult in practice, so that it is not recommended that any multiresonator filter be attempted until detailed suggestions, which will be included in a subsequent article, have been carefully considered. The preceding discussion is intended only as an indication of the general nature of a mechanical filter and illustrated by the particular case of a torsion filter. A somewhat different approach to the subject, particularly the simple Campbell type filter, has been described in the *RCA Review*.[3]

—•••—

[The third part of this article, to appear in a subsequent issue, will describe the construction of mechanical filters for both 'phone and c.w., and the method of adjustment. — EDITOR]

[3] Roberts and Burns, "Mechanical Filters for Radio Frequencies," *RCA Review*, September, 1949.

Strays

"TV-Eye" no longer refers solely to the inflamed and swollen condition produced by the XYL's fist when one's output coax connector springs a leak in the middle of "I Love Lucy." One of RCA's newest camera units now officially bears the name.

Tech Topics

(*Continued from page 56*)

of aurora and cold weather? In its early stages, this sort of thing may be akin to witchcraft in the opinion of the scientist, but it is thinking along such lines that has made much of the amateur contribution to propagation knowledge possible.

A paragraph from another paper in the same *Proceedings* is worth quoting at this point. A report of the IRE Subcommittee on Theory and Application of Tropospheric Propagation gives this sage advice:

"The engineering profession is warned by the committee that only a skeleton of working knowledge is available, and that many things in the literature must be taken with a large grain of salt."

— *E.P.T.*

Test Lead

(*Continued from page 47*)

made by a well-known manufacturer. The lead measured 220 $\mu\mu$fd. between shield and the center conductor. A compilation of the capacities measured between other types of leads is recorded in Table I. An examination of Table I shows that

TABLE I

Type of Lead	*Capacity Per Foot*
Single Conductor, Shielded	60 $\mu\mu$fd.
Individual Leads:	
Close-spaced	3 $\mu\mu$fd.
Spaced 1½ inches	0.5 $\mu\mu$fd.
300-ohm Twin-Lead	3.6 $\mu\mu$fd.
Twisted Pair	21 $\mu\mu$fd.

the experimenter must use good judgment in choosing an instrument lead for voltage measurement.

There is a second consideration in choosing a lead and that is noise pick-up of the cable. But we will not enlarge on this subject here.

There are, obviously, many more types of leads than are listed in Table I. The manufacturers of these usually list the capacity per foot of each of the different types and other characteristics that should be considered in using these cables.

We can do no more than point out one of the pitfalls and hope that it has, or will at some later date, save you from excessive blood pressure and loss of a few precious hairs.

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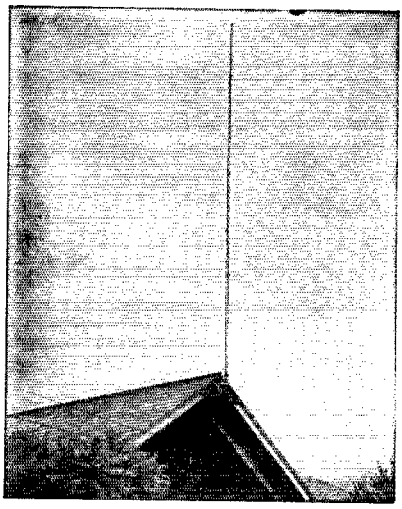

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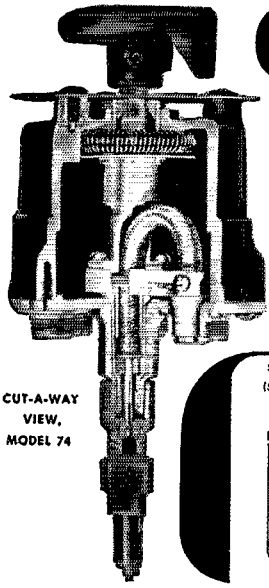

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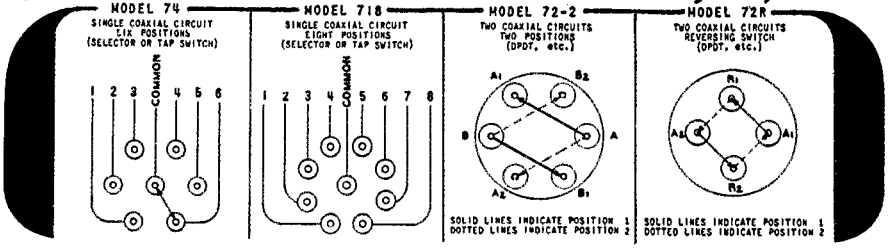
The COAXWITCH is an RF switch for use in coaxial circuits where it is important that the 50 OHM impedance of the cables be maintained. In a circuit sense, this switch consists of two pairs of "N" connectors spaced 4½" apart using RG-8/U as the connecting link. The COAXWITCH itself introduces no VSWR other than that of connectors. Characteristic impedance is maintained thru all switch details. Cut-away view shows that shield as well as center conductor is switched. Beryllium copper contacts, on the gooseneck, mate directly with male "N" (Type UG-21B/U) connectors, which connect directly to back plate of switch. Since all connectors come out in line with axis of switch, right angle connectors are usually unnecessary.

Literature Gladly Sent



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World Above 50 Mc

(Continued from page 59)

your conductor's signal during a cross-band test over this 400-mile path.

Fellows who count their countries on 50 Mc. will welcome the news, relayed by W5SFW, that VP9BG is getting on 6. Bermuda is just a good E_s hop from almost any part of the Eastern Seaboard, so VP9BG should find himself a very popular fellow!

Two big dates for v.h.f. men coming up: the ARRL National Convention at Houston, July 10th, 11th and 12th, and the annual picnic at Turkey Run State Park, near Terre Haute, Indiana, on July 19th. W5FEK promises that the Houston gang will provide the best time ever at a National Convention for the v.h.f. fraternity, with all the facilities we could ask for to make this a date worth any amount of traveling to keep. The Turkey Run Picnic has *become a v.h.f. institution, attended by 6- and 2-meter* men from all corners of the country. Your conductor will be attending both affairs, the gang in charge of the Turkey Run Picnic having very kindly moved the date forward one week end to make this possible. See you there!

Things are stirring in the 220-Mc. band in many sections of the country. W9OVL, Hammond, Ind., is on 220.7 Mc., and he says that W9OKF, Park Ridge, Ill., is on 220.08. Other Illinois 220-Mc. stations include W9RPF, Waukegan; W9DRN, Des Plaines; and W9PVK and W9PUW, Chicago. Ben sends along word that may be in time for early readers that the Chicago area v.h.f. gang are having a picnic at Thatcher's Woods, Riverside, Ill., June 28th.

The 420-Mc. band is getting more attention every day, and there is every indication that some new records should be set for this frequency before the end of the year. W8BFQ, Everett, Ohio, had her first 432-Mc. QSO with W8RUE, Pittsburgh, on May 10th at 0130, after many unsuccessful tries. The 420-Mc. tests are frequent along the Atlantic Seaboard these evenings, and operation has reached the stage in some areas where contacts are possible without making arrangements on some lower band.

A New Two-Way Record

If we exclude light-beam communication, we've never heard of hams invading that unassigned region in the spectrum above 30,000 Mc. until W8IRO and W8IPJ came along with a claim to the record for DX work in this range. They report working a distance of ¾ mile two-way on May 7th, tests having been made in both daylight and darkness. The path is line of sight, except for a treetop through which the signal must pass.

It was found that when W8IRO's antenna was lowered to below rooftop level there was a considerable drop in signal level, but this effect occurred only at night. No details have been received as yet regarding the gear used in this work.

Happenings

(Continued from page 44)

expenses for the operation of the Merit Award Committee not to exceed $250 in the year 1953.

73) On motion of Mr. Brabb, unanimously VOTED that the General Manager is hereby authorized to pay expenses for the operation of the Public Relations Committee not to exceed $1000 during the year 1953.

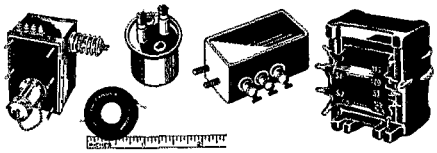
74) Whereupon, on motion of Mr. Cooke, the Board adjourned *sine die* at 11:58 a.m.

75) (Time in session as a Board, 8 hours, 52 minutes; as a Committee of the Whole, 1 hour, 51 minutes; total time 10 hours 43 minutes. Total authorizations, $25,550)

A. L. BUDLONG
Secretary

FREED

TRANSFORMERS



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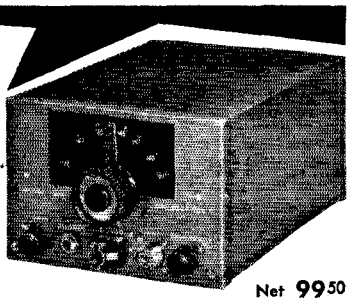

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"226" RECEIVER: Freq. range 143-149 mcs. 2-RF, (6AK5's) 2-I.F. with 6 tuned circuits. Shunt-type noise limiter. Antenna trimmer. 7 tubes plus OB2 voltage regulator for HF oscillator. Tunable.

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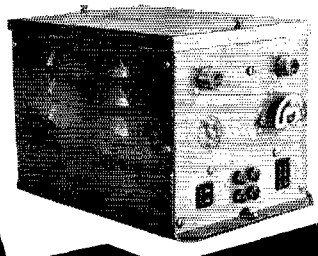

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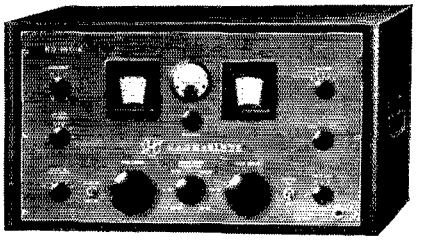

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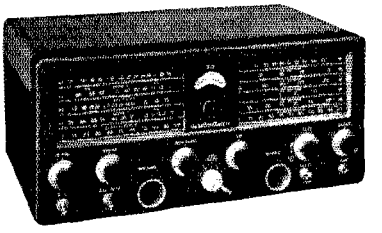

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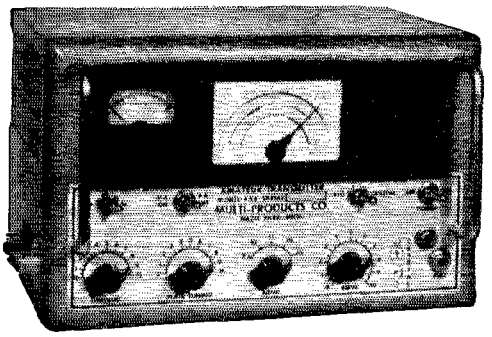

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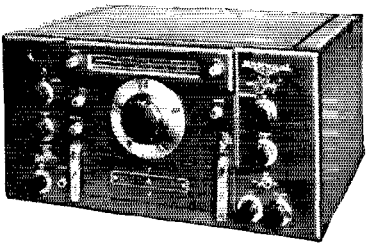

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YL News & Views

(*Continued from page 45*)

First YLCC

OM W1BFT, Carl Evans, has received YL Century Certificate No. 1! For details of this new certificate offered to any amateur who QSOs 100 or more YLs, see this column, February, 1953, *QST*.

Keeping Up With the Girls

The YL-OM Contest score of OM W3LXE was one of the top 27 OM scores and should have been included in the May column, and YL W4RLG's combined score of 20,790 points should have been listed as well. Our apologies. . . . W8s OEP UDA, WN8s KLZ and MHE attended a party given by W8ATB in honor of W6IFK, La Verne. . . . W2GPK, Sylvia, daughter of W2EEO and W2CYK, recently became the bride of K2AAO. . . . Betty Gillies, West Coast Chairman of this year's Women's Transcontinental Air Race is now W6QPI. . . . The January, '53, issue of the Portuguese radio journal, *Boletim da Rede dos Emissores Portugueses*, contains an article by CT1YB, Maria, on her introduction to radio. . . . VE3DEA has been enjoying "a real picnic on 20 meter c.w. DLs, ZLs, HBs, OXs, VOs, ONs, SMs." Denny says she's really getting out with her new home-built rig. . . . Fifteen-year-old WN4ZFF, Doris Ann, of Richmond, Va., received some nice publicity in her city's papers. . . . W3s AKB CDQ LSX MAX QOG RXJ SGF SLS TAK, WN3s TGW TSC VSA, W4s RIG and WRC attended a get-together in Washington, D. C., arranged by W3MAX, Barbie. The girls discussed the formation of a local YLRL chapter and planned another meeting in September. . . . A joint meeting of the YLRL units of N. Y. C. and L. I. was held on May 15th at the home of W2TBU, Kit, in Long Island City. YLs present were W2s BXT EEO IGA IQP JZX KDP MVV OWL QWL RAQ SUR TBU, KN2CFF, W3JSH/2, and W1QON. . . . We regret to note the passing of VE3BTE, Rose Hallifax, of Hamilton, Ontario, on April 18th after a long illness (see May *QST*, p. 138).

The shiny, efficient rig Dorothy Saunders now uses bears little resemblance to the first breadboard outfit she built in 1927 when she was a sophomore in high school. Then, as nu2BY, she was one of a dozen licensed YLs in the world. Today, with two calls — W4UF for her home on an island in Florida (Englewood) and W4ZKD, used when she is in Georgia six months of each year — she continues to be active on 75, 40, 20, and 10. A licensed pilot with a Ph.D. in Botany, she has done research work for the government for years, and her work has taken Dorothy and her husband to many countries which are good DX to work when at home.

HAM-ADS

(1) Advertising shall pertain to radio and shall be of nature of interest to radio amateurs or experimenters in their pursuit of the art.
(2) No display of any character will be accepted, nor can any special typographical arrangement, such as all or part capital letters be used which would tend to make one advertisement stand out from the others.
(3) The Ham-Ad rate is 30¢ per word, except as noted in paragraph (6) below.
(4) Remittance in full must accompany copy. No cash or contract discount or agency commission will be allowed.
(5) Closing date for Ham-Ads is the 25th of the second month preceding publication date.
(6) A special rate of 7¢ per word will apply to advertising which, in our judgment, is obviously non-commercial in nature and is placed and signed by a member of the American Radio Relay League. Thus, advertising of bona fide surplus equipment owned, used and for sale by an individual or apparatus offered for exchange or advertising inquiring for special equipment, if by a member of the American Radio Relay League take the 7¢ rate. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and all advertising by him takes the 30¢ rate. Provisions of paragraphs (1), (2) and (5), apply to all advertising in this column regardless of which rate may apply.
(7) Because error is more easily avoided, it is requested signature and address be printed plainly.
(8) No advertiser may use more than 100 words in any one issue nor more than one ad in one issue.

Having made no investigation of the advertisers in the classified columns, the publishers of QST *are unable to vouch for their integrity or for the grade or character of the products or services advertised.*

QUARTZ — Direct importers from Brazil of best quality pure quartz suitable for making piezo-electric crystals. Diamond Drill Carbon Co., 719 World Bldg., New York City.

MOTOROLA used communication equipment bought and sold. W5BCO, Ralph Hicks, 204 E. Fairview, Tulsa, Okla.

SUBSCRIPTIONS, Radio publications. Latest Call Books, $3.00. Earl Mead, Huntley, Montana. W7LCM.

QSL's-SWL's Meade WØKXL, 1507 Central Avenue, Kansas City, Kans.

QSLS, SWLS. Samples, 10¢. C. Fritz, 1213 Briargate, Joliet, Ill.

QSLS: Fluorescent QSLs radiant and glowing with quality-control QSLS Kromekote three colors and up. Rainbow maps. DX QSLS. Samples rushed. 10¢. Uncle Fred. Box 86, Lynn, Pa.

WANTED: Cash or trade, fixed frequency receivers 28-42 Mc., W9VIY, Troy, Ill.

QSLS, SWLS. High quality. Reasonable prices. Samples. Write to Bob Teachout, W1FSV, 204 Adams St., Rutland, Vermont.

WANTED: Marconi multiple tuner, coherer, spark coil, magnetic detector, etc.; DeForest responder, coherer and other early equipment; Marconigraphs, Modern Electrics; Electrical Experimenter and early Call Books and text books of wireless. Franklin Wingard, Rock Island, Illinois.

WANTED: All types of aircraft radios, receivers and transmitters. Absolutely top prices. Dames, W2KUW, 308 Hickory St., Arlington, N. J.

WANTED: Top prices paid; Navy selsyns 1 DG, 1F, 1CT, 5CT, 5D 5DG, 5G, 6G, 7G, etc. and BC-348, BC1221, AN/ART-13, AN/ARC-1, AN/ARC-3, RTA-1B, AN/APR-4. Electronic Research, 719 Arch St., Philadelphia 6, Penna.

WANTED: Selsyns and syncros. Top dollar paid. Write full descriptions to: Box 84, Babson Park 57, Massachusetts.

WANTED: AN/ARC-1 or AN/ARC-3 or components. Write to J. Durant, 5526 Parkland Court, Apt. 202, Washington, D. C.

QSL samples. Dime, refunded. Roy Gale, W1BD, Waterford, Conn.

SELSYNS or synchros wanted: Navy or Army ordnance 60 cycle types. Will pay $35.00 each for 1DG, 1DF, 1CT, 1G, 1F; $25.00 each for 5DG, 5G, 5F, 5CT; $20.00 each for 5D, 6G, 6CT, 6DG, or sizes 7. Subject to inspection. Other types advise. Also want: Autosyns, Servo Control motors, PM motors, inverters, tubes and other electronic components. Electro Sales Co., Inc., 50-58 Eastern Ave., Dept. Q, Boston 13, Mass.

QSLS-SWLS, as low as $1.50 per color. Samples dime. Stronberg, P.O. Box 151, Highland Station, Springfield, Mass.

QSLS: "Brownie," WJCJI, 3110 Lehigh, Allentown, Penna. Samples 10¢; with catalogue, 25¢.

WANTED: Marconi, Wireless Specialty, Electro Importing, DeForest or any other manufactured apparatus made before 1920: *QST*, Wireless Age, Marconigraphs, Modern Electrics or any wireless periodicals issued before 1920. Early catalogs, bulletins, books. Describe all items in detail and price wanted. Louis Rizoli, W1AAT, 100 Bay View Ave., Salem, Mass.

NAVY ARC5 series 40 and 80 meter transmitters, converted to V.F.O. with common power supply, in perfect condition, with tubes: $35.00; SCR-522 with tubes, converted, $35.00; Six 304TL, $4.00 each; BC-1161A receiver, in good condition, no tubes. Clement Gouveia, W6TSS, 3310 63rd St., Sacramento, Calif.

COLLINS 32V3 transmitter, perfect condition, original carton, manual, extras. Submit cash offers. Dr. Raynold Arcuri, W2KSV, 8 Linden Ave., Pelham, N. Y.

QSLS? QSLS? Modernistic? State-map type? Rainbow? Mobile? Girl-type? Photographic? Cartoon style? Largest variety. Samples 20¢. Rus Sakkers, W8DED, Ham Print Shop, 53 East 7th Street, Holland, Michigan.

WANTED: Ham receivers and commercial-built transmitters. Not government surplus. Need them for export. Will discuss trade on anything you need. Uncle Dave's Radio Shack, 904 Broadway, Albany 4, N. Y.

BIRTH announcements: ham-styled. 25, $1.00. Carl T. Narvestad, Granite Falls, Minnesota.

W2AOA Print: Quality QSL/SWL cards. 10¢ samples. Doscher, Box 54, Goshen, N. Y.

HAM Special! RG-8/U Cable, 225 ft. reel, $12.25; FL-8A filter, $2.95; 1000 Kc crystals, $3.60; manuals for BC-348, BC-779, BC-610, SCR-522, $1.00 each. Postage is additional. Request free bulletin. Lectronic Research Laboratories, 719 Arch Streets, Philadelphia 6, Penna.

QSL's, SWL's. Fair prices for excellent quality cards. Eleven styles for you to choose from. Samples, 10¢. Almar Printing Service, 602 Barker Bldg., Omaha, Nebraska.

CODE slow? Just the help you need in psychological aids booklet. One dollar postpaid. Inquiries invited. Donald H. Rogers, Fanwood, N. J.

ATLANTIC City vacation! Kilowatt accommodations at low power prices. Near beach and Boardwalk. Luxurious rooms with private bath and radio or budget special rooms with just running water. Family suites. QSL brings information and rates. Ben Robin, W2BIG, Mgr., Commodore Hotel, Pacific Avenue at St. Charles Place, Atlantic City, N. J.

QSLS. Highest quality, quick delivery. Samples, 10¢. Reflective call-letters for mail-box, car bumper, etc. Genuine Scotchlite reflects in two colors up to 185 times brighter than paint. Apply like scotch tape. Last for years. $1.00 each; three for $2.00, postpaid. Dortch, W4DDF, Jocelyn Hollow Rd., Nashville, Tenn.

WANTED: Duomatic type AKS-7 electronic key. Hank Zimmerman, W3UVB, 529½ Smithson, Erie, Penna.

"SURECHECK Tests". Novice, $1.50; General, $1.75, Amateur Extra, $2.75. Similar to FCC tests. Amateur Radio Supply, 1013 Seventh Ave., Worthington, Minnesota.

SELL your microwave test equipment and communications equipment to Weston Laboratories, Inc., Littleton, Massachusetts. Highest cash prices offered or trade for new ham gear.

PRECISION-made, custom built antennas for all bands . . . literature available. Antenna, Incorporated, Wakefield, R. I.

WANT *QST*s older than 1920. Have 200 copies from 1932 to 1953 at 25¢ each. WØMCX Jablonsky, 1022 No. Rock Hill Road, Rock Hill 19, Mo.

WANTED: B & W coil type 80 TL. W2VMX, 17 South Surrey, Ventnor, N. J.

SELL: Complete station: 300-500 watts, cw-am 'phone, 10 thru 80 meters. Enclosed in steel cabinet and TVI-proofed. SX43 Hallicrafters receiver, 20 meter Hy-Lite Antennae Beam, including coax lines and prop pitch motor, desk, chair and spare parts. $500.00. Reason: Moved to California. W2NMM, J. Bertuch, 90 Brookside Ave., Mt. Vernon, N. Y. Tel. MO 8-8257

BETTER than new, looks new, Deluxe BC610E, BC614E. Little used, with commercial low-pass, Brute Force filters. No TVI. Coils 10 thru 80. Complete with spares and manual. Price, $600.00. W6COI, Box 322, San Jose, Calif. Phone: Axminster 6-6841.

COLLINS 32V2, 75A2 recvr, $900. Used less than 25 hours. Jones Micro-Match, $20.00; Baldwin phones, $7.50. McMurdo Silver 903 wavemeter all coils, $4.50. F.o.b. Dunbarton, N. H. A. J. Brizzolari, W1THM, R.F.D. 2, Dunbarton, N. H.

DELUXE QSLS. Petty, W2HAZ, 17 Southard, Trenton, N. J. Samples, 10¢.

GONSET Commander mobile transmitter and companion VFO. Never used, $110.00. Sonar MR3 mobile receiver with power supply, $65.00. L. Harrison, Bay Shore Boulevard, Rochester 9, N. Y.

FOR Sale: BC406A, 2-meter receiver with power supply. Two RF; four IF, 6V6 output; VFX680, NBFM/cw exciter, tubes, two crystals, three coils. Both in excellent condition; Make an offer. WØGSV, Scheuneman, 798 Sherburne Ave., St. Paul, Minn.

QSLS! Interesting samples, 10¢. Tooker Press, P.O. Box T, Lakehurst, N. J.

BARGAINS! New and reconditioned Collins, Hallicrafters, National, Hammarlund, Johnson, Elmac, Gonset, Morrow, Babcock, Harvey-Wells, RME, Millen, Lysco, others. Reconditioned S38, $29.00; S40A, $69.00; SX43, $119.00; NC173, $149.00; NC183, $199.00; HF-10-20, $49.00; VHF152, $49.00; VFH152A, $59.00; RME45, $89.00; Collins 75A1, $229.00; Meissner bandswitching VFO, $49.00; HQ129X, S76, SX71, SX42, NC125, HRO7, HRO60, NC183D, Collins 75A2, 32V1, 32V2, 32V3, many others. Shipped on trial. Terms. List free. Henry Radio, Butler, Mo.

VIKING II transmitter, for sale, 4 months old, like new, $270.00; 3-element 10-m. beam, $20.00; Eico tube tester, $25.00; tape recorder, Webster Eko tape, 6 rolls, 1200' tape, regular $222 value, $140.00. Gerard Moor, W1OGY, 53 Garland Avenue, Cranston, R. I.

FOR Sale: 5 — JAN 813, $30.00; 4 — New 5881, $8.00; new E.V. 210 Mic, $10.00; BC929A radar ind., $10.00; Chicago 1100 VCT, .212 A. with matching 5V 6A. fil., $15.00; 2 $\mu\mu$ 3 Kv oil-filled cond., $4.00; UTC output trans. PA-4L6 new, $8.00; Sylvania type mod. monitor, $10.00; W5HSO, Douglass, P.O. Box 35, Albuquerque, New Mexico.

10, 15 and 20 meter beams, aluminum tubing, etc. Perforated aluminum sheet for shielding. Radcliff's, 1720 No. Countyline St., Fostoria, Ohio.

FOR Sale: Sonar CFC vfo, $30.00; Eldico TR75-TV (807 final), modified for VFO, and with coax output, $35.00; Lysco A-129 mobile transmitter, $20.00. W2GAU, F. H. Atkinson, 150 E. 52nd St., New York 22, N. Y.

BARGAINS: 10-amp. Variac mounted with meters, etc.; speech clipper and power supply; 125-watt xmtr in cabinet. All at giveaway prices. Write for full details. W2IKZ, Faulkner, 136-05 Sanford Ave., Flushing, L. I., N. Y.

WANTED: Instructograph and Novice transmitter. Have two BC611D to sell or swap. Charles Holmberg, Ovid, N. Y.

COLLINS 32V-3 transmitter, $685; 75A-2 receiver and speaker, $335; Temco 65GA transmitter and spare new final, $250; SX28A receiver and speaker, $125.00; Amertran 6200V plate transformer, $39.00; complete PE103A, new, $25.00; new prop pitch motor with welded mounting plates, $20.00. Oser, W1RMS, 198 Euclid Ave., Waterbury 10, Conn.

SELL: Hammarlund PRO400X, complete, like new. Weston VOM, $35.00. New Electro-Voice mike, 210S, PTT SW cable, coiled, $16.50. Richard Long, 184 L Street, South Boston, Mass.

WANTED: Millen high frequency transmitter, #90810, complete with 2 and 6 meter coils and all tubes. Must be in excellent operating condition. State best price in your first letter. Have for sale three new 304TL's, $5.00 each. Jack H. Ashley, W4OSC, P.O. Box 254, Ware Shoals, S. C.

NOVICES: I am cleaning out my shack; free parts with each order while they last. Selling 300 watt phone/cw rig. ARC-5 transmitters, new and used standard commercial parts, A thru Z. Send for complete list or information. Maurice C. Ricks, W9QMJ, P.O. Box 701, Evanston, Ill.

NATIONAL NC-183D, 18 months old. Has had the best of care. Best offer over $200.00 takes it. Also HT-17, 25-watt xtal xmttr. coils for 80, 40, and 10: $35.00. Beals, W2MPB, 210 Jewett Ave., Buffalo 14, N. Y

WANTED: One up to ten Green Flyer phonograph motors, dual speed. Thomsen's Television and Audio Co., 513 Glenbrook Road, Glenbrook, Conn.

SWAP: pair 4-250A and sockets, new, for HT-18 or 15 watt VFO exciter. All band. F. Greene, 199 Jackson St., Newton Centre, Mass.

FOR Sale: Collins 32V3, Collins low pass filter, 75A2 receiver, speaker, crystal calibrator, and D 104G microphone. Purchased December 1952. Like new, and best offer over $950.00 takes it. Also have Gonset Triband, and Gonset Clipper. W2GVS, Bressler, 1901 Ave. P, Brooklyn 29, N. Y.

FOR Sale: Good used HQ129X, $110.00; almost new Tecraft CV-2 2-meter converter, $35.00; 425 volt, 375 mil, 6-volt dynamotor, $7.00. Hardy Benson, Jr., W5LJG, 3728 Gilbert St., Dallas 4, Texas.

S-40B receiver. As new, with phono and FM inputs, wired for Select-O-Ject (*Handbook*, 1952). Send-receive switch wired with 110V of any relay operation in send position. Make an offer. Also 16mm Keystone 300 watt projector, Model CC, and 32 cal. Savage automatic pistol. Swap for ham gear. Jaray, 36 Flower Lane, Roslyn Heights, N. Y. W2NEK.

TRADE: one Argus C3 35 mm. camera, good condx., with flash attachment, one Weston exposure meter (new) and up to $150.00 for a good National, Hammarlund, etc. receiver. Donald Pigg, 32A Glenwood Road, Baltimore 21, Md.

TAPEMASTER PT-125, $75.00. W8VVD, Smith, 467 Park Ave., Birmingham, Michigan.

SELL: BC457 xmitter, converter to 80 m, Xtal controlled. Less power supply and xtal, $12.00. Express collect. W1QXP, Dunnell, 32 Pine St., Exeter, N. H.

WANTED: SX42 and speaker, Williamson HI-FI amplifier. George Chernowitz, 705 Grand Avenue, Ridgefield, N. J.

WANTED: Rectifier power unit for LM-18. W3VES/1, % ARRL, W. Hfd., Conn.

URGENTLY wanted ART-13 finished or unfinished or any parts therefrom, to complete the one I have. Trade BC348-R, KW components or will pay cash. All letters will be answered. W9GPC, K. C. Horne, Steelville, Mo.

SELL: New Millen 90810 transmitter 11–10–6–2 meters, with tubes, coils, xtals for all bands, $100.00. Allan Murphey, W4JAG, Kentucky Utilities Co., Princeton, Ky.

FOR Sale: Twenty-two 12 volt motors, 300 volt 150 mil generator. Originally built for FM bus receivers. Will have more later. Best offer. Chronicle Pub. Co., Marion, Indiana.

QSL'S-SWL'S, samples, 10¢. Malgo Press, 1937 Glendale Ave., Toledo 14, Ohio.

FOR Sale: Back issues of *QST*, August 1920 through 1952. Sell complete. Make an offer. Mrs. Darrell Downard, Watterson Trail, Buechel, Kentucky.

MODULATION monitor. General radio broadcast type, $50.00. W2DSU, Merry, East Greenbush, N. Y.

FOR Sale: Supreme AF100 transmitter with coils for 80, 40, 20, 15, 10 meters, in excellent condition, with new spare final tube. See 1948 *Handbook*, p. 120 for description. Will ship in original crate: $275.00 F.o.b. Fayetteville, Arkansas. Also new, never used Electro-Voice 440 mike, $18.50. One used excellent condition Turner Model 87 mike, $20.00. One RM29A remote control, surplus, $10.00. Joe D. Olson, W5OXR, Box 1001, University of Arkansas, Fayetteville, Arkansas.

SACRIFICE: 3 used VFO shortwave machines, metered, for sale; 300 and 500 watt; conversion to transmitter simple; also one used 3200 volt C. T. power transformer: best reasonable offer accepted for any or all items. KN2BTF, Carl Koenig, 72–25 136th St., Kew Garden Hills 67, Long Island, N. Y.

SELL: like new, 32V3, $700; 75A2 xtal calib., FM, speaker, $400 or both, $1,025.00 F.o.b. Petersburg, Va. Hylite 10, 20 meter beam, $65.00; Millen Grid Dip, $45.00; Triplett Mod. #650 Vac-VOM, $50.00; 5–304 TL, $5.00 each; all parts ¾ kw pwr supply, $70.00; complete mobile station TBS 50, deluxe Triband Gonset antenna WE 375 Ma. dynamotor, all $140.00, misc. mikes, bridges, power supplies, modulation transformers and tubes. Price on inquiry. W4IWA, George Cottrell, 115 Shore St., Petersburg, Va.

SELL: 522 complete, modified, $30.00; 150 fone/c.w. xmittr, wooden rack T-55 final, TZ-40 modulators $75.00; 400-W fone/c.w. xmittr, pair 813's final; 811 modulators, paneled for rack-mounting, $125.00, also 274 N series xmitters and recvrs, spare tubes for xmitters included. Other gear and coax. R. H. McAfee, Sentinel, Oklahoma. Will trade for tape recorder.

HARVEY-WELLS reconditioned transmitters TBS-50D, $99.50; TBS-50C, $89.50; TBS-50B, $69.50; TBS-50A, $89.50; TBS-50, $79.50; Gonset Triband converters, $29.95; National SW-54s, $34.95; other used equipment available. Write for latest list. W1BFT, Carl, at Evans Radio, 10 Hills Ave., Concord, N. H.

HARVEY-WELLS Deluxe TBS-50D, fone and cw, 2–80 meters, 8 tubes, 50 watts, with APS-50 110-volt power supply. Used 19 hours, in first-class condition. Cost $177.00. Sell both for only $120. Stu Cowan, W1RST, 13 Mortimer Drive, Old Greenwich, Conn.

BARGAINS: Extra special: Motorola P-69–12, mobile receivers, $19.50; Globe King, $315.00; HT-9, $199.00; Supreme AF100 or Temco 75GA, $250.00; HRO-50, $275.00; 75A1, $250.00; SX-71, $169.00; S-76, $139.00; SX-42, $189.00; SX-43, $129.00; HRO Senior, $119.50; RME 2–11, $99.50; RME-45, $99.00; EX Shifter, $69.00; S-40A or SX-16, $69.50; VHF-152, $49.00; HF 10–20, $59.00; Globe Trotter, $69.50; MB611 mobile transmitters, $19.95; 90800 exciter, $29.50; DM–36–10 meter converter, $19.50; XE-10, $14.95; Gonset 10–11 converter, $17.50, and many others. We need used receivers. We give the highest allowances for S20R, S-40A, B; NC-57; NC-100; NC-125; SX-24; SX-25; HQ-129X, and similar receivers. Free trial. Terms financed by Leo, WØGFQ. Write for catalog and best deal to World Radio Laboratories, Inc., 740–44 West B'way, Council Bluffs, Iowa.

HALLICRAFTERS transmitters. Model HT-18. Brand new. Limited quantity available. Ideal for driving medium power tubes or as low power transmitter. All band operation. List: $110.00. Prepaid closeout price, $89.50. (Send 10¢ for large Surplus Catalog.) Surplus Center, 862 "O" St., Lincoln, Nebr

WANTED: Amertran 2650–0–2650 V 115 v. primary 2 Kw plate transformer. Also RCA surplus 1 Kw modulator transformer (500 watts output) with screen winding. Want two of each. State price. J. L. Roemisch, W2AHU, 364 N. Fullerton Ave., Upper Montclair, N. J.

3–6 Mc. ARC-5 receiver, in excellent condition, converted, $15.00. S. Kostenbauder, 309 Center, Milton, Penna.

WANTED: Viking II, VFO and other associated transmitting equipment. Top price paid. Hilton W. Long, Walpole St., Dover, Mass.

SELL Meissner 150-B transmitter with spares, $300.00, plus crating charge; National 5886 power supply, $25.00; RCA TMV-97-B R.F. signal generator, 90 kc. to 25 Mc. with TMV-128-A sweep modulator, $15.00 for pair; Clough-Brengle R.F. signal generator, 100 Kc. to 30 Mc. model OCA, $20.00. W4ES, A. O. Bliss, 2585 S. Bayshore Drive, Miami 33, Fla.

SELL or trade: Globe King, 400-A for Johnson Viking II Kit and Johnson VFO or monetary equivalent. Am in the service and need smaller outfit. Fred Park, W9VLF, 426 East State St., Paxton, Ill.

FOR Sale: 32V1 with spare 4D32, $410.00; SX71, $155; R42, $22.00; Gonset Triband, $25.00; ST203A, $35.00; Pentron Wire Recorder Radio, $45.00; all in excellent condition. F.o.b. Richland, Washington. W7RAG, A. Platt, 409 Hartford, Richland, Wash.

FOUR complete TV sets, 7", $35.00; 10", $45.00; 12½", $55.00; 14", $65.00; Millen SSB selector, $45.00. Will trade. W4API, Spitz, 1420 South Randolph, Arlington, Va.

ELECTRONIC key: Eldico, Model EE-1, $18.00 R. H. Holloway, W9AHP, RFD #2, Downers Grove, Ill.

50 Kc coils for your Super Q5er. Q 60 with 390 $\mu\mu$ capacitor. Similar to coils used in amplifier described in the March 1953 *QST*. $1.00 each, six for $5.50. Bob Seymour, 567 Elmgrove Drive, Elgin, Ill.

HAMPLATES: Your call letters on 5½ x 11 heavy aluminum with reflective Scotchlite background, $3.00 pair. Black letters on white background, $1.50 pair. Hamplates, Box 8366, Portland 7, Oregon

QSLS-SWLS. Attractive, reasonable. Samples 10¢. Refunded. Joe Harms, W2JME, 225 Maple Ave., North Plainfield, N. J.

BC-610E for sale with speech amplifier. Technical manual included, excellent condition, all bands, showroom appearance. Write to W5LVM, P. O. Ohlson, 7614 Maxwell Ave., Dallas 17, Texas.

NEW crystals for all commercial services at economical prices; also regrinding or replacement crystals for broadcast, Link, Motorola, G.E. and other types. Over 17 years of satisfaction and fast service. Eidson Electronic Co., 1902 No. Third St., P. O. Box 31, Temple, Texas. Phone 3-3901.

NEED Hallicrafters HT18 NBFM. Must be in good condition. State price. WØQVZ, Kelley, Box 765, Fort Dodge, Iowa.

FOR Sale: FL 8 filters, $2.00 ea. Heavy duty 60 cycle, 110 AC Autosyn motors, $4.00 ea. Xtal controlled 110–156 Mc receiver with 110 V AC power supply and squelch circuit built in, $35.00. Thordarson T50176 5 volt at 206 amps, 230 V primary. Collins plate transformer 2600-0-2600 at 300 Ma, 230 V primary. Amertran driver transformer, #27271. Wanted: Leece-Neville alternator, RCA KW modulation xfrmer, 4-250 and 4-400 tubes. M. D. Haines, W5QCB, 1316 S. W. Military Drive, San Antonio 4, Texas.

MUST sell Hallicrafters HT18 VFO, excellent; Millen 90810 VHF transmitter coils tubes, Tecraft 2-meter converter, new; Globe King 400B coils, break-in, TVI-proof, tubes, like new; Crown rotator, perfect; Mims rotator, Sonar SR9 10 meter receiver, never used. Going to school. Larry Hess, W8GTT, 2576 Edgerton Road, University Heights 18, Ohio.

WANTED: RCA Thermin any condition. Elmer Turner, W1TF, 512 Fellsway, East, Melrose, Mass.

STATE Map postcards, also lithographed postcards from your photo or drawing for QSL, QTH and WAS confirmations. Ward-Sharp, 56 Kendall Ave., Rutland, Vt.

SALE: Complete mobile rig, 50-watt transmitter band-switched remotely from 10 to 75 meters. PE103 dynamotor, Gonset Triband converter with noise clipper, matching remote control head with Shure push-to-talk mike, Morrow SC-10 generator filter, crystals. Master Mobile heavy duty mount, 8 ft. whip antenna with base load. All equipment is clean and guaranteed to your satisfaction. Best offer above $125.00. 1 Kw transmitter complete with BC696 and BC459 exciters, 100TH buffer, 304TL final, 100THs modulator, speech amplifier, 2 2000V @ 600 Ma. power supplies. 12 meters. Write for further information. Best offer above $250.00; F.o.b. Glenwood, Iowa. R. H. Knox, 608 N. Locust, Glenwood, Iowa.

NOW Available, immediate delivery, two meter crystal controlled converters, wired and tested, $12.00; with tubes and crystal, $17.33. Phone transmitter pre-assembled kits, $34.50. Write for specifications. LW Electronic Laboratory, Route 2, Jackson, Michigan.

WANTED: ART-13 transmitter, DY-17 dynamotor, ARC3 receiver, transmitter, GN-58 hand generator. Sell: LM freq. meter with modulation, $65.00; 21A teletype printer, $50.00. RBL receiver, $85.00; S-27 receiver, $75.00; BC-610-E, complete. Tom Howard, W1AFN, 46 Mt. Vernon St., Boston 8, Mass. Tel. Richmond 2-0916.

FOR Sale: Bud CR1772 relay rack cabinet, completely assembled with six front panels including meter panel and three meters; with power supplies for 450 watt rig. Buffalo area only. Cannot ship. Available for inspection. Price $100.00. Contact W2KEL, Tisdale, 170 Ridgewood Road, Buffalo 20, N. Y.

WANT BC 610. Can be less power supply and/or modulator. G. K Woods, 1200 Jefferson Davis Highway, Arlington 2, Va.

WANTED: ARC-5 or 274N Command transmitter. Range 1.3 to 2.1 Mc. State price and condition. Roy Scherman, W9FHS, 4640 Kasson Ave., Chicago 30, Ill.

50 WATTER. Millen 6L6-807 RF, modulated by PP 6L6s, two high voltage supplies all in 2 ft rack. Needs little work. Bargain at $45.00. Edward F. Lear, W2VTQ, 32 Rock Lane, Levittown, L. I., N. Y., LEv. 9-3569.

WANTED: Coils for Collins 30J transmitter. Any band. T. L. McAlister, W5HDU, Box 516, Morton, Texas.

BOEHME continental code tape transmitter with speedometer and driving mechanism, $50.00. RCA police superhet AC receiver, 28–42 Mc, $25.00. 20 meter beam rotator, half-horse motor, $25.00. F.O.B. Washington, D. C. Borsody, W2AYN/4, 1413 No. Barton, Arlington 1, Va.

LOOK Here, Fellas! Hamfesters Radio Club of Chicago announces its 19th Annual Picnic and Air-Mobile Meet August 9, 1953, at Mance Park, ¼ mile east of Route 45 and ¼ mile south of Route 66 (Stinson Airport). Donations, $1.50. J. Ruth, W9GVO, Chairman, 4460 Oakenwald Ave., Chicago 15, Ill. Free parking of planes at Stinson Airport, but pilots must furnish their own tie-downs. Food, ice cream and beverages available. Treasure hunt and games for kiddies. Hammo and hamfesters style prize-table. Plenty of tables, parking space.

JAZZ Records! Have over 10,000 collector's items, Dixieland to Bop, for trade. Want high power fone rig, Viking II, good receiver or what have you? Also have new Argus C-3 with telefoto lens, filters and light meter to trade. W6PXE, Stein, 6201 Glen Oak, Hollywood, Calif.

MON-KEY, new, $20.00; Carter V-420 6 volt Dynamotor, 425 volt, 200 Ma. output, $20.00; new tubes 813, $6.00, 829B, $8.00; 250TL $10.00; 807, $1.00, 815, $2.00; 872A, $1.00; coin operated radios, good condx, $15.00; Candler System code course, like new, $10.00; Electro-Voice, good dynamic mike, $8.00. W4SOR.

FOR Sale: Temco 75GA xmitter in A-1 condx, $250.00. Also cleaning house. Send for big list. Wilkerson, W6ODD, P. O. Box 776, Camarillo, Calif.

I Need transmitters and receivers. Trade your old gear on a new Hallicrafters SX-88, or HT-20, Hammarlund HQ-140X, Barker & Williamson 5100, Elmac, Gonset, National, RME, Sonar, etc. Highest trade-in allowance. Convenient terms. Fast four hour shipping service. Dossett, 855 Burlington, Frankfort, Ind.

866A KIT, two tubes, sockets and transformer, $4.98; Diodes 1N34. 10 for $5.98; T2FD antenna resistor, 400 ohm non-inductive, $2.49. "Tab" sells and trades radio parts and cameras. Write for Tabogram. "TAB", 111 Liberty St., New York 6, N. Y.

QSL's. We have printed a million. Samples 10¢. VVS Print, Vern Slagle, 1704 Hale Ave., Ft. Wayne 6, Ind.

WANTED: ART-13, ATC, DY-12, DY-17, and any parts any condition. ARC-3, APN-4, APN-9, ARC-1, BC-348, BC-342, BC-312, ARN-7, SCR-694, Collins 32V-1, 32V-2, 75A-1, TCS, BC-639, BC-939, BC-223, RA-34, RA-62. RTA-1B, APR-4, APR-5. Teletype equipment, technical manuals, tubes. Will trade for new ham equipment. Alltronics, Box 19, Boston 1, Mass. RIchmond 2-0916.

QSLS-SWLS, as low as $1.50 per color. Samples dime. C. W. Stronberg & Son, P. O. Box 151 Highland Station, Springfield 9 Mass.

OLD *QSTS*: Have broken runs of files from 1917 through January 1953. Rare chance to fill those gaps in yours. Will sell singles or entire file. State wants. Best offer only, and first come first served. Mrs. I. Creaser, 76 Cortland St., Springfield 9, Mass.

FLASH — Broadband multi-Z Antenna, *QST* 1953, the R.I. Hamkits 20M, $6.50; 40M, $8.50; 80M, $10.50; 160M, $14.50. Bronze wire, clear plastic spreaders. Postpaid. Antenna, Inc., Wakefield, R. I.

RTTY. An amateur teletype, monthly bulletin, $1.80 per year, available from Southern California Radio Teletype Society, 3769 East Green Street, Pasadena 10, Calif.

FOR Sale: Ham receivers, lowest prices. WØMLB, Box 4, Kearney, Nebraska.

FOR Sale: AR88LF receiver, in excellent condition: $195.00. Delivered free, price $185.00 within 100 miles of Minneapolis. All queries answered. J. W. Cronn, W2RDD/Ø, 7125 Knox So., Minneapois, Minn.

FOR Sale or trade: Brand new, complete Jerrold Mult-TV Master System. Want $150 cash or will trade for low power c.w. transmitter. Peck, W2OIF, 143 State St., Auburn, N. Y.

WANTED: SX42 and speaker. Williamson Hi-Fi amplifier. George Chernowitz, 705 Grand Ave., Ridgefield, N. J.

FOR Sale: 4–125 transmitter in 66" cabinet; Panadapter; 10–11 Gonset; BC522 transmitter, receiver; BC453, BC454, BC455 receivers; Leece-Nevill 100 amp. alternator, complete; BC645 transmitter, receiver; 696 mobile transmitter, modulator with instant filament tubes. C. Sanford, W5OLC, 6339 Lavendale, Dallas 30, Texas.

WANTED: RCA Kw modulation transformer, with screen-grid winding, and pair 810's. State price. R. W. Jordan, WØCIG/5, R. W. Jordon, 3321 Commerce Ave., Houston, Texas.

SELL Marconi PV-500-HF Canadian naval transmitter, 3 to 19 megs, continuous coverage. Phone or Cw, 500 watts output PP810's, primary power 110 volts 25 amps, single phase. Complete band-switching ECO or xtal. Perfect condition. Price: $1850. Complete details from VE7RV, D. W. Meakin, 6807 Angus Drive, Vancouver, British Columbia, Canada.

VFO for Viking. Over 10 mills drive, 80 through 10 meters. Stable, in 6 x 6 x 6 cabinet. With plugs, $25.00. F.o.b. W1IKW.

FOR Sale: All components S.S.B. unit, mounted and in cabinet, two 807 final, crystals, two meters, $65.00. Hundred sixty meter constant modulation, two 807 final, mounted on chassis and panel, two meters, two power supplies including one thousand volt for final, $45.00. All F.o.b. Roanoke, Va. Write to W4CA, Wohlford, 846 Campbell Ave., S.W.

SELL: FT-241A crystals 100 pcs, mixed, for $25.00. First check received. J. T. Chen, 26 Kate Lane, Metuchen, N. J.

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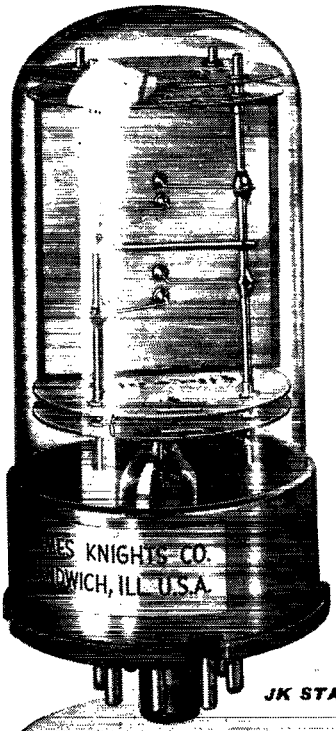

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The JK G-12 is a precision 100 kc G-T cut crystal intended for operation in Meacham Bridge and similar oscillators. Available for operation at series resonance or into large load capacities. Resistance approximately that of usual lamp used for amplitude stabilization, simplifying bridge circuit design. The JK G-12 is vacuum sealed. Equipped with octal base it is more convenient than usual "soldered-in" type of precision standard crystal. Suitable for transistor oscillators. Will fit JK 07EH temperature control unit. Consult us on specific applications.

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Into this situation, Lieutenant Colonel Davis boldly led his Marine battalion. Over eight miles of heavily defended icy trail they attacked, and across three ridges deep in snow.

They fought three days and nights.

But finally Colonel Davis reached and freed the company. He opened the pass and held it till the two regiments got by. Then, fighting through the last of the enemy and carrying his wounded with him, he led his own gallant battalion into safety.

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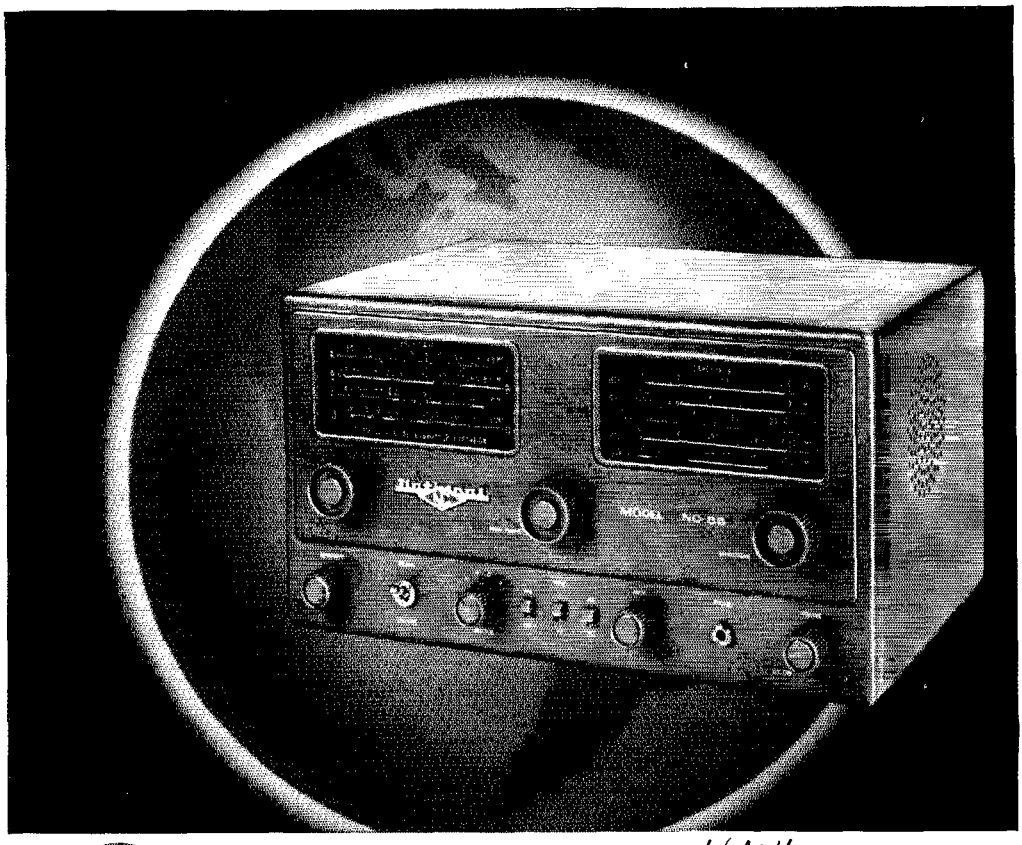

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These rugged, RCA-developed *VHF* beam power tubes have no equals for mobile or emergency rigs. Because of their high efficiency and high power gain, they require less drive and deliver more output at lower plate voltage, than any other similar types of comparable price range. Translate these advantages into practical results and they spell *power economy, more watts per dollar, and compact transmitter design.*

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