QST

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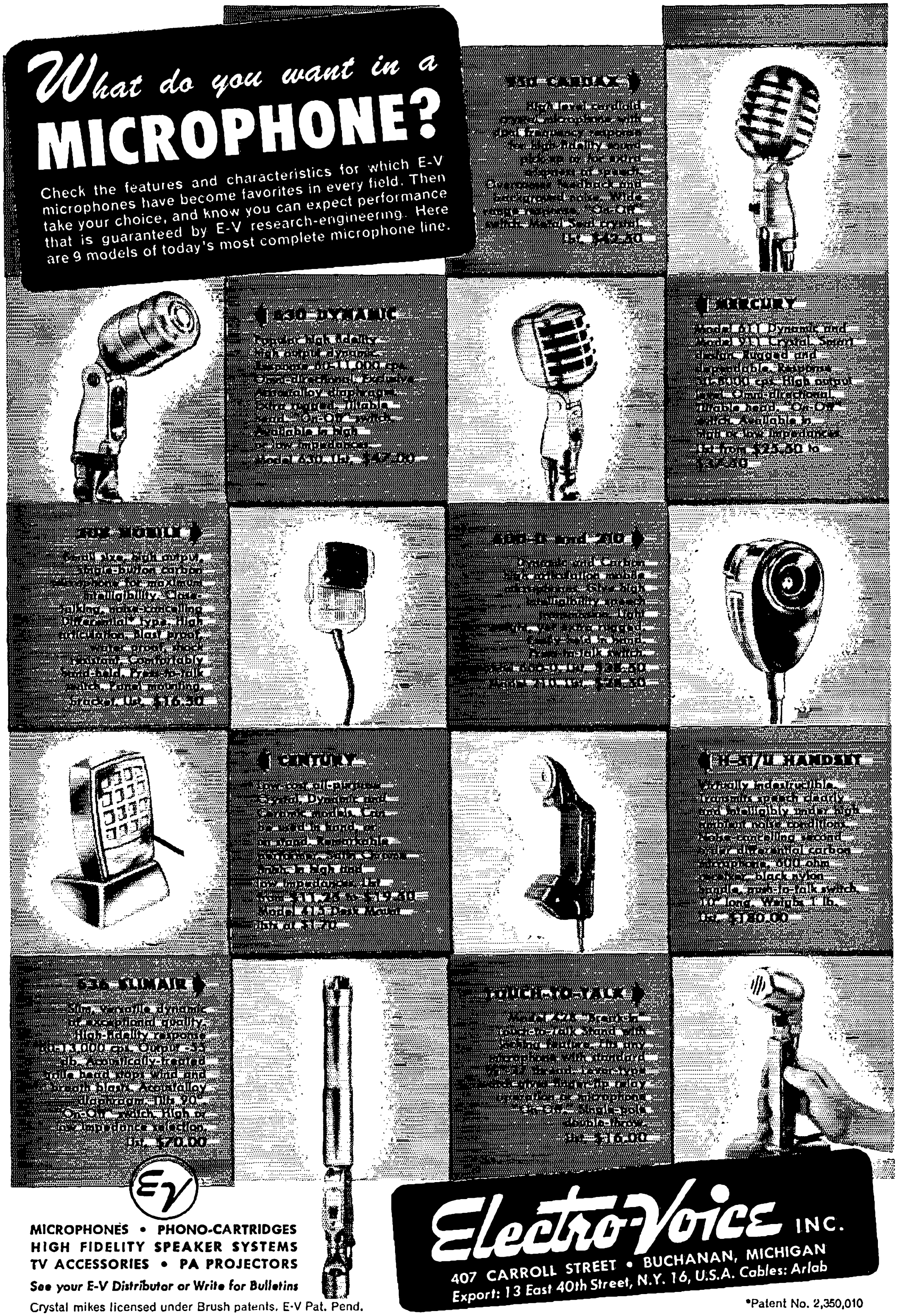
amateur radio

August 1953
40 Cents
45c in Canada

PUBLISHED BY THE AMERICAN RADIO RELAY LEAGUE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Check the features and characteristics for which E-V microphones have become favorites in every field. Then take your choice, and know you can expect performance that is guaranteed by E-V research-engineering. Here are 9 models of today's most complete microphone line.
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Two GL-813's . . . better-built, better-shielded . . . will help you log those elusive contacts overseas.

● **PLENTY OF POWER**—beam power, meaning low drive! It's a GL-813 characteristic, as amateurs know. The r-f wallop that's so desirable for DX hunting will be found in the 800-w phone input (ICAS max) of two GL-813's, or 1-kw CW input. Yet you need only 8 to 9 w drive either way!

THE BEST-BUILT 813 . . . in those details that save you time, trouble, and circuitry! One example of G-E superiority is the large ground-plane barrier that shields the tube internally. It helps protect from feedback—does away, in most cases, with the need to neutralize. Precision-made grid structures, special factory testing at every stage: these and other plusses give you a power tube that will serve as your dependable partner around the clock.

ASK YOUR G-E TUBE DISTRIBUTOR to show you a GL-813! Study the tube for its superior features and workmanship. A pair will be a gilt-edge investment for your DX work this fall and winter. *Tube Department, General Electric Company, Schenectady 5, New York.*

NEXT MONTH: TERMS OF THE 1953 EDISON AWARD!

● Tribute again will be paid to all radio amateurs by General Electric's Edison Award for 1953. Terms of the Award will appear on this page in the September issue. The winner, in addition to a handsome trophy and a valuable gift, will receive national recognition for performing outstanding public service.

You can help to honor amateurs everywhere by proposing a suitable candidate for the Edison Award. Get ready to make your choice, in order to prepare and mail your nominating letter!

ELECTRONIC TUBES OF ALL TYPES FOR THE RADIO AMATEUR

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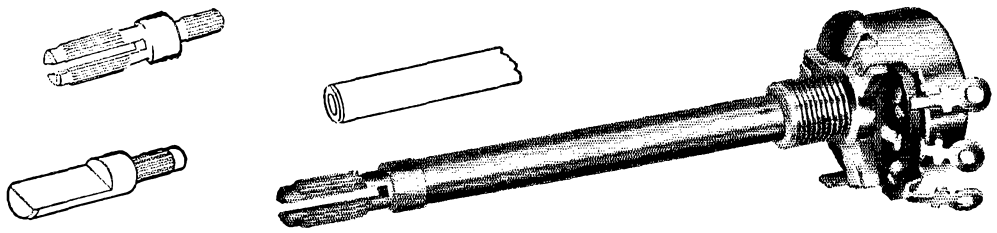
166-188

MALLORY HAM BULLETIN



Designed And Constructed For Maximum Usefulness To The Amateur . . . The Mallory Midgetrol*

There is no question but what the physical size of a volume control, as well as the length, diameter and contour of its shaft, determine to a great extent its usefulness to the amateur for building new radio equipment or repairing old.

Mallory engineers very definitely recognized the importance of these factors when they designed the Mallory Midgetrol series 15/16" diameter carbon controls, for these controls were designed specifically for maximum usefulness to the amateur (and for that matter, to the industrial or professional radio service user as well).

Practical imagination plus good old-fashioned engineering ingenuity went into the Midgetrol to give you a versatile control whose physical size (15/16" in diameter) is small enough to fit the most miniature portable equipment, yet whose electrical characteristics make it entirely suitable for the largest communications set.

Far-sighted engineering has also given you a sensible, *permanently fixed, plain round brass shaft*, which may be altered quickly and effectively to accommodate standard "split-knurl" or "flatted" type knobs without sacrificing the highly desirable advantage of a stable, permanently fixed shaft. (Every round shaft Midgetrol is delivered complete with two unique steel "shaft-ends" which may be pressed permanently into the brass control shaft to accept common knob styles. No filing or unusual handling of the control shaft is required.)

In addition, the unique Midgetrol design has virtually licked the old and annoying problem of unsatisfactory AC switch installation, for an ingenious arrangement for locking the switch permanently and solidly into place has eliminated forever the annoyance of having to remove the control housing to attach the switch. Actually, a switch can be attached to a Midgetrol in much less time than it takes to tell about it.

When you go to see the Midgetrol at your Mallory Distributor's, don't expect a flashy, spectacular volume control, for the Midgetrol was not designed to be that kind of control. Instead, you're going to see a sensible control, designed to do the things a good volume control should do, and yet be as universal as possible without sacrificing a thing in good engineering fundamentals.

Frankly, we're extremely enthusiastic about the possibilities this round shaft Midgetrol has for amateur work, and we think you will be too, when you see it.

*Midgetrol—Trade Mark

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QST

AUGUST 1953

VOLUME XXXVII • NUMBER 8

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

OFFICES

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Entered as second-class matter May 29, 1919, at the post office at Hartford, Connecticut, under the Act of March 3, 1879. Acceptance for mailing at special rate of postage provided for in section 1102, Act of October 3, 1917, authorized September 9, 1922. Additional entry at Concord, N. H., authorized February 21, 1929, under the Act of February 28, 1925.

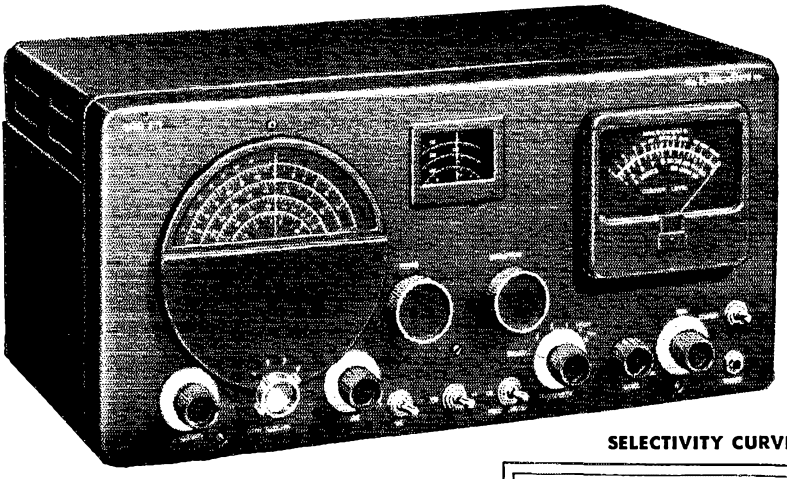
INDEXED BY
INDUSTRIAL ARTS INDEX

—CONTENTS—

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

AND YOU'LL CHOOSE

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



Model S-76

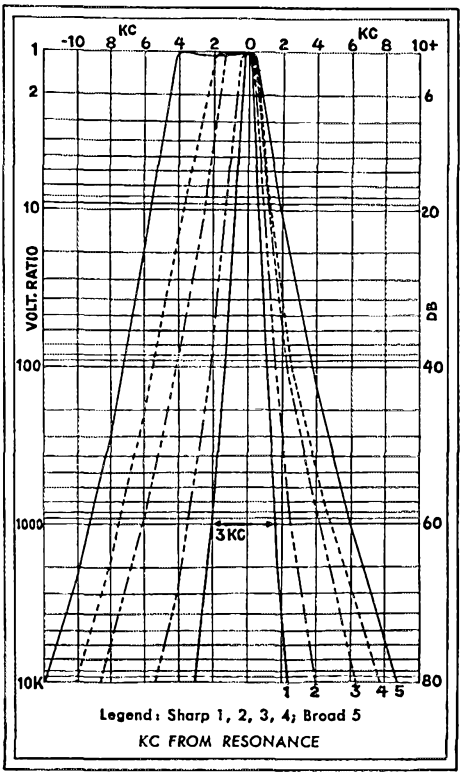
Double conversion receiver. Broadcast Band 538-1580 kc plus three short-wave bands covering 1720 kc-34 Mc.

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

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

For 105/125 V. 50/60 cycle AC
Use R-46 speaker **$179.50**

SELECTIVITY CURVES, S-76



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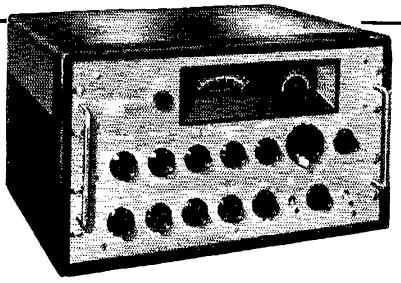


Model HT-20. T.V.I. suppressed 100 watt AM-CW transmitter with all spurious outputs above 40 Mc at least 90 db. below full rated output.

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

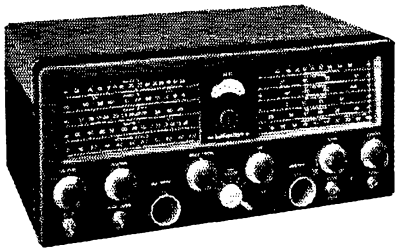
For 105/125 V. 50/60 cycle AC.....**$449.50**

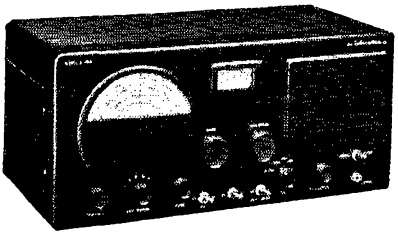
Model SX-71. Covers Broadcast Band 535-1650 kc plus four short-wave bands covering 1650 kc-34 Mc and 46-56 Mc.

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

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

For 105/125 V. 50/60 cycle AC.....**$224.50**





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

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

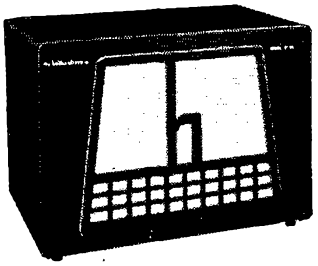
S-40B For 105/125 V. 50/60 cycle AC **$119.95**

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

32 lbs. **$119.95**

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

Satin black steel cabinet matches all Hallicrafters receivers. Cloth covered metal grille. 15" x 10⅞" x 10⅞" deep. Shipping weight 17 lbs. **$19.95**



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Section Communications Managers of the ARRL Communications Department

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

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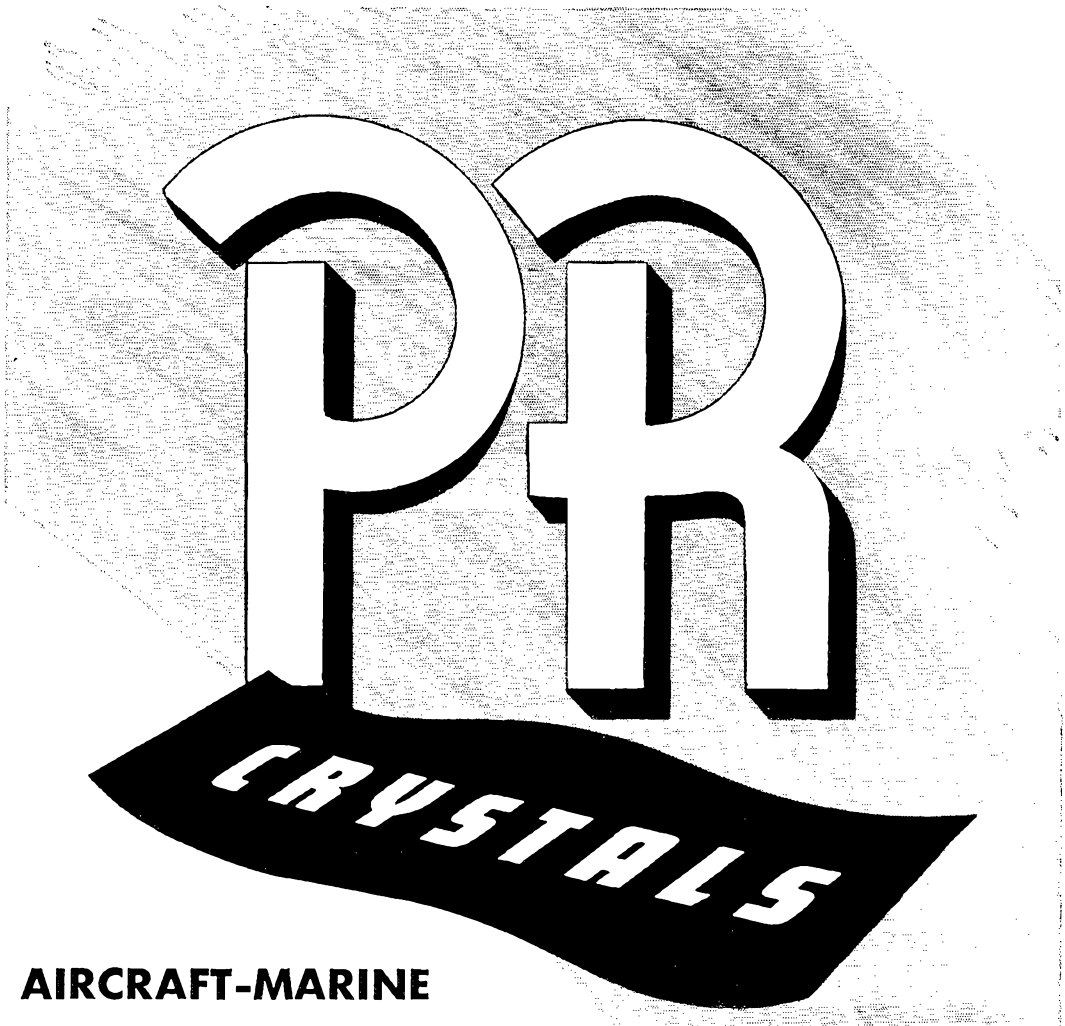

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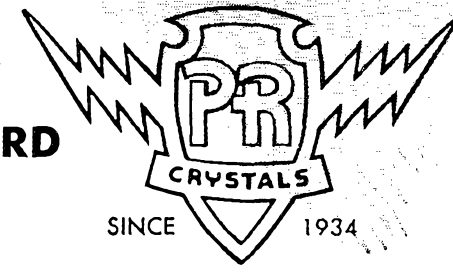

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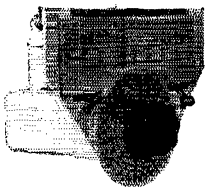
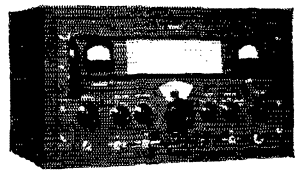


70E-8A Permeability Tuned Oscillator — The versatility, accuracy, stability and voltage coefficient that distinguish a good v.f.o. are standard in the 70E-8A. Every component is highest quality — meets strict specifications. 16 turns of the vernier dial cover the linear range of 1600 kc to 2000 kc. Use in exciter or measuring instruments for truly professional performance. You can depend on it to give you long service free from trouble.



32V-3 VFO Transmitter — A bandswitching, gang-tuned amateur transmitter. Rated at 150 watts input on CW, 120 watts phone, this little receiver-size rig has the kick of a kangaroo, and its excellent audio provides extraordinarily good readability. The 32V-3 covers the 80, 40, 20, 15, 11 and 10 meter ham bands. It is thoroughly filtered and shielded to minimize the possibility of TVI.

KW-1 Transmitter — Engineered for maximum power allowed by your license. Its input is a full 1000 watts on phone or CW. The entire transmitter, including power supply, is in one attractive cabinet. Complete bandswitching of the exciter, driver and power amplifier by a single control on the front panel. It covers all bands from 10 through 160. TVI reduction is accomplished by well engineered shielding and filtering. It's as easy to handle as a 32V-3.

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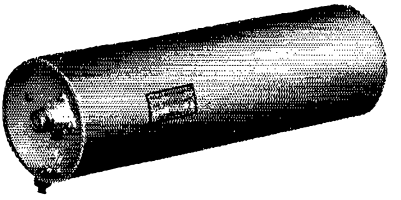

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is a noncommercial association of radio amateurs, bonded for the promotion of interest in amateur radio communication and experimentation, for the relaying of messages by radio, for the advancement of the radio art and of the public welfare, for the 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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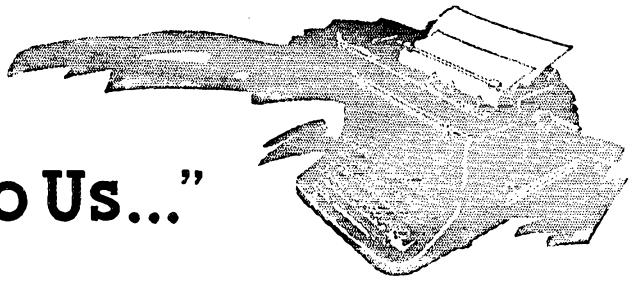


"It Seems to Us..."

QSL BUREAUS

Since 1933 — just twenty years ago — the ARRL QSL Bureaus have been serving amateurs in the United States, its possessions, and Canada — League members and non-members alike. A minimum of six times a year since, *QST* has carried a running announcement of how the system works and what to do to get cards. Yet there is evidence of unfamiliarity and misunderstanding of the system. Our QSL Managers tell us of the stacks of unclaimed cards in their files, and some of the QSLs are mighty juicy. The W2 QSL Manager recently estimated that unclaimed cards in his bureau form an impressive stack some forty-one feet high. Perhaps we're more anxious than some of you are that these paste-boards reach their destinations! Anyway, here goes with a summary of how our QSL Bureau system operates. We hope that the sale of No. 10 envelopes skyrockets shortly after this issue of *QST* reaches the membership.

Cards arriving at headquarters in bulk from foreign countries are sorted by U.S. call areas, Canadian provinces, and U.S. possessions, and then packaged and mailed to the various QSL Managers, one for each call district. Upon receipt of these cards, or others mailed directly to them by foreign amateurs and societies, the QSL Managers sort them by call letters, placing them in the envelopes filed by you amateurs. Envelopes are mailed out when a sufficient number of cards have accumulated to make use of the postage affixed to the envelopes.

Our QSL Managers are a busy bunch, volunteering their time to help guys like you and me obtain the necessary cards for WAC or DXCC. Some of them handle thousands of QSLs each month, leaving little time for hamming. It will be to your QSL Manager's advantage, as well as your own, to follow these simple rules. If you work any DX at all, place an envelope on file with your QSL Manager. Use a standard No. 10 envelope with postage affixed, with your full name and address written on the front and with your call letters typed or printed in the upper left-hand corner. If you have ever worked DX under another call, make sure that an envelope is filed with the QSL Manager of that district, also. Some of the gang keep two or three envelopes on file. The important thing to remember is that you should replace each envelope used by your QSL Manager in forwarding your QSLs. Alternate issues of *QST* list our QSL Managers under the heading of ARRL QSL Bureau.

The present QSL Bureau system is the result of a very successful experiment performed back in 1932 and 1933. Originally, when amateur radio had first spanned the Atlantic and DX QSLs made their first appearance, headquarters acted as the distributor for all QSLs not mailed directly to the addressee from a foreign amateur. In those days QSL cards and SWL cards were not too numerous. As more and more DX QSOs took place and more cards came into headquarters, we were finally forced to discontinue the forwarding of SWL cards in 1932. This was when we were really beginning to feel the "squeeze" from the work necessitated by a rapidly increasing number of foreign cards. At the same time we realized that sooner or later we would be facing a serious problem in our QSL forwarding. A system was conceived that looked like a good solution to the problem. We had carried on some correspondence with a W2 on this QSL business, and when he happened to drop by for a visit, the idea was explained. It involved a system of district QSL Managers who would receive cards from headquarters, sort them, and mail them to amateurs who had supplied them with self-addressed envelopes. The W2 agreed to give it a whirl, and all League members in the second district were written a letter which explained the plan and requested them to mail an envelope to W2AEN if they wished to receive their DX cards. If the test case worked we would ask for volunteers in other districts. During ten months of trial, the operation was completely successful.

Twenty years ago, the March, 1933 issue of *QST* carried an announcement of the new ARRL QSL forwarding service. The new service wasn't the granddaddy of our present QSL Bureau system — it was the same system we have today, and for twenty years it has been ticking like clockwork. In that early issue of *QST* our first volunteer QSL Managers were listed. One of them was H. W. Yahnel, W2SN, and since that date W2SN has handled a fabulous number of cards. "Hank" had done a terrific job through the years in forwarding

the cards that have brought fancy DX certificates into many a W2 ham shack. Another pioneer of the QSL Bureau system is W. Bert Knowles, VE3QB, who signed up as soon as the service was extended to Canada in August of 1933.

Our QSL Managers appreciate a word of praise now and then, and they deserve every bit of it. Additionally, they appreciate the kind of coöperation that makes their job a little easier and at the same time increases the efficiency of the system. We like to help them as much as possible, but the main help can come only from you. The best thing you can do for your QSL Manager, and for your own countries confirmed tally, is send in that envelope. In all probability, there are some cards waiting for you at your QSL Bureau.

A.R.R.L. ELECTIONS

As part of its democratic structure, the League provides for an annual election of directors and vice-directors. Elections are staggered, half of our sixteen divisions holding elections one year and half the following year. Each director and vice-director is elected for a two-year term. A director, as the representative of the amateurs in his division, is responsible for soliciting their opinions and suggestions and bringing them to the attention of the other directors in session at their annual meeting. From the letters you fellows write your directors, from the suggestions you offer at club meetings and hamfests and conventions, League policy is formulated. Your new idea may be responsible for a change in Board policy — that is, if the fifteen other directors feel that your suggestion is good. And how they feel depends on how *their* amateurs feel.

We would like to have a penny for every letter we have received intimating that the headquarters staff decides ARRL policy. This is not true. None of the headquarters personnel has a vote at Board meetings. You people are the policy-formers and when we on the staff carry out the policies of the Board, we're carrying out your orders.

Elections for director and vice-director are coming up in half of our divisions this fall. This is to remind you that careful consideration should now be given your present directors and vice-directors as well as likely candidates for these important posts. Supporters of directors and vice-directors now in office should see to it that petitions nominating these gentlemen for reëlection are filed. Those who intend to back new candidates should circulate petitions to insure that such candidates are nominated. Don't wait for someone else to start the ball rolling. You may be disappointed.

Each nomination for director or vice-director must be in the form of a petition signed by at least ten Full Members of the League. And all petitions must be received at headquarters not later than noon, September 20th. A detailed explanation of nominating procedure may be found on page 48 of this issue. By all means, read it. If you're inclined to do any nominating, get started with a petition now. And when election time rolls around in a couple of months, vote for the man of your choice.

OUR COVER

If you like to build your gear in experimental fashion first, you'll appreciate the ease and speed with which you can "snip and solder" a form-fitting chassis of "hardware cloth." W2CGN gives several examples of this technique on page 44 of this issue.

Strays

Clipped by W4IJM from a UP dispatch in the Miami *Daily News* concerning ARRL's summer-scheduled TVI-clinic tour: "The tour will . . . end in Indianapolis, July 23rd. Nearly every city with *low-brand* channels will be covered." [Italics ours.]

—•••—

Two of W8NAF's QSLs were carried from Wright-Patterson Air Force Base, Ohio, to Washington, D. C., and back on the 30th of May by the first jet-carried U.S. mail. Time of departure at Dayton was 3:54 P.M. and time of arrival, Washington, 4:48 P.M.

—•••—

Five v.h.f. stations, seven microwave stations and 75 mobile units help keep traffic moving over the 118-mile New Jersey Turnpike. Each mobile station carries a fixed 2-element Yagi beam, the directivity of which can be reversed by merely throwing a dashboard toggle switch. This was among aspects of the turnpike's complex communications system discussed by Paul F. Godley — "Paragon Paul" of 1920s' amateur Transatlantics fame — at a summer meeting of the American Institute of Electrical Engineers.

—•••—

The latest (third) edition of the popular booklet titled *Television Interference* is now available, as announced by Remington Rand's Laboratory of Advanced Research. Its collection of articles, many newly added, are arranged chronologically. *Television Interference* deals with all phases of TVI and its preface suggests certain sections for study by the TV viewer, TV serviceman, TV engineer, radio amateur, power company engineer and industrial engineer. Since the appearance of the first edition in 1951, material for which was compiled through the efforts of Phil Rand, W1DBM, now ARRL Technical Consultant, the booklet has become an invaluable reference on the subject of TVI. For your copy, send twenty-five cents in coin to cover postage and handling charges to: Miss Anne Smith, Remington Rand, Inc., 315 Fourth Ave., New York 10, N. Y.

Low-Noise R.F. Amplifiers for 144 and 420 Mc.

Using New TV Tubes for Improved V.H.F. Receiver Performance

BY EDWARD P. TILTON,* W1HDQ

• **The mass demand created by television has resulted in the development of new tubes that are capable of surprising performance at 144 Mc. and higher frequencies. Here are r.f. preamplifier designs that will bring v.h.f. and u.h.f. reception up to a level that was impossible with any moderately-priced tubes we've had heretofore.**

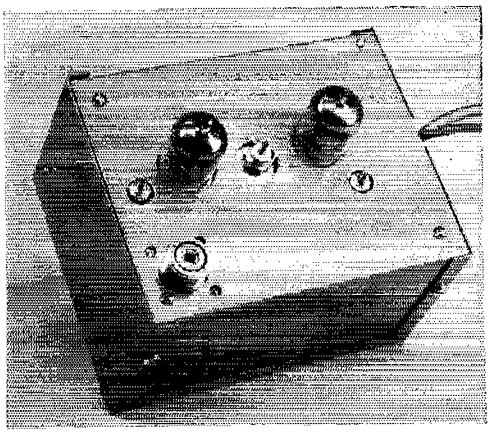
TELEVISION has been blamed for many things, but we should not overlook the fact that mass acceptance of TV as an entertainment medium has brought certain benefits to amateur radio. Today we find ourselves with new or improved tubes and ingeniously-designed components that might never have been made had it not been for the demand created for them in the TV field.

Among the more recent dividends of this nature have been several new tube types designed especially for u.h.f. TV applications. The 6AJ4, 6AM4 and 6AF4 are particularly interesting to the ham who is striving for better reception at 144 Mc. and higher. These tubes were developed for use as r.f. amplifier, grounded-grid mixer and oscillator, respectively. As we were interested in r.f. amplifier service, only the first two types were tested. They are 9-pin miniatures, identical as to base connections, and similar as to operating conditions, so trying either one is done readily enough. The 6AF4 has a 7-pin base, and is a low-g_m triode not particularly well suited to amplifier service.

Two experimental amplifiers were built. One is a two-stage preamplifier using the series cascode circuit for operation on 144 Mc., the other a grounded-grid single-stage job for 420 Mc. Both show performance that will be of interest to anyone who is trying to improve weak-signal reception on these bands. The 2-meter amplifier has a slight edge on anything tested here previously. It is capable of bringing converter performance up to the point where external noise is the principal factor in weak-signal reception, even in a quiet location. The grounded-grid 420-Mc. amplifier showed a noise figure well below that of an earlier design built around a 6J4.[1]

The superiority of these new tubes begins to be evident around 144 Mc., and it increases with frequency. At 50 Mc., for instance, a noise figure under 3 db. is obtained quite readily with a triode-connected 6AK5 working into a grounded-grid 6J6, as shown in *QST* [2] and all recent editions of the *Handbook*. This combination works well at 144 Mc., but if we try to go to 220 with it there is a considerable drop in effectiveness. A 6BQ7, 6BK7 or 6BZ7 will give somewhat better results than the 6AK5-6J6 combination at 144 Mc., and is markedly superior at 220 Mc. (These three dual triodes were developed to enhance the performance of TV tuners that cover the range 54 to 220 Mc.) Since the 6AK5-6J6 cascode is capable of such good performance at 50 Mc., there is no point in going to the newer tubes at that frequency unless aims such as greater circuit simplicity are served.

At 144 Mc. nearly all of our tubes are beginning to hit the downward slope of their noise-figure/



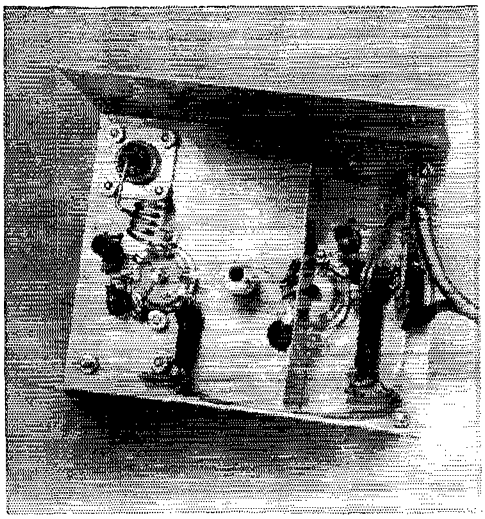
Two-meter preamplifier using two 6AJ4 tubes. Adjustments are (*left to right*) input tuning capacitor, slug of neutralizing winding, and the plate tuning capacitor of the second stage.

frequency curves, though the three dual triodes mentioned above are still very good there. The 6AJ4 and 6AM4 were designed to work well up to 900 Mc. or more, so they are capable of excellent performance at 144, 220 or even 420 Mc. The results obtained with the two amplifiers to be described bear this out very plainly. The advantage in using the 6AJ4 or 6AM4 at 144 Mc. is slight, though measurable. But at 420 Mc., the margin is such as to make a very real difference in receiver performance over that obtainable with any tubes hams could buy heretofore at moderate prices.

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

[1] Tilton, "R.F. Amplifiers for 420 Mc.," *QST*, Jan., 1952, p. 28.

[2] Tilton and Chambers, "Crystal-Controlled Converters for V.H.F. Use," *QST*, Sept., 1950, p. 11.



Interior view of the 144-Mc. r.f. amplifier. A small shield across the second tube socket isolates the input and output circuits. The amplifier is built on a copper plate, which is then fitted to the top of a standard aluminum utility box.

The 2-Meter Amplifier

The 144-Mc. preamplifier shown on this page started out as an experiment, so it was built on a flat sheet of flashing copper to make it easier to work on. When the desired results were achieved this copper plate was fastened to the top of a $3 \times 4 \times 5$-inch aluminum utility box to give the amplifier a finished appearance. The parts could be mounted directly on the box in duplicating the original, though the plate method makes for greater ease of wiring and assembly.

Looking at the interior view, we see the coax fitting, the first tube socket and the input circuit at the left. Between the two sockets at the center of the copper plate is the slug-tuned neutralizing winding, L_2. A small copper shield divides the second socket, isolating the input and output circuits. This shield is not always necessary, but it may be an aid to neutralization. At the far right are the output circuit and the bifilar-wound chokes for the heater circuit of the second stage.

The tuning condensers, C_1 and C_2, are plastic trimmers, another example of a component designed for TV applications that turned out to be ideal for ham purposes. These cylindrical trimmers allow lead lengths shorter than is possible in most instances where old style flat-plate trimmers are used. Their minimum capacitance is also appreciably lower than in other designs.

The 6AJ4 was designed for u.h.f. use, so its grid is brought out to five different pins to reduce lead inductance. These may be strapped together or used individually, as layout requirements dictate. In this instance, Pin 4 was used for the hot end of L_1, with the trimmer, C_1, connected to Pin 3. In the second stage Pins 3 and 4 were tied to the grid side of R_2, and Pin 1 was by-passed by C_4.

[3] Tilton, "Noise Generators — Their Uses and Limitations," *QST*, July, 1953, p. 10,

Adjustment

There is only one simple way to adjust a low-noise r.f. amplifier and be sure of what you are doing. That way is to use a noise generator. The writer has found this out before, but never more forcibly than in working with the project herein described. An experimental r.f. amplifier was built and tested, using conventional signal-generator methods. Innumerable adjustments were made and various components tried, but with highly confusing results.

Making adjustments for maximum gain is satisfactory in the early stages of work with v.h.f. amplifiers, but when you get down to the real objective, the best possible signal-to-noise ratio, it is well-nigh impossible to rely on signals or signal generators in making final adjustments. Our r.f. amplifier work was interrupted while we got something in the nature of a reliable noise generator going.[3]

With the noise generator approach only a few minutes' work was needed to get the r.f. amplifier project on the right track. Adjustment of the neutralizing winding and the tuning of the input circuit of the first stage were accomplished in short order, with results far superior to the best that was done in endless fussing with these circuits previously. The principal reason for this is the fact that optimum signal-to-noise ratio (lowest noise figure) is not closely associated with maximum gain in low-noise circuits. The

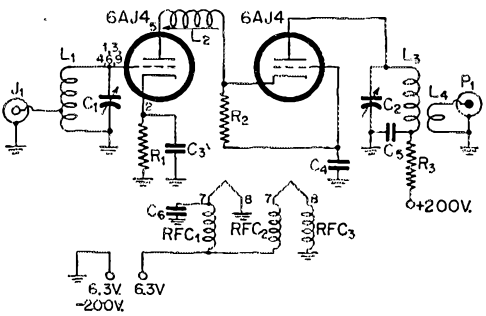


Fig. 1 — Schematic diagram and parts list for the low-noise preamplifier.

C_1, C_2 — Plastic trimmer, 1 to 8 $\mu\mu$fd. (Erie style 532-10).
C_3, C_4, C_5, C_6 — 0.001-μfd. disk ceramic.
R_1 — 68 ohms, ½ watt, carbon.
R_2 — 0.47 megohm, ½ watt.
R_3 — 470 ohms, ½ watt, carbon.
L_1 — 4 turns No. 16 tinned, ¼-inch diam., spaced 1 diameter, tapped at 1¾ turns from ground end.
L_2 — 4 turns No. 24 on ¼-inch slug-tuned form.
L_3 — 5 turns No. 18 enam., ¼-inch diam., spaced half diameter.
L_4 — 2 turns insulated wire wound over cold end of L_3.
J_1 — Coaxial antenna fitting.
P_1 — Coaxial plug on cable of suitable length to reach converter input.
RFC_1 — 22 turns No. 22 enam., 1/16-inch diam., close-wound.
RFC_2, RFC_3 — 18 turns each, No. 24 enam., ¼-inch diam. Twist wires together before winding. Coat turns with household cement.

grid-dip meter method of adjusting circuits cannot be relied upon, either, as the input circuit is not resonant in the band at the point where the noise figure is best.

It is possible to adjust for best signal-to-noise ratio using signals or a signal generator, but take it from one who knows, that's the *hard* way! If, after all this noise-generator sales talk, you still think you're going to do the job without one, here's how to go about it — but don't blame us if you're dissatisfied with the results.

Using a signal, peak the plate circuit of the second stage for maximum response, assuming that the preamplifier doesn't oscillate. Should oscillation occur, adjust the slug in the neutralizing winding to stop it. The input circuit, L_1C_1, must be peaked for best signal-to-noise ratio. This can be done, though tediously, by using the receiver S-meter, provided the system has enough gain so that the meter reads on noise alone. Best noise figure is obtained with the input circuit detuned on the low-frequency side of the maximum-gain point. The best setting of L_2 can be found in the same manner, by watching the rise in *signal over noise*, not the meter reading on the signal alone.

This sounds simple, but the trouble lies in the insensitivity of the S-meter as an indicator of small changes for better or worse. The noise generator will show you any small change, either way, so clearly that arriving at the optimum settings is a simple matter. Adjustment of the tap position on L_1 is not critical. The best point as to noise figure will be up on the coil somewhat from the point where maximum signal is obtained. Here, again, this is a noise-generator job.

The 420-Mc. Job

The grounded-grid amplifier for 420 Mc. was patterned after one described some time ago in *QST*,[1] and appearing in recent editions of the *Handbook*. The earlier model used a 6J4, of which the 6AJ4 is an improved and less expensive offshoot. It is built on a frame of flashing copper that serves as combined chassis and tank circuit. The whole assembly is 10 inches long and 1¼ inches square, except for the bottom, which is about 1¾ inches wide. Edges are folded over with lips ¼ inch wide which slide into a bottom cover made from a sheet of copper 2½ by 10 inches in size, with its edges bent up ¼ inch wide on each side.

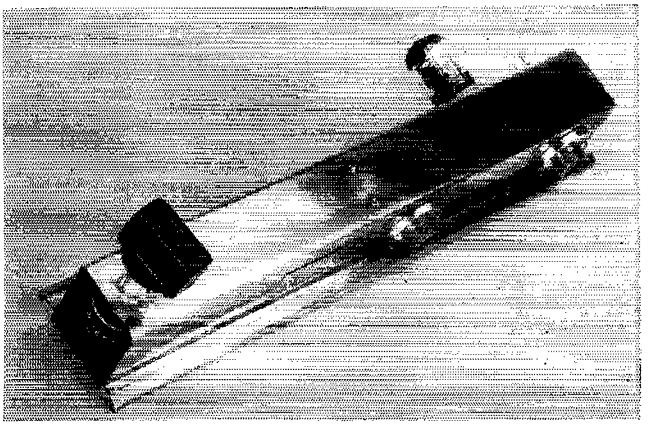
The plate circuit is a half-wave line of ¼-inch copper tubing tuned by a copper-tab capacitor at the far end from the tube. Plate voltage is fed in at the point of minimum r.f. voltage, which in this instance is about 5 inches from the open end. The antenna is connected to the cathode through a coupling condenser. The input impedance of the grounded-grid amplifier is so low that nothing is gained by using a tuned circuit at this point. The cathode and heater are maintained above ground potential by small air-wound r.f. chokes. Output is taken off through a coupling loop placed at the low-voltage point along the line.

The tube socket is two inches in from the end of the trough, and is so oriented that its plate connection, Pin 5, is in the proper position to connect to the line with the shortest possible lead. A copper shielding fin is mounted across the interior of the trough 2⅛ inches from the end, dividing the socket so that Pins 3, 4, 5 and 6 are on the plate side of the partition.

Minimum grid-lead inductance is important. This was insured by bending all the grid prongs down against the ceramic body of the socket, and then making the mounting hole just big enough to pass this part of the socket and the prongs. They were soldered directly to the wall of the trough.

Input and output connections are coaxial fittings mounted on the side wall of the trough. B-plus and heater voltage are brought into the assembly on feed-through capacitors mounted on the same side of the trough as the tube. Connection to the inner conductor of the line is made with a grid clip, so that the point of connection can be adjusted for optimum results.

The copper tubing is slotted at the plate end with a hack saw to a depth of about ¼ inch, and a strip of flashing copper soldered into this slot to make the plate connection. A copper tab about the size of a one-cent piece is soldered to the other end of the tubing to provide the stationary plate



A highly effective r.f. amplifier for 420 Mc. The tank circuit is a half-wave line made of flashing copper. Coaxial fittings are for input and output connections. Heater and plate voltages are brought in on feed-through bypass capacitors just visible on either side of the 6AJ4 tube.

of C_4. The line is supported near the low-voltage point by a ¼-inch-thick block of polystyrene. This is centered at a point 5¼ inches in from the tube end of the trough assembly. The hole for the B-plus feed-through is 4¼ inches from the same end.

The movable plate of C_4 is attached to a screw running through a nut soldered to the upper surface of the trough at a point ⅜ inch in from the open end. If a fine-thread screw is available for this purpose it will make for easier tuning, though a 6/32 thread was used in this model. This made a rather wobbly contact, so a coil spring was installed between the top of the trough and the knob to keep some tension on the adjusting screw.

Adjustment of the 420-Mc. amplifier is also made easier if a noise generator is used, though it is not as important as in the case of the 2-meter job. If the amplifier is working properly there will be an appreciable rise in noise as the plate circuit is tuned through resonance, and it may break into oscillation if operated without load. When connected to a following stage, with a reasonably-matched antenna plugged into J_1, the amplifier should not oscillate unless the coupling loop, L_2, is much too far from the inner conductor.

When the amplifier is operating stably, and tuned to a test signal (or to a peak of response to a noise generator) the next step is to locate the optimum position for feeding the plate voltage into the line. This may be done by running a pencil lead slowly up and down the inner conductor, until a spot is found where touching the lead to the line has little or no effect on the operation of the amplifier. The plate voltage clip should be placed at this point and the process repeated, moving the clip slightly until it is at the minimum-voltage point precisely. This adjustment should be made at the midpoint of the tuning range over which the amplifier is to be used.

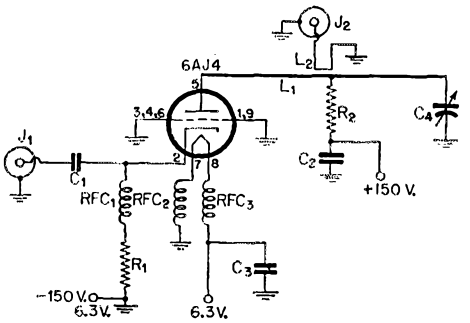


Fig. 2 — Schematic diagram of the 420-Mc. r.f. amplifier.

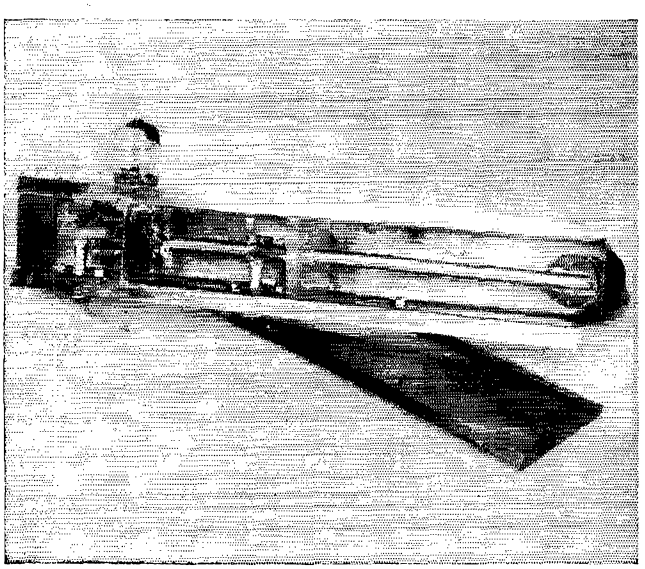
C_1 — 500-$\mu\mu$fd. ceramic.
C_2, C_3 — 1000-$\mu\mu$fd. ceramic feed-through (Erie style 2404).
C_4 — Copper tabs ⅞-inch diam.; see text and photographs.
R_1 — 150 ohms, ½ watt.
R_2 — 470 ohms, ½ watt.
L_1 — ¼-inch copper tubing, 7⅜ inches long, tapped 2⅜ inches from plate end.
L_2 — Loop of insulated wire adjacent to L_1 for ¾ inch.
J_1, J_2 — Coaxial fitting.
RFC_1, RFC_2, RFC_3 — 9 turns No. 22, ⅜-inch diam, spaced one diam.

The position of the coupling loop should then be adjusted for best signal-to-noise ratio. This will probably turn out to be with the insulated wire lying against the inner conductor for a distance of about ¾ to 1 inch, starting at the minimum-voltage point we have just located.

Results

Using the 5722 noise generator described in *QST* for July, the noise figure of the 2-meter preamplifier was checked at under 4 db. This is a shade better than the best r.f. amplifier tested that has served at W1HDQ for the past three years it made a perceptible improvement in

(*Continued on page 104*)



Bottom view of the 420-Mc. r.f. amplifier, with the slip-on cover removed. The inner conductor of the tank circuit is held in place by a block of polystyrene, mounted near the low-voltage point on the line. The plate-voltage feed-through and output coupling loop may be seen at the left of this support. Heater, cathode and antenna-circuit components are in a separate compartment at the tube end of the assembly. The line is tuned at the opposite end by a handmade copper-tab capacitor.

Negative Feed-back Modulation

Reducing Distortion in the 'Phone Transmitter

BY RICHARD CLAY,* W9JRO/4

THERE are basically two types of electrical systems. One is the "open loop" or calibrated system, and the other is the "closed loop" system. An amplifier without feed-back is an open-loop system, and a feed-back amplifier is an example of a closed-loop system. Most modulation systems at present are open-loop systems, and they depend on inherent linearity in the modulator itself to provide a faithful output. This requirement of linearity can be relaxed a great deal if the modulator forms part of a closed loop.

There is a system of closed-loop modulation which is currently popular in amateur circles. It is called the Rothman system[1] and utilizes a portion of the transmitter output to provide the power for modulation. This system has several advantages. One is its high efficiency, and another is the ease with which a transmitter may be tuned up when using this system.

There is a serious disadvantage, however. The feed-back has a positive sense. This means that the system is regenerative and exaggerates non-linearities. This can easily be understood by imagining that the modulator saturates at the peak of a modulation cycle. There will be proportionally less output power and therefore less available modulator power. This will increase the effect of the original saturation.

This situation can be remedied by reversing the polarity of the feed-back. When this is done the feed-back voltage has the wrong polarity to be used directly in the modulator. It is now used in an entirely different manner. It is compared with the audio signal to determine any departure of the transmitter output from what it should be. This error signal is then amplified and used to modulate the transmitter. A block diagram of this system is shown in Fig. 1.

If the modulator tends to saturate at the peak of a modulation cycle there will be less negative feed-back voltage and the resultant error signal will be larger. This provides greater modulator power and tends to compensate for the saturation. Thus when negative feedback is used there is not such a great need for linearity in the modulator itself.

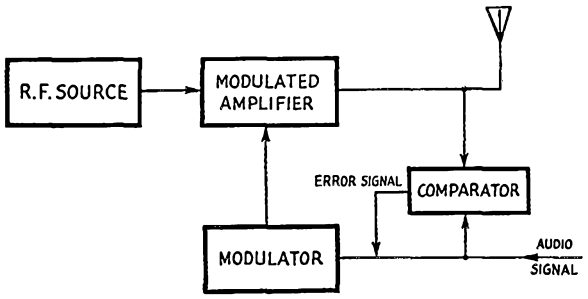


Fig. 1 — Block diagram of negative feed-back modulation.

Linearity is needed only in the demodulator. This can be a simple diode detector. There is negligible power involved, so a small diode is sufficient for an amateur transmitter of any size. Voltage breakdown is the only consideration, and this is a problem only in high-power transmitters.

Good frequency characteristics are necessary only in the audio stages prior to the comparison

* RCA Engineer, Box 372, Cocoa Beach, Fla.

[1] Goodman, "The Rothman Modulation System," *QST*, Jan., 1952; Rothman, "Rothman System of Modulation," *CQ*, April, 1952.

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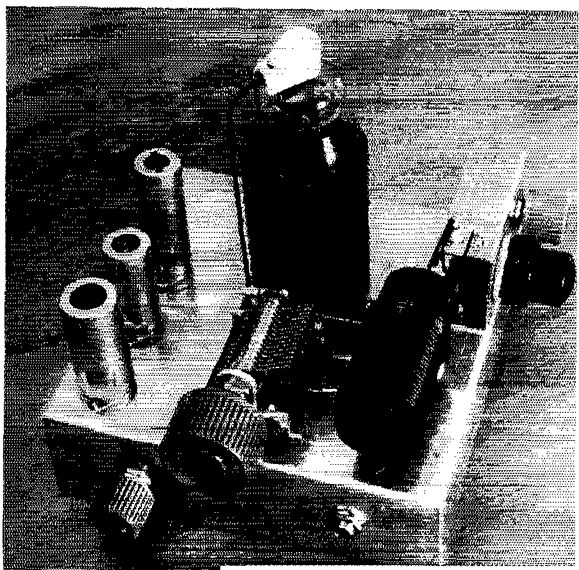
An experimental low-power transmitter was used to test the negative feed-back principle.



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point. This is true because the loop closure tends to minimize the error and this causes the output to follow the signal injected at the comparison point. Hence the frequency characteristics of the circuit following the comparison are of less importance. This does not mean to imply that any circuitry should be designed carelessly.

It might appear from the above that it would be best to make the comparison at a very low level stage. This is not advisable in a high-power transmitter because of the high gain that follows the comparison. This is inside of the closed loop and will amost invariably lead to oscillatory instability.

There is an easy way to determine the point at which the comparison should be made. It is based on a fundamental property of electronic regulating systems. The error in such systems is approximately the reciprocal of the gain inside the closed loop.

For amateur work a linearity of 1 per cent would be considered more than adequate. This means that the comparison would be made at a point in the audio amplifier such that the total gain is 100 from that point onward. This includes any attenuation in the demodulator and coupling link. If 2 per cent linearity is satisfactory, a gain of 50 will suffice.

In a practical application, it is wise to provide a gain control in the demodulator so that it is possible to vary the effective loop gain. The gain inside the closed loop should be adjusted well below the value that causes oscillation in the modulation system. It is necessary to provide a gain control in the audio stages prior to the comparison in order to adjust the modulation level.

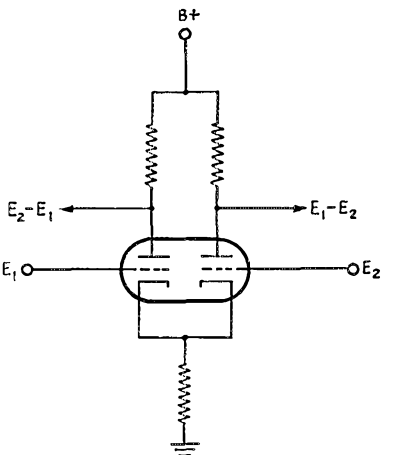


Fig. 2. — The basic circuit of a difference amplifier.

Probably the easiest way to compare the feedback signal with the audio signal is to use a difference amplifier. This consists of a dual triode

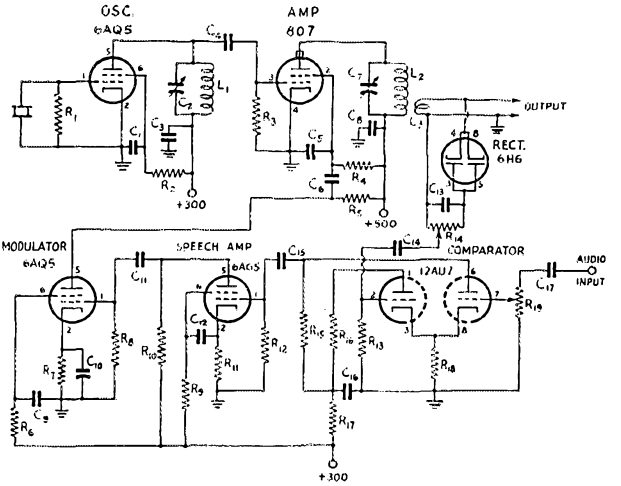


Fig. 3 — Circuit diagram of an experimental transmitter using negative feed-back modulation.

C_1, C_3, C_5, C_8, C_{13} — 0.001-μf. mica.
C_2 — 50-$\mu\mu$fd. variable.
C_4 — 100-$\mu\mu$fd. mica.
C_6 — 1-μfd. 600-volt paper.
C_7 — 140-$\mu\mu$fd. variable.
C_9, C_{11}, C_{12}, C_{14}, C_{15}, C_{17} — 0.1-μfd. 400-volt paper.
C_{10} — 5-μfd. 50-volt electrolytic.
C_{16} — 12-μfd. 450-volt electrolytic.
R_1, R_2, R_6 — 20,000 ohms, 1 watt.
R_3 — 10,000 ohms, 2 watts.
R_4 — 60,000 ohms, 10 watts.
R_5 — 15,000 ohms, 10 watts.
R_7 — 1500 ohms, 2 watts.
R_8 — 0.47 megohm.
R_9 — 82,000 ohms.
R_{10} — 33,000 ohms.
R_{11} — 300 ohms.
R_{12}, R_{13} — 0.56 megohm.
R_{14} — 10,000-ohm potentiometer (loop gain control).
R_{15}, R_{16}, R_{18} — 0.22 megohm.
R_{17} — 0.18 megohm.
R_{19} — 0.5-megohm potentiometer (audio gain control).
All resistors ½ watt unless otherwise noted.
L_1 — 35 turns No. 20 enam., ¾-inch diam.
L_2 — 30 turns No. 14 enam., 1¼-inch diam.
L_3 — 7 t. No. 16 enam., wound over L_2 at "cold" end.

with a common cathode resistor that is much larger than is usually used for grid bias. The basic circuit is shown in Fig. 2. The signals are placed on the two grids and the output is taken from one of the plates. The output at the plate of the triode into which the audio signal is placed will be the feed-back signal minus the audio signal. The output at the other plate will be the audio signal minus the feed-back. These outputs are 180 degrees out of phase so the proper one can be selected in order that the over-all feed-back will be negative.

A Practical Transmitter

A small transmitter has been built to demonstrate the above principles. It operates in the 80-meter band — the circuit is shown in Fig. 3. The r.f. portion consists of a 6AQ5 crystal oscillator and 807 power amplifier. This arrangement was used for simplicity. The r.f. section of any well-designed transmitter would be satisfactory if it is adaptable to a modulation system.

In this circuit another 6AQ5 is used as a re-

sistance-coupled modulator for the 807 screen. This is a rather small tube for this purpose, and its ability to perform favorably without the benefit of the negative feed-back might be questioned. A 12AU7 is used as the difference amplifier. A 6H6 with both sections in parallel is used as a diode detector to demodulate the r.f. output and develop the feed-back signal.

The antenna link is used as the r.f. source for the feed-back signal. This causes no harm, since the demodulator presents a high impedance and offers virtually no loading on the antenna, but it means that the loop gain depends on the amount of antenna coupling. The attenuator in the demodulator must be adjusted whenever the position of the antenna link is changed. In the experimental model a fixed link was used, but this is not recommended because of its inflexibility.

It is observed that an increase in potential at the output plate of the difference amplifier causes the grid of the 6AQ5 to go negative, driving the plate positive. This increases the transmitter output. Since the diode rectification yields a voltage in the negative sense when connected as shown, the increase in r.f. causes the feed-back grid of the difference amplifier to go negative. This signal is the opposite of that which would produce the increase in plate potential which was assumed. Therefore the feed-back is negative as required.

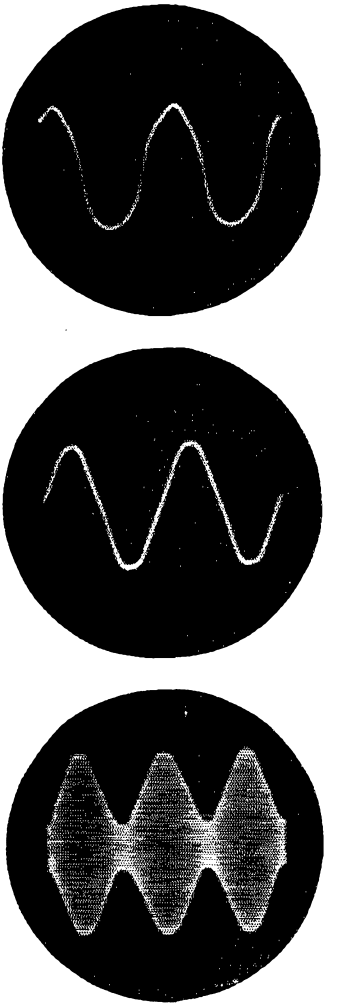
The maximum loop gain was measured experimentally and found to be around 30. This value causes the closed loop to oscillate, however, and the maximum usable gain is around 20. This limits distortion to around 5 per cent.

Adjustment

The adjustment of the transmitter is relatively simple. The gain control in the demodulator is set at zero and the r.f. portion of the transmitter is tuned as usual. The antenna is then coupled properly. The gain control in the demodulator is advanced until the modulation system oscillates and is then brought back considerably below this level. If the modulation system shows no tendency to oscillate, the gain may be left at the maximum value. The setting of this gain control is not at all critical.

The audio signal is then introduced, and the audio gain is adjusted to provide the proper level of modulation. This must be checked by normal procedures. The transmitter is then ready for operation. This same procedure would be followed in adjusting any transmitter using negative feed-back modulation. In the unit shown a few volts of audio input is necessary to modulate the carrier 100 per cent.

Laboratory tests have been performed on this circuit to determine the effectiveness of the feed-back. It is possible to disconnect the demodulator and operate the system as an ordinary open-loop system. The photograph shows the results of these tests. The top photograph shows the appearance on an oscilloscope screen of the demodulated carrier when the system was operating as an open loop and the audio signal was a pure sine wave. The distortion is quite obvious. The middle photograph shows the comparable closed-loop performance. The linearizing effect of the negative feed-back is apparent. The bottom photograph shows the appearance of the modulated carrier when using negative feed-back.



'Scope pictures showing the effect of negative feedback modulation. A pure sine-wave input to the audio system without feed-back resulted in a demodulated signal as in the top picture, while the same input signal with negative feed-back modulation gave a demodulated signal (*center*) and r.f. picture (*bottom*) with very little distortion.

There is no great advantage in applying negative feed-back modulation to existing transmitters that have well-designed and reasonably-linear modulation systems. The disadvantage of the possibility of instability in the modulation system will most likely outweigh the advantage of increased linearity.

Negative feed-back modulation offers the greatest opportunities for amateurs who use screen grid, suppressor grid, or some other type of modu-

(Continued on page 104)

Eighty Watts on Six Bands

A Bandswitching Rig Using Subassemblies

BY DONALD H. MIX,* WITS

• **This convenient multiband rig is made up of units described in earlier issues of *QST*. Covering all bands from 10 to 80, it is complete with power supply and control circuits. It can be operated at inputs up to 80 watts on c.w. and 60 watts on 'phone. Provision is made for the connection of an external plate modulator.**

THE "Bandbox" single-control frequency-multiplier unit described in *QST* for April, 1952,[1] was designed as a basic unit — a subassembly — that, once built, could be placed in any transmitter line-up, or removed, much as a single component might be handled, according to the builder's fancy. Therefore, little consideration was given, at the time, to anything specific in the way of associated units. However, subsequent response showed that there were many who would like to see some definite suggestions or a suitable oscillator and output stage to be used with the multiplier unit — particularly something built along the shielded-unit idea.

Accordingly, a VFO[2] and a multiband 6146 amplifier[3] were described in later issues of *QST*. But, it seems that the job wasn't finished. There were still quite a few who wanted further information on power supply and control circuits. It is true that sometimes unforeseen problems arise when an attempt is made to combine units to form a complete transmitter.

In the photographs, the three units mentioned above have been assembled to make up an 80-watt bandswitching transmitter complete with power supplies and control circuits. By reducing the output coupling by means of the panel control on the variable output link, the input can be reduced slightly to comply with the power limitations applying to the Novice. In operation, the rig works very smoothly. After setting the VFO for the desired frequency, and the multiplier switch for the desired band, it is only necessary to resonate the single control of the multiplier for desired amplifier grid current and tune the amplifier stage to resonance.

Circuit Considerations

Fig. 1 shows the circuit external to the individual units. High voltage for the 6146 amplifier is obtained from an inexpensive b.c. transformer, T_1, working into a bridge rectifier. This arrangement is similar to the "economy" power supply described in the November, 1952, issue of *QST*.[4] The supply delivers 550 volts at a full load to the amplifier of 150 ma. on a c.w. A choke-input filter is used with this supply, and the 6X5GT rectifier

* Assistant Technical Editor, *QST*.

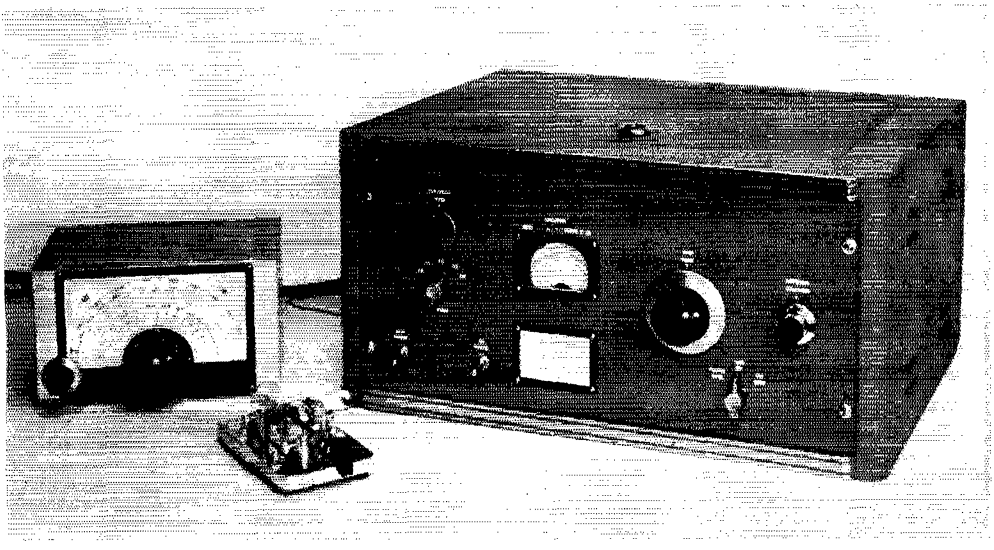
[1] Mix, "The 'Bandbox' — A Single-Control Frequency-Multiplier Unit," *QST*, April, 1952, p. 11.

[2] Mix, "Simple Remote Tuning for the VFO," *QST*, Jan., 1953, p. 27.

[3] Mix, "Multiband Tuning for the 6146 Amplifier," *QST*, May, 1953, p. 33.

[4] Grammer, "More Effective Utilization of the Small Power Transformer," *QST*, Nov., 1952, p. 18.

An 80-watt 6-band bandswitching transmitter built around VFO, frequency-multiplier and output-stage units described in earlier issues of *QST*.



filaments are operated from the 6.3-volt winding of this transformer. The required filter-condenser voltage rating is obtained by connecting 500-volt electrolytics in series. A supply voltage of 350 for the VFO, frequency multiplier, and the screen of the 6146 is obtained from a second supply using a condenser-input filter. All transmitter-tube heaters are operated from the 6.3-volt winding of the low-voltage transformer.

A comparison between Fig. 1 and the original circuit for the amplifier will show that the biasing battery voltage has been increased to 45. This was done from the consideration that 45-volt batteries are more generally available than the 22.5-volt units. A corresponding reduction in amplifier grid-leak resistance should be made — to 12,000 ohms. Otherwise, there is no objection to the use of the original values.

Provision is made for the external connection of a plate modulator. There are Millen safety terminals at the rear for connecting in the output of the modulator, and an audio choke is included for the screen circuit. Also, an a.c. outlet and switch, S_1, are available for the modulator power supply.

The rotary switch, S_3, performs, in a single operation, the combined duties of power control and meter switching. In the mid-position, the meter is switched to read grid current, plate voltage is removed from the 6146, and the screen is grounded. While the switch is in this position, the VFO may be set to frequency and the frequency multiplier tuned for the desired amplifier grid current without putting a signal on the air. When the switch is thrown to the right, plate and screen voltages are applied to the amplifier, and the meter reads plate current with a 10-times shunt across the meter. This is the operating position for c.w.

For 'phone operation, the switch is thrown to the left, instead of to the right. In this position, the modulator-input terminals are connected in the plate circuit of the 6146, and the choke, L_1, is inserted in the screen lead.

Construction

The components are assembled on a 13 × 17 × 3-inch steel chassis, with a $\frac{3}{16}$-inch aluminum rack panel 8¾ inches high. An aluminum chassis could be used, but is not necessary since the units

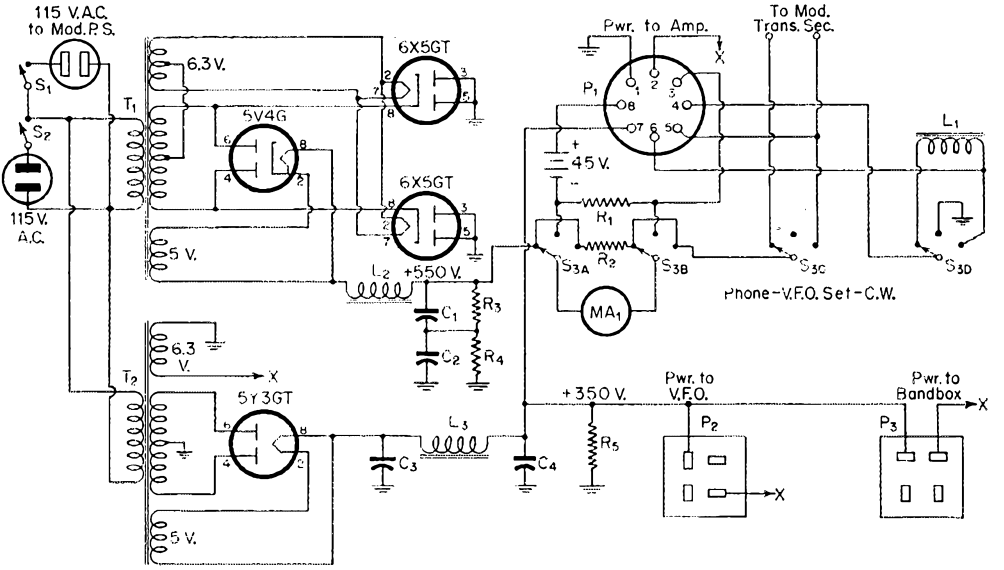
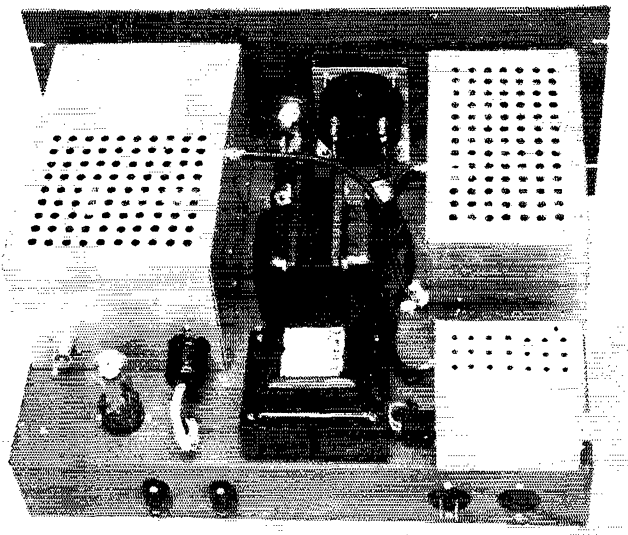


Fig. 1 — Power and control circuits for the 80-watt multiband transmitter.

C_1, C_2, C_3, C_4 — 16-μfd. 500-volt electrolytic (e.g., Aerovox PRS-16).
R_1 — 100 ohms, ½ watt.
R_2 — 10-times shunt for 25-ma. meter (No. 30 wire wound on 1-watt resistor of 50 ohms or more and connected to its terminals. Adjust turns to give required multiplication — see ARRL *Handbook*).
R_3, R_4 — 20,000 ohms, 10 watts.
R_5 — 50,000 ohms, 10 watts.
L_1 — 35-hy. 15-ma. choke (e.g., Thordarson T-20C51).
L_2 — 7-hy. 150-ma. filter choke (e.g., Halldorson C-5027).
L_3 — 10.5-hy. 110-ma. filter choke (e.g., Stancor 1001).
MA_1 — 3-inch d.c. milliammeter, 25-ma. scale (e.g., Triplett 327A).
P_1 — Octal male connector (Amphenol 86-PF-8).
P_2 — Female cable connector to fit VFO connector (Jones S-304-CCT).
P_3 — Female cable connector to fit multiplier connector (Jones S-304-CCT).
S_1, S_2 — S.p.s.t. toggle switch.
S_3 — 4-wafer 3-position rotary switch, bakelite insulation (e.g., Centralab 1427, or assembled from Switchkit parts).
T_1 — Power transformer: 375–0–375 volts r.m.s., 150 ma.; 5 volts, 3 amp.; 6.3 volts, 4.7 amp. (e.g., Thordarson 24R06U).
T_2 — Power transformer: 360–0–360 volts r.m.s., 120 ma.; 5 volts, 3 amp.; 6.3 volts, 3.5 amp. (e.g., Halldorson P-9315).



Inside view of the 80-watt multiband rig. Two power supplies are sandwiched in between the individually-shielded units. Along the rear are modulator-input terminals, a.c. input connector, and an outlet for an external modulator power supply.

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are already shielded in aluminum boxes. Also, since each of the r.f. units is shielded and filtered, the power wiring has been done with ordinary unshielded wire, although, of course, there is no objection to the use of shielded wire.

The frequency-multiplier unit is placed at the left-hand end of the chassis, far enough to the rear to allow space for shaft couplings between the panel and the shaft bearings. To facilitate the use of coax-cable r.f. connections between the units, the bakelite pin-jack input and output terminals of the frequency-multiplier unit were replaced with shielded 'phono jacks, similar to those suggested later for the VFO and amplifier units.

The amplifier is mounted at the right-hand end of the chassis. If the shafts of the panel bearings for the amplifier unit are long enough, the unit can be spaced back of the panel the same distance as the multiplier unit. In this case, the link shaft is run through a ¼-inch hole in the panel, while the tuning-condenser shaft is cut to fit the insert of the National AM dial. If the shafts have been cut short, however, it will be necessary to move the unit farther back to make room for shaft couplings.

The VFO unit is mounted in the rear left-hand corner of the chassis, with the remote-tuning-cable connector toward the left.

All three units are fastened down to the chassis with self-tapping screws from the bottom. If a steel chassis is used, the aluminum cover plates of the multiplier and amplifier units should be used between the chassis and the bottoms of the boxes, the self-tapping mounting screws going through both the chassis and the covers into the lips of the boxes. The paint on the chassis should be removed in the areas to be covered by the units, so that the shielding will make good electrical contact with the chassis. This operation can be made easier by using an application of paint remover, being careful not to allow the remover to creep beyond the limits of the edges of the units and thus spoil the appearance of the chassis. Allow a safety margin of ¼ to ½ inch when applying the remover.

The low-voltage transformer, T_2, is centered between the two larger units, and placed as far to the rear as possible. A flush-mounting transformer happened to be on hand, but a vertical type is easier to mount, since it requires no large cutout on the chassis. The 5Y3GT is placed to the rear of the amplifier box, in such a position that it will not interfere with the power plug.

The high-voltage transformer, T_1, is mounted in front of the low-voltage unit with a space of about ¼ inch between the two. The two 6X5GTs are, in turn, mounted forward of the high-voltage transformer, spaced about 3 inches apart, center to center. The 5V4G is in front of the right-hand 6X5GT, leaving space for the meter.

(Continued on page 106)

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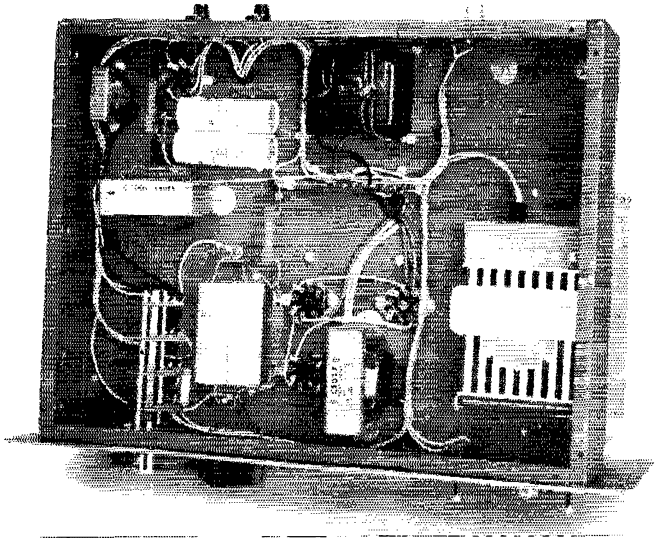

Bottom view of the 80-watt bandswitching transmitter. The low-voltage power-supply components and screen audio choke are in the upper left-hand corner. Below, at the center, are the filter components for the high-voltage supply. The biasing battery is held in place by an aluminum cleat and a pair of long machine screws. The power-control switch is at the lower left.

An F.S.K. System for the Amateur Teletype Station

Using the Reactance-Tube Modulator for Controlling Carrier Shift

BY F. A. BARTLETT,* W6OWP

". . . (C) When frequency-shift keying (type F-1 emission) is utilized, the deviation from the mark signal to the space signal, or from the space signal to the mark signal, shall be adjusted as nearly as possible to 850 cycles and, in any event, within the range 800 to 900 cycles per second" [new Section 12-107 of the FCC Rules Governing Amateur Radio Service.]

So reads the official FCC requirement for amateur f.s.k. An additional stipulation — agreed upon by amateur teletype groups — is that the higher frequency of the F-1 signal shall be the mark frequency for teletype work. Translating this information — dealing with what up to now has been a strictly commercial phase of radio — to circuits suited to amateur use is a problem facing every newcomer to the RTTY ranks. The purpose of this article is to describe a simple system for amateur teletype transmission using f.s. keying. No tone circuits, v.t. keyers or auxiliary relays are required. The normal transmitter output frequency becomes the teletype marking frequency and the space

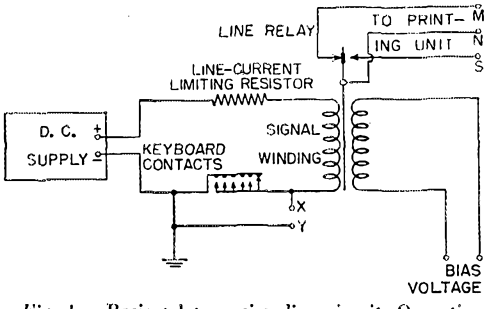

Fig. 1 — Basic teletype signaling circuit. Operation of the keyboard interrupts continuity in timed sequences. The line relay responds and energizes the printing unit. This is typical of "local-circuit" operation and serves as the foundation for the f.s.k. system described in the text.

function of the teletype keying causes a downward carrier shift.

Prerequisites are: a stable VFO, an operating teletype machine with keyboard and line relay, and an f.s.k. receiving converter.

Getting Down to Fundamentals

The teletype, despite its mechanical complexity, operates on a signaling circuit of simple proportions. It can be resolved, as shown in Fig. 1, into a source of current, a keyboard and a line relay. When idle, the circuit is closed, with marking current flowing from the d.c. supply through the keyboard contacts and the signal winding of the line relay. Depressing a letter on the keyboard causes a selector-cam contact mechanism to interrupt the circuit for precisely-timed intervals. The line relay responds and energizes the printing unit.

In adapting the machine for radio, an f.s.k. receiving converter is used. If the converter is the on-off (single-ended) type, it may be connected as a direct replacement for the d.c. supply of Fig. 1. When receiving radio signals, current in the signaling circuit will be interrupted by the space keying of the incoming f.s.k. transmission and the machine will print. When no transmission is being received, operating the keyboard will produce local printing just as the machine did with the d.c. supply of Fig. 1.

A more common type of f.s.k. converter employs both the marking and spacing signals to energize the teletype line relay. This converter replaces the d.c. supply of Fig. 1, but requires addition of a d.p.d.t. switch to permit local keying. The actual circuitry will be covered later.

A Twofold Problem and Its Solution

Up to this point, the printer is one-way only — it will receive radio signals but makes only monitor copy when the keyboard is operated. The problem is to make the d.c. pulses in the local signaling loop perform the f.s. keying function in the transmitter. This is a two-step procedure. First, a means must be built into the transmitter to produce a controllable shift of frequency with applied d.c. voltage. Secondly,

• In connection with a radioteletype converter described in the January issue by W2PAT a method of modulating a carrier with the standard audio frequencies of 2125 and 2975 cycles was shown. This system is *not* normally used at the lower frequencies; instead, the carrier frequency itself is shifted by the necessary amount to produce the required audio beats in the output of the receiver by means of the b.f.o. in the receiver. This article shows a simple method by which the d.c. pulses from the transmitter keyboard *operate* to shift the transmitter carrier frequency by the required amount.

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a connection into the local signal circuit must be established.

Step No. 1 is not difficult. Frequency-shift keying is essentially f.m. applied to radiotelegraphy. The f.m. reactance tube modulator is just the thing for the controllable shift of frequency that f.s.k. requires. Fidelity, in the audio sense, is not necessary. The reactance stage for f.s.k. may be reduced to its simplest form. Fig. 2A shows the circuit applicable to most amateur VFOs. A miniature 6C4 triode is used. Its small size and the few components needed should simplify installation problems. Positive voltage applied to the input terminals will produce a downward shift in frequency. The magnitude of this shift is controllable (for a fixed setting of C_1) by adjustment of R_1.

Heterodyne exciters operating on the difference-frequency beat require an upward shift in

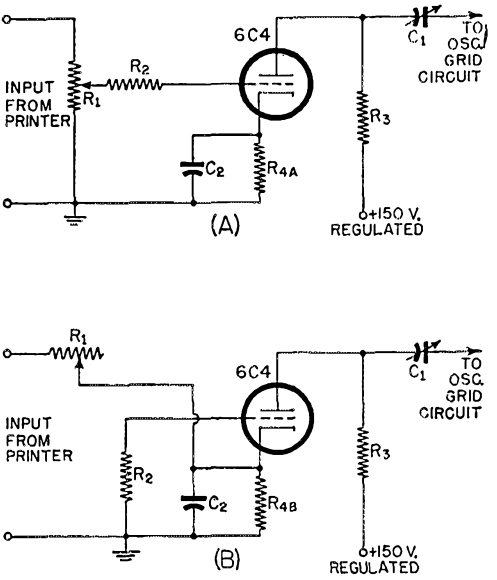


Fig. 2 — Reactance-tube circuits for developing oscillator frequency shift. Circuit A is for use with conventional VFOs. The connections shown in B produce a "reverse shift" as required in heterodyne exciters operating on the difference-frequency beat.
C_1 — 50-$\mu\mu$fd. variable air padder.
C_2 — 0.01-μfd. molded-plastic by-pass condenser.
R_1 — 50,000-ohm variable resistor.
R_2, R_3 — 56,000 ohms, 1 watt.
R_{4A} — 7500 ohms, 1 watt.
R_{4B} — 2200-ohms, 1 watt.

variable-oscillator frequency if the output frequency is to move downward. To provide this reverse shift, the connections shown in Fig. 2B should be used. In either case, remember that the reactance tube and its components become a part of the oscillator. The tube socket should be mounted to permit as short and direct a connection as possible between the reactance tube plate and C_1, and from C_1 to the oscillator grid. Wiring should be done carefully, making each connection electrically and mechanically sound. Where the station VFO is already equipped with a reactance-tube stage for n.f.m., simple alteration to permit d.c. drive to the modulator grid should prove satisfactory. Use the circuits of Fig. 2 for the basic hook-up.

Now let's tie the reactance shifter to the teletype keyboard. Referring back to Fig. 1, if a voltmeter is connected between points X and Y, it will read voltage whenever the keyboard contacts interrupt the circuit; i.e., at spacing intervals. This voltage will be positive with respect to ground and equal to the supply voltage. In the mark condition, the voltage obviously will be zero. Basically, the voltage existing from X to Y on the spacing function is the source of reactance-tube drive. Two requirements, however, must be satisfied:

1) The voltage must be stable to assure a constant shift range.

2) A click-suppression circuit must be installed to wipe out the transfer clicks produced by the keyboard contacts.

Working Circuits

The circuits diagrammed in Figs. 3 and 4 meet these requirements. The first shows connections with an on-off type converter. The second illustrates use of the mark-space type unit. In both cases, the line relay is a WE215A or WE255A. In the on-off circuit (Fig. 3), the relay bias winding is supplied with a 15-ma. current at all times. This current is shown taken from the converter power supply. If desirable, however, it may be supplied from a d.c. source within the printer.

In Fig. 4, when S_2 is in the send position, the bias winding of the relay is provided with a 15-ma. current while the signal, or mark winding, draws 30 ma. This marking current is interrupted by operation of the keyboard and the relay responds by virtue of the current in the bias, or space winding. S_1 is used to open the signaling loop when adjusting the shift range.

Voltage stabilization in both circuits is provided while in the space condition by a VR-105. Resistor R_1 should be chosen to allow approximately 20 ma. through the VR tube with the circuit on space. This minimizes the voltage drop on the heavier-current marking condition. Speaking in general terms, the loading is such that the VR tube normally fires only on space. This is no drawback because stabilization is unnecessary on the marking portion of the keying cycle.

"Simple but effective" describes the click-suppression circuit made up of RC network R_3C_2 and the neon bulb NE. The RC time constant is just sufficient to prevent the short-duration contact-transfer pulse from firing the neon bulb. This blocks the unwanted clicks from the reactance-tube input.

Adjustment Notes

It is suggested that C_1 the reactance tube coupling condenser, be set to provide a maximum of 850 cycles shift at the lowest operating frequency. This will make adjustment of R_1 (Fig. 2)

less critical when doubling to higher bands. Keep in mind that the effectiveness of the reactance tube changes with oscillator tuning. When a change of 50 kc. or more is made in operating frequency, readjustment of the shift range may be required.

It is worth mentioning at this point that a calibrated b.f.o. control on the receiver is a handy means of setting the shift range. A good audio oscillator is recommended for the initial calibration which, for the RTTY station, need only include a zero reference point and two check points. One of these will be 850 cycles high; the other, 850 cycles low. Most communications receivers have sufficiently stable b.f.o.s to rely on these settings. Values shown for the click-suppression circuit (Figs. 3 and 4) may vary in different installations. Tune in the space side of the transmitted signal (mark frequency at zero beat) and operate the teletype "letters" key. If clicks are heard, increase the capacitance of C_2 until the signal is clean. Values up to 0.25 μfd. may be used without serious distortion of the keying pulses. If the clicks still persist, trouble in the keyboard contacts is indicated. The 0.025-μfd. value shown was worked out on a machine equipped with an r.f. filter. Keyboards not so equipped appear to require increased capacitance.

If a tape distributor is available, its signaling contacts may be series-connected with the keyboard in Figs. 3 and 4. No switching of the signal wiring is necessary, since continuity through the nonoperated unit is automatically established in the idle position. The value of C_2 may have to be altered slightly to accommodate the keying characteristics of both keyboard and tape distributor.

No provision has been made for telegraph f.s. keying. Amateur RTTY under the new regulations is too new for establishment of set procedures for telegraph identification. The writer favors keying the transmitter carrier since this allows maximum readability at the receiving point. This is especially true where QRM or weak-signal conditions have rendered the f.s. signal unreadable and c.w. remarks are necessary for conclusion of a QSO.

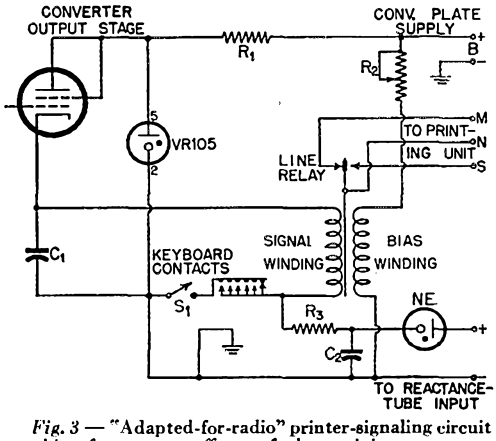


Fig. 3 — "Adapted-for-radio" printer-signaling circuit working from an on-off type f.s.k. receiving converter. Local copy and f.s. keying voltages are provided automatically whenever the keyboard is operated.
C_1 — 0.1-μfd. 600-volt paper.
C_2 — 0.025-μfd. 600-volt paper (refer to text).
R_1 — 2000 to 5000 ohms, 20 watts (refer to text).
R_2 — 10,000 ohms, 10 watts (adjust for 15 ma.).
R_3 — 20,000 ohms, 1 watt.
NE — 1-watt neon bulb (no series resistor).
S_1 — S.p.s.t. toggle switch.

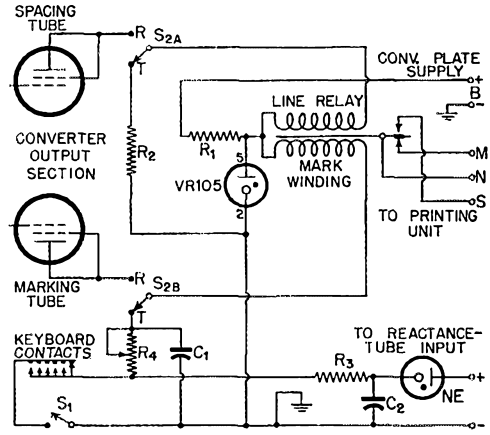


Fig. 4 — Signaling circuit for use with a mark-space type f.s.k. receiving converter. A relay may be substituted for S_2 for remote switching of send-receive functions.
C_1 — 0.1-μfd. 600-volt paper.
C_2 — 0.025-μfd. 600-volt paper.
R_1 — 2000 to 5000 ohms, 20 watts (see text).
R_2 — 7000 ohms, 10 watts.
R_3 — 20,000 ohms, 1 watt.
R_4 — 4000 ohms, 10 watts (adjust for 30 ma.).
NE — 1-watt neon bulb (no series resistor).
S_1 — S.p.s.t. toggle switch.
S_2 — D.p.d.t. send-receive switch, 250-volt insulation, toggle or wafer type.

August, 1928

. . . An editorial forewarns amateurs that next year's tightened regulations will call for universal improvement in technical and operational performance.

. . . Associate Technical Editor Ross Hull goes to high-*C* circuits, more rigid construction and looser coupling in "Overhauling the Transmitter for 1929."

. . . R. B. Bourne, 1ANA, writes on "Acoustic Wave Filters and Audio Frequency Selectivity," providing data necessary for the construction of practical units.

. . . In "28,000 Kilocycles — And How!" the ten-meter layouts of 1SZ, 2GP, 2JN, 5AUZ, 5HE, 6UF, 8ALY and 8EX are briefly described.

. . . In "Concerning Lunar Effects on Electromagnetic Waves," Greenleaf W. Pickard doubts that the moon has tangible influence on short-wave communication.

. . . "Following the 'Southern Cross' to Brisbane," by J. Walter Frates, 6CZR, extols the work of amateurs who kept watch on KHAB along the route of this great flight.

. . . "Army-Amateur Activity in the Philippines" tells the story of op1HR and the functioning of affiliation between ham radio and the Army Signal Corps.

. . . American 1ASF and Canadian 1AR are the two top scorers listed in results of the 1928 International Relay Party held last February.

A Four-Band Miniature 'Phone-C.W. Rig

13 Watts for a Variety of Uses

BY W. W. DEANE,* W6RET

• **Here is a compact transmitter that will appeal to the Novice or old-timer who is looking for a versatile mobile, fixed-station, portable or emergency 'phone-c.w. transmitter, neatly packaged in a 6 × 6 × 6-inch miniature cabinet. It covers the bands 3.5, 7, 14 and 28 Mc.**

DURING the past few years, many articles have been written describing small transmitters for mobile or portable work. However, practically all have been confined to one- or two-band operation, 'phone or c.w. operation (but seldom both), plug-in coils for band-changing, or other such restrictions. To overcome these shortcomings, the transmitter described in this article was designed and constructed. This unit is adaptable to mobile, fixed-station, portable or emergency use. The principal considerations in the design were maximum band coverage, both 'phone and c.w. operation, simplicity in adjustment, compactness and, of course, minimum cost.

Circuit

To achieve these features, the circuit illustrated in Fig. 1 was utilized. A 6AQ5 operates as a grid-plate crystal oscillator and another 6AQ5 is used as the final amplifier with a pi-network output circuit. Both the oscillator and final-plate coils are bandswitched by a ceramic wafer switch, S_1. Several audio circuits were considered, but all were discarded in favor of the one presented by W1JEQ in the September, 1952, issue of *QST*.[1]

Construction

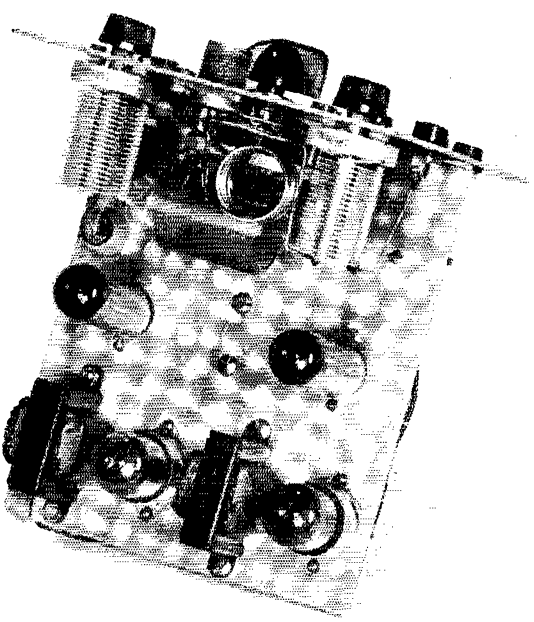
The transmitter is constructed within a 6 × 6 × 6-inch miniature cabinet. The general construction, layout and wiring details are adequately indicated by the accompanying photographs except, perhaps, for the mounting of L_3 and L_4. Fig. 2 shows the method of mounting these two coils. L_3 is soldered across the extreme contact ends of S_{1B}. Taps are made at the 30th and 44th turns, and soldered to the 40- and 20-meter positions, respectively, of S_{1B}. L_4 is mounted vertically and is soldered directly to J_6 and the 10-meter contact point on S_{1B}. Note that on 10 meters L_3 is completely shorted out. Leads for the oscillator plate coils are brought to S_{1A} through half-inch holes fitted with grommets directly under S_1.

The audio section is located across the rear of the chassis, with T_2 in the rear right-hand corner as viewed from the panel. The 6AQ5 oscillator is located forward of T_1 and the 6AQ5 final-amplifier tube is in front of T_2.

All power wiring should be done with shielded wire and the by-passes applied as recommended

* 550 South "G" St., Oxnard, Calif.

[1] Chambers, "A Two-Band Miniature Mobile Transmitter," Sept., 1952, *QST*.



Plan view of the miniature-tube 'phone-c.w. rig. The modulator is at the rear of the chassis, with the output coils and tuning condensers mounted on the panel.

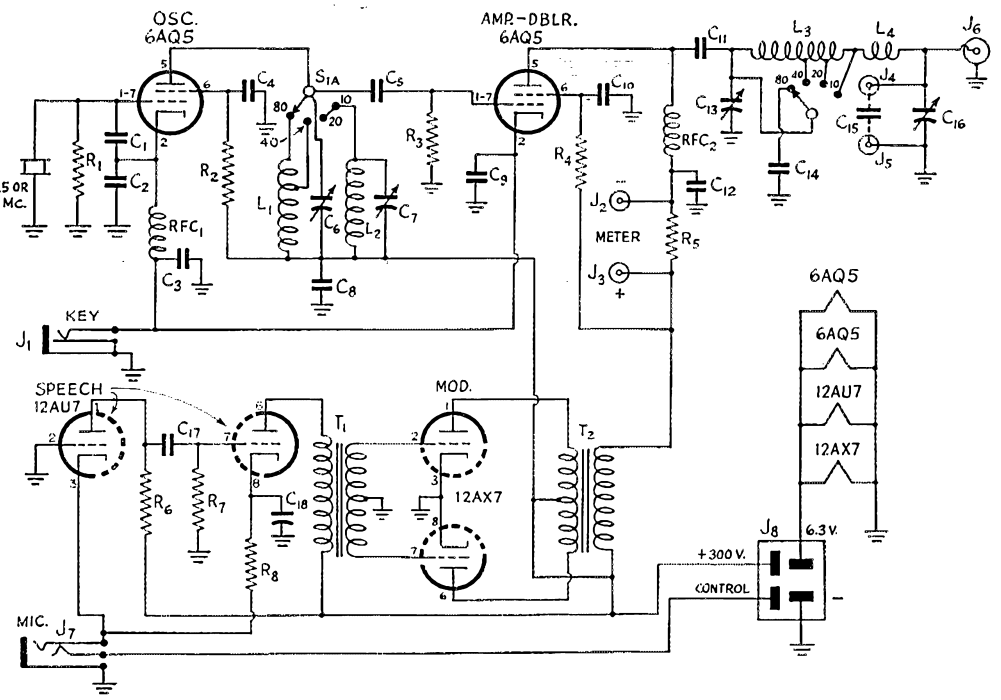


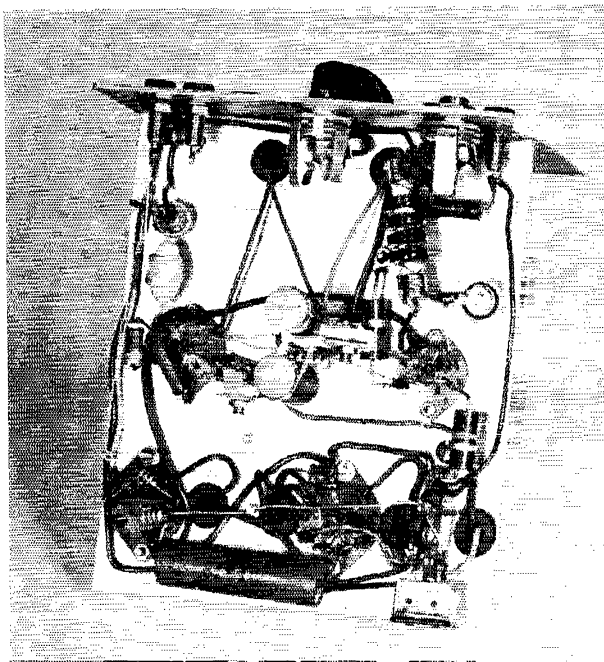
Fig. 1 — Circuit diagram of the miniature 'phone-c.w. transmitter.

C_1 — 20-$\mu\mu$fd. ceramic.
C_2, C_5 — 100-$\mu\mu$fd. mica.
C_3, C_4, C_8, C_9, C_{10}, C_{11}, C_{12} — 0.001-μfd. disk ceramic.
C_6, C_7 — 30-$\mu\mu$fd. mica trimmer.
C_{13}, C_{16} — 140-$\mu\mu$fd. variable (Hammarlund HF-140).
C_{14} — 100-$\mu\mu$fd. mica.
C_{15} — Fixed mica output padder (see text).
C_{17} — 0.01-μfd. disk ceramic.
C_{18} — 10-μfd. 25-volt electrolytic.
R_1, R_6 — 47,000 ohms, ½ watt.
R_2 — 56,000 ohms, 2 watts.
R_3 — 22,000 ohms, ½ watt.
R_4 — 10,000 ohms, 1 watt.
R_5 — 100 ohms, ½ watt.
R_7 — 0.47 megohm, ½ watt.
R_8 — 470 ohms, ½ watt.
L_1 — 42 μh. — 95 turns No. 30 enam., ½-inch diam., close-wound, tapped at 3rd turn from ground.
L_2 — 2.2 μh. — 16 turns No. 30 enam., ½-inch diam. ½ inch long.
L_3 — 32 μh. — 54 turns No. 20, 1-inch diam., 1⅝ inches long, tapped at 30th and 44th turns (B & W 3016 Miniductor).
L_4 — 0.6 μh. — 5 turns No. 18, 1-inch diam., ⅝ inch long (B & W 3014 Miniductor).
J_1 — Closed-circuit key jack.
J_2, J_3, J_4, J_5 — Pin jack.
J_6 — Coaxial connector.
J_7 — Microphone jack.
J_8 — Male power connector (Jones P-304-AB).
RFC_1, RFC_2 — 1-mh. r.f. choke.
S_1 — Double-pole, 4- or 5-position wafer (see Fig. 2).
T_1 — Driver transformer: single plate to p.p. grids, ratio 2.66 to 1 (Triad A81-X).
T_2 — 5-watt modulation transformer, 50-ma. secondary, tapped (Triad M-1X).

♦

Bottom view of the miniature-tube rig, showing the placement of the oscillator coils and trimmer condensers near the center. The power connector is at the rear.

To connect 12AU7 and 12AX7 heaters for 6-volt operation, connect Pins 3 and 4 together as one terminal. Other heater terminal is Pin 9. 6AQ5 heater terminals are Pins 3 and 4.



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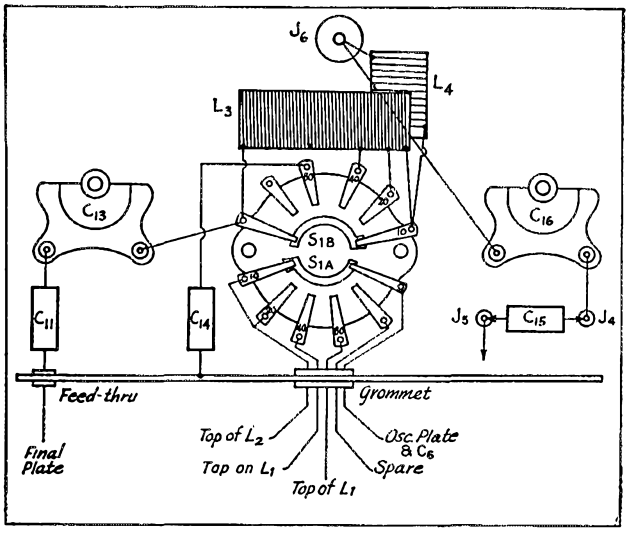


Fig. 2 — Sketch of output-coil connections and associated components.

in the TVI chapter of *The Radio Amateur's Handbook*.

Adjustment

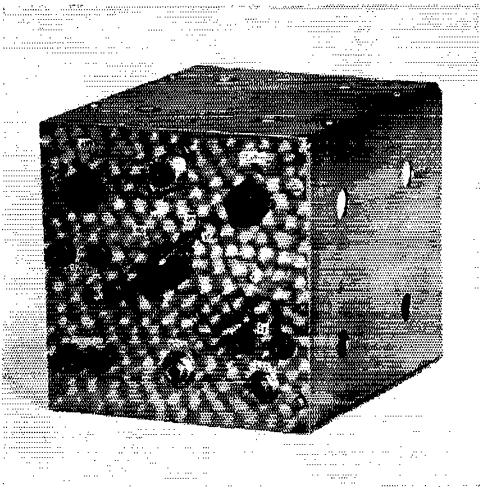
Standard tuning procedure applies. With an appropriate crystal inserted (3.5-Mc. crystals for the 80-meter or 40-meter bands and 40-meter crystals for the 40-, 20- and 10-meter bands), adjust the oscillator plate circuit for maximum drive to the final. This can be determined either

TABLE I

Tube	E_p	E_{sg}	E_g	E_k	I_p	I_k
6AQ5 osc.	300 v.	225 v.	—	—	—	35 ma.
6AQ5 final.	290 v.	225 v.	—50–80	—	45 ma.	—
12AU7 input	120 v.	—	—	4 v.	—	—
12AU7 amp.	290 v.	—	—	8 v.	—	—
12AX7 mod.	300 v.	—	—	—	—	15–25 ma.

by removing the ground from R_3 and measuring the current flow, or by measuring the voltage drop across R_3. In either case, a 2.5-mh. r.f. choke should be connected in series with the negative prod of the high-resistance voltmeter. For 3 to 4 ma. of grid current the biasing voltage should be between 65 and 90 volts. When the trimmer C_6 is adjusted for 3.9 Mc., with the switch in the 80-meter position, the circuit should resonate in the vicinity of 7250 kc. when the bandswitch is turned to the 40-meter position. Then, when S_1 is turned to the 20- and 10-meter positions, it should be possible to resonate the oscillator output circuit in the 14-Mc. band by means of C_7. Only approximate resonance is necessary for any of the bands, since the circuit is reasonably broadband.

The final amplifier is brought into resonance by C_{13} and the antenna loaded with C_{16}. (A 15-watt lamp makes a suitable dummy load for initial tune-up.) The minimum plate current with no load will be approximately 20 ma. When loaded into an antenna or dummy load, the plate current should be about 45 ma. The plate current is measured by connecting a 100-ma. meter at pin jacks J_2 and J_3. When operating on 80 meters, an added capacitor, C_{15}, may be required across C_{16} to obtain sufficient loading. The capacitance value will have to be determined by experiment and may vary from 100 to 1000 $\mu\mu$fd. This condenser is plugged into 'phone-tip jacks J_4 and J_5 located on the front panel directly below C_{16}. Table I at left indicates transmitter voltages and currents to be expected.



A miniature 4-band 'phone-c.w. rig for portable or mobile use. The two output tuning condensers and the coax output connector are at the top. At the center are pin jacks J_4 and J_5 for the 80-meter output padder, and the bandswitch. Crystal socket, microphone jack, key jack and plate-currents jacks are across the bottom.

Is Your Rig R.F.-Tight?

Electronic Weatherstripping as an Aid to Shielding

BY OTMAR P. SCHREIBER,* W2UUH

• Do you have your rig shielded and filtered and still have trouble with TVI? Perhaps your shielding is not as complete as you think it is. In this article, W2UUH tells how you may quite easily make sure that your enclosure is leakproof, yet "openable."

UNDOUBTEDLY, there is many a ham who feels that the job of suppressing TVI from his rig is an insurmountable task. Yet the requirements to be met in his case are much less stringent than those imposed upon most military installations. There is probably no place where it is more essential to reduce r.f. leakage to the very minimum than in a modern combat plane. A night fighter would not be very effective if its radar, v.h.f. communications equipment, and motor-ignition system could not be used simultaneously. In spite of the fact that space limitations dictate that these units must be placed in close proximity, effective isolation is achieved. *The leakage from megawatt-peak radar transmitters can be reduced to less than 5 microvolts per meter!* In accomplishing this, electronic weatherstripping has played no small part.

The Problem

The importance of shielding is continually stressed in *QST* and the *Handbook*, not only to prevent direct radiation of harmonics, but also as a means of keeping harmonic currents from flowing around power-supply and antenna filters, largely nullifying their intended function. However, the point that many hams do not appreciate is that the shielding must be *tight*.

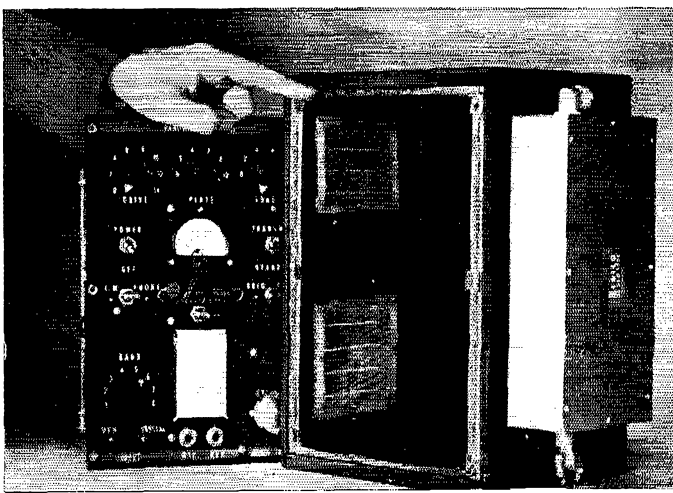
In this instance, the word *tight* has a meaning that is not too well understood. Everyone is familiar with the fact that wave-length decreases with increasing frequency. This is highly important when considering the leakage from a rig at TV frequencies, especially as stations start using the new u.h.f. channels. Leakage is directly related to the *longest* dimension of an opening — not the area, as is often supposed. For example, an opening between a lid and a chassis 8 inches long, but only 0.006 inch wide may leak far more than a ¼-inch diameter hole, yet each opening has the same area. While the leakage from either opening will be greater at 50 Mc. than at 5 Mc., the leakage from the crack increases at a greater rate than that from a round hole of equal area, as the frequency is made higher. At 500 Mc. (Channel 19 in the new u.h.f. band), where 8 inches is more than a quarter wavelength, the 0.006 × 8-inch slit acts like an efficient antenna!

Now, it's practically impossible to see an opening 0.006 inch wide, and cracks like this are common to the majority of shielding enclosures usually considered as tight. It is for this reason that the importance of using closely-spaced tight-drawing fasteners has been stressed in the past. Equipment can be designed so that it can be operated without the necessity for ready access to the interior. However, most hams would still prefer the convenience of a hinged cover for inspection and minor adjustments, were it not for the problem of leakage. Needless to say, a lid that requires the removal of a multitude of fasteners is of little practical purpose.

Electronic Weatherstripping

Electronic weatherstripping, as it is popularly called, is not a new development, having been in use for various applications for a number of years. As the term implies, it is parallel in purpose to household weatherstripping — to seal off unavoidable leaks. Metex* stripping is composed of monel wire which is knitted, not woven or braided. It is the interlocking loop structure which results from knitting that gives the required resiliency, or spring, to the finished product. Compressing the knitted mesh gives it the desired cross-sectional shape and stability without sacrificing its elastic properties. The

*Metal Textile Corp., Roselle, N. J.



Using electronic weatherstripping to de-TVI a Harvey-Wells transmitter. This photo shows the stripping around the panel and the shielding of the louvers. Not shown is the stripping around the rear opening.

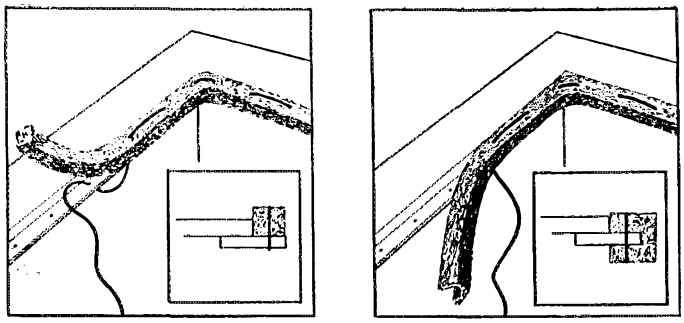


Fig. 1 — Two methods of applying TVI-20-S electronic weatherstripping: A — Using unopened strip; B — Using partly-opened strip. In both cases, the stripping is "sewed" on with approximately No. 26 bare or enameled wire. Stitching holes (No. 50 drill) should be roughly an inch apart, those at the corners not over ⅜ inch apart. The corners are preformed and flattened to avoid lumps. Fully-opened stripping can also be applied as shown in A.

result is a resilient, conductive metal-to-metal filler between mating surfaces — one that readily conforms to the often unsuspected minor irregularities in these surfaces — and continues to do so no matter how often the doors or panels are opened and closed. Only a few screws or fasteners are needed to exert sufficient compressive force on the weatherstripping to obtain a leakproof seal. The number of fastenings will, of course, depend on the size of the enclosure, but in all cases will be considerably less than when using the "brute-force" method — many screws, closely spaced.

Experience has definitely shown that the corrosion resistance of monel makes it preferable to other metals, even though they may have higher initial electrical conductivity.

Installation

As a result of discussions with many hams, individually and at group meetings, a new type of weatherstripping (identified as Metex TVI-20-S) has been designed especially for universal application to ham problems. It is furnished in a continuous strip compressed to a ⅛-inch-square cross-section (see Fig. 1A). This strip is so constructed that the cross-section can easily be changed to 1/16 × ¼ inch, or to form a channel (see Fig. 1B) to fit spaces, such as the hinge side of a lid, where the space will not accommodate a thickness of ⅛ inch. Pulling one end of the strip apart will expose the longitudinal split in one side, and the remainder of the strip will easily open for the required length.

The sketches of Fig. 1A and B show one satisfactory method of applying the TVI-20-S. In each case, small holes are drilled at intervals of an inch or two and the stripping is "sewed" on around the edges of the opening with copper wire. The metal surfaces with which the stripping makes contact naturally must be thoroughly cleaned down to the bare metal. This can be done by scraping with a knife and then brightening up the surface with sandpaper or steel wool. Paint remover will make the job easier, but it must be applied very carefully to avoid damage to the finish adjacent to the desired surface to be bared. Apply the remover sparingly with a small brush and immediately wipe off any of the remover that strays away from the desired area. Within a quarter or half hour, the finish should become soft and wrinkle up. It can then be removed quite easily with a putty knife. Wipe off the surface with turpentine and finish up with sandpaper or steel wool.

While other methods may be devised to attach the weatherstripping to the enclosure, there are certain precautions that must be observed. Solder will soak into the material like water into a sponge. On hardening, it will destroy the resiliency of the mesh and may cause leakage for several inches on either side of the soldered spot. Similarly, adhesives that set hard will have the same effect, and even those that do not set hard should be applied sparingly in spots an inch or more apart, since most adhesives are dielectric.

An Actual Application

The photo shows how the author used the electronic weatherstripping on a Harvey-Wells TBD-50. This rig belongs to W2IMM who formerly had to operate mobile from the curb in front of his home to be TVI-free and then only when the trunk was closed, in spite of the low-pass filter used in the antenna. He lives in a heavily-populated but good TV-signal area and likes to live at peace with his neighbors.

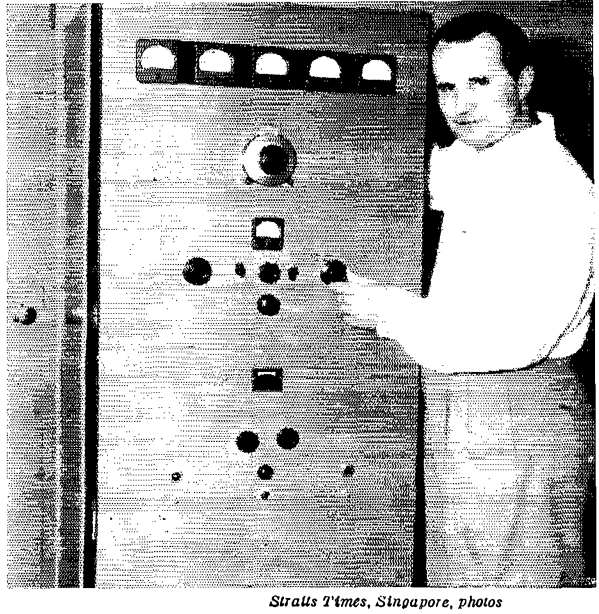
TVI-20-S was sewn around the front and the smaller rear openings of the cabinet, as shown in Fig. 1A. Note that all paint was first cleaned off and that the screws and nuts supplied with the rig are still used.

The photo also illustrates an interesting method of shielding louvers first used by W2TH. Electronic weatherstripping was used to make good metal-to-metal contact between the cabinet and the screen. The screen and stripping were held in place by passing self-tapping screws through a clearance hole in the cabinet and screwing them through the stripping and screen, and into a sheet-metal backing strip with tapping holes. The only evidences of any alterations on the exterior of the cabinet are eight screwheads per louver — no blistered paint from soldering. Actually, the backing strip need not be metal so long as it is stiff enough to compress all the stripping between screws. Wood strip, or other similar material, might be used,

(*Continued on page 108*)

A Seafaring Kilowatt

The "New Look" of W2ZXM/MM



Straits Times, Singapore, photos

WE LIKE to keep a roving eye on one of America's favorite roving amateurs—Captain Henrik Kurt Carlsen, W2ZXM of *Flying Enterprise* fame.[1] We thought you'd be interested in the new kilowatt rig "Captain Stay-Put" whipped together in spare time aboard his new command, *Flying Enterprise II*.

Kurt not only enjoys keeping a solid signal consistently on the air but he likes to "roll his own." And when he builds he does a seaworthy and airworthy job of it.

The transmitter, shown at upper right, is capable of putting out well over a kilowatt but is kept coasting along at legal maximum input. Its r.f.-section tube line-up: VFO or crystal input to four 6AQ5 buffers/multiplifiers, 807 driver and push-pull 4-250As. The modulator section: a 6SJ7 preamp, 6SJ7 speech and a 6SJ7 driving a pair of 4-250As in class AB_1. Except for the final tank coil, the outfit bandswitches from 80 through 10 meters with choice of VFO or five crystal frequencies. Despite the fact that much operation is done outside the three-mile limit, Captain Carlsen's gear is constructed with TVI and BCI possibilities in mind.

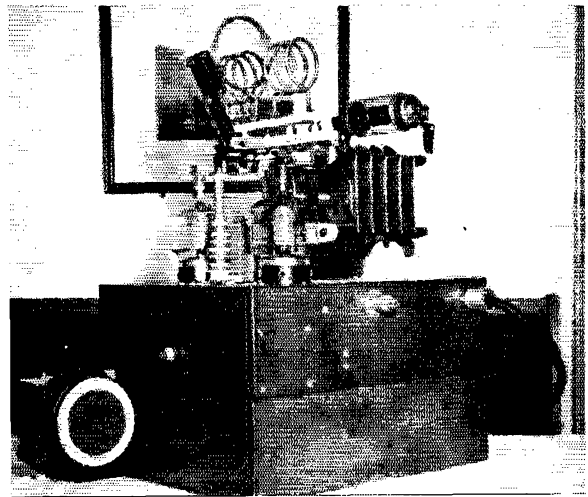
There are six separate power supplies in Kurt's cool kilowatt. A special 5-kw. d.c. motor-generator is available for powering W2ZXM/MM although the set-up is operable at reduced power directly off the *Enterprise II* main generator through a 2-kw. step-down transformer. Most relays are actuated by selenium-rectifier power units to avoid hum complications.

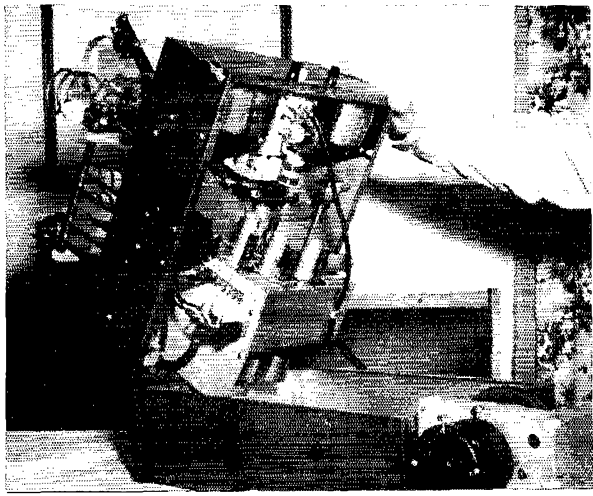
Strict maritime regulations must be observed when installing such a seagoing hamshack as W2ZXM/MM. No part of the ship's commercial gear can be used for ham purposes nor can interference by the amateur layout be tolerated. There are other gimmicks to watch out for, too. For instance, you cannot employ plug-in power cords of lengths exceeding 1½ feet. (Did you ever see a landlubber station that could comply with *that* specification?)

The Captain also keeps a private 5-watt commercially-licensed station ready for action and tries his hand at radio-controlled model aircraft experimentation now and then. When 28-Mc. conditions permit, you'll have good opportunity to work W2ZXM/MM, whether he's on the road to Mandalay or off the shores of Tripoli.

[1] "W2ZXM/MM—'Captain Stay-Put'," *QST*, Feb., 1952, and "*QST* Visits 'Captain Stay-Put'," *QST*, Mar., 1952.

The entire r.f. section of Captain Carlsen's kilowatt is accounted for by the unit shown in two views below. Thorough coating with pressure-sprayed aluminum paint is one of the precautions necessary against sea corrosion. Compact construction is possible through use of forced-air cooling, yet all circuits are easily and quickly accessible for maintenance. Subchassis are of aluminum; the final, however, is mounted on steel. To ensure compliance with amateur power regulations, an overload relay kicks off the rig when the final input exceeds 990 watts. All construction was done in the W2ZXM/MM shack, the Master's private cabin aboard *Flying Enterprise II*. "Captain Stay-Put" is installing a rotary beam so that he will no longer be tempted to spin the ship to vary fixed-antenna directivity!





Magnetostriction Devices and Mechanical Filters for Radio Frequencies

Part III† — Mechanical Filters

BY WALTER VAN B. ROBERTS,* W2CHO

• **In this third and concluding installment two practical designs for mechanical filters are given, along with adjustment procedures. Their construction is admittedly beyond the ability and facilities of most amateurs, since accurate machine work and good test equipment are required. Nevertheless, even if you aren't in a position to experiment in this field you will find the article informative — and will appreciate why commercially available filters, using materials worth intrinsically only a few cents, cost as much as they do.**

IN designing a mechanical filter that is not merely a slight variation of an old design, the following questions must be answered:

1) What materials will be used for resonators?

2) What mode of vibration will be used in each resonator?

3) What resonator dimension will be chosen when any dimension is arbitrary?

4) What coupling means, including material and mode of operation, will be used between resonators?

5) How shall the different elements of the filter be joined together — by welding, soldering, one-piece construction, press fitting, or what?

6) Shall electrical circuits and ferrite resonators form part of the filter?

7) If metal resonators are used at the ends of the filter how shall they be damped?

8) Shall the filter be symmetrical or single-ended?

9) How shall drive and take-off be accomplished if the end resonators are metal?

10) How shall the filter be mounted so as not to cause detuning or unintentional damping?

Several of the above questions call for extensive research before they can be answered most fittingly for any given filter requirements, but in any case it is evident that a mechanical filter can take on an almost infinite number of physical forms. For example, if there were only ten possible resonator modes a six-circuit filter could be made up in a million different ways, according to the answer to Question 2 only. In a relatively brief introductory article such as this it would probably be confusing to try to discuss more than a very few of the possible filter forms, and it seems best to decide arbitrarily on a couple of simple forms for the purpose of illustration. The details of the calculations entering into the design will likewise, for simplicity, be omitted.

An I.F. Filter for 'Phone Signals

As a first example, then, let us choose a torsion filter with electrical end circuits coupled with ferrite resonators, and aluminum resonators between the ferrites, as shown in Fig. 20. It is to be very selective so as to be useful for single-sideband reception or generation so it should have quite a number of circuits. Seven should be enough. It will be centered on 100 kc. so that the resonators will be of convenient size. This frequency is useful as the second i.f. in double-conversion receivers. A band of 3000 cycles/second will be sufficient for a single sideband so B will be taken as 0.03. Its output should be reasonably flat in the transmission band so the peak-to-valley voltage ratio will be taken as 1.05, which corresponds to a ripple of only about 0.4 db. As there are electrical circuits at both ends it will be of the symmetrical type. Let us further assume that the ferrites will be one-quarter inch in diameter and that the aluminum portion of the filter will be turned out of quarter-inch dural rod, all resonators being a half wave long. (Note that the physical length of a half-wave resonator is obtained by dividing the torsion-wave velocity of the material by twice the operating frequency so that the ferrite resonators will not be exactly the same length as the aluminum ones.) This completes the arbitrary specifications of the filter.

Calculation shows that the required coefficients of coupling between the end circuits and the ferrites are only a little over 2 per cent and that the Qs of the end circuits must each be 55. These values are readily obtainable.

* 155 Hodge Road, Princeton, N. J.

† Part II of this article appeared in July, 1953, *QST*.

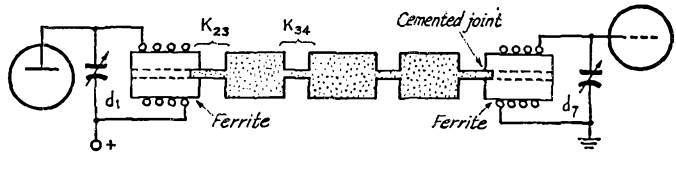


Fig. 20 — Mechanical filter analogous to the electrical circuit of Fig. 19. High-Q mechanical resonators replace the three center circuits of that figure, while the end sections are magnetostrictively coupled to the electrical circuits.

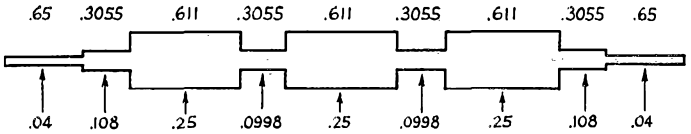


Fig. 21 — An i.f. mechanical filter designed for 'phone reception, having a 3-kc. bandwidth centered on 100 kc. The material is aluminum and the filter is of the torsion type using electrical end circuits coupled with ferrite resonators, as shown in Fig. 20. The coils in this filter must have the proper Q to act as terminations, as described in the text, and must be moved over the ferrites until the proper coupling is obtained. See Fig. 22 for explanation of dimensions.

The calculations of the various resonator and neck dimensions required to meet the specifications involve the densities and torsion wave velocities of aluminum and ferrite. If the densities are taken as 2.8 and 4.8, respectively, and the velocities as 3.1 and 3.3 kilometers per second, the result of the calculations is a drawing to be given to a machinist for the aluminum part of the filter as shown in Fig. 21. Note that the diameter (0.108 inch) of the necks joining the aluminum and ferrite resonators (at the ends) to give 1.66 per cent coupling differs very little from the diameter (0.0998 inch) of the necks joining the aluminum resonators, where the required coefficient of coupling is 1.6 per cent. However, as described in Part II, the coupling varies as the fourth power of the neck diameter so that a small change in diameter makes a relatively large change in coupling.

In Fig. 21 it was assumed that the hole in the ferrites is 0.04 inch in diameter. It makes little difference what the exact hole size is so long as it is small enough so that it makes little difference to the resonator energy. On the other hand, if it is too small, it is difficult to turn the tips down small enough to fit in the holes. It will also be noted that the tips have been made the same length as the ferrite resonators so that the ferrites can be cemented to the tips throughout the full length of the hole. This joint must be good and solid, especially at the ends of the ferrites, and the tips should be a fairly close fit in the holes. Armstrong's A-2 cement is good for the purpose. It can be obtained from Armstrong Products Co., Argonne Road, Warsaw, Ind. It might be better to make the tips a little too long and file the excess off after cementing, as the exact length of the ferrite may not be known until it has been ground off to the right frequency.

An I.F. Filter for C.W. Signals

As a second example of filter design let us suppose we want a band of 300 cycles/sec. at 100 kc. For c.w. use not many circuits are needed — four should be more than enough. But perhaps we would like very high frequency stability over a considerable range of temperatures. In this case the resonators should be made of NiSpan-C, which is a nickel alloy obtainable from the H. A. Wilson Co. of Newark, N. J.[4] This material is sufficiently magnetostrictive to permit drive and take-off (although with considerable transmission loss even for narrow-band filters) so that ferrite transducers are not needed. It is hard to machine, however, and the filter is best made by grinding. The material can be obtained in quarter-inch rods and so the resonator diameter will be assumed to be one-quarter inch.

The c.w. filter is too narrow to allow the use of electrical end circuits, so the resonators will all be made of the metal and hence the required terminating damping must be supplied mechanically. To simplify construction, a single-ended filter will be chosen as it requires damping at one end only.

This time we must provide enough mechanical damping to reduce the apparent Q of the first resonator to 328. The most stable way to do this is to attach a mechanical transmission line to the free end of the first resonator. This is simply a long wire of diameter chosen to take away vibration energy at the rate necessary to bring the Q down to the desired value. An infinitely long wire would be ideal but a moderate length such as a foot or two can be used if the wire is wrapped with electrical Scotch tape to cause enough attenuation so that reflections from its far end are not noticeable. For compactness, the wire can be coiled up, provided the coil circumference is large compared to the wavelength of the torsion waves traveling along the wire. The wire size required depends on the density and velocity of propagation of torsion waves. Since copper wire is available in closely graded sizes, copper is a logical choice for the line. For copper, calculation shows that the diameter required in this case is 0.069 inch, which is between 13 and 14 gauge. Probably either No. 13 or No. 14 would do well enough.

Since the Q of the first resonator is still pretty high even with the line connected to it, the line can probably be attached first and the resonator tuned afterwards. It can be soldered or press fitted into a hole drilled into the end of the resonator just far enough to grip the wire solidly.

So much for the mechanical design of the filter. Drive and take-off coils are to be placed over the first and last resonators (respectively or vice versa). The coils are preferably tuned so as

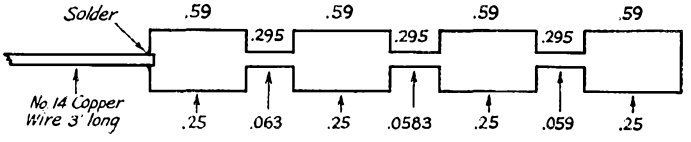


Fig. 22 — Mechanical filter for c.w. reception. Its bandwidth is 300 cycles centered on 100 kc. The material is NiSpan-C. The complete filter arrangement is shown in Fig. 23. Except as indicated, dimensions are in inches. Cross-section is circular, with arrows indicating diameters and upper numbers indicating length.

[4] 105 Chestnut St., Newark 5, N. J.

to obtain maximum transmission, but due to eddy currents in the metal the Q of the circuits will be so low that they will not affect the transmission characteristics appreciably except that they will help reject frequencies well outside the passband. The resonators must be permanently biased by briefly shorting a battery through the length of the structure, the time of contact being very short so that no heat will be developed. The

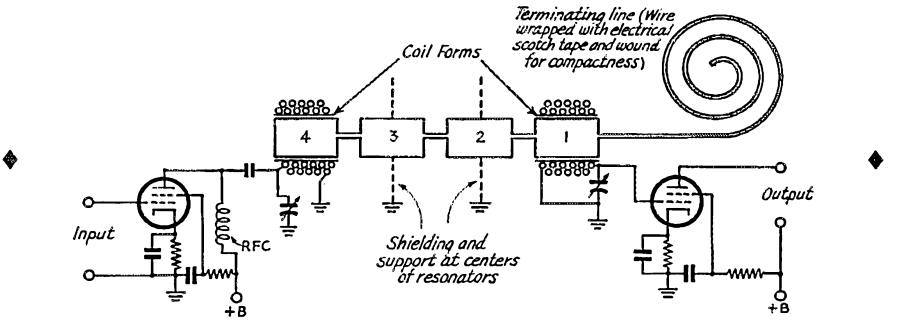


Fig. 23 — Circuit using the filter of Fig. 22. Constants associated with tubes are conventional. Inductances of the drive and take-off coils, although not critical except that they determine the impedance level so a large L/C ratio is preferable, must be such as to be resonated to the operating frequency by the variable condensers. Coil Qs are not important in this filter. The coil forms should fit fairly closely over the resonators but the filter should be supported so as not to touch them. Shunt feed is indicated for the drive coil so there will be no d.c. in the coil to magnetize the resonator; however, this precaution may not be necessary.

working drawing for the filter will be as shown in Fig. 22, if the velocity of NiSpan is 3×10^5. The circuit is given in Fig. 23.

Tuning

The most difficult part of the work is the final tune-up. For this, some sort of bridge scheme is very helpful — and, in fact, a necessity when resonance is to be detected in feebly magnetostrictive resonators. To supply the bridge a good stable signal generator is needed, with a dial or other means capable of measuring frequency differences as little as one part in ten thousand. The output of the bridge is fed through a reasonably flat video amplifier to an oscilloscope. A suitable layout is shown in Fig. 25.

In the bridge shown, resistors R_1 and R_3 may be more or less equal to the output impedance of the signal generator; the coils, with the sample and dummy in place, should be of the same order of impedance at the frequency of operation. Coarse balance of the bridge is most conveniently obtained by adjusting a dummy in one of the coils which is generally similar to the resonator or sample to be observed, and a finer balance by adjusting a smooth-running potentiometer, R_2, whose resistance is small compared to R_1. The dummy must not be biased or it will produce responses itself, which may confuse matters.

The idea is to balance the bridge to a very small output at frequencies off resonance of the sample so that when the generator frequency passes through the resonance frequency of the sample a twitch in the 'scope pattern will be seen. Sometimes it is helpful to supply the 'scope with horizontal deflection voltage direct from the generator, so as to produce an elliptical pattern which changes shape at resonance. If the figure is not a good ellipse it means that there are harmonics somewhere, but this does not prevent observing resonance although harmonics in the generator output will prevent obtaining a perfect bridge balance. The detector or output arm of the bridge does not have either end grounded, so a small transformer is used to obtain single-ended output. This may be a ferrite torus with ten or so turns concentrated at one side of the torus and several times as many output turns concentrated on the other side, if the video amplifier has high input impedance — otherwise, the output turns are adjusted to suit the amplifier input impedance. The whole set-up is less sensitive to body capacity and stray pick-up if it is built to be shielded as much as possible and connections are made by concentric cables with the outer conductors grounded.

Assuming such a set-up and some experience in balancing it and observing the responses of single resonators, there are several ways to attack the problem of tuning the elements of a complete filter. None of them is easy and entirely satisfactory. If it were possible to clamp perfectly all the resonators except the one being tuned, that one could be tuned like a single resonator. When quarter-wave necks are used the resonator should be tuned to the middle of the desired band, since quarter-wave necks clamped at their far ends should not affect the frequency. If the observed frequency is too low, file a little off the resonator ends. It is not necessary to file the entire end face — just take a little off the

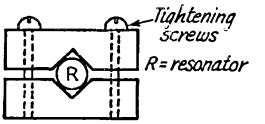


Fig. 24 — Suggested clamp for metal resonators. If the axial length is small, one such clamp may be put on each end of a resonator. The clamps may be of brass. The dimensions should be unimportant unless by bad luck the clamp itself happens to exhibit resonance at the operating frequency.

corners. If the frequency is too high, file a slight groove around the middle of the resonator. The resonators should be close enough to the right frequency to begin with so that the amount of filing will be quite small. The clamps should grip the resonators very firmly at several points around each end, as indicated in Fig. 24. If the clamps are really effective only a single response should be observed even when clamps are put only on the resonators adjacent to the one being tuned. By this process a narrow-band filter can usually be tuned quite well, but of course the process can be used only if all the resonators are magnetostrictive or are made so by plating them with about 0.001 inch of hard nickel.

Another method, which can be used on the 'phone filter first described with the ferrites cemented on, is to put one of the ferrites in the sample coil of the bridge, clamp the aluminum resonator next to it, and tune the ferrite by grinding the ends or the middle. Then move the clamp along to the next aluminum resonator but keep the ferrite in the test coil. Now two resonances will be observed. If the two do not fall at equal distances on each side of the ferrite frequency it must be the fault of the resonator next to the ferrite, so it is tuned until they do. Then the clamp is moved one step further along whereupon the ferrite will show three responses. If the middle one of these does not fall on the ferrite frequency the third resonator should be tuned to make it do so. This process can be continued indefinitely in theory, always tuning the most recently unclamped resonator to make the spectrum of responses shown by the ferrite symmetrical about its own frequency, but as cumulative errors arise in practice it is better to turn the filter around after reaching the middle and repeat the process from the other end.

Even if by the above methods or otherwise, the mechanical part of the filter has been perfectly tuned, the battle is not yet won, for it remains to tune and couple the end circuits correctly and to adjust their Qs to the required value. This process is complicated by the fact that any change in coupling, by moving the coil more or less over the ferrite, changes the tuning considerably, and even to some extent the Q of the coil. The systematic procedure is to connect the coil to a Q-meter and adjust its coupling to the ferrite so that with the resonator adjacent to the ferrite clamped, and the circuit properly tuned, two responses are observed on the Q-meter, separated by the fraction k_{12}. To get these responses the coil Q must be fairly high. Then, keeping this coupling between coil and ferrite, reduce the coil Q (measured at a frequency off resonance of the ferrite) to the required value by inserting resistance in series. If this is done for both coils, there remains only their tuning to be adjusted after the filter is connected up for a transmission measurement. However, human nature being what it is, the systematic procedure will probably not be followed. Instead, a more or less successful adjustment of the coil coupling, tunings, and Qs will be made by cut-and-try with the filter connected up for transmission. This method will probably give satisfactory performance if the theoretical curve is not really needed, and in fact might well be the best method if a sweeping generator were used and the output curve displayed on a 'scope so that the effects of the various adjustments on the performance curve would show up at once.

Some Miscellaneous Remarks

The filter may well be built in a chassis containing an input tube and an output tube and the tuning condensers. Good shielding must be provided between input and output circuits in order to realize the full attenuation of the filter at frequencies well outside the band. The mechanical part should be so mounted that the points of large motion do not touch anything. The resonators can be supported at their centers, or in the case of torsion elements, needle-point supports can be inserted into tiny cone-shaped holes at each end of the structure. The c.w. filter that has been described is small enough so that it could be supported entirely from the wire line which in turn can be clamped between pieces of soft rubber or felt. The complete filter unit can be tested by supplying voltage to the grid of the input tube from the signal generator and measuring the output voltage across a resistor in the plate circuit of the output tube. The performance curve can be made by holding the signal generator voltage constant and plotting output voltage against frequency, or by plotting the generator voltage required to keep the output constant.

Ferrites are too hard to be tuned with a file. A grindstone will cut them but is likely to crack them. An iron grinding turntable with Carborundum powder in water is fine but not usually available. Fine emery or garnet paper and patience is a practical answer.

Theoretically all the dimensions can be scaled down by a given factor to give an operating frequency scaled up by the same factor. (The fractional band is not changed but the bandwidth in cycles goes up in proportion to the operating frequency.) It is recommended, however, that any initial experimenting be done at a frequency such as 100 kc. where the dimensions of the parts are not too small. For 455 kc., for example, the

(Continued on page 110)

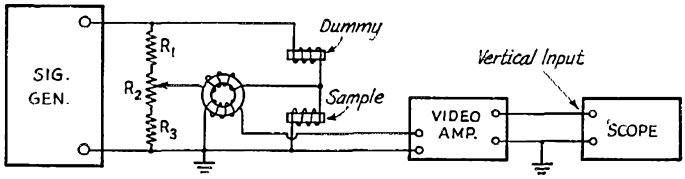


Fig. 25 — Test set-up for adjustment of frequency of magnetostrictive resonators. R_1 and R_3 are approximately equal to the output impedance of the signal generator, while R_2 is a potentiometer having low resistance compared with R_1–R_3.

The "Plain Ground-Plane" Antenna

Solid and Simple Construction for 10 Meters

BY S. E. McCALLUM,* W2ZBY

• **Ground-plane antennas are hard to beat for general-coverage work, but in the 10-meter band they start to get big and a little difficult to build. That is unless you follow this simple design of W2ZBY's that has proven itself at several locations.**

LADS with machine shops or unlimited funds can turn the page. For this "plain ground-plane" is for plain folks who have a rough time getting machined fittings made. We are talking about a 10-meter ground-plane antenna that's inexpensive, light, sturdy, efficient — and b-r-o-a-d.

Back in 1950, the boys in Bergen County, New Jersey, were going mobile like crazy in response to the call of civil defense. We asked Antennexpert Bob DeCamp, W2AFG, how to put up a simple little vertical, the better to work all the mobiles from home.

"Put up a ground-plane," he said.

The thought made us shudder — what with not having access to a machine shop to make fittings and not being too sharp at figuring out how to match a line to such a radiator. A few weeks later we tried him again — explaining that all we wanted, really, was just vertical polarization that would do the trick without too much time or cost.

"Put up a ground-plane," said Bob.

So we strung up a folded dipole vertically in a tree — a trick Ralph Hasslinger, W2CVF, used — and to our knowledge still uses — to blast the county c.d. channels quite successfully with 75 watts. But our 110 watts on the same lash-up didn't even blast the flies off the insulators.

Ralph wouldn't divulge the secret of the magic powder he sprinkles over all his gear, so we approached DeCamp again — this time talking vaguely about various types of verticals, hoping to trick him into a general discussion wherefrom we could extract some ideas on a nice simple affair. He gave us a cold eye and said:

"Put up a ground-plane."

Instead, we made a coaxial vertical antenna à la *ARRL Antenna Handbook*. We used TV masting for the skirt, running the coax up the middle with the braid attached to the top of the skirt and the center conductor to the base of an 8-foot whip mounted above. The boys politely reported 9-plus and changed the subject. The signal seemed to hop around quite a bit: A half mile in one direction, Don, W2LST, would barely hear it; on the other hand, Doc, K2BV, 10 miles the other way, said it was "way over 9." The more we used the coaxial vertical antenna, the more fellows gave these reports — and the less we liked it for omnidirectional work with mobiles.

We picked up the 'phone to call DeCamp again — and then put it down without making the call. No use, we thought. He'll just tell us to put up a ground-plane.

And Ground-Plane It Is

To get our mind off the subject we opened the September, 1952, issue of *QST* that had just arrived. But there is no rest for the wicked. For on page 18 we found "Matching Coax Line to the Ground-Plane Antenna," by Robert T. DeCamp, W2AFG — an article complete with cut-and-dried (not cut-and-try!) formulas for making a ground-plane for any frequency out of whatever material you happen to have on hand for radiator, radials and feeder. Well, we had radials (sections of TV masting) and we had feed line (70-ohm coax). The only thing lacking

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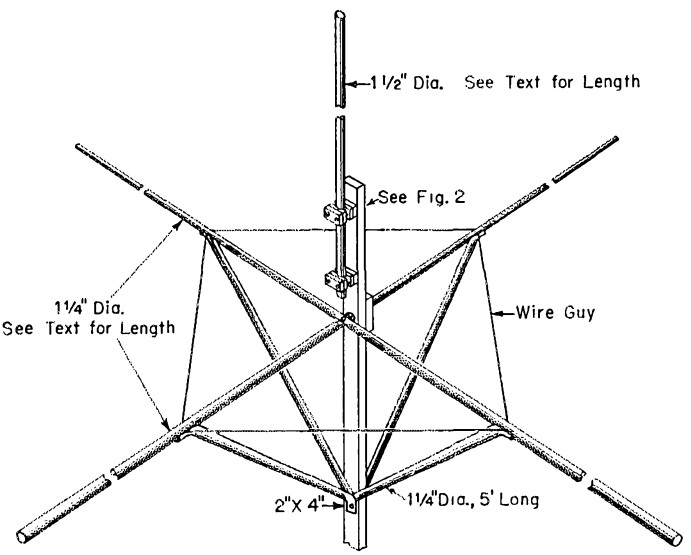

Fig. 1 — Constructional details of the "plain ground-plane" antenna. Made from TV mast sections and self-supporting on a 2 × 4, this 10-meter antenna is strong enough to withstand practically any storm or weather.

was a really suitable radiator. DeCamp already had told us to stay away from seamed TV masting as a radiator, and we wanted something with bigger diameter — thus broader — than wire or whip.

Lo and behold, we looked out the window and saw our good friend Sal, W2HGT, plodding up the driveway with a beautiful 9-foot length of 1½-inch-diameter aluminum tubing over his shoulder.

"What'll I do with it?" he asked. "I've two more pieces like this at home."

"Give me two of them and I'll make us each a ground-plane that'll knock the boys into the back seats of their cars," we replied.

"Good deal," said Sal.

When he left, we sobered a bit at the thought of constructional problems ahead. But, fired with imagination from DeCamp's article — and with a background of practical know-how on how-not-to get vertically polarized! — we boldly put through the landline call to DeCamp after all and announced that we were going to put up a ground-plane. We held the 'phone away from our ear expecting blasts of: "I told you so," and "It's about time." But he fooled us; he quietly said:

"Let me know when you're ready and I'll come out and help."

Pencils and scratch pads melted away for about a week while we tried to figure out an easy and inexpensive way to mount all the components. We wanted no machined fittings — yet something light, and strong enough to laugh at an 80-mile-an-hour gale. The first finished design looked like a telephone pole complete with crossarms and would have weighed, conservatively, about three tons. More pads, pencils and head-scratching until finally we arrived at the design shown in Fig. 1.

The finished product doesn't look like it was made in a factory. It wasn't — it was hammered out, literally, in the back yard with hammer, pliers, file, saw, screwdriver and brace and bit. But —

It's easy to make.
It's strong.
It's light.
It's cheap.

And best of all, it lays down a signal evenly for miles around — with a standing-wave ratio of 1.5 to 1 *at the edges of the 10-meter 'phone band!*

What do the locals tell us now? "Best signal we've ever heard from W2ZBY, OM." And one time we hooked on a little 6AQ5 rig, and were tickled pink to be called a liar when we announced we were running 9 watts — especially inasmuch as the antenna was down among some trees only 9 feet above ground! Sal tells us (yes, we really did make a second ground-plane for him) that, confidentially, the boys report his 45 watts now knock out old master filter-builder Ralph, W2CVF, with the magic folded dipole hung up in a tree.

Construction

The drawings show the construction, but we'll run through the procedure with a few hints learned the hard way. Start with the polystyrene and wood blocks that hold the radiator to the 2 × 4 upright. We used this clamp-type construction because we had the material and because it is strong. We defy any 100-mile-gale in the world to rip the radiator off the upright! In fact, our ground plane already has remained solid in a gale that pretzeled W2ALZ's triangular aluminum tower. In making these clamp-insulators, each set of blocks should be clamped in position on the 2 × 4 and drilled all at once. This saves a lot of cussing when the long ¼-inch

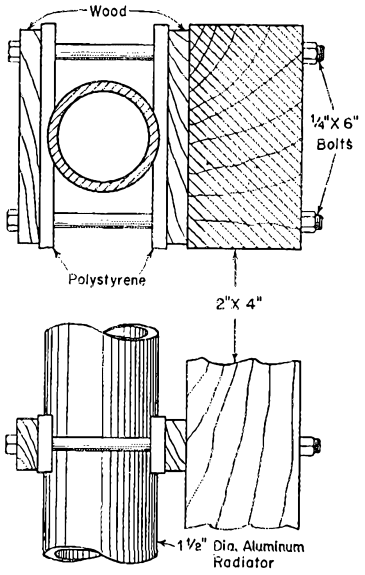

Fig. 2 — Details of one of the two radiator supports.

bolts are slipped in place. The drawings show the poly blocks have round slots to provide a good grip on the radiator. A half-round file does the job — and we found that a can of beer applied internally during this tedious process helps considerably.

The next job is to drill the 1¼-inch hole in the 2 × 4 upright. Two important points here: The hole must be precisely perpendicular to the 2 × 4, because a fraction of an inch off at the center means 6 inches or more upward and downward tilt at the ends 8 feet away. Second, the radial should fit snugly to prevent horizontal play that would put strain on this weakened point in the 2 × 4. We used an expansion wood bit which was set a trifle too conservatively and so we had to file out the hole to pass the radial. Be sure to measure the radial itself before setting the bit. The second time we did the job (building the one for W2HGT) we set the cutter on the expansive bit out a trifle farther, planning to shim the radial up snug. However, fortune smiled and neither file nor shims were necessary.

(*Continued on page 110*)

Adding a Bandspread Range to the BC-221 Frequency Meter

Greater Accuracy in the Ham Bands

BY BEVERLY DUDLEY *

For the measurement of amateur frequencies, the dial-reading accuracy of the popular BC-221 heterodyne frequency meters can be quadrupled by adding a simple bandspread arrangement. This provides a third frequency range whose fundamental frequency is continuously variable from 3500 to 4000 kc. One switch and two adjustable capacitors are the only components needed to add the bandspread range, and the two general-coverage ranges of the instrument are available at any time they may be required. By bandspreading the BC-221 frequency meter so that it covers only the higher-frequency quarter of the high-frequency range, it is possible to read frequencies to about ± 10 cycles in the 80-meter band, and to about ± 80 cycles in the 10-meter band, provided the instrument is carefully used and is correctly operated and checked against a properly-adjusted 1-Mc. crystal oscillator which forms part of the instrument.

The circuit of Fig. 1 is a typical schematic wiring diagram for the variable-frequency-oscillator section for BC-221 units. The circuit constants given include the range of values which are likely to be encountered in different models. It seems likely that the same diagram would also apply to the LM equivalents of the BC-221 meters, although no information is at hand by which this statement can be checked.

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Modifications

The diagram of Fig. 2 shows the circuit of the instrument after modification to provide bandspread operation. The necessary changes are indicated by means of heavy lines. A 3-position 4-pole switch is required. In addition, an adjustable capacitor, C_{10}, in series with the main tuning condenser, is needed to restrict the frequency range for bandspread operation. In order that the calibration for bandspread operation may be made independent of that of the general-coverage high-frequency range, a separate padding capacitor, C_{11}, is also required.

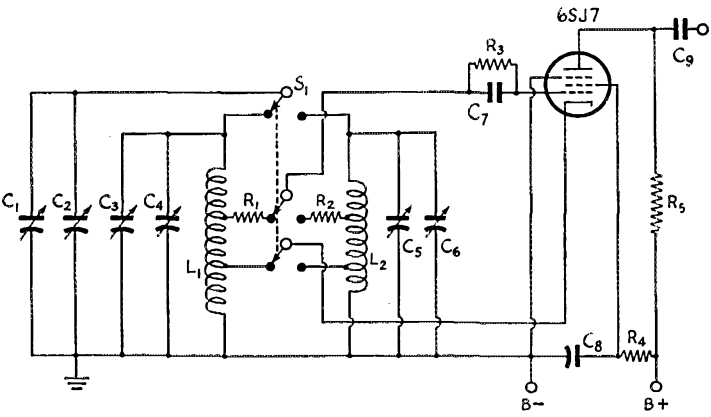

Fig. 1 — Typical circuit of the oscillator section of BC-221 frequency meters. Values given below include upper and lower limits for components found in different models.

C_1 — Trimmer — 1 to 2 μμfd.
C_2 — Tuning condenser — 150 to 235 μμfd. max.
C_3, C_4 — Low-frequency adjustment — total about 25 μμfd.
C_5, C_6 — High-frequency adjustment — total about 25 μμfd.
C_7 — Grid condenser — about 250 μμfd.
C_8 — By-pass condenser — 0.002 to 0.1 μfd.
C_9 — Coupling condenser — 10 to 50 μμfd.
R_1 — 1500 to 4500 ohms.
R_2 — 30 to 400 ohms.
R_3 — 0.15 to 0.33 megohm.
R_4 — 7500 to 20,000 ohms.
R_5 — 50,000 ohms.
L_1 — Tuning coil — 6.5 to 10 mh.
L_2 — Tuning coil, 24 to 39 μh.
S_1 — 2-position range switch.

The 3-pole 2-position range switch (S_1, Fig. 1) normally supplied with the frequency meter is replaced by S_2 (Fig. 2), a 4-pole 3-position wafer switch of small size. The Mallory 3143J (shorting) or 3243J (non-shorting) switches, which are but 1¼ inches in diameter, or miniature Centralab wafer switches, should do nicely for this purpose. In substituting the band-changing switch, it is recommended that as much wiring as possible be done on the switch before it is mounted on the coil subassembly, since space in the BC-221 is at a premium. In replacing the range switch, be careful not to disturb the circuit elements, or their adjustments, any more than is absolutely necessary to make the substitution, for the instrument can be

easily thrown off calibration.

Not all models of the BC-221 frequency meter are alike in construction or circuit design, so no specific directions can be given for the placement of the bandspread capacitor, C_{10}, or the bandspread padder, C_{11}. The capacitance of these two condensers depends upon the circuit constants for the particular model BC-221 meter being modified, and only approximate values can be indicated. Most models of BC-221 frequency meters use a tuning condenser having maximum capacitance of 200 $\mu\mu$fd., but values as low as 150 $\mu\mu$fd., and as high as 235 $\mu\mu$fd., are encountered in some models. A bandspread tuning capacitor, C_{10}, adjustable over the range of from 60 to 120 $\mu\mu$fd., should be adequate in any case. The bandspread capacitor can be made by wiring a fixed capacitor of 50 $\mu\mu$fd. in parallel with a small adjustable capacitor of 75 $\mu\mu$fd. maximum capacitance. The padder for the bandspread range, C_{11}, should probably have a maximum capacitance of somewhere between 5 and 20 $\mu\mu$fd. A certain amount of experimentation may be required to select the proper values in any given case. Once the proper capacitance values are determined, they need not be changed.

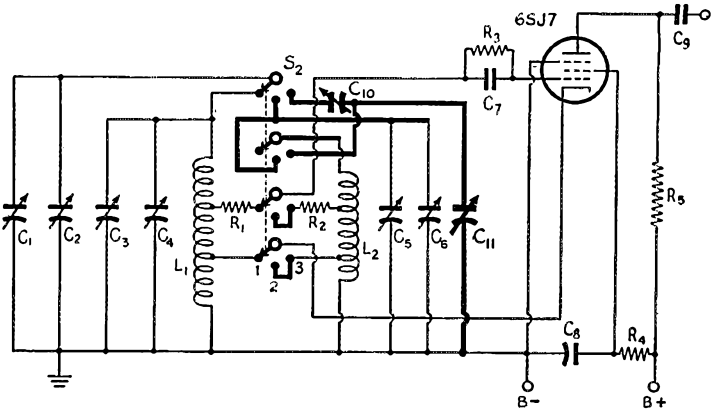

Fig. 2 — The heavy lines show the necessary modifications in the circuit of Fig. 1 to include the bandspread range of 3500 to 4000 kc. Aside from those given below, values remain the same as for Fig. 1. Switch position 3 gives the bandspread range. The other two positions give original ranges.
C_{10} — Bandspread tuning condenser — 60 to 120 $\mu\mu$fd., adjustable.
C_{11} — Bandspread padder — 5 to 20 $\mu\mu$fd.
S_2 — 4-pole 3-position range switch.

The changes required for adding the bandspread range will upset the calibration of the BC-221 frequency meter. Consequently, the calibration on both general-coverage bands should be checked when the necessary wiring modifications have been completed. If the changes have been carefully made and the added parts have not been mounted too close to the coils, it will probably be found that the instrument can be brought back to its original calibration merely by properly setting the trimmers, C_3 and C_4, for the low range, and C_5 and C_6 for the high-frequency band. If adjustment of these trimmers does not bring the unit back to its original calibration, the meter requires recalibration. Calibration is a straightforward, if tedious, process but can be accomplished without any auxiliary laboratory equipment by the procedure described previously by the author.[1] When the instrument has been calibrated for both general-coverage ranges, the bandspread range should be calibrated.

Bandspread Calibration

Probably the best method of calibrating the bandspread range is to begin by locating the 3500- and 4000-kc. crystal check points near the ends of the dial scale. With a receiver tuned to 3500 kc., and C_{11} set to its midposition, adjust C_{10} so that zero beat is obtained when the BC-221 dial reads about 200 divisions. Then set the receiver to 4000 kc. and, while leaving C_{10} untouched, vary C_{11} until a zero beat is obtained when the BC-221 dial reads about 4800 divisions. This procedure leaves 200 scale division unused at each end of the dial. Several successive trial adjustments may be necessary before these two conditions can be fulfilled simultaneously.

With the frequency limits for bandspread operation thus delineated, an approximate calibration curve for the meter can be made by means of a communications receiver covering the 80-meter band, and plotting frequency *versus* dial setting on graph paper. After such an approximate graphical calibration is at hand, a number of calibration check points can be more precisely determined by the procedure outlined below (also in reference[1]). Finally, a calibration book for the bandspread range should be prepared.

With the BC-221 meter set for "crystal check," exact dial readings for the major crystal check frequencies in the range between 3500 and 4000 kc. should be determined. In this frequency range, the major crystal check points (together with their approximate dial readings), when using the 1000-kc. crystal normally supplied,

(*Continued on page 114*)

[1] Dudley, "Calibrating a BC-221 Frequency Meter," *QST*, March, 1950, p. 40.

• In an earlier issue of *QST*, the author discussed the calibration of the BC-221 frequency meter for the benefit of numerous hams who had picked up these instruments minus the calibration charts. In this article, he describes a simple method of adding a bandspread range that quadruples the dial-reading accuracy for amateur bands.

The Multiband Antenna Coupler

Six Bands Without Coil Changing

BY GEORGE L. THOMPSON * W2JJI

• **In this article, W2JJI neatly solves the problem of the bulky inconvenience of the usual antenna tuner. Working on the principle of the multiband tuner, all bands from 80 to 10 can be covered with two coils and no switching. The simplicity and compactness should appeal to the low-power and high-power man alike.**

THE antenna coupler described in this article was designed chiefly to simplify bandchanging when using a bandswitching transmitter. No plug-in or switched coils are used, and only a single split-stator tuning condenser is required to cover all bands from 3.5 to 28 Mc. Moreover, this design features simple construction with relatively few parts which are to be found in most junk boxes.

The Circuit

The circuit of the coupler as used at W2JJI, and the method of connecting it to the transmitter and receiver are shown in Fig. 1. When 3.5- or 7-Mc. energy is fed from the transmitter to link L_3, the circuit will act as if it were connected as in Fig. 2A because the two halves of the small coil, L_2, will have little reactance at these low frequencies, and may therefore be thought of as long connecting leads between the grounded end of the large coil, L_1, and the condenser stators. Fig. 2A shows that we have a simple parallel-tuned circuit under these conditions, with the two sections of the condenser in parallel across coil L_1. This circuit may be resonated at either 3.5 or 7 Mc. if the total maximum-to-minimum capacitance ratio of the condenser is at least 4 to 1, and if the inductance of the coil L_1 is such as to resonate at 7 Mc. with the total minimum capacitance.

When 14-, 21-, 27- or 28-Mc. energy is fed from the transmitter to link L_4, the circuit will act as if it were connected as in Fig. 2B, because both the center of coil L_2 and the rotor of the condenser are at ground r.f. potential, and may therefore be connected together by coil L_1 with no change in the electrical properties of the circuit. Fig. 2B shows that we also have a simple parallel-tuned circuit under these conditions, but with the two sections of the condenser in series across coil L_2. This circuit may be resonated at any frequency between 14 and 28 Mc. if the inductance of coil L_2 is such as to resonate at 28 Mc. with the minimum capacitance which, in this circuit, is half the capacitance of one section of the condenser. The maximum-to-minimum capacitance ratio in this circuit will still be the same as when the two sections of the condenser were in parallel, which again permits a 2-to-1 frequency coverage.

With the condenser nearly open, the coupler will tune to either 7 or 28 Mc. With the condenser nearly closed, it will tune to either 3.5 or 14 Mc.

Because of the arrangement of the coils L_1 and L_2 in this circuit, only one of them at a time can be hot. This enables us to connect two antennas at the same time to the coupler, one on each coil. The one on the coil that happens to be cold will not affect the circuit while the one on the hot coil is taking power from the transmitter. If the antennas are designed so that one may be used on both 3.5 and 7 Mc., and the other on all the higher-frequency bands, no switching of antennas will ever be required. If you use more than one low-frequency or more than one high-frequency antenna, provision must be made for changing their connections to the coupler when changing bands. But one high-frequency and one low-frequency antenna may be left connected to the

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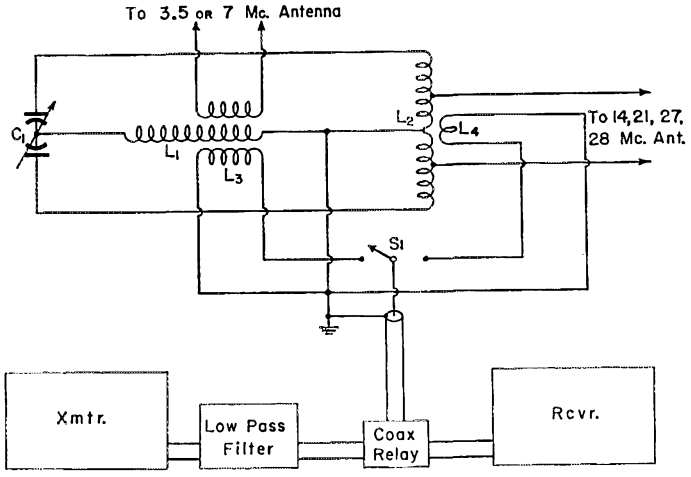


Fig. 1 — The multiband antenna-coupler circuit and method of connecting to transmitter and receiver. Components and values are discussed in the text.

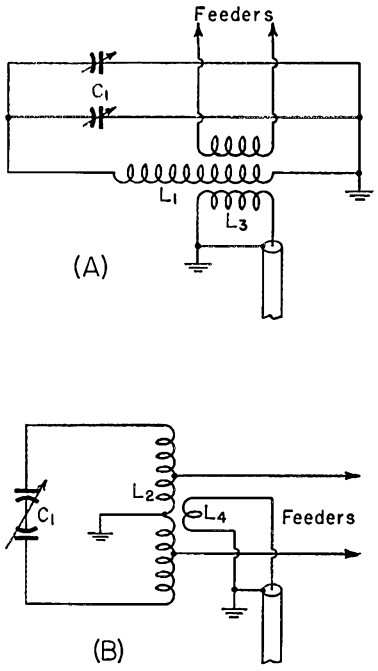


Fig. 2 — A — Equivalent circuit of the coupler when low frequencies are fed to L_3. B — Equivalent circuit when high frequencies are fed to L_4.

coupler at the same time. If several antennas are to be used, the various feed lines should be equipped with links or clips to make it possible to change antennas quickly.

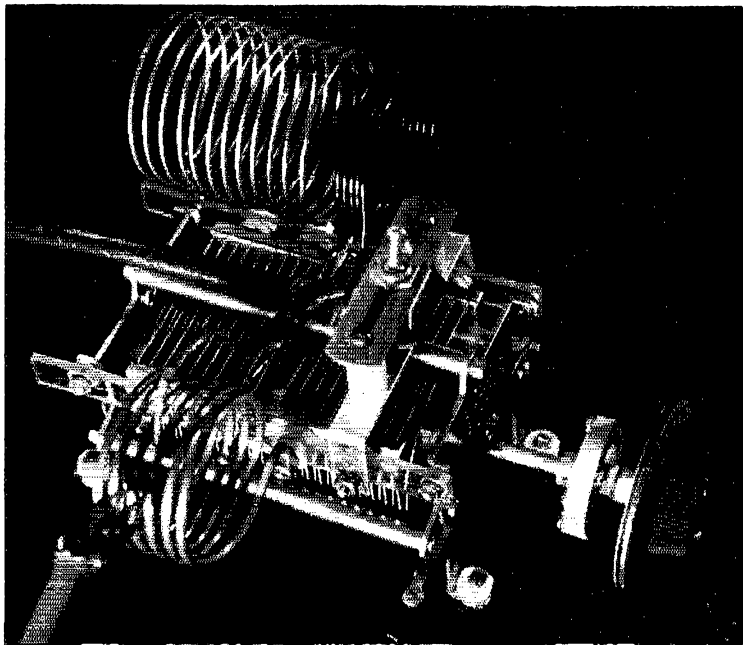
Tests have shown that the simultaneous connection of the two antennas does not result in any noticeable increase in harmonic output. The coils in the tuner have been so proportioned that when operating on the lower-frequency bands, the circuit is detuned considerably from resonance with harmonics falling in the higher-frequency bands.

Fig. 2B shows that the circuit is a balanced arrangement for the higher frequencies. Therefore, it is suitable for use with almost any type of feed system, and is conveniently adaptable to use with a center-fed multiband antenna designed for 14, 21 and 28 Mc. However, as Fig. 2A indicates, the circuit is unbalanced for the two lower-frequency bands. Individual dipoles for 3.5 and 7 Mc. with matched low-impedance lines can be coupled inductively, as shown. A single antenna consisting of a half wavelength of wire for 3.5 Mc. (or multiples of a half wavelength for 3.5 Mc.) can be used for both 3.5- and 7-Mc. operation by connecting it to the rotor of the tuning condenser. In this case it is a simple voltage-fed wire.

By removing the ground connection at the junction of L_1 and L_2, and moving the L_3 link coil to the center of L_1, the circuit will be balanced for both high and low frequencies. However, the center of L_2 will then be hot at low frequencies and it will be necessary to provide good insulation between L_2 and L_4. Also, it will probably be inadvisable to leave feeders connected to L_2 while operating at 3.5 Mc. or 7 Mc. from the consideration of simultaneous radiation from both antennas, possibly with an increase in harmonic output.

The photograph shows a 300-ohm flat line from a 20-meter folded dipole clipped across a turn at the center of the high-frequency coil, L_2, and the end of a half-wave dipole for 3.9 Mc. clipped to the frame of the tuning condenser which is hot at this frequency.

The location of the coax antenna relay between the coupler and the receiver, when in the receive position, puts the coupler between the antenna and the receiver. The received signal is built up by the resonant circuit of the coupler, so the greatest response to incoming signals is automatically secured at and near the frequency to which the transmitter is tuned. Practically no signal will be received, however, when the receiver is tuned to some other band than that to which the coupler is tuned. This is in some respects an advantage, and in others a disadvantage. One advantage is the reduction in the amount of noise that reaches the first stage of the receiver.



The multiband antenna tuner, showing the method of mounting the coils and link switch.

The Condenser

Since it is believed that most hams prefer to use materials on hand, or easily obtainable, in constructing a device of this type, only a general description of the construction and critical values will be given. The model shown in the photograph was made entirely from parts obtained from the junk box.

The condenser should be selected first. It must be a dual-section job, and must have a maximum-to-minimum capacitance ratio, somewhat greater than 4-to-1. A 5-to-1, or greater, ratio is desirable. A condenser having a maximum capacitance of 140 or 150 $\mu\mu$fd. per section will be suitable if its minimum capacitance is not over 30 $\mu\mu$fd. The one shown is a Cardwell with a maximum capacitance of about 240 $\mu\mu$fd. and a minimum capacitance of about 30 $\mu\mu$fd. per section. It is larger than necessary, but happened to be available. The original insulators, having been broken, were replaced with lucite strips and steatite bushings. The bushings were found necessary when the lucite bubbled up internally at critical points under the influence of the r.f. The voltage rating of the condenser depends upon the power output of the transmitter. A plate spacing of 0.047 inch will stand about 1500 volts and is sufficient for an r.f. power of 500 watts. For greater power, wider plate spacing should be used. The coupler shown is used on a 400-watt plate-modulated transmitter.

The mechanical construction of the condenser selected will determine how the coils and s.p.d.t. switch are to be mounted. The coils, L_1 and L_2, are permanently soldered to the condenser terminals since they are never changed. In the model shown, a soldering lug is bolted to the center of each lucite strip to act as a tie point for the center tap of L_2 on one side, and a tie point for the grounded end of L_1 on the other side. These two points are then joined with a heavy wire running across the top of the condenser. The outer braid of the RG-8/U from the coax relay is soldered to the center of this heavy wire. One end of each of the link coils, L_3 and L_4, is also soldered to this same point. The other ends of the link coils are soldered to the switch contacts. The center conductor of the coax is soldered to the movable arm of the switch. The switch is mounted on stand-off insulators and homemade metal brackets supported by the condenser frame itself.

Since the frame of the condenser in Fig. 1 is hot when on 3.5 or 7 Mc., the condenser must be insulated from the chassis. Any suitable stand-off insulators may be used for this purpose. In the model shown, steatite bushings were used to insulate metal stand offs. In any case, be sure to provide sufficient spacing to prevent flashovers to the chassis. The tuning dial must also be insulated from the condenser drive shaft. A ceramic coupler or section of insulated shaft may be used for this purpose.

Coils

The sizes of the coils are fairly critical. As pointed out before, the inductances of L_1 and L_2 will depend upon the minimum capacitance of the condenser used. L_2 is made of ⅛-inch copper tubing (No. 10 wire would do). This coil is 2 inches in diameter and about 1½ inches long. If the minimum capacitance of the condenser is about 30 $\mu\mu$fd. per section, 6 turns will be required for L_2. If less than 30 $\mu\mu$fd., 7 or 8 turns may be needed to enable the circuit to tune from the high end of the 28-Mc. band to the low end of the 14-Mc. band. The low-frequency limit will depend upon the maximum capacitance of the condenser. If this is somewhat more than four times the minimum capacitance, no trouble should be encountered with a 6-turn coil for L_2. A grid-dip oscillator will quickly show if L_2 has the proper inductance. This coil should be adjusted before L_1 is attached.

Coil L_1 should be made of No. 12 wire or heavier, 2 inches in diameter and about 2½ inches long. This coil will require 12 to 14 turns. The grid-dip oscillator again may be used to check the frequency range by coupling it to coil L_1, coil L_2 being left in the circuit. It should be possible to tune from the high end of the 7-Mc. band to the low end of the 3.5-Mc. band if L_1 has the proper inductance.

If 50-ohm coax is used to connect the transmitter to the coupler, the link coils, L_3 and L_4, should have a reactance close to this same value. Five turns will therefore be required for L_3, and 1 turn for L_4. These coils are coupled as shown in the photograph. All coils are air-wound and supported only by their leads. The 1-turn link is made of No. 12 well-insulated wire, as it is held in place by friction between the center turns of L_2. The 5-turn link is made of No. 12 enamel-covered wire. Both link coils are 2 inches in diameter.

Adjustment

The adjustment of this coupler is fundamentally the same as for any of the more conventional types. The general idea is to get maximum transfer of power from the transmitter to the antenna. To do this requires a low standing-wave ratio on the link line between the transmitter and the antenna coupler. This is accomplished by making the various antenna feed lines that are to be connected to the coupler all look like 50 ohms to the transmitter. Detailed data on one procedure for matching to flat lines may be found in February, 1950, *QST*.[1] This method requires the use of an s.w.r. bridge in the link line. With the model described in this article, an antennascope[2] was used to make the necessary adjustments. To use this instrument, disconnect the link line from the coax relay, or from the receiver, whichever is more convenient, and connect this end of the line

(*Continued on page 116*)

[1] Grammer, "Eliminating TVI with Low-Pass Filters," *QST*, February, 1950.

[2] Scherer, "Building and Using the Antennascope," *CQ*, September, 1950.

YL NEWS and VIEWS

BY ELEANOR WILSON,* W1QON

Last month the YLRL election results arrived so late that there was only time to list the new officers. Further information about them is provided in this issue. Look for information and photographs of the various YLRL District Chairmen in YL columns to come.

The new President, Margaret Wells, W1BCU, has capably served YLRL for the past two years as Secretary-Treasurer and is well prepared for her new duties.

Ruth Siegelman, W2OWL, the new Vice-President, has had four terms of office in the N.Y.C. YLRL. Ruth, whose OM is not licensed, operates ten 'phone.

Barbara Houston, W3OQF, is the new Publicity Chairman. The XYL of W3MAX, Barbie is a former *YLRL Harmonics* editor (1949).

Readers should already be familiar with the new Secretary-Treasurer, Miriam Blackburn, W3UUG. Miriam has merited much praise for her outstanding work as editor of *Harmonics* during the past term. The Ladies' Amateur Radio Klub of Chicago and vicinity (LARK) has agreed to assume editorship of *Harmonics* for the current term.

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As of June, 1953, there were over four hundred YLRL members, with the membership growing weekly. The club was organized in 1939 by Ethel Smith, W3MSU (then W7FWB). A letter from her, published in *QST*, expressed curiosity as to the actual number of women amateurs. Ethel requested all YLs to make themselves known to her, with the idea of banding together. Ten girls answered, a constitution was drawn up, and the YLRL emerged.

Any licensed woman amateur radio operator may join. Novices, too, are invited to join; however, their membership is limited to the duration of validity of their licenses. All licensed YLs, regardless of age, are eligible, and YLs of all countries and continents are warmly welcome.

Write President W1BCU at Woodland Road, Foxboro, Mass., or any of the other officers and they'll be pleased to answer questions you may have concerning the YLRL organization and its activities.

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

"Pin-Up Operator" is the honored title bestowed upon W7ONM, Marion Blalock, by MARS station K5FEF and the Far East Net of Japan. OM W5YPA, chief operator at K5FEF, relates that "Marion is always ready to take all our traffic, regardless of QRM. Her operating procedure, ability to copy without repeats, and her eagerness to serve the military has won her this salute."

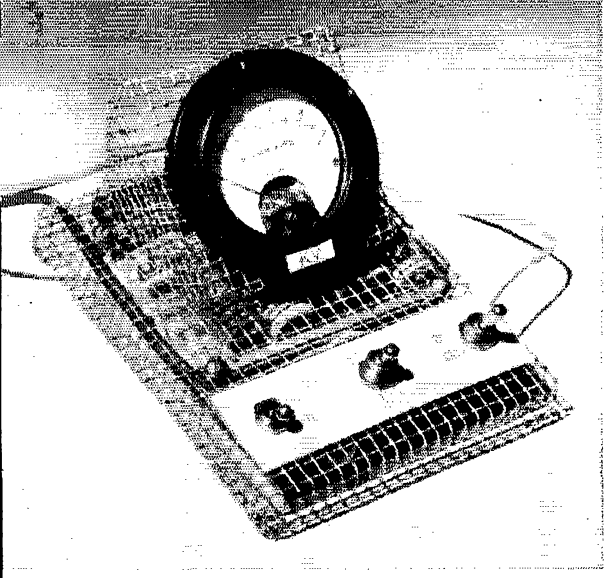
YLs Active in Emergencies

Bouquets to the many YLs who have so capably handled reams of traffic during and following the country's recent storm disasters. It would be impossible to list all of the girls, but we're proud of their splendid example of unselfish service to community and country!

Keeping Up With the Girls

Newly-licensed DL6OSM, Margret, of Lubeck, Germany, is the daughter of DJ1AD, Hilde. . . . At present KL7ANG is the only active YL in Anchorage, although there are several others in town. Nancy, who is Secy.-Treas. of the Anchorage Amateur Radio Club, operates 75 and 80. . . . Unfortunately, both W7NJS, Beth, and W7OVW, Irma, lost their husbands (W7HJI and W7BMG respectively) by death within two days of each other. . . . W5RZJ, Louisa, was pleased to meet thirteen YLs at the New Mexico State Picnic at Roswell. . . . KH6AOO/2, Lee, is now residing in Bethpage, Long Island. . . . YLs who attended the annual Oregon Amateur Radio Association Convention at Salem were W7s ECC FKS FWR GLK HHH ITZ JNS NTT ONM QWX QXH RAX RIC SBX SJW SPC, WN7s RVM RZD and SYF. . . . WNØNXU, Janet, is a nine-year-old YL from St. Louis, Mo. . . . W4UDQ, D.B. and OM, W4HHK, are happy about the new arrival at their house — a son on May 12th. . . . W4VCB, Evelyn, will be in Formosa for the next two years. . . . OM W1BFT, who received YLCC No. 1, estimates that he has worked some 150 YLs. . . . WØKQY,

(Continued on page 120)



A few minutes with diagonal cutters and a soldering iron produced this base and meter support.

Quick-and-Easy Chassis

Simple Construction for Experimenter's Gear

BY S. MILTON THOMSEN,* W2CGN

TODAY'S small and lightweight radio components do not require the ponderous, hard-to-work chassis to which we have become accustomed. Hardware stores sell a material almost ideal for making small chassis and subchassis. This material is called "hardware cloth." It is a heavy wire screen of quarter-inch mesh, costing about ten cents per square foot. With a square yard or two on hand, you can have a chassis of the size and shape you want, just a few minutes after you decide you want it.

Cutting requires only tin shears or a diagonal cutter; bending is easily and neatly done along the edge of a board or in a small vise. Spot-soldering holds the bent-down edges in place. No small holes need be drilled; wires can be brought through anywhere. Larger holes, any size or shape, are cut with a diagonal cutter.

Soldering directly to the chassis is easy even with small pencil-type irons, because the screen is well tinned, and there is not much material in it to conduct heat away. No grounding lugs are needed and items like tie points and sockets (with metal shells) mount more quickly with solder than with bolts.

Rigidity of the finished chassis is surprisingly good. Even small filament or power transformers are well supported when mounted at a corner. If necessary, bracing cross members of hardware cloth can be soldered in place. Larger chassis can be assembled from several "strip" chassis soldered in place side by side. I have a receiver made up of four such strips: front end, i.f., audio output, and power (including a filament transformer and a selenium rectifier).

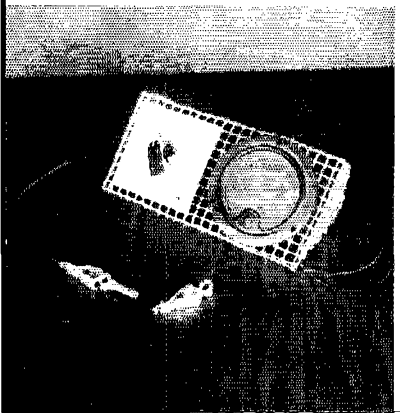
Unsuited for this construction are items with heavy components, or precision r.f. items. Particularly suited are all those small gadgets for which suitable chassis are hard to find, gadgets such as multirange meters, audio amplifiers, power supplies, test oscillators, and various test circuits. Several examples are shown in the photographs.

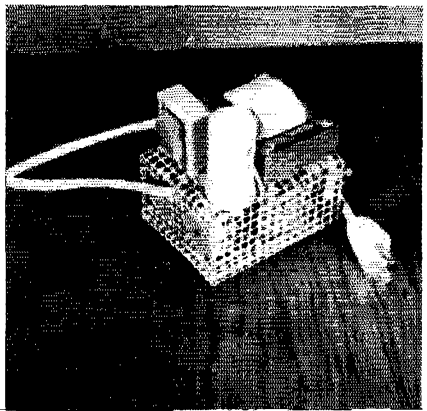
Because this material is so easy to work, new techniques are possible. For example, instead of planning in detail before beginning to assemble, you can plan as you go along. Parts can be mounted on a flat sheet before the sheet is cut to size, and the wiring can be done before the sides are bent down.

There are two things to watch when you buy hardware cloth for this purpose: (1) It should be bright and shiny; too long a stay in the dealer's back yard makes it dull and hard to solder. (2) The cross wires should be reasonably straight and perpendicular, so the resulting chassis will be rectangular.

*25 E. Welling Ave., Pennington, N. J.

A few more examples of experimental lash-ups using hardware-cloth chassis and brackets.





Results — Armed Forces Day Activities

Receiving Competition

ONE hundred and thirty-seven operators have received certificates of merit signed by the Honorable Charles E. Wilson, Secretary of Defense, in recognition of making perfect copy of his Armed Forces Day message to radio amateurs. This represents 46 per cent of the total participants (295). The message was transmitted at 25 w.p.m. by military stations AIR, NSS and WAR at 2000 EST on May 16, 1953. A paraphrase of this message was transmitted by AIR, NPG and WAR at 2400 EST on the same day. Very poor conditions made reception difficult. Certificate winners follow:

W1s BDI CBT FPS IIB/4 LV NC WPR YGV. *W2s* BO CVW CWK IGS JB LYH PFL RUK SHZ TUK UAP VMX VNJ WBT WC WH WVE ZMK. *W3s* BHK CA FFN GJY MCG OSX PDJ PTZ QCB QQS. *W4s* AGR CH KE KJ KUI LYV NWO OXX SDR SR URF. *W5s* BI EGX FAL HNW JPC NEL NIY OTH RKB SKG SPH TOU YMT. *W6s* AXV BVY/4 CAJ CBX CJ CRT DCH DDE DTY FJW GQY NAZ OWP PQ ULL WPI YB YHM ZPX. *K6* EA. *W7s* BJY BVZ KQV. *W8s* FFK FLA HS HWZ KNX SDD WVL. *W9s* AKP ANB BA JMG NTJ UBW UC. *WØs* KXL MOS NHZ SPR WMH. *KG4* AO. *KG6s* ACH ADG/5. *KH6s* ABR ARB FX. *KP4s* KD PM.

Larry M. Bane, William J. Beetham, John H. Bennett, Eugene Bergeron, George W. Blankenship, Charles F. Carpenter, Bernard I. Cohen, Turner Cook, Oscar F. Curtis, Clifford E. Darnell, S. Natale DiLorenzo, Walter C. Glass, jr., Enrique O. Gutierrez, Howard D. Haller, Lester R. Hillman, G. L. Hodges, Jack Howell, P. P. Lutzen, Donald James Mauthe, Joseph T. Peccini, James H. Reed, Derald E. Rogers, Robert G. Schneider, Keith D. Sullenger, D. C. Timmons, Bernard Weeks and Peter E. White.

Military-to-Amateur Test

Operating on preannounced military frequencies, AIR, NSS and WAR worked amateurs in the 3.5-, 7- and 14-Mc. bands. The three military stations made a total of 342 QSOs with amateur stations. Special Armed Forces Day QSL cards have been sent to all stations worked by AIR, NSS and WAR. Contacts of all stations were limited because of the very poor conditions present during the test. Operators making contact are to be commended for their perseverance.

AIR operated simultaneously on 3497.5 (A1), 7635 (A3) and 14,405 (A3) kc., working amateurs in the 3.5-, 7- and 14-Mc. bands. Operators were: W1QIY, Thomas B. Greenhaigh, A/1c, USAF; W4SDK, Howard Riddle, T/Sgt, USAF; W6TOQ, Wayne E. North, S/Sgt, USAF; W9CSK, Norman K. Hester, A/1c, USAF; WØQHK, Lawrence Rudolph, A/1c, USAF; Robert J. Callahan, A/1c, USAF; Francisco X. Guiterrez, S/Sgt, USAF; Clarence S. Lewis, A/2c, USAF; Jane Nolan, A/2c, USAF; Denis H. Rapier, S/Sgt, USAF; Mary G. Shives, S/Sgt, USAF; and Hugo Williams, S/Sgt, USAF. AIR made 125 contacts.

NSS operated simultaneously on 4015 (A1), 7375 (A1) and 14,385 (A1) kc., working amateurs in the 3.5-, 7- and 14-Mc. bands. Operators were W1NK, Cmdr. R. E. Coleman, USNR; W2ZNM, K. Stern, ET3, USN; W3MCG, Cmdr. K. R. Medrow, USNR; W3MSU, Ethel M. Smith, RM3, USNR; W3NZF, Lt. Cmdr. G. C. Dixon, USN; W3PTZ, D. C. Jensen, AL1, USN; W3RHF, Lt. R. F. Herbig, USN; W3SSL, J. L. Lambert, RM1, USN; W3VDI, W. L. Makofsky, RM2, USN; W4LW, Capt. R. R. Hay, USN; W4RPI, Lt. Cmdr. F. O. McDonald, USN; W4UCN, Lt. L. C. Moore, USN; and R. A. Glendenning, RM2, USN. NSS made 144 contacts on the three amateur bands. KP4PM worked NSS on all three bands.

WAR operated simultaneously on 2220 (A3), 4085 (A3) and 6997.5 (A1) kc., working amateurs in the 3.5- and 7-Mc. bands. Operators on 6997.5 kc. were KL7AOX, Frank Stoll, SFC, USA, and W4EEP, Paul Allyn, M/Sgt, USA; on 4085 kc. W3UWI, James A. Long, Major, USA, and WØMOS, Paul Weaver, PFC, USA, operated from MARS mobile unit No. 1 at Bolling Air Force Base. WAR made 73 contacts on two bands. (No calls were heard on 1.8–2.0 Mc.)

WN5WYT and WN7SPD were the only Novice stations contacted. The following amateurs worked each of the three military stations on one or more frequencies:

W2 LV, *W3s* FNO HC, *W4s* ANK PYN SR, *W5s* HNW JPC, *W6s* CJ FHW, *K7* FAO, *WØ* SPR and *KP4* PM.

Armed Forces Day Radioteletype Broadcast

Armed Forces Day found WWV announcing W-2 conditions (very poor). In spite of this a very creditable showing was made by amateurs who copied the radioteletype broadcasts.

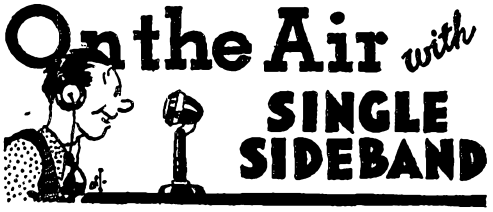
The broadcast from NDC, Norfolk, Va., was copied by K1NAI, W1UDX, W2s KLD SKK

(Continued on page 120)

Message from the Secretary of Defense

It is a pleasure for me as Secretary of Defense to extend Armed Forces Day greetings to the Radio Amateurs of America. Our theme for today is "Power for Peace" and the scientific hobby of amateur radio — which has made possible many of the communication and electronic marvels of our age — is symbolic of American power for peace. Radio amateurs overcome barriers of language and academic background. They conduct technical investigations for the advancement of the radio art and the ultimate betterment of mankind. The potential use of amateurs for both military and civilian defense is clearly demonstrated by the public service rendered local authorities and Red Cross officials in times of disaster and communication emergency. The Department of Defense pledges continued support of the Amateur Radio Service in all its public service activities.

CHARLES E. WILSON, *Secretary of Defense*



One of the newest DX stations to appear on s.s.b. is Capt. Anthony Borgia, **DL4IE**, ex-W6EOU, ex-W4POA. Operating on 14,302 with a Multiphase Exciter driving an HK-257 to 250 watts peak output, a good signal is laid down in this country via a 5-wavelength vee beam. . . . **OZ7T** reports that s.s.b. is still coming along fine in Denmark, although most of the activity is confined to 3.7 Mc. Active stations include **OZs 3EA, 5AL, 5BS, 7NU** and **1WV**, and 3EA is also on 14 Mc. 7T suggests that a standardized calling frequency (say, 14,330) would help DX and Ws to get together on s.s.b. a little easier. If, for example, Ws listened on 14,330 after their CQs, they could establish contact with the DX and then the DX could move off to an agreed-upon frequency. Another version of this would, of course, be for the W operator to indicate during the CQ where he is going to listen first, but it wouldn't help a rock-bound DX station who didn't have a crystal for the frequency. . . . **W9KNP** passes along the word that the Starved Rock (Ill.) Hamfest saw a big turnout of s.s.b. men, including **W8JBG, W9DOD, W9DOG, W9UNS, W9TFU, W9CCT, W9LBH, W9DKA, W9NQK, W9RPG, W9MO, W9CAJ, W9SZH, W9DRV** and **WØKAA**. **W9DYV** was on hand to demonstrate s.s.b. to the 1300 in attendance.

A Carrier Null Indicator

The usual method for balancing out the carrier of a s.s.b. exciter is to tune it in on the receiver, turn down the transmitter audio gain and then adjust the transmitter carrier control for minimum on the S-meter. This can be very bothersome when one is often reinserting and removing carrier for demonstration or educational purposes. Mark Moynahan, W2ALJ, passes along a simple gadget that he uses with his Central Electronics 10-A exciter, and it has the advantage that it can be left in the circuit at all times, without pinning the needle when the operator starts talking. It shows excellent sensitivity in the milliwatt range and yet it is not overloaded by the 10-watt peak output of a 6AG7.

As can be seen in Fig. 1, it uses a 1N34 r.f. voltmeter, with a selenium rectifier across the indicator. At low voltages the

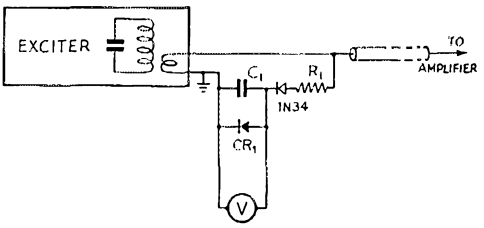


Fig. 1 — W2ALJ uses the above circuit for the continuous monitoring of carrier suppression. A selenium rectifier, CR_1, "shorts" the meter at high values.
C_1 — 0.005 μfd.
R_1 — 2000 ohms.
CR_1 — 120-volt 40-ma. selenium rectifier.
V — 0–3 1000-ohm-per-volt voltmeter.

selenium rectifier has little or no effect, and the residual carrier will indicate in a normal manner. At higher voltages the selenium conducts and prevents "pinning" of the meter. At W2ALJ, final-amplifier outputs of 3 and 225 volts (across a 52-ohm line) give voltmeter readings of 0.2 and 2.6 volts. The basic idea is a useful one that should find other applications around the ham shack.

A Receiver for 20-Meter Mobile S.S.B.

Knowing the trouble some ops have in tuning in s.s.b. on any ham band with a home-station receiver, the usual reaction upon hearing about W2EWL's *mobile* 20-meter s.s.b. station is "Migosh! How does he tune the stuff in?" The secret is that he doesn't do the tuning at 20 meters — he tunes the i.f., *à la* the Collins 75A receiver. Tony's mobile receiver consists of a crystal-controlled converter working into a BC-453, and the 453 is used as the tunable i.f. In the converter (Fig. 2) the slug-tuned signal circuits are stagger-tuned to cover 14.0 to 14.35 Mc., and the two r.f. stages plus the triode mixer give a receiving set-up with excellent sensitivity. The slow tuning rate of the BC-453 simplifies the actual tuning-in problem, of course, and the stability of the converter-plus-453 combination holds the signals from then on. W2EWL's mobile s.s.b. station is quite effective, as anyone who has heard or worked him can testify. But no s.s.b. op is ever satisfied, and Tony is planning to QRO shortly to 500 watts peak on 20 mobile.

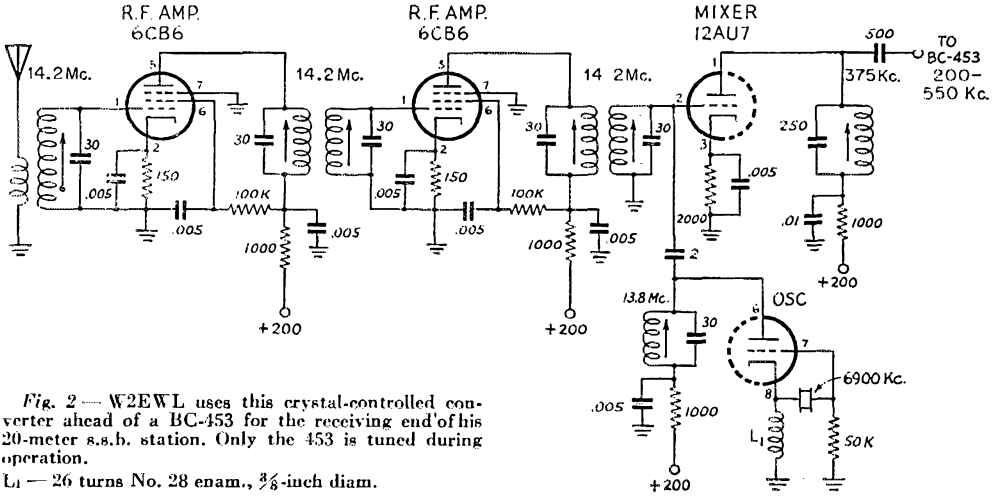
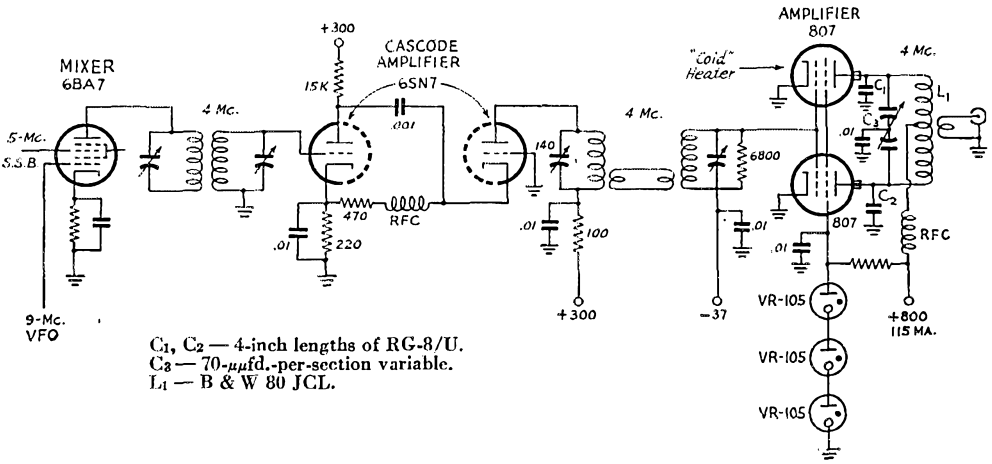


Fig. 2 — W2EWL uses this crystal-controlled converter ahead of a BC-453 for the receiving end of his 20-meter s.s.b. station. Only the 453 is tuned during operation.
L_1 — 26 turns No. 28 enam., ⅜-inch diam.

A Cascode Driver Stage

For a number of years the "cascode" circuit has been the exclusive property of the v.h.f. men and the TV set manufacturers, but no more. Art Hale, W4AWS, of Orlando, Fla., finds that it makes an excellent replacement for a 6AG7 amplifier, if you have had trouble taming one of those fiery tetrodes. As used at W4AWS (see Fig. 3), the 6SN7 cascode follows a 6BA7 converter that gets its signal from a modified SSB Jr. exciter and a 9-Mc. VFO. The output from the cascode is link-coupled to an 807 amplifier that is a little unusual in that it uses an extra 807 for neutralizing and balance. With 6800 ohms swamping in the 807 grid circuit, a peak grid current of about 2 ma. shows plate-meter peaks of about 115 ma. Battery control-grid bias is used, and the screen is stabilized at 315 volts by three VR-105s in series.



C_1, C_2 — 4-inch lengths of RG-8/U.
C_3 — 70-$\mu\mu$fd.-per-section variable.
L_1 — B & W 80 JCL.

Fig. 3 — The cascode circuit is used as a driver by W4AWS for his neutralized 807 output stage. A "cold" 807 is used for neutralizing and for circuit balance.

Zero-Bias Tubes for Linear Amplifiers

W3USX uses a pair of RK65s in his final amplifier, with the grids tied together to give zero-bias operation with 2400 volts on the plates. They drive to 400 ma. plate current with only about 15 watts at the grids, and this is obtained from a Class A 4E27. The zero-bias operation is apparently quite effective, and only a small amount (about 5 watts) of grid-circuit swamping is required.

W7CJB ties the screen and control grids of an 829B together for zero-bias operation at 400 volts on the plate. The 80-$\mu\mu$fd. built-in screen condenser adds to the input capacity, of course, but this is no hardship, and a 6AG7 drives the 829B to 150 ma. on peaks. Resting plate current runs around 15 ma.

An Oscillator for the Edmunds Exciter

Two of the problems of construction of an Edmunds crystal-filter exciter are finding a suitable test oscillator and accurately setting the oscillator frequency in the filter notch. Woody Davey, W7CJB, of Missoula, Mont., solves the problems in a hurry by using the oscillator circuit shown in Fig. 4A. When the 470-$\mu\mu$fd. grid condenser is plugged in (it's mounted in a crystal holder), a VFO is available for aligning the filter. Replacing the condenser with the proper crystal gives a crystal oscillator that can be pulled about 400 cycles by tuning the 140-$\mu\mu$fd. variable.

Woody uses the simple absorption wavemeter of Fig. 4B to indicate output at the 6AG7 plate circuit — he likes it a lot better than a v.t.v.m. for the job. When used in conjunction with the VFO, he can align the crystal filter in about 90 seconds.

Low-Frequency Oscillators

Braulio Dueno, KP4HF, uses a commercial filter at around 30 kc. in his s.s.b. generator, and for a stable low-frequency signal to be modulated, he uses the beat between two surplus crystals (Channels 360 and 383 — 530.55 and 500 kc.). Each crystal works in a half-6SL7 oscillator with a 2.5-mh. r.f. choke for the plate load — the output from one oscillator is fed to the control grid of a 6SK7 and the other oscillator drives the 6SK7 suppressor grid. A 30-kc. tuned circuit in the plate circuit of the 6SK7 picks out the difference frequency and furnishes crystal-controlled 30-kc. energy for a 1N21 balanced modulator. KP4HF suggests that the principle can be used for obtaining various other crystal-controlled frequencies throughout the low-frequency range.

Feeding R.F. to the Monitoring 'Scope

W6IBR passes along a little stunt he picked up from W6ROG. He tapes a wire to his antenna lead for a distance of about one foot and ties the other end of this wire directly to one of the vertical plates of the 'scope. The capacity between the wires is enough to give about 1½ inches deflection on the 'scope, but this will vary with transmitter power, frequency, and impedance at the take-off point. The dodge is used in place of the coupling condenser, C_1, Fig. 3, page 118, February, 1953, *QST*.

— *B. G.*

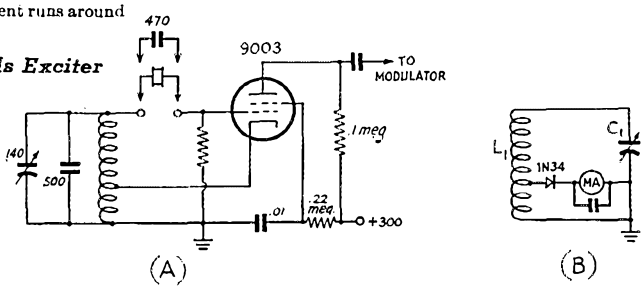


Fig. 4 — W7CJB uses the circuit at A for the oscillator in his Edmunds exciter. Plugging in the 470-$\mu\mu$fd. condenser in the grid circuit gives a VFO for aligning the crystal filter, and plugging in the crystal gives a crystal oscillator that can be "pulled" about 400 cycles for accurately dropping the frequency into the filter notch.

The absorption wavemeter at B is used to indicate output from the 6AG7 stage of the exciter, by placing it near the 6AG7 tank coil and tuning the wavemeter to resonance.

L_1C_1 — Tunable to 75-meter band. L_1 is tapped about ¼ total turns.
MA — 0–150 microammeter.

Happenings of the Month

ELECTION NOTICE

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

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

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

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

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

(Signatures and addresses)

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

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

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

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

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

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

For the Board of Directors:

A. L. BUDLONG
Secretary

July 1, 1953

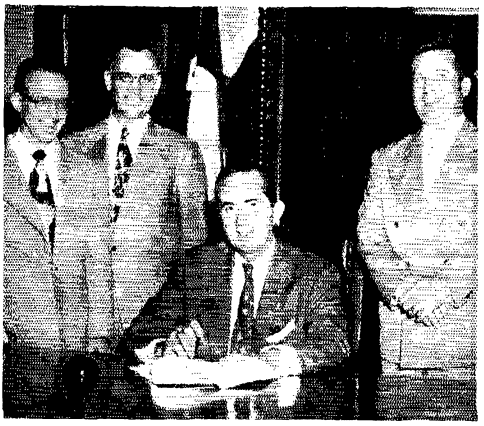
LICENSE PLATES

Texas, Oklahoma and Michigan may newly be counted among the states granting call letter license plate privileges.

Governor Shivers of Texas signed a bill on May 27th granting call letter plates to all amateurs maintaining mobile installations. Two filibusters in the legislative houses almost neutralized many months of planning and work by Texas amateurs but concurrence was finally obtained through the concerted efforts of W5FXN, W5QDX, W5NFC and WN5YPG. Several of the Texas clubs and W5s NZE and CQ are listed as being particularly active in this drive.

Oklahoma is to receive call letter plates and special state-issued personal identification cards. House Bill 744, recently signed by the Governor, provides that in the interest of public peace, health and safety the Act shall take effect immediately.

Cosmo Calkins, W8HSG, was largely responsible for Michigan Governor Williams' signing the call letter license plate bill. As Legislative Technician for the Michigan Senate, W8HSG expended such effort in behalf of the bill that the Michigan Senate unanimously adopted a resolution naming House Bill 101 "The Cosmo Bill."



Governor Allan Shivers of Texas signs the bill authorizing call letter license plates for amateurs with mobile units while W5NFC, W5QDX and Rep. Thomas R. Joseph, jr., sponsor of the bill, smile their approval.

At last word, a California license plate bill was awaiting only the Governor's signature.

One-half the 48 states now grant call letter plates. They are: Alabama, Arkansas, Delaware, Florida, Georgia, Indiana, Kansas, Louisiana, Michigan, Minnesota, Mississippi, Missouri, Nebraska, Nevada, New Mexico, North Dakota, Ohio, Oklahoma, Oregon, South Dakota, Tennessee, Texas (mobile only), Virginia (mobile only) and Wisconsin. In addition, the Canal Zone and Alaska grant the privilege.

KOREA RESTRICTION

A number of countries have filed formal objection with the International Telecommunications Union to amateur communications, and FCC has no alternative but to impose a prohibition against U. S. amateurs working such countries. Korea was added to the list in early June, it now reading: Austria, Cambodia, Indonesia, Iran, Korea, Laos, Thailand, and Viet-Nam.

DELTA DIVISION CONVENTION

New Orleans, Louisiana, Sept. 5th–6th

A Delta Division ARRL Convention, sponsored by the Greater New Orleans Amateur Radio Club and the Westside Amateur Radio Club, will be held September 5th-6th at the Jung Hotel in New Orleans. The program will include talks on TVI and u.h.f., films to interest those in many phases of ham radio, and varied activities for the ladies. President Dosland will attend and will address the Convention. Amateur license examinations will be conducted by the FCC.

Registration fees are $8.00 for licensed amateurs, $5.00 for YLs and XYLs. Further information may be obtained from Henry Heymann, W5PDP, Chairman, 3215 Octavia Street, New Orleans 15, La.

COMING A.R.R.L. CONVENTIONS

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

HAMFEST CALENDAR

CALIFORNIA — Saturday, August 8th, at Cedarbrook Park in San Jose — the SCCARA will hold its Annual Bar-B-Q. A really good time is guaranteed. Send your preregistration now to P.O. Box 6, San Jose. Tickets $3.50 per person.

GEORGIA — Sunday, August 30th, at Robinson's Tropical Gardens near Atlanta — the Annual Hamfest of the Atlanta Radio Club. The menu will feature fried chicken and free drinks. Fun for all with transmitter hunt, contests and games for the XYLs and YLs. Tickets are $3.00 for adults, $1.75 for children. Reservations should be obtained from Reagin Warren, W4RVH, 490 Angier Ave., N.E., Apt. No. 3, Atlanta.

INDIANA — Sunday, August 16th, in Highland Park in Kokomo — The Kokomo Amateur Radio Club will hold a hamfest, with registration starting at 10:30 A.M. Lunch will be potluck, so all are requested to bring something. There will be a transmitter hunt and entertainment has been arranged for the XYLs and kids. Registration fee is $1.00. Advance registration not necessary, but may be obtained through W9DKR on 75 'phone.

NEBRASKA — Sunday, August 16th, in Lincoln Park, Superior — the Annual Hamfest-Picnic of the Kansas-Nebraska Radio Club. Information is available from C. L. Garman, WØFYX, Courtland, Kansas.

OHIO — Sunday, August 30th, at Happy Days Camp, Virginia Kendall Park, just north of Akron on Route 303 — the Buckeye Shortwave Radio Association will conduct its 7th Annual Ham Outing. The registration time is 2:00 P.M. and the fee is $2.00 per family. For further details contact R. J. Nuss, W8KDW, R.D. 1, Box 138, Doylestown.

QUEBEC — Saturday and Sunday, August 8th and 9th, at the Chatillon Restaurant on Provincial Highway No. 2 Cap Santé — the Radio Amateur of Quebec, Inc., will hold its Annual Hamfest. The hamfest site is 35 miles south of Quebec on the north shore of the St. Lawrence. The main events will be held on August 9th. All W and VE amateurs are welcome to attend. For further information, write to Gaston Choquette, VE2KB, 6534 Bordeaux, Montreal.

Quist Quiz

For many years A has refused to use any antenna system that can't be coupled to his transmitter by just connecting it to the swinging-link terminals. He claims that all antenna couplers are "lossy" and he doesn't want to suffer the loss in output power. His friend B argues that antenna couplers aren't lossy at all, and that *more* power is delivered to the antenna when a coupler is used. Who is correct?

(Please turn to page 102 for the answer)

Hints and Kinks For the Experimenter

EMERGENCY CONTINUITY TESTER

A SIMPLE continuity tester can be constructed with a receiver and two test leads. One test lead is connected to the receiver antenna terminal and the other is connected to the antenna. With such connections, continuity can be easily detected by the increase in gain in the receiver.

— *Ronald J. Finger, WN9VCH*

MODIFICATION OF W5LVD'S BREAK-IN SYSTEM

THE electronic break-in system recently described in *QST* [1] has been installed here at W5VRP. Because the VRP transmitter line-up is somewhat different than the one for which the system was designed, and because of a desire to avoid the use of a battery in the control circuit, it was necessary to modify the original circuit.

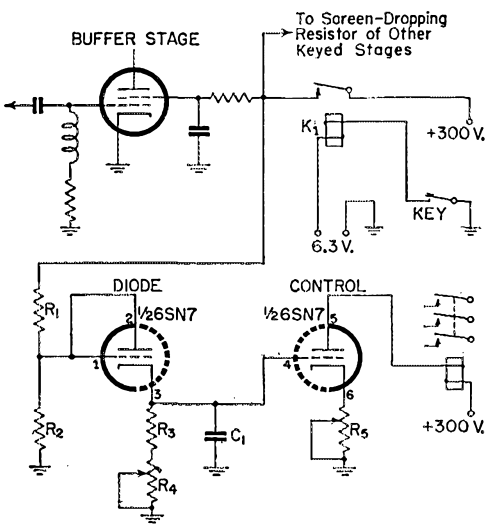


Fig. 1 — Circuit diagram of the break-in system at W5VRP.

C_1 — 1.0-μfd. 200-volt paper.
R_1 — 0.27 megohm, ½ watt.
R_2 — 0.1 megohm, ½ watt.
R_3 — 0.2 megohm, ½ watt.
R_4 — 1.0-megohm linear-taper potentiometer.
R_5 — 20,000-ohm potentiometer.
K_1 — S.p.s.t. 6-volt relay.

The revamped circuit does eliminate the battery and also makes the action of the first diode control tube independent of the number of stages or the type of tubes that are keyed.

Fig. 1 shows that a keying relay, K_1, has been introduced to the circuit and that the plate potential for the first diode of the control section is now obtained from a voltage divider, R_1R_2, that is connected back to the screen supply through the relay. Thus, the diode voltage is determined entirely by the values of the divider components and the supply voltage, rather than by a battery and the key-up cathode potential of a single r.f. stage as is the case with the previous arrangement. The balance of the circuit, except for minor changes to allow for the use of available components, is similar to that described by W5LVD.

— *John Althouse, W5VRP*

[1] Carey, "A Simplified Electronic Break-In System," *QST*, December, 1951, p. 20.

NEON-SIGN TRANSFORMER USED AS MOUNT FOR VERTICAL ANTENNA

BURNED-OUT gas tube (neon sign) transformers can be purchased from some electrical contractors for around one dollar each. These transformers are housed in a sturdy steel box that is fitted at each end with a large high-voltage porcelain insulator. The mounting of one of the boxes on a mast provides an ideal base for a vertical whip or ground-plane antenna. The units are now known to be sturdy enough to support 14-Mc. verticals (quarter-wave) and there is every reason to believe that they will stand up when used with a 7-Mc. quarter-wave job.

The transformer I adapted is a 350-v.a. unit manufactured by Dongan, but Acme makes one of slightly different design that would serve just as well. Either of the types is large enough to permit internal mounting of a tuning or a matching unit. Since there is a feed-through at either end of the case, it would also be possible to use the assembly as the center mount for a dipole.

— *Christopher Noble, W5PFG*

RAINPROOF SHIELD FOR TRANSMISSION LINE CONNECTORS

AN excellent weather shield for exposed transmission line couplings can be made from flexible molded-rubber tube pullers (G.E. type). These tube pullers are available free of charge at many electronics stores, for advertising purposes.

The coax or Twin-Lead is merely fed through the puller and the small end is taped securely to the transmission line just above the coupling.

To change transmission lines or check the coupling, just fold back the larger end for easy access.

If a permanent weatherproof connection is desired, the tube puller may be inverted and the large end completely filled with melted wax. When the wax hardens, the coupling may even be used under water with no ill effects.

— *M. A. Ellis, W4LTV*

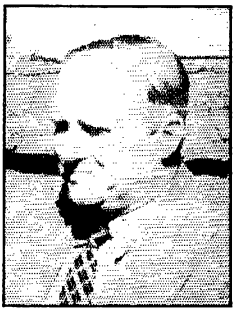
How's DX?

CONDUCTED BY ROD NEWKIRK,* W1VMW

Who:

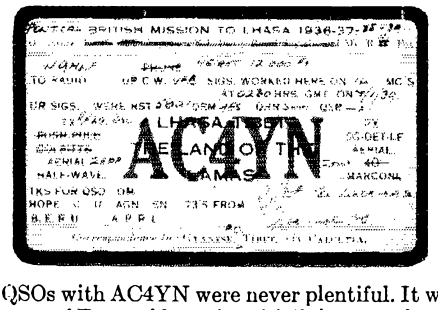
Shortly after news of the Mt. Everest denouement reached an expectant outside world, sadder news forthcame from those lands of the Himalayas to the world of amateur radio. With heavy heart we must record here the passing of Reg N. Fox — "Mr. Rare DX" for over a decade — whose call AC4YN now stands symbolic of all that is bizarre and elusory in the realm of long-distance amateur radio communications.

Reg was afflicted with an arthritic condition, a siege of illness over the years that left him partially paralyzed and in intermittent severe pain. This ailment ultimately cost him his life.



The late Reg N. Fox, AC4YN, from a photograph in *Out of This World* (Greystone Press, New York) in which author Lowell Thomas, jr., includes highlights of the AC4YN story.

Below, through courtesy of W9HLF, the QSL that confirmed the first U. S. A.-Tibet QSO ever logged.



QSOs with AC4YN were never plentiful. It was a game of Fox and hounds, with Br'er Fox always tough to capture. And how he enjoyed the chase! F. Claude Moore, W9HLF, was the first American amateur to succeed in catching up with the phantom 14-Mc. signal from Lhasa at the Top of the World. This first AC4–W QSO took place in early 1939 after years of effort by hundreds of other keen-eared U.S. amateurs. D. B. "Mitch" Mitchell, W9KOK, was the last North American ham to contact Reg before AC4YN shut down and fled Tibet to escape occupying Chinese Communist forces in 1951. Fox's plans thereafter to become an active AC5 never quite materialized.

To W9KOK, who handled nearly all Reg Fox's communications with the United States these past few years, we are indebted for first word of AC4YN's passing. Among favors of friendship Mitch gladly granted Reg was the procurement and shipment of a supply of the drug cortisone for the relieving of arthritic pain.

Prior to the Red occupation, AC4YN was the personal radio operator for that mystical holy figure and ruler of Tibet, the Dalai Lama, and was in charge of the country's communications. He spent his last months residing with his Tibetan wife and four children near the village of Kalimpong, India. There he organized a radio school with the assistance of literature furnished by ARRL through W9KOK.

From his cottage above the town Reg could survey the mountainous horizons he loved. He wrote friend Mitchell: "[From my windows] I can't quite see Everest, but the majestic Kanchenjunga is there in all its splendor. . . . I think that I shall always be in the vicinity of these grand Himalayas."

And so he shall. Finis was written to a romantic chapter in DX annals when Tibet-adopted Englishman Reg N. Fox, AC4YN, died June 4, 1953.

What:

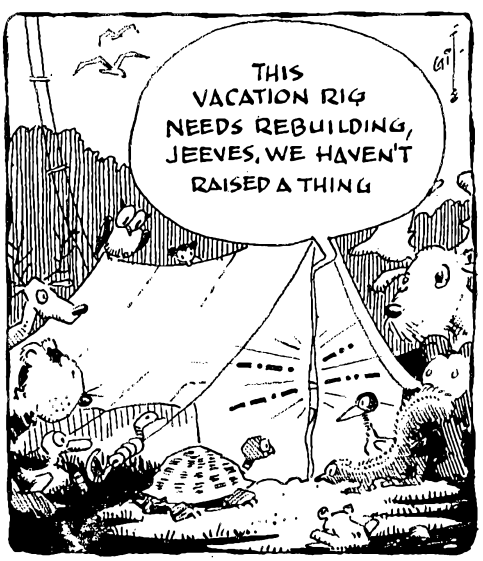
Twenty c.w. fell prey to fast-rising W8JGU for CE4AD, **CP1BX** (14,010), **GD3IBQ** (041), **HE1C** (075), **IS1AHK** (015), **KA2KS** (068), **MF2AG** (080), **OE13USA** (030), **OQ5GU** (040), **OD5XX** (070), **4X4s BN** (020-035), **FQ** (065) and **9S4BS** (053). Bill's new 3-element spinner broke the ice for his first Asians . . . . . **CR9AH** (064), **DU7SV** (080), **HHs 2FL** (014), **3DM** (042), **KB6AY** (040), **KJ6FAA** (028), **KR6IG** (060), **KT1UX** (020), **KX6UZ** (048), **ST2AR** (005), **VQ4MHA** (072), **VSs 6CG** (038), **6CI** (080), **9AP** (090), **ZC5VS** (080), **ZD2S** (070), **ZKs 1BG** (014), **2AA** (052) and **ZP5AY** (090) answered W9HUZ. Van finds that ZK2AA leaves for a visit to England in October . . . . . VE3BXY had a chance to work **CN8EG** (090), **CT3AA** (090), **FP8s AI** (100), **AJ** (100), **OA4ED** (045), **OE13HP** (085) and **9S4AX** (040) . . . . . W1BOD got a pipeline going into Japan and worked these nationals within three weeks: JAs 1AQ 1AR 1BC 1CB 1AX 2AD 2AW 3AF 6AO and 8AE. All were in the vicinity of 14,075 kc. Frank also nabbed **DU1FC** (100), **FO8AI** (100) and an OD5 . . . . . Catches reported hither and yon follow. *W6GPB:* **M1B**, VP2GH and a ZC5. *9S4AX:* **FQ8AP**, KH6ARA, PI1LS, TA3AA and VU2JG. *W2TKG:* HC1JW. *W4WQV:* LUØAAW. *W6EAY:* **FO8s** AB AD, JAs 1CR 2BJ 6AA 7AB and PJ2AD. *W5VIR:* EAs 9AP 8BC and an IS1 . . . . . In addition to **3A2XQ** (005), W7OEB/7 latched onto KAs 2FC 7LJ 8AB 9WH, OX3GL and many Oceanians. Ev still stalks HP1LB, KG6AAY, KR6s LL LP, TF3AB and VR-2CG. He reports **W7s** RME RVD and SMB bagging their shares of the stuff, too. W7SMB pokes out fine with 35 watts and a 550-foot piece of copper . . . . . "CR" at W1AW encountered these specimens on 20: **EAØAF** (067), **EL2P** (033), **LZ1KAB** (020), **OY3PF** (003) and **VS9AR** (068) . . . . . The Asiatic 14-Mc. viewpoint is furnished by KR6LL in this collection: **CP5EK** (060), **CR9AF** (066), **EA8AY** (060), **FA8IH** (050), **FF8JC** (068), **I1YCD/Trieste** (065), **JA4BB** (060), **KW6BB** (065), **MB9BS** (065), **MP4KAC** (196), **SP3AK** (060), **TI2TG** (050), **VQ2s AB** (065), **GW** (060), **VS2DH** (067), **ZB1BF** (068), **3A2AW** (055), **5A1TJ** (060) and **9S4AL** (060). All but MP4KAC were raised . . . . . West Gulf DX Club's *DX Bulletin* and So. Calif. DX Club's *Bulletin* advise to be on the watch for AC5XA in Bhutan, **C3AW** (076-090), **FE8AE** (082), **GD3UB** (015),

* DX Editor, *QST*.

HE9LAA (075), HZ1AB (060 t8), I1BLF/Trieste (012), KR6KH (079), KX6AY (083), LB8YB (015), OD5LC (100), OY3IGO (154), ST2GL (015), SU1CH (015), TA3CR (080), UQ2AN (030), VK1s BA (024–038 t8), HM (050) at 1400 GCT, RL (007 t8), VP2MD (005) in the Leewards, VQ5CL (054) from 0800 to 1100 GCT, VU2s CS (050), JK, W5TUX/KJ6 (080), XZ2ON (020), ZCs 2AC 3AA, ZP5AY (060 t8), 3A2AT (103 t8) and 5A1TG (040). So much for 14-Mc. c.w. Let's hope things soon hot up a bit!

On *twenty 'phone* we find the stalwarts still plugging along. The band picked up a little during the hot months and even the boys on day shifts got chances to work DX after dark. W6YY ran off with FM7WF (14,105), JA5AD (150), KR6s AF LA, KW6BB, VP2GX (163) in the Windwards, VS2s BD (040), BS and UW. Another neat one caught was KG6IG of Chichi Jima in the Bonins who was suppressor-grid modulating a mere 25-watter into a *25*-wavelength long wire. OD5AD and YI2AM escaped . . . . . VK1s BJ and HM (172) operate the same rig in the Cocos and can only hear comebacks when all of nine commercial transmitters for aircraft communication, located right in the hamshack, are off the air. This from W6YY, who also hears that ZC5VR (175) is on 14-Mc. 'phone with tough-to-copy grid modulation . . . . . Still trusting to and getting good results from his n.f.m., W2TXB climbed to 112 'phone countries worked because of CR6AI, SU1MR (132–178), ZD1SS and ZD4BK . . . . . W1WQC made it 89 with EA9AR (310), FM7WF, OD5AD (290), SU1MR, VP2GX (ex-VP2AC) and SVØWH (257). Margaret of SU1MR told Ham that more SUIs are due on the air soon . . . . . Licensed only about a year ago, W8JWV is already up to 75 'phone countries worked. Bill's latest: DU7SV, KAs 2FS 2GP 5HM 7LJ 7RC, KG6s AAY AEX FAA, OD5AD, SU1MR, YI2AM and ZS9G. The rig is a Viking-I . . . . . M1B (150) has been pinning back the ears of L. M. Michel around 2200 GCT . . . . . The WGDXC boys recommend the following frumptious 'phones: AP2R (165), CPs 5AB (163), 5EK (190), CT3AN (160), DU1RS (190), EA6AR (135), ET2WW (193), FO8AD (145), HI8WF (196), HZ1AB (304), JA1AC (150), OD5AC (138), OQØDZ (136), OY2Z (140), SP5AJ (125), SVØWG on Rhodes, VP2s AJ (180), KM (030), VS7GW (310), ZK2s AA (185), AB and ZP5CF. A Ceylon switch to the 4S7 prefix may be imminent; also a Viet-Nam (FI8) change to 3W8.

Now for a peek at the world of *forty* c.w. W9HUZ grabbed 7-Mc. entries CN8RM (7033), KB6AY (50), KG6FAA (10), KW6BI (55), LU3ZO (15), PJ2AA (30), VP6AF (40), YN1AA (73) and YV5DE (24) . . . . . W1MX, with W4YHD at the helm, caught up with EA6AF (42), FF8AJ (14), LUs 4ZO (13), 4ZS (30), 5ZO (17), PZ1WX (30) and SP2KAC (23). Jim bumped into ex-VR1C in the person of W6PZ on 7 Mc. . . . . Prior to losing his tower to a big wind, WØFBI raised KW6BB (07) and VK9YY (17) for two nice additions . . . . . Ex-DL4LQ hears the good signal of



One of the few Portuguese Guinea stations active, Anibal Vicente's Bissau installation, CR5AC, is always the object of much attention whenever the bands are open to Africa. (*Photo via W2TXB*)

FO8AD (09) each morning; W3SUJ finds most of his 40-meter stuff between 1830 and 2200 EST . . . . . UAØKB rattled the 'phones of W4ZAE. Mick heard the Russian (if legit) say that their W ban is officially off now. LU3ZO and W5TUX/KJ6 (22) bring W4ZAE up to 50 worked . . . . . Via W4ZAE, the Transcontinental DX Club reports FM7WD (05), PJ2CH (33), VP8AJ (08), YU1DF (10), ZD4AF (04) and sundry Europeans . . . . . KH6PM writes, "Our local radio club had a DX contest on 40 meters a couple of weeks ago and we were all quite surprised at the DX available . . ." Among the trophies snagged were C3BF, CX1FB, CR7LU, FO8AI, JAs 1AC 3AA 7AC, KJ6AX, PZ1WZ, W2AOS/KG6, VQ2GW, numerous ZSs and ZK1AB. An interesting development was the working of TTØAD (40) by KH6s ER MG and PM. Lovely if legit! . . . . . W2TKG nabbed No. 61 in ZK1AB (18), and ZC5VS (80) has been giving the gang British North Borneo on occasion.

Fifteen 'phone is duck soup at W5VIR. Tex salted away CP5AB, CX1GG, FO8AI, HC1FS, HP1PH, HR1KS, KH6AR, KZ5IL, OA4CL, PY3SI, VK4TN, XEs 1OM 3BR, YV1BC, ZLs 1BY 1BZ 1CD 1GW 1RF 2AFA 2ALZ 2LV 4DC 4HJ and ZP5FI . . . . . LZ1KAB (21,030) raised W1AW; W2TXB hears that ZD1SS (320) cruises fifteen 'phone every Sunday around noon EST, a sure bet for a QSL . . . . . ZD9AA (217), on both 'phone and c.w., brought W3AYS to the 67-country 21-Mc. mark. "CB" added 'phones CN8MM, CT1QF, HP3FL, KV4BD, OA4C, PJ2AA, PY2AC, VP6CJ and ZP5DC. TA2EFA (296) got away . . . . . Last but not least, W6ZZ rattled off KG4AU, KH6AQ, KZ5s CP WA WZ, TI8EP, VP5s EM SC and VP6EB. TI8EP was operating aboard a fishing boat off Panama.

Fifteen c.w. was used by W3AYS to catch KH6AR, TF3KG and 9S4AX . . . . . W5VIR employed the same medium to raise CE3DG, CT1TT, EA7CP, EI2T, FO8AI, FF8AG, KZ5IL, LUs 4DAV 6AX 8DDN, OA4s C DT, PJ2AJ, ZLs 1AIX 2AFA 2GS 2LF and VK3GX. That makes 47 15-meter countries for Tex . . . . . DL4JN collected VS9AP (21,030), ZC4RX (025) and ZE3JO (040). Bill still chases LU3DD (045) and TA3AA (060).

Eighty and *ten* meters have been scraping bottom these humid days but W9HUZ cornered CT2BO (3505), VQ4HJP (3515), VP7NS (3509) and YV5DE (3507) despite the static . . . . . KP4KD found 3.5-Mc. inhabitants PYs 6F1 and 7ACQ workable, a new country to Ev on 80 . . . . . Ex-DL4LQ hears that 9S4AX has a 28,400-kc. 'phone set-up cooking which nabbed JA3AQ, KG6ABI, KR6LL, OE13HL and ZD2DCP, so there's still DX on 10! . . . . . W4ZAE and the TCDXC gang verify that last remark by reporting A3 QSOs with FF8s AQ (28,254), AW (28,337) and CR7LU (28,203). Mick's gang also heard KJ6AF (28,428), ZLs 2SW (28,377) and 4BW (28,400) but no workee.

We thought *one-sixty* would be a dead subject by now but here's a startling report from Low Band connoisseur W1BB: ". . . On May 3rd at 1030 GCT, W2WWP QSOd ZL1WW on 160 meters." W2WWP and ZL1WW were RSTs 349 and 239 on 1899 and 1904 kc., respectively. This was on

schedule made at ZL1WW's request through ZL2ACV. Since May 3rd two more W2WWP/ZL1WW 1.9-Mc. contacts have been made. These QSOs should certainly establish W2WWP as North America's Static-Eater of the Year!

Where:

In some cases Eritrean stations have adopted ET2 prefixes while retaining the last two letters of their call signs. This rule isn't hard and fast, though, judging from the ET2WW entry to follow .._ .._ VU2JP, QSL manager for ARCI (India), says cards can still go via ARCI's Box 6666, Bombay, address but that they'll be QSPd faster if sent to VU2JP's home QTH: J. S. Nicholson, Munnar P. O., Travancore, S. India .._ .._ AP2R, as in the roster that follows, volunteers to continue as Pakistan's manager.

AP2R, Cpl. R. Handley, 583728, RAF Sqdn., RPAF, Drigh Rd., Karachi 8, India
CEØAA, (QSL to CE3AG)
CN8HE, 736th ACW Sqdn., APO 30, % Postmaster, New York
DL4EK, QSL % Mrs. Dave Hynes, 43 High St., Greenfield, Mass.
ex-DL4LQ, Alfred Rugel, 304 No. Park Blvd., Independence, Kans.
ET2WW, (Previously MI3US) Box 374, Asmara, Eritrea
F7SHP, Radio Sec. Hq. Sig. Off., APO 55, % Postmaster, New York
FB8BI, P. O. Box 587, Tananarive, Madagascar
ex-FB8ZZ, Joseph Klein, Rue du Couvent, à Kaysersberg (Haut-Rhin), France
ex-FF8AF, (QSL to F8HZ)
FK8AO, (ex-FQ8AE) Georges Birepinte, Box 23, Noumea, New Caledonia
FQ8AV, Louis LeCocq, Box 69, Fort Lamy, Tchad, F. E. A.
FQ8AW, Point-Noire, Moyen Congo, F. E. A.
FY7YE, Mario de Lepine, B. P. 60, Cayenne, French Guiana
HE1C, (QSL via USKA)
HH3DM, Box 943, Port-au-Prince, Haiti
HK1EQ, Avianca Taller, Deradio Soledad, Barranquilla, Colombia
JA2AI, Yosinobu Tange, 2 Warizuka, Kasugai Aichi, Japan
JA6AK, (QSL via JARL)
KL7AWB, Box 219, Anchorage, Alaska
KR6IG, NavFax, Navy 905, FPO, San Francisco, Calif.
KR6LL, Capt. Glenn H. Luse, AO-725174, 307th A&E Sqdn., APO 239-1, % Postmaster, San Francisco, Calif.
MD5DO, E. J. Ashby, 25 Guildford Rd., Horsham, Sussex, England
MP4BAB, (QSL via G3IDC)
OD5BH, Box 235, Tripoli, Lebanon
OQ5GU, Paul Hiernaux, Post Box 673, Leopoldville, Belgian Congo
SU1MR, P. O. Box 672, Cairo, Egypt
VK1BA, (QSL via WIA)
ex-W6INQ/KM6, (QSL to KM6BG)
YK1AH, Box 35, Damascus, Syria
YU2CB, Post Box 95, Pula, Yugoslavia
ZB1BF, (QSL via RSGB)
ZC4HG, (QSL via ZC4JB)
ZC4VP, (QSL via ZC4JB)
ZK1BG, (QSL via ZK1AB or NZART)
ZS6ZU/ZS2, (Marion Island; QSL to ZS6ZU)
5A1TJ, Box 372, Tripoli, Libya
5A1TM, Box 372, Tripoli, Libya
5A1TP, (QSL via RSGB)
5A1TQ, (QSL via RSGB)

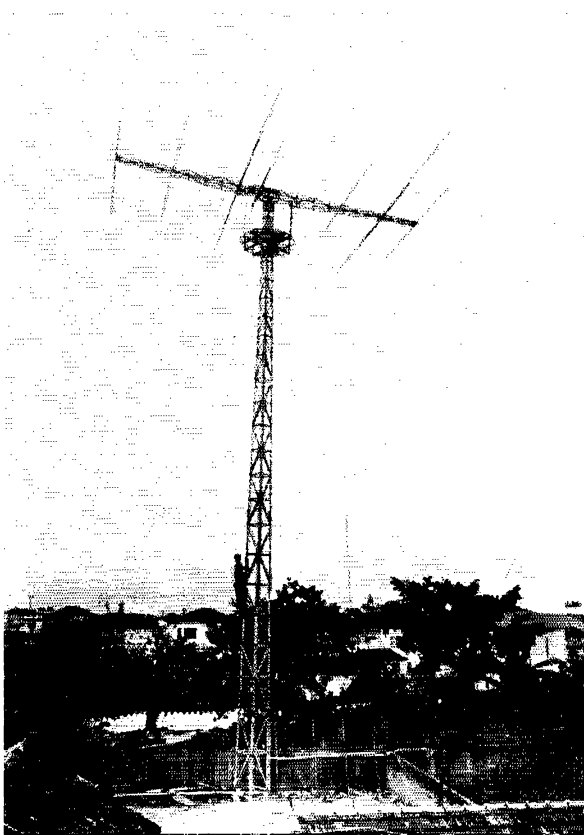
Much QTH assistance this month from W1s BOD MX RB WPO WQC, W2VMX, W3s AXT AYS EH, W4s YHD ZAE, W5UUK, W6s GPB YY, W8JGU, W9s HUZ KA, F7AW, KR6LL, L. M. Michel and the WGDXC gang.

Tidbits:

Asia — AP2R presents his operating schedule for the benefit of those still needing Pakistan (times GCT): 0200–0330, 14,070-kc. c.w.; 1030–1330, 14,220-kc. 'phone; and 1400–2000, 14,200-kc. 'phone. Other Karachi actives are AP2s L and N. APs 2K and 5A are located in Quetta and Lahore, respectively .._ .._ Reports that VS9AS permanently took over VS9AW's station in Oman are incorrect. VS9AS does use some ex-VS9AW gear in Aden, however. VS9AW QRTd on January 26th at 1315 GCT; if you worked a VS9AW after that date and time you'll have to try again. Other Aden QSO possibilities are provided by VS9s AD AN and AP. It will take ex-VS9AW time to get going from G3GUK because he must assemble a new station from scratch. When he does hit the air again he'll be watching for the ou-the-air pals he made while in Oman .._ .._ As of June 1st, Korea joined the list of countries U. S. amateurs are not permitted to work. For the FCC ban list at this writing we refer you to page 63 of this *QST* .._ .._ KR6LL, due back Stateside last month, piled up 82 countries since February 1st. Glenn reports that there are five KR6s active on c.w. and about twenty on 'phone. KR6LL developed a might respect for ground-plane antennas and highly recommends them for 20-meter work. He knocked off 43 consecutive daily skeds with ZC4IP without a miss.

Africa — Tangier notes from CN2AS: CN2s AO and AP are undoubtedly the most active Tangier amateurs at present and the latter busily represents the Zone on 15 meters. CN2AP is also an ardent v.h.f. proponent when signing G2CIW in the U. K. CN2AS, himself, has been holding his own on most c.w. DX bands .._ .._ FA3HH, who prides himself as a 100-per-cent-QSL station, submits a long list of Ws who have failed to answer his pasteboards. Some of the birds on his blacklist are chronic gripers in their own rights who should be cleaning up their own front yards before they squawk about late EA9DC, etc., QSLs .._ .._ Vidal Johnson, of G. B. Ollivant Ltd., Freetown, Sierra Leone, desires to correspond with any amateurs who would give him mail assistance in the technical aspects of hamming .._ .._ African Tidbits courtesy of WGDXC's *DX Bulletin:* VQ8CB is now VQ8AB in Mauritius, leaving sparse Chagos activity behind, if any. . . . These French African ops have been vacationing in France: FF8s AB AG AJ AN AS and FQ8AL. . . . F3RG is ex-FD3RG-FF3RG. . . . FB8s BB and ZZ have also been in France.

Oceania — Via WØPYK we learn that KH6ANZ has become KC6AA on Yap Isle. KC6AA is ex-WØENT and is supervisor of the island's government radio station. He employs a Viking-I on 10, 15 and 20 meters, A3 and A1. WØPYK says that KC6AA will be especially interested in working into his "back home" Kansas City area .._ .._ A club station bearing the label KC6YI will shortly be installed on Yap. Truk Island's Central Electronics Depot will furnish all gear needed, so KC6YI should be *very*



We paid a photographic visit to top DXCC 'Phone Honor Rollee PY2CK's shack last month. Here's a shot of the fellow's mammoth 14- and 28-Mc. rotary beam, the take-off point for a big sig regularly heard around the world. That's Jayme halfway up the mast.

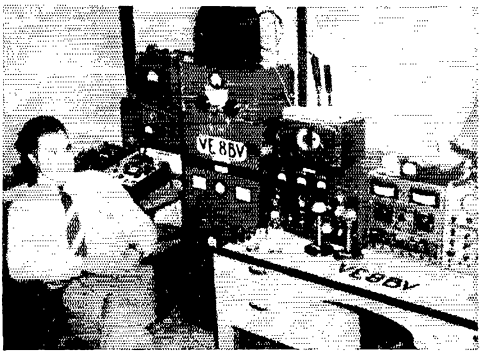
CR6AI gave many W/VEs their first Angola contacts shortly after World War II. CR6 signals are more plentiful these days but Joao's is still one of the most consistently heard and worked.

audible . _ . _ . _ Both sides of a W6YY–VK4NC 14-Mc. QSO were recorded and retransmitted by the Australian Broadcasting Commission as a feature of the popular "Australia at Home' program Down Under. That's probably the biggest W ham signal ever heard in VK-land . _ . _ . _ Bill Storer, ex-VK1BS-VK2EG, hopes to land the call VKØEG when he ships with the Australian antarctic expedition scheduled to take off this December. Exploration headquarters will be located on the White Continent itself, approximately due south of Heard Island. The way things look right now, only twenty or thirty watts will be available for ham work. That should be entirely adequate to stir up lots of business on any DX band!

Europe — Here's another award you sheepskin hounds can try for: the Turin Certificate, or *Diploma Torino*. Basically, W/VE stations may obtain the wallpaper by submitting proof of contact with five Turin IIs. Italian and European amateurs must triple and double that figure, respectively. Endorsements will be available for additional QSLs and all contacts must have been made after January 1, 1952. For more complete details write the sponsoring society, Associazione Radiotecnica Italiana, Sezione di Torino, Casella Postale 250, Turin, Italy . _ . _ . _ Eighteen-year-old OH2YV wonders if he's the youngest QSL manager kicking around. Any disputants? . _ . _ . _ Ex-DL4QH is now K6AXC after stacking up QSLs from 130 countries during his Bavarian idyl . _ . _ . _ Ex-DL4LQ notes that DJ1BZ rolled up close to 100 c.w. countries during his first six months on the air . _ . _ . _ F7AW (ex-K5AG-DL4ND) has this to say: "Station F7SHP, located in the Supreme Headquarters Allied Powers Europe, has been established as the only international amateur radio station in the world. Any operator assigned to any of the NATO nations holding a valid amateur license is permitted to operate the station under the above call. The French government has granted our power input at 350 watts. This is 300 watts more than any other ham station in France is authorized to use. We have the only three-letter call in France except that of the REF" Ford adds that F7SHP works c.w., 'phone and RTTY and has a 32V-2 driving the final of a BC-610. Receivers available at present are two 51-Js and a 75A-2. No third-party traffic is permitted at F7SHP. A distinctive QSL will confirm QSO with this station. Its 3-element 14-Mc. beam atop a 100-foot tower should put quite a signal into the U. S. A. . _ . _ . _ Would-be amateur Jose Martinez Moreso, of Calle de Balmes 182, Barcelona, Spain, desires correspondence with American amateurs . _ . _ . _ Lines of interest from SVØWP (W2DZM-W5NRP): "On the nights of the 18th and 19th of May, I was able to be on the 20-meter band with a phone transmitter at Xania, Crete, under the call SVØWP/SV9. . . . Unfortunately, our operating time was limited but some 130 stations in 20-odd countries were worked. No Ws were heard or worked." Ray points out that all non-Greek personnel operating anywhere in SV, SV5 and SV9 must sign the SVØ prefix. Moral: don't pass up any SVØs! SVØWP treks Stateward in October . _ . _ . _ According to WØRRN, PAØPZW looks for some of the tougher WAS states around 14,100 kc. between the hours of 2200 and 0200 GCT.

South America — Still no sign of CEØAA as we assemble these extracts. The way the gang have been tuning 14 Mc. with bated breaths the sudden appearance of CEØAA should result in the great-grandfather of all pile-ups. Thanks to W1ODW, W1RST, KZ5WZ, CE3AG and W6YY for extra effort to keep us posted on the Easter Island DXpedition

KP4UB amassed over 2000 QSOs in his first eight months on the air to become one of the most familiar Puerto Rican stations now active on DX bands.



VE8BV is WAS on 28-Mc. 'phone and has worked over 6000 different stations from his Yukon layout on 80 through 10 meters. Formerly VE5AGF, Gordon has kept Whitehorse on the ham map for many years.

status . _ . _ . _ Erstwhile "How's" contributor W5LAK now hunts oil with radio in Venezuela. John hasn't been able to land a YV call but keeps an ear out for ham-band buddies with an NC-183. Friends of W5LAK may drop him a line via Rogers Explorations, S. A., Apartado 463, Caracas . _ . _ . _ LUs 1DDV and 5AD, both widely worked, are owned and operated by the same gentleman.

Hereabouts — DXCC Honor Rollee WØYXO went and got himself married not long ago and was last heard from while honeymooning in the Bahamas. [Congrats to him, Boss, but he could at least have made it TI9. — *Jeeves*] . _ . _ . _ W4YE recently ran across a stack of DX QSLs made out by him as W4AGI in 1932 but never mailed for lack of postage. Depression days, you know. Now he's busy tracing QTHs and getting them off the hook. Better 21 years late than never! . _ . _ . _ From 108 countries confirmed, W9KXK has managed BERTA, WPR and WAA. Paul reports a happy influx of VP8AD QSLs . _ . _ . _ W1EFM got a great bang getting back on the air again with his 1939 807 rig after a 12-year layoff. "To me, the most striking changes since before the war are the increased use of VFOs and a far greater number of DX stations on the air." . _ . _ . _ W4GJW finds that WL7AVK is pretty fancy Novice DX. Doc Saxon's shack is out on St. George Island in the Pribiloffs, a Bering Sea outpost of about 200 souls and seals . _ . _ . _ W1TVJ bumped into CM7BS while both attended Worcester Academy in Massachusetts . _ . _ . _ FP8s AA and AK (W3BXE and W2BBK, respectively) scheduled a mid-July sojourn on St. Pierre.

CONDUCTED BY E. P. TILTON,* W1HDQ

IN last month's lead paragraphs we pointed out that the frequencies above our 2-meter band are growing up rapidly, and that new two-way records for 220 and 420 Mc. could be expected any day. Now we're glad to report that part of this prophecy has already come about: we have a new 420-Mc. record for this country, if not for the world.

Early in June, W2QED, Seabrook, N. J., and W8BFQ, Everett, Ohio, started a daily schedule on 144 Mc. at 0700 EST. Object: to try 420 whenever 2-meter conditions looked good. This 360-mile path is not open too often, even on 144 Mc., but signals do come through well enough on occasion to indicate that work on three times the frequency should be possible also. And, of course, last September, W8BFQ had heard W2QED on 435 Mc. when the 144-Mc. band was riding a peak.

They made a few scratch contacts on 144 during the first three weeks of the tests, but the signal was never good enough to maintain the communication necessary to arrange a check on the higher frequency. Margaret's near-kilowatt on 144 Mc. got through a few times when Ken's 120 watts could not get back. Then on the morning of June 24th, though signals in other directions were no better than normal, there was enough of an opening for two-way communication on 144 Mc., if c.w. were used. Tests were arranged for the higher band, 432 Mc. for W8BFQ, 435.6 Mc. for W2QED.

As has happened before on shorter paths, the signals on 420 were as good or better than on 144, and the first two-way over-the-mountains DX to be worked on 420 Mc. was under way. Signal levels were so poor on 144 Mc. that nearly two hours of trying were consumed in the process of establishing two-way contact on 420. Had the schedule been kept the other way around, high frequency first, the new record might well have been set more readily.

The same condition prevailed again on the morning of the 27th. Following the initial contact on 144, the change to 420 netted solid voice communication with W8BFQ-WJC for more than an hour. Working cross-band duplex. W2QED on 435 and W8WJC on 144, there were times when the 2-meter signal was nearly inaudible, yet there was a good signal on the higher frequency. Fading on the two bands showed no correlation whatsoever.

The long-standing previous record of 262 miles was surpassed again on June 25th, when W1RFU, Wilbraham, Mass., worked W3BSV, Salisbury, Md., a distance of about 310 miles. And on the night of June 19th, W8BFQ was getting an S4 signal from W3RE, near Washington, D. C., a rough-terrain haul of some 300 miles.

It is being demonstrated almost daily that when sufficiently-good equipment is used the 420-Mc. band is capable of providing excellent coverage. Experience on the W2QED-W1HDQ morning schedule has shown that the 435-Mc. signal can be heard just about any time that the 144-Mc. one is 3 db. or more above the noise

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

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	W5HLD.....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	W6ANN.....45	WØHVW.....45
W2IDZ.....45	W6TMI.....45	WØMVG.....44
W2FHJ.....44	W6IWS.....41	WØJOL.....44
W2GYV.....40	W6OVK.....40	WØTJF.....44
W2QVH.....38	W6GCG.....35	WØWKB.....43
W2ZUW.....35	W6BWG.....29	WØJHS.....43
		WØPKD.....43
W3OJU.....45	W7HEA.....47	WØIPI.....41
W3NKM.....41	W7ERA.....47	
W3MQU.....39	W7BQX.....47	VE3ANV.....42
W3RUE.....37	W7FDJ.....46	VE3AET.....41
W3OTC.....35	W7DYD.....45	VE1QZ.....34
W3FPH.....35	W7JRG.....44	VE1QY.....31
	W7BOC.....42	XE1GE.....25
W4FBH.....46	W7JPA.....42	CO6WW.....21
W4EQM.....44	W7FIV.....41	
W4QN.....44	W7CAM.....40	Calls in **boldface** are holders of special 50-Mc. WAS certificates listed in order of award numbers. Others are based on unverified reports.
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	

level. As this is written we've tried both bands on 20 different mornings in June, with only one failure on 435 Mc. On this morning, W2QED's 144-Mc. c.w. was peaking only 3 db. above the noise, and fading out completely. On 4 out of the 20 mornings, the 435-Mc. signal was stronger than the best that 144 Mc. could do. When we consider that this was done with 30 watts output on 435 Mc. at W2QED, compared to better than 60 watts of carrier on 144, it becomes obvious that we should not rely too heavily on lower frequencies in estimating our chances of breaking down a path on 220 or 420 Mc. Let's have more two-way communication on these higher bands, on schedule or otherwise, regardless of the indicatings prevailing on 50 or 144 Mc. There's real business waiting to be done above 148 Mc. Let's get about it!

2-Meter Standings

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

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

By the end of June, 6-meter men over the country were thinking that the man in charge of *E*-layer ionization had gone off on an extended vacation. We've wondered in the past how much effect solar activity had on the incidence of sporadic *E*. The last sunspot cycle minimum fell during the war years, so we've had no opportunity to check before, but this season's dearth of DX has nearly everyone convinced. Only a few openings, most of them short and widely scattered, came along in May, and June, peak month of the year, was shaping up as the poorest on record.

There was some DX, to be sure, but nothing like the round-the-clock, across-the-map stuff of 1946 through '51. Particularly was double-hop, normally the prime thrill for the 50-Mc. gang, missing in the 1953 ledger. WØFKY, Grand Junction, Colorado, and W7QAP, Douglas, Arizona, made things lively for the Field Day gang across the eastern half of the country on the 7th, and a burst of Cuban activity had the boys on their toes a few other times, but mostly the openings were of the 600- to 1200-mile variety, and there were not too many of them. New states were hard to come by, but that didn't keep a lot of the faithful from trying, and there was hope that the season might still redeem itself, with some of the best days still ahead at copy time. On the bright side: W3OHK, Pittsburgh, heard LU3BBX on the 24th.

But if a dirge was the order of the day on 6, a happier song was being sung on 2. Tropospheric DX was bursting out all over, aided and abetted by increased activity in many quarters, and by the installation of larger beams and higher-powered rigs. Use of c.w. was growing, too, many of the sharper DX hounds sticking almost exclusively to this highly effective method of dealing with weak signals.

The last week or so of May saw things getting under way across the Middle West and South, and a bale of DX reports and states-worked claims cascaded onto your conductor's desk just a day or two after copy for the July issue had been sent to the printer, a distressing state of affairs all too well known to those of us who must close copy *sometime*.

On May 26th, WØEMS, Adair, Iowa, worked WØBJV, Watertown, S. Dak., for what is probably the first 2-meter contact between these two states. It was State No. 22 for Frank, and he picked up another a couple of nights later by working W4OZK, Lookout Mountain, Ala. This haul of more than 600 miles was accomplished through the help of WØGUD, who can probably take credit for the first Alabama–Iowa 2-meter contact. W5RCI, W4HHK and others were also on the sidelines on this one.

On the 27th, the whole Middle West was after W4OZK, as well as W4HHK and WN4WCB in Tennessee, and W5RCI in Mississippi, and it was the same again on the 28th. Complete details of the Alabama stations' work have not been received from them, but W4OZK appears as the "first Alabama station" in many logs from W8, 9 and Ø, while WØIHD lists W4FIG, Birmingham, as his "first," also a probable first contact between Alabama and Missouri.

During the evening of the 28th, WØGUD heard a station believed to be in Colorado. The fellow was signing "WØ Ocean Easy?" and talking to someone named Fred, discussing going to Estes. Any fills on this one?

WØIHD gives us the weather dope for this period. Beginning late on the 25th, a long cold front extended from Wyoming down through Nebraska, southwestern Iowa, cutting across Missouri just north of the St. Louis area, and eastward across Indiana and Ohio. By the morning of the 26th, it was below St. Louis, and on Wednesday the 27th, it was across southern Tennessee, with its western end south of Kansas. Later the same day, the western end looped up to Wyoming, the eastern portion sloping off through southern Kansas, Missouri, and northern Mississippi and Alabama. The northern side of this front was continental polar cold air, the barometer reaching 30.26. Skies were generally clear, with thin high cloudiness at the end of the period. W9KLR mentions that the barometer was 30.4 at the peak in Rensselaer, Ind., the highest of the spring season,

and W8WRN, Columbus, Ohio, reports 30.22, when the Mississippi and Tennessee stations were in on the 27th.

All this in May was just a warm-up for what was coming in June. The week end of the June V.H.F. Party brought good conditions over much of the Middle West, as may be seen from the scores amassed by some of the W8s, 9s, and Øs, and a stretch of openings beginning the 17th made possible the greatest change in our states-worked box that we've ever recorded in a single month. Compare this one with the records appearing on page 59 of the July issue!

A detailed summary of events from W4HHK, Collierville, Tenn., just about tells the story of the Middle West and South in this one. On the evening of the 17th, Paul kept his 2130 CST sked with W9EHX, McLean, Ill. This 370-mile path usually yields S1 signals on c.w., if it is open at all, but this time, Red was coming through S9-plus on voice. Between then and 0100 on the 28th, W4HHK worked W9s EHX KPS EWO KLR, WØs IHD and YRX, W8s BFQ WRN KAY, and to top it off, W3s RUE and OMY. W3RUE then called W4AO, Falls Church, by telephone, though this was at 0300 EDT, and after about half an hour, W4HHK started hearing W4AO's c.w. weakly.

They kept at it until 0515 CST (0715 EDT) when both had to leave for work, but still no contact — and no sleep. Paul heard W4AO at intervals, the signal appearing to be tropospheric in nature at first, and later having more of a meteor-scatter character, but the 4-db. power advantage held by W4AO's kilowatt seemed to be just enough to get him through, while W4HKK could not be copied enough for a contact.

Again on the evening of the 18th, W4HHK began hearing W8KAY, Akron, Ohio, around 2100 CST, and almost at once he was in the midst of a fast and furious DX session. His first contact was W2ORI, Lockport, N. Y., a first for these two states, if we except a portable QSO made from Clingmans Dome in the Smokies some years ago, and a haul of 850 miles. Going strong until after midnight, Paul knocked off W3s FPH QYK QKI WBM, W8s FMW SFG SRW GAB EP BFQ PBU RMH GNN IEE OQ KAY, and VE3DNX. The contacts with W8EP, W8RMH and VE3DNX are believed to be the first 144-Mc. communication between Tennessee and West Virginia, Michigan and Ontario, respectively. Quite an evening's work for a fellow who was up the entire night before! Paul feels that his recently-erected 32-element array was a potent factor, as was the fine coöperation of the 2-meter operators in all the areas concerned.

Weather maps taken from the Memphis papers show the cause of all this well. Again, a nearly stationary cold front lay across eastern Kansas, northern Arkansas, passing through the Memphis area, northern Mississippi, Alabama, Georgia, and South Carolina, below a large flat high centered over northern Kentucky. W4HHK reports the band practically dead on the 19th, but he still was hearing what appeared to be meteor bursts from W4AO. With 32-element arrays at both ends of this 850-mile path, this may be a normal state of affairs.

W8FMW and W8GAB, East Sparta, Ohio, report hearing W4DBV, Rome, Ga., on the 18th. This is the first report we've had of Georgia stations being heard in W8-land.

This tremendous session netted two new states for W8BFQ, no mean event when you already have 22 to your credit. The large number of contacts made, and the in-

(Continued on next page)

Coaxial Grid Circuit for 4X-150A Amplifier

In this section in April *QST*, we mentioned that W1QVF, West Hartford, was running a 4X-150A amplifier straight-through on 432 Mc. This resulted in a batch of letters asking, "What does he use for a grid circuit?" We asked Tom for the details, and the accompanying drawing tells the story.

The famous "gold-plated special" test oscillator tank circuit is put to work again, though anyone wishing to use a similar approach could make his own coaxial assembly without too much trouble, as all principal dimensions are given. Tom's amplifier construction follows the design shown by W1PRZ in May, 1951, *QST*, except for the use of the coaxial grid circuit described herewith.

Modification of the tank to adapt it for this grid circuit application is done as follows: (1) Cut it down to 5½ inches. (2) Turn down the disk on the inner conductor to 1¼ inches diameter. (3) Drill ventilation holes, as indicated on the drawing, in the end plate and at intervals around the outer conductor near the grid end. (4) Mount the output coupling loop and coaxial connector. (5) Mount the inner conductor on stand-off insulators (see Detail A). The inner conductor must be filed flat, or hammered slightly out of shape, to make room for the ¾-inch cone stand-offs. (6) Mount the grid resistor and its feed-through by-pass. The inner end of the resistor is soldered to a 4-40 screw, and the inner conductor is tapped so that this can be screwed into it (see Detail B).

Where the amplifier is to be grid-modulated with a TV signal, the grid resistor is replaced with an r.f. choke consisting of about 12 turns of No. 22 wire on a 1-watt resistor. The output coupling loop is made of copper or brass strip, ¼ inch wide and 4 inches over-all length. This is soldered to the connecter and adjusted to suitable shape before mounting the connector in place.

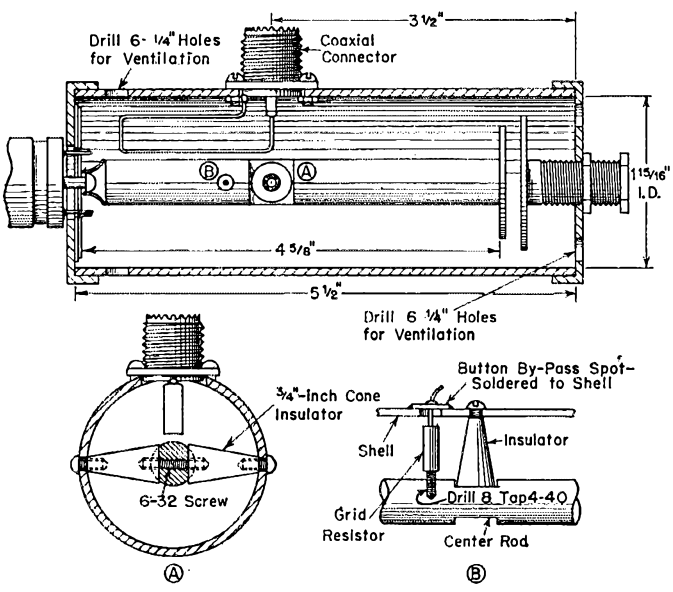


Fig. 1 — Details of the coaxial-line grid circuit for a 4X-150A amplifier used on 420 Mc. by W1QVF. Modifications of the surplus gold-plated tank are given in the text.

completeness of the reports at this stage of the game, make it quite possible that there are others, but up to now we credit Margaret with being the first 2-meter operator to reach the halfway mark along the road to a 144-Mc. WAS. This looks like a hard figure to top, but swinging an arc around her Everett, Ohio, location using an 800-mile radius shows that there are at least five more states that should not be too difficult. Increase that radius to 1400 miles, the current record, and you hit all but seven western states. Then, with moon reflection — ! We haven't as yet started engraving work for the first 144-Mc. Worked All States certificate, but who's going to say one won't someday be earned?]

Doings on 220 and 420 Mc.

More than the usual smattering of activity developed on 220 and 420 during the June V.H.F. Party, and some nice stuff was worked on both bands. W3KX/3 in eastern Pennsylvania worked W1HDQ, W1RFU, and many nearer stations. W2MLX/2 in northern New Jersey made good use of 420, and W1MHL/1, New Hampshire, worked W1HDQ and W1HDF on 220. W2FBZ also worked into Connecticut, and the 220-Mc. signal of W3KX/3 was heard up here. Contacts were made on these higher bands in W1, 2, 3, 5, 6, 8, and VE3.

Use of 220 and 420 is growing at times other than during contests. W8BFQ reports working W9REM, Downers Grove, Ill., on June 16th. This 350-mile hop was made when W9REM was running only 3 watts! Margaret holds 220-Mc. skeds with W9OVL, Hammond, Ind., at 2130 nightly. W3VIR, Willow Grove, Pa., works K2AMK, Trenton, N. J., nightly on 220, and on June 24th, he had a fine two-way with your conductor. This started out as a cross-band (144-435) QSO, with Bill on the higher frequency. It then changed to two-way on 220, with signals peaking S7 on both bands, fully as good as Bill's 145-Mc. signal was doing. W2BLV, Haddon Heights, N. J., was worked two-way on 420 Mc. several times during June by both W1RFU and W1HDQ, as were K2AH, Mountain Lakes, and W2MLX, Cedar Grove, N. J.

W6NLZ, Los Angeles, says that 420 is getting better all the time, with nearly all the gang now using crystal control, and most of them going to higher receiver selectivity. W6OCU and W6BDC are reported working out on 220 regularly, though there is considerable trouble with TV oscillator radiation in the Los Angeles area. W6ORV is working on 1200-Mc. gear, and W6ELS listens to airborne radars on 10,000 Mc., for want of amateur signals to work with.

From Independence, Mo., WØONQ reports two-way contacts on 432.7 Mc. with WØTMJ at Odessa. Both use 832 triplers. WØTMJ has a corner-reflector array, and WØONQ uses 16 driven elements with a screen reflector. Signals average 6 S-units over the noise over this 30-mile path. They are using crystal-controlled converters built along the lines used by W9MBI, as discussed some months ago in this department. A crystal on 7073, multiplying to 63.6 and 382 Mc., provides injection for conversions from 432 to 50, and 50 to 13 — 9 Mc., the range tuned to cover 432 to 436 Mc. A 6AN4 coaxial-line r.f. amplifier is used ahead of a crystal mixer, the tank for the latter being the famous gold-plated special.

There is 220-Mc. activity in Mexico. XE1SA writes that he is working XE1ZZ, in what is probably the first work on 220 in that country.

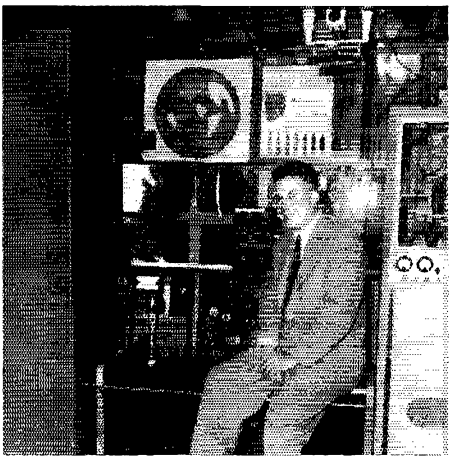
We find scattered but growing interest in amateur TV. Hardly a month passes that we don't receive a few reports on video work on 420. This month's comes from W4ATO, Albany, Ga., who has been on the air with TV since March, 1951. He recently went "live" with a 5527 camera, and is able to transmit clear pictures to W4PGK, who uses a modified u.h.f. TV converter ahead of a standard TV receiver.

Thanks, Gang!

An unusually large volume of v.h.f. correspondence was received by your conductor this month, and consequently, we are not able to make detailed acknowledgment of all of it, either by personal mail, or through the medium of this department. We want all of you to know that your letters and cards are invaluable in the preparation of this section of *QST* each month, so we acknowledge, with our heartfelt thanks, the help of the following amateurs, in addition to those specifically mentioned in the text: W1s MMN MEP UXI HDA PYM; W2s VMX ORI GLU UK YBK AOD UTH NGA; W3s QYK RUE SSJ QKI YHI UKI UQJ NNV RXT; W4s AO TMQ VIL FLW; W5s NHD POG SCX; W6s PIV BWG VMM MVK DLR; W7s QAP JRG; WSs BAX WXV WRN NOH UZ; W9s ZHL ZHB ALU FVJ IFA LEE GFL; WØs WKB INI VIK III; VE3AET, XE1GE, and JA1AN.

And thanks also to the hundreds of you who sent in V.H.F. Party logs. You'll find the official results beginning on page 60 of this *QST*.

He Makes What We Hams Use



JACK A. MCCULLOUGH, W6CHE
Eitel-McCullough, Inc.

"One day as I came home from school I recognized some familiar but charred pieces of 6CHE in the alleyway. It seems I forgot to turn off a switch and the fire department had done the rest." . . . That's what happened to Jack's first station, just 30 years ago. But it wasn't long until a better 6CHE was on the air, working across the Pacific and sometimes snagging a South American or an African. After "The Inverted Ultraudion Amplifier" appeared in *QST* for September, 1933, Jack McCullough and Bill Eitel, W6UF, built a tube for use as a grounded-grid amplifier and knocked off several first W6-European 'phone contacts, replacing it in 1934 with a pair of the new 150Ts in a controlled-carrier linear amplifier. Right now Jack works 20 c.w. most of the time — and he's always ready for a rag-chew — but he was on the air at the postwar openings of 2½, 10, 80 and 40, too. A DX Contest would hardly be complete without W6CHE; 130 countries are to his credit. Active ham, *QST* author, convention speaker, Jack has failed to heed the warning of the Principal who in 1927 removed him from the presidency of the High School Radio Club: "Forget amateur radio, Jack. I can assure you that nothing will come of it."

Correspondence From Members-

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

FIELD DAY

6031 38th Ave., S. W.
Seattle, Washington

Editor, *QST:*

At a recent meeting of the West Seattle Amateur Radio Club a motion was passed to request the League to alter the rules of future Field Day contests as follows: Field Day shall start simultaneously in all time zones, say 4:00 P.M. Central Standard Time, and continue for twenty-four hours.

This would conform to the rules of other contests and it is believed would allow a fairer advantage for West Coast stations to obtain more station contacts.

— *Mrs. Toddy Nye, W7LCS, Secy.*
W. Seattle Amateur Radio Club

SWITCH TO SAFETY

1938 Howard Court
Falls Church, Va.

Editor, *QST:*

I think that your article in the June *QST* entitled "How to Live Longer" by Don Mix is so very appropriate.

As a ham who has seen equipment range from open chemical rectifiers and all-exposed wiring to modern self-enclosed "switch to safety" construction and one whose own young son (W4YZC) is just beginning in the game, I found Don Mix's article of tremendous interest. With so many youngsters entering the hobby of ham radio through the Novice licensing system, it seems all the more important that we do everything possible to minimize the possibility of accident and even death by electrocution which has needlessly befallen so many hams in the past.

Please continue the campaign and periodically remind all of us by timely articles such as this of the importance of employing safety techniques in our amateur construction.

— *Leland W. Smith, W4YE*

LEAGUE SERVICE

5405 Georgia Avenue
West Palm Beach, Fla.

Editor, *QST:*

This is to advise that the check from ——— was received okay the same day on which I received your letter inquiring about same. So the matter is closed at last.

Thanks a million for all of your help. I've been a member of ARRL for many years — and this is the second time that you have helped me out of a "scrape." It is mighty heartening to belong to an organization with such a strong sense of service, and which insists on integrity by its advertisers second only to its own. The warm appreciation that I feel makes petty arguments of small cliques or pressure groups seem insignificant, indeed!

— *Hurshell D. Turner, W4MVJ*

QRP OR QRO?

29 Mount View St.
Newton, New Jersey

Editor, *QST:*

The following is proposed by the Sussex County Amateur Radio Association:

1. That the power input limit be lowered in the bands from 3.5 to 30 megacycles to approximately 300 watts in order to relieve QRM, etc. The largest percentage of present day amateur stations are running less than this figure, as witness the increasing popularity of the commercial transmitters in the 150-watt class. Such a limit would encourage development of antenna technique and operating practice.

2. Due to the influx of foreign broadcast stations into the forty-meter band, and the inevitable fact that they are moving down the band more and more, thereby ruining the c.w. portion, we suggest that the entire band be exclusively for 'phone operation, and the 3.5- to 4-megacycle band be exclusively for c.w. operation.

— *George Whattam, W2CZE, Secy.*
Sussex Co. Amateur Radio Assn.

1000 Overlook Avenue
Chattanooga, Tennessee

Editor, *QST:*

Occasionally some frustrated individual suggests that our power limit be reduced. Mr. Wellman (June *QST*) says his 175 watts "will do as well as a kw." So why does he complain? And, if his claim is true, his 175 watts will also cause as much QRM as a kw. . . .

. . . Under an extension of his philosophy, we would have a restriction limiting the horsepower of automobiles to that of the car he happens to think is adequate. . . . I hope he doesn't fancy a motorbike as ideal for the average man.

As for the gentlemen from Bermuda, since we do not propose restrictions for VP9s, they should not propose any for us.

I don't think anything is accomplished by publishing such suggestions. FCC is plenty good at dreaming up their own screwy proposals and we don't need to give them any ideas.

— *Ward Buhrman, W4QT*

ANY IDEAS?

Univ. of New Hampshire
Durham, New Hampshire

Editor, *QST:*

I have an electronic problem that might interest hams reading your journal *QST*.

For recording animal calls in the tropical jungles, a walk-about preamplifier is needed to accompany the microphone at the end of half a mile to a mile of cable. I have one design but it is heavy, and proved too susceptible to 100 per cent relative humidity and temperatures between 80° and 90° F. It uses three 6AK5 tubes, and permits the man with the microphone to monitor what is going over the wire to the recording unit, as well as converse with the sound man at the recorder.

I would like a lighter unit, possibly using miniature or subminiature tubes and hence demanding less battery current. Sealed moisture-proof transformers are a must and in future I would plan to use ceramic tube sockets. The frequency response needs to be from 15 to 15,000 cycles. Lighter earphones, such as hearing-aid type or the lightest used in secretarial voice recorders would be an improvement. Within these specifications, I'd like to see the cost cut away down — to fit a very limited research budget.

Someone on a hobby basis might like to help get this recording research project back in the field, in return for credit in publications.

— *Lorus J. Milne*
Professor of Zoölogy

CARDS, PSE

P. O. Box 374
New Port Richey, Fla.

Editor, *QST:*

. . . Many contacts I have had have promised faithfully to QSL. My lifelong ambition is to work WAS and WAC mobile but it seems as though without the coöperation of all concerned this task is impossible. With the passing of time it seems as though the request for a card is getting to be an embarrassment to many a ham. Why? After all, it is not asking a guy for his right arm although many have displayed such emotions. I QSL 100 per cent and consider it a privilege and a pleasure. Can anyone give me a good excuse for a two-penny stamp? Pretty cheap excuse.

— *Von Lighthill, W6RIG/4*

June V.H.F. Party Results

Contest Activity Sets Spring-Fall Record

With close to 300 logs submitted, and scores running well ahead of previous contests, the June V.H.F. Party of 1953 stands as the top v.h.f. contest of the spring-fall series since this type of activity was begun seven years ago. The added incentive for Novice and Technician operators, written into the rules for the first time with this party, was a factor but it doesn't tell the whole story. The boom in 2-meter operation generally shows plainly, and the growing appreciation of the fun that can be had in one of these week ends of concentrated v.h.f. operating is bringing more of the gang into the picture every time.

Conditions? Well, from all we can tell, Fate was rather kind to us this time. The 50-Mc. band was open a couple of times; not enough to make it a walkaway for the 6-meter gang, but the threat kept them on their toes throughout the party. On 144 Mc., there was a good inversion across the Middle West that drifted eastward just in time to make a few contacts possible over the Alleghenies in the closing hours of the party. In California there was some work over distances up to 400 miles or so, a distinct rarity in that mountainous terrain.

One of the outstanding v.h.f. contest scores of all time was amassed by a group of hams who, because they operate together, are ineligible for a section award. The v.h.f. section of the Waltham Amateur Radio Association, W1MHL/1, deserves some kind of special solid-gold hand-fabricated award, we think, in view of their continued outstanding contributions to the success of our spring and fall v.h.f. contests. Operating from Pack Monadnock Mountain in Peterboro, N. H., W1s PYM, QMN, and RUD rolled up 259 contacts on 50, 144 and 220 Mc., for a total of 7317 points, with their section multiplier of 27.

The country's highest competitive score was posted by W1RFU, Wilbraham, Mass., who worked 50, 144, 220 and 420 Mc., from one of New England's finest v.h.f. locations (he lives there!) to roll up 150 contacts. His multiplier of 29 pushed the total score to 4756 points. He has the distinction of working the best 420-Mc. DX of the contest, too, with W3KX/3 near Tannersville, Pa., about 200 miles.

The Electric City Radio Club gang of Scranton, Pa., deserve a big hand for their work in setting up W3KX/3 in Pennsylvania's Poconos, and *keeping* it set up in the midst of a violent storm Saturday night. Another iron-man act was turned in by WN1WID/1 and his crew, who lugged gear for 144 and 220 up the rocky slopes of Mt. Monadnock, Jaffrey, N. H. W1FMU/1, a semimobile set-up on West Peak, Meriden, Conn., W6GCG/6 on Mt. Loma Prieta, W2UPT/2 on a 3265-foot elevation near Stamford, N. Y., and W3PZK/3 in West Virginia also did fine jobs.

The YL department was doing right well again in this one. W8BFQ, Everett, Ohio, racked up the country's second highest score, and W2FBZ, new to v.h.f. competition, was not far behind, with the fourth-place score nationally.

In the pre-contest publicity we promised listings of the outstanding single-band scores. Actually, in looking over the results, the advantage of working more than one band becomes pretty obvious; nobody anywhere near the top on a national basis got there by only one band, but some very good work was done, particularly on 144 Mc. Apparently, the best man in this department was W3IBH, Philadelphia, who worked 160 different stations in 8 sections for 1280 points. W3UKI, of the same city, did just about as well on 144 Mc., and he also piled up a good total on 50 Mc. Gerry's 122 contacts in 10 sections was one of the best 2-meter scores, even so. We used to think that midwestern stations did well to make 40 or 50 contacts on 144 Mc., but look at W9KLR, Rensselaer, Indiana, with 113 in 9, for 1017 points. W3QKI, Erie, Pa. (out of reach of most of the Atlantic Seaboard activity) had 84 in 8, for 752. W6ZYH, with WN6SCZ helping, worked 110 2-meter stations, and W6IVW caught up with 97. W2UK, New Brunswick, N. J., made no effort to run up a big score. Tommy was after sections, and he set an all-time v.h.f. contest section total, with 16 worked. The one-banders had better watch out if W2UK decides to bear down next September!

Nobody made an outstanding 50-Mc.-only score, but use of the band was a big help to the fellows who were set up to do the job right. Participation on 220 and 420 was up over previous contests, despite the new lower credit for these bands. Several users of the higher bands found it possible to make contest hay there without arranging the contacts previously on 6 or 2. Work on 220 was reported by 19 contestants and 26 used 420 Mc.

One of the better W6 scores was turned in by W6TTB. Don will be remembered by Middle West 6- and 2-meter operators, particularly, as ex-W9SUV. Perhaps not too many of them knew, however, that he is blind!

Looking through the high scores, you miss one of the most significant: W7LEE, Parker, Ariz., worked 9 stations in 4 sections (Ariz., San Diego, Los Angeles, and Nevada) from his "impossible" 2-meter location in the Colorado Valley.

In the following tabulation, scores are listed by ARRL divisions and sections. Unless otherwise noted, the top scorer in each section receives a certificate award. The highest Novice and Technician in each section also receive certificate awards. Asterisks denote Technician winners. Columns indicate the total score, the number of

contacts made, the section multiplier, and the bands used. A represents 50 Mc., B 144 Mc., C 220 Mc., and D 420 Mc. No contacts were reported for any higher band. Multiple-operator stations are shown at the end of each section with the calls of all operators participating.

ATLANTIC DIVISION

E. Pennsylvania

W3UKI.....2499-147-17-AB
W3IBH.....1280-160- 8-B
W3SAO.....602- 86- 7-B
W3OXQ.....576- 72- 8-B
W3TDF.....531- 59- 9-B
W3QFM.....248- 31- 8-B
W3SON.....216- 54- 4-B
W3NOK.....92- 23- 4-B
W3SVL.....92- 23- 4-B
WN3UZF.....64- 32- 2-B
W3RSC.....50- 25- 2-B
W3SSU.....39- 13- 3-B
W3PNL.....10- 10- 1-B
W3KX/3 (W3s KDW LCK LCM LZD MRQ NNH OST PMG QGE RDC)
2575- 94-25-ABCD

Md.-Del.-D.C.

W3PYW.....680- 68-10-B
W3TOM/3...448- 64- 7-B
W3YHI.....324- 54- 6-B
W3LMC.....312- 52- 6-B
W3JZY.....222- 37- 6-B
W3JEW.....200- 50- 4-B
W3MZQ.....148- 37- 4-B
W3TFA.....112- 28- 4-BC
WN3UJG/W3UJG*....51- 15- 3-BC
VE1OU/W3...45- 15- 3-B
W3NH.....33- 11- 3-B

S. New Jersey

W2BDL.....1545-103-15-AB
W2QED.....1530- 98-15-ABD
W2UK.....1200- 75-16-B
W2BLV.....287- 38- 7-BD
W2AF/2.....280- 28-10-A
W2ADA.....256- 32- 8-AB
W2ZQ[1].....96- 24- 4-B
W2ORA.....52- 13- 4-AB
W2DMU.....16- 8- 2-A

W. New York

W2RUI.....1391- 98-13-ABCD
W2UTH.....720- 80- 9-AB
W2OPQ.....720- 60-12-B
W2ORI.....710- 66-10-BD
W2FCG/2....530- 53-10-B
W2ALR.....384- 61- 6-BCD
W2CCR.....270- 54- 5-BD
W2IRU.....245- 44- 5-BD
W2OWF.....234- 39- 6-AB
KN2CEH....105- 35- 3-B
W2VCI.....87- 29- 3-B
W2QY.....44- 22- 2-B
W2BLN.....27- 9- 3-B
W2CTA.....15- 15- 1-B
K2ALZ*.....12- 3- 2-CD
W2UPT/2 (K2s AST CVX, W2s JGJ MTB)
756- 54-14-AB

W. Pennsylvania

W3QKI.....752- 94- 8-B
W3FPH.....612- 51-12-AB
W3QYK.....182- 26- 7-B
W3KJM.....76- 19- 4-A
W3KWH (W3s NRQ SDV UHM)
272- 34- 8-AB
W3ONP/3 (W3LJV)...110- 22- 5-B

CENTRAL DIVISION

Illinois

W9WOK.....595- 85- 7-AB
W9PK.....497- 71- 7-AB
W9DRN.....240- 60- 4-B
WN9YOI.....240- 60- 4-B
W9PPA.....171- 57- 3-B
W9USI.....144- 48- 3-B
W9CRN.....102- 34- 3-B
W9KCW.....40- 20- 2-B
WN9YNC.....12- 12- 1-B
W9BUK.....11- 11- 1-B

Indiana

W9KLR.....1017-113- 9-B
W9ORZ.....522- 58- 9-B
W9BUM.....136- 34- 4-B

Wisconsin

W9BTI.....288- 48- 6-AB
W9YEG.....204- 51- 4-B
W9NVK.....152- 38- 4-B
W9RXS.....144- 36- 4-B
W9GFL.....95- 19- 5-B
W9UJM.....92- 23- 4-B
W9LEE.....24- 12- 2-B

DELTA DIVISION

Tennessee

W4VVQ.....57- 19- 3-B
W4HHK.....36- 12- 3-B
W4TIZ.....16- 8- 2-B
W4TIE.....14- 7- 2-B
WN4YEL.....7- 7- 1-B

GREAT LAKES DIVISION

Kentucky

W4PCT.....650- 65-10-AB

Michigan

W8RMH.....720- 77- 9-BC
W8GNN.....511- 73- 7-B
W8LEE.....372- 62- 6-B
W8RWW.....318- 53- 6-B
W8NOH.....270- 45- 6-B
W8UMI.....198- 33- 6-B
W8BGY.....180- 30- 6-B
W8GYU.....124- 31- 4-B
W8DDO.....96- 24- 4-B
W8ZKL.....96- 24- 4-B

Ohio

W8BFQ.....3552-150-22-ABCD
W8WXV.....1070-107-10-B
W8LPD.....756- 84- 9-AB
W8SFG.....594- 66- 9-B
W8HQK.....306- 51- 6-AB
W8HOH.....275- 55- 5-AB
W8SVI.....270- 54- 5-B
W8DRN.....248- 31- 8-AB
W8SDJ.....200- 50- 4-B
W8LOF.....160- 32- 5-B
WN8MVE....150- 30- 5-B
W8LUZ.....135- 45- 3-B
WN8KQV....123- 41- 3-B
W8HCD.....120- 40- 3-B
W8HSY.....114- 38- 3-B
WN8MVA.....46- 23- 2-B
W8BMO.....44- 22- 2-AB
W8CIT.....42- 14- 3-A
WN8LGI.....40- 20- 2-B
W8IJG*.....36- 9- 2-CD
WN8MXR....34- 17- 2-B
W8FOU.....33- 11- 3-B
W8HUA.....18- 9- 2-B
W8TCO.....10- 5- 2-A

W1QMB sets up the gas-engine generator for W1MHL/1, atop Pack Monadnock, Peterboro, N. H. In the rear are the 4-element 50-Mc. array and a 16-element flopover beam for 220 Mc. A separate 144-Mc. station was operated from the ranger's cabin nearby. This group ran up nearly twice the score of the next in line in the June V.H.F. Party.

HUDSON DIVISION

E. New York

W2BVU.....976- 61-16-AB
W2YXE.....360- 45- 8-B
W2ISK/M...120- 22- 5-B
W2ACY.....85- 17- 5-B
W2OPW.....80- 20- 4-B
W2PKY.....80- 20- 4-B
W2MXJ.....40- 8- 5-B

N. Y. C.-L. I.

W2DLO.....2242-118-19-AB
W2GMT.....1474-134-11-B
W2GLU.....840-120- 7-B
W2KFV.....384- 64- 6-B
W2BNX/2...336- 56- 6-B
W2AOD.....315- 43- 7-BD
W2JBQ.....294- 42- 7-B
KN2BGM....212- 53- 4-B
W2WKR.....204- 51- 4-B
K2CQP.....171- 57- 3-B
W2LID/M....168- 42- 4-B
W2LWI.....140- 35- 4-B
W2KIR.....136- 34- 4-B
W2IN.....88- 22- 4-B
W2KU.....30- 10- 3-B
KN2AZT.....22- 22- 1-B
W2FBL.....15- 15- 1-B
W2TUK.....8- 8- 1-B
W2LGK.....5- 5- 1-B

N. New Jersey

W2RGV.....3281-193-17-AB
W2FBZ.....3006-167-18-ABC
W2DZA.....900- 52-15-ABCD
K2DFJ.....385- 77- 5-B
W2AZP.....355- 71- 5-B
W2RQI.....255- 51- 5-B
W2ZWB.....84- 28- 3-B
W2CEE.....60- 20- 3-B
W2MLX/2 (KN2DFC) 2337-119-19-ABD

MIDWEST DIVISION

Missouri

WØIHD.....24- 8- 3-B

Iowa

WØEMS.....12- 6- 2-B

NEW ENGLAND DIVISION

Connecticut

W1HDQ[2]....4920-152-30-ABCD
W1KHL.....1330- 95-14-AB
W1PHR.....840- 70-12-B
W1WKW....810- 90- 9-B
W1QBH.....756- 57-12-ABD
W1VLK.....726- 58-11-ABD
W1HDF.....720- 49-12-ABCD
W1VLE.....660- 64-10-BD
W1SPX.....603- 61- 9-ABD
W1VLH.....406- 58- 7-B
W1RVZ.....300- 50- 6-B
WN1WYM...245- 49- 5-B
W1AW[2].....180- 36- 5-AB
W1TXI.....168- 34- 4-BD
W1KHM.....168- 28- 6-AB
W1URC.....156- 26- 6-B
W1VLA.....126- 42- 3-B
WN1YDM...126- 42- 3-B
W1OLG.....60- 20- 3-B
W1HYF.....45- 15- 3-B
W1UYP.....18- 5- 2-BD
W1FMU/1 (W1s RJA RMZ) 1177-107-11-B
W1HXD/1 (W1UIY WN1WRG) 195- 39- 5-B

Maine

W1JDS/M....80- 20- 4-B

E. Massachusetts

W1CTW....2220-148-15-ABC
W1BJN.....1176- 98-12-ABC
W1AQE.....873- 97--9-AB
W1RUU.....693- 63-11-AB
W1TPZ.....474- 79- 6-B
WN1YFH....390- 78- 5-B
W1PLX.....360- 60- 6-B
W1LMU.....342- 57- 6-AB
W1DJ.....322- 46- 7-A
W1JQH.....148- 37- 4-B
W1CPB.....124- 31- 4-B
W1TQF.....108- 27- 4-B
W1OLP[3].....100- 25- 4-B
W1JNX.....63- 21- 3-B
W1OED.....57- 19- 3-B

(Continued on page 122)

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

Summer Schedules. Net attendance and traffic have held up well. Some nets have adjusted operation to three times per week and a later or earlier period to suit the convenience of netters. A few nets are discontinuing, to resume in the fall; others continue with operation streamlined and in reduced volume because of vacation-absences. Some operating mobile are making it a point when away on vacations to report into their home net to clear traffic on the progress of the vacation. Visiting ham stations in "vacation land," and radio reporting-in as a visitor on the local section net is also proving popular.

The AREC and RACES Program. Data reported in EC annual reports ('52) in almost all cases showed an increase in the size of EC-AREC groups. There is a higher percentage of full (active rather than supporting) members than last year. Forty-three percent of all AREC members have mobile units. There was a big increase in '52 over '51. "10, 75, and 2" continue the popular bands for mobile. Half of all our AREC groups reported that planning toward participation in RACES had been instituted. About 12 percent indicated that there were neither civil defense nor RACES plans that they knew of. There was an estimated increase (9.4 per cent) in the number of amateurs registered in the Amateur Radio Emergency Corps, bringing the estimated total to 32,761 members. It appears that several thousand home stations now have emergency power, over 60 per cent battery power and 40 per cent gas generator power. More RACES plans have been approved by FCDA and FCC in the last 30 days. It appears that about 60 individual amateur stations with RACES authorizations would be covered under these plans. Adding to the nine-state coverage (under plans) New York City, Nassau, Schenectady and West Chester counties plans now have official approval.

Tornado Work Has a C.D. Parallel. Industrial disasters, wartime attack, hurricanes and floods often catch the nation by surprise. The Flint, Michigan and Worcester, Massachusetts, tornadoes were no exception (story coming up). The complete destruction wrought resembled Hiroshima and Nagasaki indeed and taxed the relief provisions of these communities to the full. *An atomic attack would result in such devastation a thousandfold.* One of the most conservative papers referred to the relief work as "a test in civil defense."

There was not so much an inadequacy of numbers as of *training* in the matter of c.d. workers. Among the many lessons learned, it was emphasized again and again that *trained* workers, instead of casual people who wanted to help by getting in at the last minute, could have accomplished more. One report stated that "communications were never adequate to quickly reinforce areas where the crisis was greatest . . . there was never adequate reconnaissance to aid the heads in making assignments or exchange of worker personnel." Now so far as our own communications contribution of amateur radio is concerned we always want to be proud of the performance of our amateur group. ECs and SECs therefore strive to recruit and lay local plans and drill or *test* at intervals *as well as* in the annual fall S.E.T. to the end that our AREC constitute "one strong and single amateur facility" to be deployed and used as the job may require! Training is indeed necessary, for the Radio Amateur Civil Emergency Service requires disciplined and planned communications. RACES is a joint undertaking of civil defense and amateur radio and you and I have to get signed up in it (a) to make use of our part in the amateur regulations under RACES (b) that our work reflect creditably on us personally and (c) to uphold the tradition and stature of the amateur service.

TVI Committee Note. ARRL is pleased to announce an addition to the long list of interference aids available for committee use (page 50, June *QST*). The article by W5IT entitled "Handling TVI Complaints due to Poor TV Sets" appeared in June *QST*, and is available upon request from the Communications Department.

RTTY Progress. Results in Armed Forces Day exercises are given on page 45 of this issue. Of 295 submissions on the 25 w.p.m. official message by the Defense Secretary 137 rated certificates for perfect copy! NDC, NDS, NDW2 and NDW sent a special transmission for those equipped to take it by radioteletype. Radio conditions were not good; nevertheless there were some 62 submissions. For a first-year showing, this radioteletype participation is especially gratifying.

Directional CQs Appropriate in Summer. We're reminded, by receipt of a bulletin stating that a Regional Net is dropping to one session during summer, to pass along this idea. With no late session, the netters have been called upon by the NCS to be on the lookout in their general operation for any stations calling "CQ Ohio" or for any of the particular points in their area.

W8DAE in closing his bulletin quotes W4PL. "The steady day-in and day-out handling of traffic, free, gratis, for nothing, and on the house, with the compliments of amateur radio, is our

most pleasant contact with John Q. Public. When you mail messages be sure to indicate 'through courtesy of amateur radio.'" Concerning summer nets, whenever the regulars are around and no NCS on the job during streamlined summer operations, it is customary for some one of the group present to take charge and see that any traffic is cleared, then QNF the net as early as possible.

Emergency Lessons. "We learned, among other things, that one station at the point of a disaster is not enough to prevent a serious bottleneck. We learned that we *should* do something about stability and limiting the bandwidth of our carriers. We learned that both 'phone and c.w. are equally effective in moving traffic. We learned that 99 per cent of our out-of-state hams are gentlemen and will QSY when asked. We learned we can't please everyone with one plan. We learned the Michigan gang is patient, understanding, loyal, and faithful." — *QMN (DARA)*

Preparedness for Emergency Communications. Amateurs, true to tradition, once again met the need for providing emergency radio facilities during the critical first days after Flint and Worcester were devastated by surprise tornado visitations. The story is being reserved for our next issue when all reports (still coming in) can be correlated. There are lessons for all to note. Enough has been disclosed to indicate general thanks due and that amateurs generally can take pride in the performance under stress of all amateurs who helped.

All ECs, Radio Officers and civil defense organizations should note the close similarity between these disasters and potential military incidents. Where planning and recruiting and some radio tests had been held this paid off. There was not, so far as is now known, any difficulty in pushing out the more important messages of community interest, ahead of the personal (agony) traffic; the degree of public interest and necessity is spelled out in the texts themselves. See "With the AREC" this month to better appreciate (a) that those stations *in the emergency area* should best be served by others outside by their keeping radio-silent *until* called upon, and (b) that useful amateur channels *outside* the congested 'phone bands should be planned and utilized to the outside for each emergency contingency if the best and fullest use of all our assets is to be had in future emergencies.

About organizing: Don't miss that item elsewhere in these pages announcing our new AREC Slide Collection. It can be booked (in turn) with the lecture notes that come with it, by affiliated club groups or ECs addressing such amateur groups. Every community should have both Amateur Radio Emergency Corps and Radio Amateur Civil Emergency Service plans, and recruitment-registration of *every* active amateur license, to be really ready to do the best job, and not be caught unprepared on that day when our community runs into the unexpected!

— *F. E. H.*

W1AW OPERATING SCHEDULE

The current W1AW operating schedule, effective through September 26th, may be found on page 79 of May *QST*.

DXCC NOTES

International telecommunications treaties prohibit international radio communication by amateurs of certain specified countries where amateur radio operation is either forbidden altogether or restricted to intra-country communications. Looking to future international conferences, ARRL must respect these provisions in setting up uniform award rules in order that our position as a law-abiding group may be maintained. Text of the Public Notice of December 21, 1950, (see page 23, February 1951, *QST*) issued by the FCC, has forced ARRL to reject DXCC confirmations representing contacts made after this date with countries covered by the notice. Prefixes of these countries are: AR (OD), EP, EQ. FI, HS, J, OE, PJ and PK (except JA and OE Allied occupation forces stations, and PK7). HL is added to this list as of June 1, 1953. Confirmations cannot be accepted for DXCC or other ARRL operating awards, nor can ARRL DX Contest contacts with these countries be credited.

NOTE: Subsequent FCC notices modify the above list so that DXCC credit, and ARRL DX contest contacts, will be accepted as of the following dates: PJ, March 11, 1952; AR (OD) and JA (Japanese nationals), October 15, 1952.

DX CENTURY CLUB AWARDS

HONOR ROLL

W1FH.....253	W6AM.....239	W3KT.....237
W8HGW....250	W3GHD....239	W2AGW....235
WØYXO....246	G6ZO.....239	W3CPV....235
W6VFR....246	W6SN.....239	PAØUN....235
G2PL.....246	W3JTC....238	W2QKS....234
W3BES....245	W4BPD....238	W3EVW....234
W6ENV....242	W2BXA....237	W6MEK....234

RADIOTELEPHONE

PY2CK....227	W1NWO....208	W1MCW....198
W1FH.....225	ZS6BW....205	SM5KP....198
VQ4ERR...220	W1JCX....204	W2BXA....195
XE1AC....213	W8HGW....204	W6DI.....195
	W9RBI....200	

From May 15, to June 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

VK3YD....130	CT3AN....105	HB9NL....101
G3EMD....116	W5DF.....103	W2BWC....100
DL4EA....106	W4EJH....102	W5QLY....100
	W2FBS....101	

RADIOTELEPHONE

ON4MS....125	CN8MM....106	I1WAL....101
W4QT.....106	DL7AB....102	VE7HC....101
	I1ASO....101	

ENDORSEMENTS

W7AMX....232	ZS2AG....162	W6BIL....130
CE3AG....230	VE8AW....160	ZS6BJ....124
KH6IJ....210	I1IT.....150	W1APA....123
G6YQ.....200	ON4MS....149	ZL1AH....123
W5JUF....195	W2ZVS....141	W8YHO....122
W2ALO....191	W6NZ.....141	W6YK.....120
KP4KD....190	PY2AJ....136	I1VS.....120
G3YF.....181	W3AYS....133	4X4CJ....113
I1OJ.....174	W6DBP....133	W2BBK....112
W5LGS....170	W6TXL....133	EA3CY....111
ON4AZ....164	GM2DBX...132	W9ALI....110
	W1BLO....131	

RADIOTELEPHONE

W6AM.....190	G2BXP....143	HB9LA....130
CE3AB....180	F9HF.....142	ON4MS....125
W5JUF....167	ZS1KW....132	KL7AFR....122
I1YJ.....161		I1VS.....120

It is easy to criticize, but not so easy to criticize constructively, and even harder to do so without offending someone. It is a fact that most criticisms of our emergency nets in operation during an actual emergency are made by persons who themselves would not have done nearly so good a job in the same circumstances — this mainly because the critic fails to take into consideration factors of which he is not aware and which are not apparent, such as fatigue, emotion, nervous tension and various kinds of pressure to do this or that or the other thing on behalf of selfish interests or people. The recommendations we are about to make for emergency net operation (see also recommendations for handling emergency traffic under "Traffic Topics") are made in full cognizance of the above factors; and while they result principally from listening during the recent Worcester tornado emergency (and we did a lot of listening), they are not intended to reflect unfavorably on the activities of any individual or group. There is no job done that could not have been done better. If we accept that as axiomatic, let us examine how the job can best be done without trying to insinuate that *we* could have done it better than it was done.

One of the biggest headaches in any emergency net is the great number of hecklers from out of the area who want to help. Good intentions are commendable, but they often backfire. A good NCS should make occasional indications that stations are asked not to QNI unless he calls for them.

Even worse are the stations who barge into the nets with urgent "worry" messages and who, when asked to QRX, frequently break in to remind the NCS that they are waiting — or call the destination station without regard to the NCS.

In any emergency net, the emergency stations in the disaster area are the ones to be served. If they are weak (and quite often they are) a clear channel is required; this is easy on c.w., and usually on 10 meters and below, but pretty difficult on 75-meter 'phone. Yet invariably it is on 75-meter 'phone where most medium-distance emergency work is done. A great to-do results about clearing a channel, usually causing more QRM as a result. One of the biggest assets at a disaster-area emergency station which wants to work other than locally would be a good c.w. operator, so that the medium-distance work could be taken out of the crowded 75-meter band. Closer collaboration between section 'phone and c.w. nets could work wonders in this regard.

The net control station of any emergency net should be that station with the best combination of strong signal and operator ability (i.e., NCS experience), and a station not in the disaster area, since such a station will have traffic-handling and other emergency station responsibilities. Experience has shown that stations in the disaster area, when they get on the air, will be on the frequency of local emergency and/or traffic nets if possible. By that time the net is usually in operation, awaiting the appearance of a disaster-area station. When that station does get on the air, the first order of business should be to *clear his official traffic*, if any. After that, give him any official traffic. Thirdly, clear his personal and press traffic. And last, only when no other precedent traffic is on the hook, send him "worry" messages, to be interrupted at any time by traffic of a higher precedence (see "Traffic Topics").

If there are two or several stations available in the emergency area, it is often beneficial to set up two channels, one for "in" traffic and one for "out" traffic.

Casual stations who break the net asking if they can help should be told they can help — either by standing by without transmitting unless called upon, or by moving away about ten kilocycles and helping "police" the frequency by calling casual interfering stations and asking their coöperation. It should not be the NCS's responsibility to do this. He has enough to do.

These are just some passing thoughts. No doubt many more will suggest themselves or be suggested in information on amateur operations in Worcester and Flint. The most crying need of all is for advance preparedness for operation under emergency conditions — something most of us admit is needed but few of us do anything about. If we would only realize it, the things we usually wind up doing in an emergency, after a lot of false starts, we would do immediately if we were prepared for that type of operation in advance. And the only way to prepare for it is to *practice* it.

NATIONAL CALLING AND EMERGENCY FREQUENCIES

C. W.	*'PHONE*
3550 kc.	14,050 kc.	3875 kc.	14,225 kc.
7100 kc.	21,050 kc.	7250 kc.	21,400 kc.
28,100 kc.		29,640 kc.	

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

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

NATIONAL RTTY CALLING AND WORKING FREQUENCY

3620 kc.

This frequency is generally used by amateurs using radioteletype throughout the United States. Other frequencies are under discussion and will appear under this heading in future issues of *QST*.

— • • • —

On May 22nd an explosion and fire occurred at the Mount Vernon, Ohio, Central Telephone Exchange. The city was without intra- and inter-city communications. Sensing the situation, W8PEN, Knox County EC, got on the air and called for assistance. At 1825 the Ohio Emergency Net

In San Angelo, one of the Texas cities hard hit by the May tornadoes, Maurice (Tony) Nixon, W5JIG, was on the air handling emergency traffic within two hours, and remained active for almost 48 hours. Here he is at his rig during the emergency. (*San Angelo Standard Times photo*)

was activated on 3860 kc., with W8CTZ acting as NCS. A state of emergency was declared by Mt. Vernon's mayor and Mt. Vernon c.d. officials. The actual emergency was in effect until around midnight when four magneto-powered emergency telephone lines were put into operation, although at the request of Mt. Vernon officials, the net remained in operation until 3:20 P.M. the following day.

Numerous mobile units from Columbus and other points drove to Mt. Vernon to assist and a number of stations remained on the air at their fixed locations during the entire night.

Unfortunately, the calls of the various mobile stations are unknown. Here is a list of stations that aided in the emergency:

W2GNT, W3UAM, W5QOT/8, W8s AJW AOX BGQ BTW CTZ CXF DGK DMM DVT EYE FOJ GUE GVT HHU HNP HUX HXB IAY IJH KXG/8 LAO NYY PEN PGR QC QQ UPB UXF VTI WEV WRL WWU YEW and ZCQ.

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On the evening of June 8th a violent wind, rain, and hailstorm swept across northern Ohio demolishing homes and bringing about a death toll of 19 in Cleveland. Governor Lausche declared Cleveland a disaster area. Three known nets were active in the area, two on 10 meters and the Ohio Emergency Net on 3860 kc. W8AJH, Cuyahoga County EC, was NCS of the west side net on 29,520 kc. and W8DGK ran the east side net on 29,160 kc. Numerous mobile units were dispatched on errands at the request of the Red Cross, Cleveland Police Dept. and Ohio Defense Corps. The 3860 net was controlled by W8CTZ and numerous messages were handled to and from Cleveland with several stations doing liaison work between 10 and 75 meters. In the Cleveland Heights Area Civilian Defense Net the most active participants were W8VFU, W8UDL/M, W8DGK, W8IRM/M, W8HHN/M, W8FLC and W8FKS/M. W8VFU acted as net control from 2245 June 8th until 0800 Tuesday. W8FLC then took over net control and was on until 1500 Tuesday. Many fixed stations reported into the net and stood by for possible service. Some of the fixed stations were off the air for a while due to power failure which points out again that the mobile units are the most useful and dependable in case of total disaster.

On 75 meters the following were active: W2OY, VE3UJ, W8s AJW AMH FBD FJV FVC GDB HVA OSN KCY MEI NYY OAC PM TAZ and TIH.

On ten meters were W8s AEU AGA AJH BDZ AZU BDA CPP CAI DEV DGK ET FZN FLC DJZ FKS DRR GCP HKG HXL IGR IRM IND INW HHN JFA JFD JVN LEX MAE MWE MXO OBF OXS RRA RJF SST TAI UDL UZJ UKW VFU VK VM YHR and ZJQ.

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A tornado struck Sarnia, Ont., and vicinity at 1725 on May 21st, causing complete failure of power and telephone lines. Emergency equipment using the call VE2DZ was set into operation and contact established with London, Windsor and Toronto amateurs, requesting emergency power for hospitals, military aid for additional patrol and regulation. Conditions washed out communications around midnight. Further public communications were conducted the next day, when partial telephone and power service was restored.

In London, part of which was also hit, two civil defense cars were sent out with the civil defense units making the run over Number 4 highway. This group finally reached Elginfield and set up a portable station using the call VE3QC and operated by VE3s QC BVP AGX AGP and BBI. Traffic was handled for c.d. units, Provincial Police and RCAF units in London. From this point VE3YJ/M worked into the surrounding territory. In London proper, VE3NI took control of a group of stations including VE3s WP APT TO and AJH to handle traffic to Elginfield and Sarnia. VE3JU assisted in relaying. Others who assisted were VE3s AIV EI FD FAC and BVM. All in all, an excellent job seems to have been done for amateur radio.

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Eleven SEC reports were received for April activities, representing 1787 AREC members — a new low for the season. This makes 54 SEC reports received so far this year, compared with 65 at this time last year. 20 different sections have reported this year, compared with 23 at this time last year. How come we're falling behind?

TEXAS TORNADOES

This will supplement the preliminary report on the Texas tornado emergency of May 11, 1953, which appeared in July *QST*, under "With the AREC." We now have additional information collected by SCM W5GF.

In Waco, the principal rôle was played by the Central Texas Amateur Radio Club. Within 45 minutes after the tornado struck Waco, they had two mobiles at the rear of the City Hall, providing temporary emergency communications. Before two hours had elapsed, the club's 5-kw. power plant was in service supplying power to the City Hall, and this was their only source of power until 24 hours later when the power company put a 25-kw. unit into action. W5ZDN, the club station, was active at the clubhouse. W5RDL was set up at the City Hall. Others who supplied equipment and the services and facilities of their stations and operating abilities were W5s FZB TVA DZ ATW NCD KAU BIN BOB RUM OKM VHF and SGN. Others who assisted were W5s TUB RDG CQ NSM YPT YVH UNF AME TTL DYN RTD CQQ TCH YVM YPV KR and W4PYU. Our reporter (W5YVH) asserts that there were also others active in Waco. The message count of the above group was 4594, most stations being on the air continuously for 85 to 90 hours. QRM was terrific, as usual, but coöperation from outside stations was excellent.

In San Angelo, another Texas city hard hit by a tornado on May 11th, W5JIG was on the air within two hours, reporting into the Northwest Texas Emergency Net and starting a flow of communication which lasted two days. W5CMV assisted W5JIG as second operator. W5ETL, W5SBI and W5PNL were also on the air and assisting. The first few hours of operation were devoted to Red Cross and other emergency matters such as medical supplies, police matters and compilation and transmission of casualty lists. Not until early Tuesday morning were official emergency messages cleared so that work could begin on welfare messages on behalf of individuals. W5JIG operated eleven hours straight, took a three-hour layoff and came back on again for four more hours. With the help of a relief operator, the station was active until 0035 Wednesday.

In Dallas, W5LEZ got on the air at 1800 May 11th. Contacting a Waco station, he found that the most urgent need was emergency power units. Generators were furnished by the Red Cross and the Naval Air Base and dispatched to Waco from Dallas. Waco traffic was routed over W5TAC and traffic for San Angelo via W5LEZ. The Caravan Club prepared a complete emergency-powered station to go to Waco if needed. Later, because of the very heavy traffic load, another station was sent to Waco and set up at the Red Cross headquarters. This station commenced operation at 0630 the next morning, after which contact was maintained for the next 36 hours, with relief operators taking over as required.

During periods of long skip on 75 meters WØCPI was contacted and handled much Red Cross traffic into St. Louis. Traffic was about 90% Red Cross, the total traffic count about 670. Those taking part were: In Waco, W5s ATM DSK MIM and K5FEJ; in Dallas, W5s CPW DAS HB JLT MIM LEZ QXD TFJ TGK TJE TOC VEE WCV WLR. Assisting in relaying and guarding the frequency were W5s IWQ TFY VIM and K5FBB.

A.R.R.L. ACTIVITIES CALENDAR

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
Dec. 4th-6th, 11th-13th: 10-Meter WAS Party
Dec. 6th: CP Qualifying Run — W6OWP
Dec. 15th: CP Qualifying Run — W1AW

28-MC. VOLUNTEERS WANTED!

All ten-meter operators will find it of interest to consider devoting some regular time to participation in a program to assist newcomers to our hobby. The ARRL on-the-air code-practice program has met with considerable success on the 28-Mc. band, and can be even more successful with *your* participation. A mimeographed listing of amateurs participating in this program is available to any interested person on request (as are listings of MARS, Naval Reserve and Press Stations). If you feel that your ten-meter gear affords good local coverage, at times when interested parties can listen, notify ARRL by radiogram, card or letter. Give your call, full name and address, anticipated schedule (days, hours, speeds) and request printed instructions if needed. Look ahead to beginning your program at the start of the operating season, but let us know *now*, so *QST* listings can be made available about the time you begin. A strong amateur radio constantly needs new amateurs and good operators — do your part!

TRAFFIC TOPICS

The recent series of emergencies (Waco, Flint and Worcester) make the subject of emergency traffic a timely one. Listening on frequencies being used for emergency traffic (on 75 and 80 meters) coming from and going to the disaster areas brings many thoughts to mind, and makes us examine more closely the practicability and completeness of the recommendations we make in *Operating an Amateur Radio Sation* and *Emergency Communications*.

We conclude that in general the recommendations are sound but that a good many traffic men either haven't read them or don't agree with them. The result is the same either way — temporary disruption of traffic nets until a system can be set up. This is to be expected, but in listening we perceive that our traffic nets in an emergency could settle down tn business *so* much more quickly if only more of our operators understood the principles of (1) everyday net operation and (2) emergency net operation, and if only those who did understand them would abide by them regardless of personal influences at work.

One of the biggest problems in handling traffic in emergency nets is designation of traffic. Most of the really important traffic within a comparatively small disaster area such as existed in the recent tornadoes is handled on ten meters and below, and this is as it should be. Most of the personal traffic, both incoming and outgoing, is handled on the 75- and 80-meter traffic and emergency nets. Nevertheless, *all* nets should be equipped and ready to cope with *all* kinds of traffic. It seems to us that the time is ripe to make a few observations on the handling of traffic during an emergency.

Basically, there are two kinds of emergency traffic — that affecting the welfare of the general population, or a considerable segment of it, and that concerned with individual welfare only. The former consists of such things as Red Cross traffic, traffic concerning the restoration of utilities, rescue work, need for or dissemination of medical, police or fire assistance, press dispatches, etc. The latter can be pretty sharply broken down into three categories: (1) Notification of death or injury; (2) reassurances of well-being; and (3) "worry" messages. Some of these categories can of course be further broken down, making things more complicated. One of our biggest jobs in an emergency, where it is not already done for us, is to sort out the traffic given us for transmission and handle it in a way which will best serve the public welfare and redound to our credit. This, fellows, is no cinch.

Looking at it from a detached viewpoint, it is pretty obvious in which order the above traffic should be handled. Trouble is, when something personal is involved or when a tearful plea is received from someone with loved ones in the disaster area a good many of us fail to maintain that detached viewpoint and, subconsciously or not, swell the importance of the traffic we hold out of all proportion to its actual importance. This usually results in our insisting that our traffic be handled first and the necessity for the NCS (if he is not cowed by our insistence) to explain why other traffic has to come first.

In most cases it is up to us amateurs to decide the comparative importance of different kinds of traffic, and when to send each. We have to use our judgment, divorced as far as possible from personal aims. The subject deserves much more extensive treatment than we can give it here, but let's enumerate a few thought-provokers:

(1) *In emergencies*, traffic might be designated *Official, Notification, Press, Assurance* and *Worry*, and handled in that order of precedence. At the same time these designations would indicate precedence, they are one-word descriptions of message content. This will help the originating station to know how to designate them when filed (and give him less excuse for upgrading) as well as better enable each handling operator to evaluate the contents on the basis of the designation given. Probably there is some justification for putting Press ahead of Notification.

(2) Within their respective designations, traffic *coming out* of the disaster area should be handled before traffic *going into* the area.

(3) Traffic not connected with the emergency may be deferred until normal communication is restored into and out of the disaster area, but emergency traffic should *all* be handled as possible. That is, "worry" traffic deserves handling if there is no more important traffic in the net, and provided of course the station in the disaster area is equipped and willing to handle it.

(4) The originating station puts the precedence designation (if any) on the message (customarily before the number or after the check). By whom and under what circumstances this designation can be changed, if at all, is really a knotty problem which will need more thinking about.

For years, we at ARRL have refrained from getting into this subject for reasons too numerous and perhaps too obvious to go into here. We *still* shy away from "priority" designations (Urgent, Rush, Priority, Deferred, etc.) as such, but having listened to a lot of confusion in emergency nets your NEC is gradually coming around to the belief that *some* kind of generally-accepted precedence designations are needed in emergency traffic work.

In "With the AREC" we are discussing the subject of emergency net formation, organization and operation this month; suggest you traffic men take a look since it also concerns you.

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TCPN reports 30 April sessions of 44 stations handling 2750 messages. In May, 37 stations handled 3415 messages in 31 sessions. TCRN conducted 31 sessions in May, five stations handling 3155 messages, an average of about 100 per session.

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National Traffic System. WØDQL, manager of the Minnesota Section Net (MSN), wrote to us some time ago to opine that we put too much emphasis on Regional and Area Nets and not enough on Section Nets. The latter, representing as they do the "grass roots" of traffic handling, are scarcely mentioned. This is quite true, a good criticism and one worth discussing.

The Los Angeles Section had a get-together on May 3, 1953, to celebrate the first anniversary of the founding of LSN, and they got together to pose for this photo. A lot of traffic talent is represented here. *Left to right, standing:* W6s CCO, DPL, DDE, QIW, BHG, YCJ; *center row:* W6s JQB (RM), GYH, FMG (RM), CAK, OFJ, NTN; *bottom row:* W6s NCA, GJP (RM), FCT, CMN, K6EA and W6IGH.

The fact is that there just isn't room in these pages for details of section nets because there are too many of them. However, your SCM will invariably be glad to reproduce some section net information in his monthly *QST* column if you will send it to him. The information we reproduce herewith on NTS Regional and Area Nets is pretty much a substitute for the monthly SCM column in which the Section Net can be taken care of. We *do* solicit reports from section traffic nets ('phone or c.w.) and will continue to list the data in the tabulation below as long as room permits — after which we will have to resort to some kind of summarization. But don't you fellows who are doing the delivering and originating at section level get the idea we've forgotten you. We have to administer Regional and Area needs because this is a responsibility of Headquarters under the new Rules and Regulations of the Communications Department. Your SCM is the man to whom you should turn for publicity on section net activities. Meanwhile, if you want to submit data as below, drop us a line for a few copies of the form used by other NTS (including section) nets.

May reports:

Net	*Sessions*	*Traffic*	*High*	*Average*	*Most Consistent*
EAN	21	1086	143	51.7	1RN, 2RN
CAN	20	1032	119	51.6	
PAN	18	763	98	42.3	
1RN	20	336	49	16.8	Conn., Me., W.M.
2RN	42	450	24	10.7	NJN
3RN	42	299	26	7.0	MDD
4RN	42	427	47	10.0	E. Fla.
RN6	53	854	59	16.0	LSN, BAN
RN7	52	452	53	4.9	Wash.
8RN	13	82	17	4.8	Ohio
9RN/TLJ	25	2240	224	89.6	All
TEN	42	1992	137	47.4	
TRN	37	82	10	2.2	OSN
QKS (Kans.)	18	159	26	8.8	
TLCN (Ia.)	21	866	83	41.2	
Minn. C.W.	26	133	14	5.1	
Minn. 'Phone	24	108		4.5	
Total	495	10,275	224	20.8	
Record	568 ('52)	10,275	224	22.1 ('51)	

Speaking of section nets, we want to offer the suggestion that there is a definite place for the section 'phone net in NTS, for quite often it has the coverage that a c.w. net cannot provide. If your section is one of those that does not have a traffic net because there aren't enough c.w. men available, why not try to organize one on 'phone, using the c.w. men you *do* have to effect liaison with the regional net?

W6ELQ, in relinquishing the reins of PAN (no successor as yet), wants to acknowledge the invaluable assistance of W7NH. Nellie is former manager of RN7 and knows her way around in the Pacific Area.

The RN6 report listed representation from nine section-level nets, including some from newly-included sections of Arizona and New Mexico, but none from Colorado or Utah.

RN7 certificates have been issued to W7OE and W7TCI. W7CZX will be asked to assist manager W7PKX in keeping the net going during the summer.

9RN/TLJ boasts the best attendance record as well as the highest traffic total this month. W9TT wants it known that their one-session high of 224 (on May 4th) included no "book" messages and was cleared in three hours.

TEN will reduce schedule to three nights per week (but 100% CAN liaison) if traffic warrants it — but traffic was plenty good in May! Summer NCS needed.

TRN summer schedule (starting June 1st) is Monday and Friday on 3675 kc. and Wednesday on 7150, all at 1945 EST, with a representative to EAN each night if possible. Maritime representation was nil in May.

AREC ORGANIZATION

A newcomer to ARRL Training Aids, the slide collection "Amateur Radio Emergency Corps Organization" will prove valuable to affiliated club groups, as well as AREC groups. The basic structure of the AREC, with emphasis on the EC's job, is presented on 41 slides (total showing time about 25 minutes). The lecture commentary is available in printed form, or pre-recorded for your use on wire or tape. Booking arrangements are available upon request from the Communications Department.

BRASS POUNDERS LEAGUE

Winners of BPL Certificates for May traffic:

Call	*Orig.*	*Recd.*	*Rel.*	*Del.*	*Total*
KG6FAA	567	3019	2807	188	6581
W3CUU	296	3019	2145	893	6353
W6IAB	62	2709	2623	65	5459
KA7LJ	1002	1594	694	899	4189
KL7AIR	277	1536	1749	63	3625
W4USA	58	122	1384	1224	2788
W4PL	20	1376	1006	300	2702
K4WAR	189	1210	1164	46	2609
W6KYV	143	1206	447	759	2555
K6FCA	29	1120	1039	110	2298
W9JUJ	25	1062	864	145	2096
W7BA	37	894	858	34	1823
KA7RC	369	648	593	55	1665
W9CPI	23	744	605	139	1511
K5FBB	409	504	463	41	1417
WØBDR	5	677	648	15	1345
K3WAS	381	442	416	26	1265
K6FAL	245	508	423	72	1248
WØSCA	3	616	611	1	1231
K4FDB	65	640	500	5	1210
W5MN	64	561	251	304	1180
W4WHC	954	63	16	38	1071
W4TAV	15	532	457	40	1044
WØQXO	8	510	454	56	1028
W5EB	58	466	422	40	986
W3WIQ	9	477	413	61	960
W6HK	72	435	367	68	942
W6YHM	13	445	410	39	907
W9NZZ	314	294	1	292	901
WØJXJ	5	438	409	29	881
W5GZK	16	427	389	38	870
W9TT	25	399	422	22	868
W6YDK	54	400	278	113	845
W7PGY	21	411	396	15	843
W8AUJ	29	413	340	50	832
W4PJU	½5	406	325	81	817
K3WBB	35	375	311	71	792
W4YIP	4	375	351	28	758
W4KRR	77	371	225	74	747
KØWAD	12	366	312	49	739
W2RUF	17	378	250	85	730
W1SJO	5	321	280	26	632
W4SHJ	252	190	157	26	625
W6GYH/6	3	301	251	51	606
W9WWT	15	292	277	10	594
W4HQN	4	295	272	10	581
W4FPC	12	19	494	19	544
W7CZX	11	262	260	1	534
W8JAR	15	256	239	17	527
WØUPU	26	250	220	30	526
WØFUF	2	258	246	10	516
W6IZG	9	256	179	69	513
W4IWV	5	165	170	170	510
Late Reports:					
W2BTB (Apr.)	57	3379	2740	71	6247
W4PL (Apr.)	16	1298	979	175	2468
W4PL (Mar.)	12	1274	1012	144	2442
WØSCA (Apr.)	3	834	832	1	1670
K3WAS (Apr.)	437	301	270	25	1033
K3WAS (Mar.)	505	117	84	30	736
W3VON (Apr.)	720	3	1	2	726
W3CVE (Apr.)	457	40	18	22	537
W2ZOL (Apr.)	7	391	93	19	510

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

W2AEE	153	WN9UQP	131	W8FLM	106
W8KQY	148	W4DRD	127	W8MAI	104
WØUCV	144	W5TFB	126		
K5NBQ	143	W8URM	121	Late Report:	
W6UGA	136	W5OLG	114	KG6AEJ (Apr.)	200
W6BPC	135	W9UNJ	114	W3CVE (Feb.)	171

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.

ELECTION NOTICE]

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

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

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

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

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

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

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

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

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

You are urged to take the initiative and file nominating petitions immediately. This is your opportunity to put the man of your choice in office.

— F. E. Handy, Communications Manager

Section	*Closing Date*	*SCM*	*Present Term Ends*
Yukon*	Aug. 14, 1953	W. R. Williamson	Mar. 17, 1949
San Francisco	Aug. 14, 1953	R. F. Czeikowitz	Apr. 14, 1952
West Indies	Aug. 14, 1953	William Werner	Aug. 15, 1952
Maritime*	Aug. 14, 1953	Arthur M. Crowell	Oct. 16, 1952
Western Florida	Aug. 14, 1953	Edward J. Collins	July 29, 1953
Eastern Florida	Aug. 14, 1953	John W. Hollister	July 31, 1953
North Carolina	Aug. 14, 1953	J. C. Geaslen	Aug. 15, 1953
Indiana	Aug. 14, 1953	Clifford C. McGuyer	Oct. 14, 1953
South Carolina	Aug. 14, 1953	T. Hunter Wood	Oct. 15, 1953
Vermont	Aug. 14, 1953	Raymond N. Flood	Oct. 15, 1953
North Dakota	Aug. 14, 1953	Everett E. Hill	Resigned
Ohio	Oct. 15, 1953	John E. Siringer	Dec. 14, 1953
Eastern New York	Oct. 15, 1953	Stephen J. Neason	Dec. 14, 1953
Illinois	Oct. 15, 1953	H. F. Lund	Dec. 14, 1953
Alabama	Oct. 15, 1953	Dr. Arthur W. Woods	Dec. 14, 1953
Quebec*	Oct. 15, 1953	Gordon A. Lynn	Dec. 15, 1953
Alaska	Nov. 13, 1953	Glen Jefferson	Jan. 15, 1954

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

ELECTION RESULTS

Valid petitions nominating a single candidate as Section Manager were filed by members in the following Sections, completing their election in accordance with regular League policy, each term of office starting on the date given.

Eastern Pennsylvania	W. H. Wiand, W3BIP	June 15, 1953
South Dakota	J. W. Sikorski, WØRRN	July 2, 1953
East Bay	Ray H. Cornell, W6JZ	Aug. 16, 1953
Southern New Jersey	Herbert C. Brooks, K2BG	Aug. 26, 1953

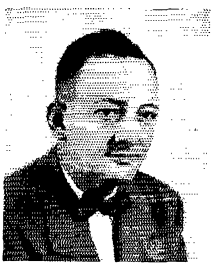
In the New Mexico Section of the West Gulf Division, Mr. G. Merton Sayre, W5ZU, and Mr. Thomas F. Marshall, W5RFF, were nominated. Mr. Sayre received 85 votes and Mr. Marshall received 81 votes. Mr. Sayre's term of office began May 4, 1953.

In the Iowa Section of the Midwest Division, Mr. William G. Davis, WØPP, and Dr. A. J. Ploog, WØSCA, were nominated. Mr. Davis received 151 votes and Dr. Ploog received 139 votes. Mr. Davis's term of office began June 16, 1953.

MEET THE SCMs

Arthur W. Plummer, SCM Maryland-Delaware-District of Columbia, became interested in amateur radio in March, 1934, and within a very short time had acquired his first license with the call W3EQK, which he now holds.

Transmitting equipment in W3EQK's shack consists of a pair of 5514s at 250 watts input, modulated by 5514s in Class B. The station receiver is a Hallicrafters SX-28; antennas are two-element 20-meter and two-element 10-meter beams. SCM Plummer also works mobile with his Elmac A-54 rig and Gonset triband converter. Operation from the home rig is on 10- and 20-meter 'phone while mobile operation is conducted on 10-, 11-, 20- and 75-meter 'phone.



In addition to his numerous SCM duties, Art keeps busy as Official 'Phone Station, Official Bulletin Station, Official Observer (Class I), and 'Phone Activities Manager, and is a member of the Baltimore Amateur Radio Club. He participates in many contests and was winner of both the 11th and 12th All-Sections Sweepstakes for Maryland-Delaware-District of Columbia.

Art's diversified interests include photography, 8-mm. movies, flying (he has been a licensed private pilot for a number of years) and pistol and rifle shooting. His favorite sports are baseball and football. His occupation: Weapons Instructor for the Baltimore Police Department.

BRIEF

The 6th V.H.F. Sweepstakes score of W2KU was erroneously credited to W2ICU in April *QST*.

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 August 12th 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 WGOWP only* will be transmitted on August 1st 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 with W1AW.

Date Subject of Practice Text from June *QST*

Aug. 3rd: *Automatic Multiband Mobile Antennas* . . . , p. 11
Aug. 6th: *Methods for Compact Construction*, p. 15
Aug. 10th: *Magnetostriction Devices* . . . , p. 24
Aug. 14th: *The Electronic Voltmeter* . . . , p. 28
Aug. 18th: *How to Live Longer*, p. 18
Aug. 20th: *QRM Rejection the Simple Way*, p. 22
Aug. 25th: *Build Your Own Steel Tower*, p. 41
Aug. 28th: *A Single-Package Mobile Unit for 28 Mc.*, p. 33
Aug. 31st: *The World Above 50 Mc.*, p. 61

• 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. New officers of the Delaware-Lehigh ARC are NNT pres.; SCT and KMM, vice-pres.; PYF, act. mgr. The South Philadelphia RAC now meets on the first Tue. of the month at Childs School, 17th and Tasker Sts. It seems that the York Club invited the Lancaster gang to participate in a 2-meter transmitter hunt on May 17th, to their sorrow. Lancaster took first and second places! Lancaster also put 7 mobiles in the Armed Forces Day parade May 16th, and on May 3rd provided communications for a simulated disaster and emergency drill held by the Lancaster County Fire and Police at Columbia, Pa. Since the E. Pa. c.w. net is closed down for the summer, 3RN invites E. Pa. to report in Mon. through Fri. on 3590 kc. at 7:45 P.M. and 9:30 P.M. EST. DSG is moving to Narberth. DUI reports good results with off-center-fed antenna, while EYY says the same for T2FD. BYB reports the Oreland group is all set up for c.d. and is waiting for the final RACES plan to jell. UQJ lost 420-Mc. antennas, complete with chimney, in the recent windstorm. He expects to be on shortly with some new gear and is eager to contact 420-Mc. operators near York. UUA is all set for low-power 'phone as soon as his General Class ticket arrives. Traffic: W3CUL 6353, BIP 207, BFF 123, PDJ 112, NOK 89, AEQ 63, ONA 58, MAC 46, DUI 45, KAG 41, QOL 39, RSC 32, PYF 30, VN 22, PVY 21, SHP 17, AD 16, VDE 8, UUA 2.

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA — SCM, Arthur W. Plummer, W3EQK — Liz, CDQ, sailed June 24th for Europe and will return in September. WN3VOZ reports his first QSO was May 7th after being on the air three days with 6AG7-6L6. OSF will be heard from soon via twelve-elements on 2 meters. GHQ is active on 10 meters after a two-year silence. PTZ is laying out antennas on a new farm 20 miles south of D. C. CQS is QRL with MEPN-VFN and TCPN traffic, 'phone and c.w. EQK, your SCM, discovered a surprising amount of interesting activity on all bands by members of the DARC on a recent visit to Wilmington, Del. Delaware is there for you guys who are trying for WAS, so get out and dig for it. Gov. Boggs signed the Delaware License Plate Bill into law recently. Lt. Sam Stant, Delaware State Police, W3STS, is given credit for the majority of work towards its passage. C.d. communications in Delaware will be 100 per cent complete and in operation by the time this is printed. Our hats are off to the Chicken State. DARC elected the following officers June 4th: IYE, pres.; RFK, vice-pres.; UMV, secy.; HGA, treas. The Chesapeake Club heard QAU speak at the May 11th meeting on "Cascode *vs* Grounded Grid and Other R.F. Amplifiers." On May 25th a very interesting speaker, Charles Christianson, Field Engineer for Bendix, spoke on "Transistorized Electronic Circuits" and demonstrated an oscillator-a.f. power amplifier, a multivibrator and other circuits using transistors. RMD, new NCS and manager of MEPN, reports 48 active members. QCB, assistant to 2nd Army MARS director, reports 3USA will be on soon. ONB reports a visit with BIP and YDA. QZC is putting up f.m. antennas to get Baltimore f.m. stations on his homemade tuner. UGF says summer QRN is no good for traffic skeds. Your SCM requests that all reports be in not later than the 5th of each month as he has a deadline to ARRL of the 7th of each month. Late reports make extra work! Thanks, fellows. The SCM has full and complete information on officers and members of the following clubs: Chesapeake at Towson, Md.; Delaware Amateur Radio Club at Wilmington, Del.; and Baltimore Amateur Radio Club. Will all other clubs in the Md.-Del.-D.C. Area please come through so the files can be completed and brought up to date? Complete information on members of MEPN is also on hand. I would appreciate it greatly if Net Managers of other nets ('phone and c.w.) will send up-to-date lists. EQK hopes to be on 75 meters soon in order to participate in MEPN, both fixed and mobile. DC is sporting a new type mobile antenna for 75 meters only and says it works on receiving as well as transmitting better than any mobile antenna he has ever used. Your SCM expects to be mobiling in Canada during part of July and wrote to the Department of Transport, Office of Telecommunications Divisions, Ottawa, Canada, for permit, receiving a list of Canadian frequencies and rules and regulations concerning operation, also a two-section card. When this card is filled out and returned to the above address, authorization for mobile work will be granted. This information is for any who are contemplating a Canadian trip. Traffic: (May) K3WAS 1265, WBB 792, W3CVE 244, COK 222, K3FBA 205, W3JE 154, UGF 118, ROU 110, QZC 85, ONB 81, JHW 34, CQS 27, NOE 24, NNX 8, QCB 4, HC 3, EQK 3. (Apr.) K3WAS 1033, W3VON 726, CVE 537, COK 164, NOE 17. (Mar.) K3WAS 736. (Feb.) W3CVE 285.

SOUTHERN NEW JERSEY — SCM, Lloyd L. Gainey, W2UCV — CCS has turned over Net Control of the New Jersey 75-meter Emergency 'Phone Net to ZQ. The club station of the DVRA now has quite a responsibility to carry on the fine tradition of this net, which is over ten years old. UAP turned in an HT-9 for a new Viking, which adds one more fine transmitter to this section. NFL is putting a fine signal on the band with his 2-meter mobile rig. K2AER ran up 66 contacts during the Sweepstakes and most of them were made on single sideband. ANI is now slant 9 in Ft. Wayne, Ind., and is looking for local stations on 40-meter 'phone from 1830 to 1930 EDST. LY recently acquired a Gonset 2-meter communicator and is putting a fine signal on the air. ASG reports Haddonfield has purchased five Gonset 2-meter communicators for use by the local civil defense organization. Oaklyn purchased three. These units certainly will relieve the hams of the necessity of supplying all the equipment as well as the operators. Traffic: K2BG 355, W2RG 163, ZVW 71, ASG 26, ZI 11.

WESTERN NEW YORK — SCM, Edward G. Graf, W2SJV — SEC: UTH. RM: RUF. PAM: GSS. NYS meets on 3615 kc. at 7 P.M. and on 3980 kc. at 6:30 P.M.; NYSS on 3595 at 8 P.M.; NYS C.D. on 3509.5 and 3993 kc. at 9 A.M. Sun. TBD resigned as EC for Erie County as he has moved to New Jersey. Look for him on 2 meters. NYS is planning a picnic for July 26th at Marcellus County Park on Route 20N, southwest of Syracuse. K2AIB is looking for a Delaware contact on 40 meters. VLL is using UNJ style VFO exciter and a Norgard audio plase shift network. DEQ has gone s.s.b. PPY has been appointed EC for Erie County and Radio Officer for c.d. The Ithaca Radio Club operated QLU, its emergency truck, in a successful c.d. test May 23rd. IEP is a regular on 75 meters. UTH has a rig on 6 meters with an 815 final. WUB, CZT, and AKM are on 2 meters. FE has a new 32V-3. KN2ANC is a new call in Hammondsport. The Fort Stanwick ARA held a Ham-Family Day at Becks Grove, Rome, on May 17th. The Malone Radio Club put an AREC display in a communications center sponsored by the Rotary Club. CWZ, ADG, and KN2s CBU and CBS operated the 2-meter rig at the display to relay traffic to CFY for out-of-city delivery. HXG is new EC for Seneca County. YLM is EC and Radio Officer in c.d. for Broome County. A joint Binghamton-Scranton meeting was held in Montrose, Pa., representing the Binghamton, Scranton, Sidney, Elmira, and Corning Areas. The IBM Amateur Radio Assn. has been formed, meeting at 8 P.M. the 2nd Fri. of each month at the IBM Gun Club. Officers are YLM, pres.; W. Swarthout, vice-pres.; CFW, secy.; A. Lubowicki, treas.; OW, act. mgr. 5LUU now is K2CXE. BHP and BFL now are mobile. The Greater Buffalo Mobile Club conducts hidden transmitter hunts. MJF, active on 40-meter c.w., has CL AB2 modulator to work the locals on 'phone. TH, of FCC, spoke on Conelrad at the Rochester Hamfest. Appointments renewed: EMW as ORS, NAI as EC. Net certificates were issued to RQF, JNM, ABV, MSE, RVH, BTB, HBU, IPC, BKI, IEP, BHQ, BGG, BZE, EFK, EUP, GIH, JPE, OYI, OZR, PYB, QLK, RUC, RUF, ROL, SYT, SAM, SNC, SSS, TAX, TBD, UJR, UYG, UZB, VUN, VYJ, WCH, WSF, ZQQ, ZXH, EFX, KZ, PDB, PZI, PPL, UHI, and DPD. New officers of Rochester DX Assn. are PUN, chairman; BZN, asst. chairman; AXR, secy.-treas. Rochester Mobile Club officers are YPR, pres.; ACO, vice-pres.; ZZS, secy.-treas. Traffic: (May) W2RUF 730, GSS 190, HKA 93, JWU 73, ZRC 53, OE 36, DVE 26, IPC 26, SJV 21, K2DG 20, W2FGL 20, CYD 18, FEB 14, OZR 10, RQF 10, RJJ 9, YFZ 8, JMT 7, EMW 6, COU 3. (Apr.)

W2BTB 6247, ZOL 510, NAI 273, CFY 107, OE 59, FGL 15, COU 5.

WESTERN PENNSYLVANIA — SCM, R.M. Heck, W3NCD — RMs: NUG and GEG. The WPA Net still is going. RM NUG reports the May traffic total as 99, with the most consistent reporting stations being UHN, SIJ, KNQ, NRE, and UVD, in that order. Your SCM received a letter from Herb Heller at Sandia Base, Albuquerque, N.M., who wishes me to extend his thanks to all the hams who handled his Pittsburgh traffic. He says that he is doing some operating from K5FEF and expects to put his old call back into circulation as W3OFI/5 so that you may be able to work him directly. Thanks to Bucktail Amateur Radio Club Secretary IIX and the publication *Bucktail Hamster* we have the following notes: RVS now is working out on s.s.b. LEL is on 75 and 80 meters with low power. TCP repaired the club gear in readiness for Field Day. KLH, who recently was hospitalized, is back in action. The Radio Club of Erie elected new officers, with directors as follows: KNQ, OIE, KLD, ODF, KKT, and LKU. The Club's emergency communications trailer was used in a dress rehearsal of the coming c.d. disaster test centering on Meadville, Pa., with communications to be handled by amateur radio and reported to be satisfactory. The same evening some of the Erie hams who already had quite some day again were activated on a call by the local c.d. in a surprise drill during which communications were handled by ODF, LKJ, TKT, STK, TMK, and PIY. KNQ is reported receiving his Old Timers Club certificate. Traffic: W3WIQ 960, UHN 76, NUG 58, SIJ 27, KNQ 17, NCD 15, KUN 2.

CENTRAL DIVISION

ILLINOIS — SCM, H. F. Lund, W9KQL — Section Nets: ILN 3515 kc.; IEN 3940 kc. SEC: HOA. RM: BUK. PAM: UQT. CJV has changed QTH to Versailles. HIB has returned from Korea. UZP has finished his 14-Mc. rotary. 6CIW/9 makes frequent trips to D. C. and visited MARS Headquarters recently. NIU is hunting for more chassis room on an ARC-5 so he can get on 75-meter 'phone. YCR is the new call issued to the Quad City Club for its station at the airport. SXL lost two meters as casualties to his 2500-volt power supply. DBO has new NC-57. TXC has completed RTTY demonstrations for 5th Army so now is active on USA. FRP moved the trailer so now has to put new mast and antennas up. Newcomers to ILN are DBO, LMC, POL, and YZE. UXB is emergency station at Northbrook City Hall and operates on 29.56 Mc. ACU has a "V" beam working on all bands. UIN gives code practice on 7.2 Mc. The Midway Club had a very successful first anniversary party and received excellent publicity in the *Zion-Benton News*. The Lane Tech Club has been elected to membership in the Chicago Area Club Council. Watch the expiration dates on your appointments, fellows; the shack is too hot in summer for me to keep my work up and send notification cards. ICF will personally deliver a "pink" QSL he received to the person who was using his call on 160-meter 'phone just a shade out of the band, if said individual will make himself known. DOQ and MLR keep daily schedule on 7115 kc. 4CVO/9 is leaving for sea duty in the Atlantic. CGY has a Motorola "Dispatcher" and acts as Net Control for the 144-Mc. mobiles around Waukegan; mobiles are OUD, PVV, KXX, NRC, and UXS. FTJ/9 works low power during the week from Great Lakes and then travels to Ft. Wayne on week ends to a kw. rig. TJX got a Navy transfer to Cleveland. 2POW/9 has a new 10-meter mobile rig on the air. UXP and Novice WXK are joint owners of a boat; the name: *QST*. GRV has a new Chevrolet punched full of holes; for a mobile, of course. Novices RQF, TOL, and TIX all made General Class. The Iroquois County Radio Club held its fourth annual transmitter hunt at Watseka, Ill. on Apr. 30th, with amateurs from Iroquois County, Kankakee, Ill., and Kentland, Ind. participating. Among the 38 persons taking part were RID, IYN, HKA, LCH, NKR, ILW, KLD, FMA, QGO, PKW, NJS, PKS, CVW, QAY, OVI, AVS, TYN, and WN9VQC. IYN was in charge of the hidden transmitter which was located in the woods about 7 miles south of Watseka. The first mobile unit to find the hidden transmitter was OVI, second was QAY, third LCH and last TYN. After the hunt a wiener roast was held and prizes were distributed. The outing was enjoyed by all. Traffic: (May) W9OKI 369, POL 334, CSW 319, YIX 176, SXL 112, OKQ 110, W6CIW/9 73, W9EHS 68, CTZ 47, BUK 45, PHE 21, W4CVO/9 7, W9LMC 5, TBI 2. (Apr.) W9CSW 358, POL 214, OKI 152, YIX 109, SXL 90, TBI 80, OKQ 72, EHS 50, STZ 40, LXD 39, BUK 34, USA 25, W6CIW/9 24, W9JLL 23, DOR 20, PHE 14, FRP 10, BA 8, DBO 3, NJE 3.

INDIANA — SCM, Clifford C. McGuyer, W9DGA — The Madison ARC had a picnic at Clifty Falls State Park. LZI visited the Shelbyville Club. JUJ reports QIN traffic for April as 937. The FWRC held a Red Cross drill with EOG, BKJ, CLZ, UDD, NYK, and PMT participating. FMJ has been transferred to Detroit A.T.&T. for a few months. The FWRC has a $5 attendance prize for its members. AZJ moved to Ohio. LZI vacationed in Canada. UCT, GSY, JUJ, PEO, NDH, VGD, ERB, BNF, GM, FYC, DOK, YHA, OMD, OFW, and WN9WRD participated in an aircraft air watch on Armed Forces Day at Muncie. IFR is building a new shack. OLX has new Viking II and VFO. NZZ reports poor arctic conditions for his traffic, but Stan still had a total of 901. TT reports conditions poor for stateside traffic. NYK, LDL, KFS, PMC, TDW, UDD, and BKJ furnished communications for the Memorial Day Parade at Fort Wayne. QYQ has a Viking rig, HRO receiver, and his Gen. Cl. license. YND is a new call in Evansville. RBX worked an aero-mobile on 40-meter 'phone. New officers of the Martinsville ARC are DUD, pres.; SWM, vice-pres.; UPJ, secy.-treas. PMT visited HGV. The Key and Mike Club of New Albany had ELJ club station demonstration in New Albany and Jeffersonville on successive week ends. JJU is with the Indiana State Police. ERB has a new home-built all-band rig for his car. NTR will be in Indianapolis this summer. KLR now has 13 states on 2 meters. JWB reports Monroe County has formed a club with the following officers: BOC, pres.; JNX, corr. secy.; IGW, treas.; JWB, secy.-publicity. QYQ reports Orange and Lawrence Counties are forming a club. JWB built a "Field Day Special." FFH will take a summer cruise to South America. WUH works in the Snail Net. HQF was selected for the A-1 Operators Club and received his 120 sticker for his DXCC. AIN gave a talk on antennas for TARS. PQR has a pair of 1625 tubes in his final. RIV and WDS work 15 meters. QAV works 40-meter 'phone with screen modulation. LXW left the State Police in favor of WEOA. JFJ won the $30 jack-pot at a TARS meeting. RCD is feeling much better. New appointments this month include K9AAY as EC for Shelby County, ZCI as OPS, and WUH as ORS. JBQ reports RFN traffic as 119. MZH, OLX, and RBX received QIN certificates. YIE and YIJ are new hams in Kokomo. FFE and NSY received RFN certificates. New Novices are YIQ, YJG, WHL, YJD, YIR, YIT, and WWF. UHV, UPJ, and YKG received their Tech. Class licenses. The TARS held a transmitter hunt on 29.6 Mc. headed by EHU and AIN. UMS has been appointed Radio Officer for the Vanderburgh County C.D. Traffic: (May) W9JUJ 2096, NZZ 901, TT 868, WWT 594, YWE 414, JBQ 369, RBX 283, QLW 147, NTA 142, PPS 142, WN9UQP 131, W9PWB 126, OLX 116, HLY 108, KDV 94, WBA 92, CMT 84, SWM 74, DOK 64, DGA 61, PMT 60, VNV 48, TG 36, DKR 35, BKJ 29, ERB 28, FYM 23, LQE 21, SKP 21, BCJ 19, WUH 18, OFW 16, STW 7, BDP 6, NTR 6, YVS 2. (Apr.) W9QLW 102. (Feb.) W9HLY 25.

WISCONSIN — SCM, Reno W. Goetsch, W9RQM — SEC: OVO. PAM: ESJ. RM: IQW. Nets: BEN, 3950 kc., 6 P.M.; WIN, 3625 kc., 7 P.M.; State mobile and c.d. frequency, 29,620 kc. Congrats to UNJ, who makes BPL this month. QNL is wiring his Viking II. Two new Milwaukee Area OOs transmit Official Bulletins as follows: OOF on 29,000 kc., 1915 CST, Mon., Wed., and Fri.; LSK on 3960 kc., 1700 CST, Mon., Wed., and Fri., 3700 kc. at 1700 CST, Tue. and Thurs. CXY and IQW are curtailing operation for the summer months. UFY is now mobile. HID has new mobile strength meter. BVL is mobile on 75 meters. SIZ is installing mobile. FUS is building new audio sine-wave generator. WAM passed General Class exam and is on with NC-183 and Globe Scout transmitter. MQV attended the annual TLCN party with many old-time traffic-handlers present. RQM received A-1 Operator certificate. Mobiles of ONY and BPR and XYL MOT represented MAREC in Milwaukee's Armed Forces Day Parade. WN9WWJ has had more than 300 QSOs in 15 states with his Philmore NT-200 rig. Green Bay's V.H.F. Club sponsored a one-half hour program on WBAY-TV. GFL is busy putting mobile in his new car. DSP has antennas down for his move to a new QTH. KHO is putting up LEE's old fifteen-element beam. LEE puts out Official Bulletins on 144.7 Mc. at 1955 daily except Mon. and Fri. LSK is president of Marquette U. Club and secretary of MRAC. Under the direction of EC VHA, communication was supplied for the State Motorcycle Endurance Run May 31st, on 29,620 kc. with Net Control NUW/9 at Minocqua and mobiles at 17 check points on the 225-mile route. MQC has new four-element 20-meter beam. RTP is newly-appointed ORS. ONV is ready for operation on 10 meters after TVI-proofing job. TPS is Radio Officer for State C.D. Control Center. Traffic: (May) W9UNJ 416, CXY 200, ESJ 200, MQV 178, LSK 167, RTP 116, IQW 67, CFP 45, DR 45, SAA 34, OVO 17, GMY 12, HDV 10, VHA 9, RQM 8, SIZ 8, NLH 7, WØMBD/9 7, W9NLE 4. (Apr.) W9DR 20, ONV 9.

DAKOTA DIVISION

NORTH DAKOTA — SCM, Everett E. Hill WØVKP — EBA is on the air from his home QTH at Northwood. USY and WSL handled Cando's traffic for two days when the land line went out. USY now has a new VFO. The SARA party at Mayville was a huge success. There was a nice turnout from all over the eastern part of the State. HYL, DPT, FXJ, HCT, and HCR participated in a rescue operation on Lake of the Woods. EXO has a new antenna. MXD is rumored to be the State's most active net man. MPR, at Dickinson, is 14 years old. A new signal on 75 meters is OEL. Your SCM wishes to extend his congratulations to the SARA for a wonderful first year. By now all of you should have received the AREC net plan. If you haven't

(Continued on page 72)

THIS PAGE is written this month with a feeling of reluctance and inadequacy of the ability of the writer to express in mere words the feeling that exists in the hearts of all of us here at National. The occasion of saying "au revoir" to our guide and friend for many many years leaves us with an "empty" feeling.

Although we hope to see him occasionally, effective as of June 1, 1953, Mr. William A. Ready has resigned from active participation in the business affairs of the National Company, Inc., and has retired to enjoy a well-earned vacation. This is the sort of thing that most of us dream about, but it must be a drastic step to one who has been so actively interested, not only in a business, but in the well-being and happiness of those working for him.

Mr. Ready was not a licensed ham himself, but he has always been greatly interested in amateur radio and has contributed toward providing increasingly more effective equipment for ham communications, perhaps more than any other person alive today. During the past two decades or so that this page has been written, Mr. Ready has often contributed by personally writing many of its pages. The reprint that appeared last month is a key to the practical, down-to-earth character of the man.

We feel this to be a very appropriate time to pause for a while to think back at what has transpired in the past here at National. We see a picture of steady progress under Mr. Ready's direction, a progress that has been a happy and inspiring one. For those who can remember, National Co. really got started in the radio business by manufacturing the Browning-Drake broadcast kits and the old Velvet Vernier dials. Then came the shortwave receivers, starting with the TRF regenerative circuits, called the SW-5, SW-45, and SW-3. A shift to super-heterodyne receivers was imminent, and the AGS was designed, followed by the old reliable FB-7. Later came the first HRO, the NC-101X, NC-200, NC-2-40D, NC-173, and NC-183, and many others. The latest models show a constant trend of improvement and the present HRO-60 stands as the top DX getter of them all.

As we try to "look ahead" to the future, it seems to us that the progress that has been made to date is but an example of greater things to come. Carrying on the policy that has been laid down by Mr. Ready, a policy of continued expansion and improvement of our ham equipment while maintaining, as always, the highest standards in the industry, will result in a steady growth for National Company. This growth is limited only by our imagination, and the growth of the amateur fraternity itself.

The 70 radio hams here at National and all the other workers, join me in bidding Mr. Ready a fervent "well done, and God-speed."

C. C. HORNBOSTEL, *President*

done so, send in the registration orm attached. When I originally took the SCM job, I had more time to devote to attempt building the section. The situation has been altered since I went into business for myself, and have to be on the road. I feel that I am now unable to do full justice to the position. With regrets I find it necessary to resign to make room for someone in a better position to carry on. I wish to thank all of you for your kind assistance. Traffic: WØLHB 32, USY 9.

SOUTH DAKOTA — SCM, J. W. Sikorski, WØRRN — Asst. SCMs: Earl Shirley, ØYQR, and Martha Shirley, ØZWL. SEC: GCP. PAM: UVL. RM: OLB. The Prairie Dog ARC; Vermillion, has received the call of OJY. GDE is trustee. SMV, Sioux Falls, and LBS, Tulare, are new ORS appointees. IZA, Vermillion, presented a ham demonstration to the high school science club. 5SJN/Ø is VFO with Collins 70E-8. WNØNAB has completed 2-meter fixed and mobile rig with 829B final. IZA, Vermillion, has accepted a position at Ball State College, Muncie, Ind. GDE has accepted EC appointment for Clay County. DTB, Centerville, is control-room operator for WNAX, at Sioux City. After missing 2-meter openings for years, BJV finally connected and worked Illinois, Iowa, and Nebraska. Hams at Ellsworth AFB, Rapid City, are conducting a concentrated effort to acquaint base personnel with amateur and MARS facilities and operations. UVL's RTTY is operating successfully. Director PHR attended the Board Meeting at Hartford. Traffic: WØOLB 88, PHR 64, W5SJN/Ø 35, KØFCR 22, SMV 6, LBS 3, MPQ 3.

MINNESOTA — SCM, Charles M. Bove, WØMXC — The Mobile Amateur Radio Corps of Hennepin County has elected new officers. ZDU, your SEC, was elected pres.; SAU, vice-pres.; CSC, secy.; and EAL, treas. The Minnesota State C.W. Net had a dinner and business meeting at the Criterion Cafe in St. Paul. Various net problems were discussed and a new Net Manager was elected. Those attending from the longest distance were BDR and his XYL of the TLCN Net from Iowa and RXL from Duluth. We can't find words to thank DQL for the splendid way he handled the MSN and the MJN to bring it out of a bad slump. OMC has been elected as Net Manager and we would like everyone to give him the support that he deserves in making it a bigger and better net. We would like to see more stations in Southern Minnesota report into either the MJN or the MSN. It won't be long now before BGY will be out of the hospital and on the way home. HPN now owns a Viking II. DSF, signing DL4AY located in Germany, is busy trying for DXCC with his 32V-3 and 75A-2. CGK changed his final to a pair of 814s. HBE is operating portable from his lake cottage. GPQ is making a three-week tour of the western states. 5WVA/Ø now is ØNUF. JNC has a new antenna and claims that he can work anything he hears. IXS is located in the public school at Royalton. They have a radio club there with about 40 members. They have 20 Novice operators operating the station on 3709 kc. St. John's Radio Club at Collegeville now is affiliated with ARRL. WNØNOP is a new ham. The St. Paul Radio Club recently elected ALI, pres.; YCR, vice-pres.; FFW, treas.; and KJZ, secy. Any EC whose certificate needs endorsement, please mail to the SEC, Bob Coons, ZDU, 15 So. 5 St., % Northern States Power Co., Minneapolis, Minn. Traffic: WØOCV 304, CXM 208, OMC 190, CGK 171, DQL 143, HBE 87, GHX 84, KNR 65, HFY 64, TJA 62, RXL 42, GGQ 36, CQY 32, MXC 32, DYD 28, HMV 22, BUO 21, CID 19, GTX 19, HMV 18, CO 7, FFU 7, OPA 7.

DELTA DIVISION

ARKANSAS — SCM, Fred E. Ward, W5LUX — The warmer weather has made some of the boys hard to catch and a lot of mobiles are being tuned up for vacation time. YHV sends a nice letter and writes that the Searcy Club is going to 10 meters in a big way for local emergency work. Sam would like to see a Novice net for Arkansas. If you boys will drop me a card and let me know what you think maybe we can get one started. LUX has a new Gonset Super six converter for mobile. He visited W1AW while on a trip East. A lot of appointments are running out now, so be sure to check the endorsement date on yours.

LOUISIANA — SCM, Robert E. Barr, W5GHF — Our latest ORS appointee is MNT, in Baton Rouge, who is one of the mainstays of the Louisiana contingent of the Gulf Coast Hurricane Net on 3935 kc. EB continues with a tremendous volume of overseas traffic via his Guam schedules. NG reports TVI is negligible with his 400-watt 40-meter traffic rig in operation. DMP is fighting parasitics in the big rig, with ZAB lending a helping hand. FMO acts as promotion man with state coverage for the New Orleans Club in arranging for an FB Division Convention in early fall. TRQ is vacationing in Oregon this year. The Evangeline Radio Club was host for the hams of South Louisiana at an excellent meeting held at St. Martinsville on May 31st. HEJ is recovering from a severe back injury. TST was one of the many Baton Rouge residents marooned in the May floods. GMO promises to get the big rig back on soon. IDK is looking forward to his retirement after many years of service with Brown Paper Company. KKI and GHF saw some action in the Waco tornado emergency. MIU is getting that rare DX on 20 meters. JYD has returned to the Bayou State after a year in New Mexico. FDC, Lou, and family are vacationing in Washington, D. C. Traffic: W5EB 986, NG 352, K5NBQ 143, W5GHF 40.

MISSISSIPPI — SCM, Dr. A. R. Cortese, W5OTD — The clubs in this section have been very lax in reporting activities the last several months. Your SCM would like state-wide coverage. NUV is on 6-meter mobile. TIW and TXK are on 75-meter mobile. TYW is a new call. K5FBB had an exhibit on Armed Forces Day. The Gulfport High School ARC had a practice field day in May. The North East Mississippi Club now is organized and will join the League. OTD is portable at his office (all bands). New ECs are SRT for Copiah County, TFU for Lincoln County, and RDA for Jackson. WZ is back as RM. The time is near for the convention in New Orleans. Let's make this one the biggest and best ever. How about it, gang. See you there? Traffic: K5FBB 1417, W5JHS 146, KYC 123, YBH 2.

TENNESSEE — SCM, Mark M. Bowelle, W4CXY/WLG — SEC: NJE. RM: AGC. PAM: PFP. Section nets: c.w., 3635 kc: 'phone, 3980 kc. All nets will continue operation throughout the summer. Three stations made BPL, led, of course, by the one and only PL. The Memphis and Jackson clubs alternate meeting places; last month they all met at Memphis and this month at Jackson. Memphis has submitted its plan to RACES. FLW reports that 6 meters was bad during May. ZZ is the papa of a new YL operator. Up at Kingsport the Bays Mountain and KARC combined for Field Day. MEI will change his YL to XYL July 25th. OEZ reports that Nashville was in there hard on Field Day. IIB has been on the sick list but was not too sick to lend a hand in the Waco and Warner Robbins tornado work. UDS got two new counties. WQW visited AKJ, YIP, CAT, TFM, WZX, NBS, and APC and in turn was visited by VBA, WZX, LC, and 5BBX. WAX has introduced 75-meter 'phone to Henderson, much to the chagrin of his mentor, AGC. TUP is doing right well for himself with 20 watts on 40 meters. VFL moved his 75-meter rig to VUA's QTH for the duration of the Waco emergency, and with VUA on 40 meters they did some FB work. Traffic: (May) W4PL 2702, YIP 758, IWV 510, PFP 269, SCF 269, AGC 127, VUA 124, WQW 110, OGG 70, VFL 64, VKE 59, VJX 54, IIB 39, VAB 30, TYU 18, FLW 14, OEZ 12, RMJ 9, UIO 8, BAQ 7, DTI 7, NPS 4, UDS 4. (Apr.) W4PL 2468. (Mar.) W4PL 2442.

GREAT LAKES DIVISION

KENTUCKY — SCM, Ivan C. Kelly, W4TUT — Summer months are the best barometer of activity. It's not hard to get the individual reports in during the cold part of the year but just let hot days arrive and the reports become only a handful. The Paducah Radio Club, and a very active one it is, has been approved for affiliation with the ARRL. It has thirty-one members, with TGV in the plush chair, THY as vice-president, and WAO as counter of the money and keeper of the records. MRT and MWR spearheaded the Field Day activities around Lexington. WN4YZE now is an AREC member and the only outlet in Spencer County. UWA received his high school diploma and ORS appointment at the same time. ZLK talked long enough for RCC but took time out for Tech. Class exam. KZF reports a fine trip to California. JUI still is helping Novices. K4WBG is off the air at Ft. Knox with transmitter rework. K2CYI/4 moved in and is working that point. URF has been busy joining MARS, taking 1st-class commercial exam, getting 20-w.p.m. sticker, and sending 13 OO reports. SZL is removing TVI from the 813 — he hopes. SMU made WAS. WHC and TAV turn in the best traffic reports for the month. BAZ, TUT, CMP, and KBY hand weather reports to the Civil Air Patrol on Ground Observation work. RFN has 75-meter beam. NIZ operates daytime from commercial vertical. Traffic: W4WHC 1071, TAV 1044, MWX 275, BAZ 258, SBI 130, UWA 68, NIZ 57, W2CYI/4 53, W4SMU 36, JPP 34, WN4ZLK 31, W4WBD 12, URF 9, JUI 4, SZL 3.

MICHIGAN — SCM, Fabian T. McAllister, W8HKT — Asst. SCMs: Joe Beljan, 8SCW; Bob Cooper, 8AQA; Mickey Wills, 8CPB. SEC: GJH. New appointments: OBS to ZXC, OO (Class IV) to DLZ. URM has been appointed QMN Net Manager for the summer. New officers of the Genesee County Radio Club are: FBO, pres.; RTN, vice-pres.; GPF, secy.; FOV, treas. The Central Michigan Amateur Radio Club has elected the following officers: FSZ, pres.; KWO, vice-pres.; CPV, secy.; DSH, treas. The Michigan MARS gang would like to see more of the boys on the MARS nets. They meet weekdays on 4020 kc. and evenings on 2360 kc. ERN and KNH have joined the boys in the service. After five years of concentrated effort DLZ finally received the coveted WBE certificate from the Radio Society of Great Britain. Last month in this column we reported briefly on the results of the Statewide C.D. emergency test. Sure, it was one of those things that "can't happen here," but the boys and girls turned out to show the State C.D. people that we are taking this thing seriously. Then, within the past month, those same guys and gals, plus lots of new ones, had an opportunity to demonstrate the real value of amateur radio in time of emergency. The wind had hardly gone out of the Port Huron tornado when it appeared in even worse form in the Flint Area. At this writing another page in the story of the radio

(Continued on page 74)

TYPICAL OPERATION (Frequencies below 120 mc.) Radio Frequency Power Amplifier and Oscillator Class C Telegraphy or FM telephony (key down conditions, one tube)	
D-C Plate Voltage	2500 volts
D-C Screen Voltage	350 volts
D-C Grid Voltage	-150 volts
D-C Plate Current	200 ma.
Driving Power	3.8 watts
Plate Power Input	500 watts
Plate Dissipation	125 watts
Plate Power Output	375 watts

Quality screen-grid tubes became popular eight years ago when Eimac introduced the 4-125A radial-beam power tetrode to the electronic industry. Since that time thousands of engineers and amateur radio operators have used the Eimac 4-125A in a wide variety of applications and have consistently received outstanding, dependable performance. This versatile tetrode contains the *pyrovac** plate, controlled emission grid wire, low inductance leads, thoriated tungsten filament, and input-output shielding. All of these advanced features are found only in Eimac tubes. Add to this, high power output with low driving requirements, simple circuit design that minimizes TVI, low grid-plate capacitances, and ability to withstand heavy momentary overloads, and you have the Eimac 4-125A — quality tetrode in the 125 watt field.

Write our Amateurs' Service Bureau for a free copy of the information filled 28 page booklet, "Care and Feeding of Power Tetrodes".

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amateur is being written at Flint; the operators are still on duty and we know they can be depended upon to stick it out until the final "all clear" has sounded. Our hats are off to you folks who had any part in handling the thousands of relief and inquiry messages; and I am sure that your splendid work will long be remembered by the grateful people of the afflicted communities. By the way, are YOU registered with your local Emergency Coördinator? Application blanks are available upon request from the EC or the SCM. The license-plate bill was signed by the Governor late in May and we understand it will be effective with the issue of the 1954 plates. Traffic: (May) W8URM 277, FLM 275, IQJ 192, ILP 144, ZLK 122, FGB 121, MAI 118, GTM 93, JYJ 70, IKX 61, QIX 60, KOD 56, DLZ 51, FBV 50, HKT 41, NUL 40, SCW 40, GJB 39, FSZ 22, SJF 12, GCP 11, AQA 10, EGI 8, WVL 6, FFG 5, FX 3, HK 2. (Apr.) W8RTN 74, ELW 65, SCW 54, SPF 46, CPB 28, SJF 16, YKC 6, IEA 2.

OHIO — SCM, John E. Siringer, W8AJW — Asst. SCMs: C. D. Hall, 8PUN, and J. Erickson, 8DAE. SEC: UPB. RMs: DAE and PMJ. PAM: PUN. Newly-appointed ECs are HNY and HTP. BPL was made by JAR and KQY, Dayton youngsters. The big event of the month was the communications emergency at Mount Vernon, where amateurs supplied all outside communications for a number of hours. This occurred on May 22nd with PEN, Knox County EC, getting the net under way and CTZ acting as NCS of the Ohio Emergency Net on 3860 kc. It was incorrectly reported in this column that the Tusco group, winner of the OCARC F.D. Trophy, was located in Canton. This club group is made up of amateurs residing in Dennison, New Philadelphia, Dover, Urichsville, etc. HOX would like to see a Great Lakes QSO Party. Perhaps the OCARC may consider sponsorship. ITXN reports AQ was high Ohioan in the Vermont QSO Party with 585 points, edging AJW by one contact. LVF has procured a Bandmaster. The Lake-Geauga and Morgan County Clubs are the latest ARRL affiliates. The OVARC is tops in the section in DX and SS Contests. Items from Morgan County: LJH has a new Viking II, AOX has purchased an antenna farm, CRS has a 40-foot vertical (all-band) and the club station, HDQ, has 300-watt output rigs. Springfield's *Q5* mentions a club all-band contest which ran from May 15th to June 15th. We also are told that IMP is recuperating from a broken leg, CAS is home from Casablanca and ex-AUP now is 4YZ. DARA's *R-F Carrier* states that the club auction of May 23rd brought in a goodly amount of change, the Stag Dinner of June 5th was well attended, ENH has replaced FDW as head of the club's technical committee, and HTI is moving to Ann Arbor. According to *Carascope*, new CARA committees are composed of FZU, LFM, and CXD for publicity; HOR and GKN for TVI. TSE was named as assistant editor of *Carascope*, while Bob Betts will be circulation assistant. DVT will be activities assistant. An orchid to GZ, who has been doing a bang-up job as an OO. The GCARA *Mike and Key* informs us KFD is often on 40-meter c.w. from K4WAR; MUF, MYG, and MXY are newly-licensed in the area; and HQE has finally gotten on the air a year after receiving his license. *Shack Gossip*, out of the wilds of Toledo, tells us that MQQ is the newest licensee in Toledo, MGB has built a new c.w. transmitter, VTZ is preaching 160-meter mobile, while VTZ has just gotten on the band. Apparently the GLEN picnic at Tiffin attracted a fairly large crowd, judging from reports. In closing, we wish to thank the traffic-handling and reporting gang. This section's activity has been constantly on the increase and those responsible deserve to be congratulated. Traffic: W8JAR 527, KQY 397, FYO 260, DAE 255, GDB 234, UPB 209, IFX 194, AMH 165, LMB 87, DG 83, CTZ 80, RO 79, SRF 73, EQN 72, BN 63, AL 61, NYY 56, YGR 53, PMJ 39, AJW 36, KNX 33, HUX 32, UZJ 25, DL 22, PUN 22, GZ 17, WRL 16, BLS 6, KIH 6, EIV 5, ET 5, WYL 5, HFR 4, TTY 4, BZD 1, HNP 1, TLW 1.

HUDSON DIVISION

EASTERN NEW YORK — SCM, Stephen J. Neason, W2ILI — SEC: RTE. RMs: TYC, KBT. PAMs: IJG, JQI, K2CA. Congrats go to APH, HEI, and FGL, who set new traffic records on NYSS recently. A major section meeting was held recently at Poughkeepsie. All matters pertaining to the ARRL field organization were discussed, including o.d. NEC George Hart, 1NJM; Director Cooke, OBU; and Vin Kenny, of the NYSCDC, were honored guests. Your SCM acted as chairman and SEC RTE and EC LDS, of Dutchess, had charge of the arrangements. To the latter, our sincere thanks and congratulations for a job well done. Many fine door prizes were awarded. BSH is celebrating his 32nd year on the air. George is doing a fine job with his Novice class and reports two more graduates this month. BSI is active on 3.8 Mc. again and is eager to contact the old gang. JYU and GXO are on 1.8 Mc. IFP is operating from a Boy Scout camp in Vermont for the summer. MEV is a new ham in Kingston. VP, LEL, and DVZ are conducting tests on 144- and 28-Mc. mobile. APH is QRL but will be active again when his new ranch-style home is completed. IVP and IFP are both interested in RTTY and plan operation this fall. How about some more news from the RTTY gang? The Mohawk-Hudson Novice Training Net operates every Thurs. at 1800 and Sun. 1330 on 3716 kc. A postcard to BSD will bring more information, plus the net bulletin. K2BDJ, MRQ, and HEI have been awarded Section Net certificates for activity on NYSEPN. Appointment: MRQ as OPS. Endorsements: LRW as ORS and OPS, GRS as EC, HEI as OBS. Many appointments now are available. Drop a line to the SCM for particulars. Avoid loss of your appointment; check your endorsement date now. Traffic: (May) W2TYC 206, IFP 179, MRQ 64, ILI 56, IVP 32, EQD 28, KBT 23, AAO 21, BSH 14, GDD 5. (Apr.) W2EQD 42, KBT 22.

NEW YORK CITY AND LONG ISLAND — SCM, George V. Cooke, jr., W2OBU — Asst. SCM: Harry Dannals, 2TUK. SEC: ZAI. RM: VNJ. PAM: YBT. Membership in the section AREC now is well over the 700 mark and still growing. All counties and boroughs are really on the ball and activity is at an all-time peak. Brooklyn tops the list, KGN the new EC there reporting 195 actively engaged in AREC o.d. drills. Suffolk is second with a membership of 140. K2DHC/FI/2 is the new call of the Nassau C.D. Hq. GFO, 4KKM is out of the Army. The Brooklyn Radio Club has signed up 100 per cent in the AREC. New Asst. ECs in Brooklyn are JCI, IEJ, and KN2BOY. OBW/4LVX has returned to the Island after a long stay in Georgia. OQI now is located in Center Moriches after getting his Engineering Degree at the University of Florida. The Brookhaven Town Radio Club now meets the 2nd Fri. of each month. The FLIRC Annual Picnic was attended by more than 60 hams and their families. JEX was winner of the 10-meter transmitter hunt and LID won the 2-meter hunt during the grand afternoon at Bethpage State Park. PDU headed up coverage of the Bridgehampton Auto Races, with OQI, EBT, ZUN, JFP, QGF, IVX, OBW, and FTV lending assistance. The 6-meter group on hand acted in a race-reporting capacity while the 10-meter net was there as an accident and emergency facility. PRE has resigned as EC for Manhattan and UWG is expected to take up where Mike left off. The Columbia University Radio Club has been approved for League affiliation; AIP is pres.; OLA, secy. New members of the Mid-Island Radio Club are JBQ, OME, IRY, K2BMD, and BGJ. The Club now meets in Mineola the 1st and 3rd Thurs. of each month. A group of the Mid-Island members, including KTF, CMH, HBF, and K2AZT, demonstrated the Baldwin o.d. network to the local church Men's Club. K2BGZ now is in the Army and operating at K4WCL. K2AFX passed the General Class exam and now operates all bands c.w. K2BVV is a new call in Massapequa. MUM has been appointed ORS in Levittown. KN2DDO is the latest ham in Westbury. The Wantagh Radio Club has received its League affiliation. Club officers are ELK, pres.; DUS, vice-pres.; MVX secy.-treas.; DQN, trustee. During its first eight weeks of existence the newly-formed Fordham Radio Club in the Bronx enrolled 52 members and elected the following officers: K2CWQ, pres.; IVG, vice-pres.; EWI, secy.; ZYC, treas. The club net meets on 3850 kc. Sun. at 1030. Bronx hams are invited to join. NEK, UAL, BHI, and DCT are new members of the North Nassau Club. K2BUN, a member of the Club, received a certificate award from the League for being section winner and high-scorer in the Novice Roundup. KRB has the distinction of being the New York Radio Club's 200th member. SME, WRF, MPC, K2BQI, and KN2CPJ were initiated at the same time. KAY is leaving for a two-year hitch in the Army as a major. The NYRC presented K2BWA with a year's League membership for being an honor student upon high school graduation. OTA was presented with an honorary membership in the Jamaica U.H.F. Club; he was a founder of the Club in 1941. K2CYI is operating /4 at Fort Knox. LEO now is located in Wye Mills, Md. TUK has a new Viking II and VFO and returned to NLI after a long layoff. QBR and VKS have new XYLs. The Staten Island Club will hold a picnic at Rhinehart's Grove on the Island Aug. 23rd. Traffic: W2VNJ 392, AEE 376, JOA 163, LEO 113, GP 101, EC 97, K2CYI/4 53, W2IVS 32, LGK 30, KJG 10, KQC 9, YBT 4.

NORTHERN NEW JERSEY — SCM, Lloyd H. Manamon, W2VQR — SEC: NKD. PAM: CCS. RMs: WCL, NKD, CGG. JKH, nearing DXCC, reached the 100 worked this month but so far has only 85 confirmed. EAS is receiving many letters expressing appreciation for messages delivered. Traffic totals show that he went over 200 this month for the first time. K2BCK is back after a two-week tour of duty for the Navy in Washington, D. C. He visited the MARS headquarters station while there. CUI reports he has been forced to give up all skeds on 40 meters because of adverse propagation conditions. HXP is hard at work constructing 2-meter walkie-talkies. Excellent OO reports were received this month from GVZ, NIY, and TPJ. An interesting letter was received from DXD, presently stationed in India. He sends his best regards to the gang in Northern New Jersey, and says he hopes to be back with us again soon. The 25-year roster recently published by the RVRC is loaded with real old-timers. The Club is planning a reunion for the old-time members in the near future. FQN completed 10 days of maritime operation, Detroit to the Jersey Coast on 10-, 40-, and 80-meter 'phone and c.w. He had a swell time and is preparing suitable QSLs to commemorate the trip on the new 52-footer *Margrafian* II. Lt. Commander BAI, USNR, completed training cruise on a destroyer. VPL is building a new home and finds it hard to

(Continued on page 76)

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HAMMARLUND

keep up the 2-meter activity. AJB is home from college, and expects to spend the summer on 80-meter c.w. to increase his code speed. HJD is active on 2 meters. K2BEV is rounding out the first year of ham activity with plenty of 40-meter DX and 2-meter c.d. activity on the Middlesex AREC Net. HWH, SVX, PGX, and QCY attended a recent RVRC meeting. The first three are Bloomfield Radio Club members; the last-named is a member of the Morris Radio Club and is comm. coördinator, Morristown C.D. The Middlesex County C.D. Area 7 drill was a huge success. Amateur radio activity was praised by the Area Director at the recent state directors' meeting held at the state office of c.d., Trenton. FQN headed up the amateur activity for this drill in the absence of BAI. Full support was had from the entire AREC gang. HUZ is mobile on 2 meters. HJD is back on 2 meters. The MCARA gang is promoting a club 2-meter portable emergency equipment program. KN2CTL has a new rig on 2 meters. EOK has a new Bandmaster Senior on 75 meters. OOG operated the amateur station at the Monmouth County Council, Boy Scouts Camporee held recently. More than 500 messages were handled during the three-day encampment. 8JWK/2 now is on FSK teletype in the 80-meter band. Traffic: W2CUI 242, EAS 210 NKD 91. CFB 13, ZDH 8, CJX 4, K2BCK 2.

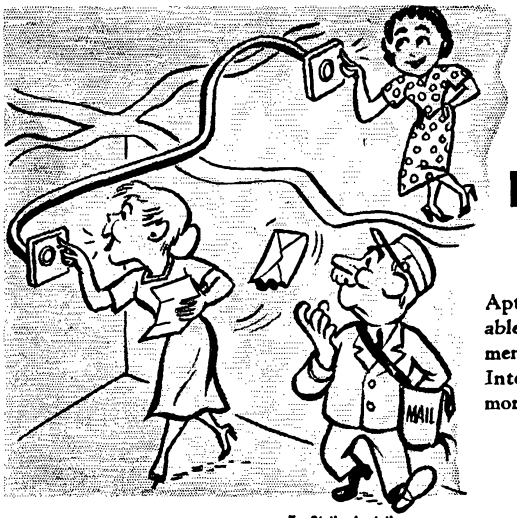
MIDWEST DIVISION

IOWA — SCM, William G. Davis, WØPP — Asst. SCM: Dr. A. J. Ploog, ØSCA. SEC: VRA. RMs: QVA, SCA, YTA, and BDR. TLCN had its 6th annual get-together May 16th at the home of AUL. New Net Manager is BDR, of Marshalltown, the outstanding traffic man of the Midwest. AUL was married to Carol Myer May 29th. The knot was tied by EHH, DDW played the organ, and UAD was best man. UWF is installing radio equipment for the Air Force in Labrador. YBD is an operator at KAYL. YBV now is the owner of KCHA at Charles City. TLCN went on summer sked June 1st and meets Mon., Wed., and Fri. at 6:45 P.M. BDR is new RM. He pulled out all the stops and topped our old traffic maestro, SCA. The Waterloo Club's monthly transmitter hunt had an added attraction, the interception of a mobile, BCB, who was passing through town. KØWAD is a newcomer to the BPL ranks. BDR, SCA, and QVA renewed ORS appointments. BDR's accomplishments in ham radio are particularly noteworthy because Russ is blind. He is setting a pace that will make a fellow with all his faculties dig right in and work. It's wonderful to set such an example for those in like condition. The Military Amateur Radio Club (Iowa State) provided a message service at Veishea time. KØWAD received messages on 6 meters. ØBVX, 3SDW, ØDHF, ØLFT, 9OVQ, 9SDP, ØDLR, and ØGXH assisted and handled about 300 messages to 26 states in 7½ hours operation. Traffic: (May) WØBDR 1345, SCA 1231, KØWAD 739, WØOZO 391, PZO 391, BVE 313, QVA 221, GXH 191, YTA 171, FSX 166, ERP 110, BBZ 65, EHH 62, NYX 23, BLH 15. (Apr.) WØSCA 1670, BVE 167. (Mar.) WØERP 16.

KANSAS — SCM, Earl N. Johnston, WØICV — SEC: PAH. PAM: FNS. RM: KXL. Summertime is hamfest time. Christy's Picnic held May 24th was a record-breaker with 264 registered. The mobile hunts on 10 and 75 meters was a new feature, with NAS and KOL winning. ZUX reports amateurs from Scott City, Garden City, and Dodge City are working on a hamfest to be held in Dodge City this fall. The date will be announced later. The Johnson County Radio Amateurs Club also participated in the simulated bombing of Kansas City, Mo., on April 26th, providing communications for Red Cross Base station with 12 mobiles. Those participating were BIO, ODU, IPQ, GLN, WMH, LQV, ZGK, IIJ, UQV, OJW, DXM, IPG, DEL, DTD, IIS, ONM, EDB, WUT, KGK, NZP, and CLH. WMH is Radio Officer for the Johnson County setup, with KGK as assistant. The JCARC also is planning to hold its first annual banquet Oct. 9th. EIB has his Extra Class license and his XYL, OCP, now has her General Class ticket. FEO is back in Ft. Scott and is working on his modulator. WNØOEE is a new call in Wichita. LHX's XYL MPB, now has her General Class ticket. We surely will miss Ned Smith, DVV, an ardent 2-meter fan who passed away suddenly May 16th. Traffic: (May) WØUPU 526, FUF 516, BLI 277, NIY 264, FNS 88, YOS 75, FEO 42, HFP 16, IFR 15, ICV 12, VBQ 8. (Apr.) WØUPU 18.

MISSOURI — SCM, Clarence L. Arundale, WØGBJ — SEC: VRF. PAMs: AZL and BVL. RMs: OUD and QXO. The Houston Club has changed its name to Missouri Ozarks Amateur Radio Club with the following officers: JGD, pres.; CTB, vice-pres.; LCU, secy. The St. Louis University Amateur Radio Club is now affiliated with ARRL. Following the Waco, Tex., disaster RCE, the St. Louis EC, contacted CPI to determine if he could establish contact with Waco to handle Red Cross traffic. Contact was established with K5FEJ and W5KAU with a total of 51 messages being handled during the night. QXO also handled quite a few Waco messages. OUD is learning to copy traffic on a Braille writer and hopes to improve her speed soon. It is reported that lightning badly damaged the shack and rig at AVJ. CXE's activities still are limited because of illness. QMF has a new 2-meter beam operating. GAR monitors 7160 kc. daily from 1:30 P.M. to 4:00 P.M. looking for traffic. ETW

(*Continued on page 78*)



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Stranding	Solid	Solid		7x30	7x30	7x30	
Nom. Diam (inches)	.145	.265		.310	.210	.220	
No. Pairs	1	6		6	Not Paired	Not Paired	
Insulation Thickness (inches)		.010		.010	.010	.010	
Tinned Copper Shielding	None	None		None	Over 1 conductor	Over 3 conductors	
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No. Pairs	2				
Insulation Thickness (inches)	.015	.010	.010	.010 .018	
Tinned Copper Shielding	Over 1 pair				
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is spending a few weeks in W6-Land. JEU has 36 watts on 75-meter 'phone. OKN has been in the hospital several weeks. FNK has 500 watts on the air. Traffickers Club certificates were earned by CXE, BAF, KØWBD, BVL, JXJ, CPI, and KØFAY/FCT. CPI, QXO, and JXJ again qualify for BPL. New AREC members: BOS and WNØNXO. GMG will operate his station to handle traffic during the DeSoto Sesqui-Centennial. A display of ham equipment will be set up at the local theater. WNØOIL now is on the air. Traffic: (May) WØCPI 1511, QXO 1028, JXJ 881, GAR 214, BVL 142, KIK 76, GBJ 71, HUI 70, EBE 59, CKQ 51, IJS 40, OUD 37, PTG 33, BUL 29, CXE 20, QMF 20, KWV Ø 9, GMG 8, SPR 8, FNN 6, CMZ 5, WIS 3, CZC 2, ETW 2, MRQ 2, YHL 2, BPD 1. (Apr.) WØJSR 66, IQY 27.

NEBRASKA — SCM, Floyd B. Campbell, WØCBH — Asst. SCM: Thomas S. Boydston, ØVYX. SEC: JDJ. PAM: EUT. VEC demonstrated his radio-controlled car and teletype equipment at an LARC meeting. VYX now is being called pappy. OHP and URN have mobile rigs tested and ready to be installed in cars. DJU's new QTH is Lincoln. BXJ is busy getting the TV station on in Lincoln. JJL was a Lincoln visitor on his way to the East to finish his hitch in the Army and plans to return to Lincoln to live. OAO now lives on a farm with plenty of antenna room. DMY was on vacation during the tornado at Hebron but his house was not badly damaged. The c.d. control center will be in the State House, according to latest reports. R. J. McCormick, RM2 (WØNHZ), is Radioman Stationkeeper at amateur radio station KØNRL with equipment to operate either 'phone or c w on 20 meters; also a portable station on 40, 75, and 80 meters. KØNRL is at the service of any club or individual desiring any tests or communication exercises. A standing invitation is issued to all to have a look around whenever you are in Lincoln. KXD is getting the mobile rig in shape. The Lincoln Amateur Radio Club has made application for the 1953 Midwest Convention, so keep an eye and ear peeled for further developments come Oct. 10-11. Traffic: (May) WØRDN 434, JDJ 86, VYX 70, NAA 62, BJF 60, CBH 39, WR 31, HXH 30, HWM 28, FSX 26, HTA 25, QHG 19, FSE 18, BPF 17, TIP 16, EGQ 14, MAO 12, QOU 12, BUR 10, FMW 10, ERW 7, MJK 7, THF 6, DDP 5, FTQ 5, JKE 4, KXD 4, ORW 4, KØWBF 4, WØHQQ 3, KWQ 2, LEF 2, QHN 2, VPR/mobile 2, BEA 1, DJO 1, LSV 1. (Apr.) WØFQB 310.

NEW ENGLAND DIVISION

CONNECTICUT — SCM, Roger C. Amundsen, W1HYF — SEC: LKF. PAM: FOB. RM: KYQ. CN-3640, CPN-3880, CEN-29,580 kc. Twenty Connecticut stations met on 3880 kc. for the first section meeting ON THE AIR on June 7th at 0900. Because of the recent section banquet and 'phone net picnic another in-person meeting was hardly called for. List of Net Certificate awards: CPN — RRE, LIG, ABZ, RMZ, MLT, NEK, IKB, RKA, FOB, and SJO. CN — RRE, KYQ, CUH, AYC, BDI, KV, NJM, AW, QJM, RFJ, and HYF. The next section meeting is scheduled for Sept. 19th at 8 P.M. at GB in New Haven. On May 24th at Hubbard Park in Meriden some thirty CPN men and friends had a swell picnic. On May 1st and 2nd RWD did an FB job at Boy Scout of America Cavalcade. PHP is a new reporter. YEY, at Choate, is off until fall. WFN is new in Ansonia and is building a 75-meter 'phone rig. YFG now is in operation. KYQ reports conditions good on CN. He had 20 QNI. KV 17 and RRE 14. URM is a new ORS: LIG is a new OPS: RY is a new EC. GVK, CUH, and HUM renewed ORS appointments: FRL and ABZ renewed EC appointments. UZJ, LQZ, NFG, RPJ, WHG, FKQ, and QXT participated in Memorial Day Parade mobile operation in Hamden. YHC (ex-W7RND, DL4VN, DL2OB), a man of many calls, reports from Iceland. I am getting more Connecticut news from Iceland than from Connecticut. Hi! WKW is after OBS appointment. VJG, VJH, and WAV are all generals now. RMZ had VJG help restore his beam. FMU operated from West Peak during the V.H.F. Contest. JYP lent his FB 2-meter rig to TIB. HYF visited MMN and OAK in Vermont. JW is hard at c.d. work. Traffic: WISJO 632, KYQ 152, AW 134, AYC 103, LIG 93, CUH 91, RRE 71, BDI 51, FOB 43, YEY 37, KV 30, HYF 20, UNG 19, NEK 16, RWD 15, PHP 11, ODW 10, QJM 6, LV 3, NFG 2.

MAINE — SCM, Bernard Seamon, W1AFT — SEC: BYK. PAM: OLQ. RM: LKP. The Pine Tree Net meets on 3596 kc. Mon. through Fri. The Sheepscot Valley C.W. Net meets Mon. through Fri. at 6:15 P.M. EDT on 3710 kc. WN1WSV is N.C. KLH, the Sage of Hancock, now has some competition at last. TZN now has his TBS50 fired up in his store in Hancock and puts out an FB signal on 75-meter 'phone. Your SCM received a nice card from WN1YOX, in Kittery. He reports that he is experimenting with super flea power — two 1S5s on 7180 kc. Many of the gang have been operating portable and mobile rigs at Maine's famous fishing spots. We have heard BDL, LBJ, PTL, VED, and RUO. Don't forget Stevie's (BOK) Big Party at Dexter on Aug. 16th. It will help the OB out a lot if you get your tickets early, as he wants to order enough chicken pie for all. The North-Eastern Radio Club of Boothbay Harbor has acquired a fine new club house near the golf course at Boothbay, Maine. At last report meetings are held every other

(Continued on page 80)

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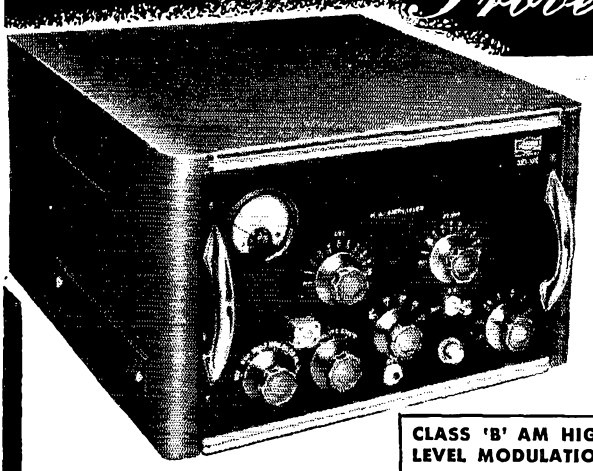

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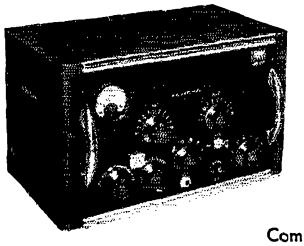

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Friday and all hams are invited. There are many more mobile rigs than ever before on the roads in Maine this summer. We have seen W1s, 2s, 3s, 4s, and 8s. Fire the rigs up on 3960 kc. boys and give the Maine gang a call. Your SCM would appreciate reports of your activities and traffic-handling on or before the 7th of the month. There's not much news in the summer, so please give us a hand. Traffic: W1LKP 138, NHT 97, VV 34, BX 32, BTY 28, AFT 23, PTL 19, EFR 17, TWR 10, BOC 9, VXU 8, IXC 6, WAU 6, BEU 5, VYA 3.

EASTERN MASSACHUSETTS — SCM, Frank L. Baker, jr., W1ALP — New appointments: ZK as EC for Region 6 of this State's c.d. set-up, MKW as EC for Dennis, WAG as ORS, MON as EC for Stoughton. Appointments endorsed: As ECs — JCK for Eastern Massachusetts traffic nets, JXM Avon, RQZ Abington, QVN Randolph, ADM Canton. As ORS — MME, NID, and RQZ. As ORS — WU, DWO, and BY. As OO — BGW, YHM, South Boston, is on 2 meters. YAL, in Needham, is on 2, 40, and 80 meters. ALP attended the ARRL Board meeting with BVR. We are sorry to have to announce the death of ex-W1UG, of Braintree. Heard on 10 meters: RVK, NBE, TXU, AAU, and QCL and VVZ mobile. TQS is going to Provincetown for the summer and will be on 20 meters. HGJ's son has the call WN1YJG and is on 2 and 80 meters. FWS's son-in-law took the exam. HKG, our Malden EC, and his group brought the Malden Amateur Club's radio truck, TYM, down to the South Shore Club's meeting. This group has a very nice set-up. AVY, WKM, PWL, and CCA took part in a c.d. test in New Bedford. PKW gave a talk at the Eastern Mass. Club meeting on "Chasing the Elusive DX." NF moved to a new QTH and is on 2 and 6 meters. SW has applied for ORS appointment, and the station is closed down for the summer, reports VGX. SMM and RRP are operating KBN on 40 and 80 meters and they had a good display for N.U.'s open house. LM is rebuilding the transmitter. UTH wants more members for the Teen-Age Net on 3630 kc. at 1730 Mon. through Fri. and on 7175 kc. Sat. at 12:45. BB is working on crystal c.d. transmitters. NUP applied for ORS appointment. UXL is in MARS and TCPN. NFQ is C.D. Director for Foxboro and OJI is his Communications Officer. MKW is on all bands. V L is in Guam and operates MARS station KG6FAA. CTW, LLY, OOP and 3OTC-1 furnished safety communications at the Sports Car Club of America Races at Thompson, Conn. VPT operated at playground in Arlington on Field Day. KJD is mobile on 10 meters. ZR is back in Nonquitt for the summer. QZR, Fairhaven, has a Viking and is mobile on 10 meters, as is WAY. ME has TBS-50 and Elmac transmitter. WGN has vertical polarized antenna on 10 meters. UID moved his shack to the second floor. CTZ is building a new 10-meter mobile rig. AVY says that the New Bedford gang hangs around 29,000 kc. so if you are down the Cape way look for them. VVA has his General Class license. TTY is moving to a new QTH. At the last c.d. drill of the Winthrop group there were 10 stations on with the following present: DJ, OIR, UOC, BDU, CMW, MQB, HFJ, NMX, SBT, PBX, LVA, BB and quite a few XYLs. VXA writes from Germany. He is with 7LAN, now DL4AY and DL4AV, and says he can't wait to get home again. The Quannapowitt Radio Assn. is holding its 2nd Annual Bean Supper. Traffic: (May) W1EMG 400, TY 121, SW 77, KBN 65, AVY 38, BY 22, LM 19, UTH 18, WU 13, BB 6, IKT 5. (Apr.) W1NUP 197, UXL 138, JCK 56, SS 38, UTH 26. (Mar.) W1JCK 154.

WESTERN MASSACHUSETTS — SCM, Roger E. Corey, W1JYH — SEC: KUE. RM: BVR. RAM: RDR. WMN meets at 7 P.M. Mon. through Fri. and WMNS at 8 P.M. Mon., Wed., and Fri. on 3560 kc. TVJ moved into the top traffic spot this month, replacing "Old Faithful" BVR. SPF, Worcester EC, provided special communications for c.d. officials during a recent air-raid alert. His crew consisted of mobiles AAP, SPF, ONA, PIY, UQL, JWM, JNA, and QCQ and fixed stations VMF, UQW, VHN, and SDU. LIB keeps busy on the TCPN, the N.E. Emergency 'Phone Net, and the Dragnet, but finds time to operate mobile also. RDY spoke on "Modulator Design Considerations" before the HCRC. UKP and NEL are new members of the HCRC. RFU, GJO, VNH, TTL, RRX, OBQ, MNG, and RVW took part in the V.H. F. QSO Party. YCG has forsaken his college QTH for his home in Maryland during the summer vacation. UVI checks into WMNS and WLN frequently. BDV will divide his time between the beach and portable operation from York Beach this summer. COI worked KZ5 for his first 21-Mc. contact and reports hearing some quite juicy DX on that band. VNH now is General Class and is active on 144 Mc. MNG passed the Extra Class exam. RFU is complaining of QRM on 432 Mc. after making 8 contacts on that band during the V.H.F. Party. JAH gets his TV on a rhombic aimed into Mt. Greylock and lays claim to the title of the section's poorest v.h.f. location. QWJ has mastered the s.s.b. art and is considering RTTY. OBQ has a new S-76 and a Jackson 144-50. QUQ is experimenting with a T2FD antenna. EHH has a new QRO mobile on 50 Mc. with a 2E24 final. WEF has built a new VFO and is active on 80-meter c.w. and 75-meter 'phone. Traffic: W1TVJ 159, BVR 84, DVW 47, HRV 26, MNG 24, SPF 23, HRC 19, TAY 17, JYH 12, LIB 10, RRX 8, RLQ 6, JAH 5, UVI 2.

(*Continued on page 82*)

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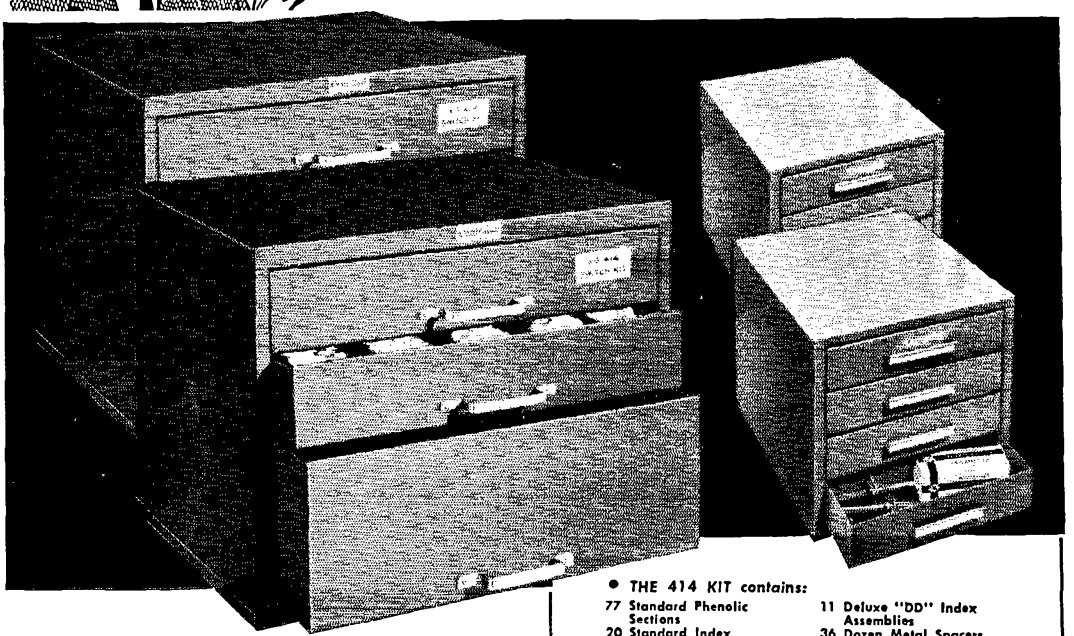

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35 Bar Knobs	4 Dozen Attachable Flat Shafts
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Plus miscellaneous shields, brackets, and hardware.
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32 Deluxe "DD" Steatite Sections	4 Dozen Tie Rods
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	26 Dial Plates
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NEW HAMPSHIRE — SCM, Carroll A. Currier, W1GMH — SEC: BXU. RM: CRW. PAM: UNV. The Port City Amateur Radio Club has a new tower for its antennas. The TCPN would like some more outlets in New Hampshire. What say, some of you boys, why not call in and get some good experience? The Net meets every day in the year at 1800 hours. KYG and his XYL, QJY, and the two jr. operators have moved to California. Be sure to reserve September 13th to attend the New Hampshire State Convention to be held at the Masonic Temple on Main St. in Concord. It is being sponsored by the Concord Brass Pounders. HOU has a Viking II with ECO and is getting some FB reports. The N.H.C.W. Net is on summer sked of Mon., Wed., and Fri. nights. UKH is now 7TDE. The Nashua Mike and Key Club is glad to announce that the long-looked-for licenses now are coming for the eleven Novices who graduated from their Club school. Congratulations! Why don't some of you strangers to the New Hampshire activities column send in some new items and keep us up-to-date? I enjoyed my visit with the Nashua Mike and Key Club members and gave them an idea as to the many duties of an SCM. Traffic: W1POK 66, SAL 59, GMH 45, CDX 43, JWJ 17, QJX 14, UNV 14.

RHODE ISLAND — SCM, Merrill D. Randall, W1JBB — SEC: MIJ. RM: BTV. RIN is now on summer schedule, meeting every Mon., Wed., and Fri. at 7 P.M. EDST on 3540 kc. R. I. c.d. still meets every Sunday at 10 A.M. EDST on 3993 kc. If you R. I. amateurs are really interested in an excellent 'phone net, call in on 1890 kc. at 11 A.M. EDST any Sunday and talk to any of the following: OMC, QLD, RT, TRX, 6TWT/1, and ULS. They are raring to go and are awaiting a full roster in order to select times and skeds. TRX, incidentally, is operating 160/10 meters from Portsmouth. 6TWT/1, who we are very glad to welcome to our bailiwick, is operating all bands with the help of a Viking I from Newport. By the time you read this TGD, one of the mainstays of RIN, will be on 75-meter 'phone. BBN was laid up for several weeks with a bum leg. JFS is awaiting transfer from R. I. — we'll miss him! Traffic: W1BBN 38, OIK 27, TGD 21, BVI 17.

VERMONT — SCM, Raymond N. Flood, W1FPS — SEC: NLO. PAM: AXN. RN: OAK. Asst. RM: TAN. Vermont QSO Party scores are listed in the Vermont bulletin, *Green Mountain Static*, copies of which were sent to all stations in each state reporting. UFZ has a Lysco 381 with n.f.m. and likes the 40-meter 'phone band. The Rutland CWRC listens on 3600 and 3860 kc. each hour on the hour for any stations with traffic for Rutland. FPS received an Armed Forces Day certificate. The c.d. operators of the Tri-County ARC are setting up the local c.d. station in the new Municipal Bldg. in Brattleboro. QQ has a new jr. operator. VEB got married. SCE and TEW are sporting new 75A-2 receivers. VSA is EC for Chittenden County. Traffic: W1RNA 117, OAK 113, AVP 37, FPS 21, NDB 18, IT 14, AXN 10, TAN 7, TXY 6, ELJ 4, VZE 4, UFZ 2.

NORTHWESTERN DIVISION

ALASKA — SCM, Glen Jefferson, KL7NT — The Sourdough Net is doing fine work with NCS passing to a new station now and then. AOS, on at Shuyak, is handling the detail at this writing. The evening call-up ties in a goodly number of fellows out in the "bush." AH sold his business in Anchorage and now is Stateside for an indefinite period. AOT, PQ, BK, AGU, AN and their XYLs spent Memorial Day at Sourdough Lodge. AGU and his XYL brought home the bag limit of trout; everyone else is quiet on that score. AUQ is on TDY at Anchorage for a stretch. The Anchorage gang is pushing a noise-elimination program. Much is needed to restore decent receiving conditions. Traffic: (May) KL7AIR 3625. (Apr.) KL7AQH/KL7 120.

IDAHO — SCM, Alan K. Ross, W7IWU — Hayden Lake: FIS writes that activity is slowing down with the moving away of RHX, ELJ, and WN7SPA. Lewiston: A nice letter was received from the EC, IDZ, who reports the ham club there is after a station license. OOV, Helen, has been appointed OPS. OOW is Asst. EC. Salmon, WN7SOZ, has applied for AREC membership. Boise: The Gem State Radio Club is having summer picnics. The local 29.5-Mc. net meets each Sun. afternoon for mobile activities and Sun. evenings for a net session. Sorry I missed last month's report. Hamming has been slow with me because I have been putting together a Tech-Master TV kit. By the time I read this again, I'll know how the TVI is for sure! Traffic: (May) W7TCI 149, MKS 28, FIS 11, NVO 4. (Apr.) W7FIS 2.

MONTANA — SCM, Edward G. Brown, W7KGJ — A number of Montana hams certainly deserve thanks for their coöperation and teamwork in the flood emergency at Great Falls and Havre. KGX, LWR, and GCS were mobile; RIL, QPK, TCR, and DXK with DXK portable. SFK, MM, BOZ, and K7FCC were Net Control Stations. Supporting stations were EWR, CVQ, NJZ, NZJ, TVU, FEE, EGZ, PKX, QYO, GCV, BFW, LBK, JZW, HJM, FTY, GSV, RYZ, RDO, NCS, RKH, CPY, and FIL. This emergency and the way it was handled proves the Montana gang can handle emergency conditions as well as any and certainly don't have to take a back seat when an emergency exists. ROM now is on 40 meters. SMY has 272-ft. center-fed at

(*Continued on page 84*)

A NEW MOBILE RECEIVER CONCEPT

SUPER-CEIVER

Super-ceiver, a new Gonset development, offers you mobile receiver performance equal to that of a high-quality, fixed station communications receiver.

The Super-ceiver combination consists of three elements: HF tuning head, which may be a Super-Six or other standard, good quality converter, a control box and the all-important Model 3041 unit, the heart of the combination. The latter is actually a crystal controlled, superheterodyne receiver with input circuits fixed-tuned to the output frequency used for the average converter. (1430 kc for Super Six) When preceded by a converter, this input constitutes the first I.F. of a dual-conversion receiver and the high frequency used insures adequate image rejection. The second conversion to 265 kcs. provides a new high order of mobile receiver phone selectivity. Four, double tuned I.F. transformers provide highly desirable steep-shoulder and restricted band-pass selectivity characteristics. A highly stable voltage regulated BFO with adjustable pitch control permits CW or SSB reception. Manual AF and RF gain controls, (and AVC) provide optimum, wide-range adjustment for strong or weak signals. The well-known Gonset noise clipper effectively copes with ignition interference. Between carrier, background noise suppression, (squelch) brings this new amateur unit into line with long established commercial practice. A well-filtered, vibrator power supply, (built in) also furnishes regulated voltage for the associated HF converter. PM speaker is mounted on the Model 3041 panel. A highly compact control head mounts RF and AF gain controls, also BFO and MUTING on-off switches. Four foot cables with connectors are supplied for easy interconnection of all three elements. Here in brief, is a description of the Gonset Superceiver combination, a new mobile receiver concept.

Six band operation, (10-11-15-20-40-75) when used with "Super Six".

"Finger-tip control" wth remote control head 2" high to match Super-Six converter.

COMPACT! Model 3041 unit is 6⅞" wide, 6¾" deep and 5¼" high. Control head is 5" wide, 3½" deep, 2" high.

Price includes tubes and 1430 kc crystal for Super Six input. (Crystal may be factory exchanged for 1525 or 1550 kc inputs at no charge if sent in with the warranty registration card supplied with each equipment.)

$119.50

INCLUDING FEDERAL EXCISE TAX.

(Price does not include Super Six converter.)

SEE IT AT YOUR DEALER

GONSET CO.
801 SOUTH MAIN ST.
BURBANK, CALIF.

the ranch west of Laurel. JRG was on the air May 2nd with single sideband rig using modified W1JEO exciter with 1625 final voice-control carrier insertion. Ken plans to put his new s.s.b. rig on 6 meters soon. TKB worked ZL1CI with low power on 80-meter c.w. TRU is the new call issued to the Harlo Radio Club. MM is doing a swell job with the Montana State Net, so please give him all the support you can and keep the net rolling. A good way to do that would be to originate a message once in a while. Traffic: W7CT 48, BNU 21, RDO 21, CVQ 12, LBK 12, RDM 2.

OREGON — SCM, John M. Carroll, W7BUS — The Salem gang is to be congratulated on the fine convention — good organization and informative meetings. FRT is to be complimented on a fine year-long job. Annual additional charge for amateur license plates as discussed in the meeting by the Secretary of State is felt to be in error after plates are once made. Joe Hallock, FCC Engineer in Charge, 13 District, states the biggest obstacle in Novice and General Class licenses is the law on emergency and portable operation, indicated by recent examinations. Salem Brewery invited the entire convention to tour the plant on Saturday and announced on Monday it was closing down permanently — probably too many free samples. Swap shop operations indicated war surplus prices are not holding up. The civil defense talk indicated more information is to come as soon as a new plan is coördinated with National C.D. Headquarters. Ex-Oregonian LY brought out new subjects along electronics lines now used by the Navy. K6BJ will mail dope on the r.f. bridge voltmeter discussed in the meeting on receipt of a card. Activities for YLs and XYLs are very well planned. Traffic: W7HDN (April-May) 67, AHN 63, GDV 25, PRA 25.

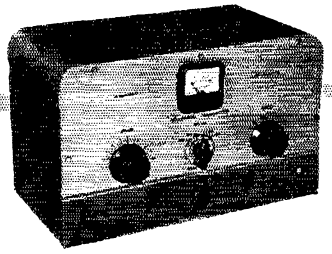
WASHINGTON — SCM, Laurence M. Sebring, W7-CZY — SEC: BTV. RM: FIX. PAMs: PGY, EHH. AIB made a 3000-mile vacation trip. The Casade Radio Club of Everett has the following new members: QPZ, JFC, and TMU. BG attended the Northwestern Division Convention. OE has completed modernization of transmitter control circuits and dummy antenna. 6ZDF operated PEB's rig while PEB was on vacation. The Lower Yakima Valley Radio Club has been affiliated with the ARRL. SOX, signing DL4AY, still is plugging away in an attempt to make DXCC. POZ moved to Clarkston. PHC joined the Silent Keys. He was one of the real old-timers, and one of the founders of the AARS. RME and RVD are chasing the elusive DX. PXY has a new rig on 75 meters. EHJ has new Cessna 140, which keeps him up in the air. JJK is new EC for Puyallup Valley. SMB spends most of his time on c.w. MTX received his Old Timers Club certificate. OEB worked 3A2XQ and CR9AH on 20 meters. OIH is building a new hacienda. The Wenatchee crew operated on Field Day at Lake Wenatchee. PQT, EC for Skagit County, checks into WSN regularly. OEX and BA were made honorary members of FEARL. PGY has a new Lysco exciter. FIX took a long motor trip — no mobile. JPH and PGY's daughter were married. KZP is spending his time fishing. GAX passed away. PRF is home from Alaska. PCV had a house-warming; ten hams and their wives were present. SZF is mobile with an Elmac and Gonset super-six. HCJ and NXN have walkie-talkie rigs on 10 meters. NLJ visited DYD. 6TLI now is W7. GBU took a business trip to Atlantic City. EEN is mobile on 10 meters. AAQ and NV are planning TV. 6VJR/7, CZY, GBU. HCJ, JEM, JGV, JNP, NLJ, NXN, OHI, OPR, OWS, PCV, PKJ, PXA, RFP, SBA, and TLI attended the Spokane Club picnic at Fish Lake, near Cheney. CWN has a new converter for his mobile. The Skagit Valley Club met at CZY's shack. KT is trying out the traffic business. EUY and CZY tried 6-meter airborne mobile. Traffic: W7BA 1823, PGY 843, CZX 534, PYV 446, RTQ 332, FIX 244, MSI 186, OE 183, KT 177, FRU 101, AMC 83, OEB 78, BG 73, APS 60, RXH 56, NWP 53, BLX 39, EHH 33, AIB 30, CWN 29, SKT 29, GAT 26, HNA 25, W6ZDF/7 15, W7HFL 14, QUO 13, ETO 12, LVB 3, PQT 2.

PACIFIC DIVISION

HAWAII — SCM, John R. Sanders, KH6RU — This will be the last call for the BIG HAM CONVENTION at Honolulu, Aug. 15th! Be there! HARC planned for Field Day operations at Bellows Field again this year. The Honolulu Mobile Club held another successful Treasure Hunt. AVO, who has activated the KONA Coast with new hams turned out of his classes, starts a new class in July. AWL, his XYL, is active on 7-Mc. 'phone. Recent graduates of the classes are Novices AWR and AWN. Gang, this will be the last report from your present SCM. I have for some time known that my business was not allowing sufficient time to properly carry out the SCM duties but I have carried on as best I could. Now the job is being placed in the able hands of KH6KS, who will be assisted by his ever-helpful XYL, KH6AFC. Please extend them your coöperation, gang, and many thanks for that given me. Traffic: (May) KG6FAA 6581, KA7LJ 4189, KA7RC 1665. (Apr.) KG6AEJ 249.

NEVADA — SCM, Ray T. Warner, W7JU — SEC: HJ. ECs: KOA, LGS, NWU. OXX, TJY, VO, and ZT. OPS: JUO. 5FOU/7, the most recent EC member, is on the

(Continued on page 86)



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Range	80-40-20-15-11-10 meters
6AG7	Oscillator - Multiplier
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5U4G	Rectifier
105-125 volts AC 50/60 cycles 100 watts	
Size — 8¼" high x 13⅛" wide x 7" deep	

MODEL AT-1

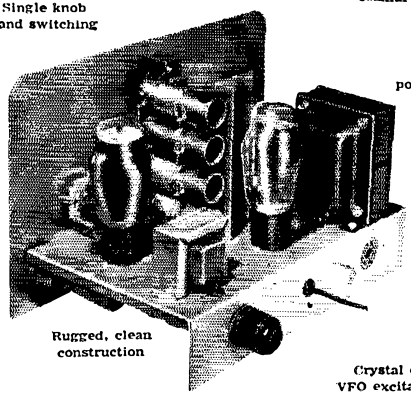
$29.50

SHIPPING WT. 16 LBS.

Pre-wound coils — metered operation

52 ohm coaxial output

Single knob band switching



Built-in power supply

Rugged, clean construction

Crystal or VFO excitation

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

Four band operation 535KC to 35MC

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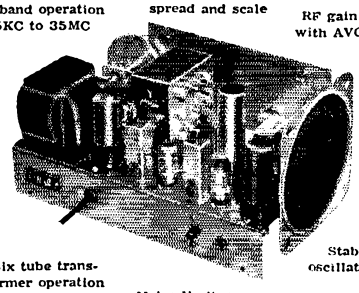


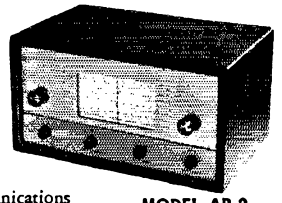
Six tube transformer operation

Noise limiter — standby switch

5½" PM speaker — headphone jack

Stable BFO oscillator circuit

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.

MODEL AR-2

$25.50

SHIP. WT. 12 LBS.

CABINET

Proxylin impregnated fabric covered plywood cabinet. Ship. wt. 5 lbs. No. 91-10. **$4.50**

THE IMPROVED Heathkit GRID DIP METER KIT

- **Pre-wound coil kit**
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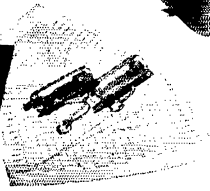

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air with a Viking II at Blue Diamond, near Las Vegas. Helen, the XYL of Asst. Director BVZ, now is WN7TPI. JU mobiled in Arizona for several weeks and personally met many of the Arizona gang. KOA is RACES Radio Officer for Elko County. PCH, with Bell Tel., transferred to Oakland. QYK and KOI are active in the C.A.P. QYK has a new 500-watt rig ready. KOA, who is quite emergency conscious, has TCS and 522 in a panel truck. JU was heard in Los Angeles on 144 Mc. by 6NLZ. The sonic barrier on 144 Mc. to the Coast still remains to be broken by two-way communications. JUO was active during the V.H.F. QSO Party week end. WN7SRN, in Sparks, is active on 40 meters.

SANTA CLARA VALLEY — SCM, Roy I. Cousin, W6LZL — The San Mateo County Amateur Radio Club held its sixth annual hamfest June 28th. The San Francisco Radio Club was host to the Central California Radio Council recently and the two main topics were Field Day and the License Plate Bill in the State Legislature. Club representatives reported on the progress of Field Day activities, and ACN reported that the Bill was progressing hopefully but to keep writing to your local representatives. AEV, our SEC, reported a new organization will be needed in San Mateo County to help QIE with the tremendous job of covering the County. The Monterey Bay Radio Club held its election of officers. JZ was the honored guest speaker at SCCARA's May meeting. NPEC had a technical movie at its meeting. NTQ has new eight-element 144-Mc. beam which works FB, and also had an FB spread in the local news sheet. WMM helped a couple fellows with chirps. He is almost ready for 144-Mc. mobile. YHM sent in another FB traffic effort but has to QRT for the summer as business calls him away from home QTH. MMG is keeping his hand in on BAN. HC reports the new rig and antenna makes for better QSOs. SYW reports giving 40 meters a whirl. Traffic: W6YHM 907, HC 51, MMG 19, AIT 16, SYW 14.

EAST BAY — SCM, Ray H. Cornell, W6JZ — K6FAL continues to make BPL. The Mt. Diablo Club now meets at the Sheriff's Office on Arnold Industrial Highway on the 3rd Fri. K6DX and W6FAR turned out to be old friends from crystal detector days. KL7AMJ/W6 is a new ORS appointee. WN6QZE is building a light beam transmitter. VSV, MXQ, GQK, RLB, and LOZ spent the June 6th week end on a Tehama County high spot. VSV worked WKO on Mt. Able to establish a new within-California 2-meter DX record. During the V.H.F. Party Bay Area stations worked up to 120 stations, and many worked more than 100. Looks like there is plenty of v.h.f. activity. OCD recently became a father. UHM has designed a 2-meter crystal-controlled converter for SARO. EY and CBF found SARO's hidden transmitter in a record 35 minutes. PB has a 70-ft. surplus radar tower. PSV gets so much fun out of whipping TVI that he actually enjoys receiving complaints. RPR, YFA, and PYH are a few who soon will be on sideband with multiphase exciter units. K6AQP, Guy Kane, formerly 3A2AB, is a new member of the Northern California DX Club. KN6APB is working his share of DX on 40 and 80 meters. Europeans have been rolling through at all hours to the delight of the local boys and the consternation of the propagation boys. TI has a new Collins Exciter unit. PEK is active on all bands with a Johnson Viking. MFZ and MXQ were Field Day chairmen for ORC and EBRC, respectively. Thanks to PYH and EJA for news of the Northern California DX Club each month. Many clubs have appointed a member to send me news of their group each month. Why doesn't your club do the same? East Bay clubs are all thankful to K6BJ, who has visited most of them with his tuna fish can r.f. bridge and his mobile antenna. There is a nice picture of GIZ and his layout in the May/June *DX'er*. ELP reports for Skyriders as follows: The Skyriders Club meets the last Sat. of each month. The last meeting was held at the QTH of KKB with a large turnout. The Club's picnic, held at Knowland Park on May 17th, was a huge success with better than 90 per cent of the members attending. GGC's XYL reports for the Mobileers that a hidden transmitter was held in May, with NTU hiding the transmitter and GGC the first in. There was a group of about 71 Mobileers, XYLs, and children present. CTH has been unmobilized by illness. MTN handled many messages from Waco, Tex., during the recent tornado. Traffic: K6FAL 1248, W6IPW 308, BPC 296, JOH 155, KL7AMJ/6 17.

SAN FRANCISCO — SCM, R. F. Czikowitz, W6ATO — SEC: NL. PL 5-6457. *Eureka Area:* EC: SLX. The Humboldt Amateur Radio Club meets the 2nd and 4th Fri. in the YMCA rooms, Municipal Auditorium, entrance on "E" St., Eureka. *Marin Area:* EC: KNZ. Tamalpais Club EC: ZUB. This is just a word of appreciation of a public-spirited citizen — Art Walters, DKH, president of the Marin Radio Club. Art personally paid for several hundred postpaid post cards, which he took to radio clubs in the area — among them the San Francisco Radio Club — distributed them to all attending, had them filled out and signed in favor of the California License Plate Bill, and handled all for mailing to the Senators and Assemblymen from each area. Congratulations to ZQK and his XYL, of the Tamalpais Club, on the new daughter. The Marin Radio Club meets the 2nd Fri. at the American Legion Hall, Larkspur. The Tamalpais Radio Club meets the

(*Continued on page 88*)

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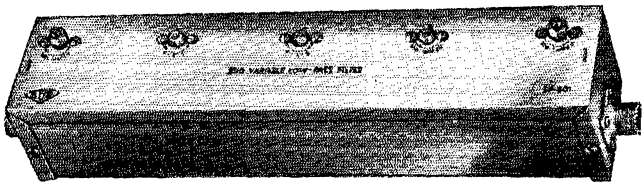

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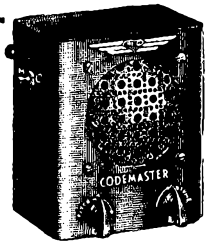

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It has a 4" built-in permanent magnetic dynamic speaker and will operate up to twenty earphones.

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3rd Fri. at 7 Loma Avenue, Tiburon. *Santa Rosa Area:* FC: LOU. Congratulations to the new directors of the SCRA, EBI and LGQ. The TVI committee is set up and operating, and considerable interest is being shown in the TVI elimination procedures. The Sonoma County Radio Amateurs meets the 1st Wed. in the Board of Supervisors Room, County Court House, Santa Rosa. *San Francisco Area:* EC: RYS. GGC, the genial acting president of the SFRC, won the 75-meter hidden transmitter hunt at a recent Sunday morning Mobileer breakfast. HJP, Major Art Monsees, is signing DL4AY and reports that he is hard at work plugging away for DXCC from Germany before being rotated Stateside in October, 1954. SWP, our most dependable traffic-handler, is checking in on RN6, PAN, and MARS, and reports another excellent total this month —384, plus MARS messages. The San Francisco Radio Club meets the 4th (NOT the last) Fri. at 51 Lakeshore Plaza, opposite 34th and Taraval. The Highfrequency Amateur Mobile Society 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 meetings are restricted to members because they are held on the Naval Reservation. Traffic: W6SWP 384, GCV 61, ATO 8, BIP 4.

SACRAMENTO VALLEY — SCM, Harold L. Lucero, W6JDN — Asst. SCM: Willie van de Camp, 6CKV. OBS: OMR, AVZ. RM: PIV. AVZ has shown a desire to be Asst. SCM in his area so with his help we should have more dope soon. TYC has been very active on the nets and expects to have several ARRL appointments soon. KN6ANZ and KN6ASZ are new hams in Chico. AVZ is busy trying to sell the boys 160 meters for local work. SLV has gone mobile in anticipation of the vacation trip East this summer. K6PH has moved to Missouri. TRS completed all-band portable set for Field Day. MON returned to Chico for a visit. The Golden Empire Radio Club is having lots of fun with hidden transmitter hunts on 160 meters. The Mt. Shasta Radio Club was busy getting everything ready for the Mission Trail Round-up which was held June 27-28. The Tall Pine Net is active every Sunday at 0930 PST and would like more of you to check in. JKA of Alturas will try a hand at the EC appointment. IOM has new auto-transformer to boost his power. FYK was a visitor in Mt. Shasta during a business trip. ARR is leaving us and a new EC will be needed in this area. ANR and KUP check in on the Mission Trail Net. HVB, of Central Valley, has been on 40-meter 'phone and is doing fine work. KTF, vice-pres. of the Redding Radio Club, will try to see that information from that club is forthcoming. OOP checked in and now is in Yreka, Calif. Let's get more information in for next month's report, fellows. Traffic: W6TYC 199, AVZ 56, JDN 43.

SAN JOAQUIN VALLEY — Acting SCM, Edward L. Bewley, W6GIW — SEC: KRO. RM: EXH. The Fresno Hamfest again was a big success. They get bigger and better every year. We are looking forward to going next year. KRO is very busy with SEC work. Bill is doing a fine job and getting good coöperation from the gang. 8HWZ/6 is a Modesto resident and Naval Reserve station-keeper. BHI, formerly of Stockton, now is in Burbank, working for Collins. In April he married CVE, with LTY as best man. ZRJ and his XYL, who is waiting for her Novice ticket, are printing the Merced Club paper. Doc reports the Club is getting a station together and has a 200-watt transmitter, thanks to JWC. ZRJ, IER, and DVI now are mobile on 75 meters. QUE and CPT are back on 144 Mc. OVR has received his Technician Class license. ILH and HIP are new calls on 144 Mc. PJF is very busy with the Stockton Club paper and doing a swell job. Traffic: W6TSO 74, EXH 49, OPU 38, OBA 34, ZRJ 30, GIW 17, MGP 17

ROANOKE DIVISION

SOUTH CAROLINA — SCM, T. Hunter Wood, W4ANK — UFP wants to see more activity on the South Carolina C.W. Net. The following participated in a mobile outing on 75 meters in Charleston on June 7th: ANK, BIZ, NZG, TPE, TWW, and UPK. Future outings are planned for Sunday afternoons. OSC has a new 8 x 12 hamshack. Twelve South Carolina amateurs attended the Charlotte, N. C., Hamfest. ELW, of Manning, and WOA, of Clemson, are new on 75-meter 'phone. Congratulations to NZR on leading the S. C. SS Contest. TTJ has abandoned 75-meter 'phone for 40- and 20-meter c.w. temporarily. TTG is having reception trouble and has a program for encouraging new amateurs in Springfield. South Carolina amateurs regret the loss of CZA, who passed away at Fort Moultrie on June 3rd. "Vic" gave long and active service as secretary of the Charleston Amateur Radio Club for years, was a member of TLC and AARS and formerly was Route Manager of South Carolina. He was not as active during the past several years because of failing health, however. CZA will be long remembered by many an old-timer and newcomer alike. Traffic: W4ANK 155, UFP 6.

VIRGINIA — SCM, H. Edgar Lindauer, W4FF — Virginia nets have not shown any tendency to follow the general pattern by reflecting a slump. This month's total of 3565 reached a new high for this time of year. KRR, SHJ, HQN, UHG, JAQ, KX, UWS, and GR accounted for 80

(Continued on page 90)

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D63N • DeLuxe 6m 3-El. (No T), $21.95. 1 — 8′ Boom, 1″ Alum. Tubing; 3 — 6′ Center Elements, 1″ Alum. Tubing; 6 — 2′ End Inserts, ⅞″ Alum. Tubing; 1 — Beam Mount.

D63T • DeLuxe 6m 3-El. T-match, $24.95. 1 — 8′ Boom, 1″ Alum. Tubing; 3 — 6′ Center Elements, 1″ Alum. Tubing; 6 — 2′ End Inserts, ⅞″ Alum. Tubing; 1 — T Match (4′), Polystyrene Tubing; 1 — Beam Mount.

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S152T • Std. 15m 2-El. T match, $22.95. 1 — 12′ Boom, 1″ Alum. Tubing; 2 — 12′ Center Elements, ¾″ Alum. Tubing; 2 — 5′ End Inserts, ⅝″ Alum. Tubing; 2 — 7′ End Inserts, ⅝″ Alum. Tubing; 1 — T Match (6′), Polystyrene Tubing; 1 — Beam Mount.

D152N • DeLuxe 15m 2-El. (No T), $29.95. 1 — 12′ Boom, 1″ Alum. Tubing; 2 — 12′ Center Elements, 1″ Alum. Tubing; 2 — 5′ End Inserts, ⅞″ Alum. Tubing; 2 — 7′ End Inserts, ¾″ Alum. Tubing; 1 — Beam Mount.

D152T • DeLuxe 15m 2-El. T match, $32.95. 1 — 12′ Boom, 1″ Alum. Tubing; 2 — 12′ Center Elements, 1″ Alum. Tubing; 2 — 5′ End Inserts, ⅞″ Alum. Tubing; 2 — 7′ End Inserts, ¾″ Alum. Tubing; 1 — T Match (6′), Polystyrene Tubing; 1 — Beam Mount.

S153N • Std. 15m 3-El. (No T), $26.95. 1 — 12′ Boom, 1″ Alum. Tubing; 3 — 12′ Center Elements, ¾″ Alum. Tubing; 2 — 5′ End Inserts, ⅝″ Alum. Tubing; 2 — 6′ End Inserts, ⅝″ Alum. Tubing; 2 — 7′ End Inserts, ⅝″ Alum. Tubing; 1 — Beam Mount.

S153T • Std. 15m 3-El. T match, $29.95. 1 — 12′ Boom, 1″ Alum. Tubing; 3 — 12′ Center Elements, ¾″ Alum. Tubing; 2 — 5′ End Inserts, ⅝″ Alum. Tubing; 2 — 6′ End Inserts, ⅝″ Alum. Tubing; 2 — 7′ End Inserts, ⅝″ Alum. Tubing; 1 — T Match (6′), Polystyrene Tubing; 1 — Beam Mount.

D153N • DeLuxe 15m 3-El. (No T), $36.95. 1 — 12′ Boom, 1″ Alum. Tubing; 3 — 12′ Center Elements, 1″ Alum. Tubing; 2 — 5′ End Inserts, ⅞″ Alum. Tubing; 2 — 6′ End Inserts, ⅞″ Alum. Tubing; 2 — 7′ End Inserts, ⅞″ Alum. Tubing; 1 — Beam Mount.

D153T • DeLuxe 15m 3-El. T match, $39.95. 1 — 12′ Boom, 1″ Alum. Tubing; 3 — 12′ Center Elements, 1″ Alum. Tubing; 2 — 5′ End Inserts, ⅞″ Alum. Tubing; 2 — 6′ End Inserts, ¾″ Alum. Tubing; 2 — 7′ End Inserts, ⅞″ Alum. Tubing; 1 — T Match (6′), Polystyrene Tubing; 1 — Beam Mount.

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S202N • Std. 20m 2-El. (No T), $21.95. 1 — 12′ Boom, 1″ Alum. Tubing; 2 — 12′ Center Elements, 1″ Alum. Tubing; 4 — 12′ End Inserts, ⅞″ Alum. Tubing; 1 — Beam Mount.

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D202N • DeLuxe 20m 2-El. (No T), $31.95. 2 — 12′ Booms, 1″ Alum. Tubing; 2 — 12′ Center Elements, 1″ Alum. Tubing; 4 — 12′ End Inserts, ⅞″ Alum. Tubing; 1 — Beam Crosspiece, 1″ Alum. Tubing; 1 — Beam Mount.

D202T • DeLuxe 20m 2-El. T match, $34.95. 2 — 12′ Booms, 1″ Alum. Tubing; 2 — 12′ Center Elements, 1″ Alum. Tubing; 4 — 12′ End Inserts, ⅞″ Alum. Tubing; 1 — T Match (8′), Polystyrene Tubing; 1 — Beam Crosspiece, 1″ Alum. Tubing; 1 — Beam Mount.

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per cent of this total with KRR, HQN and SHJ crashing through to BPL in the process. YE, ex-SCM of both Georgia and Alabama, has taken up QTH in Falls Church, Va., and is presently an ORS. In addition he is the OM of YZC, 14 years old. LW took up residence in Norfolk and with it the job as editor of the *VN Bulletin* beginning with the September issue. Dick also will send out interim information on items of interest using the VN frequency 3680 kc. each Fri. at 2000 hours EST. LJE skeds KG4AU daily on 14.285 Mc. at 1245 hours except week ends. Norfolk's AREC members, IUO, VAS, YVG, and LJE conduct regular preparedness drills. IUO is the EC there. LW is QNI on Naval Reserve Round-up each Fri. at 2200 EST on 7110 kc. During the Waco, Tex., disaster HQN and KX handled an aggregate of 830 emergency messages during 72-hour continuous operation. The VN summer session, Mon., Wed., and Fri., reports plenty of activity. KRR, UWS, UHG, and SHJ keep things humming. FF has moved to the beach for the summer. VN QSO Party winners were UWS with 75 QSOs and 30 counties for a score of 4500, followed in order by FV 4480, RTV 4088, TEJ 4026, all 'phone, and UHG 3864. WN4YVO, of Falls Church, took the Novice prize. CJJ has taken over EC appointment in Arlington replacing LRI, whose new QTH rendered him ineligible for that area. Traffic: (May) W4KRR 747, SHJ 625, HQN 581, UHG 255, JAQ 171, KX 151, UWS 146, GR 120, W5WXP/4 98, W4NV 71, LNX 66, OGX 54, VUY 53, KFC 45, JAU 44, EBH 34, FF 33, KRX 25, CFV 24, IYI 22, RJW 22, TYC 22, LW 21, LJE 16, WAB 16, GQL 14, YKX 14, JZG 13, PWX 13, KG 12, SPE 6, LK 5, WBC 1. (Apr.) W4TYC/9 25.

WEST VIRGINIA — SCM, John T. Steele, W8MCR — The Stonewall Jackson Amateur Radio Club held its picnic at Jackson Mill with thirty attending. Rigs on 75 and 80 meters were in operation; seven out-of-town hams attended. We regret that OXO has moved to North Carolina. Tabe says to look for him when he gets a W4 call. UHK, PZT, and BWD headed up the Field Day activities which the Stonewall Jackson ARC held on "Snake Nob." The hams who attended last year will recall the incident of two snakes coming out of the top of the pipes used for the antennas soon after they were raised. GUL is going mobile on 10 meters. GBF could be heard pounding out traffic at the Fairmont Hobby Show. GCZ made WAS. The West Virginia 'Phone Net closed for the season with the Annual Picnic held at Parkersburg. We wonder if Pete was there with his wash tub. There is no dice on the call-letter license plates at this time; the bill died in the Committee room. HLF, from Beckley, was awarded first place in the recent YL/OM Contest. Traffic: W8AUJ 832, HZA 63, GEP 61, DFC 39.

ROCKY MOUNTAIN DIVISION

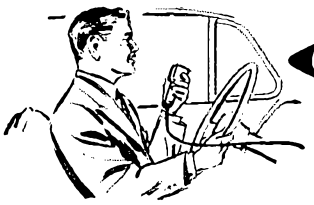
COLORADO — SCM, Karl Brueggeman, WØCDX — SEC: AEE. As this is being written in Modesto, Calif., the traffic reports will have to come next month. Your SCM has talked with quite a few of the hams out here and heard EKD in Denver, describe the weather, etc. I tried hard to contact Bob, but the little 9-watter in the car just didn't carry through. The Denver Radio Club has purchased a 14-foot house trailer to use as a mobile emergency station. The funds to purchase the trailer were raised by donation, and at the last club meeting about half of the cost of the trailer was donated — out of a clear sky, too. Nice going, fellows. The Grand Valley Radio Club (Grand Junction), dinner was a great success with fifteen couples present. GDC received a two-column write-up in the local paper with pictures of his rig and tower. FKY reports a big opening on 6 meters on April 24th. He has his XYL monitor the TV set for openings and then hurries home to work 6 meters. CVG has moved to a place with more room and is putting up an antenna farm. TV keeps schedules with his son in Dallas. HEM is rebuilding his rig to get rid of TVI. The Colorado Emergency 'Phone Net needs more members in the small towns around the State. The frequency is 3.890 Mc. and meeting time is 1730 MST on Tue. and Thurs., and 0730 on Sun. Let's all get on and handle the traffic.

WYOMING — Acting SCM, Marion R. Neary, W7KFV — The Pony Express Net has resumed operation on 3920 kc. at 0900 MST Sun. MWK is back in Wyoming for a short while and operating 3.9-Mc. mobile. KFV has 10A exciter and 150-watt linear amplifier on s.s.b. PKX has the high traffic count as usual. MUG returned from CAA school at Oklahoma City. A few monthly reports would help fill out this column, fellows Traffic: W7PKX 168, MWS 11.

SOUTHEASTERN DIVISION

ALABAMA — SCM, Dr. Arthur W. Woods, W4GJW — KIX answers AENB, AENP, and RN5. OAO answers AENB, AENP, and MARS. PPK answers AENB, AENP, and MARS and is attending summer school, also. RLG sends a traffic report but no news. UJJ answers AENP and AENB and handled considerable tornado traffic. TKL was elected vice-president of Huntsville Club to finish the term of LHR. AENB needs operators to help out with summertime traffic. Traffic: W4UJJ 165, KIX 159, RLG 110, OAO 76, TKL 21, PPK 16.

(Continued on page 92)



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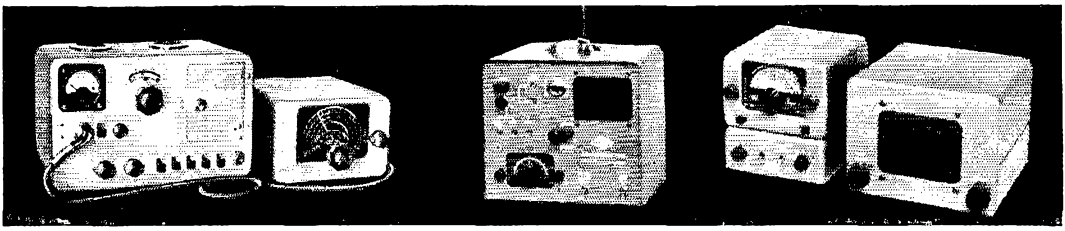


Gonset 3016 "Commander"

All-band Phone-CW transmitter for mobile use. Covers 1.7 to 54 mc. Supplied with 2 plug-in final coils which cover 80, 75, 40, 20, 15 and 11-10 meters. Up to 50 watts input on CW; 35 watts on phone. Use with any carbon or high-impedance crystal or dynamic mike. Tubes: 6AG7 crystal osc., 6146 final, 12AT7 speech, 2—7C5 mod. 5⅜ x 8⅛ x 7⅛" deep. With tubes; less crystal, mike and key. Requires 300 v. DC at 200-225 ma and 6.3 v. at 3.15 amps. 8 lbs.

98-041. *NET*.....**$124.50**

VFO MODEL 3020 TUNING HEAD. (Illustrated at right above.) For VFO control of above on 75, 20, 15 and 10 meters. Requires no tubes. 5¼ x 3½ x 5¼". Shpg. wt., 3 lbs.

98-042. *NET*.....**$29.95**

Gonset 3026 "Communicator"

Complete 2-meter Amateur phone station in portable case. *Transmitter:* AM phone; 5-7 watts output; takes crystal or carbon mike. Uses 8-mc crystals. RF Section: 6CL6, 12AV7, 2E26, 9006 tuning eye rect. and 6E5 tuning eye. *Receiver:* Tunes 144-148.3 mc. Cascode RF stage; noise limiter; PM speaker; 6BQ7, 12AT7, 2—6BH6, 6BJ6, 6T8. *Receiver-Transmitter Tubes:* 12AX7, 6V6, 2—6X4. With tubes and 19" whip; less mike and crystal. 10¼ x 9¼ x 7". For 110-120 v., 50-60 cycles AC or 6 v. DC. Shpg. wt., 24 lbs.

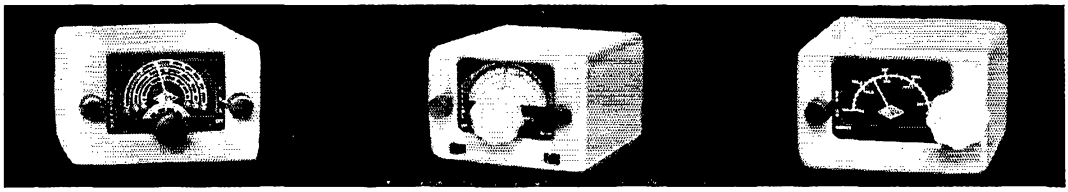
84-912. *NET*.....**$209.50**

Gonset 3040 "Super-ceiver"

For use with Gonset "Super-Six" (illustrated above but not supplied), Morrow, RME, etc. converters. Crystal-controlled, 4 double-tuned high-Q 265 kc IF transformers, BFO with pitch control, separate AF and RF gain controls, noise clipper, built-in speaker. Adjustable squelch. Integral power supply; battery-saving circuit. Separate control head for dash, under-seat or trunk mount. Main unit, 6¾ x 5¼ x 7"; control head, 2" h. With cables and connectors, tubes, speaker, crystal for 1430 kc input, power supply, mounting brackets. 6 volt operation. 8 lbs.

84-914. First deliveries in October.

NET.....**$119.50**



Gonset 3002 Converter

Provides continuous coverage from 3 to 30 mc. in three ranges. Each range is spread over nearly 360° to permit simple, accurate tuning. Range A: 3-8 mc; Range B: 8-18 mc; Range C: 18-30 mc. Has illuminated dial. Power requirements: 10 ma at 135 volts and 6 volts DC at 0.75 amp. 1500 kc output. Supplied complete with tubes, cables, and instructions. 5¼ x 3½ x 5¼". 5 lbs.

84-954. *NET*.....**$44.75**

Gonset 3030 "Super-Six" Converter

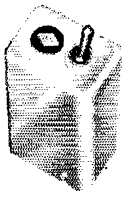
Covers 75, 40, 20, 15, 11-10 meter Ham bands—as well as 19 and 49 meter bands (for world-wide short-wave broadcasts). Panel controls: Antenna Trimmer, On-Off, Band Selector. Has RF Gain Control, Oscillator Compensator, and hi-lo impedance Antenna Switch on rear panel. The "Super-Six" may be used with any receiver covering 1430 kc. Supplied with tubes and cables. Housed in gray metal case, 5¼ x 3½ x 5¼". Power requirements: 80-135 volts DC at 10 ma and 6 volts at 1 amp. 5 lbs.

84-913. *NET*.....**$52.50**

Gonset 3008 Converter

A sensitive 2-meter converter. Features super imposition tuning system—any 144-148 mc signal can be heard by tuning dial only 2 mc from 144-146, or 146-148 mc. Images from one half are heard simultaneously with fundamentals in other half. Eliminates all non-Amateur VHF images. Output frequency, 1 mc. Requires 135-250 volts DC, 20 ma; 6 v. DC. With tubes, cables. 3½ x 5¼ x 5¼". 5 lbs.

84-926. *NET*.....**$44.50**



Gonset 3001 Clipper Noise Limiter

An easy to install noise limiter for any receiver with 2nd detector-AVC and 1st audio in one tube. Effectively minimizes ignition noise, atmospheric static and other peak-type interference. Recommended for use with Gonset equipment in mobile installations, but will improve reception of any receiver. Size, 2 x 4 x 1½". Complete with 9006 tube, cables and installation instructions. Shpg. wt., 2 lbs.

60-596. *NET*.....**$9.25**

3006 STEERING POST BRACKET. Mounting bracket for all Gonset converters. May also be adapted to mount any conventional mobile converter. Converter can be mounted on either side of steering post. With mounting straps and hardware. Shpg. wt., 1 lb. **84-994.** *NET*.....**$3.90**

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EASTERN FLORIDA — SCM, John W. Hollister, jr., W4FWZ — SEC: IM. The mobile Flamingo, Pelican, and DEN and BEN Nets in and around Miami and Fort Lauderdale are well organized. The FEPN on 3910 kc. will be the same reliable net. 3675 kc. will hold down its end but at this time we are shy on the 7-Mc. band. Daytona: MSP reports the following active on 144 Mc.: MSP, VXZ Deland, AYV Umatilla, MPJ Eustis, NNE Orlando. Listen at 7, 8, and 9 P.M. RWM reports 2DXL now is in Daytona Beach. Fort Lauderdale: Listen for the Flamingo Net on 29,044.4 kc. at 7:30 P.M. Fri. and the DEN at 8:15 P.M. The BEN is on 29.4 Sun. at 1:15 P.M. WN4ZOL is the XYL of MLS. Broward, Dade, and Palm Beach fixed and mobiles will handle communications for the Miami-Palm Beach Boat Races. IM says plans are shaping up for the Gold Coast Hamfest to be held at Fort Lauderdale this year. Key West: WN4YUQ is club activities manager. MRY is ex-6FTQ. WN4ZLI is the XYL of YUQ. Work ten Key West stations and get a nice certificate. (QSLs via MCX.) Club officers are SWI, MCX, OVK, WKS, and OPZ. KG4AJ is ex-W4IWM (all bands). Miami: Ye SCM had a most enjoyable visit with the Dade Club. GHP built the slickest VFO exciter ending with an 829B and TVIed on all bands. LVV is new club president. MVR and his XYL WYR have the AREC in good shape and want more members. New Port Richey: KJ has turned NCS for 3497.5-kc. MARS Net over to RQN in Jacksonville. Sarasota: TFP and YI are mobile with an Elmac and Super Six. Bill made his WAS. LMT reports the Florida 'Phone Traffic Net handled 304 messages in May. Tampa: A good traffic team is 6PWZ/4 (ex-4LDM) and his XYL 6PXC/4 (ex-4KZT). Clewiston: PJU reports Tropical Net (3945 kc. at 6 P.M.) NCS and ANCS are TJU, PJU, 6PWZ/4, and PZT. Traffic: W4PJU 817, FPC 544, DRD 239, W6PWZ/W6PXC 212, W4PZT 189, QBR 186, LMT 125, ZIR 66, RWM 65, SJK 59, KJ 52, VIE 28, SVB 12, FWZ 11, IM 9, TFP 3.

WESTERN FLORIDA — SCM, Edward J. Collins, W4MS/RE — SEC: PLE. PQW won the Globe King transmitter at the Mobile Hamfest. QK and SZH are QRL getting things ready for the Pensacola Hamfest. HJA is getting the mobile gear in the new car. WN4ZPN is on every A.M. looking for his son, KG6ADX. WN4ZFL has moved to 7 Mc. IREV/4 has moved into 4UTB's old QTH. PTK is going great guns on mobile rig. TTM keeps the home transmitter going. NOX/NYZ handle the G. I. traffic. FHQ meets the Pensy Net on 10 meters. UCY still is faithful to 10 meters. ZGD keeps the big Navy transmitter going all day and the rig at home at night. WN4YFF, W4YFG, and YFH are looking at higher power. UQZ conducted a very FB Novice program in his Science Classes this past school year. AXP is getting back into stride after a recent operation. KVE has returned to the air. ART is heard on 144 Mc. MS has temporary antenna up on 50-Mc. so as not to miss an opening. MUX was heard on 20-meter 'phone. DAO is a 3.5-Mc. regular. UXW had a large time at the Mobile Hamfest. Please contact PLE if interested in CD appointments, etc. KWM keeps 14 Mc. hot. ROM has a vertical perking. HIZ is an 144 Mc. RZV has been handling traffic. UC keeps the parts rolling. AXF has been on hunting DX.

GEORGIA — SCM, James P. Born, jr., W4ZD — The Georgia Cracker Radio Club and affiliated nets held the annual meeting at the Kennehoochee Amateur Radio Club's Hamfest May 31st at Lithia Springs, Ga. Officers elected were ZD, pres.; RPO, first vice-pres.; ACH, second vice-pres.; OKL, third vice-pres.; MZO, secy.-treas.; and NS, historian. The officers of the Club also are the NCS of the Georgia Cracker Emergency Net as follows: ZD, Net Manager; RPO, north NCS; ACH, south NCS; OKL, east NCS. LRR won the Viking II at the Kennehoochee Hamfest. LJB has a new ham shack and plans to return to the air soon. The Atlanta Radio Club's Annual Hamfest will be held Aug. 30th at Robinson's Tropical Garden on Paces Ferry Road on the banks of the Chattahoochee River. A Viking II transmitter will be given to some lucky attendant. WN4ZHJ is a new ham in Carrollton. TO is off the air and is moving to a new ham shack. USA has a new SP600-JX receiver. Members of any net in Georgia are eligible for membership in the Georgia Cracker Radio Club. Any net member interested, please contact the Club's secretary, W4MZO, 1084 Berkshire Road, N.E., Atlanta, Ga. Traffic: (May) W4USA 2788, K4WAR 2609, FDB 1210, W3SAF/-4 299, W4OCG 184, W1UOP/4 103, W4ZD 73, NS 23. (Apr.) W4MTS 14.

WEST INDIES — SCM, William Werner, KP4DJ — SEC HZ. AK, CY, HZ, LX, MC, OA, and QR renewed AREC membership. Welcome to new AREC members QM, RL, RO, and KV4BD. IS obtained WPR-125 certificate. New Novices are WP4s UM, UN, UO, UQ, UR, US, UT, and UU. UW renewed ORS appointment. WP4TQ belongs to Emergency Service Boy Scouts of America Amateurs. VP2KM reports regularly to the 3925-kc Net. Present schedules of nets follow: 80-meter AREC, 3559 kc., 8 P.M. Mon. 3925-kc AREC, 8 P.M. to 10-meter AREC, 28.8 Mc., Fri. 8 P.M. Armed Forces Net, daily, 4 P.M., 3925 kc. GW reports to the 3925-kc. Net from a hospital bed. RC put up 7-Mc. folded dipole and 135-foot end-fed Zepp. CX is readying ART-13 for all-band operation. GN/mobile has

(*Continued on page 94*)

Famous CRESCENT INDUSTRIES — a long-time builder of record players and other quality electronic audio products — is FIRST to break the forbidding $90 mark in tape recorders, an almost impossible task considering the components and precision required! RADIO SHACK is proud to be the first company privileged to bring you the glad tidings!

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Photo courtesy Herbert Smith (W8AIU), South Euclid, Ohio

worked Florida, Haiti, and Virgin Islands on 75 meters. RH put up 36-foot tower. DV has 200-watt mobile working on 75 meters. BR has new 80-meter antenna. HM is on with p.p. 812s. MV is experimenting with Balun coils on ART-13. CO operated portable from a tent at Sabana Grande for 2 days while 80,000 people waited for the miracle promised by a vision of the Virgin Mary. Forty stations of the 3925-kc. AREC Net participated in a civil defense drill on May 31st during a simulated air raid and bombing of many towns of the Island. Reports were relayed to C.D. Control Center at Gurabo via OA at Caguas and ID at San Juan. Operators at Control were MC and RK. The San Juan group had its net on 3885 kc. for fixed stations at the c.d. office and City Hall with mobiles reporting to the City Hall station. ID, the Island NCS, contacted both nets simultaneously. ID/KP4, at City Hall, originated 25 and received 15 messages from HZ/mobile. DJ/mobile at the fire station handled 2 and DV/mobile at the hospital handled 2. Traffic: KP4MC/KP4 98, ID 65, HZ/m 25, DJ 20, RC 10.

SOUTHWESTERN DIVISION

LOS ANGELES — SCM, Howard C. Bellman, W6YVJ — Asst. SCM, Bill Coe, 6KWQ. RM: GJP. RM for LSN: BHG. Official Observers Class I are CK, K6FA, W6YSK, and YVJ. OOs Class II are YSK and YVJ. OOs Class III are CBO, CNP, EBK, GKM, HPV, JQB, LGP, UGA, and UTE. OOs Class IV are CBO, CNP, EBK, K6FA, W6GKM, HPV, JQB, LGP, UGA, UTE, and WOO. CK, a long-time Observer, has been quite ill but is back observing now. SCR reports code practice is given by K6USA on 3590 kc. at 7 P.M. PDST. AWI and others at Mt. Lee manned the cerebral palsy campaign net over 25-hour Telethon. ZHJ has 420-Mc. rig of 6J6s. OBS schedules were submitted to *PAN News*. Geo. Whitten is a new Technician and Novice K6BAD. Four names have been submitted for the SEC job. The Centinella Valley Net worked in the Apr. 16th Cancer Drive on 10 and 2 meters. On Apr. 30th they helped Inglewood on the same bands. reports OI. HOH reports the YRA UCLA Club is on 20 meters mostly. FEI sent along AREC applications for KG6ABK/6, W6QYW, and QYZ. I tell you now of the worst news we could have received, the resignation of FMG as RM of LSN. Asst. RM BHG will take up where Red left off. Those also resigning are QR as PAM, because of increased net activities, ESR as ORS, and HLZ as OBS. NCO resigned his post as Radio Chief of C.D. District 13. BUK and KYV are renewing OPS and ORS certificates, respectively. CCO has applied for ORS appointment. GMC, president of Monrovia Ham Club, reports of helping May 16th in the parade with mobile rigs for slow-downs and emergencies with GMC, RWB, HSI, WDI, K6ABA, and W6AQW. MU is on 2 meters. SWE has new General Class ticket and Viking II. HK is chairman of the Operating Committee for the Jamboree. VDT is 75-meter mobile. GSX is on the sick list because of auto QRM on Ridge route, says AWI. ESR has final r.f. OK now. Sam was campaign chairman for eight beach cities, including Torrance, in the Cancer Fund Drive. GYH, KYV, HK, and K6FCA make BPL. ONI reports the 2-meter net growing fast. Welcome to the newly-affiliated Pacifico Radio Club and its officers, KPM, pres.; *NJU, secy.; HII, treas. HKD and his Disc-cone* antenna are DXing on 2 meters. As Asst. Manager of RN6, CMN makes RM. COZ is on "vacation" at a girls' camp. Traffic: (May) W6KYV 2555, K6FCA 2298, W6IIK 942, GYH/6 606, CMN 412, LYG 293, MBA 293, UGA 288, BHG 207, CAK 200, FMG 160, HLZ 92, K6EA 88, W6DDE 71, BLY 31, COZ 26, ESR 17, CBO 15, OXS 12, HKD 10, AM 8, YVJ 2, PZN 1. (Apr.) W6DDE 40, CK 9, SWE 4. (*Nov.*) W6NCA 101.

ARIZONA — SCM, Albert Steinbrecher, W7LVR — Armed Forces Day found some 50 stations participating in "Operation Bird Watch," the Defense of Luke Field, Phoenix, against the "Six Bandits" Jets trying to make a sneak attack. Luke Field Control Station was manned by JYH, QZH, RBA, and SUI. Mobile and fixed stations around the State, organized and controlled by IRX, were on the "watch" and reported all passing aircraft to Luke Field. The following participated: ACD, DRQ, FAR, FAU, HUV, HYQ, JGX, JNZ, JQP, JU, JUY, KVK, KOY, KUJ, KWB, LBN, LEE, LFZ, LQB, LSK, LVR, LZL, MAE, MDM, MHE, MII, MWD, NAP, NDJ, NRZ, OED, OIF, OQS, OUE, OYG, PJY, PKM, PMQ, QFQ, QJS, QOC, RFE, SDN, TLG, USX, VRQ, and YZU. Honors went to MWD, who first sighted the "bandits" approaching Wickenburg. The Annual Arizona Picnic at Montezuma Well was one of the biggest and best ever held. Credit for arrangements goes to GYK, JYH, and OAS. Movies of GYK's European trip were shown. Those present were: AH, BBM, DJH, EAI, EAW, EL, FJT, GGO, GYK, HYQ, IKH, JFT, JYH, KMQ, KOY, LJN, LQB, LSK, LVR, MAE, MDD, MES, MWD, MWQ, NGJ, NKG, NRZ, NUL, OAS, OIF, PMQ, PSH, PZ, QJV, QNO, RAB, RAK, REO, RFE, RG, RIJ, RTE, RUK, RYS, SHR, SIX, SNI, SQN, SUN, TLY, UPX, and YZC. Traffic: W7KOY 139, LVR 15.

SAN DIEGO — SCM, Edgar M. Cameron, jr., W6FJH — Asst. SCMs: Thomas H. Wells, 6EWU; Shelley E.

(*Continued on page 96*)

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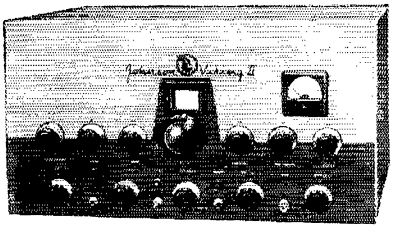

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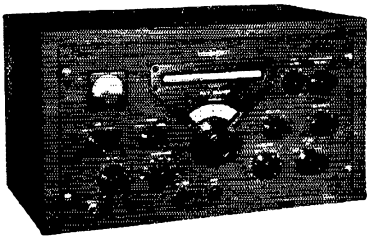
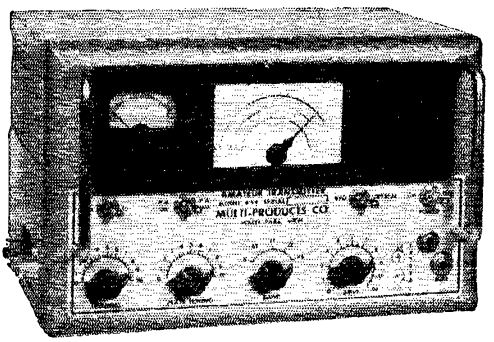


COLLINS 75A-3 with 3 KC Mechanical Filter. Less speaker. Net $530.50



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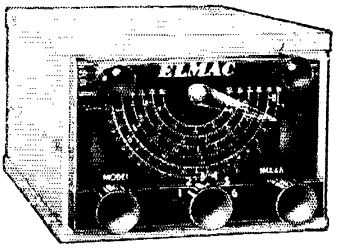

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Trotter, 6BAM; Richard E. Huddleston, 6DLN. SEC: SK. Asst. SECs: WVA, FOP. ECs: DEY, ZLV, HRI, QJH. RM: MUE. PAM: JPM. The IAB gang plans s.s.b. by July. FCT mixes bowling with hamming. AKY is handling lots of Legion Net traffic for Escondido. GDG and QBM are back home. QBN is on 24-hour-day hot DX schedule! Our new OO, ORD, finds most rigs on the air are pretty clean! A local boy, LRB, will leave Escondido to become an executive in Region 12 of the Boy Scouts organization. At a recently convened Mobileers breakfast in San Diego SEC SK presented EC certificates to W6s QJH and HRI. Go to it, Tiny and Ralph, the boys will back you up 100 per cent, I know. Yours truly was happy to see all the XYLs at the Mobileer breakfast, especially the little girl who just passed her Novice Class exam. Escohi students attending were QBN and Marv, who recently passed the Novice Class exam, also. The Mobileer breakfast guest, ex-gUAV, gave an FB technical discussion on noise-limiters. Santa Ana YLs PJU and RWM dropped the "N" from their calls recently. W6s HAA and TKR are on 2 meters. UQI is recovering from a serious operation. The Brawley gang stood by with gear when 25 SP railway gasoline tank cars were derailed on the desert. A big picnic was given by the L.A. Area Council of Amateur Radio Clubs up in Brea. Traffic: W6IAB 5459, YDK 845, IZG 513, FCT 23, CHV 9, AKY 8, IAC 6, JPM 5.

SANTA BARBARA — SCM, Vincent J. Haggerty, W6IOX — IHD is PAM for the section and reports that JFP, QAJ, and IHD are active on 145.8 Mc. and YCF and UJA are ready to join them. Santa Barbara EC, KFM, reports AREC obtained the power plant from the County, the trailer from KZO, welding work was done by JML and electrical work by DYX to complete its mobile emergency power supply. DLR invites new members to the Tri-Counties Net on 3820 kc. Mon. at 7 P.M. OXJ has a new Viking rig going and works traffic on LSN and SJVN. Route Managers FYW and QIW are forming a c.w. net for the section; prospective members please contact them. YCF works ECN, MARS, and Tri-Counties Nets. ORI works on the Mission Trail Net. ORW is on 2 meters with a new rig. Traffic: K6NBI 50, W6FYW 32, YCF 27, OXJ 21, ORI 13.

WEST GULF DIVISION

NORTHERN TEXAS — SCM, William J. Gentry, W5GF — Asst. SCM: Thomas B. Craig, 5JQD. SEC: QHI. PAM: IQW. The RM position still is vacant. Don't we have any traffic men interested? TFB received his ORS appointment and made BPL also. BVG worked WAC in 12 hours on 14 Mc. Wish I could do the same. OLG, Scoutmaster of Troup 2007 in Grapevine, Tex., took radio equipment to the Scout Exhibition in Fort Worth. A total of 114 messages was handled with the assistance of ARK and RRM. The Sweetwater Amateur Radio Club now is officially an ARRL Affiliated Club. IMZ and GXE are rebuilding their rigs in Grapevine. WHE is a new OO in the Northern Texas section. OJD has been too busy for ham radio. WJW, JZF, and WCR have been on 75 meters lately. PXI received a nice letter of citation from Governor Shivers for the assistance the NW Texas Net boys gave in handling traffic in the Waco and San Angelo tornado emergencies. Amateurs in the surrounding cities are to be congratulated on the assistance they gave the hams in San Angelo and Waco. A job well done. Traffic: W5UFP 369, VXR 287, PXI 281, PAK 219, TFB 189, OLG 184, BHK 150, RRM 121, VFH 112, LEZ 31, WHE 31, SRQ 20, ASA 17.

OKLAHOMA — SCM, Jesse M. Langford, W5GVV — SEC: AGM. RM: MQI. PAMs: SVR and ROZ. This month saw the License-Plate Bill pass the Legislature and become a state law after being signed by the Governor. The Norfolk Club hamfest and picnic was well attended and Orrin Gatlin presented the E. C. members with state civil defense certificates. Jay Thompson, Sayre, is building up a Viking II while waiting for his license. KY and SWJ are appearing in a movie to be used in the Tulsa Community Chest drive. KY now is on with a new Viking. COA, one of the original El Reno hams, passed away recently. VLW received his WAS certificate, earned in ten months on 80-meter c.w. with only 25 watts. SCX is running 2 meters ragged with schedules into Texas daily and reports the following Oklahoma stations active on 2 meters: HXK, HXL, AJZ, YPJ, and IOW. The Caravan Club of Oklahoma reports rapid growth, with 36 members now active. TFP now is using a 75A-2. ORH entered the last Frequency Measuring Test. TKS now is limited to 800 watts until the 304TL final is rebuilt, but has worked 25 Canal Zone stations and received certificate for same. VHP will be operating portable from Colorado Springs during July and August. EHC is using semi-vertical doublet on 7 Mc. and reports good results. MQI will hold skeds with his son on c.w., courtesy of NLZ, who built them a new transmitter. Traffic: (May) W5GZK 870, SWJ 137, KY 133, TKS 117, MFX 100, PML 84, SVR 71, TFP 62, MQI 61, TLL 50, PA 41, GVV 40, ORH 38, OFG 31, RST 29, VNC 24, ITF 21, NWJ 21, TKS 13, UGO 12, TKE 4, VHP 4, EHC 3. (Apr.) W5PA 64. (Mar.) W5PA 11.

SOUTHERN TEXAS — SCM, Dr. Charles Fermaglich, W5FJF — Hats off to the Austin gang for promoting the

(*Continued on page 98*)

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Single Sideband Exciter SS-75

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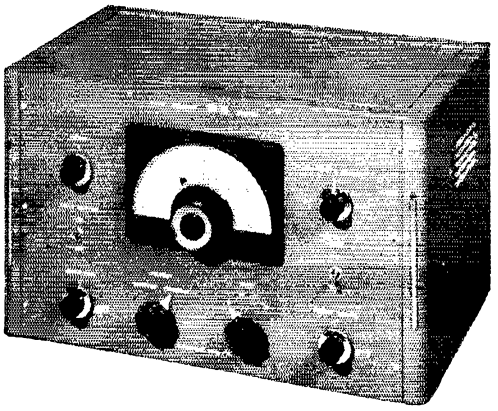

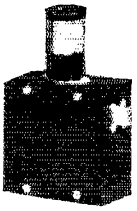

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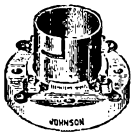

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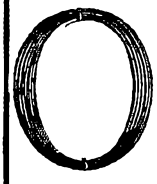

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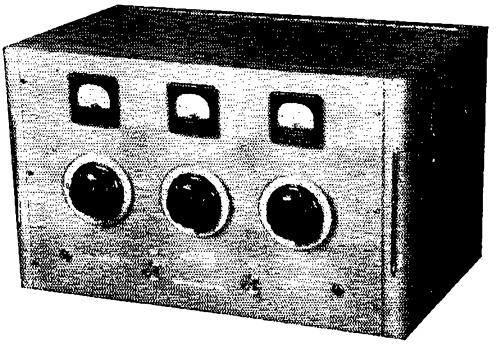

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license plates with our call letters. Looks like only mobiles will be able to obtain these special license plates so if you want your call letters on your license plates you best go mobile. It shows that together we can get a job done. Read my editorial in the last *HARC News* on "Our Fraternity." I hope you all agree with what I said because that is what we need to do to stay free Americans and privileged hams. FEK reports that FSC worked 5 states on 2 meters within 14 hours and with only 7 contacts — Tennessee, Louisiana, Texas, Oklahoma, and Mississippi. PZS handled Waco emergency traffic. He is moving to Wichita Falls. Some of the Houston gang are teaching various phases of c.d. communications. Some of these are RPW, RWS, AEQ, ADZ, KFY, and QJS. A new Gulf Coast Storm Net has been formed, which meets Thurs. at 7:00 A.M. on 1808 kc. but may move to 2 meters. It intends to cover from Brownsville to Orange 50 miles inland. MWN is temporary NCS. GCSN has no constitution or by-laws. It is not a social net and is not used for visiting. It is strictly business. There are stations in Woodsboro, Refugio, Rockport, Corpus, and Victoria. STEN had an FB conference and convention in Kerrville. We all had a swell time and STEN decided to handle emergency weather reports for the U. S. Weather Bureau. The new STEN officers are N.C., KBU; Alt. N.C., QEM, secy.-treas., FIW; P.R.O., KBP. Zone 1: Z.C., NHW; Alt. Z.C., TBK and ONG; P.R.O. RWX. Zone 2: Z.C., MMO; A.Z.C., JN; P.R.O., RYZ. Zone 3: Z.C., LVE; A.Z.C., PTR; P.R.O. ORG. Zone 4: Z.C., OKL; A.Z.C., YJB and KSW; P.R.O., NES. Zone 5: Z.C., QDH; A.Z.C. NNB; P.R.O. REM. C.W.: Z.C., BE; A.Z.C., GUW; P.R.O., ABQ. WKL is on 75 meters with a TCS; he also is on 2 meters. He checks into MARS and has a new mobile rig. FJF is back on c.w. after several years. He is checking into the STEN C.W. Net. His fist is a bit rusty but he expects to get into shape soon and donate most of his spare time to operating 75, 40, and 20 meters. 'phone and c.w. He is planning to go v.h.f. also. Listen for his new mobile. Traffic: W5MN 1180, PZS 28.

NEW MEXICO — SCM, G. Merton Sayre, W5ZU. RM: NKG. PAM: BIW. Approximately 250 attended the Third Annual New Mexico State Ham Picnic at Bottomless Lakes State Park near Roswell on May 23-24. The Pecos Valley ARC did an excellent job of arranging for activities, including an exhibition of the latest communication equipment put on by Lt. Carson and personnel from White Sands Signal Corps Agency at White Sands Proving Ground. RTT schedules were maintained and all transmitters were available for licensed ham operation as K5WSP. The pole-setting exhibition was particularly enjoyed. RWH won the hidden transmitter hunt and RZS the mobile competition. QD and QKA handled prize drawings. The Sandia Base Radio Club officers are PTF, pres.; UWA, vice-pres.; RQK, secy.; 2GXZ/5, treas. OIA is enjoying new Collins 32V-3 and 75A-3. A complete report is not available on the number of stations assisting with San Angelo and Waco tornado traffic, but nets on 3633 and 3838 kc. and MARS nets were active in New Mexico. The following are believed to have handled traffic: BIW, CEE, DRA, K5FBF, K5FEE, FRP, GGO, JZT, KBP, MOX, NJR, NKG, K5NRX, NSN, OIA, PGJ, PXA, QKA, RNT, RWH, SNZ, TBA, UAR, VHW, WPA, and ZU. Your new SCM invites applicants for ARRL appointments, and especially wants monthly reports on your activities. Traffic: W5JZT 128, ZU 22, OIA 7.

CANADIAN DIVISION

MARITIME — SCM, A. M. Crowell, VE1DQ — SEC: FQ. EC: EK. RM: OM. The Maritime 'Phone Net, which meets nightly, is the best outlet for your traffic. ARRL net certificates are being issued to all regular net members. The recent social evening and lobster supper for HARC members, wives, and YLs at the summer QTH of LZ proved to be a very happy event. KM, recently posted to the U.K., was presented with a small token of the esteem in which he is held by the gang. Recent visitors to the city were ex-NN, VN, ABB, and VE3AMK. New calls around here are IL, GZ, and ACC. Congrats to our president, OM, and his XYL on their wedding anniversary and to HJ, SP, ZR, and BK on their graduation from N.S. Tech. FRAC notes: LX lost his antenna. PF seems to be the antenna putter-upper. WB has skeds with UT. TVitis will be the subject of a talk at an early FARC meeting. NRC officers are VO1RG, pres., VO1J, vice-pres.; VO1D, secy.; W1QDM/VO1, treas. This, a new club in VO1-Land, has some very FB plans and aims for the future. The club station, VO1NR, will be on soon. The membership is now 42 and ARRL affiliation has been requested. Traffic: (May) VE1FQ 161, AAW 38, GG 30, ABZ 6. (Apr.) VO6U 241, VE1FQ 190, VO6B 89, VE1OM 14, VO6AB 10, VO6R 9, VE1DB 6, VO6T 2.

ONTARIO — SCM, G. Eric Farquhar, VE31A — During the recent tornado in Sarnia and vicinity ham radio played an important part in getting word regarding loved ones to an anxious world. DF and DZ operated rigs from the area. These stations were set up within an hour after the twister struck. Their calls for assistance were answered by CP, IL, KM, NG, RU, UJ, NO, and many others who, unfortunately, must go unnamed from this quarter because, as is so often experienced by news-gatherers, no information

(*Continued on page 100*)

is available. To all taking part, may we say "well done." Another nice piece of work done by amateur operators, this time in the confines of the City of Toronto, was the extensive search for three missing children. The Nortown Radio Club, cooperating with the city police, provided communication via mobiles in the extensive search. Those taking part were AIB, AXM, AZX, BUO, BBM, BRI, BYZ, DFC, DFA, DGX, DHG, DNA, DQW, DQX, DLS, EAD, HZ, NG, KW, NO, RU, UU, and VE7KU/3. DNE, a newcomer to Hamdom had 104 contacts and broke into traffic-handling to boot. VD moves traffic with five watts. We welcome DSM to the game. DIG, now located in Hamilton, looks for antenna space. VZ chases gremlins which locate in 813s. EAB reports an increase in 2-meter activity. FN is a new Toronto outlet on OSN. The annual dinner-dance held by Nortown was a success. Congratulations to ATR in heading the traffic list for the month. May we ask you fellows to let your SCM know your doings, whether they seem small to you or not. It is the only way we can make a contribution to the column. Traffic: VE3ATR 300, IA 135, CBR 115, BUR 107, KM 77, BJV 47, AJR 20, VZ 11, VD 9, DFE 5, AUU 3, BSU 3, DNE 1.

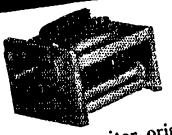
QUEBEC — SCM, Gordon A. Lynn, VE2GL — Keep in mind the Eastern Canada ARRL Convention to be held Sept. 19th in Victoria Hall, Westmount, Montreal, sponsored by the Montreal Amateur Radio Club. EC sends his report of activities in Three Rivers. CA reports conditions variable so traffic is low, although 5 VKs and 1 ZL were worked during the month. The South Shore ARC held a successful spring dance in Masonic Temple, St. Lambert, May 23rd with 110 hams and friends present. MG has been appointed as EC for Verdun, replacing QY, who has changed QTH to Drummondville. AEW has a Hammarlund HQ-129X receiver. ZF again is working portable from his place in the Laurentians. DR finds gardening interferes with radio but manages to get on for week-end DX and occasionally for traffic. Traffic: (May) VE2EC 11, GL 2. (Apr.) VE2DR 67.

BRITISH COLUMBIA — SCM, Peter McIntyre, VE7JT — Mobile operators are out in force with bi-monthly trips and outings planned. New mobiles heard lately are AHP and ABD. Those of you who will be operating in the U.S.A. are reminded to make certain you comply with the FCC regulations of band operation and notification of the proper FCC district engineer of the district in which you will be operating mobile. As of June 1st, AD, of Victoria, has been appointed EC of District No. 1. Congratulations to 7QC, of Merritt, who was the recipient of the annual cup award of the BCARA as the amateur doing the most for amateur radio in 1952. He keeps possession of the large trophy for one year and receives a small miniature for permanent possession. We would also like to say "well done" to HR, our QSL Manager, and HI, the other nominees for the cup award and want to let them know that their effort for the amateurs is not going unnoticed. The TVI committee is in operation and is acquiring the necessary equipment. I would like to hear from all the clubs in British Columbia as to their activities and any pertinent data pertaining to amateur radio in the Province. Your SCM attended the recent Oregon Amateur Radio Assn. Convention held in Salem, Ore. A to-the-point talk by WØTSN, the ARRL president, gave hams a great deal to think about. Traffic: VE7TF 218, QC 70, AA 26, JT 24.

SASKATCHEWAN — SCM, Harold R. Horn, VE5HR — QL is the new PAM, gang. Your coöperation and assistance when called on will help Jim considerably. If you will be off the net, or wish to drop out, please let the PAM know, so time can be saved on roll call. Will some one volunteer for Section Emergency Coördinator? Please let me know. BZ, who has done a good job, wishes to be relieved of this important office because of other activities. KD is a new call at Raymore and PF is new at Choiceland. ES visited the Saskatoon boys with his XYL and mobile. NC and CO made some W contacts during openings on 50 Mc. during the month. JO works 14 Mc. with a 6146 running 40 watts. Traffic: VE5PJ 16, DS 8, HR 7, DD 6, FG 6, GI 6, RE 6, MX 4, GO 2, VL 2.

NEWARK'S Page of Values!

VARIABLE CAPACITOR BUY!



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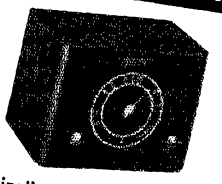

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90G102. BT-1. Metal Cabinet..... **9.95**

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54G028	2	1500	1.39	- - -
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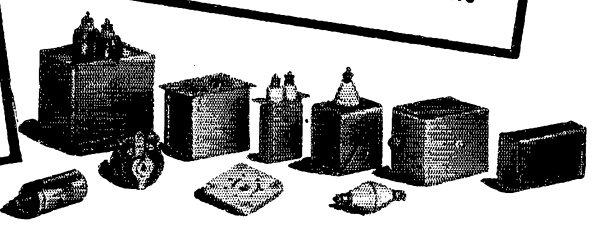

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2 Mfd. 600 VDC. General Electric Pyranol-filled capacitor. Flange type mounting. Ceramic pillar terminals, 10/32" studs. Size, 2x2¾x1". Wt., 1 lb.
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Feed-thru Insulator. Double cone high glaze ceramic insulator. 1¼" diameter. Mounts with 1" above chassis. Complete with 10/32" threaded rod, washers, and nuts. Wt., ½ lb.
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Low-loss Steatite Socket. For 829B/-3F.29 or 832 tube. Center has large cooling hole. Less shield Base. Mfd. by Johnson. 2" mtg. centers. Wt., ½ lb.
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Order from Department T-8

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223 WEST MADISON STREET • CHICAGO 6, ILLINOIS

Strays

In a purely coincidental issuance, W1OAK's dachshund "Wiener" sports dog-license number 73 in Barre, Vermont.

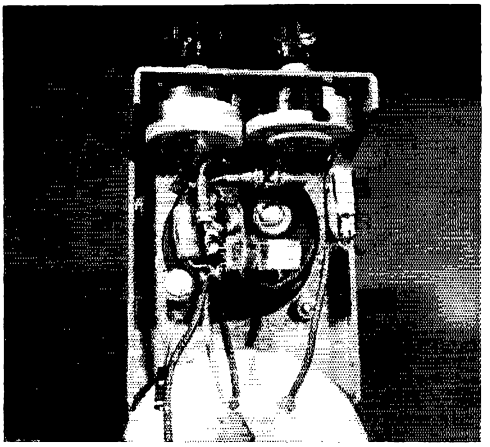
—•••—

From *Skip,* organ of the Fresno Amateur Radio club, in its pep announcement of W6TO/6's Field Day effort: "There will be a TV set on the hill so that operators, relaxing when off watch . . . will have something to enjoy." The supply of sledgehammers, we presume, was ample enough to go around.

—•••—

Ubiquitous is the word for amateur radio. WN3VBP writes that the call sign W6ROS appears on the radio-shack set of TV skit "Time for Beanie," while W6SJJ spotted amateurs EI5AB and PK4M in the "Wash Tubbs" comic strip.

—•••—



Clarence A. West, W2IYG, has developed what he believes to be the smallest grid-dip oscillator ever built. His experimental electronic test instrument is built around a single RCA-2N33 point-contact transistor and is powered by a miniature 22½-volt hearing-aid battery. The complete unit, together with power supply, is contained within a metal case measuring 5 by 2¼ by 2¼ inches and its total power consumption is only 25 milliwatts. Mr. West is an engineer for the Radio Corporation of America.

Answer to* QUIST QUIZ *on page 49

A is correct, although he overemphasizes the importance of the "losses." A properly designed and adjusted antenna coupler will dissipate a little power in the coil, because the coil has some resistance, but the loss should never exceed 4 or 5 per cent of the total power. A loss of this order will have no detectable effect on the signal strength. Antenna couplers provide great flexibility in coupling to various antenna systems, help to discriminate against harmonics, and using a coaxial link line between coupler and transmitter offers a convenient spot for a low-pass filter.

Neither the antenna coupler nor the swinging link should heat appreciably during a transmission — if they do, they are either inadequately designed or improperly adjusted. Heating is always a sign of loss in any r.f. circuit.

Uncle Dave's Radio Shack

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FORT ORANGE RADIO DISTRIBUTING COMPANY

24-Hour Service
ON ALL STOCK ITEMS

We Can't List Everything

Write UNCLE DAVE—He's Got It!

Collins 32V-3 Transmitter

$775

VFO Controlled, Bandswitching, Gangtuned. Covers 80, 40, 20, 15, 11 and 10 meters; 150 watts CW; 120 watts phone; entire RF section enclosed in metal shield. (In Stock)

COLLINS 75A-3 RECEIVER **$550**
With Mechanical Filter and Speaker

EXTRA SPECIAL

Heavy Duty
ANTENNA ROTOR
Very Popular National Brand
WITH 75 FEET OF 4 CONDUCTOR CABLE
A REAL BUY **$29.95**

MOBILE TRANSMITTER KIT

STANCOR
ST203A
$36.50

72 ohm KW
Transmission Line
9c per ft.; $5.00 per 100 ft.

VIKING MOBILE TRANSMITTER KIT

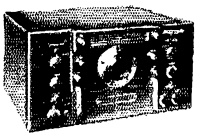
$99.50 Amateur Net

In Stock for Immediate Delivery

ELDICO TR-75-TV TRANSMITTER KIT

The ideal novice transmitter. New TVI circuit. Uses 6L6 as oscillator and 807 amplifier to PI Network output. **$64.95**

NATIONAL HRO SIXTY



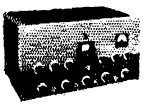
$483.50
Matching Speaker $16.00

Here's the latest and the greatest of the famous National HRO series! Features dual-conversion plus 12 permeability-tuned IF circuits!

NC 183-D (Less Speaker) $369.50
NC 125 (Less Speaker) $149.50
SW 54 (Complete) $49.95

USED EQUIPMENT — Send for Demonstrator and Used List

JOHNSON VIKING II



Kit, complete with tubes—less crystal, key and mike **$279.50**
(In Stock)
Wired and Tested $334.50

SONAR SRT 120 TRANSMITTER

All bands 120 watts CW, 100 watts phone.

Switches to all six bands. TVI suppressed, with 10 tubes.
Less Power Supply **$198.50**

SONAR MR-3	(Complete Mobile 5 Band Receiver)	$89.95
SONAR SR-9	(Mobile Receiver)	$72.45
SONAR MB-26	(Mobile Transmitter)	$72.45

Mobile Season Is Here!

MASTER

Mobile Antennas and Mounts
2, 10, 20, 40, 75
IN STOCK FOR IMMEDIATE DELIVERY
Send for Circular

SPECIAL

Electric "HAM" Clock 24-Hour with GMT Indicator **$11.95**
Regular $15 — Just a few left at this price

Sure We Take Trade-ins **TOP ALLOWANCE**

JULY SPECIALS
Demonstrators

Sonar SR9	2 Meter Receiver	$57.50
Sonar MB26	2 Meter Transmitter	$57.50
National SW54	Receiver	$42.50
Harvey-Wells TBS50D	Transmitter	$119.95
Harvey-Wells APS50	Power Supply	$34.50
Hallicrafters S76	Receiver	$149.95
Hallicrafters S77	(AC-DC Version of S40B)	$99.00
Hallicrafters S40B	Receiver	$109.00
Gonset	2 Meter Converter	$33.95
Gonset	Marine Converter	$33.95

MOBILE SPECIAL!

Single button carbon hand mike. Complete with cord and plug. Finest made. While they last, Post Paid **$3.75**
Dozen $36.00

FOREIGN TRADE SOLICITED

EXTRA SPECIAL

NATIONAL HRO-60 Demonstrator (Complete) **$450.00**

COLLINS DEMONSTRATOR MODELS ALSO AVAILABLE — WRITE FOR DETAILS

Fort Orange RADIO DISTRIBUTING COMPANY

904 BROADWAY, ALBANY, N. Y.
TELEPHONE ALBANY 5-1594

R.F. Amplifiers

(Continued from page 16)

weak-signal readability. The change for the better is very slight, however, as the principal result of installation of the preamplifier has been to make it easier to hear the noise being picked up by the antenna. Apparently, on 144 Mc., as on 50 and 28 Mc., there appears to be little point in going below about 6 db. or so in noise figure,[4] though it is reassuring to know that you can "hear the antenna."

The 6AJ4 and 6AM4 were both tried, individually in each stage, and together in both stages, but no measurable difference in noise figure could be found between them. If the amplifier is adjusted at 146 Mc., it will not be necessary to change it in tuning from 144 to 148 Mc.

Results with the 420-Mc. amplifier were more rewarding, for we still have quite a way to go on this band to reach the ultimate in front-end performance. The best we've done heretofore was a noise figure of about 12 db., obtained with the 6J4 amplifier.[1] The 6AJ4, when used ahead of a crystal-controlled converter having a crystal-diode mixer, showed a gain of 17 db. over the crystal mixer alone, and it improved the signal-to-noise ratio of the system by more than 10 db. Tests with the noise generator show a noise figure of under 6 db. for the 6AJ4 amplifier. Admittedly this may be on the optimistic side, but signal-to-noise measurements, both in the laboratory and on the air, bear out the 6-db. improvement over the 6J4.

If you're straining for the weak ones (and what v.h.f. enthusiast isn't?) that improvement helps!

[4] "External Noise at 28, 50 and 144 Mc.," *QST*, Oct., 1950, p. 33.

Negative Feed-back Modulation

(Continued from page 19)

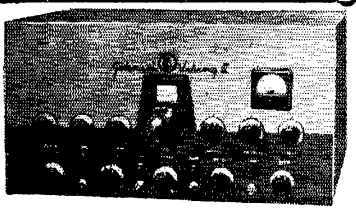
lation system that has admitted nonlinearities and yields questionable results. It should be particularly applicable to portable and mobile rigs where the weight and power requirements of Class B modulators are a decided handicap.

In the experimental unit, it was not possible to obtain complete linearization after the modulation level reached around 90 per cent. This is not an inherent limitation in the general scheme but simply indicates that, in this particular unit, the closed-loop compensation is stretched to the breaking point at this modulation level.

Strays

Associated Police Communication Officers, Inc., a group that includes many prominent amateurs, will hold the 19th Annual Conference of APCO on August 25th–28th in Detroit. The 25th anniversary of practical mobile police radio will be celebrated at the same time. All amateurs associated with police communications are invited to attend; the ladies, too, are welcome.

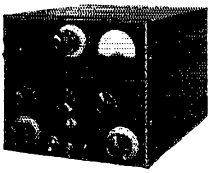
Lafayette for High Voltage BARGAINS!



NEW! JOHNSON VIKING II

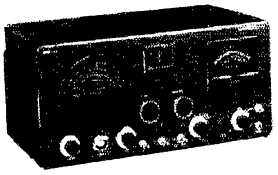
The Johnson Viking II transmitter kit incorporates all the desirable features of its predecessor plus those required for effective TVI suppression. 100 watts output on phone and 130 watts on CW on all bands 160 thru 10 meters. New final amplifier uses parallel 6146 tubes. All parts supplied, including 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**

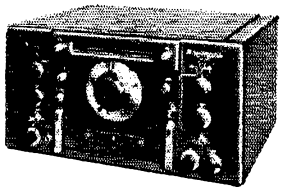
JOHNSON MOBILE TRANSMITTER KIT



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

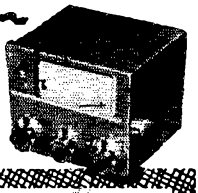




Lafayette has been the Headquarters for fine communications receivers for 32 years. All the latest models are available as soon as released by the manufacturers. Be sure to check Lafayette before you buy your new receiver.

HALLICRAFTERS		NATIONAL	
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! STANDARD BRAND

Better than 60% off

Made by leading tube manufacturers. Individually boxed in STANDARD BRAND boxes. Fully guaranteed. Available only from New York Mail Order Division

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**

Most popular sizes for radio and TV. Famous brand. All fresh, new stock. Input voltage 130 volts. You can't go wrong at these prices.

SELENIUM RECTIFIER

Lots of 10

RE-12, 65 MA., ea. 59c..... 57c ea.
RE-14, 75 MA., ea. 62c..... 59c ea.
RE-10, 100 MA., ea. 77c..... 72c ea.
RE-11, 250 MA., ea. 1.25..... 1.19 ea.
RE-13, 400 MA., ea. 1.59..... 1.52 ea.

Lafayette Radio

FAMOUS IN RADIO FOR 32 YEARS

NEW YORK, N. Y.	100 Sixth Ave.
BRONX, N. Y.	542 E. Fordham Rd.
NEWARK, N. J.	24 Central Ave.
PLAINFIELD, N. J.	139 West 2nd St.
BOSTON, MASS.	110 Federal St.

Eighty Watts

(*Continued from page 22*)

The meter is mounted behind the panel as a safety measure. It is held in an aluminum bracket, with the face of the meter flush with the front edge of the chassis. The meter should be placed so that its center comes about 7 inches from the left-hand end of the chassis, and the center of its scale about 5½ inches up from the bottom edge. The meter-scale opening in the panel is cut out to fit the inside dimensions of a National CFA chart frame. If desired, a hole can be drilled in the panel to give access to the zero-adjust screw of the meter. A similar chart frame, centered 3½ inches below, helps to balance the panel layout and is very useful for logging the multiband-tuner settings for the various bands, since it is not too difficult to tune the amplifier up on a harmonic, instead of the desired fundamental, without realizing it.

The two power switches are placed either side of a line running through the two multiplier controls, and the rotary switch, S_3, is centered on a line between the two amplifier controls. These three switches are mounted 1½ inches up from the bottom edge.

Panel bearings for the controls are not used, the short extension shafts riding in ¼-inch holes, reamed out just enough to provide free turning without excessive play.

Holes lined with rubber grommets are drilled in the chassis to pass the power leads to the three units. R.f. connections between the VFO output and the multiplier input, and between the multiplier output and amplifier input are made with RG-59/U coax cable in lengths as short as possible to minimize capacitance and yet provide shielding. The plugs that fit the shielded 'phono jacks can be easily attached to the ends of the RG-59/U by baring the center conductor so that it will extend through to the tip of the plug, and fraying the braid out around the shell of the plug, and soldering. Be sure, however, to leave enough of the inner insulation so that the inner conductor does not short against the grounded shell. After the cables have been carefully made up, it would be well to check for short-circuits with an ohmmeter.

The filter and audio chokes can be seen in the bottom-view photograph. The filter condensers are also mounted under the chassis, supported at each end on terminal strips. The biasing battery is held in place with a simple clamping arrangement. A pair of 2-inch machine screws are spaced slightly greater than the width of the battery. They are fastened permanently in place with nuts. An aluminum cleat with holes to fit the machine-screw spacing is held down with nuts and lockwashers at the bottom ends of the screws.

The cabinet shown is a Par-Metal DL-128. A hole is cut in the left side, toward the rear, to line up with the connector in the VFO unit for the remote-tuning cable.

(*Continued on page 108*)

Bob Henry says

"Some things call for a specialist!"

When it comes to amateur radio apparatus deal with the man who knows . . . BOB HENRY

Bob's a radio ham himself—and he's built his hobby into a nationwide business. All his experience and "know how" are at your service. He sees to it that you get speedy delivery—complete selection—a time-payment plan tailored to your needs—and a really liberal trade-in allowance. Yes, Bob knows the wants of the radio ham or hobbyist —and he delivers! Write, wire, phone or visit either store today.

SOME ITEMS IN STOCK ARE:

Collins 75A3 (speaker $20.00)	$ 530.00
Collins 32V3 $775.00; 35C2	$ 40.00
Collins 70E-8A	$ 97.50
Collins KW1 xmitter	$3850.00
Hallicrafter S53A $89.95; S38C	$ 49.50
Hallicrafter S72L $119.95; S72	$ 109.95
Hallicrafter S76 $179.50; S40B	$ 119.95
Hallicrafter SX62 $299.50; SX71	$ 224.50
Hallicrafter HT-20 xmitter	$ 449.50
Hallicrafter TW1000 portable	$ 149.50
National NC88 $119.95; SW54	$ 49.95
National NC183D $369.50; NC125	$ 179.95
National HR060	$ 483.50
Hammarlund HQ140X	$264.50
Johnson Viking II (wired $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
Harvey-Wells VFO $47.50; APS50	$ 39.50
Lysco 600S $189.95; Lysco 600	$143.95
Babcock MT5A	$ 99.50

Prices subject to change. Some prices higher on west coast.

Johnson, Gonset, Elmac, Babcock, Morrow, Eldico, Lysco, Hallicrafters, National RME, Millen, Master Mount, B&W, RCA, HYlite, Bud, Vibroplex, Eimac, all others.

First with everything for the radio amateur

HENRY RADIO STORES

"LARGEST DISTRIBUTORS OF SHORT WAVE RECEIVERS"

TWO STORES: Butler, Missouri & 11240 West Olympic Blvd., Los Angeles 64, Calif.

Adjustment

Adequate drive is obtained with the VFO screen operated from the tap between the two VR tubes in the VFO unit (approximately 108 volts). With a fixed bias of 45 volts and a 12,000-ohm grid leak, grid currents in excess of 3 ma. should be obtainable on all bands. It should be limited to 3 ma. by detuning the multiplier unit. If the power supply shown is duplicated, the high-voltage supply should deliver 550 volts under a load of 150 ma. plus bleeder current, making the operating input to the amplifier a little over 80 watts. For 'phone operation, the 40-watt 6L6 modulator shown in the last several editions of *The Radio Amateur's Handbook* should be just about right for this transmitter. The modulation-transformer secondary should be set for 5000 ohms, and the plate current under modulation should be limited to 112 ma.

Rig R. F.-Tight?

(*Continued from page 80*)

and does not require pre-drilled tapping holes.

The resistor-mounting strip at the rear was shielded with a separate aluminum box. In addition to this shielding and the low-pass filter (with coax fittings replacing the normal antenna feed-through terminals) which W2IMM had already installed, we added 0.001-μfd. disk-ceramic capacitors to all eight power leads, microphone and push-to-talk leads, and key lead. With these changes, W2IMM is now able to operate on 10 meters on the same table with a TV set tuned to Channel 2. The only alteration on the TV set was the addition of a high-pass filter in its antenna leads. There is no noticeable TVI.

If you have not had TVI troubles to date, naturally you may have only a casual interest in the cures used by others for the disease that might put them off the air. But the spread of more-sensitive receivers in fringe areas on the one hand, and the very human desire to build a bigger and more-powerful rig on the other, may suddenly put any one of us face to face with TVI. This may be particularly true if you have been operating in the v.h.f. bands and find you are interfering with stations starting to operate on u.h.f. bands.

We want to state most emphatically that, while electronic weatherstripping is no panacea for all of your ills, military experience has amply demonstrated that it is a sure, simple and inexpensive aid in keeping your loose r.f. inside your rig — and putting you back on the air and in the good graces of your neighbors.

—•••—

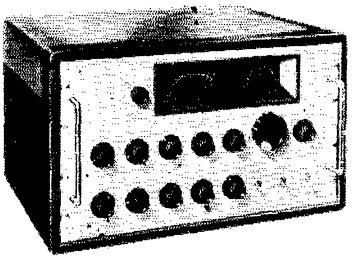
[NOTE: TVI-20-S weatherstripping is being made available through Allied Radio in Chicago, Harrison Radio in New York, and Radio Shack in Boston. — ED.]

If You Want More in a Receiver . . .Xmtr . . . Converter . . .You'll Want This FB Ham Gear

New at Harrison

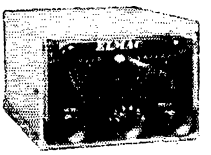
hallicrafters

Model HT-20 Transmitter



TVI-suppressed. Spurious output not less than 90 db below 100 watts on all frequencies above 40 mc. Continuous coverage from 1.7 to 31 mc (160 thru 10 meters). 100 watts phone or 115 watts CW. Full band-switching. Has 10 position crystal and external VFO input. All stages metered – single meter with 6 position meter switch and output tuning indication. Crystal mike input. PP 807 modulators and 4D32 final amplifier. For 105-125V., 50/60 cycles. With tubes and instructions $449.50

● HARRISON HAS IT! ●



ELMAC 6-BAND RECEIVER

10-tube dual conversion receiver covers 160 meters and broadcast, 80, 75, 40, 20, 15 and 10 meters. 10 tuned circuits provide high selectivity. Built-in noise limiter and BFO. Requires 6V AC or DC at 3.3A; 250V DC at 90 ma. 4½x6x 8½" D.

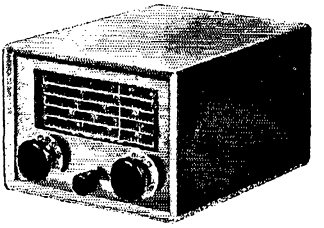
PMR-6A **$134.50**

Power Supply for 6V DC.
PSR-6 ..... **$24.50**

Power Supply for 12V DC.
PSR-12 ..... **$24.50**

Power Supply for 115V AC.
PSR-116 ..... **$24.50**

MORROW 5-BAND CONVERTERS

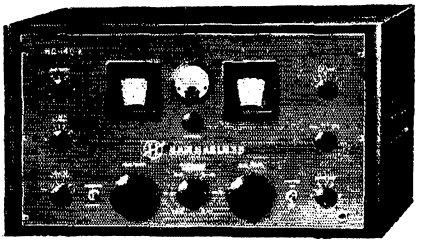


Covers 10, 11, 15, 20, 40, 75 and 80 meters. Temperature compensated Clapp oscillator for low drift performance. Better than ½ microvolt sensitivity. Built-in automatic noise limiter. Antenna trimmer on front panel. Input: 6V. filament; 100V. @ 16 ma. With tubes and instructions.

Model 5BR **$74.95**
Less Noise Limiter **5BRLN**.... **$69.95**

NEW HAMMARLUND HQ-140-X RECEIVER

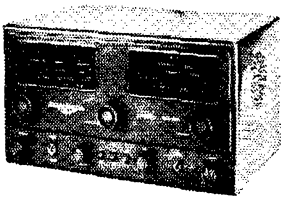
For the amateur who wants a professional quality receiver, moderately priced. Covers 80, 40, 20, 15 and 10 meter bands with calibrated bandspread. New circuit design features more efficient separate oscillator and mixer giving better stability. Uses 6BA6's for RF amplifier and all 3 stages of IF. New series type noise limiter. 6-position crystal filter. Single wire or balanced line antenna input. With tubes and instructions.



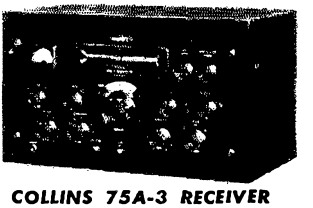
HQ-140-X $264.50
Matching Speaker..$ 14.50

HARRISON HAS IT!

NEW NATIONAL NC-88 "World Master" RECEIVER



A great new receiver that tops them all for value! Calibrated bandspread for 80, 40, 20, 15, 10 meter bands. Covers 540 kc to 40 mc in 4 bands. Has tuned RF stage, two IF stages and two high fidelity audio stages with phono input. Built-in speaker, noise limiter, separate high frequency oscillator **$119.95**



COLLINS 75A-3 RECEIVER

Featuring sensational new Collins mechanical IF filter. Gives a practically straight-side, flat-topped selectivity curve! Plug-in provision for two mechanical filters. 3 kc filter standard equipment. 800-cycle plug-in unit available as optional accessory for greater selectivity on CW. Double conversion superhet covers 160 thru 10 meter bands. Accurately calibrated directly in 1/10 mc. Here's a natural for the SSB operator! With speaker. In Stock! **$550.00**

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Magnetostriction

(Continued from page 35)

parts are so small that it takes a natural born watchmaker to work with them, and any small inaccuracies in machining have greater effect. Also, coils small enough to operate well on very small resonators are not so easy to make with a reasonably high *Q*.

Conclusion

It is believed that mechanical filters offer the possibility of obtaining performance beyond anything that tuned circuits can give, but their development is as yet far from complete. In fact, it should be fairly evident that "the surface has hardly been scratched" as yet. It is only hoped that enough has been described to help anyone with perseverance and suitable equipment to get started on what may at present best be considered as a fascinating and challenging hobby. Let there be no mistake about it, there still is no easy way to build an ideal filter for practical use in a hurry!

—•••—

[EDITOR'S NOTE: We understand that ferrite magnetostriction resonators for operation at approximately 100 kc. are now obtainable. Inquiries should be addressed to General Ceramics and Steatite Corp., Keasbey, N. J.]

"Plain Ground-Plane"

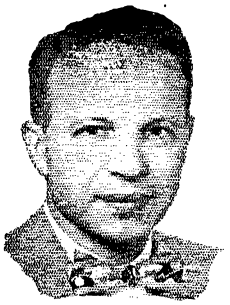
(Continued from page 37)

The next step is the radials. Take four 10-foot 1¼-inch diameter TV mast sections and telescope them together in pairs to form two 20-foot lengths. Then roughly mortise the centers by pounding them on a short length of 1¼-inch diameter steel pipe. The two 20-foot sections so formed will cross and yet remain in the same plane, as shown.

The braces for the radials are made out of 5-foot pieces of TV masting. They prevent vertical play that would put strain on the 2 × 4 where it naturally has been weakened by the 1¼-inch hole. (It was W2HGT's idea to bolt a reinforcing block to the 2 × 4 at this point, as shown).

Pound flat one end of each of the four braces. These will be the lower ends of the braces. Then proceed to make the two braces for the radial that does *not* pass through the 2 × 4. Start by drilling holes in the flattened ends of two of the braces and slipping them over the bolt placed in the 2 × 4 a few feet down from where the radials cross. It can then be seen that the upper ends of these two braces must be flattened in a plane at right angles to the plane into which the lower ends were flattened. When this is done, the next move is to hammer the upper flattened ends back at an angle to make them parallel to the radials. Then place the upper ends of these braces upside down and lengthwise on that same short piece of steel pipe and round them with a ham-

(Continued on page 112)



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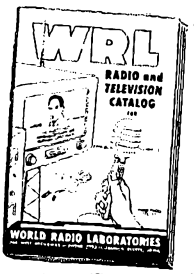

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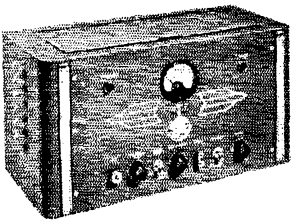

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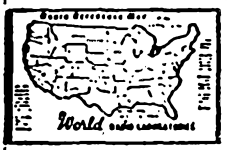
Signed C. L. Meistroff.
W4TFA

RADIO REFERENCE MAP



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mer to fit the cylindrical undersurface of the radials.

The other two braces are shaped in the same manner — except that both ends of each must be flattened in the same plane. Also, it is necessary to angle the lower ends of the latter two braces to make them lie flat against the 2 × 4. Don't drill the bolt holes through the lower ends of the last two braces — nor through the upper ends of any of the braces — until you have each end properly shaped and fitted. You will find that angling and shaping the braces will throw prematurely-drilled holes out of line. As soon as each brace is shaped and drilled, the proper point for the corresponding bolt holes in the radials themselves can be determined and drilled.

The guy wire from radial to radial prevents horizontal play. We used galvanized baling wire salvaged from bundles of asphalt shinges. Any weather-resistant wire that won't stretch will do the job.

Along about this point on our first antenna, DeCamp barged into the back yard, slide rule under his arm. We produced the sheaf of calculations that had taken us several hours and told Bob we figured from his formulas that in order to use 70-ohm coax on a ground-plane cut to the center of the 10-meter 'phone band, our 1¼-inch radials should be 8 feet 2 inches, our 1½-inch radiator should be 7 feet 6 inches and our matching stub should be 29 inches. He warmed up his slide rule and announced we were a quarter-inch off on our radiator.

Don't cut radiator or radials until the construction is complete. For only then can you measure precisely upward and outward from the point where the elements theoretically intersect (see DeCamp's article). This point is precisely the center of the bolt that holds the two long radials crossed together.

Although the "plain ground-plane" is bulky — as what antenna above 6 meters isn't? — it's easy to handle because it is comparatively light. The construction may sound complicated but, actually, it requires only a little elbow grease and a careful eye. To switch around the old saw — it's easier done than said.

P.S.: Haven't been lucky enough to be on during the fleeting moments when 10 meters is open these days, so cannot report on this antenna's DX capabilities. But W2HGT reports some nice QSOs with South Americans with his model of same — with 45 watts.

Strays

The by-line of Beverly Dudley appearing in this issue should cause old-time Leaguers a reminiscent twinge. Just 25 years ago this April Bev joined the roster of *QST* authors with an article titled "Keying Master-Oscillator Circuits." At that time, licensed as 9BR, he was with the Chicago *Evening Post* as its Technical and Radio Editor. Mr. Dudley joined the ARRL staff in 1929 and served meritoriously for several years in editorial and technical capacities.

BC-221 Frequency Meter

(*Continued from page 39*)

should be something as follows:

3500.000 kc.	200 div.
3666.667	1700
3750.000	2500
4000.000	4800

Other useful, but weaker, zero-beat check points can probably be obtained at the following additional frequencies (kc.):

3533.333	3687.500	3800.000
3555.556	3700.000	3833.333
3571.429	3714.286	3857.143
3600.000	3727.273	3875.000
3615.385	3733.333	3888.889
3625.000	3769.231	3900.000
3636.364	3777.778	3928.571

Of course, if one is available, a standard-frequency crystal with multivibrator or other harmonic generator will come in handy for making the bandspread calibration, particularly if the marker frequencies occur at intervals of 10 to 50 kc.

An incidental advantage of the bandspread arrangement is that considerably smaller effective tuning capacitance is required than that used on the general-coverage frequency ranges. As a result, the amplitudes of higher harmonics are not too rapidly attenuated, and it has been found possible to use harmonics up to at least 32 Mc., instead of limiting operation at 20 Mc., as recommended for these instruments. By making use of the fundamental frequency, and the second, fourth, sixth, and eighth harmonics of the bandspread range, the BC-221, as modified for bandspread operation, will serve to give expanded scale readings for all amateur bands up to 32 Mc., except for the 11-meter band. The latter band may be covered, without the bandspread feature, by using the eighth harmonic of the general-coverage high-frequency range of the instrument. If necessary, a harmonic generator (such as a crystal rectifier) in the r.f. output circuit can be used to increase harmonic output for this band. By adding suitable amplifiers, the BC-221 frequency meter, as modified for bandspread operation, makes an excellent basic variable-frequency oscillator for the amateur transmitter.

In conclusion, one word of advice may be in order. The BC-221 is a precision instrument whose calibration is easily disturbed. To avoid unnecessary labor in converting the instrument for bandspread operation, make sure you understand thoroughly the circuit of your meter, as given in the schematic wiring diagram affixed to it, as well as its mechanical construction. Plan all steps fully before you begin operating on the instrument in any way. Finally, if you value your present BC-221 meter, do not undertake to make the modifications described unless you are competent with a slide rule as well as with a soldering iron. Like an alarm clock, the BC-221 is easier to take apart than to get operating properly.

Antenna Coupler

(Continued from page 42)

to the output terminals of the antennascope. Couple the input terminals to a grid-dip oscillator or other low-power variable-frequency r.f. generator. Set the antennascope dial at 50 ohms and the r.f. generator to the frequency of one of the antennas to be checked. Adjust the coupling or output power of the r.f. source for approximately full-scale deflection of the antennascope meter. Connect the feed line of the antenna to the proper coil of the coupler, using some trial degree of coupling. Switch in the proper link on the coupler. Now tune the condenser of the coupler for the greatest dip on the antennascope meter. If the meter does not go to zero, increase or decrease the amount of coupling to the antenna, readjusting the tuning condenser with each change to obtain the greatest dip. When the antenna coupling that results in the lowest meter reading is found, leave this and increase or decrease the coupling of the link coil of the coupler to make a still greater dip if possible. This adjustment should bring about a complete null if the input impedance of the antenna feed line is nonreactive. If a complete null cannot be found, the antenna or its feed line need adjustment. The antennascope may be used for this purpose also. The above procedure should be repeated for each antenna to be used with the coupler, and a record kept of (1) the tap or link position of the feed line, (2) the coupler-link position, (3) the condenser-dial settings for various frequencies in each band. This record will make it possible to return quickly to the correct

Antenna-Tuner Table

Band	*Antenna*	*Feed Line Coupling*	*Coupler Link*	*Freq.*	*Cond. Dial*
10 m.	3-element beam, 72-ohm coax feed line	1-turn link ⅞ meshed at center of L_2	Maximum possible coupling to L_2	28.0 28.5 29.0 29.2	7 6 6 6
20 m.	½-wave folded dipole, 300-ohm feed line	Clipped to L_2 ½ turn each side of center tap	¾ of maximum possible coupling	14.0 14.1 14.2 14.25 14.3 14.35	63 62 60.5 60 59.5 59
40 m.	½-wave folded dipole, 300-ohm feed line	Clipped across 3 turns at cold end of L_1	Maximum possible coupling to L_1	7.0 7.1 7.2 7.3	14 13 12.5 12
75-80 m.	½-wave at 3.9 Mc. directly end-fed	One end clipped on hot end of L_1	Maximum possible coupling to L_1	3.5 3.6 3.7 3.8 3.9 4.0	86 80 74.5 69.5 65 60.5

settings when antennas are changed. (See the accompanying table for representative values of coupling.)

Don't worry if the coupler is slightly off resonance when adjusted by the above method. This

(Continued on page 118)

will be the case if the antenna feed line is not absolutely flat. Tuning the coupler slightly off resonance is necessary to produce an s.w.r. of 1 to 1 in the link line. The final amplifier of the transmitter should always be tuned to exact resonance, and loading should always be adjusted at the transmitter end of the link line so as not to upset the impedance match in the coupler, once this has been correctly set.

Exact adjustment of the links on the coupler is desirable, but not absolutely essential. Very little difference in results will be noticed if the coupling here is slightly incorrect, so if it is necessary to move the link when changing antennas, it can be returned near enough to its original position by eye. In most cases, the tightest possible coupling will be required.

It should be mentioned in conclusion that the coupler can, of course, be designed to permit operation on bands other than those mentioned. By using four times as much inductance (about twice as many turns) for L_1, the low-frequency coverage can tune to 80 and 160 instead of 40 and 80 meters. Similarly, the high-frequency coverage can be changed to tune to 40 and 80 instead of 20 and 40, or shifted toward higher frequencies to cover 6 and 10 meters, by a suitable change in the inductance of L_2. By making L_1 large enough to cover 80 and 160, it can also be made to cover 40 by shorting out about half the turns.

Silent Keys

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

W1BBK, George E. Hayward, Bridgewater, Mass.
W1BPL, Clarence C. Townsend, Branford, Conn.
W1EBB, Ernest Tryon, Lebanon, Conn.
W1DFQ, Ralph L. Buckley, West Scarboro, Me.
ex-W1UG, Joseph Derrah, Braintree, Mass.
W2JSZ, Albert L. Baker, Summit, N. J.
W6DEH, Robert I. Loudon, San Marino, Calif.
W6LJW, George O. Hamer, North Hollywood, Calif.
W6OSW, Edward G. Blosser, Willits, Calif.
W6PQS, Joseph J. Wilson, Santa Maria, Calif.
W7HJI, Frank P. McKay, Jordon Valley, Ore.
W7NVZ, Myron V. Everts, Douglas, Ariz.
W7OBL, Roy P. Greisen, Seattle, Wash.
W7PHC, William L. White, Orting, Wash.
W9EOC, Murlin D. Hoover, Bicknell, Ind.
W9GHW, Frank C. Ahlgrim, Downers Grove, Ill.
W9NWN, Glenn D. Obenchain, Logansport, Ind.
WØNHF, Emerson M. Eagleton, Canon City, Colo.
AC4YN, Reg N. Fox, Kalimpong, India

YL News & Views

(*Continued from page 43*)

Inga, YLRL Chairman for the tenth district last term, reports that to her knowledge the only other YLs in North Dakota besides herself are WØs AFK BIC CVQ DPZ DBH and HEZ. . . . Some California YLs consistently on two meters are W6s CEE FEA JMS and PJF. . . . W3RXJ, Irene, is chairman of the Washington, D. C. TVI Committee, and she has been re-elected Secy.-Treas. of the Wash. Mobile Radio Club. . . . KZ5AEE, Sis, writes that KZ5s AE CN DG DW KA LM and ML are regularly on 15 and 10. . . . OM KH6AVO writes that his wife recently received the call KH6AWL. Violet is ex-WN5UGD. . . . Among the 410 persons present at the Fresno Hamfest were W6s FEA GEV GQZ JMS KNJ LFR and PJF. W6KNJ, Betty went back home with an Elmac transmitter. . . . One of W9MGT's (Leonore) pupils in her grammar school radio class (see Nov., '52, column) has dropped the "N" from her call, making W9UDH, Marie, at the age of ten, one of the youngest YLs to have her General Class license.

Armed Forces Day

(*Continued from page 45*)

TFT WCE, W4s MOP NIS ZCA, K4NRY, K5NRL, W8s BYB NTE, W9s AKP and TCJ. Of these, W2WCE, W4MOP and W4ZCA made perfect copy.

NDS, Great Lakes, Ill., was copied by W2s JAV KLD PAI PAU, K2NRS, W3s PYW USA, K4NRY, W4OLL, W5USN, K5s AIR NRL, W9s GRW TCJ THE, WØs CIH and QHG. Of these, K5NRL, W9GRW, W9TCJ, and W9TIIE made perfect copy.

Ten stations copied NDW2, Salt Lake City, Utah. Apparently this station was not adjusted for standard shift. However, W6ITH, W6PQ, K6USN and K6USA made perfect copy and the following made readable copy: W6s CLW FLW LIJ/7 YDK, K7NRU and WØUVL.

Conditions on the West Coast appeared to be fairly good; nine stations submitted perfect copy of the broadcast from NDW, San Francisco, California. These were W6s BV DOU EV FCS ITH KY NSS OWP and ZH. Good copy was submitted by W4TAC/6, W6s AEE CLW FLW NYF SCQ and W7LQC/W7GPR.

An interesting feature was reported by W6CMQ. Official duties in the Navy prevented him from participating in reception of the broadcasts in the h.f. band. However, the text of the broadcasts was relayed to him by W6CLW on 147.85 Mc. This v.h.f. transmission was received during his absence on "automatic start" equipment. W6CMQ states "This equipment is common in the Los Angeles area. The reception of the Armed Forces Day test message by this means indicates another phase of amateur preparedness to meet emergency requirements."

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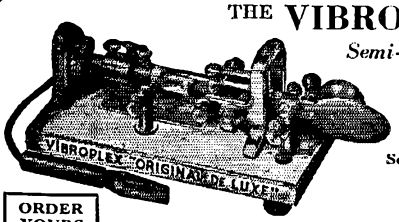

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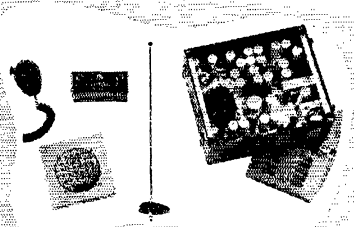

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(Continued from page 61)

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W1JDS.....28- 14- 2-B
W1LUW.....22- 11- 2-B
W1LUG.....20- 10- 2-B

W. Massachusetts

W1RFU.....4756-150-29-ABCD
W1GJO.....2071-109-19-AB
W1VNH.....660- 60-11-B
W1RVW.....658- 47-14-ABD
W2ZQA/1....280- 40- 7-B
W1JWV.....84- 21- 4-B
W1OBQ.....75- 25- 3-B
W1FKI/1.....60- 12- 5-A
W1TTL*.....2- 2- 1-C

New Hampshire

WN1WID/W1WID/1*....1272-100-12-BD
W1AZK.....637- 49-13-AB
W1LSN.....572- 44-13-AB
W1RMH.....60- 15- 4-B
W1MHL/1 (W1s PYM QMN RUD)....7317-259-27-ABC

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W1KCS.....1022- 73-14-AB
W1SGA.....516- 43-12-AB
W1KKR.....170- 34- 5-B
W1PXI.....124- 31- 4-B
W1BGM.....105- 21- 5-B

Vermont

W1MMN....120- 15- 8-B

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W7NGW.....8- 8- 1-B

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WN7SFO.....40- 20- 2-B
W7BB[4].....36- 12- 3-AB
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W6JHV.....555-111- 5-B
W6OHQ/M..370- 74- 5-B
KN6AOM (KN6AON).300- 60- 5-B

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KG6AAV/6..460- 92- 5-B
W6OTW/6...328- 82- 4-B

Sacramento Valley

W6PIV.....255- 51- 5-B
W6OTN.....200- 40- 5-B
W6MIW.....155- 31- 5-B
W6QAC.....100- 25- 4-B

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Virginia

W4AO.....972- 81-12-B
W4UBY.....270- 45- 6-B
W4BCT.....228- 38- 6-B
W4JCJ.....210- 42- 5-B
W4UMF.....155- 31- 5-B
W4OLK.....104- 26- 4-B

W. Virginia

W3PZK/8....175- 35- 5-B

ROCKY MOUNTAIN DIVISION

Colorado

WØFKY.....4- 2- 2-AB

SOUTHEASTERN DIVISION

Georgia

W4LNG/4....35- 7- 5-AB

SOUTHWESTERN DIVISION

Los Angeles

W6NLZ.....792- 68-11-ABD
W6IVW.....388- 97- 4-B
W6MMU....170- 85- 2-B
W6BWG.....105- 21- 5-AB

Arizona

W7LEE.....36- 9- 4-B

WEST GULF DIVISION

Northern Texas

W5SFW.....30- 10- 3-A

Southern Texas

W5NHB.....30- 15- 2-BC
WN5WZF.....15- 15- 1-B
W5VDA.....11- 11- 1-B

CANADIAN DIVISION

Ontario

VE3AIB....1078- 93-11-ABD
VE3AZX....528- 66- 8-AB
VE3DFW....480- 60- 8-AB
VE3AET.....426- 71- 6-AB
VE3DNX....312- 52- 6-B
VE3BAD.....210- 42- 5-A
VE3DER....210- 35- 6-AB
VE3DHG....200- 39- 5-ABD
VE3ANY.....196- 49- 4-A
VE3BBX.... 196- 49- 4-A
VE3BPB.....100- 20- 5-B
VE3DQW.....70- 35- 2-A
VE3DFM.....26- 26- 1-A
VE3DNP..... 20- 20- 1-A

* Technician.
[1] W2QOK, opr.
[2] Hq. Staff — not eligible for award.
[3] W1QON, opr.
[4] W7GXP, opr.

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., W9YIY, 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. Lectronic 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. Durrant, 5526 Parkland Court, Apt. 202, Washington, D. C.

QSL samples. Dime, refunded. Roy Gale, W1BD. Waterford, Conn.

QSLS-SWLS, as low as $1.50 per color. Samples dime. Stronberg, P.O. Box 151, Highland Station, Springfield, Mass.

QSLSL "Brownie," W3CJI, 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.

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.

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.

QSLS?? QSLS?? Mobiles? State-maps? Rainbow-maps? Largest variety QSL samples, 25¢. Sakkers, W8DED ,Ham Print Shop, 53 East 7th St., Holland, Mich.

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.

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.

QSL'S-SWL'S, samples, 10¢. Malgo Press, 1937 Glendale Ave., Toledo 14, Ohio.

W2AOA Print: Quality QSL/SWL cards. 10¢ samples. Doscher, Box 54, Goshen, N. Y.

DELUXE QSLS. Petty, W2HAZ, 17 Southard, Trenton, N. J. Samples, 10¢.

"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: SX42 and speaker. Williamson Hi-Fi amplifier. George Chernowitz, 705 Grand Ave., Ridgefield, N. J.

SELL: FM modulation monitor Browning Laboratories MD-25A, #301, $285.00. F.o.b. Mansfield, Ohio. W8VLB.

FOR Sale: BC459, $7.50, 100TH, $5.00; 815, $1.50; 829B, $5.00; 813, $6.00; Meissner signal shifter with coils for 20 and 10, $15.00. Toivo A. Rae, 224 Brookside Ave., Mt. Vernon, N. Y.

FOR Sale: New 1625 tubes, same as 807 with 12 volt filament. 97¢ plus 3¢ postage each. Wanted: Oscilloscope, audio generator and used test equipment. W7TBE, Brunner, 318 West Galer, Seattle 99, Wash.

TELETYPE tape printer, Western Union, built-in mechanical receiving distributor, typewheel, single selector magnet, $60.00. W6NSS, 1962 So. Stearns Dr., Los Angeles 34, Calif.

SELL: 32V2. Authorized commercial laboratory did de-TVI job that cost $100. Price $525. Box 382, Main P. O., Newark, N. J.

FREQUENCY Meter, BC-221-AH, original callbration book, excellent condition. John Anderson, W8LIK, 7114 Eastlawn, Cincinnati 37, Ohio.

BRAND new tubes, Pr V-70D's, $14.00; Pr 5514's, $7.50. Pr 866a's, one 866Jr, $1.25; Pr 6L6s, $3.00; Drake TV52–40 filter, $9.50; 300W ant. coupler 10, 20, 75 TVL coils and 0–2.5 RF meter, $25.00. LaRue Cleveland, 690 Fairmont, Bridgeport, Illinois.

I Have a 4X150-A tube. Will sell or trade. I want a WE Salt Shaker mike. George Sperry, 108 Oak Hill Ave., Portsmouth, Va.

FOR Sale: Masco tape recorder, ten meter beam. Doug Ryan, 58–23 185 St., Flushing, L. I., N. Y.

FOR Sale: Hallicrafters S-38C receiver, new, original carton, $45.00; Zenith Transoceanic portable, $65.00; Revere T-100 tape recorder, $110.00; Teletone 158 AM-FM 8-tube table radio, $30.00; Executone intercom master and substation, $15.00; Astatic JT-30 crystal mike, $8.00; Astatic DN-HZ dynamic, $12.50; Shure 55 dynamic, $30.00. All in excellent condition, priced F.o.b. V. R. Hein, 418 Gregory St., Rockford, Ill.

SALE: 200 watt fone/cw transmitter, including Deluxe rack, mike, bug, 90 feet coax, coils, 4 crystals. Built by engineer, no surplus, excellent on 20 meters, easily transported, and only $125.00. R. Friederich, W2FRE, 456 Beach Ave., Bronx, N. Y. Tel: TY 3-5139.

VOLTAGE Regulators, one American Trans. Co. 0 to 130 volts, at 22.5 amps, $35.00; one Superior V reg. 0 to 135 volts at 15 amps, AC, $35.00; two new Simpson 0 to 5 RF amps., $9.00 each; two type E Sangamo .0002 12.500 v. and one .001 condenser (new), $5.00 each; two Mack Devices Co. mercury relays (type 400), rated at 110 v. AC at 35 amps. and 25 amps at 220 volts, $9.00 each. J. H. Robinson, W5BG, 522 Cumberland St., Dallas, Texas.

SALE: VFO 7 Mc, $20.00 microphone, $5.00. W6BLZ, 528 Colima St., La Jolla, Calif.

COLLINS 75A2 and 32V2, extras, local, $700 cash. H. Takeuchi, 143 W. Penn St., Norristown, Penna.

SELL, swap excellent Stancor 2O3A transmitter, PE103 dynamotor, Morrow 3BR converter. Need VHF152, 2 meter transmitter. Roy Sawdey, Jr., W8ULL, Harper Rd., Solon, Ohio.

WANTED: Collins or HRO receiver in good condition. Will buy or swap for Contaflex camera with coated 1.5 lens and projector. W2UPY, A. Ostrochovsky, Jr., Rea Ave. Ext., Hawthorne, N. J.

SELL: Eldico EE2 Electronic bug with monitor spkr, $25.00; Gonset noise clipper, $5.00; W2CR, Van Wuyckhuyse, 412 Humboldt St., Rochester 10, N. Y.

COLLINS 70E8-A VFO, $75.00. B&W 504-1, all-band multiplier, $55.00; aluminum chassis and rack panel with cutouts for mounting VFO and multiplier, $5.00. All together for $130.00, the basis for fine all-band exciter. Equipment never used. R. W. Emott, W2AI, East Madison Ave., Florham Park, New Jersey.

FOR Sale: 125 watt all-band cw rig, 3 power supplies, 3 meters in inclosed metal cabinet, $75.00. W9POM, 1458 W. Taylor, Chicago 7, Ill.

WANTED: BC-348 radio receiver. Advise price and condition. Write to C. Porter, 2520 Forest Glen Road, Silver Spring, Md.

SELL: Complete mobile transmitter Stancor ST-203A modified for 75 with PE-103, Gonset converter, cables, control box, Electro-Voice mike, Master center loaded whip, all for $95.00. Also complete issues of QST 1931 to 1951 for $35.00. George, W1BKG, 35 Ridgeway Ave., Pittsfield, Mass.

SELL: 110V, 350 w. light plant, $120.00 F.o.b.; Ecophone EC2, $29.00; 3-813s, socket and fil. xfrmr, $19.00; new 4-125A, $16.00; wire recorder, $25.00; clipper dynamic mike, $10.00; Hickok tube tester, $30.00; Eico 'scope, $47.00; SCR522 xmitter, $35.00; BC610 complete. Write to Jack Zeigler, 1733 N. H., Lawrence, Kans.

FOR Sale: Meissner Deluxe signal shifter with 20, 40, 80 coils, $20.00. Combination speech amplifier and 'scope modulation monitor in Bud deluxe gray 10½" table cabinet, $40.00. Write for schematic. Tubes: two 304TLs, one 2API, $4.00 each; three 811s, two 812s, two RK60s, $2.00 each; Bud deluxe gray 37" cabinet, $12.00. R. L. Fossett, W5RPJ, 6315 Stefani, Dallas, Texas.

NC183-D, with speaker, as returned from factory, $310.00; SX-42, $100.00; BC211, $50.00; trade 2E24 for 2E26; interested in 3 in. Panadaptor. Howard Eddy, W3MCQ, 800 Renel Road, Plymouth Valley, Norristown, Penna.

MOBILE Stancor ST203A with 425 V dynamotor and cables for sale. Now on 75M. Make an offer. W4AVV, Stinnette, Jr., Umatilla, Fla.

WANTED: ART-13, ATC, DY-17, APN-9, APN-4, ARC-3, APR, 32V-2, selsyns, manuals. Will trade for new ham equipment. All-tronics, Box 19, Boston 1, Mass. Tel. Richmond 2-0916.

10, 15 and 20 meter beams, aluminum tubing, etc. Perforated aluminum sheet for shielding. Radcliff's, 1720 North Countyline St. Fostoria, Ohio.

FOR Sale: New Shure magnetic mike, $5.75; new Millen SWR bridge, $15.00, two new Deltronic transceivers with xtals 2-meter, $250.00 for the pair; Antenna tuner with two 5 amp. thermocouple meters, 3 plug-in coils in solid aluminum cast case, $12.00. W9LQI. Ashton, Ill.

QSLS! On vacation: August 1 to 15. Thereafter, samples 10¢. Tooker Press, P. O. Box T, Lakehurst, New Jersey.

FOR Sale: TBS-50C, $82.00; Gonset Tri-band, $33.50; dynamotor 6 v. input 425v, 375 Ma. output, $23.00; Master Mobile Mount spring whip, 20 and 75 meter loading coils, $9.25; dual power supply 750 v and 250 v, $21.50; 125 watt Multimatch modulation transformer, $10.00. F. C. McDaniel, 55 Power Road, Thomason Park, Triangle, Va.

COLLINS 32G2 for sale, in original packing. Used very littler $510.00; New spare 4D32, $10.00. W5GOC, C. Atkinson, Jr., 2433 Stanmore, Houston, Texas.

TOP prices or better your best offer for RT18ARC1, ARC3, ART13 gear, also any other air or ground equipment. Air Ground Electronics, Box 226, Kearny, N. J.

FOR Sale: HQ-129X, factory checked; Hy-Lite 3-el. 20 m. beam; SCR 3-E 10 meter beam; Dr. R. Arcuri, 8 Linden Ave., Pelham, N. Y.

QSLS: 24 hour service. 2 colors, $2.00; 3 colors, $3.00. Samples, 25¢, refundable with order or order direct. Satisfaction is guaranteed. Constantine Printing Service, Bladensburg, Md.

VAN SICKLE has National HFS for 27–250 Mc AM/FM, like new, $125.00 with AC power supply. Sonar MR-3 for 10–20–75 like new, $79.00, with 6 v. power supply. W9KJF, 1320 S. Calhoun St., Ft. Wayne, Ind.

EXTRA Special! Two-way cab radios at $100.00 each. In good working condition, complete with transmitters, receivers, and power supply. 40 Raytheon crystals for channel four, 18 General Electric for channel one. Publix Cab Co. 2358 Washington St., Denver 5, Colorado.

FOR Sale: Deluxe station of the late W2JSZ. 750-watt custom-built all-band phone/c.w. transmitter, plate modulated, in cabinet, fully metered and TVI-proofed, built-in Variac and monitoring 'scope, PP-100TH's; Collins 310-C-2 exciter, National speech amplifier, coax antenna relay, $750.00. Collins 75-A-2 receiver and speaker, $375. Hallicrafters SX-42 receiver with 12-in. Altec-Lansing speaker in bass reflex cabinet, $200.00. Dual beam, four-element ten, three-element twenty, on Trylon stainless steel boom, Mims rotator and indicator, $125.00. 2500-watt 115-volt mobile generator, Briggs & Stratton motor, $225.00. Cash and carry, Summit, New Jersey. Contact W2CZA for details and photos.

FOR Sale: 1 National NC173 receiver; 1 Hallicrafters HT18-VFD, 1 Gonset Tri-band converter and noise limiter; 1 Precision E400 sweep generator; 1 Precision E200C signal generator; 1 Precision 612 tube checker. All are in good condition. Best offer takes any or all. H. C. Lester, W1TMA, 29 Birch Road, Darien, Conn.

FOR Sale: Hallicrafters S-77, in good condition, $65.00. Dan Drath, W6QNB, 15 Rancheria Road, Kentfield, Calif.

VIKING II and VFO, $325.00. All necessary parts for KW final, including 2000 V 500 Ma power supply; Kw modulation transformer 810s 100TH, etc., $100.00; SX25 with speaker, $75.00; BC375E with 6 tuning units, $20.00; BC453 Q5'r, new, $15.00. Heathkit 0–7 5" oscilloscope, $30.00. W6HZE.

TELETYPE Ham special, new model, 12 parts for sale. Reasonably priced. Telemechanics, 63 Park Row, New York 38, N. Y.

SELL or trade: BC-610E transmitter complete, BC-1031 Panadaptor, midget teletype printer, #12 typing unit, RA-62, T23/ARC-5 transmitter. Want: ART-13 and parts. Tom Howard, W1AFN, 46 Mt. Vernon St., Boston 8, Mass. Tel. Richmond 2-0916.

QSTS wanted: December 1915 to January 1917 inclusive. Also, Proceedings of IRE, Vol. 1 to 4. C. W. Janes, Col. Sig. C. The S. E. Signal School, Camp Gordon, Ga.

WANTED: Code machine with oscillator and tapes suitable for class instruction Wilson High Radio Club, Wilson Junior High School, Muncie, Ind. J. Maier, Principal.

FOR Sale or trade: Best offer: National 1–10 receiver with power supply, RME VHF-152; final amplifier PP 813s with 2E26 buffer or doubler in self-contained cabinet; Meissner Model EX signal shifter; Kenyon power and modulation transformers for 1½ kilowatts; miniaturized low level speech amplifier clipper, will drive 300 watts Class B audio. W8JRG, 640 Snowhill Boulevard, Springfield, Ohio.

STROBOTAC wanted. W2ADD.

BARGAINS: New and reconditioned Collins, Hallicrafters, National, Hammarlund, Johnson, Elmac, Harvey-Wells, Gonset, Morrow, Babcock, RME, Millen, Lysco, others. Reconditioned S38 $29.00; S40B, $79.00; SX43, $119.00; S76, $129.00; SX42, $179.00; NC173, $149.00; NC183, $199.00; HF-10-20, $49.00; VHF152, $49.00; VHF152A, $59.00; RME45, $89.00; HQ129X, SX71, NC125, NC240-D, HRO50T1, HRO60, Viking I, Collins 75A1, 75A2, 32V1, 32V2, many others. Shipped on trial. Terms. List free. Henry Radio, Butler, Mo.

WANTED: Bendix communication system, Model 3801, which includes transmitter 3006 and receiver 3103 in one unit. Also Bendix power supply, Model 3206 for above. Either 12 or 24 volt, in repairable condition. E. L. Soldin, KL7ANV, 519 W. 10th, Juneau, Alaska

JOHNSON Viking II, excellent condition, best offer over $290.00 takes it. F.o.b. Talcott, West Virginia. Dr. E. W. Atkins, WN8LOS.

FOR Sale: Hallicrafters S-40B, Eldico TR-75TV and MD-40P. Make offer. Gay, W4VJH, Rt. 1, Box 4, Millen, Ga.

TELETYPE at your station? Easy! Get the entertaining Amateur Radio Teletype Society Bulletin and keep up with the latest activities, circuits, and news. Mammoth Bulletin 24 (while they last) sent immediately, free with every subscription. Send $3.00 to Section 9, 1379 E. 15th, Brooklyn 30, N. Y.

COLLINS 75A-3, still in warranty. Less than ten hours use, $475.00. Jack Haley, 3330 South 31st St., Lincoln, Nebraska.

BARGAINS: Extra Special! Motorola P-69-12 mobile receivers, $19.50; 32V1, $399.50; Globe King, $299.00; HT-9, $199.00; Supreme AF100 or Temco 75GA, $225.00; HRO-50, $275.00; 75A1, $250.00; SX-71, $169.00; S-76, $139.00; SX-42, $189.00; SX-43, $129.00; HRO Senior, $109.50; 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, $14.95; 90800 exciter, $25.00; DM-36-10 meter converter, $19.50; XE-10, $14.95; Gonset 10-11 converter, $14.95; and many others. We need used receivers: We give highest allowances for S20R; S-40A, B; NC-57, NC-100; NC-125; SX-24, SX-25, HQ-129X; and similar receivers. Free trial. Terms financed by Leo, W9GFQ. Write for catalog and best deal to World Radio Laboratories, Inc., 740-44 West B'way, Council Bluffs, Iowa.

QSLS, SWLS. High quality. Reasonable prices. Free samples. Write Bob Teachout, W1FSV, Box Q124, Rutland, Vt.

VIBRAPACK input 12V output 290V/90Ma, $9.95; Diodes 1N34, 10 for $5.98; Mobile whip antenna, 72", $2.89; "TAB" sells and trades radio parts and cameras. Write for Tabogram, "TAB", 111 Liberty St., New York City.

QSLS. We have printed a million. Samples, 10¢. VYS Print, 1704 Hale, Ft. Wayne, Indiana.

TV set, 10 inch, $39.50, also 12½ inch, $54.00. Excellent condition or will swap for a good camera. W2FUB, S. Cohn, 84–20 126th St., Kew Gardens 15, L. I., N. Y.

HALLICRAFTERS SX-71 and R-46 speaker, new, make an offer. R. L. Haynes, 214 Wood Ridge St., Woodridge, N. J.

FOR Sale: Carter dynamotor, new and unused, in original carton, 6 volts input, 400 volts 375 mills output. $30.00. W. M. Jackson, W4ILZ, Box 51, Savannah, Tenn.

COLLINS 75-A2 receiver, in excellent condition. Write to 419 East Park, Houma, La. Doug Authement.

COLLINS Twins Station 32V3 and 75A1, complete with new spare 4D32 and Electro-Voice Cardax microphone. First $875.00 takes all. F.o.b. Newton, Mass. W1QKF, Vigoda, 25 Lafayette Rd., Newton 62, Mass. Tel BI 4-6340.

TBS-50 'phone and cw, 75 meter Master Mobile antenna and mount, EE-8 telephone, make offer. Pat Duncan, W5RHU, 900 Haynes Ave., Fort Worth, Texas.

FOR Sale: Globe Champion rig with 80, 40, 20, 10 coil sets. HRO-50T-1 receiver with crystal calibrator and speaker. Both are 18 months old, and in perfect condition. These are in Dade City, Florida. Will accept reasonable offer for either or both. Arthur Davenport, W4KIN, 102-28 62nd Road, Forest Hills, L. I. 74, N. Y.

BC221 A.C. power supply, $75.00; Jones MicroMatch, $20.00; 12 volt dynamotor, 500 volts, $15.00; custom-built beam rotator, $60.00; Baldwin-phones, $10.00; Selsyns, pair small type, $10.00. W1THM.

FOR Sale: Harvey-Wells transmitter, Model TBS 50-C, $80.00; Meck transmitter, Model T-60 with coils, $75.00. W8AZP, Box 183, Salineville, Ohio.

WANTED: McMurdo-Silver 805, 100 Kc. I.F. amp. W9TMH.

HAM equipment clearance: Dream stuff, new and unused, collectors' items, Novice "buys", spares; junk. Ten page typed list: quarter. W2RUT, R. E. Curran, 803 Forest, Fulton, N. Y.

COLLINS 32V2 with 35C2 filter, 75A1, $700.00 cash. Many other items. W5THI, Larry Chilton, 3412 Whittier, Ft. Worth, Texas.

SELL: Elmac A54 Mobile transmitter, 10, 11, 20, 40 and 75, including Shure carbon microphone. First class condition. $95.00. Allan Moser, K6AQG, 7013½ West Manchester, Los Angeles 45, Calif.

COLLINS 32V2 50 hours, excellent condition, spare 4D32 and others, D-104 mike, manual, $500.00; 75A2, FM adaptor, 25 hours, new condition, manual, $360.00; BC-348Q a.c., hot and clean, $65.00; BC-314D tunes 150–1500 Kc in 4 bands, a.c. conversion almost completed, clean, manual, $40.00; BC-946 broadcast tuner, new, $30.00; BC-696, used, unconverted, $15.00; BC-457, BC-458, $5.00 each; BC-453, $15.00; BC-454, BC-455, $7.50 each; BC-221 built-in power supply, complete, good condition, $60.00; 2 new 807-W, $5.00 each. All F.o.b. Des Moines, Iowa. Will pack and ship. Transferred and need the money. Keel, WØNEN, 6001 Cottage Drive, Des Moines, Iowa

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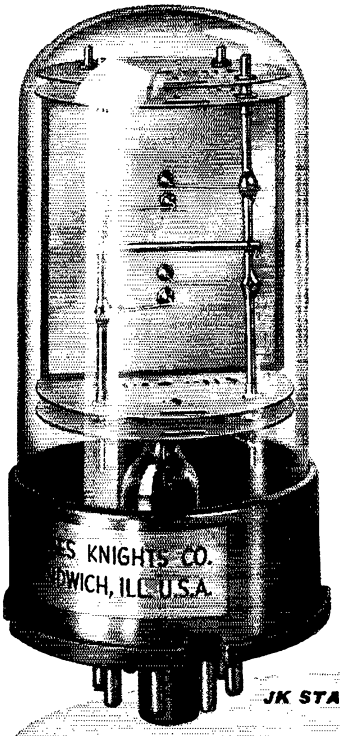


through JK PRODUCTS

crystal research

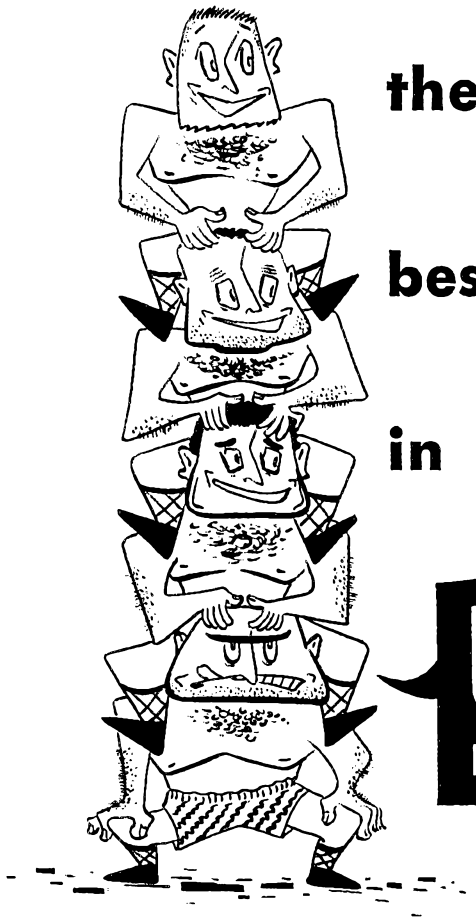
The JK G-12 is a precision 100 kc G-T cut crystal intended for operation in Meacham Bridge and similar oscillators. Available for operation at series resonance or into large load capacities. Resistance approximately that of usual lamp used for amplitude stabilization, simplifying bridge circuit design. 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.

JK STABILIZED G-12 CRYSTAL

Did you know?

Surgical cleanliness during manufacture is an important reason for the unequalled stability of JK Crystals. In an airconditioned, dust-free plant crystal blanks are repeatedly cleaned with chemicals, washed in distilled water and spun dry — plain tap water or even a fingerprint would impair stability. The final crystal, vacuum sealed in a glass holder, provides stability equal to a watch that would remain accurate to within three seconds over a year's time. Creative research combined with today's most modern production facilities brings you today's finest — JK "Crystals for the Critical".

THE JAMES KNIGHTS COMPANY, SANDWICH, ILLINOIS



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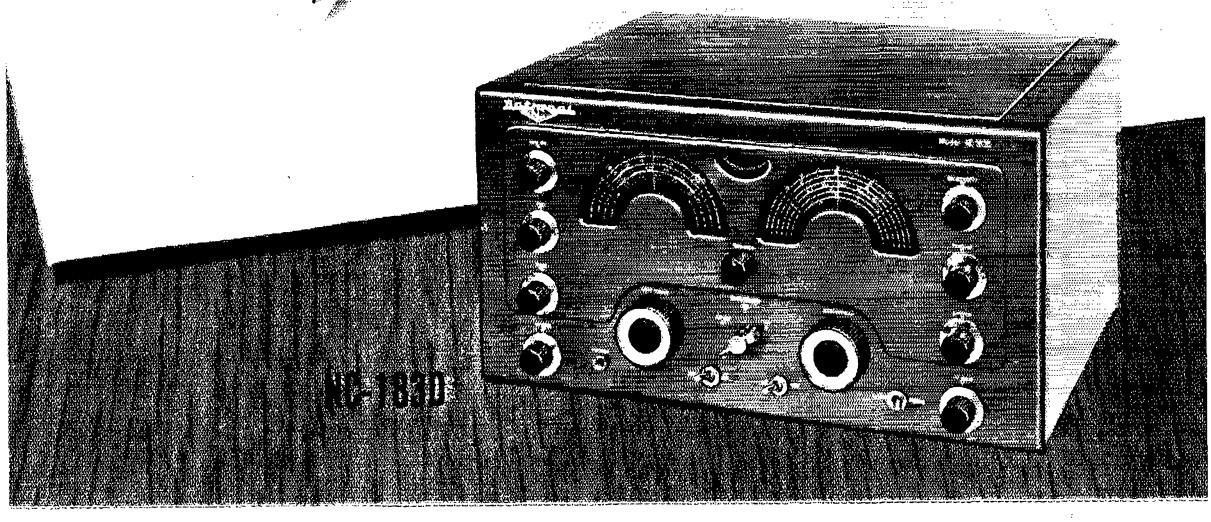
you can't log 'em if you can't hear 'em!

No matter what else a receiver does, it must pull 'em in! And that's just what the NC-183D does! Compare its Imv. sensitivity (on 6 meters) and extremely low noise level with the highest-priced amateur receivers made ($150 higher!) and you'll see why you'll hear more, log more on an NC-183D!

COVERAGE: Continuous from 540 kcs. to 31 mcs. plus 48 to 56 mcs. for 6-meter reception.

FEATURES: Two tuned R.F. stages. 3 stages of I.F. Voltage regulated osc. and BFO. Main tuning dial covers range in five bands. Bandspread dial calibrated for amateur 80, 40, 20, 15, 11-10 and 6-meter bands. Bandspread usable over entire range. Six-position crystal filter. New-type noise limiter. High fidelity push-pull audio. Accessory socket for NFM adaptor or other unit, such as crystal calibrator.

$369.50*



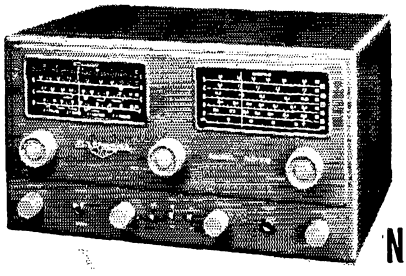
A WORLD-BEATER IN *VALUE!*

What other receiver can match the features of the NC-88 at anywhere near its modest price?

Covers 540 kcs. to 40 mcs. Calibrated bandspread for 80, 40, 20, 15, 11 and 10 meter bands! Eight min. high gain tubes in advanced A.C. superhet circuit. Tuned R.F. stage. Two R.F. stages. Built-in spkr. Ant. trim. Separate high freq. osc. Sensitivity control. Noise limiter. Delayed A.V.C. headphone jack. Standby-receive switch. Tone control.

$119.95*

**Slightly higher west of the Rockies*



NC-88

National

National Company, Inc., Malden, Mass.

see inside-then decide!

Transmitter "Finals" —100% Beam Power!

CHECK THROUGH the transmitter section of the new Mobile Handbook. You will find that every rig illustrated uses one or more beam power tubes!

Once again beam power tubes, originally developed by RCA, prove to be the choice of amateurs—for these very good reasons: RCA beam power tubes are versatile. They fit all types of transmitter operations, fixed-station or mobile. They offer better results with fewer stages, tubes, and components—operate efficiently with low-voltage power supplies. Take advantage of these features—and design a compact rig that goes places.

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