

QST

July, 1950

40 Cents

45c in Canada

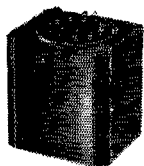
devoted entirely to

amateur radio



In This Issue — AN "EAR SAVER" FOR C. W. RECEPTION

COMPONENTS FOR EVERY APPLICATION



LINEAR STANDARD
High Fidelity Ideal



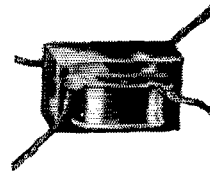
HIPERM ALLOY
High Fidelity . . . Compact



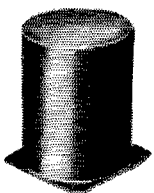
ULTRA COMPACT
Portable . . . High Fidelity



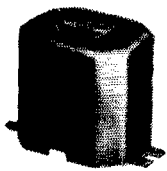
OUNCER
Wide Range . . . 1 ounce



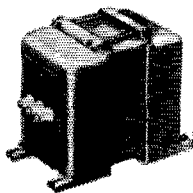
SUB OUNCER
Weight 1/2 ounce



COMMERCIAL GRADE
Industrial Dependability



SPECIAL SERIES
Quality for the "Ham"



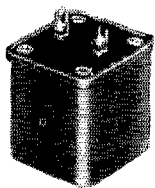
POWER COMPONENTS
Rugged . . . Dependable



VARITRAN
Voltage Adjustors



MODULATION UNITS
One watt to 100KW



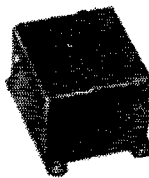
VARIABLE INDUCTOR
Adjust like a Trimmer



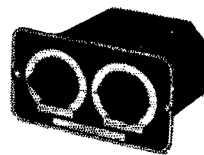
TOROID HIGH Q COILS
Accuracy . . . Stability



TOROID FILTERS
Any type to 300KC



MU-CORE FILTERS
Any type 1/2 - 10,000 cyc.



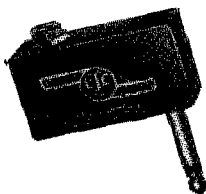
EQUALIZERS
Broadcast & Sound



PULSE TRANSFORMERS
For all Services



SATURABLE REACTORS
Power or Phase Control



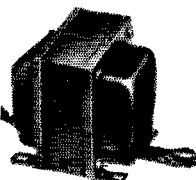
PLUG IN ADAPTER
Impedance Matching



FOSTERITE
Grade 3 JAN Components



CABLE TYPE
For mike cable line



VERTICAL SHELLS
Husky . . . Inexpensive



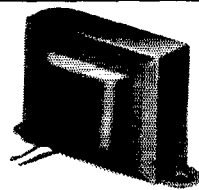
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GL-1614

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CLASS C TELEGRAPHY

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D-c screen voltage	250 v
D-c plate current	80 ma
Plate power output	21 w

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200.	1.7
300.	2.2
400.	2.7

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The
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JULY 1950

VOLUME XXXIV • NUMBER 7

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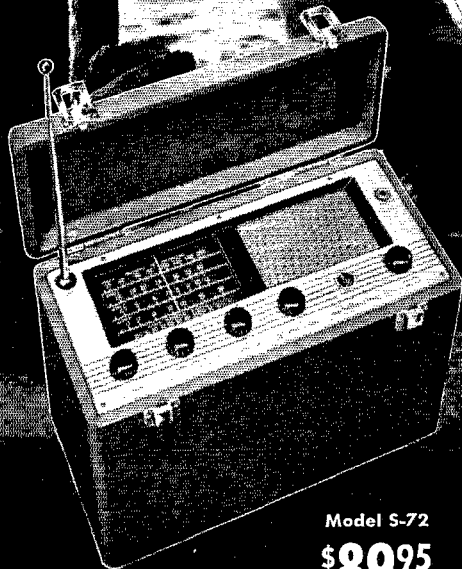
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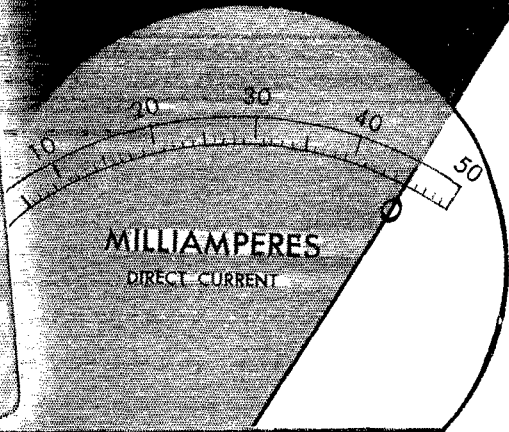
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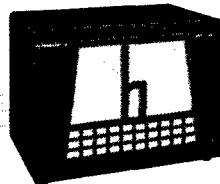
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It is an incorporated association without capital stock, chartered under the laws of Connecticut. Its affairs are governed by a Board of Directors, elected every two years by the general membership. The officers are elected or appointed by the Directors.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

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

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

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Alternate: William P. Sides W4AUP
Fleming Road, Montgomery, Ala.

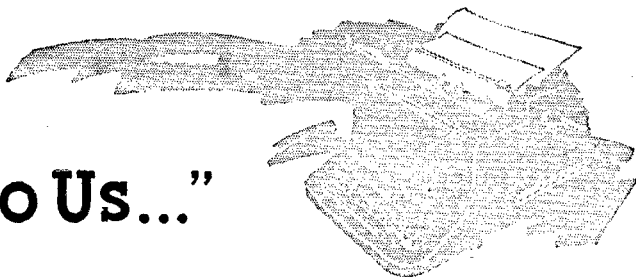
Southwestern Division

JOHN R. GRIGGS W6KW
3212 Grape St., San Diego 2, Calif.
Alternate: John E. Biekel W6NY
14820 E. Whittier Blvd., Whittier, Calif.

West Gulf Division

DAVID H. CALK W5BHO
7730 Joplin St., Houston 17, Texas
Alternate:

"It Seems to Us..."



MOBILE ON 29.6-29.7

There's a singular thrill in buzzing down U.S. 5A in the family jalopy, windows open to the warm summer breeze, calling and working fellow amateurs firmly ensconced at their operating desks throughout the world. "See that hill over there? Let's park and see what we can work on 2." Or 10, or 75, or any amateur band. No TVI, no stuffy shack — just plain enjoyment of amateur radio. One mobile operator summed it up as being "one helluva lot of fun!"

Fun? Sure. But Vanport . . . Texas City . . . South Amboy — through disaster after disaster, emergency after emergency — this one group of amateurs has steadily made its weight felt, has continually proven its worth to us all.

Mobile operation has experienced enormous growing pains in this many-faceted hobby of ours. From the early 5-meter modulated oscillators to the 250-watt "King of the Highways," mobile equipment has grown in size and versatility. Today, the call "mobile" is fast becoming as commonplace on the amateur bands as, for example, "CQ FD" during that certain week end in June. Interest has grown to the point where there are numerous clubs devoted exclusively to the mobile enthusiast, where convention and hamfest activities invariably schedule mobile demonstrations and equipment judgments. And at least one progressive club has a mobile "field day" activity scheduled for every week end throughout the summer.

"So what!" you say. "Every time I work a mobile I lose him in the QRM." Sure, the mobile station is operating with reduced power, a whip antenna; he can hardly be expected to compete with fixed stations using high power and rotary beams. Take the ten-meter band — when it is wide open the mobile operator stands meager chance of making his voice heard through the din. All of us know the importance of mobile operation — the record speaks for itself. What are we to do in order that the mobile operator may have a chance

to pursue his hobby effectively? At its 1950 meeting, your ARRL Board of Directors recognized this very problem and discussed it at length. The directors are fully cognizant of the value of mobile operation and at one point during their meeting even discussed the advisability of setting aside certain frequencies for the exclusive use of this service. Mobiles seem to have settled around 29.6-29.7 Mc. — there are several area nets in this region — and it was this group of frequencies that the Board discussed.

But . . . there were questions. For one, was it a desirable thing to request FCC to restrict even a small portion of amateur frequencies so that the average amateur at his home station could not use them? The Board felt the entire matter needed further study and, accordingly, assigned this task to its Planning Committee with instructions to report back within 90 days.

Meanwhile, the problem is still there and becoming progressively more acute as additional mobiles take to the air. So the Board, through the pages of *QST*, is relaying a request to all amateurs to *voluntarily* keep clear of 29.6-29.7 Mc. as much as possible so that the mobile gang may carry on communication with a minimum of interference.

Ten meters is a big band, fellows — there's not much fixed-station operation going on above 29.6. Next time your hand wanders to the VFO and you start shifting toward the high end, give some thought to that fellow amateur of yours out there on the road — give him the break the mobiles so justly deserve — by setting your frequency no higher than 29.6 Mc.

And as you tune around the high end of ten, listening to the mobile stations conduct their emergency drills free from QRM, you can say to yourself that by voluntarily staying away from 29.6-29.7 Mc. you have done your share toward making a better amateur radio, a better-prepared group of citizens ready to serve their community and country in times of disaster.

DOCKET 9295 ORAL ARGUMENT

Oral argument in Docket 9295, postponed from May 19th, was duly held in Washington on June 2nd before FCC Chairman Coy and Commissioners Hennock, Hyde, Jones, Sterling and Webster. Primarily a "lawyers' show," the proceedings mainly consisted of oral presentations by attorneys of FCC and representatives of interested amateur parties arguing points previously made in written filings.

Irving Brownstein argued the Commission's point of view, principally that the Amateur Extra Class license was needed as an incentive to increase standards of the "top" license, and that the "Basis & Purpose" section would mark a partnership between FCC and the amateur, that it was to strengthen amateur radio and that it did not restrict the flexibility and freedom of amateurs. Walter B. Good, for the Academy of Model Aeronautics, endorsed the proposed Technician License. Paul M. Segal and Quayle B. Smith, on behalf of ARRL, argued further the League's objection to the Extra Class license and other points of difference as presented in the League's filing of January 16th¹ and then elaborated on the League's objection to the "Basis & Purpose" section, stating that it was not in consonance with regulatory procedures of other government administrative agencies but primarily that in any event amateur radio cannot be blueprinted by the government, that amateur radio's progress in the past would have been hindered under such a regulatory theory, that amateur radio needs only minimum regulation to ensure compliance with treaties and to keep amateurs within our hands, and that while the "Basis & Purpose" statement might be a means of strengthening amateur radio in some respects it was potentially dangerous to amateur interests at international conferences.

In his own behalf as an amateur, Cecil G. Harrison briefly opposed the "Basis & Purpose" section from the standpoint that it went beyond FCC's field of regulation and got into actual management of amateur affairs. L. B. Gilmer, as its new president and on behalf of NARC, endorsed the "Basis & Purpose" section and said his membership favored the adoption of the Extra Class license if there were added a requirement that it would be available only to persons who had been amateurs for at least 10 years. Seymour Krieger, attorney for SARA, endorsed all phases of the FCC proposals and urged their prompt adoption. L. H. Whan, former president of NARC but speaking only in his own behalf as an amateur, said his recent contacts with "many hundreds" of amateurs showed no objection to the "Basis & Purpose" section but strenuous opposition to the Extra Class license, and that if

there was to be a "top" license there should be one for 'phone operators and one for c.w. operators.

League members interested in further details of the proceedings are referred to their directors, who have been provided with 80-page copies of the verbatim transcript.

~~Strays~~

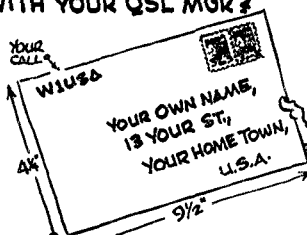
An instrument which gives an instantaneous visual display of electron tube characteristics has been developed by the National Bureau of Standards. The curve generator plots directly on the screen of a cathode-ray oscilloscope the family of plate-current *versus* plate-voltage curves for any receiving tube. A standard rectangle is displayed along with the characteristic curves to provide a direct scale for voltage and current readings. In cases where the tube characteristics are not known or where an unusual combination of supply voltages is to be used, the curve generator can provide the necessary tube data at a great saving in time and labor.

In addition to producing plate characteristic curves, the new instrument can provide a visual representation of plate current *versus* grid voltage. In this case the oscilloscope display is particularly convenient since grid-voltage increments are directly defined by calibrated vertical bars appearing on the oscilloscope screen; a standard current reference is given by a horizontal bar. All of the possible displays are produced by the curve generator without overloading the tube under test. Over-all accuracy of voltage and current readings from the oscilloscope screen is within plus or minus five per cent.

FEED-BACK

In the article by GM6LS, "A Noise Limiter for the HRO-M," on page 34 of the June issue, the value of the potentiometer resistance is given at the bottom of the second column as 50,000 ohms. The correct value, 0.5 megohm, is given in the caption under Fig. 1 on the same page.

IS YOURS ON FILE
WITH YOUR QSL MGR?



SEE PAGE 32

¹ P. 9, QST, March, 1950.

An Accessory for C.W. Reception

Audio Clipping—An "Ear Saver"

BY GEORGE GRAMMER,* W1DF

You may be overlooking a good thing if you fail to take advantage of audio limiting in c.w. reception. Of course, if you are not bothered especially by electrical noise on your favorite c.w. band you will probably have concluded that a limiter is something the other fellow might need, but not you. That is because more emphasis has been placed on noise reduction than on the fact that a clipper is an instantaneous a.v.c. system.

In our experience, the noise reduction (as that term is usually interpreted) offered by a limiter is a minor consideration in c.w. work. The real function of the limiter is to protect the operator's ears from strong signals, key clicks, and the occasional pistol shots that result when somebody switches a lamp on or off. It is perfect for break-in operation because it cuts your own signal and key clicks down to the same level as incoming signals, without relays and without any rewiring in the receiver. In addition, it wipes out a good deal of fading.

The crystal-diode limiter described by the writer some years ago¹ had the virtue of simplicity but lacked flexibility. The output amplitude was determined by the dry cells used for biasing the diodes, and the device could be used only with a high-impedance headset. It was also discovered early in the game that a fair amount of audio selectivity ahead of the limiter was a very desirable thing, for the reason that strong signals within beat-note range of a weaker desired signal too often "took control"—the well-known suppression or capture effect in all limiter

circuits. So a few outrigger circuits were added here and there, until finally it seemed like a good idea to start over again and bring the thing up to date. The result is shown in the accompanying photographs, and the circuit is given in Fig. 1.

In this one we wanted to be able to use any kind of headset, to be able to control the headset volume independently of the limiting level, and

to incorporate audio selectivity. Obviously, vacuum tubes were called for, and since that was the case the limiting might as well be done by tubes as by crystals. The input circuit is high impedance and so can be hooked to practically any kind of audio circuit. The first tube is a cathode follower because the low output impedance makes it suitable for working into the series-resonant LC circuit that gives the audio selectivity. The latter circuit is also parallel-resonated to give a rejection point just above the tone at which peak response is desired.²

The clipper circuit is one described in *QST* some time ago,³ and is about as simple and effective as anything associated with a double

triode can be. The constants are not too critical, and have been adjusted in Fig. 1 for operation at the signal levels ordinarily available from the headphone jack on a receiver. The limiter output circuit is rather heavily by-passed (by C_6) to reduce the amplitude of the harmonics generated in the clipping process. Additional by-passing (C_9) across the headset is used for the same purpose. Without such by-passing signals tend to sound "thin" or "mushy" when deeply clipped; in addition, the by-passing contributes



The audio clipper unit includes input and output amplifiers of the cathode-follower type, a dual-triode clipper circuit, and a selective audio system. This model is built in a small utility box, with a cable for power-supply connections and a cord and plug to pick up audio from the receiver's headphone jack.

* Technical Editor, *QST*.

¹ Grammer, "Noise Limiting in C.W. Reception," *QST*, May, 1946.

² Technical Topics, "Stop and Go Circuits," *QST*, October, 1949.

³ Harrington and Hadlock, "Improving F.M. Transmission Techniques," *QST*, November, 1948.

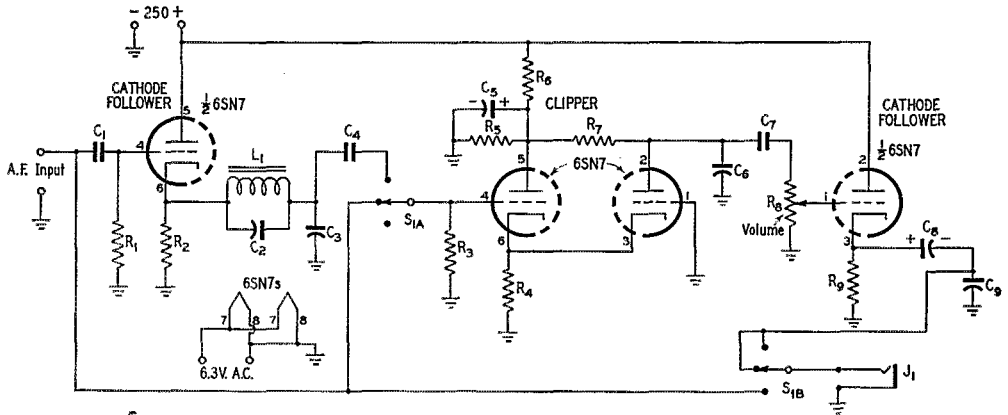


Fig. 1 — Circuit diagram of the audio clipper unit. Power requirements are 16 ma. at 250 v. d.c., 1.2 amp. at 6.3 v. a.c.

C_1, C_4, C_7 — 470- μ fd. mica.

C_2 — 0.04- μ fd. paper.

C_3 — 0.1- μ fd. paper.

C_5 — 8- μ fd. 450-volt electrolytic.

C_6 — 0.003- μ fd. paper.

C_8 — 10- μ fd. 25-volt electrolytic.

C_9 — 0.25- μ fd. paper.

R_1, R_3 — 1 megohm, $\frac{1}{2}$ watt.

R_2, R_9 — 1500 ohms, $\frac{1}{2}$ watt.

R_4 — 10,000 ohms, $\frac{1}{2}$ watt.

R_5 — 22,000 ohms, $\frac{1}{2}$ watt.

R_6 — 47,000 ohms, 1 watt.

R_7 — 33,000 ohms, $\frac{1}{2}$ watt.

R_8 — 1-megohm volume control.

L_1 — 250-mh. choke (Millen 31400-250).

J_1 — 'Phone jack, single circuit.

S_1 — 2-circuit 3-position switch.

to the over-all audio selectivity by reducing the high-frequency response. The last triode section is again a cathode follower. Its low output impedance makes for good power transfer to low-impedance 'phones, while the output voltage is high enough to give ample volume with the high-impedance variety.

A three-position switch is provided so that the gadget can either be cut out entirely, used with straight limiting and no selectivity, or with both selectivity and limiting. The "off" position is useful principally to convince the skeptical that the unit actually does something. The limiting without selectivity is useful for impulse noise, when encountered, because high selectivity and good noise suppression do not go hand in hand.¹

About the only other circuit feature that rates mention is that the coupling condensers, C_1 , C_4 , and C_7 , are chosen so that, in conjunction with the grid resistors, the response drops off below 500 cycles. This contributes to the selectivity at the low end of the scale.

The unit shown in the photographs is built on one panel and the sides of a 3 by 4 by 5 utility box. As a convenience, the parts on the panel and the box proper are connected through cabled leads made long enough so the panel can be swung out as shown. Any type of construction that appeals to the builder can be used, since there is nothing critical in the layout. The one precaution we did observe was to use a shielded lead between the "hot" input terminal and the switch, to prevent possible stray coupling between the

input and later high-impedance circuits because of the cabled leads.

The selective audio circuit chosen gives a type of frequency-response curve that the writer happens to like for the purpose. The peak is broad enough at the nose to avoid tuning difficulties, even when used in conjunction with the crystal filter in the receiver. Nevertheless, the response drops off rapidly enough, particularly on the high-frequency side, to make a marked difference in respect to the "capturing" of the limiter by strong off-resonance signals. The overall response curve of the unit, measured across

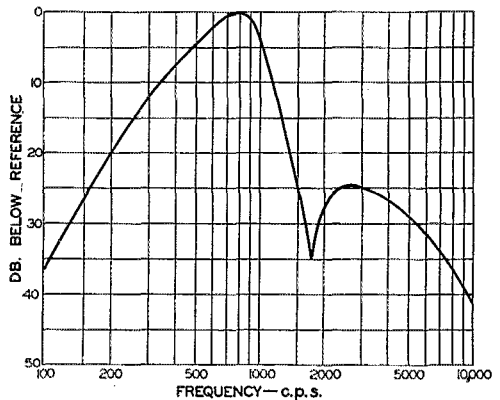
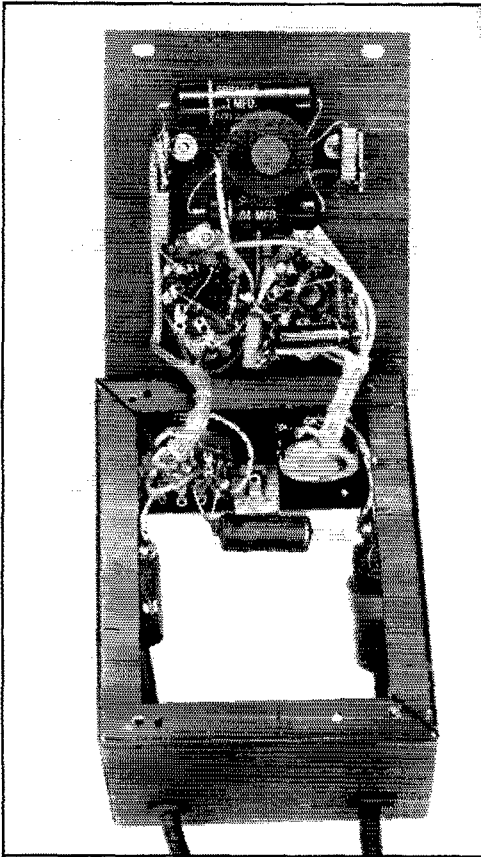


Fig. 2 — Frequency-response curve of the complete unit with the selective audio circuit switched in.



Inside view of the clipper unit. The gain control, switch, headphone jack, and the larger fixed condensers are mounted on the walls of the box. The two tubes and the selective audio circuit are mounted on the removable panel. The selective circuit, consisting of the choke coil and two tubular condensers, occupies the upper half of the panel in this view. The socket at the left is for the input and output amplifiers; the right-hand socket is for the double-triode clipper.

a 500-ohm load connected to J_1 , is shown in Fig. 2.

There is a wide latitude in choice of inductances for L_1 . The Millen coil listed under Fig. 1 was the best of available low-priced units tried, in terms of sharpness of the response curve and the depth of the rejection notch. Some of the small filter chokes such as the Stancor C-1515 and Thordarson T20C53 also work reasonably well. The former will resonate at approximately the same frequencies as shown in Fig. 2 with 330 $\mu\text{fd.}$ at C_2 and 470 $\mu\text{fd.}$ at C_3 ; the latter choke requires 0.001 $\mu\text{fd.}$ at C_2 and 0.002 $\mu\text{fd.}$ at C_3 . With any coil the values of capacitance required to place the peak and notch at frequencies that best fit your own taste in beat notes can easily and quickly be determined by simple cut-and-try. You can also, of course, substitute any

other type of selective audio circuit that you prefer.

It takes a short while to get the hang of using a clipper, if you've never had one before. The receiver's gain controls should be set so that only the stronger signals are clipped; too-deep clipping will make the receiver sound as though practically every signal overloads it. Once the proper settings for clipping level are determined, the actual audio volume is adjusted by the gain control on the unit. A little juggling back and forth between the receiver controls and the output control in the clipper unit will eventually result in the receiver's sounding very much like it does without the clipper present. The difference is that the signals and noise, including your own transmitter signal, just don't rise above the level you've set as a ceiling. There's simply nothing more to it than that — but what a world of a difference this gadget makes in operating comfort!

WWV-WWVH SCHEDULES

FOR the benefit of amateurs and other interested groups, the National Bureau of Standards maintains a service of technical radio broadcasts over WWV, Beltsville, Md., and WWVH, Maui, Territory of Hawaii, on the following schedules:

The services from WWV include (1) standard radio frequencies of 2.5, 5, 10, 15, 20, 25, 30 and 35 Mc., (2) time announcements at 5-minute intervals by voice and International Morse code, (3) standard time intervals of 1 second, and 1, 4 and 5 minutes, (4) standard audio frequencies of 440 cycles (the standard musical pitch A above middle C) and 600 cycles, (5) radio propagation disturbance warnings by International Morse code consisting of the letters W, U or N, indicating warning, unstable conditions, or normal, respectively.

The audio frequencies are interrupted at precisely one minute before the hour and are resumed precisely on the hour and each five minutes thereafter. Code announcements are in GCT using the 24-hour system beginning with 0000 at midnight; voice announcements are in EST. The audio frequencies are transmitted alternately: The 600-cycle tone starts precisely on the hour and every 10 minutes thereafter, continuing for 4 minutes; the 440-cycle tone starts precisely five minutes after the hour and every 10 minutes thereafter, continuing for 4 minutes. Each carrier frequency is modulated by a seconds pulse which is heard as a faint tick; the pulse at the beginning of the last second of each minute is omitted.

Station WWVH, operated to provide coverage of the Pacific area, broadcasts on an experimental basis on 5, 10 and 15 Mc. The program of broadcasts on the three frequencies is essentially the same as that of WWV. Reception reports indicate that WWVH is received at many locations not served by WWV, thus extending the area served by standard frequencies and time signals. Time announcements in GCT are given from WWVH every five minutes by International Morse code only.

**SWITCH
TO SAFETY!**



All-Driven Arrays

A Three-Element Beam with Binomial Current Distribution

BY WARREN M. ANDREW,* W3AM

THIS antenna is the outgrowth of ideas born during the past war, plus the fact that my kilowatt rig was running a very close second on occasions to W3ICW's 160 watts. There were also occasional reports that I was running into trouble in DX contacts from W3LTU and W2SAI. All of these stations were known to be using multiple driven arrays, and my good friend W0OEV was having a great deal of success with one as well. The antenna at W3AM at that time was a Lazy H directed on Australia.

The original design of the antenna to be described was suggested during the war by Dr. R. J. Adams, head of one of the antenna sections at NRL, a man who should be a ham because he could do so much for us. His idea called for driving all elements from the rear — that is, from the reflector forward, to use parasitic language. The impedances set up were rather fantastic and not at all practical for 20-meter work, although they would work nicely at higher frequencies where the length/diameter ratio of the conductor doesn't make mechanical problems.

The principle is quite simple to state and not hard to realize in certain configurations. The idea is to drive all elements in a flat-topped array in such a way that all fields add exactly in the forward direction and all subtract in the rear direction. This is done by picking the spacing desired and then figuring out how to feed the elements with the object of dividing the current among them in such a way that their fields give maximum forward gain and zero radiation to the rear. In a three-element array with quarter-wave element spacing meeting this requirement calls for "binomial" current distribution — that is, the center element must have twice the current that flows in either of the outer elements. Also, the relative phase of the current in each element must decrease by 90 degrees, looking from the rear of the antenna along the line of maximum propagation. The general idea is shown by the vectors of Fig. 1. In practice the results with quarter-wave (90-degree) spaced arrays have been rather exciting, to say the least. A 3-element array spaced 60 degrees also has been working well, but so far the front-to-back ratio hasn't turned out to be as great as desired because of the difficulty of feeding the close-spaced elements.

Since it is impossible to do anything alone and since ideas must be developed with the aid of others in this amateur game, it was only natural

that several people should become enthused and that several beams should result. At present there are two 3-element quarter-wave spaced arrays and one $\frac{1}{6}$ -wave or 60-degree spaced array in operation on 14 Mc., and one 2-element quarter-wave spaced array is under construction. W3AM and W3WV have the quarter-wave spaced jobs, W4NTZ has the $\frac{1}{6}$ -wave spaced, and (please note and refer to the opening paragraph) Robby,

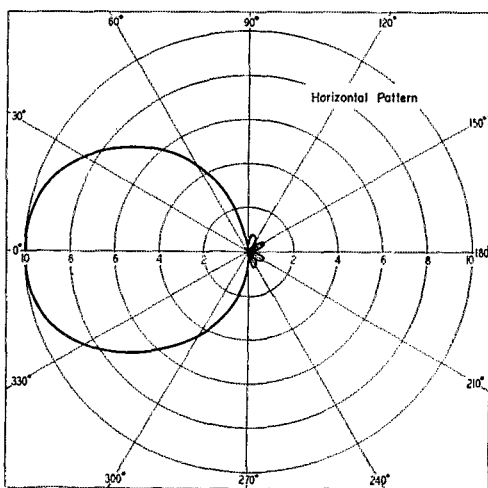
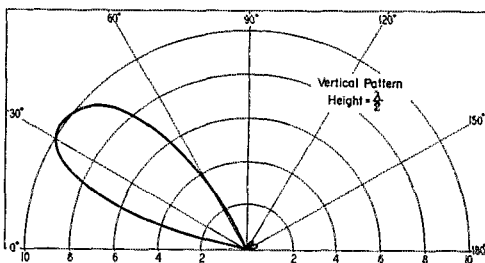
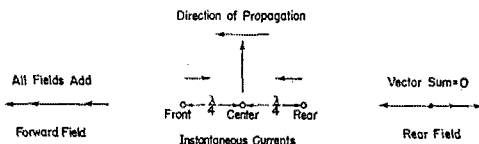
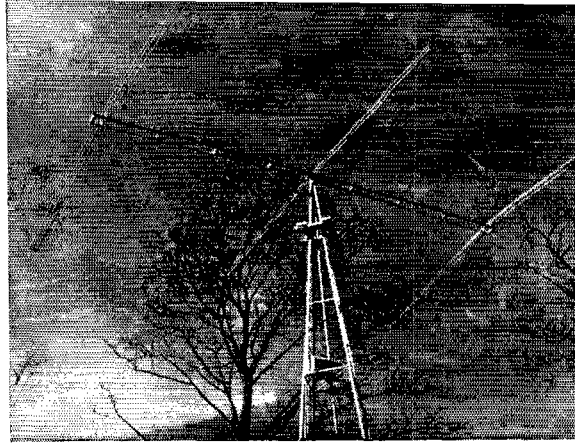


Fig. 1 — Vector relationships and theoretical horizontal and vertical (height $\frac{1}{2}$ wavelength) patterns of a three-element array having binomial current distribution, 90-degree phasing, and quarter-wave spacing.

* 3660 Southern Ave., S. E., Washington 20, D. C.

The 20-meter beam at W3AM has all driven elements. The open-wire transmission line connecting the outer elements to the drive point at the center runs along the top of the double I-beam aluminum boom.



W3ICW, is building a 2-element quarter-wave spaced on 14 Mc. and a 3-element quarter-wave spaced on 28 Mc. It might be mentioned that both W3WV and W4NTZ are co-workers at NRL. Another co-worker, R. B. Vandergrift (who, I am sorry to state, is not a ham), started scaling these antennas and stacking them for television reception, and now there are twelve such arrays getting Philadelphia from Washington. This is mentioned to show that stacking would be a help, and that the antennas scale very easily since they are so broad in their resonance characteristics.

of by the line connections, which are one-quarter wave long, and by transposing the line connecting the center and rear elements. The connecting lines must be air-insulated because a propagation rate is wanted that equals the wave velocity in free space. It is true that open line doesn't quite do this, but it is so close that the out-of-phase effect is not worth mentioning.

The original design had called for feeding the system with two RG-11/U cables connected in series at each end to form a balanced 150-ohm line, since it was estimated that the impedance of the system was about 150 ohms. But an investigation of the price situation on concentric line showed that RG-11/U was 15 cents per foot while RG-8/U was only a nickel, and since 140 feet was needed it was felt that some standing waves could be tolerated, so RG-8/U was used. As it turned out, the frequency response is so broad that the transmitter sees no change on the line in going from one end of the 20-meter 'phone band to the other, even though there are probably some standing waves on the line.

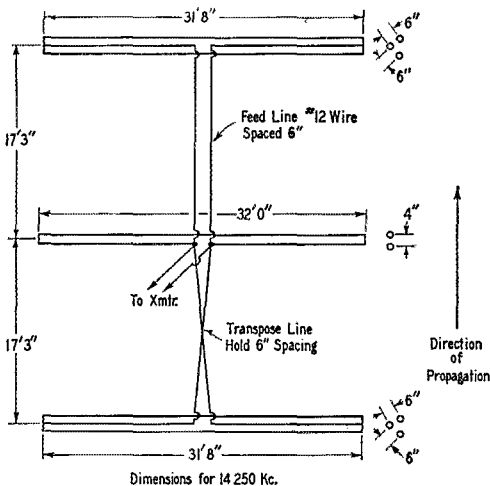


Fig. 2 — Element arrangement and interconnections of the three element binomial array.

The dimensions and layout of the antenna are shown in Fig. 2. The front and rear elements are 31 feet 8 inches long for 14,250 kc. and the center element is exactly 32 feet for this frequency. For those who want information on the mechanical layout it can be pointed out that all of these beams are mounted on parallel 3-inch dural I beams secured in surplus. Since the I beams did not have the 36-foot length necessary for W3AM and W3WV, they were extended with 24ST channel that just fitted into the I beam. An extension was made on each end to equalize the load and appearance. The writer mounted the elements right on the beams without additional support, but the others put supports under theirs.

In building a 3-element quarter-wave spaced array it is simpler to get the current distribution and the construction of the elements is more practical if the system is fed at the center element. The relative current amplitudes are obtained by making the center element a 2-conductor folded dipole and the outer elements 3-conductor folded dipoles, and then connecting all three together through 600-ohm lines. The 90-degree phase shift in the currents is taken care

Because the booms are so long, torsional swinging in a light breeze causes the ends of the elements to swing four or five feet. Metallurgists were consulted on the fatigue limit of 24ST and mechanical engineers were called in for suggestions on ways to eliminate it. The metallurgist figured the swing at about ten degrees in 17 feet and the period at about three cycles; much sliding on the slide rule gave a figure of 10 years as the minimum life with constant swinging. The

mechanical engineers came up with the idea that the design was good and a support on the end was the only apparent solution to stopping the swing. How to rotate it in that case was a problem — but who wants a beam more than 10 years, and anyway it doesn't swing all the time nor through such arcs an appreciable time, so it should last 20 years.

About this time high winds started — up to 60 miles an hour in gusts — and the elements settled right down with no swing at all. The drive motor had been made to drive through a spring mounting, so five degrees swing about the horizontal was allowed with a final pull of 150 foot-pounds on the boom. This took away the sting of sharp wind blasts and took up the inertia in start-

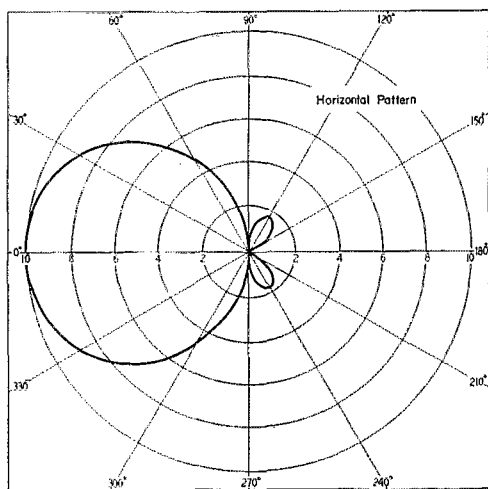
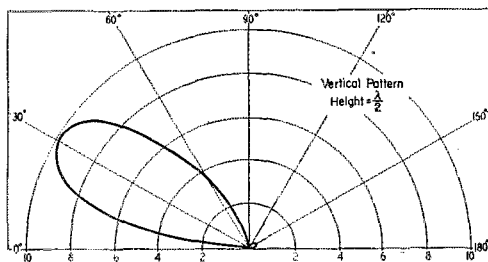
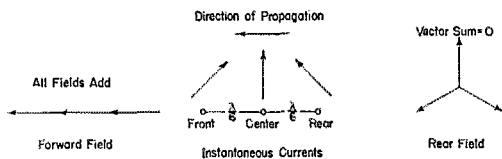


Fig. 3 — Patterns and vectors for a three-element "60-degree" array. The elements have equal currents with 60-degree phasing and are spaced one-sixth wavelength.

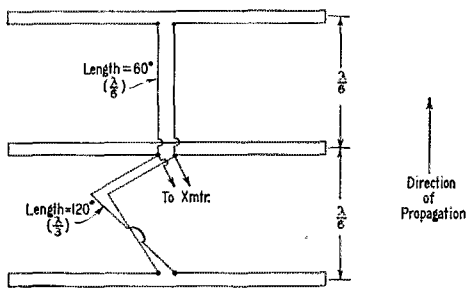


Fig. 4 — Feed arrangement for 60-degree $\frac{1}{6}$ -wave spaced three-element array. The extra length of line is required to advance the phase in the rear element. Details of element construction and connecting-line impedances have not yet been completely worked out for this type of array.

ing and stopping. It also makes up for those times when the operator forgets which way to throw the switch for the wanted rotation and immediately reverses it — without consulting the proper physics book on the result to be expected with an affair of this size!

A 20-meter antenna of this design is so large that it can't be tuned up as a system, at least in my yard. It covers a spot larger than most houses of common people. The turning diameter is about 42 feet for the array pictured, so it still goes on a 50-foot lot with some leeway.

A word should be said about W4NTZ and his troubles in feeding the 60-degree array shown in Fig. 3. He decided that the proper way to feed it was by T matches from an open-wire line. The writer maintained that a T match could never match more than the center impedance of a folded dipole, or four times the center impedance of a straight dipole under the same circumstances. Because of the close spacing the elements react considerably on one another, making the center impedance of a folded dipole less than 300 ohms by an appreciable amount, so that an open line having the lowest practicable impedance that could be built would not match a complete folded dipole, let alone a T match as such. He is now all set to try "yoke" matching — that is, changing the relative size of the two conductors of a folded dipole so that more than four times the dipole impedance can be realized — to achieve a match with his connecting line made of $\frac{1}{4}$ -inch aluminum tubing spaced one inch. The feed system for this type of beam is shown in Fig. 4. It should be noted that an extra section of line is added between the center and rear to phase the rear element forward and cancellation to the rear. If the feed could be made from the rear element forward any system would phase out correctly but, as stated earlier in this article, the impedances would be rather awful. In this 60-degree system all elements must carry the same

current to get proper cancellation to the rear, as shown by the vector relations in Fig. 3.

The two-element array that is being constructed by W3ICW calls for quarter-wave spacing and folded-dipole elements connected with 300-ohm open line a quarter wave long. It will be fed with balanced concentric pair that doubtless will not be 150 but 104 ohms to take care of the economic factor. In this system both elements must carry the same current, to give perfect cancellation to the rear. A diagram of the field vectors is given in Fig. 5.

The radiation patterns shown in the drawings are theoretical but have proven quite accurate in practice. They were calculated by Dick Shoemaker, W3KQW, another co-worker at NRL. Dick is one of those unfortunates who live in apartments, but since he has just acquired some property on a hill in Virginia it is only a question of time until there will be another array on which data can be given.

The writer's beam was completed on Sunday evening, December 4, 1949. W3WV was the first contact, to check the pattern. A CQ got W6MWM and W3ICW. Robby was about to get the first lesson that was to convert him — W3AM was six S units higher than W3ICW. The following week the log shows PY7RL, MD2HN, G6WX, EK1MD, ZE1JX, XZ2KN, XZ2SY, VQ4SC, YN4CB, and the clock on the transmitter shows the filaments were on only 4½ hours. The rare ones — for W3AM, at least — added during December and January have been VS7GR, VU2DI, ZE2JS, AP2N, DU1HR, VS6AM, ZS2DY, together with many VKs, Europeans of all varieties, South Americans and Africans. During the first week end of the 'Phone DX Contest 117 contacts in 45 countries were made in 20 hours. KH6DK has been worked on two occasions on schedule on 20-meter 'phone at 8 P.M. EST. Europeans working in the American 'phone band are contacted in the early evening because the good front-to-back ratio makes them receivable. W3WV talks with his hands and finds JAs, Cs and PKs calling him after he signs.

To compare the new antenna with the Lazy H, checks were made with some twelve VKs at various times and specific tests to show opening and closing times were run with two of them. The new antenna opened up about 30 minutes earlier than the Lazy H, its top performance was better by at least three S units, it faded out at about the same time as the Lazy H and during the last 15 or 20 minutes it seemed to have about the same signal strength. I have received reports that would tend to show that the new antenna was six S points better than the Lazy H and never received a report of lower signal strength. In these tests the switch could be made from one antenna to the other practically instantaneously, maintaining the same power input within a per cent or so that favored the Lazy H.

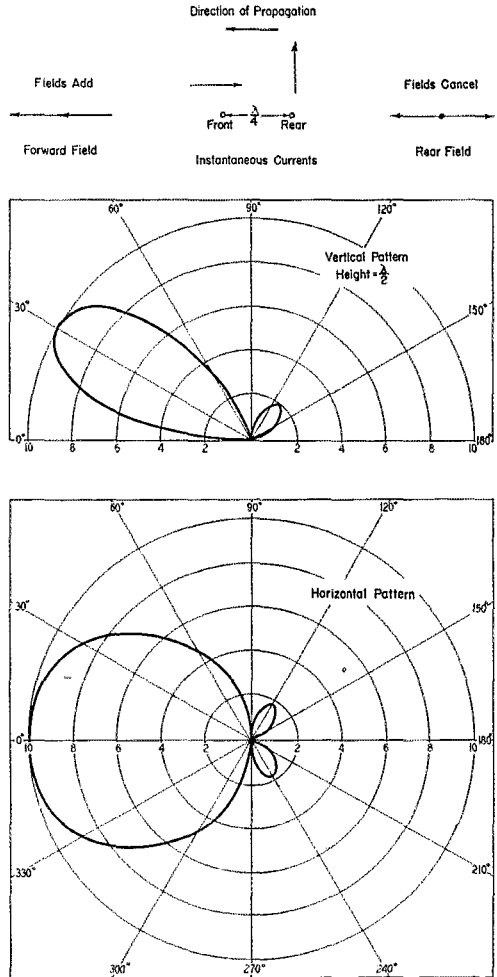
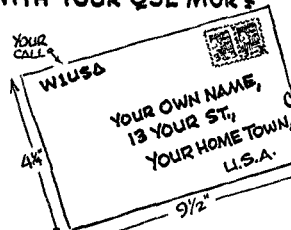


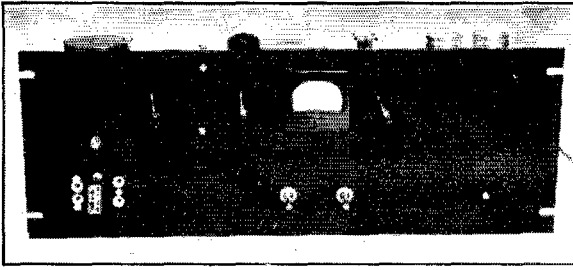
Fig. 5 — Patterns and vectors for a two-element array with 90-degree phasing and quarter-wave spacing.

All in all, the antenna has been a delight to have around. In fact, when I don't get them on the first call I go down to the basement to see if the transmitter has blown a fuse or something!

**IS YOURS ON FILE
WITH YOUR QSL MGR?**



See page 32



The front panel of the 6AG7-6L6 crystal-controlled exciter. The three different crystal sockets (lower left) accommodate the various crystal holders presently in use.

An All-Band Crystal-Controlled Exciter

BY LEONARD A. LANGLEY,* W2CDQ

HERE is a little rig designed especially for the c.w. man who likes to run his QSOs above 20 w.p.m., who appreciates the value of and likes to have break-in operation, and who also prefers the superior quality and stability of a crystal note. The oscillator can be keyed at 35 w.p.m. with 7-Mc. crystals, and even faster with 3.5-Mc. quartz. The keying characteristic ob-

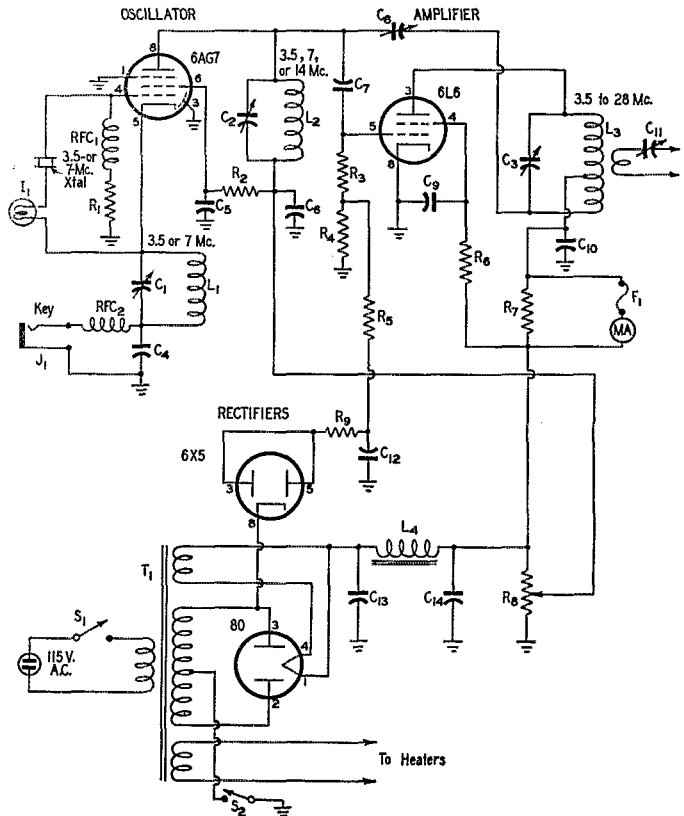
tained with this circuit was far superior to that with any other circuit tested, and even chipped crystals having low activity will key well at high speeds. Sufficient output is obtained on all bands from 3.5 to 28 Mc. for driving a tetrode stage or for use as a low-powered rig from 3.5 to 14 Mc.

The circuit, shown in Fig. 1, is a standard Tri-tet and buffer-doubler, with a few minor modifications. The high crystal current and broken crystals sometimes credited to the Tri-tet

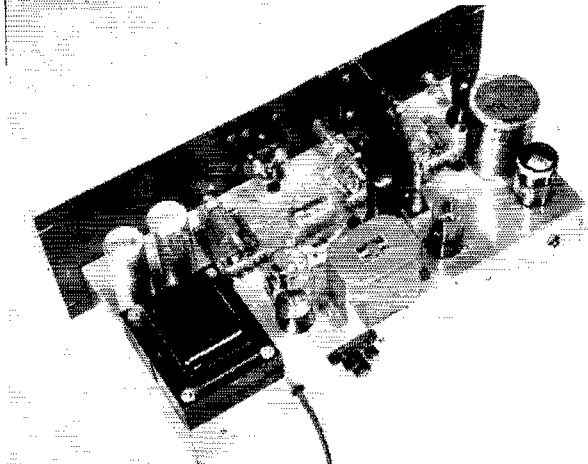
* New Road, East Amherst, N. Y.

Fig. 1 — Wiring diagram of the crystal-controlled exciter.

- C₁ — 300- μ fd. mica trimmer.
 - C₂, C₁₁ — 250- μ fd. variable (National ST-250).
 - C₃ — 75- μ fd. variable (National ST-75).
 - C₄, C₅, C₆ — 0.002- μ fd. 600-volt paper.
 - C₇ — 250- μ fd. 600-volt mica.
 - C₈ — Neutralizing condenser (National NC-600U).
 - C₉, C₁₀ — 0.01- μ fd. 600-volt paper.
 - C₁₂, C₁₃, C₁₄ — 8- μ fd. electrolytic, 450 w.v. d.c.
 - R₁ — 1.0 megohm, 1 watt.
 - R₂ — 47,000 ohms.
 - R₃ — 22,000 ohms.
 - R₄, R₆, R₉ — 10,000 ohms.
 - R₅ — 25,000 ohms, 5 watts.
 - R₇ — 50 ohms.
 - R₈ — 25,000 ohms, 50 watts, wire-wound, with slider.
- All resistors 2-watt unless specified otherwise.
- L₁, L₂, L₃ — See text.
 - L₄ — 30-henry 80-ma. choke (UTC S-27).
 - F₁ — 200-ma. fuse.
 - I₁ — 60-ma. pilot bulb.
 - J₁ — Open-circuit jack.
 - MA — 0-150 milliammeter.
 - RFC₁, RFC₂ — 2.5-mh. r.f. choke.
 - S₁, S₂ — S.p.s.t. toggle.
 - T₁ — 350-0-350 v., 200 ma.; 6.3 v., 6 a.; 5 v., 3 a. (Thordarson T22R07).



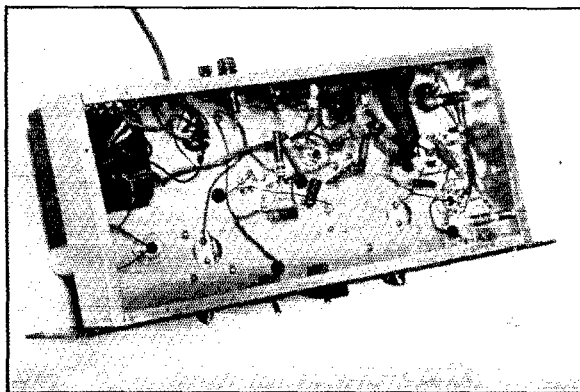
A rear view of the exciter, showing the shield partition between C_2 and C_3 . The copper coil shield over L_2 (extreme right) is homemade.



were avoided by following the book and using a well-screened tube, low plate and screen voltages, and correct tuning of the cathode circuit. A 60-ma. panel lamp in series with the crystal was used originally for crystal protection, but since it doesn't light under any condition of tuning, it can be omitted if desired. An r.f. choke and a one-megohm resistor in the grid circuit are used to secure more satisfactory keying with all grades of crystals, and the r.f. choke in the key lead improved the keying characteristic slightly and also eliminated some r.f. that was affecting the operation of an electronic bug key. Crystal switching was not included because the switch, sockets and associated wiring may introduce too much stray capacity and hamper operation with some crystals. The cathode circuit is tuned to the same frequency for both straight-through and harmonic operation. One setting of C_1 , using a crystal in the middle of the band, will usually suffice for the entire band. The cathode coils, L_1 , are wound on $1\frac{1}{4}$ -inch diameter forms, with C_1 mounted inside the coil form. The coils were wound with No. 20 d.c.c., spaced the wire diameter, using 10 and 6 turns for 3.5- and 7-Mc. crystals, respectively. The 6AG7 plate coils, L_2 , are also wound on $1\frac{1}{4}$ -inch diameter plug-in forms with the same wire, using 22 turns on 80, 14 turns on 40, and 9 turns on 20 meters.

A bias supply is used for the buffer stage for two reasons: to limit the key-up plate current and to sharpen the keying characteristic and remove any trace of chirp from a poor crystal of low activity. The fixed bias is adjusted so that the key-up plate current is about 2 or 3 ma. This gives a sharper keying characteristic than with the keyed oscillator alone, but it is not sharp enough to cause clicks. Additional grid-leak bias obtained through R_3 assures satisfactory Class C amplifier and doubler operation. The resistor R_7 provides additional protection for the meter. It is large enough to introduce no appreciable error in the readings, but it is small enough to prevent arcing through the burned-out fuse if C_3 is accidentally short-circuited.

This view under the chassis shows how the tuning condensers are mounted on insulating strips of Lucite.



Standard B&W type MEL coils were used for L_3 , in the 6L6 plate circuit. The 6L6 is neutralized, and the coil is tapped in preference to using a split-stator condenser at C_2 . The tap must be found by experiment, to avoid readjusting the neutralizing condenser, C_8 , when changing bands. In our case the taps worked out as follows, counting from the C_8 end: 3.5 Mc., 14 turns; 7 Mc., 7 turns; 14 Mc., $2\frac{1}{2}$ turns; 28 Mc., $1\frac{1}{4}$ turns. When properly neutralized and shielded, both oscillator and buffer are absolutely stable with any settings of the tuning condensers. The condenser C_{11} has been included for convenience in varying the coupling with the fixed-link coils.

If the exciter is to be used as the station transmitter, an 83-type rectifier instead of the 80 will give a little higher plate voltage.

Construction

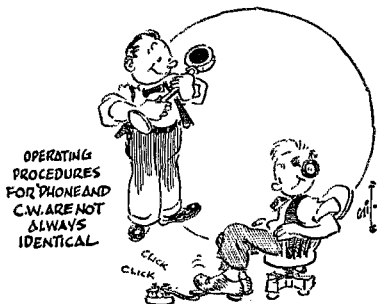
The entire outfit is mounted on a standard $8 \times 17 \times 3$ -inch chassis and a 7-inch relay-rack panel. There is nothing very critical about the location of parts, but care was taken in keeping the r.f. leads in the oscillator as short as possible. Cathode, screen and plate return leads common to a particular stage are grounded at a single point on the chassis. It was necessary to sub-

(Continued on page 98)

Basic Operating Procedure

BY BYRON GOODMAN, WIDX

DON'T let that ponderous title fool you! All it means is that in amateur radio there are some operating procedures that are basic and uniform, like turning a knob or lifting a latch to let yourself through a door. There are always a few individualists who try to go through doors without turning the knob, and there are a few photocell-controlled exceptions to the rule but, in general, opening a door is fairly well standardized and most people become accustomed to it. So it is with operating, and this article will deal with the mechanics of opening and closing the door on a QSO. Some of the procedure is mandatory under FCC regulations, but the majority is simply recommended practice based on accumulated experience.



There are two good reasons for acquainting oneself with proper and recommended procedures. First off, proper identification is required under the law, so you can avoid getting at least one kind of discrepancy notice by observing the rules. And, almost as important, the procedures quickly show a listener what the status is of any QSO — whether it is in progress, just finishing, or not yet started — and thus whether or not the station should be called. There are other refinements, of

course, but basically the procedures *keep you law-abiding and show the QSO status.*

Operating procedures for 'phone and c.w. are not always identical, because of the difference in the mediums, but the FCC regulations apply equally to both.

The regulations say that "An operator of an amateur station shall transmit the call of the station called or being worked and the call assigned the station which he is operating at the beginning and end of each transmission and at least once every ten minutes during every transmission of more than ten minutes' duration. In the case of stations conducting an exchange of several transmissions in sequence, with each transmission less than three minutes' duration, the calls of the communicating stations need be transmitted only once every ten minutes of operation as well as at the beginning and at the termination of the correspondence."

Thus, if you are using snappy break-in or push-to-talk for traffic handling or rag chewing, you have to keep one eye on the clock to be sure you don't let ten minutes elapse without signing. In contest work you are in violation if you don't sign off properly with the other station. And, of course, you must always identify your station during an on-the-air test of any kind.

The FCC requires the use of "DE" between calls in radiotelegraph work and "THIS IS" or "FROM" in voice work. Later examples will show how they are used.

Keeping a log of every transmission, also required by FCC regulation, will be treated in a later article in this series.

Insofar as the basic procedure is concerned, a QSO has three parts: the call (general or specific), the QSO proper, and the sign-off. Once the procedures are clearly established in your mind, it will become second nature to use them properly, like your "Hello" and "Good-by" in everyday conversations.

Part I — Radiotelegraphy

Calling

IF you put out a general call — the high-brow name for a good old CQ — it means that you intend to answer anyone who hears you and calls you in reply. However, a specific call, such as a directional CQ or a call on schedule or a call aimed at some particular station that is your sole interest at the time, is one that you don't want answered by just anyone. Hence the terminal signals on general and specific calls should be different, so

that anyone tuning in on you just as you sign over won't be tempted to call you if you have something else in mind but will feel free to blast if your operating is general. There are three terminal signals used for the purpose, and they show clearly the intent of the operator. A few examples will illustrate the various points.

General call, will answer anyone, just looking for a rag chew:

CQ CQ CQ DE W1AAA W1AAA W1AAA K

Call to a station (contact not yet established)

but don't mind if someone else calls you:

W2BBB W2BBB W2BBB DE
W3CCC W3CCC W3CCC AR

Specific calls, where specific answers desired, no interest in anything else:

CQ UTAH CQ UTAH CQ UTAH
DE W4DDD W4DDD W4DDD KN

VK6MO VK6MO VK6MO DE
W5EEE W5EEE W5EEE KN

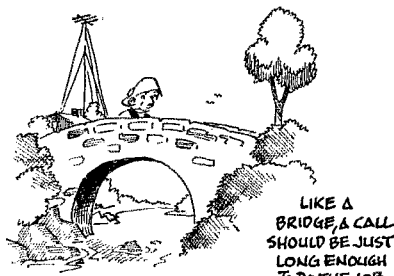
Contact has not yet been established in any of the examples above, but it is perfectly apparent that anyone tuning in on W1AAA or W3CCC just as he signs over could feel free to call, and rightly so, although courtesy demands that you listen a while to see if W3CCC raised the station he called. Anyone tuning in just as W4DDD or W5EEE signed would know not to call, having been told so by the use of KN. The lines over the tops of AR and KN indicate that the letters are run together as one character when transmitted.

There is nothing sacred about the number of times you send your call or the other station's — like a bridge, a call should be just long enough to do the job. In calling a plain CQ, the general practice is to send 3 or 4 CQs followed by "DE" and your call two or three times, repeating this anywhere from three to six or seven times. The duration of a CQ depends on many things, not the least of which is the activity in the band and the good judgment of the operator. A too-long CQ, particularly without signing your call often, may discourage a potential customer, although a directional CQ must of necessity be longer than a general one, because of the smaller chance of raising someone. On the other hand, in a contest a truly short CQ will usually pay off at the highest rate. Poor judgment includes sending a directional CQ that sounds like a plain one, thus:

CQ CQ CQ DE W4DDD W4DDD W4DDD
CQ CQ CQ DE W4DDD W4DDD CQ CQ
UTAH DE W4DDD W4DDD W4DDD KN

Another way to lose friends and show your ignorance is to use "KN" at the end of a plain CQ. It means you want no one to reply! A more common error is to call a station and sign over with "AR K"—a habit that dates back to Noah's houseboat and could only occur properly when handling message traffic, never during a call before contact is established.

When you call another station, try to visualize how long it will take the called station to tune to your frequency, always remembering that if you



call too long he may get impatient and look for another answer. Calls longer than 30 or 40 seconds are seldom if ever necessary, except at slow speeds or when calling a station on pre-arranged schedule.

During the QSO . . .

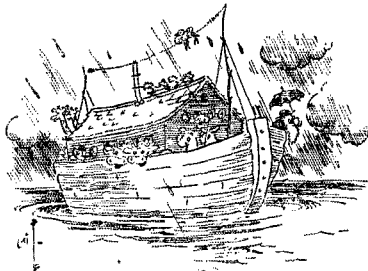
The proper calling and signing procedure during a QSO is simple because it doesn't require much judgment. If you have a good circuit (strong signals, little QRM), you can come back with a simple "W1AAA DE W2BBB" and then go into your routine. An exception might be when W1AAA has just answered a CQ by W2BBB, in which case it might be better for

ENDING SIGNALS

Signal	Meaning	Use
<u>AR</u>	End of Transmission	After call to a specific station before contact has been established. (Also at the end of transmission of a radiogram, immediately following the signature, preceding identification.)
K	Go ahead (any station)	After CQ and at the end of each transmission during QSO when there is no objection to others breaking in.
<u>KN</u>	Go ahead (specific station), all others keep out	At the end of each transmission during a QSO, or after a call, when calls from other stations are not desired and will not be answered.
<u>SK</u>	End of QSO	Before signing last transmission at end of a QSO.
CL	I am closing station	When a station is going off the air, to indicate that it will not listen for any further calls.

W2BBB to send "W1AAA" two or three times instead of once, just in case there is some QRM or other confusion.

At the end of his transmission, W2BBB signs over with either "W1AAA DE W2BBB K" or "W1AAA DE W2BBB \overline{KN} ," depending on whether or not he wants to keep the QSO a two-way affair or is open for other calls and the possibility of a three-way.



"AR K" DATES BACK
TO NOAH'S HOUSEBOAT

If the transmission from W2BBB is short (less than three minutes), W2BBB can tell W1AAA to go ahead by just sending "BK" or "K" without identifying either station. (More on this later.) However, to comply with the FCC regulation, neither station must allow ten minutes or more to elapse without identifying both of the stations involved.

Terminating the QSO

Signing " \overline{SK} " before the final identification indicates that the QSO is about to be terminated. The signal is often improperly used after the identification, but this leads only to confusion because it doesn't show exactly when the QSO ends. Since both stations should use it, obviously someone tuning in at the last minute can't tell whether he is hearing the first or second " \overline{SK} ." Proper usage is illustrated by the following example — the dashes represent the usual exchanges of pleasantries and the like:

W1AAA DE W2BBB \overline{SK}
 W1AAA DE W2BBB K (or \overline{KN})
 W2BBB DE W1AAA \overline{SK}
 W 2 B B B D E W 1 A A A

Courtesy generally requires that W2BBB acknowledge the last transmission with "R," "GE," "GN" or "GM" (depending upon the time), or just a single "dit," but anything more than this is superfluous, and confusing to an operator standing by to call one of the stations.

There is a tendency in amateur operating to stand in the doorway with hat in hand and go through the motions of signing off several times. Just why this is so has never been clearly ex-

plained by anyone, and you won't find the answer here either. It can only be pointed out that such soulful farewells are unnecessary and confusing, and the use of the above procedure is quite proper and not rude or brusque.

Many times the stations wish to indicate that they are listening for other calls right after they sign. The incorrect way is to send "QRZ?" which is actually a signal reserved for questioning a call you have heard but not copied in full. Correct procedure is to send "CQ" once. If you send "CQ" more than once, a listening operator may decide you are starting a long-winded CQ that he doesn't want to wait out. In the example above, W2BBB could send a short "CQ DE W2BBB K" immediately after his "dit" or "R" to W1AAA, or W1AAA could send a short "CQ DE W1AAA K" right after his last transmission shown above.

It is generally assumed that the station is still listening immediately after terminating a QSO, so the short CQ mentioned above is not really necessary. However, when an operator wishes to show that he is no longer listening, he uses "CL" after his last transmission. For example, W1AAA above would send

W2BBB DE W1AAA \overline{SK}
 W2BBB DE W1AAA CL

But W2BBB, being the first to sign off, would reserve his "CL" until after the last transmission of W1AAA, acknowledging W1AAA with

R W2BBB CL

Break-In Calling

The abbreviation "BK" means "break," but it is used in many different ways and so justifies a separate discussion. It is not necessary to have a



"KN"
MEANS
ALL OTHERS
KEEP OUT

station equipped for full break-in (ability to hear the other signal whenever your key is up) to use the procedures, although that makes it considerably more convenient.

One use of "BK" is to call "CQ BK CQ BK CQ BK DE. . . ." This shows that the calling station is listening on his own frequency during spaces or pauses, and you can raise him by moving on to that frequency and holding down your key

for a dash or two. The station calling CQ will stop, you sign your call, and you are in QSO. If the QRM is bad, it is smart to send his call once and then yours, to enable him to spot you. The system works best in a band or part of a band that isn't too crowded.

Some operators, particularly in QSO contests, will call (for example) "CQ SS CQ SS CQ SS DE W3CCC W3CCC BK" instead of using the more normal "K" or "KN." They do this as a go-ahead signal and to indicate that they are using full break-in at the station.

However, the use of "BK" after a CQ can lead to confusion. In many QSO contests, for example, when W3CCC calls "CQ SS DE W3CCC K," he may be answered by W4DDD who calls "W3CCC BK." If W3CCC hears W4DDD's signal, he holds his key down an instant and W4DDD sends "DE W4DDD K" and they are in QSO. Obviously anyone just tuning in to W4DDD might interpret the "W3CCC BK" as the end of a CQ by W3CCC and call the W3, thus adding to the confusion. For this reason, it seems more reasonable to reserve the use of "BK" during contests to invite the called station to break in quickly, as in the example above of W4DDD calling W3CCC.

In any operating where the transmissions are short, as in traffic handling, contests or break-in rag chews, "BK" is used at the end of a transmission, bearing in mind, of course, the FCC regulations about station identification. For example, the skeleton of a short QSO with good break-in would look like this:

```

W5EEE: CQ CQ CQ DE W5EEE W5EEE K
W6FFF: W5EEE BK
W5EEE: Dit
W6FFF: DE W6FFF K (or BK)
W5EEE: W6FFF DE W5EEE ..... BK
      (or K)
W6FFF: ..... BK (or K)
W5EEE: ..... SK W6FFF DE W5EEE K
W6FFF: ..... SK W5EEE DE W6FFF
W5EEE: Dit
  
```

The above is based on single transmissions of less than three minutes and a total QSO time of less than ten minutes, of course. Note how W5EEE identifies W6FFF as the station he is working, since several stations may have called him at the same time.

Portable and Mobile

When a station is operating portable or mobile, the operator must sign his call in accordance with FCC regulations governing such operation. For example, W6FFF operating portable or mobile in the W6 call area would always sign his call "W6FFF/6." If he were operating portable or mobile in the W2 call area, he would sign "W6FFF/2." It is not necessary for a station calling a portable or mobile station to include the portable indicator of the called station, and

W5EEE would call or work W6FFF/6 with a simple "W6FFF DE W5EEE" in the normal manner. However, W6FFF would always identify himself with the portable designation each and every time he signed his call.

An amateur station operating maritime mobile is required to indicate so with "/MM" after his call. Thus, a CQ by W7GGG operating maritime mobile would require the call in the form "CQ DE W7GGG/MM." A further requirement is that a maritime-mobile station give the name of the vessel and the location at the termination of each QSO. Thus, W7GGG/MM might finish up with W5EEE like this:

```

..... SK W5EEE DE W7GGG/MM
MS GILHOOLIE 45N 165W
  
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(NOTE: Part II of this first article, entitled "Radiotelephony," will appear in August QST.)

Strays

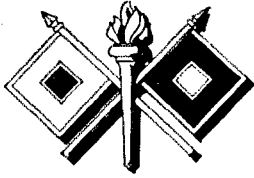
While en route to the annual Board meeting, Rocky Mountain Division Director Franklin K. Matejka, W0DD, stopped over briefly at the home of a friend, Arthur L. Greenberg, W2CYK, of the Bronx. As W0DD was leaving, the postman handed Mrs. Greenberg a little envelope she had been waiting for — good tidings that she was now W2EEO. Losing no time Frank took Mrs. Greenberg's application for Full Membership in the League, caught his Hartford train, and delivered the application to Headquarters a short four hours later. On the way home it was Director Matejka's pleasure to present the membership certificate to W2EEO personally.

— . . . —

If you're thinking of doing any anodizing (Paddon, "It's a Pretty Pickle," QST, May, 1950) or, for that matter, just plain satin-finishing of aluminum, be sure the lye solution used in preparing the metal is *weak*. One of our correspondents points out that concentrated lye solution will do exceedingly nasty things to human flesh, and is not at all to be handled lightly. In the proportions of one can of household lye to two or three gallons of water the solution is much less dangerous and is about the right strength for aluminum treatment. Care should still be taken, however, to avoid letting the solution get in contact with either the body or clothing.

— . . . —

Miniature capacitors using glass-ribbon dielectric have been developed by the Corning Glass Co. for the Signal Corps. A huge manpower saving in mass production of the units is foreseen because the glass ribbon will be of uniform thickness, whereas sheets of mica now have to be hand-sorted for uniform thickness and quality. The finished capacitor is sealed in a glass case that is impervious to atmospheric moisture.



Military Amateur Radio System



THE Reserve Officer Training Corps unit at the University of Minnesota in Minneapolis operates a typical MARS ROTC station — AØDSF.

Here hams from all over the Midwest, enrolled in the university, find relaxation from the grueling academic grind. They also do a bang-up job of public service. Like that week last March when, just as everyone decided spring had come, a howling blizzard descended from the north and swept across the Dakotas and Minnesota. Wind, snow and ice took out many of the commercial communication facilities. The remaining circuits were crowded with official and urgent traffic. Into the field went AØDSF and the SCR-399. For three days the emergency station operated continuously and maintained 100 per cent communication with the North and South Dakota emergency nets on the 40- and 80-meter bands. The principal rôle played by AØDSF was in relaying traffic for the Associated Press.

AØDSF is licensed to M/Sgt. Arthur M. Monsees, Air Force. The MARS club is under the administration of Major William F. Copley, SC, and the club president is Philip R. MacTaggart, senior Signal Corps ROTC cadet. The station has been active since November 1949, and the club boasts a membership of 15, including Army, Navy, and Air Force ROTC cadets. Three complete stations, counting the SCR-399 equipment, are maintained by the cadets who operate on the air as part of the Lakeland Net in the Fifth Army area.

Late springtime projects of the club, which members will sandwich between final examinations and regular instruction periods, include experiments with mobile installations of the SCR-610 for the club's own local emergency net (successful field contacts have already been made with portable installations of SCR-694s), and installation of a new 28-Mc. rotary beam and a "home-brewed" radar equipment.

Other ROTC Activities

Elsewhere around the nation the ROTC advanced communications classes are helping to weld amateur and professional radiomen into a common-bond fraternity. Handicapped somewhat because students live, for the most part, away from home and have many time-consuming campus activities which divide interest, the ROTC units still have provided communications links in numerous emergencies and demonstrations.

An example of the latter occurred recently at Cornell University. On the occasion of the 87th anniversary of the Army Signal Corps, the Signal Corps ROTC unit at Cornell played host to the entire populace of Ithaca, N. Y. Mayor Shaw of Ithaca, Dr. deKiewiet, Cornell president, Dr. Hollister, dean of the Engineering College, and Colonel Ralph Hospital, ROTC instructor, participated in a two-way forum on ROTC affairs and the accomplishments of ROTC cadets in the field of communications, with representatives of the Chief Signal Officer joining in via station WAR in the Pentagon. Colonel Mandelbaum, in charge of personnel and training activities in the Office of the Chief Signal Officer, and Lt. Col. Warren, assistant professor of military science and tactics at Cornell, arranged the program with the technical assistance of MARS Headquarters in Washington.



An inviting outlay of equipment and a spacious, sunlit shack lure a couple of University of California ROTC cadets away from class for the afternoon.

A New Country Calls CQ

BY JOHN MARK REED,* HC2JR

To a sixteenth century Spaniard they were merely a new archipelago of barren and volcanic islands not worth naming or claiming. To sailors whose ships were often deviated from their course by the changing Humboldt Current, missing the islandic cluster entirely, they were "the enchanted islands." To Darwin they were the inspiration for his theory on the origin of the species. To General Villamil, an Ecuadorian leader born in New Orleans, they were the opportunity to add territory to Ecuador and start a colonizing scheme. To numerous scientific expeditions they were a perfect setting for studying nature — nature practically untouched by civilization and aptly called by Beebe "World's End." To dozens of individuals of various nationalities they were a chance to start life over again. To the United States they were — during World War II — a base 600 miles off the coast of South America from which to eye the Pacific and protect the Panama Canal. And to several thousand radio amateurs the world over they were a new country for DXCC.

Ever since HC8ME broke into print¹ prematurely and gave amateurs hope of working the Galapagos Islands, it was obvious that some day somebody would have to go there. Therefore, in January of this year the Guayaquil Radio Club started the ball rolling on plans for such an expedition. Although we were almost ready to give up the project on several occasions because of the difficulties involved, six of us finally got off on April 17th aboard the small Ecuadorian Navy patrol boat *Esmeraldas*. Engine trouble held us up the river for 24 hours but the next day we were really on our way.

Our expedition was made up of the following operators: Teresa (Terry) Reed, HC2TR, Jorge Philippe, HC1JP, and the author operating English and Spanish 'phone; Sofia Philippe, XYL of HC1JP, and Cesar Ramirez, HC2KB, working Spanish 'phone; and P. K. Myhre, HC1PK-WØFQA, main c.w. operator.

Equipment consisted of 32-V1, 32-V2, and TBS-50 transmitters, 75-A1 and NC-

173 receivers, single-wire-fed half-wave antennas for 40 and 80 meters, folded dipoles for 20 and 6 meters, and a 3-element wide-spaced beam with rope rotator for 10 meters. Two 1500-watt motor generators were taken along for power.

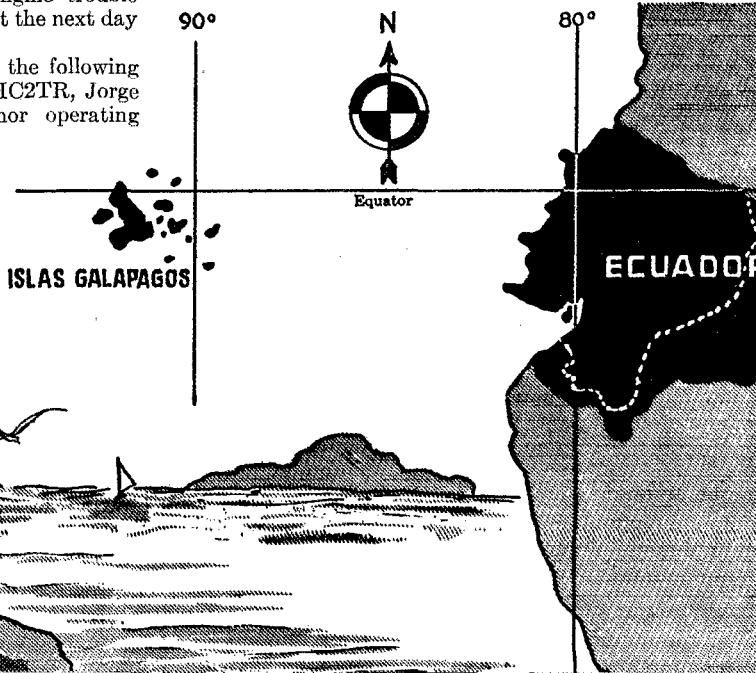
There had been many last-minute changes in our plans so, once at sea, we made it a point to get on the air maritime-mobile under the call HC9GRC to spread the word about our impending operation. Although rough weather, seasickness, and a failing generator cramped our style, we did make 116 QSOs on 10- and 20-meter 'phone. The first two Stateside stations contacted were W2YHY and W4AZD and the only Europeans were DL4GU and G2AKQ.

We dropped anchor in Wreck Bay, San Cristobal Island (Chatham), at 1645 CST April 21st. The transfer of our 48 valuable bundles from ship to shore by sloop was a delicate operation. We could ill afford to lose our remaining motor generator to the floor of the ocean at this stage of the expedition! The unloading was finished at 1800 and the matters of food and getting settled were relegated to second place while we set up antennas and prepared for the important business ahead.

HC9GRC first got on the air at 2012 CST on 20-meter 'phone. The first 20 stations worked were, in the following order: HC1AZ, HC2KB, LU6AJ, HC2OL, HK3CK, CE2DY, LU8CW, W8HGW, W3LOE, W7HIA, W9HP, WØMKF,

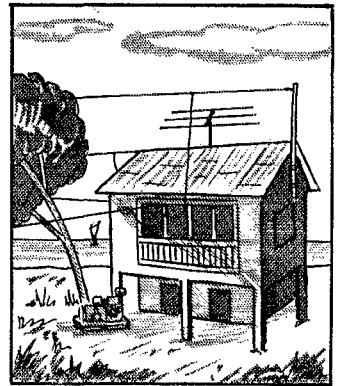
* President, Guayaquil Radio Club, Casilla 784, Guayaquil, Ecuador.

¹"Earthquake in Ecuador," Reed, Oct., 1949, *QST*.





Artist's conception of the HC8GRC operating position (left) and shack (right).



W3LTV, W0BFY, W3NA, W3BES, CO7RQ, W6PL, W4BFU, and W4IYM. C.w. operation on this band started at 0217 April 22nd with the following QSOs: W2CBS, W6GPB, W8DNC, W6GAL, and W9QDW. Ten-meter 'phone was fired up at 0742 April 22nd with the following first contacts: W4OGJ, W5JCV, W4ESP, W5MNH, W4REK, and W5NMA.

At times we worked 10 and 20 meters simultaneously. During the night when the 10-meter band faded out we sometimes got on 7-Mc. c.w., although in this we were limited because we had only one c.w. operator good enough for the situation and he generally found it best to work on 20 meters. A special effort was made for the 80-meter c.w. gang on the evening of April 24th. We worked W4BRB at 2125 and QRP W2QHH at 2130. They were followed by KV4AA, W2EQS, W3JTK, W8YJE, and W2ATE. Later, on the 27th, we worked W3DGM. It is interesting to note that W2QHH, W3JTK, and W4BRB worked us on four bands — 80, 40, 20, and 10.

We were particularly anxious to help Honor Roll members up one rung on the DXCC ladder. When we heard that W6DI was off the air with his regular rig and calling us from a 14-Mc. 25-watt mobile unit with whip antenna, we took a good look for him and made it. However, we did not feel so happy about the fellows who informed us that they were working us for their first HC or even first South American contact!

Our main disappointment was the 50-Mc. department. We started out with high hopes, working HC2OT twice on the way down the river. Thereafter we had no luck, though we called faithfully on 'phone and c.w. on 51.34 Mc. at 1930 CST every day.

One of our goals was to work as many stations as possible and at the same time contact as many countries as could be heard. Unfortunately, DX conditions were highly unfavorable for Asia and Africa and only partly good for Europe and Oceania. Therefore, we found it logical to concentrate on W-land in order to satisfy the largest possible number of hams. Nevertheless, we did work 69 countries and WAC in the course of 2116 QSOs. We know we worked 46 states but are not sure about South Carolina and Utah.

We were disappointed in the number of countries worked on c.w. and are certain that our total would have increased by 20 or 30 if the W stations had not piled up on us regardless of whom we were trying to QSO. In this situation a rare DX station can do very little unless it refuses to work anyone. Since we were at HC8 to work as many stations as possible we could hardly adopt that attitude.

On 'phone we generally had two persons at each rig, one operating and one keeping log. As can be easily imagined, this left little time for sleep. After the first day of trying to live on home standards we did not bother to undress for the three hours in each 24 that we closed our eyes. In some ways we worked harder than we did during the Ambato earthquake emergency of last August. The work was more nerve-wracking last year but there was a QRT from midnight to dawn

(Continued on page 96)



Members of the Guayaquil Radio Club expedition to HC8. Left to right: Cesar Ramirez, HC2KB; Sofia Philippe, XYL of HC1JP; Jorge Philippe, HC1JP; Teresa Reed, HC2TR, XYL of HC2JR; P. K. Myhre, HC1PK-W0FQA. Seated: John Mark Reed, HC2JR.

QST for



United States Naval Reserve



A DIRECTORY of amateur radio stations operated by members of the Naval Reserve and the Marine Corps Reserve has been compiled and distributed to Reservists who are active in the Naval Reserve program. Twelve hundred and eighty individual amateurs are listed, as well as 517 amateur stations at Naval and Marine Corps Reserve activities. Copies will be available to other USNR or USMCR amateurs as long as the supply lasts. Address your request to the Naval District headquarters in which you are located, attention of the Naval Reserve Electronics Program Officer.

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Emergency power units from Reserve Training Centers at Moline, Ill. (K9NRD), Rock Island, Ill., and Davenport, Iowa, brought light and heat to the city of Clinton, Iowa, when a million-dollar ice storm paralyzed the area. Generators were set up in a home for the aged, an academy, and a women's college, which had been turned into havens for citizens whose homes were without light or heat. Naval Reserve equipment also furnished light at the city airport and at a radio store, which served as an emergency communications center. The three Training Centers maintained

a 24-hour radio watch and local amateurs used the equipment to reach the stricken city. . . . Many additional examples of emergency communication service have been recounted in these pages. . . . "They also serve who only stand and wait," and the efforts of such folks deserve mention. . . . When a January forest fire endangered the city of Colorado Springs, a stand-by radio circuit was maintained between Naval Reserve Training Center, Colorado Springs (K0NAP), and Denver (K0NRC). Although a communications emergency did not develop, the respective crews were ready. . . . In connection with flood threats in early February, radiomen, plus fifty additional Naval Reserve personnel, assembled and stood by at the Naval and Marine Corps Reserve Training Center, Shreveport, La. (K5NRS), for possible emergency service. A 5-kw. engine-generator lighting plant was furnished to Slack Air Force Base. Contact was maintained with the Red Cross. . . . Other displays of emergency-readiness are credited to Naval Reserve Training Centers at Waterloo, Iowa (K0NRF), Sioux City, Iowa (W0USN), Lincoln, Nebr. (K0NRL), Sioux Falls, S. D. (K0NRU), Lima, Ohio (K3NRP), and Battle Creek, Mich. (K8NRB). Each of these activities was on the job to render assistance as needed during flood and storm threats in their areas. . . .

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Here and there: First "Wave" radio amateur in the First Naval District to be issued a Naval Reserve Radio Station certificate is W1SSO — Alice Sargent, RMN2, USNR. . . . K0NAD (Electronics Facility 9-139), Marshalltown, Iowa, is an active center of ham activity. Meeting in the USNR quarters, a group of amateurs formed the Central Iowa Amateur Radio Club, which has affiliated with ARRL. A new club also was organized at the local high school, with the K0NAD gang giving all assistance possible. . . . From New Hampshire comes word that Lieut. James L. Robinson, USNR, W1EKN, commanding officer of Electronics Company 1-22, Portsmouth, has invented a new type television antenna. It is described as "a V type antenna with wings, about 44 inches from end to end, constructed of steel plate." It is one solid unit. . . . Electronics Platoon 9-8, Chilli-cothe, Mo., went to the aid of new commercial station KCHI when its transmitter broke down because of modulation troubles. The Platoon had the only oscilloscope for miles around. . . . Lieut. J. J. Golnik, USN, W1SUT, is a member of the Naval Reserve Electronics Program staff of the Commandant, First Naval District; W1SUT will be heard on 28-Mc. 'phone and 3.5-Mc. c.w. . . . Electronics Platoon 8-5 (K5NBZ) at Alpine, Texas, on April 18th held an "open house" in connection with the Science Club of Sul Ross State College. A demonstration of radio communication was given, featuring a contact with W5BQT, commanding officer of Electronics Company 8-30, Frederick, Okla. . . . An "open house" also was featured recently by Electronics Company 9-185 at Marietta College, Marietta, Ohio. Considerable interest was shown by the many visitors. . . . Electronics Company 1-18, Rumford, Maine, was sponsor of an exhibit of electronics equipment at the Sportsmen's Show held in that city during March. Visitors were given the opportunity of seeing their voice patterns reproduced on an oscilloscope. . . . Naval Reserve Training Center, Corpus Christi, Texas (K5NRG), presented a demonstration of emergency equipment for the Corpus Christi Radio Club, W5MS. . . . With a score of 90.09, the radio crew at the Training Center, Joplin, Mo., won the "Oscar," a silver loving cup, in the Ninth District communication competition for the quarter ending 31 March.



The Honorable John M. Lynch, mayor of Somerville, Mass., receives his permanent commission as a Lieutenant Commander in the Naval Reserve from Captain W. S. G. Davis, USN, director of Naval Reserve for the First Naval District. Mayor Lynch, a veteran of 41 months' combat service in the Pacific during World War II, is a member of Naval Reserve Electronics Company 1-5, Somerville. In the group (left to right) are: Aviation Chief Electronicsman J. W. McClellan, W1MCG; Capt. Davis; Seaman Apprentice W. G. Hooper, jr., W1QEC; Lieut. Cmdr. Lynch; Radioman 3c R. F. Martini, W1OGW; Chief Radioman J. J. Tegins; Electronics Technician 3c D. M. Lester; Seaman G. W. Trask; Electronics Technician 2c R. W. Lord; and Commander Walter S. Rogers, W1DFS, commanding officer of the unit.

• Technical Topics —

How To Visualize a 'Phone Signal

THE usual description of amplitude-modulated telephony operation is valid enough, with its talk about "modulation envelopes" and "percentage of modulation," but it just doesn't prepare you for a further understanding. With a background of classical a.m. theory, it becomes practically impossible to form a mental picture of "suppressed carrier," "single sideband," and even plain old c.w. There isn't going to be anything in this article that hasn't been discussed many times before, but we do hope to present a picture — provided you will scrap your old ideas — that will make it easy for you to understand any of the "blah-blah-sideband" techniques that have shown up in the past few years.

At the risk of being branded a heretic and a rebel, we will start with the initial statement that to understand 'phone you must first understand c.w. Having now lost 50 per cent of our readers, we can roll up our sleeves and go to work.

Practically everyone knows that an unmodulated carrier and a c.w. signal with the key held down are the same thing. Any way you tune them in on a receiver they act the same. On a panoramic receiver they look the same. Any test you can make of them at the receiving location will give the same result. *They are the same.* Furthermore, if they are stable they take up no room in the spectrum! Oh, sure, you tune in one or the other on your receiver, with the b.f.o. on, and you can hear it over several dial divisions. Turn your b.f.o. off and the S-meter on, and the signal gives a reading over a range of several kilocycles. But neither of those effects proves that the signal is broad — it only indicates that your receiver doesn't have infinite selectivity. By definition, 14,200.000 and 14,200.010 Mc. aren't the same frequency, so they must be different. Actually, they differ by 10 cycles, and a receiver or other device that could separate signals 10 cycles apart could separate these two.

All this leads us to the first step in visualizing signals. Any single r.f. signal can be represented by an infinitely-thin vertical line on a plot of amplitude vs. frequency. Fig. 1 is such a representation, except that the draftsman couldn't draw an infinitely-thin line that would show on the paper, and we had to settle for a finite-thickness line. The frequency can be read from the "Frequency" scale, and the amplitude from the "Amplitude" scale. The taller the line, the greater the amplitude. Don't worry about the units — the frequency scale could be megacycles,

or even cycles at some part of the spectrum. Your panoramic receiver would show such a picture if it had infinite selectivity. If your receiver had infinite selectivity, the S-meter would indicate the amplitude at *one* setting of the tuning knob as you tuned across the frequency range shown, and *nothing* at any other setting.

Two Signals

Suppose now that we wish to transmit some intelligence, and let's say that the intelligence is a simple 1000-cycle tone. (WWV transmits standard tones as intelligence, so the thing isn't far-fetched.) One way to do it would be to set up another transmitter on a frequency exactly 1000 cycles removed from the first frequency. It could

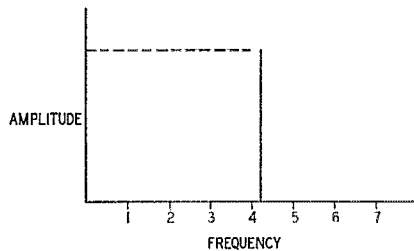


Fig. 1 — A representation of a single radio frequency, shown by plotting amplitude against frequency. A steady signal by itself takes up no room in the spectrum.

be higher or lower: it wouldn't matter so long as the separation was exactly 1000 cycles. A practical receiver (one that doesn't have infinite selectivity) would receive both signals simultaneously when tuned to or near the correct frequency, and the audio output of the receiver would be the 1000-cycle beat between the two signals. This is hardly a difficult thing to understand — you don't have to operate long in a 'phone band before you meet up with "heterodyne QRM," which is exactly the same thing. Such a signal can be represented as in Fig. 2.

In Fig. 2, the alternative signal that would also give a 1000-cycle beat is shown as a dotted line. However, we would still be transmitting our 1000-cycle intelligence if we used three transmitters separated as shown in Fig. 3. The signals removed 1000 cycles from the center frequency give 1000-cycle beats in the receiver, and the audio output from the receiver is 1000 cycles, the intelligence we are transmitting.

"Ah, yes," you say. "But what about the

2000-cycle beat between the two outside frequencies? They're separated by 2000 cycles, and you will get a beat between them."

Right you are. Except for one special case, where the proper phase relations exist, this 2000-cycle beat would show up. But the spurious effect is minimized when the center signal is made large in proportion to the other signals. Thus if we didn't wish to introduce some extraneous or false intelligence at the receiver, we would have to hold the phase relations exactly right or keep the amplitudes of the outer signals far below the amplitude of the center signal.

Obviously using three transmitters to transmit this 1000-cycle intelligence is doing things the hard way, and fortunately it isn't necessary. All we have to do at the transmitter, which we will assume is transmitting a single signal as in Fig. 1, is to beat (or "mix" or "modulate" — they're all the same) this signal with a 1000-cycle signal. As in any beating or mixing or modulating or heterodyning process, the output consists of the original two signals and two new ones, the sum and difference frequencies. The 1000-cycle audio signal isn't radiated but the others are. The resultant signal is exactly the same as the one we got in Fig. 3 using three separate transmitters! Being the same signal, it gives the same result in a receiver. And, fortunately for the art, the phase relations are right to eliminate the spurious 2000-cycle beat mentioned earlier. Sure, you know that when you mix signals like this you get such a signal — that's what your 'phone rig does — but you call it "modulation." But when you do the same thing in a receiver, you call it "heterodyning" or "mixing" or "beating." Silly, isn't it? Let's use the word "modulate" from now on, remembering that the *smaller-amplitude signal modulates the larger one*, and that we run into new products if the signal we are modulating isn't large compared to the modulating signal.

At the start we said you had to understand c.w. to follow this discussion. Let's see why that is so. Suppose, for some strange reasons known only to the powers that be, that the sole purpose of radio communication was to transmit a 1000-cycle tone. Obviously we could do it in the manners just

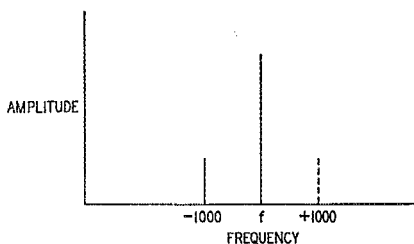


Fig. 2 — Two radio signals, separated by 1000 cycles, will give a 1000-cycle audio signal when they are mixed in a detector or other nonlinear circuit.

described, either by setting up three transmitters properly phased or by modulating the output from a single transmitter with 1000 cycles. Sooner or later some bright gentleman would come up with the idea that it isn't necessary to transmit the three signals of Fig. 3. Instead, you could transmit a single signal as in Fig. 1 and incorporate a to-be-modulated signal in the receiver. Duty-bound to receive only 1000-cycle intelligence, we could set up this to-be-modulated signal

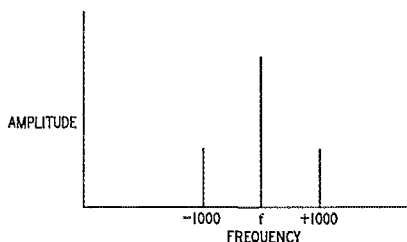


Fig. 3 — A representation of two weak radio signals and a stronger signal between them. This also represents the output of a radio transmitter modulated by a 1000-cycle tone.

1000 cycles higher or lower than the transmitted signal. Every time the transmitter was turned on, we would get the 1000-cycle tone, and in every respect we would have the same communicating ability that we had when the signal of Fig. 3 was working into a receiver where there was no to-be-modulated signal. That is exactly what we do in c.w. communications circuits, except that the receiving operator selects the tone to be transmitted and we complicate the matter by superimposing further intelligence in the form of a code made up of short and long signals and spaces.

The greater the amplitude of the incoming signal the more it modulates the local signal (beat oscillator) and the louder the audio output becomes. If we are to avoid beats between two or more *different* signals present in the receiver pass-band, the local signal (beat oscillator) must have a much greater amplitude than the incoming signals, just as in the 3-signal case described earlier. This may come as an unpleasant surprise to the proponents of weak beat oscillators, but it is nevertheless one of the facts of life that we cannot ignore.

Carriers and Sidebands

Now let's tie in these concepts to the sideband bugaboo. The big husky signal that all the other signals modulate (we almost said "beat against," from force of habit) has been and still is, called the "carrier." As you can see now, it isn't a carrier at all, because it doesn't carry anything. In a c.w. receiver you call it the "beat oscillator," even though it does exactly the same thing as a transmitted carrier and might well be called a "local carrier."

The carrier by itself conveys no intelligence. The intelligence is contained in the smaller signals and is obtained from their modulating action on the carrier. These smaller signals are called "side frequencies," and a band of them is called a "sideband," reasonable names that have no confusing aliases or synonyms.

In a communications system based on the modulation of a large signal by a smaller one (a.m. or c.w.), the amplitude of the audio output from the receiver is proportional to the amplitude of the side frequencies. The frequency of the output is determined by the frequency difference between the carrier and the side frequencies. The carrier conveys no intelligence, so it doesn't have to be transmitted and might very well be supplied at the receiver. What could be simpler?

Complex Modulation

It should be obvious that we don't have to confine ourselves to 1000-cycle tones for the rest of our lives. The modulating signal might very well be a complex signal, made up of different frequencies, without modifying the basic concept one iota. For example, if our purpose were to transmit simultaneously a 2500-cycle tone and a 1000-cycle tone of greater amplitude, we could set up five transmitters as shown in Fig. 4, with careful control of the relative phases so as not to have some 1500-, 2000-, 3500- and 5000-cycle signals in the receiver output. Or we could modulate the carrier with the 1000- and 2500-cycle signals and get exactly the same thing. The effect at the receiver would be the same. Speech and music are more complex than just two tones, but the principle is identical. The complete a.m. signal consists of the steady carrier and the two sidebands. The individual side frequencies in the sidebands are determined by the individual components that exist in the audio modulating signal at the instant under consideration. In your a.m. transmitter the audio frequencies modulate (you could say "are beat against" or "are mixed with") the carrier and generate corresponding side frequencies through what you call "modulators" and "modulated amplifiers." You would be just as correct, if not more so, to call your modulator a "power amplifier" and your modulated amplifier a "mixer" (as you would in a receiver).

Although they involve sidebands—lots of them!—frequency- and phase-modulated signals can't be treated in quite such simple fashion as a.m. If you want a picture of f.m. and p.m., finish this and then refer back to an earlier article¹ in *QST*. But the concepts you have now will enable you to understand all of the many "blah-blah-sideband" techniques referred to earlier. Let's start with the transmitter end and review the more common systems.

¹ Goodman, "Low-Frequency N.F.M.," *QST*, July, 1947.

Tricks with Sidebands

Since the carrier conveys no intelligence, it should be possible to dispense with it and introduce it at the receiver. This will save transmitter power and reduce heterodyne QRM in the bands. Unfortunately, if both sidebands are received at the detector where the carrier is introduced, the carrier has to have exactly the correct phase relationship with the sidebands if distortion is to be avoided. Since exact phase relationship precludes even the slightest frequency error, such a system is unworkable with present, and possibly future, techniques. However, if only one sideband is present at the detector, there is no need for an exact phase relationship and there can be some frequency error without destroying intelligibility. The extra sideband can be removed either at the transmitter or at the receiver, by filtering or canceling—one is *single-sideband transmission* and the other is *single-sideband reception*. Thus we could get rid of heterodyne QRM in our bands if no one transmitted the carrier but only one or two sidebands, but the double-sideband signals would require single-sideband receivers at the receiving end.

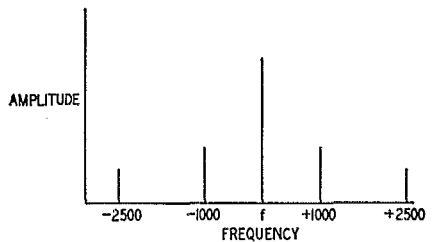


Fig. 4—A representation of five radio signals or a single transmitter modulated by 1000- and 2500-cycle tones. The 1000-cycle tone has almost twice the amplitude of the 2500-cycle tone.

Selectable-sideband receivers^{2,3} are attempts to overcome the shortcomings of conventional a.m. signals (two sidebands plus carrier). They make it possible to listen to only one or the other of the two sidebands of an a.m. signal, and thus reduce QRM by rejecting any interfering signals that fall within the range of one sideband but not the other. Some² also reduce distortion caused by selective fading. If the carrier has been suppressed at the transmitter, the selectable-sideband receiver must supply it.

In *exalted-carrier reception* the carrier is made very large, or "exalted," in comparison with a normal carrier. The advantage is, of course, that all signals within the passband of the receiver—desired sidebands, interfering carriers and side-

² McLaughlin, "Exit Heterodyne QRM," *QST*, Oct., 1947.

³ Norgaard, "Practical Single-Sideband Reception," *QST*, July, 1948.

bands — modulate only this exalted carrier, and intermodulation is practically eliminated. Exalted-carrier *transmission* is the same as using a low percentage of modulation at the transmitter, an uneconomical procedure because the *sideband energy* determines the audio output at the receiver, and so exalted-carrier *reception* is the only carrier-exaltation scheme ever used. A local carrier of large amplitude is synchronized with the incoming carrier, or the original carrier is exalted at the receiver by amplifying it more than the sidebands.⁴

Perhaps we were hasty in saying the carrier conveys no intelligence. It does. It shows the average value, or merit, of the radio path between transmitter and receiver, and thus can be used to control the gain of the receiver in inverse proportion to the strength of the signal. This is called "automatic volume control" and makes for nearly constant receiver output. However, when the carrier is eliminated at the transmitter and reinserted at the receiver, its frequency must be set rather carefully. For example, if it is set 100 cycles off, there will be an error of 100 cycles in all of the received audio signals. This is of no importance in radiotelegraphy, but in voice work manual receiver tuning for a single-sideband suppressed-carrier signal is somewhat critical. There are electronic means for simplifying this tuning, provided a weak carrier is transmitted to give a clue to the exact setting of the carrier.

A *controlled-carrier* transmitter is one that changes the level of the carrier in proportion to the amplitude of the modulating signal. Thus, with no modulation the carrier level is quite low, but when a modulating signal comes along the carrier level is immediately raised. With a minimum amount of power being used to supply the carrier, some economy is effected.

If insufficient carrier is supplied at the transmitter, extra signals will be generated and radiated, as in the familiar case of overmodulation

splatter. If insufficient carrier is supplied at the receiver, extra signals will be generated and heard, as in the case of trying to receive a single-sideband signal with insufficient b.f.o. injection.

Signals can only be modulated when they are passed through *nonlinear* circuits or amplifiers. The thousands of signals present in the ionosphere or a receiving antenna have no effect on each other because the medium is a truly linear one. If the amplifiers in a receiver or transmitter are linear, no new products will be generated. But amplifiers with incorrect operating conditions, such as are caused by incorrect bias or by overloading, will permit intermodulation to take place.

The minimum possible bandwidth of a modulated signal is the bandwidth of one sideband. Ordinary a.m. signals use at least twice this bandwidth because both sidebands are transmitted. Claims that some methods of amplitude modulation result in narrower signals than others are obviously ridiculous — any normal system resulting in double sidebands will give the bandwidth of any other, provided, of course, that both systems are in proper adjustment. Out of adjustment, they can only result in still greater bandwidths.

That's about the whole sugar-coated story. Think of modulation, beats, heterodyning and mixing as exactly the same thing, and forget about carriers transporting audio and all of the other misconceptions, and you will be able to understand any new techniques thrown at you. Visualize the carrier beating with the sidebands — excuse it, please — the audio signal modulating the carrier to generate sidebands, and the sidebands modulating the carrier to produce the audio signal, and it should all begin to make sense. For mental exercise, visualize what happens when you pull out the carrier during transmission and reinsert it at the receiver, or lop off one sideband at the transmitter or the receiver — it will all add up easily. Then try it again, thinking only in terms of "modulation envelopes" and "percentage of modulation"! — B. G.

⁴ Grammer, "House Cleaning the Low-Frequency 'Phone Band," *QST*, May, 1947.

Radiator Length and the Gamma Match

THOSE who have been having trouble getting a low-enough standing-wave ratio on the transmission line when using a gamma match¹ may profit by a recent experience of Phil Rand, W1DBM, and Bev Bond, W1Q00, with this system. The 3-element 10-meter beam at W1Q00, a prematched manufactured job, had been doing fairly well as an antenna but had been giving considerable difficulty in the s.w.r. department. Also, it used 600-ohm line, while coax feed looked more attractive from the viewpoint

of TVI reduction. The gamma match seemed like a pretty good bet and so was installed.

Using dimensions supplied by the manufacturer, the beam had originally been cut for a frequency of 28.8 Mc. When the gamma match was installed the lowest s.w.r. that could be obtained with any adjustment of the matching section was 6 to 1 at this frequency. But in the course of trying various things to obtain a better match it was observed that the s.w.r. dropped continuously as the frequency was increased, reaching its lowest value at 29.7 Mc. This suggested to W1DBM that something might be

¹ Washburn, "The Gamma Match," *QST*, September, 1949.

wrong with the element lengths, and comparison of the dimensions actually used with those given by the *Handbook* formulas did show a considerable difference. A new set of lengths for 28.8 Mc. was calculated from the *Handbook* formulas and the elements were reset to those lengths. At the initial trial, when the length of the gamma matching section happened to be 20 inches, the s.w.r. was 2 to 1. Further adjustment of the gamma section brought the s.w.r. down to 1.1 to 1, the optimum matching section length being 16 inches. On varying the frequency again for a further check, it was found that the s.w.r. came down to 1 to 1 at 28,886 kc. The discrepancy between the actual and nominal frequencies was of course too small to require any further adjustment of element lengths.

The point of all this is not so much whether or not there is a magic length for "resonance," but that the length of the driven element, in conjunction with the properties of the matching system, must be such as to cause a purely-resistive load to appear at the point where the transmission line is attached. If the matching section is a pure "matcher," then the antenna will have to be resonant if the s.w.r. is to be minimized. However, it is possible that some types of matching sections will themselves introduce reactance, and when that is the case the element length will have to be adjusted to compensate for the matching-section reactance. Not enough is known about the operation of such systems as the gamma match and "T" match to be sure which is the actual case. From the experience at W1QOO the inference is that reactive effects in the matching section must be small, since the element length came out so close to that given by a formula that was the result of careful measurement.

It is also of interest that with the new dimensions and a good match the antenna performance was markedly improved. Probably most of this is attributable to the fact that more power was getting into the antenna than was previously the case, rather than that the dimensions themselves were particularly critical. It can be said, in fact, that the efficiency of the driven element in an array is affected practically not at all by small variations in its length; the effect on the s.w.r. is probably of far greater importance. — G. G.

NATIONAL CALLING AND EMERGENCY FREQUENCIES

C. W.	'PHONE
7100 kc. (day)	3875 kc.
3550 kc. (night)	14,225 kc.
14,050 kc.	

During periods of communications emergency these channels will be monitored by stations of the National Emergency Net for personal-inquiry traffic. At other times, these frequencies can be used as general calling frequencies to expedite general traffic movement between amateur stations. Emergency traffic has precedence.

A.R.R.L. QSL BUREAU

The ARRL maintains a QSL bureau system to make it easy for you to receive your DX QSL cards, but in order for it to function it is necessary that we receive your cooperation. All you have to do is send the QSL manager for your call area a stamped self-addressed envelope about $4\frac{1}{4}$ " \times $9\frac{1}{2}$ " in size, with your name and address in the customary place and your call letters printed prominently in the upper left-hand corner. When he has an envelope full of cards for you, he'll return the envelope to you. Upon receipt of that envelope, be sure to send him another.

If you've previously held a different call, send an envelope to the manager for that call area. All QSLs for portable operation are routed via the home district.

Do not send cards for other W or VE stations for distribution via the QSL bureau; they cannot be accepted. Likewise, do not send cards for distribution to foreign stations via this domestic QSL bureau system. For the addresses of the proper bureaus to which foreign cards may be sent, see page 49 of June, 1950, *QST*.

The bureau handles only incoming DX QSLs.

- W1. K1 — Frederick W. Reynolds, W1JNX, 83 Needham St., Dedham, Mass.
- W2. K2 — Henry W. Yahnel, W2SN, Lake Ave., Helmetta, N. J.
- W3. K3 — Jesse Bieberman, W3KT, Box 34, Philadelphia 5, Penna.
- W4. K4 — Johnny Dortch, W4DDF, 1611 East Cahal Ave., Nashville, Tenn.
- W5. K5 — L. W. May, jr., W5AJG, 9428 Hobart St., Dallas 18, Texas
- W6. K6 — Horace R. Greer, W6TI, 414 Fairmount St., Oakland, Calif.
- W7. K7 — Mary Ann Tatzo, W7FWR, 513 N. Central, Olympia, Wash.
- W8. K8 — William B. Davis, W8JNF, 4228 W. 217th St., Cleveland 16, Ohio
- W9. K9 — John F. Schneider, W9CFT, 311 W. Ross Ave., Wausau, Wisc.
- W0. K0 — Alva A. Smith, W0DMA, 238 East Main St., Caledonia, Minn.
- VE1 — L. J. Fader, VE1FQ, 125 Henry St., Halifax, N. S.
- VE2 — Austin A. W. Smith, VE2UW, 6164 Jeanne Mance, Montreal 8, Que.
- VE3 — W. Bert Knowles, VE3QB, Lanark, Ont.
- VE4 — Len Cuff, VE4LC, 286 Rutland St., St. James Man.
- VE5 — Fred Ward, VE5OP, 899 Connaught Ave., Moose Jaw, Sask.
- VE6 — W. R. Savage, VE6EO, 329 15th St., North Lethbridge, Alta.
- VE7 — H. R. Hough, VE7HR, 1785 Emerson St., Victoria, B. C.
- VE8 — Joe Wasylyk, VE8CY, P. O. Box 268, Whitehorse Y. T.
- KP4 — E. W. Mayer, KP4KD, P. O. Box 1061, San Juan P. R.
- KZ5 — C.Z.A.R.A., Box 407, Balboa, Canal Zone
- KH6 — Andy H. Fuchikami, KH6BA, 2543 Namaau Dr., Honolulu, T. H.
- KL7 — Box 73, Douglas, Alaska



25 Years Ago
this month

July 1925

... "Motion pictures by radio are here!" proclaims Atlantic Division Director G. L. Bidwell in his article on the improved Jenkins system of picture transmission and reception.

... A new daylight DX record of 10,300 miles has been established by the 20-meter contacts between British 2OD, operated by E. J. Simmonds, and Australian 2CM, operated by Charles D. MacIurean.

... Bermuda, South Africa, and Somoa are the latest countries to show activity on the amateur bands.

... Useful kinks for servicing superhet receivers are presented by Assistant Technical Editor John M. Clayton.

... ARRL Headquarters has been moved to new larger quarters at 1711 Park St., Hartford.

... The Navy-MacMillan Arctic Expedition has sailed for the Far North. This year's expedition carries equipment for working amateurs on 20, 40, 80 and 180 meters.

... Dr. A. Hoyt Taylor of the Naval Research Laboratory reports on the progress of the short-wave tests between amateurs and the U. S. S. *Seattle*, on cruise in the Pacific.

... Underground antennas, with special reference to static elimination, is the newest field to be investigated by the ARRL Experimenters Section.

... Sure-fire methods for cutting, drilling, and polishing glass panels are described by an expert in the industry, S. A. Twitchell.

... The newest fashion in mobile installations is the "radio fivver" of Oliver Wright, 6GD, 6BKA.

... A new QST department, "I.A.R.U. News," makes its appearance with this issue.

... The technique of using simple Hertz antennas on 20 and 40 meters is described by Howard M. Williams, 9BXQ.

... H. A. Joyce of the ARRL Experimenters Section supplies the answers to the currently controversial question, "How are short waves reflected?"

... Station descriptions of the month: Lester Pjcker's 6ZH, San Ysidro, Calif.; Howard Storck's 8BYN, Columbus, Ohio; the Harvard Wireless Club's 1AF-1XJ, Cambridge, Mass.

Silent Keys

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

W1BIM, James E. Carpenter, Worcester, Mass.
 W1ON, Walter B. Jennings, Putnam, Conn.
 W2RH, Kenneth MacLea, Port Chester, N. Y.
 W3BRL, Charles T. Reed, Harrisburg, Penna.
 W3KTT, ex-W8KTT, Everett R. Passoja, Beaver Falls, Penna.
 W5BUA, William M. Shaw, Fort Worth, Texas
 W7CE, ex-8DFV, Joseph R. Criswell, Seattle, Wash.
 W8CBY, Harry W. Hahn, Youngstown, Ohio
 W8SKR, Merle M. Kincaid, Leavittsburg
 W9HQL, George W. Chinn, Chicago, Ill.
 W9KMI, Charles F. Rodgers, Mt. Carmel, Ill.
 Ex-W9NPW, L. W. Hansen
 CR9AN, Adrian P. Rosario
 G3AUH, E. Ailmore
 GM6KZ, W. J. McKenzie, Edinburgh
 KL7IJ, ex-K7GVS, George W. Clyde, Fairbanks

Strays

Bill Warning is W4LAW!

After months of difficulty with ignition noise in his mobile rig, W6CNE found a solution: a Stanley steamer! — W9LLX

Another "first" was established recently when an oral examination for an M.A. degree was conducted by amateur radio. Participants were Dr. Raymond Moore, chairman of the examining committee of Pacific Union College, who was in Hawaii at KH6EW, and other members of the committee and Stanley Johnson, the graduate student, who were at the college's ham station, W6DQL. The schedule had been arranged several weeks in advance but the 10-meter band was especially cooperative for the one hour of questions and answers plus another half hour of visiting — S9 signals from start to finish!

Amateurs who were members of the British Civilian Technical Corps during World War II are requested to communicate with Charles P. Hewitt, ex-8FG, 1944 Roycroft Drive, Route 2, Box 252, Holland, Ohio. Mr. Hewitt is preparing a history of this unit and is desirous of learning the name, CTC number, address, and amateur call of former members.

HAMFEST CALENDAR

CALIFORNIA — Sunday, July 16th, at Shangri-la, Moody Road, Los Altos — Annual Picnic of the Palo Alto Amateur Radio Association. Free coffee and soft beverages; other refreshments also available. Contests, swimming, baseball, etc. Bring your own picnic lunch. Hours: 10:30 A.M. to 4:30 P.M. Adults \$1.00, children 40 cents. Additional information may be obtained from members or from Secy. N. E. Powers, W6SYW, 344 South El Monte Ave., Los Altos, Calif.

ILLINOIS — Sunday, July 23rd, at Camp Hoffman, just west of Park Ridge — Annual Picnic of the Society Radio Operators. This affair is expected to be one of the largest gatherings of hams at any picnic in the Chicagoland area. For further information contact Secretary W. O. Harper, 4037 Eddy St., Chicago 41, Ill.

ILLINOIS — Sunday, August 13th, at Frankford Grove, Frankford (on U. S. 45 near Ill. 30) — another of the popular hamfests and picnics staged by the Hamfesters Radio Club of Chicago. Food and refreshments will be available. Many novel games and innovations will be featured. Contact Secy. Sol Davis, 8731 South Wabash, Chicago, Ill., for full information.

MICHIGAN & WISCONSIN — Sunday, July 23rd, at Henes Park, Menominee — Annual Picnic of the Marinette (Wisc.) and Menominee (Mich.) Radio Club. Everyone is invited — bring your own picnic lunch. Particulars available from Harry V. Frederick, W9QCQ, 2628 Parkridge Ave., Marinette, Wisc.

PENNA. — Sunday, August 6th, at Spreading Oaks Grove, South Park, Pittsburgh. Auspices South Hills Brass Pounders & Modulators. Registration is \$2.00 per person and includes a box lunch. A full program has been planned, to run from dawn to dusk. Make reservations early through Secy. C. J. Lauer, 345 S. Millvale Ave., Pittsburgh, Penna.

Coil Design for Link-Coupled Circuits

A Simple Method for Determining Proper Circuit Constants

BY KEATS A. PULLEN, JR. *

THE USE of link-coupled circuits in amateur equipment is very common these days. Fortunately, the usual sort of application is such that no real design requirements need be met. For this reason the average amateur does not know when the commonly used two-turn coil will be unsatisfactory; likewise, he does not, in general, know how to design a coupling coil when the need arises. We shall determine first when care in coil design is indicated, and then examine several routine methods which can be used for making the coils.

There are basically two conditions which can make proper design of coupling circuits necessary. These are standing waves and line losses.

Any transmission line having a length greater than approximately a tenth of a wavelength at the propagation velocity of the signal in the line may be found to have appreciable standing waves. If the line is an exact multiple of a half wavelength, and some reserve power is available, no difficulties may result. However, where a VFO is used the line cannot be considered to be a given number of half wavelengths long over a band of frequencies; a comparatively small change in frequency may change the electrical length appreciably.

Taking propagation velocity into account, the length in wavelengths of various popular types of solid-dielectric lines is given by the following formulas:

Coaxial	$l = \frac{f_{Mc.} \times \text{Length in inches}}{7795}$
300-Ohm Twin-Lead	$l = \frac{f_{Mc.} \times \text{Length in inches}}{9685}$
75-Ohm Transmitting Twin-Lead	$l = \frac{f_{Mc.} \times \text{Length in inches}}{8386}$

where l is the length in wavelengths and $f_{Mc.}$ is the frequency in megacycles. Table I shows the length of line equivalent to one-tenth wavelength for the midfrequencies of various amateur bands.

Where the line is an integral number of half wavelengths long the only harmful effect of a mismatch is the increased loss attributable to the high-current areas. When the driving power

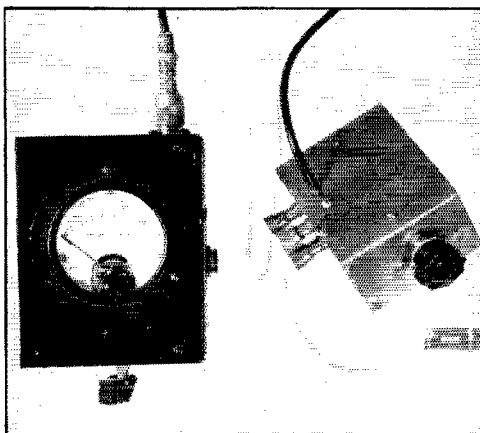
available is just enough to meet needs, it is necessary to minimize the standing wave. Then the coupling circuit must be properly designed.

If the interconnection cable is lossy, maximum power transfer is only possible when the link circuit is properly matched. Only then will a maximum amount of energy be impressed on the line, and a minimum loss occur in the line. A cable probably should be considered lossy if there is more than one decibel of loss in it.

Tuned Coupling Circuits

There are basically two types of coupling circuits: tuned and untuned. Their forms are shown in Fig. 1. The tuned circuits can be broken up into the series-tuned and shunt-tuned groups. The untuned circuits may be divided into those with no shunt capacitance and those with a small amount of shunt capacitance.

The series-tuned circuit is one tuned to resonance by use of a series capacitance. For proper operation the Q of the circuit, when loaded by the transmission line and source or load, should be of the order of two or greater. Usual practice makes it appreciably greater, but this is not necessary; actually these circuits operate very satisfactorily with a Q of two. From the amateur point of view this is fortunate, because it means the circuit can be set up for the middle of one of the amateur bands and will operate over the full band without retuning.



The complete link designer consists of two elements, the wattmeter, left, and the coil designer, right.

*% Ballistic Research Laboratories, Aberdeen Proving Grounds, Md.

Band, Mc.	Coaxial	300-Ohm	75-Ohm
3.5	208	258	224
7	109	136	117
14	55	68.3	59
21	37	45.7	39.5
28	27	33.4	29
50	15	18.6	16.1
144	5.3	6.6	57.5
220	3.5	4.35	3.95

In a series $R-L-C$ circuit, the Q is determined by the ratio of the coil reactance to the load resistance. This means the coupling-coil reactance should be twice the line impedance for a loaded Q of two. For 50-ohm cable this is 100 ohms.

In the shunt-tuned circuit, which has the tuning capacitor connected in parallel with the coil, the operating Q again should be two or greater. However, the definition of Q applied to the series circuit does not apply here; the Q of a shunt $L-R$ combination is given by the ratio of the resistance to the coil reactance. Evidently, the reactance of this coil should be half the parallel resistance for a Q of two.

In many cases either the series- or shunt-tuned circuit would be satisfactory. However, the following considerations often make one or the other more useful:

1) Where large amounts of power are involved, and only low-voltage components are available, the parallel circuit should be used.

2) Where d.c. continuity is needed, the parallel circuit may be used.

3) Where d.c. continuity is undesirable, the series circuit should be used.

Where the link circuit is coupled to a tuned circuit that is spread out, as in the case of a linear tank, adequate coupling may require a series-tuned circuit because it permits using a large coupling coil. The reader undoubtedly could add other reasons for specific choices.

As the Q of the coupling circuit is decreased the reactance of a series-tuned link coil approaches a minimum value from above the nominal line impedance. The shunt-tuned coil approaches this same limit from below. In most amateur operations calling for a tuned coupling circuit, a Q of two to three should prove a convenient value.

For the series-tuned circuit the value of reactance required in the coil and condenser is

$$X = Z_0 Q$$

where X is the reactance in ohms and Z_0 is the nominal line impedance in ohms. For the shunt-tuned circuit the required reactance is

$$X = \frac{Z_0}{Q}$$

In either case the required value of capacitance is

$$C = \frac{10^6}{2\pi f X}$$

where C is in μfd . and f is in megacycles. The required inductance is

$$L = \frac{X}{2\pi f}$$

where L is in microhenrys and the other quantities are in the units specified above. L and C values for the center frequencies of various amateur bands are given in Table II for Q s of 2, 3 and 4.

Once the required inductance is determined, any standard method of designing and adjusting the coil inductance may be used. For relatively low frequencies, say below 50 megacycles, use of the book, *The Inductance Authority*, by Ed. M. Shiepe¹ is very convenient. The design resulting from use of this book usually is close enough so that no further adjustment is required.² For higher frequencies or for cases where greater flexibility in design is required, a device such as the link-coil designer to be described is useful.

Untuned Link Coils

The usual type of untuned link coil consists of a number of turns of wire coupled closely to the

¹ *The Inductance Authority*, by Edward M. Shiepe, published by Gold Shield Products, New York, N. Y.

² The ARRL Lightning Calculator, Type A, also will determine coil designs well within the accuracy required. — Ed.

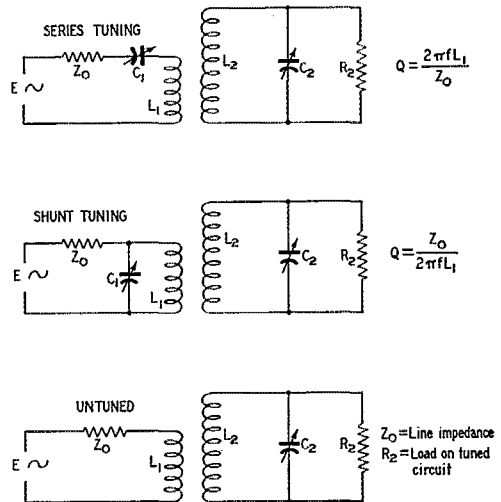


Fig. 1 — Tuned and untuned coupling circuits. As shown, these circuits represent the output end of a link-coupled circuit, in which case R_2 might simulate the grid resistance of an amplifier tube. The same design principles apply when $L_2 C_2$ represents the driving source and $L_1 C_1$ is used to couple the power into the link line.

main coil. It has usually been a matter of chance whether reasonably efficient power transfer is obtained.

A mathematical analysis indicates that the preferred value of reactance for the untuned coil is numerically equal to the nominal value of the line impedance. In case some stray capacitance is a part of the circuit, then the link-coil inductance should be reduced sufficiently to permit the effect of parallel reactance energy exchange to raise the effective reactance to the nominal value.

An example of the latter case is the coax link

² For example, calculation shows that the effective reactance of a one-turn coaxial link coil made from RG-59/U coaxial cable, mean diameter of turn $2\frac{1}{2}$ inches, is about 36 ohms at 28 Mc. Such a coil is suitable or working into either 52- or 75-ohm cable, and in the event that enough coupling to the main tank coil cannot be secured to give full power transfer, may be resonated by a parallel condenser of approximately 150 μfd . So resonated, the Q would be approximately 2 when working into a 72-ohm line. A parallel capacitance of approximately 55 μfd . would raise the effective reactance of such a link coil to 50 ohms, for use as an "untuned" coil working into 50-ohm line. The calculated inductance of a $2\frac{1}{2}$ -inch diameter one-turn coil varies between 0.14 and 0.19 μh . for wire sizes from 12 to 22, respectively. — *Ed.*

coil often used for harmonic suppression. The approximate shunting capacitance can be estimated from the capacitance per foot of the coaxial cable, using the length required to make the link coil.³

Coupling

Whether tuned or untuned, the size of the required coupling coil is established by the design criteria mentioned above. The only remaining problem is coupling. If the coil shape has been well chosen, all that need be done is to adjust the coupling to suit requirements. Interleaved coils are convenient in push-pull stages.

For transferring power into a load, tighten up the coupling, approaching from the low r.f. voltage section of the coil where possible. As the coupling is tightened, the power output increases and then levels off. If coupling is made too tight, the power may again fall off.

Either the power output is maximized, or, for input circuits such as the grid circuit of a following amplifier, the coupling is adjusted for desired input bandwidth. In such input circuits

TABLE II
Average Values of L and C for 52-, 75-, and 300-Ohm Lines

Band, Mc.	Z_0	Series Tuning						Shunt Tuning					
		$Q = 2$		$Q = 3$		$Q = 4$		$Q = 2$		$Q = 3$		$Q = 4$	
		μfd .	μh .	μfd .	μh .	μfd .	μh .	μfd .	μh .	μfd .	μh .	μfd .	μh .
3.5	52	425	4.2	285	6.4	210	8.5	1700	1.1	3550	0.7	3400	0.53
	75	280	6.4	190	9.5	140	12.7	1130	1.6	1700	1.0	2250	0.8
	300	70	25	47	38	35	51	280	6.4	420	4.2	560	3.2
7	52	240	2.2	160	3.3	120	4.4	950	0.55	1420	0.37	1900	0.28
	75	160	3.3	105	5.0	80	6.7	630	0.83	950	0.55	1250	0.42
	300	40	13	27	20	20	27	160	3.3	240	2.2	320	1.7
14	52	110	1.1	75	1.7	55	2.3	450	0.28	675	0.19	900	0.14
	75	75	1.7	50	2.5	38	3.3	300	0.42	450	0.28	600	0.21
	300	19	6.7	12	10	9	14	75	1.7	112	1.1	150	0.84
21	52	75	0.75	50	1.1	38	1.5	300	0.19	450	0.12	600	0.094
	75	50	1.1	33	1.7	25	2.2	200	0.28	300	0.19	400	0.14
	300	12.5	4.5	8.3	6.8	6.3	9.0	50	1.1	75	0.75	100	0.56
28	52	55	0.55	37	0.82	28	1.1	220	0.14	330	0.091	440	0.069
	75	36	0.83	24	1.24	18	1.65	140	0.21	220	0.14	300	0.10
	300	9	3.3	6	4.9	4.5	6.6	36	0.82	54	0.55	72	0.41
50	52	31	0.30	20	0.47	15	0.62	122	0.077	183	0.051	245	0.038
	75	20	0.47	13	0.72	10	0.94	80	0.12	120	0.078	160	0.058
	300	5.0	1.88	3.3	2.7	2.5	3.7	20	0.47	30	0.31	40	0.23
144	52	11	0.11	7.3	0.17	5.5	0.22	44	0.028	66	0.018	88	0.014
	75	7.3	0.17	4.9	0.25	3.6	0.34	29	0.042	43	0.028	59	0.021
	300	1.8	0.66	1.2	0.98	0.9	1.3	7.2	0.17	11	0.11	15	0.082
220	52	6.8	0.077	4.5	0.11	3.5	0.15	—	—	—	—	—	—
	75	4.5	0.11	3.1	0.17	2.2	0.23	—	—	—	—	—	—
	300	1.1	0.45	0.77	0.68	0.58	0.9	4.5	0.11	6.8	0.077	9	0.058

NOTE: Where no value is shown, inductance required is impracticably small. For representative coil sizes in the v.h.f. range, see chart, page 29, April, 1950, QST.

tightening the coupling beyond the minimum necessary for maximum power transfer broadens the circuit tuning. The sensitivity remains approximately constant.

The Link-Coil Designer

The coil designer we mentioned is a convenient aid in many of the design problems one meets. It is a simple unit any ham can build. It consists of two basic units which, together and individually, are very useful additions to the amateur's test gear. The first of these is the designer element shown in Fig. 2. The second is the termination unit shown in Fig. 3. This latter is essentially a low-power r.f. absorption wattmeter.

In the wattmeter element, the type and impedance of lines used in the ham shack will determine the selection of impedance level and presence of or lack of symmetry. An artificial termination for the chosen line is the first requirement. Deposited metal film resistors of the proper resistance make good terminations within their frequency limits; they should prove satisfactory to at least 60 Mc. Carbon resistors also appear to function satisfactorily. A sensitive voltage detector is connected across the artificial termination to indicate the r.f. voltage present. Germanium crystals are excellent detectors. The rectified current is fed to a microammeter or low-range milliammeter. Full-scale deflection of from 100 microamperes to one milliamperes is convenient.

The coil-designer element, Fig. 2, consists of a calibrated variable capacitor arranged to be coupled to the type of transmission line chosen. The grouping of binding posts indicated makes the unit useful for design of both series- and

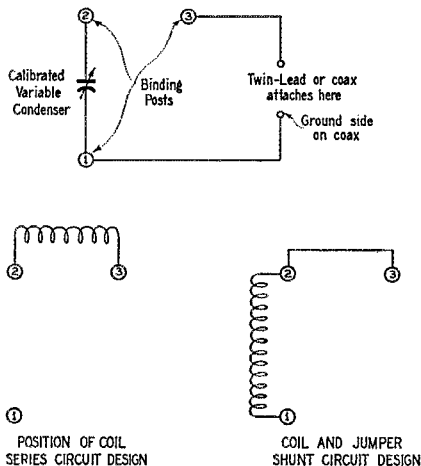


Fig. 2 — Circuit of the coil-design element. The leads between the condenser and the binding posts should be very short if the instrument is to be used at v.h.f.

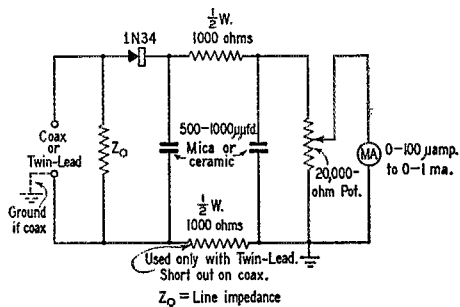


Fig. 3 — Wattmeter-element circuit. This and the circuit shown in Fig. 2 should be coupled by a length of the type of line for which the coupling circuit is to be designed.

shunt-tuned coils. The connection for adjustment of each type of coil is indicated in the figure.

The variable capacitor may be any good quality unit having a capacitance range from a minimum of a few micromicrofarads to as high as possibly 800 micromicrofarads. The binding posts preferred and used by the writer are the small vice-clamp type having nondetachable heads. They do not nick or damage the wire being used in the coil.

It is necessary to calibrate the variable capacitor, an operation that can be accomplished very quickly if one has access to a Model 160A Q meter. A coil of arbitrary size is placed across the "Coil" binding posts on the Q meter and the internal variable capacitor is set at 450 μf . Then the internal oscillator frequency is varied until resonance is indicated. The calibrating equipment is then ready.

The simplest method to use is the substitution method, in which the designer capacitor is substituted for part of the internal capacitance in the Q meter. The designer capacitor may be calibrated directly in micromicrofarads by setting it at successive scale positions, with its terminals connected to the "Condenser" posts on the Q meter and, at each setting, reducing the internal capacitance of the Q meter to restore resonance. The difference between 450 μf . and the reading on the Q-meter dial is the capacitance of the designer capacitor at that setting.

It is convenient to calibrate the capacitor in terms of frequency, if the designer is to be used with a single line impedance. As an example, if the designer is to have a nominal Q of 3, the capacitance corresponding to a given frequency is shown in Table II in the column marked "Q = 3," for the appropriate line impedance. These values will be approximate for each band. Exact values, and values for frequencies between amateur bands, may be determined from the formulas given earlier.

If no Q meter is available, a few 3% accuracy

mica capacitors can be used to perform a similar task. In this case a grid-dip oscillator, which need not be calibrated, is convenient. A mechanically-rigid coil is connected to the proper value of capacitance as determined from Table II. The resonant frequency of the combination is found with the grid-dip meter. Then the designer capacitor is substituted for the fixed mica capacitors, and the capacitor tuned to resonance. This locates the correct calibration point for the frequency in question. This is repeated at a series of points.

Using the Designer

The two elements of the designer are connected together through a convenient length of the type of line to be used. Where a series- or shunt-tuned circuit is to be used, a coil is connected to the appropriate binding posts and coupled loosely to a radio-frequency source of the desired frequency. The capacitor on the designer is then tuned for maximum deflection. If the maximum occurs at the lowest-frequency end, or at a lower frequency than that of the source field, the coil inductance is too small. An increase in the number of turns or the diameter, or a reduction of the turn spacing, may be used to correct this. If the frequency read on the designer is too high, a reduction of coil size is indicated.

Adjustment of untuned coils may be performed in either the series or the shunt connection. For a designer having a nominal design Q of 3, shunt design is carried out just like design of a tuned coil, but at one-third of the final operating frequency. Using the series connection, the design is performed at three times the final frequency. In either way the reactance at the actual operating frequency will be correct.

The shape of the coil should be chosen, before even the first try, so that as much as possible of

the magnetic field produced by the tank circuit with which it will be used will thread through the coil. This gives a maximum of flexibility to the final adjustments. With linear tank circuits, this suggests use of a single-turn hairpin coil for the link circuit. For the more standard type of tank coil, good design indicates that the pick-up coil be of the same or just slightly greater diameter than the main coil.

Applications

Many applications of these techniques will be obvious to the reader. However, it might prove interesting to outline a few of the uses which have been made of the method.

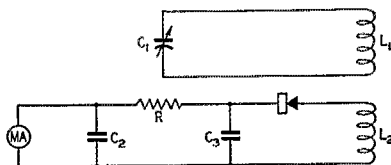


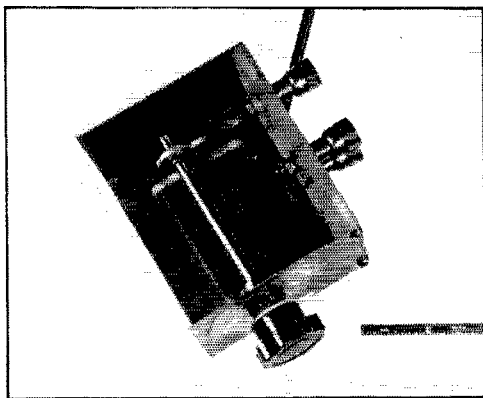
Fig. 4 — Crystal-wavemeter circuit using an untuned coupling coil, L_2 . This is an application of the principles discussed in the text. C_1 and L_1 are tuned to the desired frequency; C_2 and C_3 may be mica condensers of approximately 500 $\mu\text{fd.}$, and R a few hundred ohms.

Proper coupling-coil design permits effective operation with minimum coupling between circuits, and minimizes reactance detuning and reflection effects. One point is worth noting: Best results are obtained if the inherent Q of the coupling coil, neglecting loading, is large as possible. In other words, the coil should have low losses. This gets the energy where it can be used, instead of wasting it.

In transmitters, it has been found that the indicated techniques aid in getting energy delivered where it is needed with a minimum of effort. Except where other considerations dictate the use of an actual antenna tuner, either the tuned or the untuned circuit, made up as indicated, gives efficiency equal to that obtained with elaborate coupling systems, in working into a flat line.

Design of crystal wavemeters has proved to be very convenient using an untuned coupling coil to feed the crystal. The circuit of such a wavemeter is given in Fig. 4. A convenient reactance to assume for the crystal circuit is approximately 300 ohms. Properly, both coils for the wavemeter should be wound separately and then adjusted for the desired coupling. However, available coil forms render such adjustment difficult. The writer used a four-prong coil form, placing the tuned coil at the upper end and the pick-up coil near the prongs. Reasonably uniform sensitivity over a wide range of frequencies

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The coil design element contains a variable condenser and a set of binding posts for connecting a coil either in series or parallel.

The Loneliest Ham in the World

BY BYRON GOODMAN,* WIDX

(I don't expect anyone to believe this. I have trouble believing it myself. But I feel that it should be down on paper, for the record if nothing else.)

IT WAS a good convention, although the rains may have held down the attendance a little. At the DX meeting I mentioned how at League Headquarters we often enjoy the confidences of foreign hams who are forced to operate under cover, and how these operators in the less "enlightened" countries really have a tough time of it. It just happens to be one of the interesting sidelights to working at the League, and I've told about it lots of times, without giving away any calls, of course.

The wind-up banquet was over early, and I figured it was a good chance to catch up on my sleep. But just as I got to my room the 'phone rang, and a voice at the other end asked if he could come up and talk a little DX. Well, no matter how tired you are you don't pass up something like that, so I told him, "Sure. Come on up."

I'd put my guest in his 50s, but of course you never know. He told me his call, which didn't ring any bells, and his name.

He took his with soda, and then announced, "By, I've worked more DX than anyone else in the world."

Oh, brother! I thought. A crackpot. I know W1FH and a few of the others, and this guy wasn't one of them.

"I don't follow you, Mike," I said. "W1FH has the most confirmed, and there are a few others right on his tail. How many have you got?"

"If you mean countries," he said, "I don't have any. I'm talking about *real* DX. I have to tell someone or I'll bust. I figure I can talk to you because you know how to keep a confidence."

"Oh, you can trust me," I said, knowing I had about 40 pounds and a few years on him. And I was closer to the door. "What do you call *real* DX?"

He sipped his drink and looked straight at me. He didn't look like a nut. His eyes were clear without the glitter, and he wasn't a nervous type. "Planets," he said quietly. "I've worked four of them."

My first reaction was to gag it and ask if he had the QSLs, but then I thought better of it. "What makes you think I'll believe that, or even think it's funny?" I asked.

"Look, it's early," he replied. "Come on out to the shack and I'll show you. The Eastern train goes out at 9 A.M., and I'll bring you back before midnight. You'll get your beauty sleep."

I'm a sucker for any new angle, so I went. He briefed me while I watched his Buick's headlights take us through town and out the highway. "I got interested in 5 meters when hams were debasing tubes to get on 20," he said. "That's a



long time ago, and I hadn't had my ticket very long. There wasn't a soul around here on 5, but I didn't know enough to realize there weren't a lot of fellows on across the country. After all, QST reported activity there."

"That was before my time," I explained. "Don't blame me."

"I called CQ on Five every night every 10 minutes for I don't know how long," he continued. "Then one night, as I tuned around after my second or third CQ, I heard someone calling me. I was so shaky going back I almost pulled the key off the table. The signal signed 'MA1A' but I never gave it a thought. It was someone I could work, and that was good enough for me. I gave him a signal report and signed over. He didn't come back! I was frantic! Here he was, the first station I'd ever raised, and I lost him! Then, fully seven or eight minutes later, I ran across his signal acknowledging my report and telling me I was very weak. He wasn't weak at all, and before we were through he had told me how to build a decent antenna, although I had a little trouble at times understanding his English. It was a screwy kind of skywire, like nothing in the books then or now. We made a schedule for the next night, and during the day I built the antenna. When schedule time came I called with a lot of confidence, but no answer.

* Assistant Technical Editor, QST

Then, after a lapse of about seven or eight minutes, I heard him! This time we chewed the fat for five hours, always with the delay in his comeback. What he told me that night left me in a daze. He said he was on Mars! They had heard me calling CQ every night, and practising the code in between, and they had managed to dope out the language from what I had sent all those months. It's true I had been amusing myself by practising the code on the air — sending a page at a time from *QST* or *Scientific American* — but I didn't see how they could figure out the whole language from that. It turned out that they hadn't, really, but after a few weeks of schedules and a lot of questions MAIA knew the language as well as I did. From the first he told me that if I mentioned this to anyone else our schedule would stop, so I didn't tell a soul."

I kept looking for an angle. All I could figure was a big leg-pulling deal, so I rode along. "When was all this?" I asked.

"Oh, it started back in the '20s," Mike replied. "Since then we've moved higher in frequency, and he's told me how to build in secrecy systems so no one will ever get on to us. I can't tell you the details, but we never stay on the same frequency long enough for anyone to spot us. We swish through the 2-meter band hundreds of times an hour, but nothing would ever tag us except a TV receiver in that range."

"And you've been keeping this schedule ever since?" I asked.

"That and a few more. When we first started, MAIA asked a lot of questions, and I noticed that when I told him about our aeroplanes and submarines and guns he wasn't much interested. But since the war I have to go through all the magazines and papers for any dope on jet planes and rockets and atomic energy, because he asks a lot of questions about what we're doing with them. Ever since he told me how to build a real antenna and a good station, we've had a solid circuit. He and his friends are smart ones, all right. The things they tell me always work, and it's all stuff that hasn't been in *QST* or even the *I.R.E. Proceedings*. As he helped me improve my rig, he started hooking me up with some of the other planets."

This is really getting thick, I thought.

"Apparently these guys or things on Mars taught the Earth language, at least my version of it, to the other planets, and told how to get in touch with me. I figured the whole thing might be a hoax, so I read up on astronomy and darned if everything didn't check. Our skeds were made only for times the other planets were visible or on this side of the world, and the delay times always checked out on the button. The toughest place to get to was Jupiter, and I finally had to raise my peak power to 200 kilowatts before I could get through, although I'd been hearing them for weeks."

"What do you mean, 'peak power'?" I asked. "Are you using pulse?"

"Sure," Mike replied. "It's the only way I can get through and not have tubes that would look suspicious, just in case the law ever comes around. I put that in back in 1932, when I first worked Venus. Anyway, it's part of our secrecy system."

"How about 'phone? Didn't you try it so you can hear what their voices sound like?"

"I suggested it," said Mike. "But they said 'No.' Code was good enough for all they needed, they claimed. I figured they didn't want to tip me off, in case they don't have voices and would have to create artificial ones."

It all sounded reasonable enough, but I wasn't buying any until I saw it. Just then Mike turned off the highway onto a dirt road, and we finally ended up at a small house. In the moonlight I could see a lot of masts.

"My antenna is made of wire strung from those poles," Mike explained. "I change the directivity by phasing from the shack, and I explain to the few hams who have wandered by that it's an experimental 40-meter beam. I'm never on 40, they don't hear me, and they lose interest."



Inside the shack the stuff looked real good. I didn't see anything that looked like unusual techniques, though, and I wondered out loud about the secret stuff. Mike smiled and explained that the place had to look something like a ham station — the secret gear was hidden away and I was wasting my time snooping.

"When's your next sked?" I asked.

"Tomorrow night," Mike replied. "But we can interrogate the band if you want, just in case someone's on." He warmed up the rig a few minutes and then threw a switch. The lights dimmed a bit and I heard a few transformers groan. A pip appeared on the panoramic and Mike centered it. He sat down at the table and worked the guy on the bug. The call was "MM1F" but I wasn't impressed, because a lot of jokers with queer calls have sucked me in during the past decade or two, and I believe them

(Continued on page 98)

Happenings of the Month

W5NW ELECTED VICE-PRESIDENT

Our new vice-president, Wayland M. "Soupy" Groves, W5NW, will need little introduction to the ham fraternity, since he has been active and well-known in League circles for many years, and a member since 1923. It was also in June of that year that he was first licensed, as 5NW. Vice-President Groves served as director of the West Gulf Division from January, 1935, through 1938; and again from 1942 until his election to the vice-presidency at the recent Board meeting.



Wayland M. Groves, W5NW, new Vice-President.

"Soupy" has been employed by the Humble Pipe Line Co. since 1926, currently as assistant district gauger. His amateur radio interests have been wide and varied, but his main pleasure lies in consistently working DX in the many corners of the world that he visited while on oil company seismograph assignments in 1930, principally in Java and Sumatra. His kilowatt 'phone-c.w. gets out well on both 10 and 20 meters, attested to by the fact that, at last report, he was waiting anxiously for that 100th card to arrive. Regular readers of *QST* will recall the photograph of the four-ham Groves family on page 31 of the May issue.

CALK NEW DIRECTOR

As provided in By-Law 16, and By-Law 25 as amended, with the election of Wayland M. Groves to the vice-presidency of the League, all authority, powers and duties of the Director of

the West Gulf Division are now assumed by David H. Calk, W5BHO, previously the alternate director. It now becomes necessary to hold a special election for the alternate director vacancy.

Mr. Calk is well known to West Gulf Division amateurs, having served several terms as alternate director as well as SCM of the South Texas Section. He is in the installation division of the Houston Lighting & Power Company.

NOTICE OF SPECIAL ELECTION

To All Full Members of the American Radio Relay League Residing in the West Gulf Division:

A special election is about to be held in the West Gulf Division to choose an Alternate Director to fill the unexpired term of Wayland M. Groves, W5NW, for the remainder of 1950 and, in accordance with the provisions of the By-Laws, for the next two-year term, 1951-1952. Nomination is by petition, which must reach the Headquarters by noon of September 20, 1950. Nominating petitions are hereby solicited. Ten or more Full Members of the West Gulf Division may join in nominating any eligible Full Member residing in the Division as a candidate for Alternate Director therefrom. Suggested form:

Executive Committee

The American Radio Relay League
West Hartford 7, Conn.

We, the undersigned Full Members of the ARRL residing in the West Gulf Division, hereby nominate of as a candidate for alternate director from this division for the unexpired remainder of the 1949-1950 term.

(Signatures and addresses)

The signers must be Full Members in good standing. The nominee must be a Full Member and must have been both a member of the League and a licensed radio amateur operator for a continuous term of at least four years immediately preceding receipt by the Secretary of his petition of nomination, except that a lapse of not to exceed ninety days in the renewal of the operator's license and a lapse of not to exceed thirty days in the renewal of membership in the League, at any expiration of either during the four-year period, will not disqualify the candidate. He must be without commercial radio connections. Complete details of election procedures are contained in the Constitution and By-Laws, a copy of which will be sent to any member upon request.

If on September 20th there is but one eligible nominee, he will be declared elected. If there is more than one nominee, ballots will be sent to Full Members of the Division the first week of

October. Members of the Division are urged to take the initiative and file petitions promptly.

For the Board of Directors:
May 15, 1950

A. L. BUDLONG
Secretary

EXAMINATION SCHEDULE

The Federal Communications Commission will give amateur examinations during the second half of 1950 on the following schedule. Remember this list when you need to know when and where examinations will occur. Where exact dates or places are not shown below, information may be obtained, as the date approaches, from the Engineer-in-Charge of the district. *Even stated dates are tentative and should be verified from the Engineer as the date approaches.* No examinations are given on legal holidays. All examinations begin promptly at 9 A.M. except as noted.

Albuquerque, N. M.: Oct. 4.
Amarillo, Tex.: Oct. 2.
Anchorage, Alaska, 53 P.O. & Courthouse: By appointment.
Atlanta, Ga., 411 Federal Annex: Tuesday & Friday at 8:30 A.M.
Bakersfield, Calif.: Sometime in August.
Baltimore 2, Md., 508 Old Town Bank Bldg.: Monday through Friday. When code test required, at 8:30 A.M.
Bangor, Me.: Sometime in Oct.
Beaumont, Tex., 329 P.O. Bldg.: Thursday and by appointment.
Birmingham, Ala.: Sept. 12 and Dec. 1.
Boise, Idaho: Sometime in Oct.
Boston, Mass., 1600 Customhouse: Monday through Friday, 8:30 A.M.
Buffalo, N. Y., 328 P.O. Bldg.: Thursday
Butte, Mont.: Oct. 4.
Charlestown, W. Va.: Sometime in Sept. and Dec.
Chicago, 246 U. S. Courthouse: Friday.
Cincinnati: Sometime in Aug. and Nov.
Cleveland, Ohio: Sometime in Sept. and Dec.
Columbus, Ohio: Sometime in July and Oct.
Corpus Christi, Tex.: Sept. 14 and Dec. 7.
Dallas, Tex., 500 U. S. Terminal Annex Bldg.: Monday through Friday.
Davenport, Iowa: Sometime in July and Oct.
Denver, Colo., 521 New Customhouse: 1st and 2nd Thursdays and by appointment.
Des Moines, Iowa: July 13 and Oct. 12.
Detroit, Mich., 1029 Federal Bldg.: Wednesday and Friday.
El Paso, Tex.: Oct. 6.
Ft. Wayne, Ind.: Sometime in Aug. and Nov.
Fresno, Calif.: Sept. 13 and Dec. 13.
Grand Rapids, Mich.: Sometime in July and Oct.
Hartford, Conn.: Sometime in Sept.
Hilo, T. H.: Oct. 5.
Honolulu, T. H., 609 Stangenwald Bldg.: Monday, 8:00 A.M.
Houston, Tex., 324 U. S. Appraisers Stores Bldg.: Tues. and Fri.
Indianapolis, Ind.: Sometime in Aug. and Nov.
Jackson, Miss.: Aug. 23 and Nov. 15.
Jacksonville, Fla.: Oct. 7.
Jamestown, No. Dak.: Oct. 11
Juneau, Alaska, 6-7 Shattuck Bldg.: by appointment.
Kansas City, Mo., 3200 Fidelity Bldg.: Friday, 8:30 A.M., also by appointment.
Knoxville, Tenn.: Sept. 12 and Dec. 1.
Las Vegas, Nev.: Sometime in Oct.
Lihue, Kauai, T. H.: Oct. 26.
Little Rock, Ark.: July 12 and Oct. 11.
Los Angeles, 539 Federal Bldg.: Wednesday, 9:00 A.M. and 1:00 P.M.
Louisville, Ky.: Sometime in Nov.

Manchester, N. H.: Sometime in Nov.
Marquette, Mich.: Nov. 1.
Memphis, Tenn.: July 6 and Oct. 5.
Miami, Fla., 312 Federal Bldg.: Monday and Thursday.
Milwaukee, Wis.: Sometime in July and Oct.
Mobile, Ala., 324 U. S. Courthouse and Customhouse: Wednesday and by appointment.
Nashville, Tenn.: Aug. 2 and Nov. 1.
New Orleans, La., 400 Audubon Bldg.: Monday through Friday, except Monday through Wednesday at 8:30 A.M. when code test required.
New York, 748 Federal Bldg.: Monday through Friday.
Norfolk, Va., 402 Federal Bldg.: Monday through Friday, except Friday only when code test required.
Oklahoma City, Okla.: July 20-21 and Oct. 19-20.
Omaha, Nebr.: July 20 and Oct. 19.
Philadelphia, 1005 U. S. Customhouse: Monday through Friday
Phoenix, Ariz.: Sometime in July and Oct.
Pittsburgh: Sometime in Aug. and Nov.
Portland, Me.: Sometime in Oct.
Portland, Ore., 307 Fitzpatrick Bldg.: Friday, 8:30 A.M.
Rapid City, So. Dak.: Sometime in July.
Reno, Nev.: Oct. 11.
Roanoke, Va.: Oct. 7.
St. Louis, Mo.: Aug. 10 and Nov. 16.
St. Paul, Minn., 208 Uptown P.O. Bldg.: Friday.
Salt Lake City, Utah: Sept. 13 and Dec. 13.
San Antonio, Tex.: Aug. 19 and Nov. 9.
San Diego, 230 U. S. Customhouse: by appointment.
San Francisco, 323-A Customhouse: Monday and Friday, 8:45 A.M. Also, Class A Monday through Friday.
San Juan, P. R., 323 Federal Bldg.: Thursday, and Monday through Friday at 8:00 A.M. if no code test required
Savannah, Ga., 214 P.O. Bldg.: by appointment.
Schenectady, N. Y.: Sept. 13-14 and Dec. 6-7
Seattle, 808 Federal Office Bldg.: Friday.
Sioux Falls, S. D.: Sept. 13 and Dec. 13.
Spokane, Wash.: Oct. 2.
Syracuse, N. Y.: Sometime in July and Oct.
Tallahassee, Fla.: July 8.
Tampa, Fla., 410 P.O. Bldg.: by appointment.
Tucson, Ariz.: Sometime in Oct.
Tulsa, Okla.: July 24-25 and Oct. 23-24.
Wailuku, T. H.: Oct. 12.
Washn., D. C., 415 22nd St., N.W.: Monday through Friday, 8:30 A.M.
Wichita, Kans.: Sept. 7.
Williamsport, Pa.: Sometime in Sept. and Dec.
Wilmington, N. C.: Dec. 2.
Winston-Salem, N. C.: Aug. 5 and Nov. 4.

MINUTES OF 1950 ANNUAL MEETING OF THE BOARD OF DIRECTORS, AMERICAN RADIO RELAY LEAGUE, May 5-8, 1950

1) Pursuant to due notice and the requirements of the By-Laws, the Board of Directors of the American Radio Relay League, Inc., met in regular annual session at the Hartford Golf Club, West Hartford, Conn., on May 5, 1950. The meeting was called to order at 9:32 a.m. EDT, with President George W. Bailey in the Chair and the following other directors present:

J. Lincoln McCargar, Vice-President
Alexander Reid, Canadian General Manager
John H. Brabb, Great Lakes Division
Victor Canfield, Delta Division
Leonard Collett, Midwest Division
Goodwin L. Dosland, Dakota Division
John G. Doyle, Central Division
John R. Griggs, Southwestern Division
Wayland M. Groves, West Gulf Division
Lamar Hill, Southeastern Division
Kenneth E. Hughes, Pacific Division
Joseph M. Johnston, Hudson Division
J. Frank Key, Roanoke Division
Walter Bradley Martin, Atlantic Division
Franklin K. Matejka, Rocky Mountain Division
Percy C. Noble, New England Division
R. Rex Roberts, Northwestern Division

Also in attendance, at the invitation of the Board as non-participating observers, were New England Division Alternate Director Clayton C. Gordon, Hudson Division Alternate Director Gay E. Milius, jr. and Southeastern Division Alternate Director William P. Sides. There were also present Secretary Arthur L. Budlong, Communications Manager Francis E. Handy, Treasurer David H. Houghton, Technical Director George Grammer, Assistant Secretaries Richard L. Baldwin and John Huntoon, General Counsel Paul M. Segal and Quayle B. Smith of his office. The meeting was welcomed and briefly addressed by the Chair.

2) On motion of Mr. Collett, unanimously VOTED that the minutes of the 1949 annual meeting of the Board of Directors are approved in the form in which they were issued by the Secretary.

3) On motion of Mr. Roberts, unanimously VOTED that the minutes of the 1949 special meeting of the Board of Directors are approved in the form in which they were issued by the Secretary.

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

5) On motion of Mr. Dosland, unanimously VOTED that the Board, having examined its mail action on certain matters in Docket 9295, by which it (1) opposed the proposed Amateur Extra Class license in all respects, (2) approved the proposal to bar former holders of amateur licenses from obtaining Novice Class licenses, and (3) with relation to Technical and Novice Class licenses obtained on the basis of a mail examination and the question of their need to appear before an examiner of the Commission if they move within 125 miles of a quarterly examining point, or if such a point is subsequently established within 125 miles of their license address, approved such a requirement in the case of the Technician license and opposed such a requirement in the case of the Novice license, now ratifies these actions and decides to take the aforesaid position as of January 5, 1950.

6) On motion of Mr. Canfield, unanimously VOTED that the Board, having examined its mail action by which it opposed the changes in language for proposed § 12.0 of the amateur rules, now ratifies that action and decides to take the aforesaid position as of January 5, 1950.

7) On motion of Mr. Johnston, unanimously VOTED that all acts performed and all things done by the Executive Committee since the last annual meeting of the Board, and by it reported to the Board, are ratified and confirmed by the Board as the actions of the Board.

8) On the reception of reports of committees: Upon the request of Mr. Reid, and on motion of Mr. Dosland, unanimously VOTED that the report of the Finance Committee goes over to follow consideration of the appropriation for expense of this meeting. Mr. Noble stated the Planning Committee had nothing to report. Mr. Martin reported briefly for the Communications Department Committee; whereupon, on motion of Mr. McCargar, unanimously VOTED that the report of the Communications Department Committee is received by this Board.

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

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

11) Moved, by Mr. Doyle, that the Board of Directors hereby instructs the Secretary to request of the Federal Communications Commission the setting aside of that portion of the 28-Mc. band from 29.6 to 29.7 megacycles for the exclusive use of mobile stations. After discussion, moved, by Mr. Dosland, that the motion be amended to read as follows: That the Board of Directors hereby instructs the Secretary to suggest in QST that amateur stations operating on that portion of the 28-Mc. band from 29.6 to 29.7 Mc. give way to mobile stations when the latter are heard. Moved, by Mr. Hill, further to amend to set aside similarly portions of the 75-meter radiotelephone sub-band for

mobile "calling." But, after extended discussion, Mr. Hill's amendment was rejected. After further discussion, on motion of Mr. Collett, moved that the amendment to the original motion be amended to provide that this subject is referred to the Planning Committee for study and report to the Board within 90 days with recommendations in line with the policy of encouragement and expansion of mobile operation; but, with the permission of his second, and unanimous consent being given, Mr. Dosland withdrew his amendment, this action leaving the motion in its original form as proposed by Mr. Doyle. On motion of Mr. Dosland, VOTED, to amend the motion by striking out the original text and substituting therefore the following: That it is the consensus of opinion of this Board that mobile operation should be encouraged in every way possible, that while it is impossible at the present time to set aside any definite frequencies, this Board recognizes the need and in view of that need refers the matter to the Planning Committee for study and report within 90 days, and that in the meantime the editorial policy of QST shall be to encourage in every way possible voluntary setting aside of 29.6-29.7 Mc, on the part of amateurs for the convenience of mobile operation. Mr. Doyle asked to be recorded as voting opposed. The question then being on the original motion, as amended, the same was ADOPTED, Mr. Doyle asking to be recorded as voting opposed.

12) On motion of Mr. Doyle, unanimously VOTED that the Secretary is instructed to obtain the official transcript of the oral argument May 19 before the FCC in the matter of Docket 9295, and to furnish copies to all directors and alternate directors.

13) On motion of Mr. Dosland, unanimously VOTED to grant Mr. Doyle's request to be heard in connection with consideration of the manner in which Novice and Technician licensees will fit into the League's administrative structure.

14) On motion of Mr. Dosland, unanimously VOTED that a committee of five directors be elected by the Board to study a revision of the League's Constitution and By-Laws and report their conclusions to the Board six months prior to the next annual meeting for Board action thereon. Whereupon, as members of the committee, Mr. Collett nominated Mr. Dosland, Mr. Roberts nominated Mr. Collett, Mr. Hill nominated Mr. Brabb, Mr. Johnston nominated Mr. Noble and Mr. Groves nominated Mr. Matejka, all of whom were then unanimously declared elected to the Constitution Revision Committee. It was the sense of the meeting that the committee would elect its own chairman and that any vacancies occurring on the committee would be filled by appointment by the President.

15) On motion of Mr. Canfield, unanimously VOTED that the Treasurer and Secretary be instructed to transfer the balance of \$29,047.45 in the reserve for the Building Fund to surplus, thereby making the short term government securities and cash on hand in the Building Fund available for general fund purposes.

16) On motion of Mr. Canfield, unanimously VOTED that the Treasurer be instructed to increase the General Fund portfolio to \$100,000 par value long term government bonds by purchasing \$17,000 par value long term government bonds from funds which will be available on maturity of short term government bonds maturing in 1950, and that the balance of funds available on maturity of short term government bonds be invested in accordance with resolution BD12 adopted May 10, 1946.

17) During the course of the above action the Vice-President, at the request of the President, briefly occupied the Chair.

18) At the request of Director Canfield, without objection, the Chair ordered the election of members of the Finance Committee to be the first item in connection with consideration of the appropriation for expenses of various committees of the Board.

19) The Board was in recess from 11:00 a.m. to 11:12 a.m.

20) Pursuant to due notice, Mr. Brabb moved that

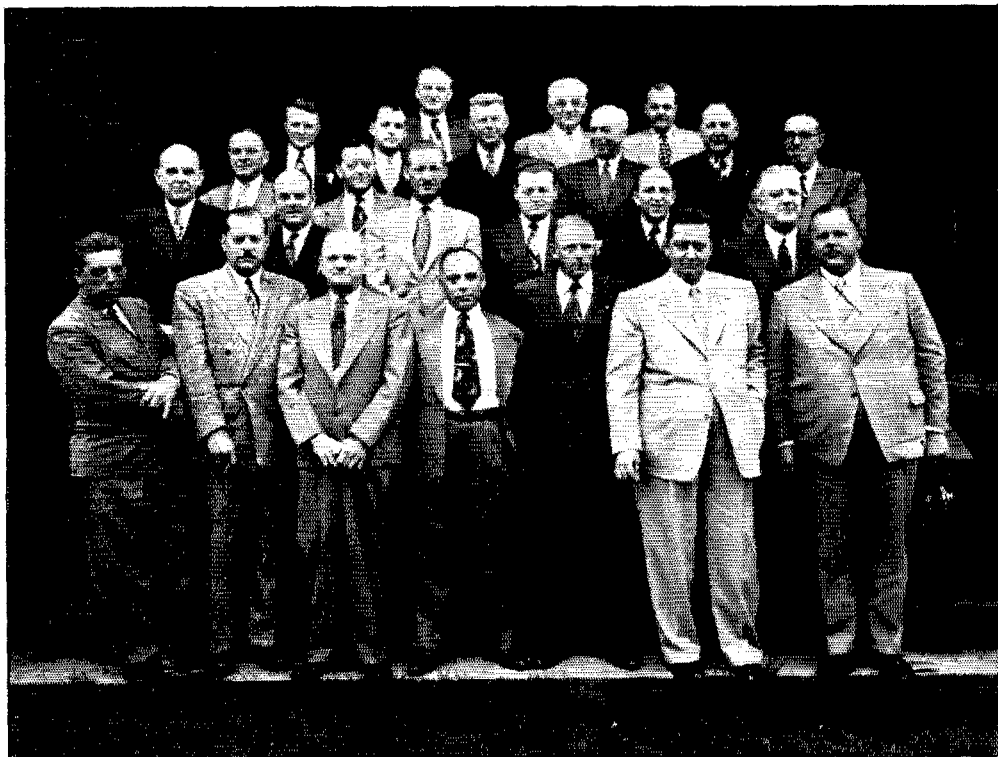
paragraph 3 of Article IV of the Constitution be amended to read as follows: The Board of Directors shall have such powers and duties as are prescribed by statute for a Board of Directors; provided however, that the President and Vice-President shall have no vote as a Director except that the President and/or Vice-President as presiding officer at regular meetings of the Board of Directors may vote in the case of a tie; and provided further that the Canadian General Manager shall have no vote as a member of the Board of Directors on those matters pertaining solely to laws and regulations governing United States amateurs promulgated by United States governmental authority. It shall direct the investment and care of the funds of the League, shall make appropriations for specific purposes, shall act upon all questions of expulsion of members, and in general shall direct the business of the League, either itself or through its officers and committees. It shall appoint the Secretary, the Communications Manager, and the Treasurer and fix their salaries, and they shall be subject to removal only by an affirmative vote of a majority of the members of the Board. But there was no second, so the motion was lost.

21) Mr. Brabb announced that at the next regular meeting of the Board it would be his intention to propose to amend paragraph 10 of Article IV of the Constitution to read as follows: There shall be an Executive Committee consisting of the officers of the League and two directors who shall be duly elected at any regular board meeting by a majority of the directors of the League. This committee

shall act in the place and stead of the Board of Directors during the intervals between meetings of the Board. Any action taken under this section shall be promptly reported to the Board and shall be subject to the approval of the Board at its next subsequent meeting.

22) Unanimous consent being given, Mr. Brabb referred to the Planning Committee for study a proposal that the Board of Directors request of the FCC more complete utilization of the 160-meter band by assignment to amateurs those frequencies not used by Loran on opposite coasts of the United States, such request to be made on behalf of the Board by the proper officers of the League and/or its General Counsel.

23) Moved by Mr. Brabb that the Board of Directors adopt an open and aggressive educational policy with regard to TVI and BCI caused by poor TV and BC receiver design and that the Headquarters staff carry out such policy of the Board by the publication of proper articles and/or editorials in *QST*. After discussion, moved by Mr. Griggs to amend the motion by striking the text and substituting therefore the following: It is moved that the Board of Directors hereby instruct the Secretary to establish the position of Public Relations Writer upon the staff of the League for the express purpose of producing written material describing the amateur's rights in relation to television and broadcast interference problems, and to supply such material in a continual flow to the press, radio and other media through which such information may reach the general public and



The ARRL Board of Directors and League officials gathered on the steps of the Hartford Golf Club during a recess on the occasion of their 1950 annual meeting. *Front row:* Director Collett, Midwest; Director Dosland, Dakota; Director Roberts, Northwestern; Alternate Director Sides, Southeastern; Director Hill, Southeastern; Director Doyle, Central; Director Griggs, Southwestern. *Second row:* President Bailey; Director Brabb, Great Lakes; Director Groves, West Gulf; Director Hughes, Pacific; Director Johnston, Hudson; Treasurer Houghton. *Third row:* Vice-President McCargar; Director Key, Roanoke. *Fourth row:* Assistant Secretary Baldwin; Alternate Director Milius, Hudson; Secretary Budlong; Canadian General Manager Reid; Director Matejka, Rocky Mountain; Communications Manager Handy. *Rear row:* Alternate Director Gordon, New England; Director Canfield, Delta; Director Noble, New England.

thereby correct the erroneous impressions now existing. It is further directed that the Secretary may employ at his discretion such additional personnel as may be needed for the purpose and at salaries commensurate with the position. After further discussion, moved by Mr. Collett to amend the amendment by striking out its text and substituting the following: that the *QST* editorial policy shall be one of furnishing reference, guidance and information to the membership to substantially improve their public relations relative to TVI and BCI problems and that any future publications dealing with TVI and BCI be supplied to television manufacturers' technical staffs, and through their organizations, the Radio Manufacturers' Association. But, after discussion, the question being on Mr. Collett's amendment, the same was rejected, Messrs. Brabb and Collett asking to be recorded as in favor. The question then being on Mr. Griggs' amendment, the same was rejected, Mr. Griggs asking to be recorded as voting in favor. The question then being on the original motion, the same was rejected, Messrs. Brabb and Collett asking to be recorded in favor.

24) On motion of Mr. Brabb, unanimously VOTED that the Headquarters staff print and issue for sale ARRL log sheets in loose-leaf form.

25) On motion of Mr. Brabb, VOTED that the following is to be given consideration by the Constitution Revision Committee in connection with the revision of the By-Laws: that proceedings for the election of a Sections Communications Manager in accordance with paragraph 9 of the By-Laws shall be taken sufficient time in advance of such election so that the notification of election of the succeeding Section Communications Manager shall reach him and his predecessor not less than thirty days before such succeeding Section Communications Manager shall take office.

26) Moved, by Mr. Johnston, that the matter of the divisions of the League corresponding to the FCC amateur call areas be referred to the Planning Committee for study and report back to the Board at its next meeting. But the motion was rejected.

27) The Board was in recess for luncheon from 12:10 to 1:57 p.m. with all directors and other persons hereinbefore mentioned in attendance with the exception of General Counsel Segal, who retired from the meeting at this time.

28) On motion of Mr. Collett, VOTED that a committee of three directors be appointed to study the advisability of three new standing committees, one each to study and advise the Board on basic functions of the Secretarial, Communications and Advertising Departments at League headquarters; each committee to consist of three members rotating annually from among the membership of the Board and to be designated alphabetically by divisions.

29) On motion of Mr. Noble, the following resolution was unanimously ADOPTED: WHEREAS, the district managers of the League's QSL Bureau system have continued to serve their fellow amateurs well, giving voluntarily of many hours of their time in the interests of amateur radio, BE IT RESOLVED, that the Board expresses its deep appreciation for their excellent work; that this action be reported in *QST* and that a letter expressing the thanks of the Board be sent to each QSL Manager.

30) Without objection, Mr. Noble stated the following as preliminary to a series of motions for subsequent individual consideration: that the Board, having examined the privileges extended to amateurs by the League — and finding the following: League membership required to hold an elective office, to hold an appointive office, to vote in elections, and to obtain WAC; League membership not required to petition Director, to be heard at ARRL forums at ARRL Conventions, to receive medals or certificates in ARRL contests, to receive publicity in *QST* for work in contests, to receive publicity in *QST* Section Reports, to get free technical advice from the League Technical Information Service, to get legal representation free if amateur radio threatened, to use the ARRL QSL Bureau service, and to receive DXCC, WAS, A-1 Operator, RCC, and Code Pro-

QSL MANAGERS THANKED BY BOARD

For the unceasing work they are performing in distributing DX cards to American and Canadian amateurs, the QSL Managers of the League were given a unanimous vote of appreciation by the Board of Directors at its May meeting.

We all can add our own personal thanks to those of the Board by doing our part to make their jobs a little easier. Simply send your district QSL manager a stamped, self-addressed envelope which is 4½ x 9¼ inches in size. Your name and address should be in the customary place on the face of the envelope, and your call letters should be printed prominently in the upper left-hand corner. For the address of your manager, see page 32 of this issue.

iciency certificates — believes that some of these services to non-members should be restricted. Whereupon Mr. Noble moved that medals or certificates for winners of League-sponsored contests shall be awarded to the highest-scoring League member in each contest group, but that non-League members shall continue to be invited to take part in the contests as heretofore and that members and non-members be listed separately (exception shall be made in the awarding of medals or certificates to non-League members in the case of foreign amateurs who are unable to become members of the League). But the motion was rejected. Moved, by Mr. Noble, that non-League members shall not receive publicity in *QST* Section Activities reports (SCMs could return letters or cards, requesting that date of membership expiration be included); but there was no second, so the motion was lost. Moved, by Mr. Noble, that legal representation, at the expense of the League, shall not normally be furnished to any other than League members; but after discussion, unanimous consent being given, the motion was withdrawn. Moved, by Mr. Noble, that DXCC and WAS certificates shall be issued to non-League members at a cost determined by Headquarters. Mr. Collett moved to amend by striking "WAS" and adding "and endorsements" immediately after the word "DXCC"; but unanimous consent being given, the motion to amend was withdrawn. The question then being on the original motion, the same was rejected.

31) On motion of Mr. Noble, unanimously VOTED that the Secretary be instructed to study the problem (and report to the 1951 Board meeting) of having the ARRL sponsor a "Technical Scholarship" which will guarantee a year's employment at Headquarters in research on amateur problems, to be awarded to an amateur who is a graduate of a recognized technical school; such an award would fill a dual purpose, i.e., a service to all amateurs and a practical medium of filling the gap in the sequence of education and application.

32) Moved, by Mr. Noble, that the Secretary be instructed to ask the FCC for as prompt action as possible on their part in opening 3800 to 3850 to Class A 'phone operation. But after discussion, the same was rejected, Mr. Collett requesting to be recorded as voting in favor.

33) Moved, by Mr. Noble, that a special rate for *QST* subscriptions be established by Headquarters for Army, Navy, and Air Corps libraries, if they raise their own funds for this purpose (this special rate not to apply to individual memberships). But, after discussion, the motion was rejected.

34) Moved, by Mr. Noble, that *QST* offer to pay for

articles accepted for publication at the rate of 5¢ per word and pictures at the rate of \$3.00 each; but, after discussion, the motion was rejected.

35) Moved, by Mr. Noble, that whereas, the 1948 QST poll resulted in a majority favoring a 50-kc. expansion of the 20-meter 'phone assignment (in which poll only the report of the ARRL Planning Committee favoring this expansion was given); and, whereas, a follow-up poll was conducted in one Division resulting in a majority of votes for not expanding 20-meter 'phone (in which poll arguments were presented on both sides of the question); the Board now instructs the Secretary to conduct another poll in QST (in which both sides of the argument will be presented, and all other present rules of the Board concerning polls will be complied with) to get the final decision as to whether or not the Board wishes to ask the FCC for such expansion. Our proposed request for such expansion is hereby withdrawn, further action to be determined after the poll results are in. After discussion, moved, by Mr. Collett, that the motion be amended by striking therefrom all reference to controversial aspects of the poll and to retain in the motion simply the matter of taking a poll on the subject of the 20-meter 'phone assignment; but there was no second, so the amendment was lost. After further discussion, moved, by Mr. Martin, that the motion be amended by striking out the text and substituting therefor the following: In view of the reaction of League membership and other amateur groups to the Board proposed action concerning the 14-Mc. sub-allocation, and to the apparent delay in the effective date of the Atlantic City table, that the instructions to the Secretary be rescinded; at such time as the Atlantic City provisions appear nearer at hand that the matter be again submitted to the Board. But, after extended discussion, the question being on Mr. Martin's amendment, the same was rejected. The question then being on the original motion, the same was rejected.

36) The Board was in recess from 3:25 p.m. to 3:34 p.m.

37) At this point Mr. Roberts read a telegram requesting the Board to authorize the holding of an ARRL National Convention in Seattle in 1951; whereupon, on motion of Mr. Roberts, unanimously VOTED that the Board of Directors authorizes the West Seattle Amateur Radio Club and the North Seattle Amateur Radio Club of Seattle, Washington, to hold an ARRL approved National Convention in Seattle, at some date during late July or early August, 1951, under the requirements as set forth in sections 44, 45, 46 and 47 of the Constitution and By-Laws as revised to November 1, 1949.

38) Mr. Roberts moved the adoption of the following resolution:

RESOLVED: That, to facilitate the operations of the ARRL QSL Bureau System, QSL cards on file which are unclaimed for a period longer than one year may be destroyed by the district QSL managers without further authority; and that suitable publicity be given this change of policy in QST.

CONSTITUTION & BY-LAWS AND OFFICERS' REPORTS AVAILABLE TO MEMBERS

In April of each year the officers of the League make comprehensive written reports to the directors. The Board has made these reports available to interested members. The cost price is 75 cents per copy, postpaid. A copy of the Constitution & By-Laws will be sent to any member free upon request. Address the Secretary at West Hartford.

After discussion, moved, by Mr. Collett, that the resolution be tabled; but there was no second, so the motion to table was lost. The question then being on the adoption of the resolution, the same was ADOPTED, Mr. Collett asking to be recorded as voting opposed.

39) Moved, by Mr. Matejka, to amend By-Law 25 by deleting therefrom all text after the words "shall immediately resign his office of Division Director". The yeas and nays being ordered, the question was decided in the affirmative: Whole number of votes cast, 16; necessary for adoption, 11; yeas, 16; nays, 0. Every director voted in the affirmative except the President and Vice-President, who abstained as required. So the By-Law is amended.

40) After discussion, by order of the Chair, the Secretary was directed to provide duplicate voting sheets in connection with all future solicitation of mail expressions from Directors.

41) On motion of Mr. Hill, unanimously VOTED that the Secretary is directed to furnish Alternate Directors with certificates and pins similar to those furnished to Directors.

42) On motion of Mr. Hill, VOTED to return to consideration of Mr. Brabb's proposed amendment of Section 3 of Article IV of the Constitution but, after discussion, unanimous consent being given, the matter was referred to the Constitution Revision Committee for its careful consideration.

43) On motion of Mr. Griggs, VOTED that the Board of Directors hereby instructs the Secretary to establish liaison with the Federal Public Housing Authority for the purpose of establishing the rights of licensed radio amateur operators to erect antenna structures when their place of abode is located in a Federal Public Housing Project.

44) Moved, by Mr. Griggs, that the Board of Directors instructs the Secretary and the Editor of QST to include in the aforesaid publication a column detailing the activities of the feminine members of the American Radio Relay League who are also licensed amateur radio operators, said column to be given a distinctive and appropriate title and to appear in all issues of QST produced after 1 July 1950. After discussion, moved, by Mr. Collett, that the motion be amended to provide for such a column once each quarter; but there was no second so the motion to amend was lost. The question then being on the original motion, the same was rejected, Messrs. Collett and Griggs asking to be recorded as voting in favor.

45) On motion of Mr. Griggs, unanimously VOTED to refer to the Planning Committee a study of the advisability of requesting of the Federal Communications Commission the establishment of a 50-kc. sub-allocation of the 7-megacycle band, from 7.25 to 7.3 megacycles, for amateur radio teletype communications (a.f.s.k.) service on a non-exclusive basis.

46) Moved, by Mr. Griggs, to amend By-Law 42 of the League's Constitution and By-Laws to specify *Roberts' Rules of Order* rather than the *Revised Cushing's Manual*. But, after discussion, the yeas and nays being ordered, the question was decided in the negative: Whole number of votes cast, 16; necessary for adoption, 11; yeas, 8; nays, 8. Messrs. Brabb, Collett, Dosland, Doyle, Griggs, Groves, Key and Matejka voted in the affirmative. Those who voted opposed are Messrs. Canfield, Hill, Hughes, Johnston, Martin, Noble, Reid and Roberts. The President and Vice-President abstained, as required. So the proposal to amend was rejected.

47) The Board was in recess from 5:21 p.m. until 5:29 p.m.

48) Moved, by Mr. Martin, to amend By-Law 5 (a) by adding to the counties of the Hudson Division in the state of New Jersey the county of Morris. After discussion, the yeas and nays being ordered, the question was decided in the affirmative. Whole number of votes cast, 15; necessary for adoption, 11; yeas, 14; nays, 1. Those voting in the affirmative are Messrs. Brabb, Canfield, Dosland, Doyle, Griggs, Groves, Hill, Hughes, Johnston, Key, Martin, Matejka, Noble and Roberts. Mr. Collett voted opposed.

Mr. Reid did not vote and the President and Vice-President abstained as required. So the By-Law is amended.

49) On motion of Mr. Martin, affiliation with the League of the following amateur radio clubs was unanimously approved:

- Adirondaack Radio Club...Glens Falls, New York
- Lebanon Valley Society of Radio Amateurs.....Lebanon, Penna.
- Fort Necessity Amateur Radio Association.....Uniontown, Penna.
- Batavia Amateur Radio Association.....Stafford, New York
- Rebel Radio Club.... West Palm Beach, Florida
- Cathode Ray Amateur Radio Club.....Great Falls, Montana
- Blennerhassett Amateur Radio Club.....Parkersburg, West Virginia
- Hellgate Radio Club.....Missoula, Montana
- Tri-County Radio Association.....Alliance, Ohio
- Old Pueblo Radio Club.....Tucson, Arizona
- Ann Arbor Radio Amateurs...Ann Arbor, Michigan

50) The Board recessed for dinner at 6:19 p.m., reconvening at 8:03 p.m., with all directors and other persons hereinbefore mentioned in attendance.

51) Moved, by Mr. Reid, that By-Laws 3 and 4 be amended by changing the amount specified as Canadian dues to \$4.25. After discussion, the yeas and nays being ordered, the question was decided in the affirmative: Whole number of votes cast, 16; necessary for adoption, 11; yeas, 16; nays, 0. Every director voted in the affirmative except the President and Vice-President, who abstained as required. So the By-Law is amended.

52) On motion of Mr. McCargar, unanimously VOTED that there is hereby appropriated from the surplus of the League, as of this date, the sum of six thousand dollars (\$6,000) for the purpose of defraying the expenses of holding this meeting of the Board of Directors, any unexpended remainder of same to be restored to surplus.

53) At this time Mr. Reid reported to the Board for the Finance Committee.

54) On motion of Mr. Johnston, unanimously VOTED that there is hereby appropriated from the surplus of the League, as of January 1, 1951, the sum of eight thousand two hundred and fifty dollars (\$8,250) for the legitimate administrative expenses of the directors for the calendar year 1951, the said amount allocated as follows:

Canadian General Manager.....	\$300
Atlantic Division Director.....	400
Central Division Director.....	750
Dakota Division Director.....	500
Delta Division Director.....	500
Great Lakes Division Director.....	800
Hudson Division Director.....	500
Midwest Division Director.....	650
New England Division Director.....	300
Northwestern Division Director.....	800
Pacific Division Director.....	450
Roanoke Division Director.....	300
Rocky Mountain Division Director.....	300
Southeastern Division Director.....	400
Southwestern Division Director.....	700
West Gulf Division Director.....	600

any unexpended remainders of these funds at the end of the year 1951 to be restored to surplus.

55) On motion of Mr. Hughes, unanimously VOTED that there is hereby appropriated from the surplus of the League the sum of \$187.93, to be sent to W. A. Ladley for expenses incurred by him during his 1949 term as director beyond the amount of the Pacific Division administrative appropriation for the year.

56) On motion of Mr. Collett, unanimously VOTED that there is hereby appropriated from the surplus of the League, as of this date, the sum of two thousand five hundred dollars (\$2,500) for the purpose of defraying the ex-

penses of the Constitution Revision Committee, any unexpended remainder on the date of the next annual meeting of the Board to be restored to surplus. During the course of this action it was noted as information that the committee had elected Mr. Noble its chairman.

57) On motion of Mr. Roberts, unanimously VOTED that there is hereby appropriated from the surplus of the League, as of this date, the sum of five hundred dollars (\$500) for the purpose of defraying the expenses of the Finance Committee, and the sum of two thousand dollars (\$2,000) for the purpose of defraying the expenses of the Planning Committee, any unexpended remainder of either on the date of the next Annual Meeting of the Board to be restored to surplus.

58) On motion of Mr. Doyle, after extended discussion, unanimously VOTED that the Board of Directors appoint a Membership and Publication Committee whose duty it will become to effect an increase in League membership (a) through a study of the desirability of a third class of League membership, the Junior Class; (b) through the supplying of QST, or a similar monthly publication dedicated to the beginning amateur.

59) On motion of Mr. Collett, unanimously VOTED that Mr. Doyle is named as Chairman of the Membership and Publication Committee; whereupon, without objection, Mr. Doyle named Messrs. Griggs and Hill as the other members of the committee.

60) On motion of Mr. Collett, unanimously VOTED that the sum of three thousand dollars (\$3,000) be hereby appropriated from the surplus of the League, as of this date, for the purpose of defraying the traveling expenses of the Section Communications Managers and QSL Managers of the League, applicable within the continental limits of the United States and Canada only, in the period between this date and the date of the next annual meeting of the Board as follows: (1) SCMs to attend one official ARRL Convention within their respective Divisions. (2) Within ARRL Sections in the continental limits, SCMs to attend in their own Section, in addition to the above, no more than five major ARRL Section organization meetings per year, to include hamfests only if sponsors schedule an ARRL Section organization meeting. (3) QSL Managers of the League to attend one official ARRL Convention within their respective call areas, provided that, where such convention is more than 500 miles from the QSL Manager's residence, reimbursement for travel expense, as provided below, shall not be for more than a total roundtrip of 1,000 miles. A designated Full Member may be authorized and subsequently reimbursed under these provisions to represent the SCM and speak for him at meetings (1) or (2) as above, provided the SCM has the advance concurrence of the Director concerned and the Communications Manager and gives written approval to such substitution. In the case of newly-elected SCMs, if five meetings for their Section have already been reimbursed, they may, on getting written approval of their Director and the Communications Manager, attend specific proposed additional (but not more than three such) Section organization meetings. It is further moved that reimbursement be made in the above at the rate of 7½¢ a mile via the shortest commonly-traveled route if personal transportation be used or in the exact amount of the fare if railroad or bus be used. In (1) and (3) expenses may include one night's hotel accommodation at actual cost but not to exceed four dollars (\$4.00) and the Convention registration fee. All allowances for expenses shall be subject to approval by the Communications Manager in the case of the SCMs, and by the Secretary in the case of QSL Managers, of a report submitted with the itemized request for reimbursement, covering the representation of ARRL, reporting attendance, meeting discussion, questions, recommendations, or QSLs distributed, etc., by the individual attending the meeting. At the end of the designated period, any unexpended remainder of this appropriation shall be restored to surplus.

61) On motion of Mr. Roberts, unanimously VOTED that there is hereby appropriated from the surplus funds

of the League, as of this date, the sum of two thousand dollars (\$2,000) for reimbursement until the fund is exhausted, at the rate of 7 $\frac{1}{4}$ ¢ per mile or actual rail or bus fare, to Section Emergency Coördinators to a maximum of ten trips each per year per Section, throughout their respective Sections for the purpose of close contact with Emergency Coördinators and through meetings, selling clubs and individuals on the necessity for Emergency Corps work, and contacting relief agencies and other local agencies to be served, subject to submission and approval of a full report to the Communications Manager; if one SEC replaces another and the Section quota of trips has been exhausted by his predecessor, he may with the written concurrence of his Director and the Communications Manager request advance approval and subsequent reimbursement for specific travel (but not more than five trips) under the provisions above; any unexpended remainder of this sum on the date of the next annual meeting of the Board to be restored to surplus.

62) At this point, the Secretary reported at length on the problems confronting the telecommunications field, with special reference to the amateur service, in connection with the implementation of the Atlantic City allocations table at the forthcoming Extraordinary Administrative Radio Conference to be held in The Hague in the autumn of 1950. Thereafter, on motion of Mr. Dosland, unanimously VOTED that there is hereby appropriated from the surplus of the League, as of this date, the sum of ten thousand dollars (\$10,000) for the purpose of defraying the expenses of planning for, representation at and participation in the Extraordinary Administrative Conference, if in the opinion of the Secretary League participation is required, any unexpended remainder of same to be restored to League surplus.

63) The Board was in recess from 9:40 p.m. to 9:45 p.m.

64) On motion of Mr. Doyle, unanimously VOTED that there is hereby appropriated from the surplus of the League, as of this date, the sum of two thousand five hundred dollars (\$2,500) for the purpose of defraying the expenses of the Membership and Publication Committee, any unexpended remainder on the date of the next annual meeting of the Board to be restored to surplus.

65) On motion of Mr. Dosland, unanimously VOTED to re-appoint the Finance Committee (at present consisting of Messrs. Reid, chairman, Canfield and Noble) to serve until the next regular meeting of the Board, any interim vacancies to be filled by appointment by the President.

66) On motion of Mr. Dosland, the Board recessed at 9:58 p.m., under order to reassemble at 9:00 a.m. on the morrow. The Board reassembled at the same place on May 6, 1950, and was called to order by the Chair at 9:37 a.m., with all directors and other persons hereinbefore mentioned in attendance.

67) Mr. Reid moved to amend By-Law 5(b) by adding immediately after the words "in the Dominion of Canada" the words "Newfoundland Division", and to amend By-Law 6 by striking therefrom the words "Newfoundland and Labrador" — attached to the Maritime Division" and By-Laws 7 and 8 by striking therefrom the words "Newfoundland and Labrador." After discussion, moved by Mr. Dosland to amend the motion to read that By-Law 5(b) be amended by adding, immediately after the words "Prince Edward Island," the words "and Newfoundland and Labrador," and that By-Law 6 be amended by striking therefrom the words "Newfoundland and Labrador" — attached to the Maritime Division," and By-Laws 7 and 8 by striking therefrom the words "Newfoundland and Labrador." The yeas and nays being ordered, Mr. Dosland's amendment was decided in the affirmative: Whole number of votes cast, 16; necessary for adoption, 11; yeas, 16; nays, 0. Every Director voted in the affirmative except the President and Vice-President, who abstained as required. The question then being on the original motion, as amended, the yeas and nays being ordered, the question was decided in the affirmative: Whole number of votes cast, 16; necessary for adoption, 11; yeas, 16; nays, 0. Every Director voted in the affirmative except the President and Vice-President,

who abstained as required. So the By-Laws are amended.

68) Mr. Doyle presented a preliminary report of the Membership and Publications Committee, outlining a "tripod" plan to obtain 10,000 more Full Members of the League through three teams: The "Maxims" to consist of the Directors and affiliated clubs, the "Handys" to consist of the Communications Department field organization, and the "Warners" to consist of the Headquarters staff members, key chain awards to be made to those teams obtaining their quotas of 3,333 each. On motion of Mr. Dosland, the principle of such a plan was unanimously APPROVED.

69) On motion of Mr. Dosland, by unanimous vote, the Board appointed, pursuant to the terms of the Trust Agreement under the Pension Plan, the following persons to serve as a Pension Committee from this date until the next annual meeting of the Board: Arthur L. Budlong, George Grammer, David H. Houghton.

70) The Board was in recess from 10:35 a.m. to 10:42 a.m.

71) On motion of Mr. Johnston, the following resolution was unanimously ADOPTED by rising vote: WHEREAS, on February 20, 1950, Francis Edward Handy completed twenty-five years of continuous service to the American Radio Relay League, as Communications Manager, be it RESOLVED, that the Board of Directors, meeting at West Hartford, Conn., May 5, 1950, in recognition of Francis Edward Handy's untiring efforts on behalf of the League, does hereby express its deep appreciation of his loyalty, fidelity and intelligent devotion to the best interests of the institution of amateur radio.

72) On motion of Mr. Martin, unanimously VOTED that the Board commends the Headquarters staff for its excellent work in the production of the latest edition of *How to Become a Radio Amateur*.

73) On motion of Mr. Dosland, unanimously VOTED that the Finance Committee is directed to study the feasibility of presenting to the Board at each annual meeting an advisory budget.

74) The Board was in recess from 11:45 a.m. to 11:49 a.m.

75) The Chair announced the appointment of Mr. Collett as Chairman of the Committee to study the advisability of creation of three new standing committees. Without objection, Mr. Collett named Messrs. Key and Roberts as the other committee members.

76) On motion of Mr. Collett, unanimously VOTED that there is hereby appropriated from the surplus of the League, as of this date, the sum of two hundred fifty dollars (\$250) for the purpose of defraying the expenses of the Committee to study the advisability of the creation of three new Standing committees, any unexpended remainder on the date of the next annual meeting of the Board to be restored to surplus.

77) On motion of Mr. Collett, unanimously VOTED that there is hereby appropriated from the surplus of the League, as of this date, the additional sum of two hundred dollars (\$200) for the legitimate administrative expenses of the director of the Midwest Division for the calendar year 1950, any unexpended remainder at the end of the year to be restored to surplus.

78) Without objection, Mr. Collett requested that the minutes record the desire of the Midwest Division to thank the Headquarters staff of the League for another year of faithful devotion to the high ideals of the American Radio Relay League.

79) At the request of the Chair, the Secretary read to the Board a communication from Dr. Arthur W. Woods, W4GJW, of Birmingham, Alabama, suggesting the designation of an annual founder's day in memory of Hiram Percy Maxim and Kenneth B. Warner, the same to be the occasion of a special contest.

80) On motion of Mr. Brabb, unanimously VOTED that there is hereby appropriated from the surplus of the League, as of this date, the additional sum of two hundred dollars (\$200) for the legitimate administrative expenses of the

director of the Great Lakes Division for the calendar year 1950, any unexpended remainder at the end of the year to be restored to surplus.

81) With reference to the Board's action at its 1949 annual meeting directing that a request be made for the issuance of a commemorative stamp on amateur radio, the Secretary, by unanimous consent, was authorized to defer submission of such a request until an appropriate anniversary in amateur history was determined by study.

82) On the question of the sub-allocation of the proposed 21-Mc. amateur band, with unanimous approval, the Secretary was instructed to keep Directors informed on the progress of implementation of this band, in order that the Board might make its recommendations in this respect to the Federal Communications Commission at the appropriate time.

83) The Secretary reported at length on plans for the holding of a twenty-fifth anniversary congress of the International Amateur Radio Union in Paris on May 18-19-20, 1950, with particular reference to correspondence recently received from the Council of the Radio Society of Great Britain urging the League, as the Headquarters society of the Union, to send one or more representatives to the Congress. After discussion, on motion of Mr. Dosland, the following resolution was unanimously ADOPTED:

Whereas, a twenty-fifth anniversary celebration of the founding of the International Amateur Radio Union is to be held in the form of an IARU Congress in Paris on May 18-19-20, 1950, and, Whereas, the Board of Directors of the American Radio Relay League has carefully considered the invitation to send representatives to the Congress and,

Whereas, the Board of Directors of the ARRL is reluctantly obliged to decline the invitation, much to its regret, primarily because of necessary and extensive activity by its headquarters staff at this time in connection with proceedings in domestic regulatory matters, be it and it is hereby RESOLVED that the Board of Directors of the American Radio Relay League expresses its sincere regret to the host society for the Congress, the Réseau des Emetteurs Français, at the inability of the League to have representatives present in Paris for the sessions of the Congress.

84) On motion of Mr. McCargar, unanimously VOTED that the Secretary is directed to transmit the following to the R.E.F., in Paris, with the request that it be read to the IARU Congress there May 18-19-20, 1950:

On this occasion of the twenty-fifth anniversary of the International Amateur Radio Union, the Board of Directors of the American Radio Relay League extends to the assembled delegates in Paris hearty good wishes for a most successful Congress and expresses deep regrets that domestic circumstances have made it impossible for ARRL delegates to be present.

85) At the request of the Board, Secretary Budlong and Counsel Quayle B. Smith briefly addressed the meeting on the status of proceedings in Docket 9295, and gave an outline of the proceedings for the oral argument before the Commission.

86) Proceeding to the matter of consideration of Communications Department Committee recommendations, after extended discussion, without objection, the Chair stated it was the sense of the meeting that each director should read the report, and the letter from the Chairman of the Committee, and thereafter make written narrative comment thereon addressed to the Chairman of the Constitution Revision Committee, same to reach him not later than July 1. Whereupon, on motion of Mr. Doyle, unanimously VOTED that the Communications Department Committee is discharged with the thanks of the Board.

87) Proceeding now to the election of a President and Vice-President, on motion of Mr. McCargar, two-thirds

concurring, Special Rule A was SUSPENDED. The Chair then APPOINTED Messrs. Hill and Matejka as tellers.

88) Nominations for President being in order, Mr. Reid nominated Mr. Bailey. Mr. Johnston nominated Mr. Groves, but Mr. Groves withdrew his name as candidate. Mr. Doyle nominated Mr. Dosland. Mr. Johnston nominated Mr. Canfield, but Mr. Canfield withdrew his name as candidate. Whereupon, on motion of Mr. Griggs, unanimously VOTED that the nominations are closed.

89) The vote having been taken, the result of the ballot was announced by the tellers as follows:

Whole number of votes cast	18
Necessary for election	10
For Mr. Bailey	9
For Mr. Dosland	9

Neither candidate having received a majority, a second ballot was ordered, the result of which was announced as the same as the first ballot; thereupon succeeding ballots to the number of 12 were ordered, the result in every case being as in the first ballot. During the course of the above, following the eleventh ballot, the Board was in recess from 1:51 p.m. until 3:28 p.m.

90) By unanimous consent, the Board proceeded to the election of a Vice-President. Mr. Canfield nominated Mr. Groves. Mr. Johnston nominated Mr. McCargar. The vote having been taken, the result of the ballot was announced by the tellers as follows:

Whole number of votes cast	18
Necessary for election	10
For Mr. Groves	9
For McCargar	9

91) Moved, by Mr. Hughes, that the Board do now adjourn. The yeas and nays being ordered upon request, the motion was rejected, 1 vote in favor to 15 votes opposed. Mr. Hughes voted in the affirmative and every other director voted opposed except the President and Vice-President, who abstained.

92) The Board recessed for luncheon at 3:38 p.m., re-assembling at 5:05 p.m., with all directors and other persons hereinbefore mentioned in attendance except Messrs. Grammer and Milius.

93) No candidate for Vice-President having received a majority, a second ballot was ordered, but upon representation by Mr. Brabb that his ballot had been erroneously marked was, unanimous consent being given, declared invalid. Thereupon a third ballot was ordered, the result of which was announced as follows:

Whole number of votes cast	18
Necessary for election	10
For Mr. Groves	10
For Mr. McCargar	8

Mr. Groves, having received the majority of the votes cast, was thereupon declared by the tellers to be elected Vice-President of the League for a term of two years. (Applause)

94) On motion of Mr. Canfield, unanimously VOTED to proceed now to further balloting for President. A thirteenth ballot was thereupon ordered, the result of which was announced as follows:

Whole number of votes cast	18
Necessary for election	10
For Mr. Bailey	9
For Mr. Dosland	9

At this point, with the consent of his nominator, Mr. Dosland withdrew his name as a candidate and, on his motion, the Secretary was unanimously ordered to cast a deciding ballot for Mr. Bailey. Which done, Mr. Bailey was declared re-elected for a two-year term. Mr. Bailey spoke briefly in appreciation to Mr. Dosland and the Board.

95) On motion of Mr. Collett, unanimously VOTED that the Director of the Midwest Division is indicated in the minutes as having voted for the candidate who in the inter-

(Continued on page 100)

More Effective Speech Amplification

An All-Triode Circuit with A.G.C. and Shaped Frequency Response

BY T. W. SWAFFORD, JR.,* WSHGU

IN ANY amateur a.m. rig it is always desirable to obtain maximum efficiency, yet few of us seriously consider the actual requirements of a good speech amplifier. The requirements for efficient transmission of complex speech differ widely from those for high-fidelity sound. The important factor is the optimum employment of available audio power.

An examination of known facts pertaining to speech energy *versus* frequency will show the lower-frequency vowels contain more energy than higher-frequency consonant sounds, yet contribute very little to intelligibility. Again, sounds

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whose frequencies are above the intelligibility range improve fidelity but at the expense of broad sidebands. When we consider selective-fading distortion and interference, as well as receiver selectivity, it hardly appears justifiable to pass any more highs than actually are required for the transmission of speech intelligibility.

In view of the above, it can be concluded that excessive low frequencies contribute to over-modulation for a given level of intelligible frequencies whereas excessive highs increase sidebands with no apparent increase in intelligibility.

It is not possible to determine analytically the distribution of frequency components in speech of

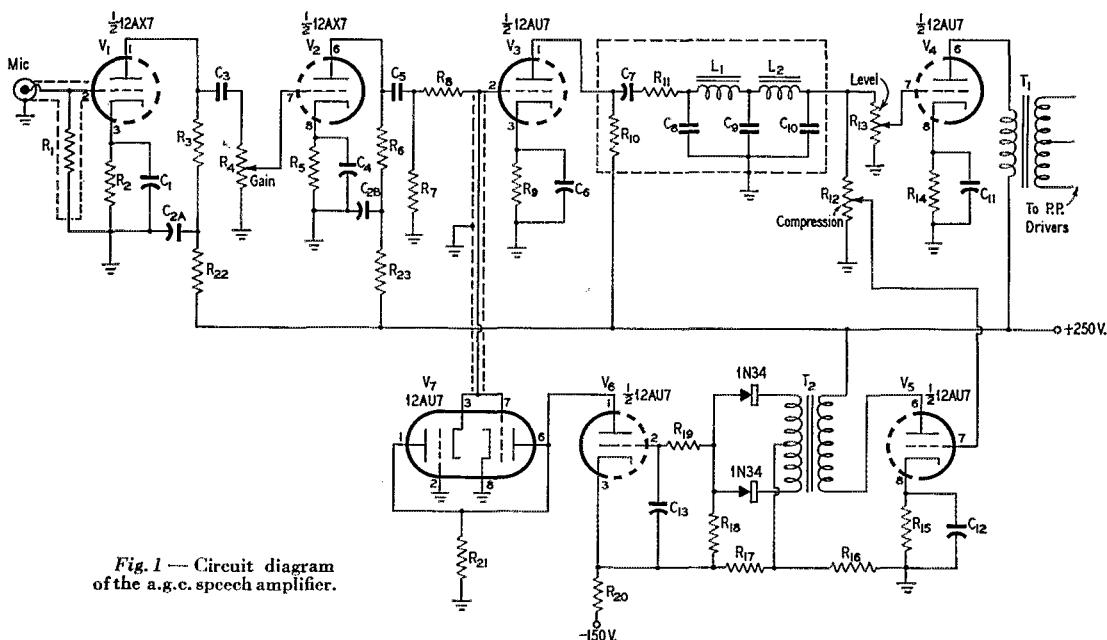


Fig. 1 — Circuit diagram of the a.g.c. speech amplifier.

- C₁, C₄ — 50- μ fd. electrolytic, 6 volts.
- C₂ — Dual 10- μ fd. electrolytic, 450 volts.
- C₃, C₅ — 0.002- μ fd. mica.
- C₆, C₁₁, C₁₂ — 25- μ fd. electrolytic, 25 volts.
- C₇ — 0.01- μ fd. paper, 600 volts.
- C₈, C₉, C₁₀ — 0.001- μ fd. mica.
- C₁₃ — 0.25- μ fd. paper, 600 volts.
- R₁, R₁₉, R₂₁ — 1 megohm, $\frac{1}{2}$ watt.
- R₂, R₅ — 3000 ohms, $\frac{1}{2}$ watt.
- R₃, R₆ — 0.22 megohm, $\frac{1}{2}$ watt.
- R₄, R₁₂, R₁₃ — 0.5-megohm potentiometer.
- R₇ — 0.51 megohm, $\frac{1}{2}$ watt.

- R₈ — 1.5 megohms, $\frac{1}{2}$ watt.
- R₉ — 2200 ohms, $\frac{1}{2}$ watt.
- R₁₀ — 47,000 ohms, $\frac{1}{2}$ watt.
- R₁₁ — 0.27 megohm, $\frac{1}{2}$ watt.
- R₁₄, R₁₅ — 1500 ohms, $\frac{1}{2}$ watt.
- R₁₆ — 0.16 megohm, $\frac{1}{2}$ watt.
- R₁₇ — 3600 ohms, $\frac{1}{2}$ watt.
- R₁₈ — 0.1 megohm, $\frac{1}{2}$ watt.
- R₂₀, R₂₂, R₂₃ — 22,000 ohms, $\frac{1}{2}$ watt.
- L₁, L₂ — 50 henrys, 1 ma.
- T₁, T₂ — Audio transformer, single plate to push-pull grids.

various humans. However, statistics show a band of approximately 300 to 3000 cycles is all that is required for intelligibility when speaking modern languages.

There are many devices and circuits available to increase the average percentage of modulation, but not all of them are entirely suitable from a ham's viewpoint. The most common are automatic gain control (volume compression or expansion) in which gain reduction or expansion is delayed in time, and simultaneous compression, or clipping.

When a clipper alone is used in the speech signal channel the original wave is altered in that the output signal has a flatter top. In other words, clipping introduces distortion; in fact, with very deep clipping the signal may approach a rectangular shape. This implies that a clipper must be limited to a small part of the signal range, probably 6-8 db., if the quality is not to be impaired.¹

In view of the above, it would appear that a device whose gain is controlled with respect to time is required to obtain a higher average percentage of modulation without distortion. This would be true if we were dealing with gradual amplitude changes of steady-state signals but, unfortunately, speech is complex in both amplitude and frequency. Therefore, it is conceivable that the finite attack time of an a.g.c. system is insufficient to prevent speech transients from seeing full gain, thus requiring a lower average level to prevent overmodulation. Moreover, the recovery time would reduce the gain for following consonants, thus penalizing the intelligible energy. It is not the intent of the writer to evaluate both systems to the extent that concrete evidence could be shown where one system is superior over the other, but rather to point out that either system is a compromise.

It has been stated above that most of the speech energy is in the lower frequencies and hence these frequencies will contribute largely to the triggering of any gain-reduction device. Therefore, by filtering out the frequencies below 300 cycles a principal objection to the a.g.c. circuit can be overcome. Also, by developing a talking technique in which long pauses are avoided, overmodulation caused by transients can be greatly reduced. Additionally, the use of a low-pass filter will prevent the high frequencies not needed for intelligibility from creating excessive sidebands. Based on these factors, the writer set out to design a speech amplifier containing a.g.c. and appropriate filters. The filters alone improve the modulation capability by some 3 db.

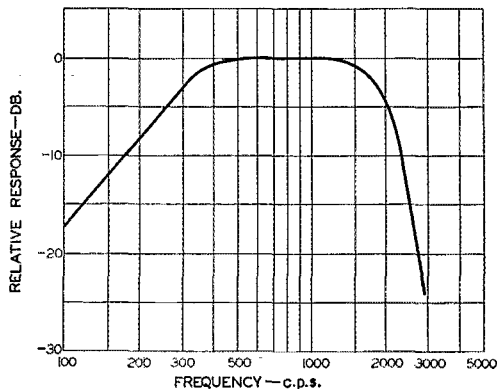


Fig. 2 — Over-all frequency response of the amplifier.

The Practical Circuit

It was decided the amplifier was to contain all triodes of the 9-pin miniature series, for compactness and because they lend themselves to modern circuit technique. An examination of the 12AX7 characteristics showed that this tube seemed to fill the bill for high- μ applications and the 12AU7 is a natural for the remainder. Our main problem was in the selection of a suitable lossier circuit of the unbalanced type that could be controlled from an unbalanced source. Many lossers were tried, such as balanced triodes in a bridge arrangement and balanced diodes with small balanced biases, but the circuit in Fig. 1 appeared to fulfill the requirements best and is the essence of simplicity. The 12AU7 compressor tube, V_7 , is especially selected to produce a high shunt resistance from grid to cathode of V_3 with approximately -120 v. d.c. "repeller" voltage on the plates, and to act as a nonlinear shunt resistor when the repeller voltage is varied between 0 and -120 volts. Variation of this shunt resistance, in conjunction with R_s , regulates the amplitude of the signal applied to V_3 . The tube used at V_7 must be selected for stability because random electron radiation from the filament frequently produces objectionable noise.

The speech-amplifier section is conventional with the exception of the $R-C$ coupling circuits and the low-pass filter. The coupling networks of the first two stages discriminate against low frequencies at a rate that approaches 12 db. per octave, with the 3-db.-down point near 300 cycles. The low-pass filter is a simple two-section full pi with an impedance of approximately 300,000 ohms. Fig. 2 shows the over-all frequency response. It should be noted that the filters used here were made from junkbox parts and the constants need not be copied exactly. Similar filters with better characteristics are available commercially.

(Continued on page 100)

¹ It has been shown that as much as 25 db. of clipping can be used without loss of intelligibility in connected speech. The point is discussed in an article by W. W. Smith, "Pre-modulation Speech Clipping and Filtering," *QST*, February, 1946. The figure of 6-8 db. represents the point at which a change in speech quality becomes noticeable. — Ed.



The World Above 50 Mc.

CONDUCTED BY E. P. TILTON,* W1HDQ

If you are a regular on 6 or 2, just skip over these introductory words; they are not for you. Instead, we want to talk a bit with those who have recently taken up v.h.f. operation, or are considering doing so. Perhaps you had your first taste of 6 or 2 in the June V.H.F. Party. Or you have a handswitching converter, bought primarily for 10-meter work, and have heard enough on 6 or 2 to excite your curiosity. Maybe you're located miles from the nearest other ham, and think of the v.h.f. bands solely for their DX possibilities, to be used during the summer and ignored the rest of the year.

However you came to be interested in v.h.f. work, you'll be having fun for the next few months. If you are working on 50 Mc. the chances are you'll be up to at least thirty states worked before July ends. If you're concentrating on 2, and doing a good job of it, you will catch enough tropospheric openings to keep your interest at fever pitch during the summer and early fall months.

But what about the rest of the year, and what about the nights right now when the v.h.f. bands *aren't* open? Wouldn't this be as good a time as any to be laying the groundwork for year-round v.h.f. operation? DX work on any band is fine; it is by applying all our energy to the working of some unusual distance or catching another hard-to-get state that real v.h.f. enthusiasts get the most out of their hobby. But we should always bear in mind that DX is not a continuous and self-perpetuating phenomenon on the v.h.f. bands in the way that it is on lower frequencies.

DX is possible on the v.h.f. bands only because some hardy souls make a business of getting on the air regularly, regardless of whether an opening appears imminent or not. None of us knows enough about v.h.f. propagation so that he can be sure of guessing right about conditions all the time, and none of us can tell when conditions are right in a given direction unless somebody over there is on the air.

The fellow who spins the dial of his converter night after night without making a sound until somebody flushes out some DX is just not holding up his end of the game. Such a technique is OK on lower frequencies; in fact it is to be recommended, in view of the overcrowded condition of most of our lower bands. But in v.h.f. work we need to

cultivate the habit of transmitting regularly, whether we hear anything going on or not. Who can say how many prospective converts we may have lost when they have tuned 6 or 2 a few times without hearing a signal?

We all need to use our transmitters more, making a practice of turning the beam in *all* directions and making calls, even if we haven't heard of any activity along some of those bearings. One of the most effective ways to develop interest is to make a schedule with a station near the edge of the reliable working radius. Keep the schedule religiously, and before long you'll often find that there are three or four other stations in that direction who will be calling you when you finish. When a fellow is heard calling CQ give him a call, even if he is in the next town; he may be trying to stir things up, too.

Organize all the fellows you know of to cooperate in maintaining a v.h.f. night at least once a week. Stick to it, and let the word get around through clubs and in contacts on other bands about such schedules. The very nature of v.h.f. operation makes it a cooperative proposition. Let's all work together to the end that every occupant of the v.h.f. bands gets more out of his investment in time, money and effort. Activity is *made* on the v.h.f. bands; it doesn't just happen. Are you doing your part? Next year's DX season will be more fun if we all work for more v.h.f. occupancy during and after this one.

May Highlights

Though there were fairly frequent openings on 50 Mc. during May the month was not equal to May, 1949, by a wide margin. Last year was extraordinary, and this month was perhaps somewhat below average in number and quality of skip openings. There were only brief flashes of double hop, and little or no transcontinental DX. This is probably more normal than last year's wide-open sessions during May, and it is probable that the double-hop sessions will develop in June and July, as they have in years gone by.

What the month lacked in E_s qualities it made up in tropospheric bending, and both 50 and 144 Mc. reached nearly peak form in this department. This favorable propagation made itself felt on 420, too, and the increased use of this assignment made it possible for new paths to be broken down in at least two areas. The fellow who

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

handles the ionospheric disturbances got his seasons mixed, sending us an aurora on the 27th, rewarding the after-midnight oil burners with fine 50-Mc. c.w. session the early morning of the 28th.

The first Mississippi-Texas 144-Mc. QSO was made on May 1st, when W5JTI, Jackson, Miss., and W5VY, San Antonio, Texas, got together. This 550-mile QSO just had to happen eventually — both stations are running high power (750 watts at W5VY, 500 at W5JTI) and big beams. Such what-it-takes was also an important factor in the first Texas-Tennessee 144-Mc. QSO, made by W5CVW, Fort Worth, Texas, and W4HHK, Collierville, Tenn., on May 22nd. Both these fellows are running 400 watts to 4-65As. The distance is about 450 miles. If a new record is to be set on 144 Mc. this season, here are some candidates to watch. How about a similar station in Florida? There is a DX haul just waiting for the right W4 to put up a good horizontal beam, get set with a good receiver and plenty of power, and then camp on the 2-meter band for the right moment!

In the more northerly part of the country the tropospheric bending season was not yet in full swing, but the operating ranges almost everywhere were stretching out well beyond the winter minimum. Expeditions to mountain locations were being planned in California, with the object of conquering the 2-meter states-worked limitation imposed on W6s by the geography of the Southwest. Along the Atlantic Seaboard, the W4s were showing up in W1 and W2 again, W1-W4 contacts being reported almost nightly in the last evenings of May.

50-Mc. TVI Tips

A properly-designed 50-Mc. transmitter, treated for harmonic radiation in accordance with principles that have been detailed in *QST* and *The Radio Amateur's Handbook*, should cause no TVI, except possibly in Channel 2. Even here the TVI, if any, is a receiver fault, though pointing this out to your neighbor won't help much in keeping the peace. A number of TV receivers now being sold will not respond appreciably to 50-Mc. signals when tuned to Channel 3 or higher, except in cases where the TV antenna and the 50-Mc. beam are in very close proximity. When interference does show up it is usually a matter of fundamental overload, and as such it is readily taken care of.

Until recently it was safe to assume that if the interference was confined to the audio, and was not tunable, that audio-circuit rectification was responsible. This is the familiar trouble that v.h.f. men have encountered in midget receivers, public address systems, and the like for years, and it usually shows up only in very near-by receivers. The cure is the same in the case of TV sets: an isolating resistor and/or r.f. by-pass condenser at the offending grid. Now, however, at least one large manufacturer is using a 45-Mc. i.f. in his sets, and these are wide open to 50-Mc. interference as a result. Again, this is usually an audio proposition, except in severe cases, where the picture may also be affected to the point of blacking out the screen completely. It's no matter of a neighbor next door; your conductor has two General Electric receivers that bring in his voice as loud as the TV sound — at a distance of a mile from W1HDQ!

If the interference disappears when the antenna is removed from the receiver some form of trap, stub, or high-

2-Meter Standings

Call			Call				
States	Areas	Miles	States	Areas	Miles		
W1PIV	13	5	550	W4HHK	11	5	630
W1HDQ	13	5	480	W4MKJ	10	5	475
W1BCN	12	4	500	W4JFV	9	5	830
W1CTW	12	4	500	W4OLK	9	4	500
W1REZ	11	4	—	W4ODG	9	4	500
W1JSM	10	3	—	W4JHC	8	4	500
W1GJO	10	3	—	W4OXC	8	4	470
W1JMU	9	3	—	W4AJA	8	4	—
W1OOP	9	3	—	W4NRB	8	4	—
W1QXE	9	3	—				
W1MBS	8	2	275	W5JTI	11	5	660
				W5CVW	5	2	450
W2BAV	14	5	430	W5ML	5	2	425
W2NLY	13	5	515	W5DXB	5	2	—
W2NGA	13	5	—	W5AJG	2	1	400
W2DFV	13	5	350	W5IRP	2	1	365
W2CET	12	5	405	W5FSC	2	1	250
W2WLS	12	4	—	W5JLY	1	1	1000*
W2DPB	12	5	500				
W2QNZ	11	5	—	W6ZEM/6	1	1	415
W2NPI	11	5	500				
W2PJA	10	4	—	W8UKS	18	7	720
W2PLX	9	4	—	W8WJC	18	7	700
W2WGH	9	4	—	W8BFO	15	6	600
W2BNX	7	4	300	W8WSE	14	6	620
W2FHI	7	3	—	W8WRN	13	5	—
W2RPO	5	4	—	W8CYE	12	6	—
W2UTH	5	4	—	W8CPA	12	—	650
W2UXP	4	4	—	W8DIV	8	4	—
				W8RDZ	8	4	340
W3RIE	15	7	760	W8BKI	7	4	—
W3KBA	13	6	—				
W3OWW	13	6	600	W9FVJ	13	6	680
W3GKP	13	5	610	W9JMS	13	6	600
W3KUX	12	5	575	W9PK	10	5	—
W3PGV	12	5	—	W9GLY	10	5	525
W3KWH	11	6	—	W9OBW	8	4	—
W3BLF	10	6	—	W9NFK	8	4	410
W3KWL	10	5	—	W9GJE	6	3	—
W3GV	9	5	660	W9UIA	6	3	205
W3HB	9	5	—				
W3LMC	9	4	—	VEIQY	9	3	650
W3KWU	8	3	—	VE3AFB	8	5	520
W3VVS	7	4	430	VE3BPB	6	4	—

W4IKZ 13 5 500 * Crossband.
 W4CLY 12 5 500 Note to 2-meter operators:
 W4FJ 12 5 450 Please check these standings
 W4FBJ 11 5 — with your records and send in
 W4JDN 11 5 — your latest figures. Mileage
 listings for W6 and W7 are
 solicited.

pass filter is in order. The stub method is simplest and least expensive, and is effective in most cases where the transmitter itself is not at fault. A ham may balk at installing high-pass filters, or even traps throughout a neighborhood, but four feet of 300-ohm line costs only a few cents, and it can make a good friend out of an enemy in a hurry.

Simply connect an open-end stub across the TV set antenna terminals, with the TV array connected. It's best to start with about 50 inches, and cut the stub a quarter inch at a time until the interference disappears. Use the longest stub possible, to prevent excessive attenuation in Channel 2. On all other channels it is probable that the stub will have no visible effect on the reception. A typical installation checked here showed an attenuation of the 50-Mc. signal in excess of 40 db., with no more than 2 db. change in the receiver response on Channels 3 through 13. When trimmed for the low end of 50 Mc. it made quite a hole in

Channel 2, but even this might be permissible in strong-signal areas. Stubs just under 50 inches cured our trouble in both of the above installations.

If the neighbor is a knob-twister the stub can be cut a little short and tuned across its open end with a small variable condenser. Such tuning may help TV reception in some instances, and it gives the set owner another knob to play with.

If you have friends in the TV service business try to talk down the broadband-antenna idea for use in areas where the set owner is dependent on one channel for his entertainment. The various broadband antennas now being widely used are designed for multichannel areas. They do not usually give as good performance as stacked arrays peaked for one channel, and they are an invitation to interfering signals throughout the v.h.f. range. Just replacing a conical array with a tuned parasitic job may completely cure borderline cases of 50- or 144-Mc. TVI, and it may improve reception in one-channel locations at the same time.

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

Tucson, Ariz.—When the normal sporadic-E skip signals (usually from 700 to 1300 miles) begin to fade out the casual 50-Mc. operator takes it for granted that the opening is about over. The real enthusiast doesn't give up then, however. He knows that some of the choicest hops are worked at just such times. There may be extensions of the normal skip distance, bringing in weak signals from 1500 miles or more, in the final minutes of an E-layer opening. And occasionally the fading of normal skip signals is merely a prelude to a double-hop opening. The latter was the case in the opening of May 7th, when W7FGG worked W9JMS, W9ZHL, W0INI, W4FLW, W0ZJB, and W9QUV, all normal E_s contacts, before raising W3JVI, Dundalk, Md., a typical double-hop distance. W2FHJ, W3MXW, and W1HDQ were heard, the last being logged just as the last signals were dropping out.

Fort Lauderdale, Fla.—Between January and May W4FNR had worked nine South Americans, but no Ws outside of local. Comes the first May opening, and still no Ws — his list for the opening session including seven VE3s. He's been making up since, however, as W1, 2, 3, 4, 8, and 9 can testify.

Winthrop, Mass.—A lot of tears are being shed over the state of the 50-Mc. band these days. "Nobody on any more — sounds like 2400 Mc." "TVI has knocked 6 out." Such remarks are commonplace, but are they representative of the true facts? Certainly not in the case of New England, where 50-Mc. occupancy is at least as high as ever; possibly higher. Take a look at the log of W1DJ. Starting a new log-book recently, Arthur took the occasion to check back over his work in 1950. Up to May 23rd the record showed 950 QSOs on 6 in 1950! How many readers can match that on any band?

Wiesbaden, Germany—A good propagation marker is now available for European 144-Mc. operators in the form of Radio Frankfurt on 97-Mc. f.m., according to DL4CK. This station atop the Grosser Feldberg broadcasts regularly in German, and should be a good indication of tropospheric bending for Gs and other amateurs who can monitor this frequency.

DL4XS has relocated his station in a salvaged SCR-399 shelter atop the Hohen Wurtzel, highest spot near Wiesbaden, and is straining for the first sign of DX from the G and PAØ direction. He is on 144.4 Mc. Tests have been run with Swiss stations by DL4CK and DL4XS, but the DX in that direction to date is DL1DA in Stuttgart, about 100 miles. Much listening and transmitting in the direction of England has yet to produce results, though English-speaking voice has been heard on two occasions. Operators in Western Europe are asked to turn their antennas in the direction of Wiesbaden, as DL4CK can show his log to prove that there are 27 stations now on 144 Mc. in that area.

Columbus, Ohio—The 2-meter DX season opened for W8WRN on the night of May 6th, with stations along a narrow north-south strip from St. Louis, Mo., to Terra



Standings as of May 25th

W0ZJB	48	W5AJG	47	W8QYD	44
W0BJV	48	W5VY	47	W8CMS	39
W3CJS	48	W5JTI	44	W8NQD	39
W9ZHB	48	W5JLY	43	W8YLS	38
W6WNN	48	W5ML	42	W8WSE	36
		W5VV	32	W8LBH	36
W1CLS	45	W5ONS	41		
W1CGY	44	W5FSC	41	W9HGE	47
W1LLL	43	W5GNQ	41	W9ZHL	47
W1HDQ	42	W5JME	41	W9PK	47
W1KHL	41	W5HLD	40	W9ALU	46
W1LSN	41	W5FRD	38	W9JMS	45
W1HMS	39	W5DXB	35	W9QKM	45
W1GJO	37			W9RQM	44
W1RIO	37	W6UXN	47	W9UIA	43
W1RO	36	W6OVK	40	W9TNS	42
W1ELP	36	W6IWS	40		
W1DJ	36	W6ANN	38	W0USI	47
W1JLK	35	W6BPT	36	W0QIN	47
		W6AMD	35	W0DZM	47
W2RLV	45	W6NAW	35	W0NFM	47
W2BYM	42			W0INI	47
W2LDZ	40	W7HEA	47	W0KYF	44
W2AMJ	38	W7BQX	45	W0JHS	43
W2QVH	37	W7DYD	45	W0PKD	43
		W7ERA	43	W0TKX	43
W3OJU	44	W7JRG	40	W0SVY	42
W3OR	35	W7BOC	40	W0HXY	41
W3JVI	35	W7JPA	40	W0TPI	39
		W7FIV	40		
W4FBH	45	W7CAM	40	VE3ANY	38
W4EQM	44	W7KFM	40	VE1QZ	32
W4QN	43	W7FDJ	36	VE1QY	28
W4FVH	42	W7EFE	35	VE3AET	27
W4GY	40	W7KAD	35	HC2OT	26
W4EQR	40			VE4GQ	20
W4CPZ	39			XE1CE	19
W4DRZ	38			XE2C	14
W4MS	38			XE1QE	10

Calls in bold face are holders of special 50-Mc. WAS certificates, listed in order of the award numbers. Others are based on unverified reports. If you have 35 or more states worked on 50 Mc. send in a list for inclusion in this section.

Alta, W. Va., coming through. An interesting feature of this session was the appearance of the stations in southern Illinois before the nearer Indiana stations were audible. At their best the stations around Indianapolis were weaker and subject to more fading than the Illinois boys. W0BJL, St. Louis, reached his peak around 12:30 A.M. Best DX known to have been worked was by W8EP, Terra Alta, W. Va., who worked into Missouri, a long haul for this early in the season. W4MEJ, Louisville, Ky., worked five states and heard six during this one.

As often happens, the following morning was the occasion of one of the best sporadic-E openings of the 50-Mc. season to date, netting W8WRN his first 50-Mc. DX contacts, and providing the first major E_s workout for a large part of the country.

Oil City, La.—Things are humming on 144 Mc. in northern Louisiana these days according to W5ML, who says that almost everyone now has at least three states worked. Aiding in this is the presence of W5MLJC, Tex-

arkana, Ark., on 2. W5MWW, New Boston, Texas, is situated atop the highest elevation in the region, and reported to have heard W8BFQ, Everett, Ohio. This is record material, should they pull off a two-way. W5DXB, Vivian, La., and W5ML work W5JTI, Jackson, Miss., regularly at 8 p.m. This is well over 200 miles.

Los Angeles, Calif.—Who holds the record for 144-Mc. mobile DX? W6NVK writes that W6BBY/6 recently worked into San Diego while in motion between Ventura and Santa Barbara, a distance of about 160 miles.

Tucson, Ariz.—In order to promote work between Tucson and Phoenix on 144 Mc. skeds are maintained on Tuesday, Friday and Sunday nights. Presently active are W7s MIV, MIW, KWO, LFX, LLO, and FGG, with more coming up. Tests are also being conducted over this path on 420 Mc., so far without result. Don't give up, gang — remember that hop took some doing on 56 and 112 Mc. back in 1939-41, when W6OVK and W6QLZ first demonstrated that it could be managed on v.h.f.

Teaneck, N. J.—Lest anyone get the impression that 220 Mc. is not being used these days, W2DZA wants it known that he and several other stations in Northern New Jersey are testing with W1CTW, Arlington, Mass., every Sunday at 8 p.m. Stations along this path are invited to take part.

Another fellow reporting 220-Mc. progress this month is W8WRN, Columbus, Ohio. Ken has his converter going and is running crossband checks with W8WM. A transmitter is nearing readiness.

Work over the W4HHK - W5NYH circuit, reported last month, has been suspended because of the latter's illness.

The World Above 420 Mc.

During May your conductor made a trip around through Western New York and Pennsylvania for a series of club meetings and hamfests. Techniques for 420 Mc. were the principal subject of discussion in these sessions, and we found interest high at every stop. For the first time we found fellows at each meeting who were already in business on 420, and there were many others in various stages of getting ready. The interest is there and in many areas it awaits only a little coordination to get things started. This is a natural field for cooperative effort such as can be organized through radio club activity. Has your club had a 420 night recently?

With the coming of warm weather some nice long-haul work is being done on 420, and more is expected as the use of the band increases and techniques improve. The first 420-Mc. work across Lake Ontario came about on May 15th, when VE3DAN, Toronto, and W2ORI, Lockport, N. Y., worked two-way. This is about 50 miles. Tests had been made many times over this path previously without results, though communication was solid on 144 Mc. Then VE3DAN raised his 420-Mc. antenna, a corner-reflector job, a few feet to clear the top of a school building just across the street. The first try with the higher antenna netted reception of W2RPO, North Tonawanda, N. Y., followed by W2ORI.

Tests with the transmitter at VE3DAN, a 6J6 job from an APS-13, brought no results, so he jacked the antenna up another few feet and tried again the following night, this time successfully. He uses the APS-13 receiver. The rig at W2ORI is an APQ-9 with a pair of 8012s running 58 watts input. The receiver is a BC-788 used as a converter, feeding a BC-923A. The antenna is also a corner-reflector job. Other stations on 420 in the Buffalo area include W2s RPO, UHI, QAG, KZ, and IRU.

W2PWP, Delanco, N. J., reports extensive activity on 420 in the region around Philadelphia. It hasn't reached the point of being possible to get contacts on 420 at will, but you can nearly always promote something on 420 by mentioning your desires on 144. Ernie's p.p. 8025s, APS-13 receiver, and 16-element array have netted him many contacts at distances up to 20 miles or so. W2OQX, with a pair of 316As, has worked 40 miles. W2PEN, Runnemed, N. J., and W2QED, Seabrook, work regularly over their 28-mile path. W2QED has worked W3OWW, Stewartstown, Penna., over 75 miles.

In East Orange, N. J., K2AH is running an APT-5 as an amplifier, developing 30 watts output. He has been heard by W2QED, 105 miles, and W2PEN, 75 miles. His antenna

is a 12-element array. W2PEN and W2QED both use 24-element jobs. This dope comes from W2BQK, former 50-Mc. stalwart, now a fugitive from Channel 2. Stan is finding more business to be done on 420 right along, with distances and signals reminiscent of early days on 56 Mc. Receiving at W2BQK is helped along by a two-stage light-house r.f. amplifier, using trough-line tank circuits. This recent addition really makes 420 come to life!

From Washington, D. C., W3PZ reports consistent work for over a year with W3PV. The path is only about ten miles but it is obscured by two large intervening hills and is thickly screened by foliage. Using much-revamped BC-788s, the signal over this path is readable only when helical antennas are used at both ends of the path. Replacing one of these with an indoor dipole, the low-powered signal is no longer readable. W3PZ has a ring oscillator with four 15Es, capable of inputs up to 300 watts. With a variable power control on this high-powered rig, it has been determined that a difference of 19.5 db. exists between the helix and the dipole. This points up the fact that the helix should be a good antenna system for use on relatively-short but indirect paths, where polarization shift is likely to be considerable. Its ability to accept any polarization may permit it to do outstanding work in such situations. More practical data on results with circular polarization are needed. Have you tried it yet?

Preliminary Report, June V.H.F. Party

Though only Eastern logs are in following the V.H.F. Party of June 3rd and 4th as we go to press, enough are on hand so that some of the pattern begins to show.

Once again, even in the magic month of June, we managed to pick a week end when there was little help to be had in the form of favorable propagation. Reports from 50-Mc. contestants in Ohio, Indiana, and Illinois show a break-through to Texas near the start of the contest, and another to Texas and Oklahoma Sunday morning.

Favorite high spots all over the country were put to good use. As in last fall's contest, W3CJB/8 was in business in West Virginia. W1DEO/1, Mt. Agamenticus, Maine, gave scores of stations that otherwise rare state. W1FZ/1, Blue Job Mountain, and W1MHL/1 on Pack Monadnock did the same for New Hampshire. W3QFM/3, 60 miles southeast of Pittsburgh, worked as far east as W2NLY on 144 Mc., and W3GZX/3, Tuscarora Summit, Penna., was doing right well.

The higher bands were getting their share of attention. W2IQQ/2, N. Caldwell, N. J., worked four sections on 220 Mc. and two on 420, as well as piling up over 100 contacts on 50 and 144 Mc. W2ORI, Lockport, N. Y., made two VE3 contacts on 420, across Lake Erie to the Toronto area, some 50 miles distant.

It was a fine party — final results next month. Next V.H.F. Contest Sept. 23rd and 24th.



Hints and Kinks

For the Experimenter



COMBINED CLEAT AND COUNTERWEIGHT FOR ANTENNAS

SHOWN in Fig. 1 is a neat and inexpensive way to accomplish a favorite antenna protective stunt, namely the use of a counterweight to keep the flat top flat yet with sufficient "give" to

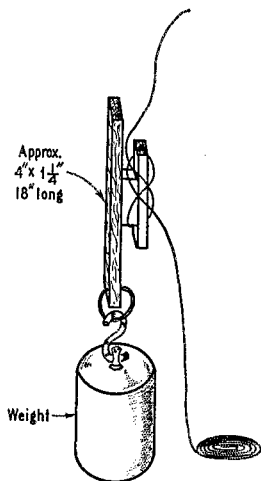


Fig. 1 — A neat arrangement for using a counterweight to keep the antenna halyards snug.

avoid breaking under sudden strains. In the usual installation, the counterweight is merely tied on the end of the halyard. Then, when it becomes desirable to lower the antenna for any purpose, the weight must be removed before the halyard can be released. The combined weight-and-cleat arrangement illustrated makes the operation a lot easier and eliminates fussing with weathered knots that usually have to be pried apart or cut before they'll come loose. — *H. H. Lippincott, W2DH*

NONSKID BUG MOUNTING

IF you are bothered by having your bug "walk" across the operating table during each transmission, your problem can be solved simply and inexpensively by placing a piece of Life Guard Cushion Rug Holder beneath it. This material, which is designed expressly to prevent small throw rugs from slipping on waxed floors, is obtainable at hardware and rug stores. It won't mar the operating table, and requires no permanent attachment. Just cut a sheet the size of the base of your bug, place the bug on it, and try to budge it. It even works on surfaces as slippery as glass.

— *C. Vernon Chambers, W1JEQ*

CRYSTAL CALIBRATOR AND R.F. INDICATOR

NEEDING something in a hurry to replace a smashed neon bulb as an r.f. indicator, I connected a 1N34 crystal diode across a 0-1 milliammeter as shown at A in Fig. 2. With the addition of a six-inch length of wire as a probe, the gadget can be used for numerous applications. The positive side of the crystal diode must be connected to the negative terminal of the meter or the meter will read backwards. In addition the probe wire must be connected to the negative terminal of the meter or it won't work. Keeping the probe lead short is desirable to eliminate indications from stray r.f. in the shack.

This gadget works like a charm, and is much more sensitive than the neon bulb. It was first used to indicate proper adjustment of the antenna tuner. In this application the probe wire was placed parallel to one of the feeders and adjustments made to produce maximum deflection of the meter. It has also been found useful as a neutralizing indicator. Merely place the probe near the tank circuit of the amplifier and adjust the neutralizing condensers for minimum indication. Other uses are the detection of r.f. on power lines, in low-level speech amplifier stages, and in checking for parasitic oscillations.

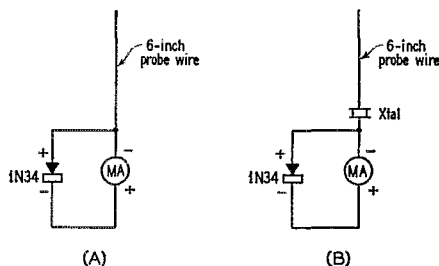


Fig. 2 — Simple r.f. indicator that has numerous uses in the ham shack. The arrangement shown in A is useful for checking for r.f. in power lines, etc., and that of B for obtaining crystal check points for VFO calibration.

By connecting a transmitting crystal as shown at B in Fig. 2, this gadget can be used to obtain highly-accurate spot-frequency check points for calibration of a VFO dial. Place the probe wire close to the transmitter, and tune the VFO across its range. When the VFO is tuned to the crystal frequency, the meter will show it. Used in this application, the gadget is extremely fre-

quency-sensitive, and it is possible to set a VFO to within a few cycles of the crystal frequency. Thus, the gadget can be used in place of a more elaborate band-edge marker.

For something which can be "assembled" in a matter of minutes, this little indicator is hard to beat. — *W. E. Bradley, W1FVH*

BANDSPREAD FOR THE VFX-680

OWNERS of the Sonar VFX-680 exciter and n.f.m. modulator may add much-needed bandspread simply and inexpensively by attaching the grid-tuner vernier drive unit from one of the tuning units for the BC-375, available in war surplus. No modification of the exciter is required.

Make up a "U"-shaped bracket $1\frac{7}{8}$ inches long and fasten one end under the cap screw at the lower right end of the exciter panel; the other end matches an existing tapped hole on the vernier and the shafts are then joined by a standard $\frac{5}{8}$ -inch-long coupler for $\frac{1}{4}$ -inch shafts. Attachment or removal requires only a few minutes. A chart may then be prepared showing the frequencies at various dial settings across several hundred easily-read dial divisions (200 for the 14-Mc. band) with excellent reset accuracy and minimum back-lash. — *Fred W. Kinsey, W9DOQ*

TAPPING SMALL COILS

FREQUENTLY it is necessary to tap a self-supporting coil which is wound with closely-spaced turns of wire. Anyone who has attempted this stunt appreciates how easy it is to short out several turns of the winding while attempting to make contact with a single turn. Connections made with either clips or solder can be handled easily and neatly if alternate turns of the winding are forced down toward the center of the coil by means of a narrow blunt instrument. Ordinarily, coils which require this treatment are ones used at reasonably low frequencies (3.5 and 7 Mc.) and, at these frequencies, neither the Q nor the inductance of the coils appears to be affected by the disfiguration. — *C. Vernon Chambers, W1JEQ*

IMPROVED KEYING FOR THE GF-11 TRANSMITTER

AFTER trying numerous ideas to eliminate the chirps and clicks that resulted from keying the GF-11 transmitter, the following system, which was suggested by W6CX, was installed with very gratifying results. Instead of the original keying system, which keyed the positive high voltage, oscillator keying in the cathode circuit of the 89 oscillator tube and cathode bias for the final amplifier were installed as shown in Fig. 3. The modifications are extremely simple, and require a minimum of digging into things and time. It is merely necessary to bring a couple

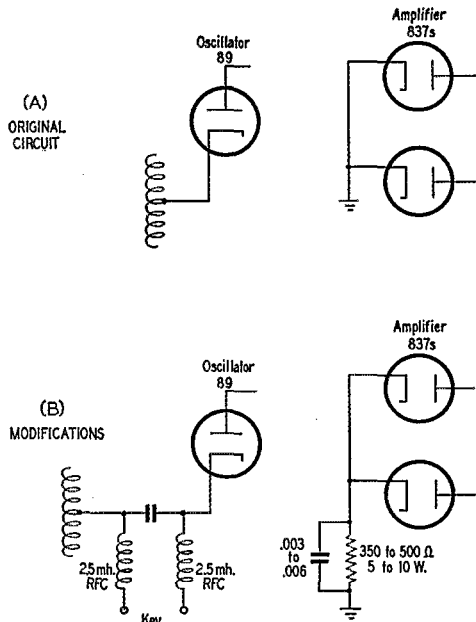


Fig. 3 — Suggested modifications of the GF-11 transmitter for improved keying. Oscillator keying is installed, and cathode bias applied to the amplifier tubes.

of leads for the key out of the rear cable plug.

Chirpless keying has been obtained even without the use of regulated supply voltages. The fact that the 837 amplifier stage draws current when the key is open tends to hold the plate voltage at a nearly constant level. A choke-input filter in the power supply is recommended for best results, but satisfactory keying can still be obtained with condenser input. If greater power output is desired, the amplifier tubes can be replaced with 1625s, which permit the use of considerably higher plate voltage. — *R. W. Thornally, W6NG*

HOME BUILT AIR-DIELECTRIC COAXIAL LINES

THE CONSTRUCTION of air-dielectric coaxial lines has always been a difficult task by the old bead-and-rod method. Shown in Fig. 4 (page 102) is a method that simplifies their construction and permits them to be made with tools available in almost every ham shack.

Ordinary aluminum tubing is used for the outer conductor, and either solid rod or small-diameter tubing for the inner. The method of spacing the inner conductor from the outer is shown in the diagram. If tubing can be used for the inner conductor, it is drilled with pairs of holes spaced approximately as shown in Fig. 4A, and polystyrene-rod spacers are inserted. The

(Continued on page 102)



Correspondence From Members -

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

THE AMATEUR POSITION

Hotel 2400, 16th St., N.W., Washington, D. C.

Editor, *QST*:

Since my temporary assignment to a post in this country, and from a study of *QST* over many years, I have noticed that a fair proportion of American amateurs share views similar to those of a comparable proportion of British amateurs regarding the assessing of benefits obtainable from membership of their national amateur radio organization. The body of amateurs to which I refer is that which regards the tangible return — the receipt of *QST* (or the *R.S.G.B. Bulletin*) — as the end all for money invested.

I wonder if this body has ever thought of the invisible assets. I wonder if they have ever considered or appreciated the immense amount of toil and conscientious effort made by these oft-belittled organizations on their behalf. Having been a keen amateur for 30 years and having had associations with the international machinery responsible for frequency allocation for some years, I have seen both sides of the medal. I am of the opinion that amateurs today retain their privileges and frequency bands very largely due to the efforts made by amateur organizations to represent the amateur case to the national authorities who attend international telecommunications conferences on behalf of their administrations.

Now, unfortunately, this representation is not uniform, for there are many countries, particularly in Europe, which would either remove certain amateur h.f. allocations in toto or reduce them to such an extent that their narrowness would result in unusability. This is understandable for it is a logical argument that the amateur contributes nothing to the national economy in those countries while technical contributions resulting from their activities in the h.f. spectrum are now little or nothing.

America is now the leading world power. It follows that the American view, as tabled at the next international radio conference, will have power and weight behind it, and it occurs to me that if that view is to embody the correct amount of amateur content, it must be represented by an organization which has the confidence and weight of every single amateur behind it.

I indite this epistle to you, Sir, because I am resident in your hospitable country, but I feel that it would be equally relevant were I to have written it to the Editor of the journal of the Radio Society of Great Britain or the Ruritanian Amateur Transmitting Society. I write it because I consider that every amateur, if he proposes to continue in his hobby, should assist to his maximum those who have his interests as their responsibility.

— E. S. Cole, G2BC

REAL HAM SPIRIT

Mission San Juan Capistrano, San Juan
Capistrano, Calif.

Editor, *QST*:

Two years ago I read my first copy of *QST*. To that first reading I owe my obtaining my amateur radio operator's license, which arrived on April 22nd. Many thanks to the staff and members of the ARRL for the spirit which makes ham radio the art it is.

The contacts that I have made with other amateurs since starting out on 40-meter c.w. have been a revelation to me of their kindness and consideration. I did not realize that the newcomer would receive such a pleasant welcome!

— Rev. Edward Roth, W6ISA

QRM

Ashton, Ill.

Editor, *QST*:

I have been led to believe that the ham organization as a whole is a bunch of friendly and loyal fellows — however, it seems there are black sheep and goats in any flock.

This is my pet peeve and I am not alone. Just why will some one deliberately tune his transmitter directly on an ARRL frequency when if he would only listen he could easily hear *QST* after 8:30 CST?

Last Tuesday evening some smart guy tuned right on top of the 7215 frequency and held it for five minutes. If they have any grievance with ARRL this is not harming ARRL. If this is their aim they certainly are shooting at the wrong birds; us guys trying to learn the code certainly get the works.

— Faust H. Boyd

AN APOLOGY

Box 80, Brule, Wis.

Editor, *QST*:

With this letter I would like to apologize to all the fellows to whom I caused interference when they were trying to copy WIAW's code-speed qualification run. I did not know of the run nor did I know that the frequency WIAW used was only one kilocycle from mine.

I had been back on the air only four days, having left the air December 7, 1941. Therefore my only excuse for this very bad breach of ham ethics is, "I didn't know of the qualification run."

— Howard N. Schmidt, W9DDD

TRAFFIC HANDLING

374 Hillside Ave., Newark 8, N. J.

Editor, *QST*:

What is traffic handling coming to when a message that has only several hundred miles to be relayed takes eight or nine days for delivery. There is only one excuse for this, and that is laziness on the part of the operator accepting the message for relay or delivery. It should be the duty of every operator accepting traffic for relay or delivery to see that this message is taken off the hook within the specified time allowed. If this cannot be done, the operator should refrain from handling the traffic at all.

Let us all get together in a spirit of coöperation and show the public that, in time of emergency or not, we can provide a public service and provide it well enough so that they can always have a good word for the ham fraternity.

— Mike Sussman, W2W0J

FIRST OR LAST?

R.D. 2, Box 328, Jeannette, Penna.

Editor, *QST*:

How is it possible for an operator to give a correct report when such a report comes first in a QSO? Remember, there's such things as QRM, QRN, and QSB. Who put the cart before the horse anyway? I'm one who believes a report on a station's signal should come last so it could be averaged over the whole QSO. I'd gladly follow such a practice if others would.

— Walter C. Downes, W3UDV

How's DX?

CONDUCTED BY ROD NEWKIRK,* W9BRD

How:

Running the usual risk of charges of abstruse sophisticated prolixity, Grade A, we exhume for discussion the old carousel entitled "CQ DX CQ DX" or, "Use Your Receiver, You Jerk." Mighty mountains have been made of this mole-hill in both written and spoken word.

Basically, recommendation No. 7 of the ARRL DX Operating Code (Communications Department Operating Aid No. 5) for W/VE amateurs reads as follows: "Listen and call the station you want. Calling CQ DX is not the best assurance that the rare DX will reply." This is general and one can't go wrong by adopting it, either in the way of retaining one's friends or insofar as the countries total is concerned.

Obviously, the prime intention of such advice is to aid in cutting reception QRM levels from a blasting bedlam down to a dull riot. Who can rightly deny that fewer hacked-up QSOs mean happier feelings all around?

Yet, as the true philosopher may attempt to point out, there is always some small good purpose or effect in the existence of anything. Truly, even Jeeves' lowly appendix may one day provide a struggling young surgeon with funds for a new set of scalpels.

It all appears to fizzle down to the fact that, given a certain amount of operating time, the average radio amateur almost invariably does one of two things. Either he transmits or he listens. Furthermore, the more he transmits the less he listens and the less he listens the more chance has a DX man with greater restraint and patience to sneak in for a good clear potshot at FV8AA or CZ1QF.

Most DX enthusiasts interested in the rare-countries angle (there's another?) concur in this preference: they'd much rather have a fellow's CQ DX interference than suffer his swiping some really juicy prefixes from them through the more intelligent use of his receiver. So they arm themselves with a little more selectivity and let him pile up his light bill undisturbed while in far-off AC4 their sentiments are aptly summed up by inscriptions on tablets of jade:

*Fanciest pasteboards on W/VE walls
Most never obtained by "you call me" calls*

* DX Editor, QST. Please mail reports of DX activity to W9BRD's home QTH: 1517 Fargo Ave., Chicago 28, Ill.

What:

VR1s A (14,106 t6), B and C (14,115-070) rated much attention the past few weeks and the fellows who reported contacts with them would fill a small logbook. VR1C has been the most prolific. W7VY added CR10AA (14,060 t6) and FB8ZZ (14,026), the latter on New Amsterdam. ZD4AB (14,043), KB6AM (14,055), KW6AP (14,005) and FK88AL (14,050) prettied up W5FXN's log while Jim has been stalking YU1CAB (14,000). A personal visit from KH6CT possibly inspired W7EYS to haul in V1AA, FN8AD, UP2KCB and ZB1AR, making 138 for Bob, and W9FKC's evening skeds with AP2N (14,128) have been running smoothly. New ones are getting tougher to find at W8SYC but EA9BB, UO5AD and UL7BS were welcomed. Clint is about to fire up some new 4-125As, too. AP5B (14,012), LZ1AB (14,023), VP2AA (14,092) in the Leewards, VS7KR (14,058), UJ8KAA (14,029), UMSKAA (14,060) and V1A were happily checked in at VO6EP and Art is up to 198 without the benefit of an AC4. W1APU, W2QHII and others are hopeful about the PX1A who advised "QSL via F3BB-REF." Howy has other less worrisome entries, though: 4X4s BX (14,001), CJ (14,032), RE (14,005), EA6AF (14,080) of the Balearics, ZB2I (14,069), KR6CA (14,001), KX6BA (14,061) — and another pixie, PX1H (14,016), who even went so far as to switch over for an A3 test. Mayhaps he needed U. S. A. for his 'phoney DXCC. W7WEN runs five watts less than W2QHH's 35 but collected OA8A (14,010), VR2BU (14,072), CR7Z (14,065), TF3ZM (14,004), FE8AB (14,030), VP8AK (14,095) and VP5AS. Things kept humming at W3QLW for EA8LP (14,128) in the Canaries, I1NU/Trieste, ZB2A (14,042), UG6s KAA (14,015), AB (14,002) and UQ2KAA (14,008) while W6DQZ lowered his non-contest WAC time to 12 hours with HB9X, W6GTE, HC8GRC, ZS5EG and an unidentified Asian. Betwixt shots at the VR1 entourage, W6EAY nailed PKs 1TM (14,007), 2ZZ (14,030), 4OO (14,040), 1HR (14,055 t8) and ZK2AA (14,120). If W6UZX and



friends have the straight pitch, and they usually do, PKs will soon be numerous enough to take over the twenty-meter band in the morning hours — whoopee! W6DZZ sloshed the sleep from his eyes for ZSSMK (14,132) and has the local gang curious as to how he can manage to work 200 countries sans a landline. Ed has had the rig on the workbench much of the time in an effort to rid the heap of Tennessee Valley Indians Two days after W6DLY reached his 200th, six feet of dural fell off the end of one of his beam elements — broken, not melted, Guy swears. Those Sixes never do things halfway. We've been told of the DXer out there who rigged things up so that he could cut out the prop-pitch rotator and switch in an Allison engine for quicker bearings. One day he looked out his office window to see his whole house whirling away toward San Pedro, the XYL never having learned not to dust the shack control panel. He expects to pass W6VFR before she gets back. Latest at W6DLY: HC8GRC, ARSAB, VR1C, ZK2AA and ZSSMK. Not greatly surprised, W8DEN had his PX1C-bound QSL returned marked "unknown" and now Syl is graying over VQ9ON The law of averages may help out W2CSO on PX1AA (14,069), PX1B (13,398) and LZ1TPI (14,006) while HC2OT (W5DNN) has fingers crossed for C8DD (14,075) who claimed Lanchow, Kansu, as his stamping grounds OH2TM (14,110) seeks South Carolina for WAS according to W4PBEK and WIBOD recommends FF8MM (14,080) after tacking up DXCC certificate No. 907 The stiff competition should have scared the screens out of W6LRU's 807s but they knocked off MD7GR (14,080), HA5BD (14,040), EA8RM (14,040), CN8ET (14,079), FK8AD (14,109), 4X4CR (14,087), SPs 1CM (14,001), 5ZPZ (14,006), UP2KBC (14,033), UR2KAA (14,082), UL7BS (14,105), VP5BF (14,024), VP8AI (14,040), VS9AL (14,075), SV0WH (14,088), ZD2DCP (14,079), ZS6DO/7 (14,018), ZS9D (14,076) and UA6SA (14,008). To nip a flock of mail queries in the bud, Stan's skywire is a 3-element rotary From the Southern California DX Club's *Bulletin* we lift FD3RG (14,055), VQ8CB (14,100), ZS7C (14,060), VK9JC (14,060), AC3SQ (14,105) and VK1YM of Macquarie (14,095) as people one should know, while the Northern California DX Club's *DXer* speaks of CR4AC (14,050), CR5AJ (14,040), VS5CA (14,010) and a ZK2GK (14,050).

With the 'phone contingent, XE1AC keeps the situation well in hand: EA8BA (14,316), HE1JJ (14,318), FM7WE (14,255), MB9BL (14,311), MD2MD (14,308), MD7WE (14,165), KG6GD/KC6 (14,187), KJ6AJ (14,279), VK9GW (14,326), VU2SW (14,305), PK1MF (14,147), PK6CS (14,157) and YO5LC (14,382) W4AZD and W4NDE fell over SP5AB smackdab in the middle of the U. S. 'phone band and Porter added VR3C, VR5GA, ZD1SS, CR4AC and VK9AB. He'd appreciate info on ways and means to get cards from VS9AH, W2EJV/PK1, CD3UB, VQ8AE and CR5UP TI2HP could use similar instructions regarding MD2AC. Humberto lists, among many juicy voicers, AP2N (14,140), EK1MD (14,310), HZs 1AB (14,198), 1KE (14,195), OE13EG (14,197), PK4DA (14,160), PK5HL (14,160), DU7AHs (14,180), TA3GVU (14,200), BZ2A (14,380), VK9AB (14,340) and 3V8BB (14,380).

It's apparently siesta time for 3.5-Mc. but HC8GRC made it 70 eighty-meter countries at W2QHH. On *forty*, Howy found TA3GVU (7002) and MD7WE (7010). That contact with 3GVU makes a five-bander now, too W7LFL pinned down VU2CL at midnight PST and also UA6s FK, FJ, FP and HC2IH, all between 7000 and 7050 kc. W3OQO captured UA0KFD and VP4TAB while W4CJS made off with VP7NN and YV5AL

A 6L6 crystal oscillator was all W8EJN needed for PY8MG, ZL1LZ, KH6ACR and several XE/CMs Shipboard SMSALF entertains the band from the Atlantic with a healthy signal and DL1FK writes of working YU1CB and UQ2KAB near the low edge According to a line from the Las Villas Radio Club the latest fad in CM6 is the working of Europe on 40 'phone through the use of 807 finals. We understand a few of the fellows down that way have 7-Mc. rotaries and, by the way they push through up here, that is not hard to believe.

There's little to jump up and down about on *ten* this time of year but XE1AC used the mike on CR4AC (28,140), CT3AV (28,306), OQ5AO (28,404), ZS3C (28,370), VQ4AC (28,210), MP4BAO (28,142) and SV0AJ (28,140) which is a good tally under any conditions TI2HP mentions ZD4AU (28,300), and DL1FK specifies FA3KC, SV5UN, ZS7B and CP4DG as having good signals on the Continent W2ZVS holds up our end with FM7WE, FF8AH, EK1s BC, RW, WX, PZ1Z, KG6IE on 1wo, VQ4ASC and ZS9D while ZKs 1BA, 2AA and CT3AV were not raised. A lone c.w. goodie was detoured by WIBOD in the person of HR1RL (28,000) W4NYX has 102 10-meter countries and is particularly interested in tracking down VP2AG for confirmation purposes.

Where:

A few listed lulus join us this month; lamp the PXs, etc. If but one of them turned out other than a ringer, however, the cause would be much worth while, wasted postage notwithstanding. While ranting on the subject, the DL1 who borrowed M1B's call for a few hand-raising CQs on 20 c.w. puts a nifty signal into VO6EP's QTH. Why not stick to convention and choose a PX call, *mein freunde!* The CM6/CO6 boys (some 86 in all) announce a QSL bureau for their district at P. O. Box 136, Santa Clara, Cuba Long an authority on matters PK, W6UZX points out that each and every PK-bound gard may be sent: P. A. R. I., P. O. Box 222, Soerabaja, Java, Republic of Indonesia You'll probably do an adroit double-take when you hit the U portion below but use of the QTHs has reportedly produced QSLs from those stations. Thus, let us not quibble.

AP5B	(QSL to W4TO)
C3WW	Box 1, Tai Pahan, Formosa
CR5AD	Box 206, Bissau, Portuguese Guinea
CR10AA	Cunha Eca, % G. P. O., Dili, Portuguese Timor
CT1CR	Apartado 527, Lisbon, Portugal
CZ1BD	Hotel Splendid, Monaco
DU1HR	(ex-KA1AI) Clark Field Amateur Radio Club, APO 74, % PM, San Francisco, Calif.
EA1BU	Augustin Folla, Calle Real, La Corunna, Spain
EA8LP	Box 175, Las Palmas, Canary Islands
FD3RG	Service Radio, Lomui Rim, French Togoland
FF8MM	P. O. Box 207, Dakar, French West Africa
HC2LF	Box 3614, Guayaquil, Ecuador
ex-KB6AL	Gus Winston, 500-36th Ave., San Francisco, Calif.
KG6IE	USCG, APO 815, % PM, San Francisco, Calif.
KL7AES	Box 967, Fairbanks, Alaska
KR6DH	Okinawa Radio Amateur League, APO 331, % PM, San Francisco, Calif.
KV4AQ	Box 147, Frederiksted, St. Croix, Virgin Islands
LU0AI	(QSL to LU9CW)



The camera lens wasn't large enough to photograph all the Finland amateur gang that attended a recent meeting and banquet in Helsinki. Here is one group replete with some of the fairer sex. (Photo courtesy W1KJO)

QST for



You could have heard two pins scratched together on 20 meters with these DX men all off the air at once. The occasion was the Vancouver 1949 Convention. *Front:* VE7HC, W6BYB; *second row:* VE7VO, VE7ZZ, W7RT; *rear:* W7DL, W7CFA.

LU0DAG	(via RCA)
LZ1TPI	Rox 830, Sofia, Bulgaria
ex-MP4BAD	Ken Smethurst, 6 Alder Lane, Hollins, Oldham, Lancashire, England
OE1RI	(via ARRL)
OE5PP	(via RSGB)
OE7AP	(via RSGB)
PK3JT	(via PARI)
PK4DA	Arie Bles, % Standard Oil Vacuum Co., Soengi Gerong, Palembang, Sumatra, Republic of Indonesia
PX1AA	M. Ramirez, Scarpia 21, Andorra
PX1B	Radio Andorra, Andorra
PX1H	Box 155, Andorra
PZ1PZ	Henry Alvarez, Cravenstr. 192, P. O. Box 739, Paramaribo, Surinam
UA3DN	Leuigradskoje Road 65, App. 147, Moscow, USSR
UA3KAH	Institute of Radio Engineering and Communications, Moscow, USSR
UA3KAQ	Radio Club, Neglinnaya 14, Moscow, USSR
UB5AZ	Raterstreet 9/14, Kiev, Ukraine, USSR
VK1PG	Box 2611W, GPO, Melbourne, Australia
VK1YM	Box 2611W, GPO, Melbourne, Australia
YK9WL	Torokina, New Guinea
ex-VQ1CUR	(QSL to G2CUR)
VQ2AB	Box 271 Lusaka, Northern Rhodesia
ex-VQ4SC	(QSL to G8SC or via RSGB)
VQ4KTF	P. O. Box 71, Kitale, Kenya, B. E. A.
VR1C	CGLPS, Unit 84, Navy 824, % FPO, San Francisco, Calif.
VR2BU	Nadi Airport, Fiji Islands
W5GAN/MM	% Atlantic Refining Co., Port Arthur, Texas
YO5LC	P. O. Box 95, Bucharest, Roumania
YU3FLA	Box 48, Belgrade, Yugoslavia
YU3FLE	Box 180, Ljubljana, Yugoslavia
ZB1BE	(via RSGB)
ZB1CH	Chas. Holmes, Hotel Point de Vue, Rabat, Malta
ZC6PM	(via W8JNF)
ZD9AC	(QSL to ZS6ND)
ZK1BC	% Radio Station, Raratonga, Cook Islands

Benefactors W1s BOD CEG DJV IKE RWS, W2s CJX CSO JBL ZVS, W5FXN, W6s AM AOR DLY DZZ UJ UZX, W7VY, W8s SYC WEN, W9s CFT KMC RBI, KH6PM, LU7CW, VE1EX, VO6EP, Northern California

DX-Club DXer, Southern California DX Club Bulletin, and P. A. Bates (no call) hope that numerous beneficiaries accrue from the preceding.

Tidbits:

W1RWS emphasizes the fact that present CR5 activity includes more than one country on the list. For instance, CR5UP counts for Principe and Sao Thome Islands whereas most of the other CR5s represent Portuguese Guinea proper JA2FM was frolicking about with 5.25 watts input when he decided to try a little QRP work. After working 1.U5AQ (near the antipodes from Tokyo) with the five-watter, Cal shrunk things to a round one-watt figure and raised VK3FH for a 569. Successive decreases to 0.18 and 0.0468 watt produced reports of 559 and 549 respectively over the 5000-mile path to Melbourne. The skywire was an old-fashioned standard doublet 15 feet high. Some fun! AC4YN, who has his troubles with arthritis and long working hours as well as DX hogs, guarantees via W7EYS that he does intend to QSL each and every contact. Meanwhile, the political situation on the Roof of the World remains unsettled enough to cause Reg much concern. Continuing on the Tibetan tangent, VE7YR inquires via W9DOQ as to the legitimacy of 20 c.w.'s AC4RN who gives AC4YN's QTH, a T8 drifting signal. And W9FKC relays an authoritative letter from the hand of AP2N which should settle all doubt as to the proper location of AC4RF. The latter has an official capacity valid only within the Tibetan frontier and should certainly know the limits of his own bailiwick. Lastly, AC4NC would have the gang informed by way of John DeMeyer that Chak is right up to snuff on QSLs for all contacts W6AM was told by LA8RB that LA4MA contacts stem from Spitzbergen which, as you know, is a fairly frilly item on the Countries List. Anyone else fixed to volunteer sentiments re Svalbard? Grenada's VP2GG in the Windwards wishes to apologize for delay in confirming contacts subsequent to the middle of November, 1949. Cards long on order failed to arrive. By now Smitty should once more be abreast of the log. VP2GG was the lone 10-meter representative of the Windward Islands for an extensive period but has been joined recently by VP2s GB and SC. This is timely assistance because one E. P. Tilton has Smitty hopped up for a greater percentage of v.h.f. activity ST2TC will QRT at the end of July for a return to his native ZC4 (MD7). "If any W fails to receive my QSL a reminder will produce it. My QTH in ZC4 will be: % Postmaster, Polis-Paphos, Cyprus." Theo's sterling reputation as a prompt and meticulous QSLer leads us to hope for more rare-country Christodoulides activity in the future, ZC4 or what have you LU7CW slips us the slant on this LU8 stuff in the Argentine. The prefix may be assigned to holders of first-class duets for mobile or fixed-portable operation from any part of the country other than the home location. LU7CW was forced to revise his long-standing policy of 100% QSL-first when only 9 Ws answered his first 24 LU8CW QSLs for contacts made mobile last year while in sight of rocky Cape Horn. As the two dozen veries were sent via bureau we have the unpleasant alternatives to believe: Either 15 out of 24 Ws do not care to answer cards or do not keep envelopes on file with their QSL managers, or both If you have not received pasteboards for QSOs with KP6AB, KP6AB/KM6, KP6AB/KH6 or KM6AP, drop a postal bearing details to William E. Fells, jr., P. O. Box 590, Hilo, Hawaii, T. H. Bill mentions the possibility of some continuing KM6 activity if the cable station personnel there get on the air. As mentioned previously, other commercial Midway installations are pulling out. KP6s AA and AC may be reached by mail through KH6MG, and KM6AH now answers to: Fred Carpenter, % CAA, Canton Island. KM6AP expects to resume activity under a KH6 cognomen Peeping over W9TRD's shoulder we learn that CR4s AC, AD, AE and AF remain quite active from the Cape Verdes; CR4AA is the short-wave b.c. station which also occasionally is given a workout at ham-band communication. The PMG at Zomba lists ZD6s EF, HJ, JL and JS as official licensees but activity in Nyassaland seems sparse. Licensees still functioning on Bahrein are MP4BAs B, D, E, K, M, P, R and S

(Continued on page 104)



Operating News



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

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

On Going Mobile. This is the time of year when the boys start polishing up the whip antenna, scraping contacts, chasing down spark-plug noise and, in general, giving the mobile rig a complete going-over. The days of hamfests, conventions, and picnics are here. The call "CQ mobile" will be heard up and down the bands throughout America.

It is pretty swell that we have the privilege of being able to operate mobile. We must be careful not to abuse this privilege. The FCC requires that an accurate log of all contacts be kept. This holds true for mobile operation as well as fixed work. At one hamfest last year prizes were given for the best installations and many would-be winners were knocked out of the scoring because of sloppy logs. Play safe and keep your log neat and up-to-date. The question often arises in mobile work as to just when a contact ends because of the fact that you pass beyond the normal range of reception. The answer to that is simple enough: when you no longer hear the other station, log him out.

Thinking along the same lines, don't forget to have your license with you when you contemplate operation away from home. Another thing: several states and cities have safety regulations governing mobile use; a number of them forbid operation by the driver of the vehicle while in motion. Such regulations should be observed when in strange territory. The important point we want to get across is to be careful when mobiling. Drivers must be alert. Unless radio operating as a passenger, one had best pull off the road in order to operate with full safety for himself and others.

Another important point: Strict compliance with FCC's 12.82(b) requires that "*when telephony is used, the call of the station shall be . . . followed by an announcement of the geographical location in which the portable or mobile station is being operated.*" The Washington Mobile Radio Club invites attention to the fact that this regulation is not being strictly observed. FCC's Example 4: "W1ABC this is (or from) W2DEF, operating portable (or mobile) three miles north of Bethesda, Md., over." 12.82(b) also provides that "*. . . a portable or mobile station using radiotelegraphy shall transmit immediately after the call of such station, the fraction-bar character (DN)*

followed by the number of the amateur call area in which the portable or mobile amateur station is then being operated. . . ."

Note that the ARRL Board of Directors recommends that all mobile amateurs be encouraged to use the frequencies between 29,600 and 29,700 kc. for mobile operation. It is requested that all other amateurs, especially fixed stations running high power, give the mobile operators a break in this particular portion of the band, and that mobile stations take advantage of using a given segment of frequencies.

Aside from the "musts" of mobile work, whether installed in a Tin Lizzie or a new Superduper Eight, mobiling is a lot of fun. There is a new world of enjoyment for the ham who hasn't tried it.

Invitation to All Mobiles. We would like to see as many mobiles as possible operative in all the frequency bands, and regardless of the frequency used each mobile ought to be registered with the nearest ARRL emergency coördinator, so it can assist in any emergency communication problem arising in that community. See your local EC to register your mobile amateur station and receive from him the AEC's identification card. (If you lack his address, send a radiogram or postal card directly to ARRL Headquarters asking for an AEC registration form and EC address.)

Prompt Reporting and Summer Nets. Many section nets report plans to continue schedules this summer season to the extent traffic volume requires and operator support is available. Where a fellow is home anyway, except perhaps for the vacation weeks, there remains the same pleasure in operating that inspires activity at other seasons. *Netters, 'phone or c.w., should be punctual always.* This is especially important in summer. At this season nets may be excused or become free and lose some of their available coverage as decreased traffic volume permits them to wind up their business in about 10 minutes instead of the customary longer periods of the fall and winter operating season.

Radio Show Stations. This is quite a year for amateur station exhibits and opportunities to explain our self-training capabilities, public service work, fraternal organization, and glamorous DX possibilities to the public. In "Traffic

Topics" this month you will find certain precautions concerning oversolicitation of messages and acceptance of those for any points where they cannot be effectively or expeditiously handled. If putting a station in operation, we strongly suggest showing all the varied and interesting kinds of amateur work. Clubs or groups planning such traffic work should read this item and are also invited to write for placarding suggestions.

July CD Parties: C.W. July 22nd-23rd, 'Phone 29th-30th. It is a pleasure to note that the April CD Parties were both well supported, as reported elsewhere in these pages. Big prewar OPS Parties were held simultaneously with the ORS activities and required a choice of 'phone or c.w.; the new set-up permits participation in either or both categories (on different successive week ends) as any individual member of the CD family of appointees may desire. *The separate 'phone and c.w. periods* will be continued. These get-togethers are tops in amateur operating and fraternalism. From the enthusiastic comments received we are confident the correct pattern has been set for the July activity and the coming season.

There's a place for you, by appointment of your SCM, in these quarterly activities for station testing and fraternalism. Whether your interest is in 'phone work, traffic, v.h.f., or other specialties, we're confident there is an appointment along the line of your natural interest for which you are qualified. If you are an ARRL member without appointment identification, drop a postal card or radiogram to Hq. for *Operating an Amateur Radio Station* which outlines the qualifications for each appointment and contains the appropriate application form to be sent the SCM who handles the appointment and operating organization matters for your ARRL section. BCNU in the CD Party.

— F.E.H.

DXCC NOTES

Many inquiries have been made about the exact location of VP8AK, who, on his new QSL, gives his QTH as "Antarctica." This station is operating from Deception Island, and counts for South Shetland Islands DXCC credit.

Although there were many DA and DK stations active in Germany until last year, their QSLs cannot be accepted for DXCC credit. However, cards from D2, D4, D5, and all DLs will fill the bill. This is another case covered by DXCC Rule 7, which prohibits the counting of cards from unlicensed stations in countries where there are normally licensed amateurs. Copies of the DXCC rules are available upon request.

A general view of the set-up of the Metropolitan Radio Club of Los Angeles (W6AMT/6) at the Los Angeles Hobby Show, showing W6MBA at the key, W6CMN kibitzing and V. J. Short, president of the club, at the microphone. Quantities of traffic were handled on both high and very-high frequencies. Note the crowd of interested bystanders.

July 1950

DX CENTURY CLUB AWARDS

HONOR ROLL

W1FH.....232	W6EBG.....221	W2BXA.....220
W6VFR.....225	W8HGW.....221	W6MEK.....216
G2PL.....223	W6ENV.....221	W0YXO.....215
	W3BES.....221	

RADIOTELEPHONE

W1FH.....192	VQ4ERR.....172	LU6AJ.....164
W6DI.....181	W8HGW.....168	W9RBI.....163
XE1AC.....179	W2BXA.....165	G2PL.....161
	W1JCX.....164	

From April 15 to May 15, 1950, DXCC certificates and endorsements based on postwar contacts with 100 or more countries have been issued to the amateurs listed below.

NEW MEMBERS

W3JTK.....150	G3LP.....103	W7LYL.....101
ZS6BW.....121	W0DGH.....102	W3ETD.....101
W9HLR.....110	W0GUV.....102	G2BJY.....100
Z61JI.....106	G8NV.....101	G3DOG.....100
W8OCA.....105	G2AJB.....101	W0DIB.....100
	DL1FK.....101	

RADIOTELEPHONE

CX2CO.....126	W8SDR.....103	W0PUE.....100
I1YJ.....114	T1ZHP.....103	W3BUX.....100
ZS6BW.....113	VE1CR.....103	W4AAW.....100
W2QWS.....103	ZS5G.....102	W6TZD.....100
VQ4SC.....103	W6SUG.....102	W0GUV.....100
	VQ5PBD.....100	

ENDORSEMENTS

W9KOK.....212	W8SYC.....170	W6CEM.....132
W2AQW.....210	W6TZD.....166	W2OST.....131
G6ZO.....210	W3KDP.....163	W5CGC.....131
W2QKS.....210	W2WZ.....161	W3ARK.....130
W6SN.....210	PY1AHL.....160	W9ABA.....130
W8EVW.....203	ZL1BY.....156	W7DET.....130
W9ANT.....232	W2CSO.....155	W1HA.....130
W6AM.....202	W1CLX.....152	W8WUU.....130
LU6DJX.....201	W3NOH.....151	ZS6EU.....130
W2IOP.....192	W8DMD.....150	G6LX.....130
W6DZZ.....192	CE3DZ.....150	W1TX.....121
W5FNA.....191	W7KTN.....150	OH2PK.....121
W6MVQ.....190	W6PQT.....142	VE3AGC.....121
F8BS.....190	W2GVZ.....141	W2AW.....121
W1BIH.....190	W6EYR.....141	W6L7N.....121
W5ASG.....183	W6JK.....140	G2HNO.....120
W2AGO.....182	W3WU.....140	W2PRN.....120
W6ANN.....181	W0OUH.....140	W6WWQ.....120
CE3AG.....180	W1MUN.....140	G6XX.....120
W3EPV.....174	KV4AA.....140	W7AYJ.....112
W8DX.....173	W8HFE.....140	W5GZ.....111
ON4QF.....171	W5LGS.....132	W1ODU.....110
W6CUQ.....170	W2ADP.....132	SM7MS.....110

RADIOTELEPHONE

W1NWO.....160	W6KQY.....130	W2AEB.....120
W1BEQ.....142	I1SM.....127	W4MB.....117
W3LTU.....140	W8AUP.....123	F3WV.....116
W1EKU.....132	W0PRZ.....121	W0ANF.....111
HC2JR.....131	W5KC.....121	





A.E.C. TIP-OF-THE-MONTH

Wire, tape or just plain disc recorders have several uses in emergency communications, as follows: (1) to record traffic at speeds faster than you can copy, either on 'phone or c.w., to be played back later at a slower speed — thus often saving vital on-the-air time during an emergency; (2) to relay the voice of an official, by means of an intermediate station or stations, to a point which cannot be reached direct; (3) to confirm what was said or not said, as a check on transmissions made during the excitement of emergencies; (4) as a means of running a "critique" on emergency tests and drills, or on the real thing, so that errors and bad practices can be pointed out and eliminated in future operations; (5) for publicity purposes for possible later retransmission of net operations over local h.c. stations, or transcription into a newspaper column. If you have a recorder in your station, patch it into the circuit during an emergency operation, real or simulated. Much can be learned by letting the gang hear what they sound like.

—Inspired by the Mission Trail Net "Blazer"

Generally speaking, those areas in which communications emergencies frequently occur are the areas in which AEC organization and preparedness are highest. There is nothing like a real communications emergency to bring the attention and need for advance planning to the fore. Usually something has to happen to show what can happen, and after it has happened we start organizing so we will be better prepared if it should happen again.

All this is perfectly natural, and in most areas will continue to be the case — but it strikes us as too much like learning the hard way. Famous last words: "It can't happen here." It may be true that in your particular locality there is less likelihood of a communications emergency than elsewhere — but it can happen anywhere. If it does, what are you prepared to do about it?

The Emergency Corps of Orange, Texas, under EC W5NMV, held an extensive test of facilities and plans last February 7th, which was so well planned and executed that

we think it deserves mention. Seven mobiles were on duty under calls of W5BUZ, W5CLV, W5KWA, W5PKY, W5PWO, W5QLD, and W6EJR/5. Thirty-one strategic points were covered throughout the city, including the Red Cross, Navy, and National Guard installations, police and fire departments, newspapers, civic clubs, court houses, sheriff's offices, hospitals, and industrial installations. Most of the interests mentioned above participated actively in the test, with the Naval Reserve, National Guard, and Red Cross, among others, supplying equipment and facilities in addition to the amateurs' own gear. Outside contact was maintained with Beaumont, Port Arthur, Houston, Austin, and Maplewood, La. During the drill, a message was sent to Governor Shivers of Texas, and a reply received indicating his approval and support of the proceedings. Some 80 persons were on hand at City Hall Park to witness the operation of the control station for the drill. All in all, an excellent demonstration of the potentialities of amateur cooperation with civic and relief agencies in case of emergency.

On April 10th a snow and sleet storm took down lines in Eastern South Dakota and Western Minnesota, causing loss of power and communications. Highway traffic was at a standstill, airline flights were canceled, and railroad communication lines were either out or in bad condition. By noon a net had been assembled with W0BJV as NCS. By five that afternoon there was quite a bit of traffic and two railroads were calling for help. Tracy, Minn., was without power, so Marshall, Minn., was contacted on 75-meter 'phone and a link on 10 meters between Marshall and Tracy was set up. Train orders were sent out of Huron to W0QIQ on 75 and relayed between Marshall and Tracy on 10 by W0VOY and W0SKQ. Another link existed between W0LEO at Wilmar, Minn., and W0BJV at Watertown, and then on two meters to Milbank, S. D., with W0TI and W0DB.

The whole emergency was handled in an orderly manner and quite a volume of traffic was handled. Those known to have assisted are as follows: W0s AZR, BGB, BJV, CJS, DE, DKJ, GCP, GQH, HAT, HEO, HWS, IZA, MMG, NGM, ORE, PHR, PRZ, QIQ, RQV, SKQ, TI, TKX, UVL, VOY, VQC, VT, YUN, ZRA, ZXW.

—W0NGM, SCM S. Dak.

The history of the development of the AEC in Southeast British Columbia is a good example of planned organization which might well be followed by some of our other organizers. SEC VE7ID divided the section into six areas, and appointed six area ECs to cover each of these areas. In the southeastern area, EC VE7US then wrote form letters to all communities, towns and cities, 15 in all, asking a suitable amateur to become community EC. Within a month, by diligent work, it had been possible to appoint a coordinator for each community, and an AEC net was formed containing both 'phone and c.w. stations.

The next step was to establish contact with service agencies and other organizations who could or might benefit from the AEC set-up. The services thus offered were utilized in several genuine emergencies; at other times, the net conducted simulated emergencies, tests and drills to keep



The energetic RM of the New York Slow-Speed Net (NYSS) is Al Lane, W2PHO, who is responsible for breaking in many newcomers to traffic handling and supplying new blood for the regular traffic nets. The rig, which is shown above the receiver, is a 6L6 driving an 829B to 240 watts. W2PHO can go on emergency power at the flick of a switch, which starts a 3-kw. gasoline-driven generator in the garage. The antenna can be ice-proofed by means of a special heating device.

QST for

interest and activity alive. The net is called three times per week for a brief check-in and report, after which it is terminated and rag-chewing ensues at the discretion of members. In any emergency, the station of QRRR origination is automatically the NCS, while other stations stand by to help or, if their help is not needed, move to another frequency. The net is, of course, tied into other similar nets in the province.

— * * * —

Thanks to all who have been sending in material for use in this column. We are sorry we cannot use all of it, but priority must be given to reports of actual emergencies, and of recent months these have more than exceeded our space allotments. We still need photographs for this page, including shots of outstanding personnel at their stations, emergency units in operation, and other AEC events. If you have anything you think we might be able to use, send it along, but please be sure to say so if you want it back.

IOWA ICE STORM

Early in the morning of Easter Sunday, April 9th, W0RWC was called by the Chicago & Northwestern Railroad and informed that all their communications were out due to a heavy accumulation of ice on the wires. He immediately called the EC, W0JAD, who discovered that his 75-meter antenna was practically on the ground, coated with two inches of solid ice. However, he immediately put up his temporary doublet, with the aid of W0RWC, W0APF, W0ZLC, W0IZF, W0HBG and W0OZQ, and the station went on the air. SEC W0FP was one of the first contacted, and the Iowa Emergency 'Phone Net was soon in action. W0JAD was the only contact with the outside world for about 30 hours, and was on the air continuously from 0600 Sunday until 1800 Tuesday. From Sunday at 2200 until Monday at 2230, power came from a 2500-watt generator loaned permanently to the Clinton Amateur Radio Club by the Climax Engineering Company of Clinton. This generator was in the W0JAD basement, wired in and ready to go at a moment's notice, which was all the notice JAD got on Sunday night; yet, operation was not interrupted. At one time it was necessary to operate portable from the railroad depot until telephone service was restored, using the call W0IZF/β. During the 60-hour stretch, 1282 messages were handled for three railroads, power companies, telephone companies, the Chicago & Northwestern Railroad, trucking companies, press associations, radio stations, the CAA, and individuals.

Elsewhere throughout Iowa and Illinois, amateurs were also active in handling emergency messages, principally through the facilities of the Iowa '75 Phone Net and the Illinois Emergency Net. W0FP, Iowa SEC, handled traffic for A. T. & T., the local Bell Company and others, with assistance of W0IGL. W9MSQ handled the Illinois side of the river, later being relieved by K9NRD (C/O Boyd Claudas, opt.). Around-the-clock operation Monday night and Tuesday to Cedar Rapids was ably handled in four-hour shifts by W0s FPO, JTF, ARW, HDX, YDX and SBV.

The following is a complete list of all amateurs reported to have participated in this emergency, either in handling emergency traffic or in monitoring and assisting to keep the frequency clear of undue interference: W1SS; W3KSF; W4s FDF, FI, 1KG; W5MNY; W8DBI; W9s AWA, BCQ, BPT, DPY, EDR, EWA, MSQ, PT, RNM, K9NRD; W0s AED, AOE, APP, ARW, AYP, DEA, EFL, FP, FPO, HBG, HDX, HUY, IGL, IZF, JAD, JAJ, JDY, JTF, KAA, KSS, KZI, LJF, MDJ, NTD, NXW, OM, OZQ, TFM, TGL, RWC, SCA, SBV, SQF, SQQ, SWD, VDN, VHK, VIP, YDX, ZLC.

MORE ON DAKOTA EMERGENCY

Last month we presented a report on amateur work done in the communications emergency in North and South Dakota and Minnesota. Since then, we have received an additional report from EC W0GHN which we think should also be added to the record of amateur work in that emergency.

Early in the morning of March 7th, all of the state of North Dakota, northern South Dakota and most of northern

and western Minnesota were faced with what has been called the worst communications emergency of all time. Freezing rain followed by high winds laid waste to hundreds of miles of ice-covered telephone, telegraph, and power lines. All long-distance and many local telephone lines were disrupted, including all Western Union and railroad telegraph lines, and over two hundred towns and villages in North Dakota and Western Minnesota were without electrical service.

On March 7th at about 6:30 A.M., officials of the Northwest Bell Telephone Co. got in touch with W0TSN and EC W0GHN to request aid in determining wire damage. W0TSN established contact with W0HFS in Minneapolis to request aid. W0GHN and an official of the telephone company drove to W0TSN in a raging blizzard, to establish W0TSN as the disaster-area net control station. By 9 A.M. stations throughout the stricken area were alerted on 3955 kc. and messages from all wire services, weather bureau, grain markets, railroads and power companies began to move. About 1:00 P.M. the same day a request came from an official of the Northern Pacific Railroad for communication between train yards at Dilworth, Minn., and Fargo, N. Dak. W0AIU and W0GHN took a special engine and caboose, for which one track had been cleared of fallen poles and snow, to Dilworth and set up a station in the yardmaster's office. W0CAQ and W0BJG set up equipment in Fargo. Within a short time, it was possible for railroad work trains to move to repair damage. W0GHN arranged for shifts of amateurs to operate both stations 24 hours per day for the duration of the emergency. Additional stations were established for railroad dispatching by W0EOZ in Jamestown, N. D., and by W0VSK in Valley City. The Northern Pacific began again to move their trains almost normally.

Meanwhile, W0LHS and W0PUJ established a 40-meter c.w. net to handle news dispatches, and another net control station was set up on 75 meters at W0RRW in Fargo to ease the burden on W0TSN. These three 75-meter 'phone nets were operative for 24 hours a day for the first three days of the emergency. W0TJ, as net control on 160 meters, established contact and provided communication for many small towns who had no outlet on other frequencies.

On the seventh the FCC declared the emergency official and ordered 3925, 3940 and 3955 cleared for emergency work. With the help of W0YBM and W9OOL, stations all over the U. S. cooperated in keeping the frequencies clear.

Throughout the disaster area as well as the rest of the country the amateurs who took part in traffic handling and frequency policing deserve high commendation for their excellent cooperation. The officials of all the companies and wire services aided, as well as the people whose anxiety was relieved by the transmission of welfare messages were profuse in their gratitude and commendation for the work done by the amateurs. W0GHN adds the following to the list of stations participating, with apologies to any who might be omitted: W0s AGD, AIU, BJG, BSL, BZJ, CAQ, EOZ, FZQ, GHN, HFS, HIV, ILO, ILW, LHS, OTJ, OYM, PUJ, PVS, RNS, RRW, UGM, VSK, and YBM. W4LTE also assisted in relay work at one point.

Mobile Work and 29.6-29.7 Mc.

The ARRL Board of Directors at its May meeting considered ways and means to encourage and assist mobile operations in all bands. The Board, in consideration of the problems of ten-meter mobile work, voted to encourage in all ways practicable the *voluntary* setting aside of 29.6-29.7 Mc. for mobile operations. This notice recommends and urges that all fixed amateur stations, especially those more favorably established as to power or situation, give way or reserve for MOBILE amateur operation, the frequencies included between 29,600 and 29,700 Mc. in the ten-meter band. Your cooperation is earnestly requested in giving the 29.6-29.7 Mc. mobile operator a chance.

BRASS POUNDERS LEAGUE

Winners of BPL Certificates for April traffic:

Call	Orig.	Recd.	Rel.	Del.	Total
W7CZY	41	1308	1216	71	2636
W6CE	11	1152	1132	19	2314
W7WJ	64	956	817	14	1851
W0ZJO	26	391	866	20	1803
W0JAD	468	0	714	457	1639
W5GZU	13	771	500	268	1552
W6JZ	24	623	594	138	1379
W5LAK	4	677	670	3	1354
W3CUL	101	610	560	54	1325
W2RUF	92	660	439	50	1241
W2CDQ	37	558	473	57	1125
W2CDQ**	33	506	465	26	1030
W5FOM	954	9	4	2	969
W3GZH	42	466	425	23	956
W2RUF**	139	450	315	25	929
W3GEG	36	453	421	5	915
W5MN	12	403	304	69	788
W3NRE	12	348	335	9	704
W6HMM	1	345	327	12	685
K5WAH	8	322	305	15	650
W8SSW**	134	270	142	106	652
VE7TF	38	299	289	6	632
W8EXZ	77	288	184	76	625
W8OXO	47	286	270	5	608
W8RJC	24	291	257	32	604
W5OQD	302	140	110	29	581
W2BSE	25	273	260	10	568
W9ESJ	32	266	206	60	564
KG6DI	259	302	0	0	561
W4NNJ	8	273	257	16	554
W6FOG	366	89	80	8	543
W9FXA	13	262	217	36	528
W8TT	9	258	199	59	525
W9QXO	8	252	196	56	512
KG6FAA	287	112	40	70	509
W6AMT/6	592	6	0	0	508

The following made the BPL for deliveries:

W2WHB	105	W9SYZ	65	W9WGM	56
W7IOQ*	105	W1BDI**	64	W1NJM**	54
W3DVV	97	W1QUA	64	KH6UL	54
W1AW*	90	W5BKH	64	W3UF	53
W9BGN	89	W3NUG	63	W6KJP	53
W6LDR	82	W6CMN	62	W2CGG	52
W8DAE	82	W7UTM	59	W4ANK	52
W5ARK	81	W6CMC	59	W4PYN*	52
W6LDR**	81	W6OT	58	W5PA	52
W2OAF	77	W2BO	57	W8TRN	51
W7FLX	74	W3OML	57	W9LFK	51
W9UBP	71	W4JEP	56		

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

* February Traffic.

** March Traffic.

TRAFFIC TOPICS

During the summer is a favorite time for country fairs and numerous other outdoor events. These provide excellent opportunities to bring the existence of amateur radio to the attention of the general public, to show them that we do something besides interfere with their radio and television sets and engage in inane chatter over the air, to show them that amateur radio is interesting, fascinating, progressive, worth while, and that it provides a *service to the nation* as well as a relaxation and hobby to its participants. Sponsoring an amateur radio exhibit at a fair or hobby show is a very worth-while activity, and the League has always encouraged it and aided it whenever possible.

One of the chief attractions at such exhibits has always

been the soliciting of message traffic from the general public, and the relaying of this traffic over prearranged circuits or over the regular amateur message-handling circuits generally available during the fall-to-spring season. These messages, if properly handled, have the effect not only of acquainting the originating spectators and curiosity-seekers with this utilitarian phase of amateur radio, but also of bringing it to the attention of the addressee of each message when the message is delivered. Thus, the potentialities of amateur radio are exhibited not only to the people at the fair, but *also* to an additional number of people exactly equal to the number of messages delivered. Such deliveries, under these conditions, add to the coverage of the exhibit station.

Unfortunately, when messages originated are *not* properly handled, when mistakes are made in transmission or relaying, when the messages are delayed unduly, the impression received, both on the part of the person originating the message and the person receiving it, is a bad one — the result, in most cases, of too few stations handling too much traffic, in spite of the best efforts of the few traffic-handlers who remain active all summer.

As summertime is the best for outdoor events where amateur clubs set up exhibits and solicit traffic, it is also the favorite season for most traffickers to go off the air for rebuilding or to avoid having to compete with unfavorable conditions, both on the air and in the home. The result is bound to be more traffic than the few die-hard traffickers can handle properly, and negative publicity for the amateur.

We therefore suggest that clubs who are intending to sponsor an amateur radio exhibit this summer take it easy on soliciting message traffic. We don't mean that you should refrain from soliciting *any* traffic, but only that you should make it a casual part of your exhibit and accept messages only under realistic restrictions. Emergency gear, QSL groupings, and photographs will all also dramatize Amateur Radio. If you do solicit traffic in quantities make sure that your traffic schedules are lined up beforehand with stations located at points for which most traffic is destined. Indicate that traffic for other points is taken subject to delay, if you accept such traffic at all. Traffic-handling, due to the voluntary nature of amateur radio, is a seasonal activity for most traffickers, who have other interests on warm, sunny days and starlit nights — even as you and I.

A little eavesdropping on 80 meters during the shank of the evening shows that we have come a long way in efficient traffic-net operation, but we still have a long way to go. Some of the nets are models of net efficiency, like the NTS area nets, TLAP, Rebel, and some of the other older nets in which participation is chiefly by old hands in the game. As one goes down the line to regional and section nets, and spontaneously-organized nets covering localized areas, the effects of lack of experience and of the casual nature of amateur radio are more apparent. The traffic moves more slowly, the QN signals are not used to best effect, or they are misused, there is more casual conversation, exchange of greetings, requests for signal reports. In some nets we have heard a roll call (to which about 10% of those called responded) lasting a full half hour before any traffic was handled. In others, we have heard participating stations identifying themselves and the station they are contacting by a 3 X 3 call at both the beginning and ending of a transmission lasting perhaps one minute, but lengthened to two minutes or more by the long-drawn-out call.

There are ways and means of shortening your net procedure without resorting to the bug — lots of them. One of the best ways is to get out your copy of the QN signals and memorize them, so that when someone springs an unfamiliar one on you, you won't have to fumble for your list. Then *use them properly!* Another way is to stick to the business of the net until all traffic is cleared; then is the time to exchange greetings with the NCS, who is your pal, or other members of the net. Identification can be cut down considerably without drawing fire from the FCC Monitoring Division (but not cut out altogether!). Roll calls, if they must be used, can be shortened to include only the regular stations, all others to report in after the roll call is completed. Report your traffic at the same time you QNI, without making the NCS ask for it. When you hear the NCS tell someone to

QNK a message to you, break in with a "K" so that the message can start immediately, without the necessity of a long interchange of calls. Keep your attention on the proceedings, so that when you are called you can respond immediately. If you have to leave the net for any reason, notify the NCS, so he will not waste time calling you. If your departure is only temporary (QNT) indicate the approximate time you will be gone, and when you return QNI again, so the NCS will know you're back.

Just a few pointers, fellows. Try to keep them in mind when in a directed net, and the increased speed and efficiency of the net as a result will add manifold to the enjoyment you get out of participating.

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Now that we have gotten rid of the "extra" check in message-handling (see p. 62, June QST), it will be possible to use the slant sign (/) in the check to indicate a corrected check, instead of changing the original check as suggested in June QST when it is determined that that check is incorrect. The originating station has the responsibility for checking a message, and *only that station* has the authority to change the check. Thus, if it is incorrect, it can be corrected upon its first transmission, but once the message has been QSLd and is relayed on its way, the check *should not be changed* under any circumstances, the dictionary, encyclopedia or grammar book notwithstanding. As a matter of fact, this goes for *any* part of the message — no changes should be made without the consent of the originating station.

In order that the check agree with the number of words in the text, as sent, however, it is perfectly feasible, when two stations handling a message agree that the original check is incorrect, to indicate a corrected check in the preamble, by inserting it following the original check and a slant mark. For example, W6ABC is relaying a message (which originated at W6DEF) to W6GHI. The check, as sent, is 10. However, W6GHI does not agree with this check and says so (QTB), claiming that it should be 11; whereupon, W6ABC recounts and finds that 11 is indeed correct the way he received it. Do they change it? No, they make it read "CK 10/11." The 10 remains as the originator's check, which is sacred and inviolate. The 11 shows either that somehow a mistake was made along the way, or that the originator did not check it properly in the first place. It has been pointed out to us that no part of any message should be changed arbitrarily by a relaying station, and we are forced to agree that it is a compromise with accuracy to recommend that relaying stations make changes which seem indicated. Relay the message the way you received it (but be sure you have it correct before you QSL!), and if the check does not tally, indicate a corrected check as above *without erasing the original check.*

APRIL CD QSO PARTIES

Listed below are the highest claimed scores for the April C.W. and 'Phone CD QSO Parties. The figures following each call indicate the claimed score, number of contacts, and number of ARRL sections worked. Complete results with listings by League divisions and sections will appear in the July CD Bulletin.

C.W.			
W6BES	178,947-337-50	W9UKT	70,490-260-53
W4KFC	128,790-422-60	W1AQE	68,105-257-53
W8ZAT	128,464-251-56	W2CWK	66,250-259-50
W1EOB	105,460-370-56	W6CUF	64,856-161-44
W3DGM	97,075-346-55	W8TZO	64,800-263-48
W1JYH	93,690-343-54	W3NTD	58,985-246-47
W3FQZ	91,840-328-56	W9QLW	58,560-238-48
W3VES	81,090-299-53	W6VAQ	55,890-135-46
W2GFG	78,000-305-50	W1NXX	55,695-230-47
W3JHM	76,270-256-58	W1CJH	54,000-225-48
W4NQV	74,520-270-54	W0IC	52,675-208-49
W2ZVW	73,500-293-49	W8DAE	50,895-210-47
W9NH	71,550-259-54	W3CUL	50,160-204-48

Others with scores over 35,000: W4AYV 49,920, W1CWR 49,500, W7EAU 45,360, W3GJY 44,345, W7GHT 42,876, W9UBP 40,950, W2OBU 40,140, W2YDG 38,745, W0GHN

38,060, W8NOH 38,010, W9CMC 37,200, W4ONX 36,240, W3NRE 36,900, W4PYN 36,190, W1QIS 36,000, W5WZ 35,200.

'PHONE

W4DCQ	8250-55-30	W4KFC	2975-28-17
W4DLX	4900-44-20	W4JQY	2340-26-18
W8NOH	4830-37-23	W1CJH	2304-25-18
W8LII	4410-36-21	W4IQV	1920-27-12
W3NTD	3520-27-23	W3CUL	1750-20-14
W1VW	3400-30-20	W4FWZ	1560-26-12
W2ZVW	3400-33-17	W0IC	1540-15-14
W3EIS	3400-28-20	W6BES	1287-13-11
W5WZ	3060-27-18	W3CIQ	1105-17-13
W4CYC	3040-28-19		

MERCY MISSION — AMATEUR STYLE

The helping hand of amateur radio stretched across two continents to lend aid to a 16-month-old girl suffering from typhus of the heart. On the evening of March 29th, Alfonso Retalmo, CE2BQ, a resident of Valparaiso, Chile, was asked by local authorities if he could contact the U. S. A. for the purpose of obtaining some aureomycin, urgently needed in the treatment of the girl's disease. Alfonso immediately put out a directional CQ and was answered by Stanley Wolf, W2HIQ, of Brewster, N. Y. After hearing about the need for the drug, Stan went to work contacting the various possible sources of supply. After considerable difficulty, the aureomycin was obtained and shipped by air on March 30th. Other stations that helped relay information were W2AQK, W2LHF, W5QS, and KP4AZ.

BRIEF

Sweepstakes corrections: In the c.w. results of the 16th SS, appearing in April QST, the call of Kentuckian W4JDU was listed incorrectly as W4IDU; in the Western Massachusetts score tabulation, W1RKB was listed incorrectly as W1RBK. W6BIP was listed as the winner of the San Francisco section c.w. award; the award winner was actually W6ATA, listed in the results as second high scorer, since W6BIP's was a multiple-operator entry, with W6JXX the assisting operator. Among the Northern New Jersey 'phone SS scores listed in the May issue, W2GKE's score was incorrectly credited to W2GKF. The club scores published with the 'phone results inadvertently omitted the score of the Beaver Valley Amateur Radio Association, whose members made an aggregate total of 205,863 points, with W3GJY the winner of a club certificate for his c.w. entry. We hasten to extend our sincere apologies to all concerned.

A.R.R.L. ACTIVITIES CALENDAR

July 1st: CP Qualifying Run — W6OWP
 July 17th: CP Qualifying Run — W1AW, W0TQD
 July 22nd-23rd: CD QSO Party (c.w.)
 July 29th-30th: CD QSO Party ('phone)
 Aug. 7th: CP Qualifying Run — W6OWP
 Aug. 18th: CP Qualifying Run — W1AW, W0TQD
 Sept. 9th: CP Qualifying Run — W6OWP
 Sept. 20th: CP Qualifying Run — W1AW, W0TQD
 Sept. 23rd-24th: V.H.F. Contest
 Oct. 8th: CP Qualifying Run — W6OWP
 Oct. 14th: Simulated Emergency Test
 Oct. 17th: CP Qualifying Run — W1AW, W0TQD
 Oct. 21st: CD QSO Party (c.w.)
 Oct. 28th: CD QSO Party ('phone)
 Nov. 4th: CP Qualifying Run — W6OWP
 Nov. 16th: CP Qualifying Run — W1AW, W0TQD
 Nov. 18th-19th, 25th-26th: Sweepstakes Contest

• 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, Jerry Mathis, W3BES — PDJ has a 522 on 144 Mc. and is active on 3.5, 7, 28, and 144 Mc. The Abington Twp. ARA is perfecting its part in the Philadelphia Council of Radio Clubs program. EU reports his BC-348Q went West and he is using his SW-3. He pines for his faithful Grebe. BXE is putting in long hours on his rig which he hopes to use on St. Pierre this summer. The E. Pa. Net has been suspended until Sept. 23rd. AXA is building the QST 144-Mc. rig. He made his best score in the CD Party by using a VFO and NC-183 receiver. OML makes the BPL for the second straight month on deliveries. CUL sends in the usual "telephone number" for traffic total. She has more power now, so look out! May suggests that E. Pa. and W. Pa. get together on one big net. The Philadelphia Wireless Assn. has two new graduates, namely QLI and QMP. The PWA is planning a picnic for members and families. The Philadelphia Area Council of Radio Clubs has lined up a full schedule of activities for the summer. Be sure to see your club representative of the Council for details as to how you may take part. PMT is the secretary-treasurer of the organization. BYB is temporary chairman and is in charge of arrangements for supplying communications for the season's Schuylkill Navy races. Traffic: W3CUL 1325, OML 141, AXA 105, PDJ 73, BXE 19, AQN 7.

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA — SCM, Eppa W. Darné, W3BWT — The Washington Radio Club, at its first April meeting, had another "Movie Night." Film subjects were "Audio Oscillator," "Electrostatics," "Vectors," "Charging Storage Batteries," and "Synchro Systems." At the second April meeting, Miss J. V. Lincoln, of the National Bureau of Standards, gave an interesting talk on "Radio Propagation Disturbances" along with movies on the subject. The club recently was assigned the call CAB. The Chesapeake Amateur Radio Club, at its first April meeting, presented a talk and demonstration by AFM, his subject being "Some T.V.I. Filters." At the April 18th meeting Dr. Bill Laing talked on "Class H Insulation" and demonstrated a temperature run on an experimental transformer. The Baltimore Amateur Radio Communications Society sponsored a Hidden Transmitter Hunt Apr. 16th, using the 27-Mc. band. HJY was chairman of the Hunt committee, assisted by KDY and MWY. The Hunt was called off because of conditions beyond the control of the committee and entrants met at Clifton Park for group photographs. PSG/3 transmits code practice at 7:00 p.m. daily on 29,448 kc. The Potomac-Rappahannock Valley Net had a number of fine drills in April. The 144-Mc. Field Operations Apr. 23rd were quite successful. The Delaware Amateur Radio Club had a complete amateur station set up at the April 13th, 14th, and 15th Hobby Show. Many messages were handled and forwarded by the MDD Section Net members via their numerous other connections. The Rock Creek Radio Assn. held an auction of surplus gear at its Apr. 28th meeting. The Maryland-Delaware-District of Columbia Net (MDD Net) will operate the entire summer, Mon., Wed., and Fri. at 7:00 p.m. Standard Time, on 3650 kc., with UF as NCS. The U. S. Naval Academy Amateur Radio Club station, ADO, has a 28-Mc. four-element beam and Collins rig. The 7-Mc. rig uses p.p. 813s. Professor Leydorf, of the Academy, has addressed the club on such subjects as "Square Waves," "Thyratrons," etc. Code classes are held nightly. MCG is building a new exciter. NNX, IFW, and JE work out well with their 40-watt mobile rigs. PTZ now has p.p. 811s in the final of his new rig. OPM has a new rotary three-element beam on 14 Mc. PRZ is back on with very little TVI; he also has his Class A ticket. IL

schedules KV4AA and is on 14 Mc. LSX is back on 7 Mc. and supervises at the Red Cross station PZA, CDQ, and AKB also are supervisors at PZA. JHW is chasing DX for the summer. EYX schedules ØVTD, has been working lots of DX with his mobile rig, and was visited by 6JZ. AKR is operating on 14, 7, and 3.85 Mc. ECP is rebuilding his exciter. VES made a large score in the CD Party. FQZ is doing extensive rebuilding. KMN operates with the Swing Shift Net. UF is organizing an Emergency Corps group in the Annapolis, Md., area. OEU is on 7-Mc. c.w. and 14-Mc. c.w. and 'phone. QCB is on 7- and 14-Mc. c.w. and has a new 40-watt rig. HIS is doing nicely on 7 Mc. QKD is a new call in the Baltimore area. AHK and HT are operating mobile. AFR is back on 3.85 Mc. AG's job requires him to move to the West Coast. Traffic: W3GZH 956, UF 469, DVW 355, SL 326, ECP 265, ADO 85, AKB 68, KMN 27, IL 17, NNX 14, BWT 7, AKR 4, VES 4.

SOUTHERN NEW JERSEY — SCM, Dr. Luther M. Mkitarian, W2ASG — PFT is new NCS of the emergency 'phone net which meets at 9:00 a.m. EDST Sundays on 3900 kc. BAX is rebuilding. ZVW is high traffic man this month. HAZ reports TVI-tis. ZYX is on 144 Mc. YSP is using a new electronic key. SVV's auto license reads AR-73-K. The Atlantic Radio Club participated in Red Cross Annual Emergency Field Day on May 7th. YRW is a proud papa, a jr. operator. NB, PEN, QED, GFZ, PWP, and CRO are active on 420 Mc. Your SCM returned from an FB vacation in Florida, where he attended the Kiwanis Convention. Club secretaries, please forward all news on or about the first of the month. Traffic: W2YVW 139, RG 44, QUH 21, YSP 20, ASG 11, KHA 10, ORS 9, HAZ 2, PFT 2.

WESTERN NEW YORK — SCM, Harding A. Clark, W2PGT — SEC: SJV, Net Mgr.: RUF. The following new appointments have been made: As OES, SFW; as OO, QQ; as ORS, CPN, FCG and WOE have renewed ORS appointments. CDQ, one of our "heavy" traffic handlers, has moved to Ohio and will be greatly missed next season. QHH made first W-PJ 3.5-Mc. QSO and completed five-band QSO with TA3GVU but says trout fishing interferes with DX. The Clayton Radio Club has purchased 600-watt gas-driven generator for emergency use. CPN keeps schedules with ØDZG, ØEKY, and ØSG. PPY will operate marine mobile all summer aboard a Naval Reserve Training Ship and will keep daily schedule with RUF on 3705 kc. The Utica Amateur Radio Club meets every Monday night at St. Peter's Hall, Herkimer Rd., North Utica. Amateurs in the vicinity are welcome to attend meetings. New officers are SSL, pres.; ZYQ, vice-pres.; ZZB, secy.; and WUW, treas. SSL works Schenectady consistently on 144 Mc. with 522 and 24-element beam. FCG is using 48-element beam on 144 Mc. BDG and WAL are building 420-Mc. equipment. Cornell University Radio Club has the call CXMX and publishes a club bulletin twice a month. PXA is having good success with low power on 160 meters. Many of the Binghamton area gang have been working into Maryland on 144 Mc. Congratulations to CDQ and RUF on the FB traffic totals the last two months. Traffic: (Apr.) W2RUF 1241, CDQ 1125, PGT 74, VBH 42, QHH 32, FCG 26, BLO 8, CPN 4, (Mar.) W2CDQ 1030, RUF 929, NAI 206, RUT 180, PGT 120, SJV 62, FCG 46, QHH 27, PUV 22, WOE 20, BLO 18, VBH 9.

WESTERN PENNSYLVANIA — SCM, Ernest J. Hlinsky, W3KWL — The W. Pa. gang received the highest praise for its splendid cooperation and skill in Operations Comet. The Radio Assn. of Erie had the following taking part: VHP, NMP, LKJ, OIH, KQB, ODF, QN, NXX, MMI, KLD, PKJ, PLX, TXZ, Ronald Barker, and Clarence Moser. KYR, station of the Boys Club of St. Mary's, was active. In Mercer County the MCRA had set-ups in five cities and their Reserve Armories. Active were CJF, QCN, NCD, GEG, LNA, ODB, QHS, KWL, MQW, QLT, MWV, and OAJ. Down Pittsburgh way, OMA deserves much credit as communications chairman of the Civil Defense. OKU acted as NCS on 160 meters, NUG for 3.5-Mc. c.w., RBJ for 3.85-Mc. 'phone, OMY on 144 Mc., and KSR and LMM operated portable at the Armory. Known active stations were GJY, UHN, CCW, LOE, OCW, OD, AAX, AVY, BSO, BKS, KJM, KSI, LKZ, NKM, KWA, LFK, OJL, OB, BO, OMA, PAP, PWQ, VZA, and TVW. UUG, MPO's XYL, is going on 14 Mc. RIK is building a mobile rig. NRQ and OMY are battling it out on 14-Mc. 'phone. QCD puts out a nice 7-Mc. c.w. signal. NDH is toying with 4-65As. RXT has a sixteen-ele-

ment 144-Mc. beam in the making. Active on 144 Mc. are MON, RWG, UHM, and PGV. NFO has a pair of VT-127s on the air. The PARCC is being reorganized with OMA as chairman; MMLL, vice-chairman; MPO, secy.; SGH, treas. Delegates are NUG, OMA, PWQ, UHN, and AVY. FCO is operating 10- and 160-meter 'phone from McConnellsville Sanitarium. The W. Pa. traffic net closed down for the summer Apr. 28th, but the 3rd Regional Net will be in effect at 9:30 p.m. DST on 3590 kc. during the summer, according to RM GEG. New station at Sharon is QLT. The Fort Necessity Amateur Assn. reports that club grounds have been improved. LAC has TVI-ed his BC-459, WVE is working the Europeans on 28-Mc. mobile. RUC is building new VFO. UVD has S20 perking FB and has new Collins 310C VFO. Altoona stations on 1815 kc. are PRO, POZ, LQD, OJX, RFM, RBD, KTB, QCH, and LJQ. The ATA of Pittsburgh is handling communications for the boat races. KKS has 1st-class radiotelephone ticket. LKJ is doing wonders with his code instruction classes. To the boys in Erie: TFX, editor of *Amateur Radio News*, spends lots of time and effort to give you the write-ups you want. Traffic: (Apr.) W3GEG 915, NRE 704, NCD 258, NUG 232, AER 52, MIZ 12. (Mar.) W3LQ 8.

CENTRAL DIVISION

ILLINOIS — SCM, Lloyd E. Hopkins, W9EVJ — Section I nets: IEN, 3940 kc.; LLN, 3515 kc. We are sorry to learn of the death of MUZ early this month. Joe was an ardent ham and devoted much of his time to young ham prospects. IAY has a 540-foot full-wave antenna on 160 meters, thanks to help from FFR, FGM, and two SWLs. LNI and APK report that DBO has returned to the air after long inactivity. LNI has new three-element beam on 28 Mc. rotated with prop pitch motor. BGN sends in a swell traffic report, making BPL. IYN watches TV programs while operating. KQL reports the Sangamon Valley Radio Club stag party was a huge success with 45 in attendance. They also have a fine code class every Wednesday with about 30 students. JJO is working on VFO and 813 final and plans to join the ILLN gang shortly. EBX seems to be returning to his old-time form with a nice traffic total. FFR plans to change trailer site again soon. EVJ visited UBP and ZQT during his Chicago trip. PEK is sporting 80 watts to a pair of 807s and is more active in nets. HON has new exciter on 14 Mc. and Q5-er to sidestep QRM. UBP, SYZ, and CMC make BPL on deliveries. BON and FKG are celebrating 20 years with the same calls. HKA reports the Iroquois County AEC group really is on its toes. Newly-elected officers of the Wheaton Community Radio Amateurs are FQ, pres.; WX, vice-pres.; FRE, secy.; EHK, treas. BRX has been transferred from AM to NBC-TV and is working much overtime. ERO is back on 7 Mc. after a serious operation. OAL is trying 3.85-Mc. 'phone. GDI was transferred to WGN-TV. YLU is going great guns on 28-Mc. mobile. YIX is getting a taste of DX on 14 Mc. WEA put rotator on TV antenna. EWR has built a new home. NN is tickled silly with the location of a new home and the unheard-of DX. BUK rebuilt the rig because of TVI. FFR is building a new exciter. SYK is enjoying his job as OBS. JTL spends lots of time away from home and uses mobile job along the way. KXN, PEK, and JPN visited the Ceoico Club at Decatur. AHC is having trouble with an intermittent in the rig. EAD put new sky hook on 7 Mc. CKW is keeping schedules on 160 and 10 meters. IPD is waiting for TV set to arrive. HTR is sporting a new car. CJV is busy with farming. LIV has TVI and has to live with it. MUD is singing the TVI blues and having trouble keeping the beam up in the recent high winds. Your SCM had a pleasant visit with the Chicago Suburban Radio Association. We are looking forward to improved conditions on the air next month. June QST gives July 17th as the closing date for SCM nominations to be filed with Headquarters, and EVJ is in the running for another term. Traffic: W9EVJ 340, SXL 185, BGN 183, KQL 173, UBP 171, SYZ 153, DUA 137, CMC 132, ERX 92, PEK 46, EDW 32, IYN 24, BUK 19, FRP 17, ASN 10, JO 10, FFR 4, JNC 2.

INDIANA — SCM, W. E. Monigan, W9RE — At this time of year it behooves each of us to check equipment, decide where improvements may be made, list items which may be useful in a local or national emergency, check our certificates for date of endorsement, forward for renewal if necessary, and thus prepare for another year of ham activity which will benefit ourselves and the nation. Evansville reports a wide interest in s.s.s.c. since ERN gave a lecture on it. GFS set up an all-band rig at his new address. EHU has a long-wire antenna. AZU and his committee worked hard at the plan for the Evansville Club Field Day. Q1W goes for the A-1 Operator's Club. New call in Evansville is JWZ. From Gary come reports that INU is helping SWLs become hams. He also is active on 28 Mc. with the Lake County mobile units. The Lake County Club has appointed a committee to solve the problem of TVI. It works with

TV listeners and interested hams to find out what is needed to allow both to operate. Several types of filters have been obtained and experiments are being made. Progress is slow but the results are encouraging. HBI is building a completely shielded kw. final. BGQ is shielding his complete transmitter. WKN has installed coaxial feed on his new 28-Mc. beam. GNR comes up with a "de-TV'd" exciter. The Lake County's "White Elephant Sale" went over in good style. From Fort Wayne, BKJ says QIN "slow speed" will continue during the summer months. At South Bend, the Michiana Club provided communication for the Armed Forces Day Parade. Both 3.85 and 28 Mc. were used. The Club's "MN" Net now operates each evening at 1830 DST on 3700 kc. LLX gave a very interesting talk on "Amateur Mobile Installation." RE installed a transmitter and receiver permanently on 29,640 Mc. FME is new secretary. The Emergency Mobile Corps has been assigned an important part in the plans of the St. Joseph County Defense Council. Decide what you can do to help in an emergency and submit your application to your local Coordinator or to PRO, Fort Wayne. Traffic: W9TT 525, QLW 404, JTX 250, DGA 118, RCB 101, BKJ 83, RE 16, YB 10, BNF 8.

WISCONSIN — SCM, Reno W. Goetsch, W9RQM — YYY, our SEC, reports from California, where he is mixing pleasure with business. UIT's OBS schedule continues daily at 0115 CST on 4-Mc. 'phone. The section meeting at Wausau was well attended, with a fine representation by the BEN and WIN nets, as well as all ARRL appointees. UFX was appointed to head a committee to develop a Badger State Council of Radio Clubs. HDZ worked an HC2 with a new beam, and reached Oshkosh with new 50-Mc. rig. DXV is whipping 4-Mc. mobile into shape. HHC uses a BC-458 on 7-Mc. c.w. HTY bought a new rig. ZVY is dickering for Collins 30K. GJY works 'em on 28 Mc. with an indoor antenna under a tin roof! VII is back on at new QTH. ERW burnt out a plate transformer but still is on with 10 watts. IQM worked HC8GRC on 7 Mc. and is watching for 50-Mc. band openings. UIM received Class A ticket and LIK is awaiting his. GJK and JM presented a v.h.f. demonstration at Door County Club. JBF is back on 144 Mc. with the 4-over-4 beam. FPE has been working Minnesota stations with regularity on 144 Mc. JBF and FPE have daily schedule on 144 Mc. at 8:45 p.m. with a listening period at 9 p.m. for other stations in the area. HC8GRC and PJ5TR (Aruba) are the latest for KXK. DPN worked F8, CM, KL7, and KZ5, while JQP picked up VK, KL7, CO, and ZL. The latest information from ARRL Headquarters was presented by Assistant Secretary Paston, 1DJV, ex-9DJV, at WVRA meeting. JXX is new call at Wisconsin Rapids, while QPN is new at Wausau. AFT got in on 144-Mc. opening Apr. 23rd with contacts to Indiana and Illinois. Latest DX at RBL: PD3RG, OR4AC, and PK5HL. VHA renewed EC appointment. Traffic: W9ES 564, FOX 528, CBE 158, LFK 125, YCV 79, PFK 76, ANM 74, IQW 60, UIT 58, UFX 37, CWZ 33, SZL 31, SZL 31, DND 28, HDZ 25, DXV 18, RKT 13, IHW 6, BZU 5, FKA 4, KXK 4, AFT 3, IQM 2, RSR 2.

DAKOTA DIVISION

NORTH DAKOTA — SMC, Rev. Lawrence C. Strandenaes, W0JWY — The RRRR of Fargo has been sponsoring a series of radio programs over station KFGO to promote interest in and explain the activities of amateur radio. HOX has been in charge of these programs and has done an FB job. Record-breaking floods in the southern and western parts of the State have put many of the hams in those areas into action handling emergency traffic. Some of those actively engaged were WSL, LIX, QZD, BILF, PGO, SSW, EOZ, KRC, ZCM, RBS, and JPW. Bad floods in the Red River Valley also alerted the boys there. Flood waters in Jamestown caused NBS and TNL to be temporarily QRT. Visitor JA2AB enlightened the Jamestown boys on Oriental hamming. Our section boasts only two old-timers with two-letter calls — DM of Grand Forks and FX of Jamestown. Traffic: (Apr.) W0SSW 112, LHS 17, JWY 11. (Mar.) W0SSW 652, EXO 46, PUJ 26, CAQ 14.

SOUTH DAKOTA — SMC, J. S. Easberg, W0NGM — April 10th was the date of the third blizzard in a row. This time it struck on the border of Minnesota and South Dakota in the northern half. Rail service was without means of communication on the Milwaukee and Northwestern lines. Links of amateur communication were set up in readiness and traffic was handled in an orderly manner, with BJV as NCS. Those known to have assisted were AZR, BGB, BJV, CJS, DB, DKJ, GCP, GQH, ITAT, HEO, HWS, IZA, MMQ, NGM, ORB, PHR, PRZ, QIQ, RQV, SKQ, TI, YUN, ZRA, and ZXW. Most of the traffic was handled on 3.85-Mc. 'phone with the use of 28, 50, and 144 Mc. The Mitchell Amateur Radio Club won \$100 in the recent Radio News Contest for new members to get their tickets. The Club plans to use the money to complete the club station.

MINNESOTA — SCM, John B. Morgan, W0RA —

Acting SCM, Charles Bove, W0MXC. SEC: BOL. The 160-meter gang has organized a traffic net to be known as the Northland Net, which will operate on 1910 kc. Monday through Friday at 9:00 p.m. EYW is Net Control. We invite everyone on 160 meters to check into this net. A new club has been organized at Kensington to be known as the Runestone Radio Club. The initial membership consists of EYW, IGZ, DAB, FTJ, JDC, IGY, NYI, VHE, EUR, IIW, and BQK. IGZ is well situated in his new QTH after many years on a nearby farm using a VHF-152 and HQ-129X with rigs on from 1900 kc. to 30 Mc. EUR has a new NC-183 and is operating mostly on 1900 kc. SYW now is Class A and has been giving 14 Mc. a whirl. Anyone holding an Emergency Corps card that is running out should get in touch with his SEC or AEC and have it endorsed for another year. We need more Official Observers. Write your SCM for application blanks. BGY has a new electronic key and has become quite adept at operating it. LDI is building a new rig. ANU rebuilt his modulator. IJN has accepted a position as operator at KWAT at Watertown, S. D. PKO is busy building a kw. CYH is going portable in the north country this summer. SUZ has a new kw, using 8000s and FDS a kw, using 810s. Mobile activities have been on the increase with two mobile hidden transmitter hunts held every month, one in Minneapolis and one in St. Paul. The Mesabi Club gang has a net operating on 1895 kc. MJJ is Net Control. PDN has been checking into the net lately with a BC-610. Traffic: W6LDI 11L, KFF 93, HEO 73, RPT 59, EA 51, RXL 48, BGY 42, MXC 41, UCV 28, UNC 24, BOL 23, PNQ 14, RA 13, FIT 8.

DELTA DIVISION

LOUISIANA — SCM, Robert E. Barr, W5GHF — EB L maintains daily schedules with West Pacific for G.I. traffic. The Alexandria Amateur Club conducts transmitter hunts periodically. 9 members owning mobile units. HEJ and HEK are equipped with portable and mobile equipment for all bands and are the latest EC appointees. CEW knocked off CR1QAA and FV7YA to bring total to 158 countries. KME's father is an able assistant in operation of KME/mobile. The Pelican (3870 kc.) and Delta 75 (3905 kc.) nets will continue throughout the summer. RDD, in Cotton Valley, is a newcomer to 7 and 28 Mc. AEN, arranges BMM's twosomes and foursomes at Broadmoor Country Club. The Pelican Net has three or more mobile members on all drills. 3.85-Mc. mobile stations now include HBY, KME, DHE, HEJ, HEK, CEW, FMO, HHT, and IZS. HHT works traffic and DX with Par East and Europe. LVG, BUF, KCH, HQ, KTB, BUK, and FMO are New Orleans traffic outlets on Pelican and Delta Nets. Plans for ham call auto licenses are going forward successfully, thanks to BV, JYD, FDC, and others. The SCM would like sample magazines, bulletins, etc., from other sections' nets, clubs, and organizations to model a like bulletin service in this section. AXU also operates NUW while in Rio Grande Valley. EB and HEJ furnished portable rig at DRF's bedside. CCD now is in Lake Charles. (GEF asks your aid in news of 144-Mc. activity, c.w. and 'phone nets, on all bands. RLF is a newcomer to the ham ranks.

MISSISSIPPI — SCM, J. C. Wallis, W5DLA — Wanted for this section: One PAM, Official Observers, any class, OES, and OBS. Drop me a card if interested. DEJ has new ten-element 144-Mc. beam. DNS has one consisting of sixteen elements, and is sporting a new homemade receiver for 144 Mc. CUU is new proxy of Meridian Club. QMQ, vice-president of Keesler Club and secretary of Gulf Coast Club, was appointed EC for Keesler Air Force Base. JHS has new power supply on ARC-5 and runs 100 watts. LAK made BPL for the second consecutive month. RDA, RGK, RHE, RHG, RIM, and RIO are new calls at Jackson. Those operating on 144 Mc. in Jackson are JTI, NLP, KTH, OYH, NIU, RDA, EYY, and ITL. Recent wind storm there was rough on antennas. It is reported PFC lost a good beam. Congrats to GHF, recently elected SCM of Louisiana. Traffic: (Apr.) W5LAK 1354, JHS 190, WZ 126, QYX 54, OMK 47, QMQ 22, ANP 10, DLA 4. (Mar.) W51GW 312, DEJ 12.

TENNESSEE — SCM, David G. Stewart, W4AFI — The 'phone and c.w. nets will remain active during the summer months on regular schedule. New appointments: GEH, LRE, and PSB as EC; IKG as new OPS; CXY and ONX as new ORS. NNJ made BPL again this month. BAQ is forming 28-Mc. mobile net. APC has closed for the summer. ETN is active on trunks and nets. NZG, LMJ, MDX, and PRG are building new transmitters. IKV is building new receiver. LMO and FQI moved to new QTH. FQI is sporting a new 28-Mc. beam. Welcome to CXY, back on 3.5 Mc. after ten years. AEE has new VFO for mobile rig. FLW is active on 50.5 Mc. nightly. LCB is working portable with 12-watter, OOA, fifteen years old, is the newest and youngest member of the 'phone net. MKB now has 132 countries on 28-Mc. 'phone and MB and AAW are trailing

closely. QT made DXCC and is on 28 and 14 Mc. now. New 28-Mc. emergency net now is active in Nashville. LUH is NCS and LJU is Alternate NCS. The net has nineteen members with ten mobile units and operates Wednesdays at 8:30 p.m. on 29.0 Mc. MJR completed new mobile-rig for 'phone and c.w. on 4 Mc. NDE and OJZ are chasing DX. NDE has started new mobile layout. LGG is on 14-Mc. c.w. chasing WAZ after making DXCC on 14- and 28-Mc. 'phone. BBL is on 4 Mc. occasionally. LMQ has new rotor for beam. MEB is experimenting with radio-controlled relays. Traffic: W4NNJ 554, APC 391, ETN 299, BAQ 158, NZG 141, ONX 42, CXY 28, AFI 27, FX 26, IKG 20, AEE 12, FLW 7, RDK 6.

GREAT LAKES DIVISION

KENTUCKY — SCM, Dr. Asa W. Adkins, W4KWO — CDA completed new 14-Mc. final, but hasn't tried it out yet. NIX works 7-Mc. DX between early A.M. schedules. OYI and PDW are active on MARS Net. ERH is changing from 304Tls to 810. Too hot in the shack, Ralph? YFA is considering KYN. New voices at Owensboro are NGN, who works at station WVJS and is active on 3.85 Mc. with a single 8005; and OYI, who is very active on 7 Mc. The latest news of LJO is that he is getting more power with a single 810 on 7 Mc. RFN, a brand-new ham from Whitesville with a Globe King, is active on 28 Mc. with a three-element beam and also is on 160-meter 'phone. Station activity cards will be sent on request. Originated message counts one, received message counts one, relayed message counts one, delivered message counts one. Put 'em up in this order, boys. Traffic: W6JQY 190, JSH 137, NIX 127, W7 77, MWX 47, CDA 43, IUY 35, MKJ 18, OYI 15, FKM 11, BXU 6.

MICHIGAN — SCM, Robert B. Cooper, W8AQA — Asst. SCM c.w., J. R. Beljan, 88CW. Asst. SCM U.P., Arthur Kohn, 8TTY. SLO: GJH. RMs/QMN: TRN, UKV. RM/8RN: NOH. PAM: YNG. The hospitalization of UKV brings the value of this RM sharply into focus and the heartfelt sympathy of the entire section goes to Dale along with the best wishes for his speedy recovery. A newcomer to amateur radio and especially the BPL column is EXZ, who scored very high in the CD Party. RJC also made BPL with a very fine total. TRN makes BPL on deliveries. DLZ reports the new assignment of "DC" as the Grand Rapids Club station call in place of "FWD." The DARA has a mimeographed letter entitled "Amateur Radio Stations and Interference to Television Receivers" that can be had by dropping a card to FX. This letter is highly recommended for those with TVI problems. Congratulations to the Straits Area Radio Club on its affiliation with AERL, as reported by CPY. IV did some fine work for the GREN as relay station during the public demonstration of amateur radio at the "Stadium" in Grand Rapids. AYW has a portable TVI-proof rig on 7 Mc. DAF is the new ORS appointment for this month and is running VFO on the QMN now. SWG is a new call in the nets and reports into QMN regularly. JUQ now is working the "BB" as NCS. QBO/ATB reports the illness of SYL and we hope he makes the grade to good health soon. DWB reports slow progress on the Straits Area Emergency Net and that FGM is a new call in Petoskey. CRE has a new "bug" and is showing how to really master the mechanical marvel. ENT has a 25-w.p.m. sticker for his "Code Proficiency Certificate." WVL has tamed his 807 and has the rig working very smoothly. ECH finds TVI a major problem to be solved before high power net activities can be resumed. YGS has a 30-w.p.m. Code Proficiency certificate. OAF is playing host to EKY, who has filled the log with 7-Mc. activity. MGQ is drilling and notching an aluminum panel for a 6-ft. cabinet in his spare time from convention activities work. TIC is developing a fool-proof system to eliminate TVI. Traffic: (Apr.) W8EXZ 625, RJC 604, NOH 416, TRN 374, IV 112, WLU 100, AYW 83, DAF 81, SWG 56, QBO 50, YKC 44, CLP 34, DWB 29, DOI 28, AQA 27, CRH 26, LR 24, CPY 23, YNG 17, ENT 16, UFH 13, FX 12, WVL 12, YNG 12, ZWM 12, EGI 11, YMO 11, SCW 6, YGS 6, ZBT 6, OAF 5, YAO 5, SWF 4, TTY 3, MGQ 2, EEF 1, NQ 1. (Mar.) W8SCW 49, DOI 36, CRH 19, COW 10, DLZ 8, CLP 3.

OHIO — SCM, Dr. Harold E. Stricker, W8WZ — Asst. SCMs, C. D. Hall, 8PUN, and Charles Lohner, 8RN. SEC: UPB. PAM: PUN. RMs: PMJ and DAE. The following new appointments have been made: DAE as RM; AL and SFI as ORS; GZ as OO; EDP as OPS; LBH as OES; WAB, AL, HRV, and DVH as ECs. That is a total of ten for the month and our section is increasing in numbers rapidly. At the last meeting of the Ohio Council of Radio Clubs the following officers were elected: ENH, chairman; PNY, vice-chairman; EQN, secy.; OAC, treas. The Ohio Council Net meets the first Tuesday of every month on 3860 kc. at 6:30 p.m. The Buckeye Net will meet only on Mondays, Wednesdays, and Fridays throughout the summer with DAE as Net Manager. From the R-F Carrier: LAX spoke at

the last meeting on "Break-in Keying Systems." The club sponsored a Hidden Transmitter Hunt June 2nd. ZOK has 119 countries confirmed on 28-Mc. 'phone. SREPCO has put out a 40-page ham directory of all Springfield, Dayton, and Miami Valley hams. The Spring Party was held on recently at Mickey's Barn. This also was made possible by SREPCO. From the Q-5: BMC has started the revival of 144-Mc. activity in Springfield. JRG has a new rig. EWU is a new member of the Springfield Club; JY and BZT were visitors at the last meeting. From the *Carascope*: The code and theory classes have an average attendance of 40 on meeting nights. WZK and YAM are spending their vacation in Michigan. Look for them after July 1st as /8. WRN reports a slowing of v.h.f. activity but the same boys, WAB, CPA, UZ, PDW, and ABO, are to be heard on almost every night. The YMCA sponsored a hobby show in Steubenville and SFI, from the Fort Steuben Radio Club, originated 94 messages as the Club had a portable rig at the affair. From the *Canton Amateur Radio Club Bulletin*: CARC voted life memberships to SQW and RQK. The 9 p.m. 28-Mc. net is rolling. The following are active: BML, CYZ, ETK, EAK, WNU, ACR, AHD, and TND. Look for them between 28,838 and 29,200 kc. ENH spoke at the last meeting of the Intercity Radio Club. At the March meeting of the Club SPF, our Director, gave an interesting account of his long experience in amateur radio. Mr. Brabb then presented a detailed explanation of the proposed new Section 12.0 of our communication laws. The meeting was opened to general discussion, with Mr. Brabb bringing out many interesting points as to the amateurs' legal rights. DAE made BPL again. ROX has just completed a 28-Mc. mobile rig. NAF, formerly of Mt. Vernon, is back in Dayton. DGG is building a new rig with 829Bs in final and 815 modulators. BFH reports the Rubber City Net (Akron) operates each Tuesday at 3624 kc. JRG reports five new hams in Springfield. AQ says that CD Contests are getting tougher and tougher. OUR is operating in BN, OEC, and MARS. GZ is holding foreign schedules in addition to his OO work. LBH worked WM on 220 Mc., a distance of 35 miles. DAE is working BN, SRN, ESN, and WIOS and states that TLAP has closed for the summer. THJ is 3.85-, 14-, and 28-Mc. mobile. BZX reports that the Piqua Radio Club will handle messages at the Hetcher Centennial in July. EYE demonstrated amateur gear to Boy Scouts at a meeting. TRX is curtailed by TVI VFO trouble. Worked our old friends W7UJ, formerly UJ, and KP4UW, formerly UW. They send 73 to the gang. Nice weather is here and some of you will have little activity on the ham bands, so kick in your reports and I will try to kick out the dope. Traffic: W8DAE 39, UPB 267, SFI 160, ZJM 137, CBI 119, WE 71, WAB 49, QLE 31, AL 28, EQN 27, GZ 25, RN 23, YFJ 23, DXO 18, TAQ 18, PMJ 16, HX 14, OUR 12, BFH 7, BZX 4, ROX 4, WZ 4, AQ 2, LHX 2.

HUDSON DIVISION

EASTERN NEW YORK — SCM, Fred Skinner, W2EQD — SEC: CLL, BSH made BPL. Congratulations, George! GYV is building new 50-Mc. exciter. GSB made WAB. SARA handled traffic from Schenectady Hobby Show. QUJ is in France and would like to hear from the gang. His address is 46, Avenue de Breteuil, Paris VII. SARA was started over twenty years ago. Any older clubs in the section? NYS Net operates on 3720 kc. at 7:30 p.m. EDST week-days during the summer, followed by NYSS Net at 8:00 p.m. JZK was appointed Asst. EC for Schenectady. Traffic: W2BSH 563, PEO 210, TYC 198, PHO 113, GYV 5.

NEW YORK CITY AND LONG ISLAND — SCM, George V. Cooke, W20BU — SEC: BYF, RM; TYU, PAM: GSC. The Tu-Boro AEC net, IAG as EC, on 29,520 kc., now has 9 members and is trying in with 3.5-Mc. c.w. AEC and NLI traffic nets. More mobile 28-Mc. operators are desired for complete coverage of Brooklyn, Queens and Nassau. WHB, EC for Manhattan and Bronx, has resigned because of his entrance into M.I.T. KTF, EC for Baldwin, Rockville Center, and Freeport, reports WFL, BOY, SMQ, OWP, CLG, UCB, and QFH are QNIing into the Nassau 80-meter c.w. AEC net on 3600 kc. Mondays and 3710 kc. Fridays. LGK has been appointed Assistant EC for Northern Queens 80-meter c.w. AEC liaison with 2-meter Northern Queens Net. The Northern Queens 2-meter Net meets at 2100 EDST Mondays. The Southern Queens 2-meter AEC Net, with NZJ as EC, added NAX, OWO, ZXQ, LOS, and CCM as new members, operating on 146.003 Mc. All these members have received sets of crystals for spot work on the net frequency. YKM and ECR put up 40' towers for better coverage on Nassau AEC 2-meter Net. YSL built emergency portable gear for 3.5 and 3.85 Mc. The Huntington Radio Club activated its AEC program by setting up emergency gear in local Red Cross stations in Northern Suffolk, conducting drills and attaining new members. The NLI Traffic Net is operating on 3710 kc. Mondays through Fridays at

1900 and 2200 will curtail operations to Mondays, Wednesdays, and Fridays at 1900 until full operations are resumed Sept. 5th. GSC has been appointed PAM and promises active 'phone net build-up. OPS appointments are needed to help Stan get his program going. The Federation of Long Island Radio Clubs announces some changes in officers as follows: FNI, pres.; ESZ, vice-pres.; AVI, treas.; JSV, secy.; and TZU, asst. secy. EC, Manager of TLAP, states that TLAP has closed for the summer and will resume full operation Sept. 23rd. The Amateur Radio Society of Queens celebrated its first anniversary, and under the call CGK operates on 144 Mc. Of 19 members they boast 15 teenagers. The Jamaica U.H.F. Club received VYM as its official call. DKH, OKX, CIEP, and OTA are very active on 420 Mc. IBL built new Clamp-Tube modulator and is working 28 Mc. CLA, former Director of the Hudson Division, has been appointed OO, Class III and IV. ZRR is OO, Class IV. VSU, now OBS on 7 Mc., received ORS renewal. RVL has been appointed OBS for 160 meters. DKO, a new ham in Manhattan, got on with the help of Empire City Club members. PZE is running 4-125A final on all bands. CSO comes up with a DX report of 182 countries worked with 155 confirmed, and 40 zones with 39 confirmed. BQP and ZOT are organizing the Sewanhaka High School Amateur Club and have started code and theory classes. The group has an AKT-13 on the air with the school call ZOT. TUK finished 144-Mc. mobile rig and expects lots of 144- and 3.85-Mc. 'phone from the car. VBT passed his Class A exam and now is on 3.85 Mc. with 40 watts. YIH worked VU2CL, Bombay, on 7 Mc. with 40 watts. DRD, CEV, and OO are the latest additions to NLI Traffic Net. YDG received Class A ticket and worked four contacts on 3.85 Mc. in the last CD Party. PF installed National TV 16" and tested against 32V-2, and reports no TVI on any channel, c.w. or 'phone, and no LP filter in the transmitter. KYN, Knickerbocker Radio Club received the call A2WYP in MARS Net and liaisons with local NLI and NYSS Nets. SQB made Class I OO. Traffic: W2BO 372, WHB 272, OAF 269, ZDE 249, EC 162, DRD 155, KYN 155, YDG 121, OBU 109, A2WYP/WZKYN 102, W2OUT 80, SJC 63, JBQ 48, VSU 28, ZKJ 28, BGO 25, CSO 24, BSO 21, CEV 16, MQB 15, ZRR 14, PF 12, TUK 3, LGK 2, VBT 2.

NORTHERN NEW JERSEY — SCM, Thomas J. Lydon, W2ANW — NJS, the new slow speed traffic net, is going forward by leaps and bounds. It now has a membership of over forty. All interested in joining up should get in touch with the RM, UWK. Bill sure did a fine job with the *NJS News Bulletin*, a three-page job with lots of current news. The NNJRA reports two new members, BGI and GYE. The Raritan Valley Radio Club, operating under QW, has a typical "Podunk Hollow" club house at Middlebush — in the woods and complete with annex. GPV is on 14-Mc. c.w. BAI, Middlesex County EC, has lined up local boys on 3.5-Mc. c.w. and 144-Mc. 'phone. OXL is rebuilding. BZJ is commanding officer of V.E.W.C. JKH has joined the 3.85-Mc. 'phone net. ZEP is active again. This month lists the largest traffic report in many a month. NIY attended the Telephone Company banquet in Albany. EBK's son is DXU. BFP has a new rig on the air, VYB, having licked TVI, is on in the evenings again. DJT is knocking off plenty of new countries so should be DXCC before long. HXU, ADP, and AGU can be heard regularly on 14 Mc. working DX. 2-meter teletype was demonstrated at Alumni Day at Stevens Inst. of Tech. on May 20. BSC also operated with three transmitters and twelve operators. Traffic: W2CUI 185, CGG 179, NKD 159, LMB 130, NCY 105, UWK 91, JUC 37, NOZ 26, NIY 22, AWY 21, WCL 20, YSP 20, CCS 19, CFB 17, OXL 15, DZA 12, BZJ 10, DIB 6, NUL 6, YOB 6, CJX 4, PXR 4, VYB 2, EWZ 1, ZEP 1.

MIDWEST DIVISION

IOWA — SCM, William G. Davis, W0PP — For the first time since I've been your SCM, HMM has been nudged off the top seat for traffic handling. It took an ice storm, but JAD did it this month. At 6:00 a.m. Apr. 9th JAD was called to assist the Chicago & Northwestern Railroad in establishing communications as the Railroad's system was out because of ice conditions. The Iowa boys responded and conducted themselves in the usual commendable manner. Those that did not directly function in the handling of emergency traffic stood by and assisted in keeping a frequency open for those involved. It seems that the Iowa gang is ready for any emergency and always receives the best of cooperation from the boys in surrounding sections. We were sorry to learn that QVA had a bad fall which incapacitated him for a time. QAO steadily is climbing toward BPL. ACW now is a resident of Omaha. ZFO has a new modulator. FP now has his Emergency Corps all set up for 1950 with 33 members. A few of the boys dropped out and a few were added with a net loss of five members to the EC. If anyone who did not renew will contact Tom he can be reinstated. It seems the editors of the two Iowa club papers I receive,

i.e. Sparks and Splatter, share the SCM's difficulty in getting news, judging from their comments. Fellows, I request your cooperation in getting the news to me. Traffic: W6JAD 1639, HMM 685, QAO 366, SCA 264, QVA 201, NYX 173, SWD 86, ZFO 22.

KANSAS — SCM, Earl N. Johnston, W0ICV — AHW participated in K.U. Engineering Exposition. A VHF-152 has been added to the station equipment. K0NBL is new NROTC station at K.U. and runs kw. on c.w. and 700 watts on 14 to 3.5 Mc. AOD and AEU have new 28-Mc. mobiles. OAG advises there are no cases of TVI in Leavenworth. IJK has moved to Denver. TDW now is an MARS station and reports into the 10th Air Force Western Net. KPJ is schooling in K.C. YGP has new Meissner Signal Shifter. EDW is going mobile. QQQ is planning a Kansas State graduates' frequency meeting once a month. SQL gave KSRC a talk on parasites and how to cure them. Central Kansas Radio Club activities center about the higher frequencies with MVG, JFE, INW, and PKD on 50 and 144 Mc. Signals on 144 Mc. are getting into Abilene and Olmitz FB. INW has a new tower and beam for 144 Mc. ZVD is using supermodulation on 28 Mc. ZNV is using n.f.m. on 28 Mc. ATS is a new ticket in Salina. YBC and ATS are mobile on 28 Mc. Officers of the Hutchinson Amateur Radio Club are KRV, pres.; BO, vice-pres.; IUL, secy.; DJE, act. mgr. JUF has a kw. rig with 100THs on 3.85 and 14 Mc. DJE runs 500 watts to 100THs on 14-Mc. c.w. and 3.85-Mc. 'phone. CED reports that the Garden City Amateur Radio Club is organizing for AEC work. CED is new EC for Zone 22. Traffic: W6WGM 184, OAG 180, SKF 86, NLY 83, FD 69, KRK 50, AHW 43, TDW 34, IPI 24, ICV 17, FRK 16, CQO 10, DJE 6, LIX 6, TVU 6, BNU 3, KXL 2.

MISSOURI — SCM, Ben H. Wendt, W0ICD — A simulated emergency drill was conducted by the Bluff Amateur Radio Society in which a BC-459 and an SX-25 were used on 7-Mc. c.w. and a Harvey 80-T and an SX-43 were used on 3.85-Mc. 'phone and 7- and 14-Mc. c.w. The power to operate the gear was received from a 3-kw. emergency gas generator. ZAO prepared an FB paper on BCI and TVI for presentation at the Bluff Society. The HARC held an enjoyable spring party with many out-of-town guests present. The gang at Rolla hopes to have a flourishing club in that area soon. PLJ has just found out that 144 Mc. is a lot of fun. DU worked ACNC for his WAZ. Ray has 191 countries to his credit to date. CMC has a radio class going at Orreilly V. A. Hospital. OJD's present antenna is an end-fed which looks like a "J" and seems to work OK. New outlets are being solicited by MON because the closing of school leaves some areas without outlets. The Show Me Net requests MON members to QNI during periods that MON is not active. TLY has been appointed Assistant SCM. He can be contacted on the c.w. nets of the section for traffic headed for the SCM. At present TLY is being occupied by building a better rig for 3.5-Mc. a.c. LSA and DEQ are the proud possessors of Class A tickets. After participating in the last CD Party, KIK wonders why more appointments do not participate. NNH is moving up in frequency since the QRN gremlin is taking over on 3755 kc. AGB has QSY'ed to Michigan. PME has added a 'scope, a Q5-er, and has converted the NR-19 rig to operate on 115-volt a.c. LSA has a new kw. rig operating on all bands, c.w. and 'phone. AXL has a new Gon-Set 3-10 converter. SOM has a new three-element beam. OMG is remodeling to combat TVI. Traffic: W6QXO 512, CGZ 330, RYG 195, WAP 97, KIK 70, OUD 67, DEA 12, SOM 10, QMF 5, TLY 5, NNH 4, ICD 2.

NEBRASKA — SCM, Scott E. Davison, W0EOD — FFA is now radio operator at KSUM at Fairmont, Minn. The Ak-Sar-Ben Club held an FB "Social Night" at the Birchwood club. AIN now is Naval Reserve station N9WAY. AY is completing buffer and modulator for new 'phone rig. JDJ is sporting new A ticket. The Hastings Club bought grid-dip meter for club use. The Pioneer Club purchased new heavy-duty a.c. generator for emergency unit. CMO is fixing up emergency rig. TIP reports all-band mobile installation. New officers of the QRM Club are WBE, pres.; WGB, vice-pres.; Joe Foster, secy.; HXH, treas.; and JDJ, act. mgr. GJL has 616 final. The following were issued certificates in the 160 Emergency Net: FMW, IDR, KBR, TIF, YSK, YWK, GHM, MJY, YLC, ZJF, AGE, HYR, MTI, TIP, VQR, and K0NBJ. We regret to report the death of ex-9VKG, who passed away in Arkansas. UVZ can be heard on 28 Mc. from Fremont. GMZ added Select-O-Ject to his NC-240D. KJP reports 3.85-Mc. 'phone night net cancelled for the summer months. FAM is back "in the saddle" after antenna trouble. DMY puts out one of the nicest fists on the air with his electronic key. FAM and AY are new ORS. TQD is back on the air. DEA and his XYL and OED visited the QRM Club at Lincoln recently. APK is a new call in Omaha. NNW is TVI-ing his 28-Mc. kw. QHK and JJK are working on 420-Mc. rigs. XQR and HZE attended IRE demonstration in Lincoln. Traffic: (Apr.) W6KJP 165, FMW 74, IXL 39, FAM 33, DMY 17, LJO 12, TIP 10, CMO 4. (Mar.) W6FMW 100, GMZ 7.

NEW ENGLAND DIVISION

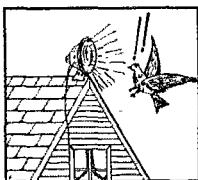
CONNECTICUT — SCM, Walter L. Glover, W1VB — The Amateur Radio Emergency Corps of Norwalk now is officially affiliated with ARRL. KYQ, after an absence of

nine years, has been appointed EC for Bristol and again is active in the nets. FOB is new OPS. NJM has raised power to 450 watts. NBP has a complete emergency mobile truck in operation with two transmitters, two receivers, and other gear. DJV reports a new FB hilltop JJK location. The SARC is conducting theory classes with JBK in charge, and code classes under NZM. CARA visited SARA, one night recently. XU is making schedules for radio chess matches for the benefit of the Yale Chess Club. ODW managed to find time to get into the CD Party. LKF has turned over the management of CRN to STU and KZA. LKP advises that 29,680 kc. crystals are being distributed to ECs for mobile operation on the section emergency frequency. Pete has been running around the State getting things organized for the new State Police set-up. The regular spring meeting of the Connecticut Net was held on May 13th at AW. The attendance was probably the best ever, and included members of CN, CTN, CPN, and ECs. Summer operation was discussed, and it was decided to continue all schedules throughout the summer as far as possible with a rearrangement of NCS stations, etc., effective June 1st, continuing until Sept. 15th, when the regular winter schedule again will be resumed. HYF resigned as "ye scribe." Rog certainly rates a big vote of thanks for all his time spent on this job. QVF is continuing the bulletin for another year. From all reports it might be said that the section has just concluded one of its best winter seasons in activity, traffic, and emergency matters, and your SCM wishes to extend his appreciation to all those who have helped to keep the ball rolling. Traffic: (Apr.) W1NJM 354, KUO 244, KV 225, BDI 142, DAV 122, BYB 104, LV 85, ORP 84, CTI 72, QIS 59, HYF 56, BIH 29, VW 16, GVK 11, KYQ 7, YU 6, DJV 3. (Mar.) W1BH 21.

MAINE — SCM, Manley W. Haskell, W1VV — Pine Tree Net: 3550 kc., 1900, Mon., Wed., Fri., summer schedule. RM NGV. Sea Gull Net: 3961 kc., off for the summer, traffic will be handled at 1700 by stations present, PAM FBI, New RM, NGV, ably coached by NXX, former RM, is doing a bang-up job. NGV made BPL three times during the last year. NXX is taking a well-deserved rest after a long period of c.w. traffic supervision for Maine. QUA, former SEC, made BPL for April with 64 deliveries. He runs 8 watts to the final. OTM is a new OPS. RQR is a new ORS, and SFZ is both OO and OBS. The Second Annual Portland Hamfest will be held July 29th in the Hotel Eastland, Portland. Registration is free and will start at 11 A.M. The tickets are \$3.50 each. Deadline for mailing of tickets is seventy-two hours prior to the hamfest. Address all orders to Manley W. Haskell, 15 Hemlock Street, Portland, Maine, and make checks and money orders out to the same. Do not send cash as we are not responsible for it. RPT, RUO, and RJQ have received their Class A tickets, with all but RJQ already on 3.85 Mc. The Auburn Radio Club has new rooms at old transmitter house of WLAM and also use of the tower for antennas. RUO reports a new club in his section, with the quarters formerly used by the Naval Reserve. Traffic: (Apr.) W1YA 314, NGV 241, QUA 192, ROM 97, LRG 92, LKP 72, VV 71, NXX 53. (Mar.) W1NXX 33, OTM 33, RQR 31, PTL 29, SFZ 26, FBZ 22, AFT 14, IGW 12, AMR 5, GJK 4, JTH 4, IXC 2, RJQ 2.

EASTERN MASSACHUSETTS — SCM, Frank L. Baker, Jr. W1ALP — The following have had their appointments endorsed: As ECs, QNJ, PZ, BKR, and NSP. As OPs, PZ and KBJ. As ORS, WU and OJM. As OOs, OJM and BGW. SS now is an OPS. PDG has taken over as EC for Norwood. We are sorry to have to report the death of AEC of Fairhaven. RP had his third baby. YL IPC, in Swampscott, is on 144 Mc. HNV is on 3.85-Mc. 'phone. KFX, in Braintree, is on 144 Mc. FOX, in Taunton, is on 3.85-Mc. 'phone. GWC is on 28 Mc. Others on 144 Mc. are QW and RAL, in Methuen; KLO, in Randolph. VX is on 144 and 28 Mc. SLX is a policeman. We hope GM feels better after his operation. SNK, in Cohasset, has an 829 on 144 Mc. and also is on 50 Mc. This is a challenge to some of the gang on 50 Mc. How about some news for this column? IXD says he will be on the air again in the fall. The South Shore Amateur Radio Club has elected QMD, pres.; DDO and AKY, vice-pres.; QOI, secy.; RTW, treas. The Norfolk County Radio Club held its annual banquet and elected the following officers: CQN, pres.; NOV, vice-pres.; ORY, secy.; AYI, treas. SUU is a new ham with a 325-watt rig, three-element beam on 81-ft. tower. NBN has new SX-71 receiver ordered. NNG will have mobile rig in his car. MNQ now is a landowner. RLF is building 300-watt rig. Bill Maguire, of Sylvania, was speaker at the Merrimack Valley Amateur Radio Club meeting. SNZ's XYL is remodeling the shack. SNZ handled some urgent traffic from W6 to Alabama by 'phone back to W5 and then to W6. STX is a new ham in West Roxbury and is going to Bowdoin College in Maine. Doc Crosby, formerly DDM, in Chatham, writes that he has a new call, QP. OJM writes that he has been commuting between Wright Field and Washington, D. C., and hopes to be home soon. MRQ is very busy with no time for radio. The Brockton Radio Club had a demonstration on audio amplifiers, and also held an auction. WU is building a new antenna tuner. The Framingham Radio Club and South Shore Club went out on Field Day. MEG, ATP, and HVP will be on 420 Mc. soon. DFS is Navy Coordinator at

(Continued on page 74)



Now that the Select-O-Ject, a very versatile accessory, has had some measure of distribution and some of the users have had a chance to voice their reactions, we are indeed gratified with the results. The only point of general comment that needs explanation is the "Reject-Boost" control in boost position. Apparently most users expect the entire audio spectrum to be boosted simultaneously, which it is not. (This could be done merely by turning up the audio gain control on the receiver.) Instead, the general level of the audio background is attenuated about 20 db, and the one frequency selected for boosting is boosted about 15 db. As you can readily see, this results in a net boost of 35 db to the selected frequency! Since it is a single audio frequency that is boosted, we assume that this feature will have little use for the "phone" boys, but the brass pounders can really use it to advantage.

Some of the more unconventional uses to which the SOJ can be put are as follows:

1. As a C.W. oscillator on the VHF bands. It can be fed into a modulation driver and keyed for MCW. Binding posts on the back of the SOJ provide an easy means of connecting in a key. Because of the variable pitch arrangement, its pitch can be made to correspond to that of an audio filter in a receiver.

2. As a means of generating 10 kc. carrier for a SSSC exciter, when using an SSSC filter such as the National Type F-22.

3. As a means of supplying the two standard audio frequencies for teletype operation, using two SOJ units.

4. As an oscillator to supply variable frequency audio voltage to measure the fidelity of an audio amplifier or modulator.

5. As an easy means of checking loud speaker response, when used in conjunction with a suitable amplifier.

6. As a means of driving away dogs and pigeons without annoying the neighbors!!

(This last use is highly experimental and may require a few minor changes in the circuit to include super-sonic range.)

We have probably just scratched the surface of its possible uses and would be interested in any unusual uses you may have found for it.

W. W. BARTELL, W1PIJ



Somerville and would like local hams to contact him. The call is K1NRS. KJK is handling a lot of traffic. The Quantawort Radio Assn. held a meeting at the Boston Navy Yard. 2BYE gave a talk at the South Shore Club on "The Future of Ham Radio." BGH has gone back to 807 in his 3.85-Mc. rig. The T-9 Radio Club will hold a meeting at HMC's shack with an election of officers. ZR moves back to Nonquitt for the summer. BB is busy making beam tests with the help of local hams on 28 Mc. May QST reported EH as being a CAP call. This report was in error — EK has the CAP call. Traffic: W1RXT 234, EMG 207, LM 186, TU 148, QJW 115, PU 102, SS 100, ZR 73, KJK 55, BB 24, DMS 17, DBO 14, NWL 14, MDU 11, WU 6, HWE 2.

WESTERN MASSACHUSETTS — SCM, Prentiss M. Bailey, W1AZW — SEC: UD, RM: BVR. Net frequency: 3725 kc. Mon., Wed., and Fri. 7 p.m. Now that we have struggled through a couple of hobby shows we will try to get down to business. The PRC and HCRC participated in hobby shows in their respective cities. Plenty of traffic was originated by JYH and OSA and all in all things went well. The Pittsfield Radio Club was alerted for emergency service during a local forest fire. RZG received Class A ticket. JYH had a visit from AXA. BDV is looking forward to his York Beach vacation again this year. BVR received his Class A ticket and has started working on a 40-watt modulator. IMF had a siege of pneumonia. QJN is getting new TBS-50B. A new ham is SZW. RIA received Class A license. MVF operates at K1NRRU, as well as reporting regularly in WMN. MVF is new ORS. MUN has been traveling during the month. RHU now is OO. Russ has 15-watt 3.85-Mc. phone now. EOB has been busy with DX and traffic; he now has 130 countries with 95 confirmed. NY renewed EC appointment. BVR renewed ORS, EC, and RM appointments. SIT reports into WMN occasionally. RDR had 28-Mc. transmitter at Springfield Hobby Show. MOK renewed EC appointment. Thanks to all who helped clear the hobby show traffic. Please note the change in weekly traffic net schedule. Traffic: (Apr.) W1EOB 387, RHU 94, BVR 78, RZG 23, BDV 16, MOK 10, AZW 9, GJV 6, MVF 4. (Mar.) W1MVF 15.

NEW HAMPSHIRE — Acting SCM, Clifton R. Wilkinson, W1CRW — RM: CRW. The NHN now is on summer schedule; Monday, Wednesday, and Friday at 7 p.m. EDST. CRW is busy in new business venture, and late getting into nets. EWF reports he is off the air moving his equipment to new attic room. POK has been doing lots of rag-chewing and DX on 7 Mc. PPU will not be very active for rest of the summer as vacations change his working hours. Wats was NCS for 1RN one night a week. QGU is back in Snowville and will report in NHN. QJX, our Manchester outlet, is doing a fine job. SAL handled the NHN while CRW was off and did it like a veteran. NMB reports the Nashua Mike and Key Club building should be finished this year. He expects to be back on the air soon. RFP is on the air with more power. Monthly reports are few. How about a little help, gang? I think it would be nice to have a get-together for the NHN gang. Anybody got any ideas? Traffic: W1CRW 71, PPU 59, SAL 51, QJX 22, RFP 6.

RHODE ISLAND — SCM, Roy B. Fuller, W1CJH — RM: BTV. PAM: BFB. The RIN summer schedule will be Monday, Wednesday, and Friday at 1900 on 3540 kc. NCS in order will be HLY, BBN, and BTV. KMC, the club station of Kingston College, is active on all bands. KNE and LWA designed identical transmitters for use on Field Day so that in case of failure there would be ease of interchangeability. QLD has designed a battery-powered transmitter-receiver for 3.5-Mc. emergency work. Several hams have used it as a prototype for building theirs. QLD will gladly furnish details if you want something for a stand-by outfit. NAARO has had several contacts with the National Red Cross station in Washington. Officers of the local Red Cross and National Red Cross have gotten together this way, and opinion has it that the amateur cause has not suffered by making these contacts possible. BBN is the Wednesday representative on EAN. QR is QRT for the summer but will be back with the traffic net next fall. Traffic: W1BBN 147, BTV 112, QR 53, CJH 10.

VERMONT — SCM, Burtis W. Dean, W1NLO — SEC: JEN, RM: KRV, PAM: PZX. The Tri-County Amateur Radio Club has been organized in Brattleboro with PFS, pres.; AZV, vice-pres.; MVX, secy.; Vito Rizzi, treas.; SDG, act. mgr.; CGV, chairman of tech. committee. NLO attended display of ham equipment by the club at the Hobby Show in Brattleboro Apr. 29th. KJG visited BJP, RLS, and RWX. SVT is Phil Drake of Derby. RWX has Millen VHF transmitter and NC-183. At the College of Technology Open House at UVM, 83 messages were handled. Messages originated over 1LVP/1 with AXN, JEN, NLO, OKH, PIT, QVS, and RQT taking part in relaying. MMN and OAK have extended an invitation to members of the VTN and their families to attend a picnic at their QTH in Orange, Sunday, July 16th. AEC meetings have been held at OGW and IDM with your SCM in attendance. Traffic: W1IT 51, JEN 49, RNZ 34, ELJ 33, OAK 29, RNA 15, AXN 4.

NORTHWESTERN DIVISION

IDAHO — SCM, Alan K. Ross, W1WU — Lewiston: A nice letter was received from EC FRM. KRLC Station Manager Thomas gave the club \$50 towards a Harvey

Wells TBS-50 transmitter. The rig has been purchased for club and emergency use. Moscow: Another nice letter outlining emergency set-up was received from EC ELH. 28-Mc. mobiles are GGH, LNB, and NGI near Troy, with ELH on both 3.85 and 28 Mc. GHT sends in the following news: MRL will attend Washington U. Medical School, St. Louis, Mo., next fall. 2MRL/7 is bothering HME with key clicks. BVK cleared up clik trouble on his 7-Mc. kw. BVK also is in the racing-boat business. OLA, a newcomer, is on 28-Mc. mobile. Boise: LNZ, from Spokane, now is working Boise with USBR and has 3.85- and 28-Mc. mobile. The Boise 28-Mc. mobile gang is playing hound and here now. Let's have some news from the Magic Valley area. Traffic: W7EMT 89, GHT 38, IWU 21, NH 14, BDL 12.

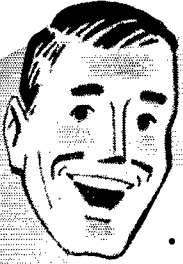
MONTANA — SCM, Fred B. Tintinger, W7EGN — New officers of the Gallatin Valley Amateur Radio Club are NUS, pres.; ED, vice-pres.; MHQ, secy.; and LTT, act. mgr. New call in Bozeman is OIQ. IXL and OIQ are working on 144-Mc. gear and also have interested NKE in Big Timer. Flying saucers in Missoula turned out to be a vertical balloon ham antenna. A new call in Missoula is OHH and can be heard on 3.5- and 7-Mc. c.w. BQP, in Anaconda, won the first printed-on-copper certificate for being the first out-of-town station to QSO six Butte stations. JFR, EC for Butte, is putting on a drive for a bigger and better AEC unit. New calls in Butte are OIO and OIP. The Billings Club has applied for club call letters. The Glacier Radio Club is asking for support and opinions from other radio clubs in its effort to introduce a bill in U. S. Congress requiring manufacturers of electrical equipment to filter their products for noise radiation before leaving the assembly line. Traffic: W7KGJ 112, CT 44, EGN 28.

OREGON — SCM, J. E. Roden, W7MQ — Astoria: FNX reports the local radio club meets in an FB shack at the local airport. Aurora: GZW will have mobile on 3.85 Mc. HRR is new from Vancouver, Wash. Bend: HHH reports CNA will be back on the air soon. Coos Bay: EJJ and his gang were well represented at the Portland Convention. WL is new president of OARA. Eugene: UJ reports HPS has completed a five-element 28-Mc. beam. MZK is new treasurer of Valley Radio Club, Grants Pass: RTA reports MGO has plans for high power and more DX. LWV keeps his mobile busy by visiting the Ashland and Medford Clubs frequently. Ashland: KTG is new check-in on OEN phone net. Klamath Falls: MYI is making plans for a kw. to help keep the OSN frequency, 3585 kc., free of QRM. La Grande: KVG is ready to install new rhombic for additional DX on 14-Mc. c.w. Medford: FMQ has joined Silent Keys after a short illness. OJA is doing a good job as jump station from OSN c.w. net. North Bend: New officers of the Southwestern Oregon Amateur Radio Club are HHO, pres.; IF, vice-pres.; ODA, secy.; HQE, treas.; NBW, publicity. Nehalem: HNR is new OPS. Portland: WJ is new PAM Manager. FU is new OO. Class I, EX is new OES. DHX is new OBS. The Dalles: EQI is new EC for this area. Traffic: W7WJ 1851, GWE 377, MQ 151, AJN 146, LT 119, MTW 105, ESJ 92, IIV 83, APF 77, HDN 76, GNJ 63, GXO 63, HLF 57, FY 40, FRT 38, KL 33, MYI 33, NOB 33, ODA 31, ADX 19, NOJ 19, DHX 18, AZK 14, BDN 14, BSY 13, NQD 12, JPM 9, KTF 5, JOG 4, NGG 3.

WASHINGTON — SCM, Lawrence Sebring, W7CZY — SEC: KAA. RM: JJK. PAM: CKT. OEB now has a 25-w.p.m. certificate. ATW is working some nice DX on 7 Mc. JJK and MTX are working 144 Mc. with BC-625s. KCU still is the top non-fair traffic originator of the nation. ZU is concentrating on painting his "yacht." ACF is practicing using smoke signals so that he will be ready the next time his rig blows up. LVB has a nice emergency rig with 6SN7 receiver and 6L6 transmitter. AXT handles traffic on WSN and WARTS. FIX has a new Ford and took a vacation. DRA is looking for a place to set up a business. JZR is experimenting on 430 Mc. NWP has a new S-40A receiver. KAA got his Class A ticket. LJM put his rig in a cabinet to help eliminate TVI. KTL is rebuilding his house and a 28-Mc. beam. OWN has more time for radio now that the bowling season is over. ETO is planning the WSN picnic to be held in Stevens Pass this summer. JC is working DX. IOQ handles more overseas phone patches than "Ma Bell." EVW is on 430 Mc. with an SCR-645 and APQ9. AFS checks in on WSN when not busy at the bank. The Skagit Amateur Radio Club has a fine bulletin printed twice a month. The editor is MVH. Club officers are JBH, pres. LFA and LTQ, vice-pres.; MGG, secy.-treas.; MVH, EC. KGV is with the USCG survey. The National ARRL Convention will be held in Seattle in 1951. Start planning now on being there. RT is the acting manager and promises that it will be the biggest thing yet. The AEC, under the leadership of KAA, is growing by leaps and bounds. If you are not a full or supporting member see your local Emergency Co-ordinator and sign up now. It does not cost you a cent and you do not have to be a member of the ARRL to belong. If there is no EC in your community drop a line to KAA. Please send in your activity reports on the first of the month to the SCM. DDQ is new OO. OJ is EC for Port Angeles. Traffic: (Apr.) W7CZY 2636, JJK 429, KCU 273, FIX 234, MTX 140, JZR 115, IOQ 101, ZU 72, ACA 34, LVB 31, DRA 29, ETO 23, AXT 22, NWP 19, KAA 15, KTL 14, LJM 14, AFS 12, CWN 8. (Mar.) W7IOQ 428, AXT 12, EVW 5, KTL 5.

(Continued on page 78)

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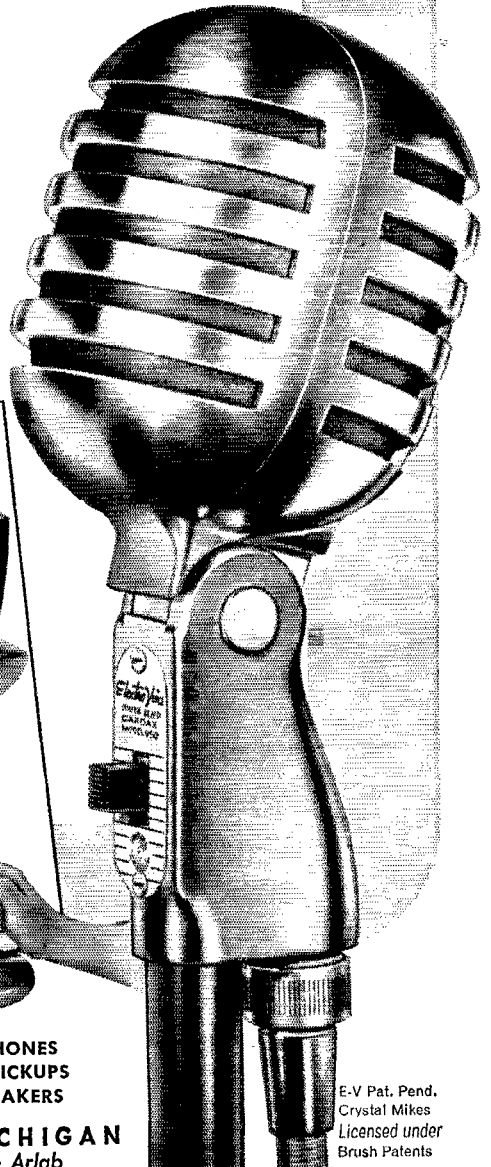
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... with performance and control facilities advanced, for the amateur, to the present frontiers of the art.

The new 75A-2 double-conversion superheterodyne is a development and refinement of the now famous 75A-1, basic design features of which have been retained. The sensational stability, calibration accuracy and sensitivity so highly praised by present Collins owners are also retained and enhanced in the 75A-2.

In addition, the 75A-2 provides the greatly improved degree of selectivity that is a must for operation in the amateur bands today.

For your better acquaintance with the 75A-2, here are its new features:

Drum Type Dial with vernier, both actuated simultaneously by the single tuning control. The slide rule dial is calibrated directly in one-tenth megacycles, the vernier dial at one-kilocycle intervals on all bands, except on 11 and 10, where it is two kilocycles. A zero set control is on the front panel. The new Collins type escutcheon is similar to that on the Collins 51J communication receiver.

160 Meter Band Added. Besides the additional coverage, this provides another check-point with WWV at 2.5 mc. Total coverage includes the 160, 80, 40, 20, 15, 11 and 10 meter bands.

Separate CW Noise Limiter Added, really effective on CW. Shunt type, following output of first audio amplifier. Front panel control.

15 Miniature Tubes and rectifier (two more than the 75A-1). The 75A-2 tube line-up: 6AK5 RF amplifier, 6BE6 HF mixer, 12AT7 crystal oscillator, 6BE6 LF mixer, 6BA6 VFO, 6C4 VFO, three 6BA6 IF amplifiers, 6AL5 AVC — detector — audio detector, 6BA6 BFO, 6AL5 noise limiter, 12AX7 AVC amplifier — audio amplifier, 6AL5 CW noise limiter, 6AQ5 power amplifier, and a 5Y3 power rectifier.

Accessories Available are the new Collins 8-R-1 100 KC crystal calibrator and the new Collins 148C-1 NBFM adapter. Controls are provided on the front panel for both of these accessories, and both plug into sockets which have been added on the top of the chassis, inside the cabinet. No wiring or soldering is needed.

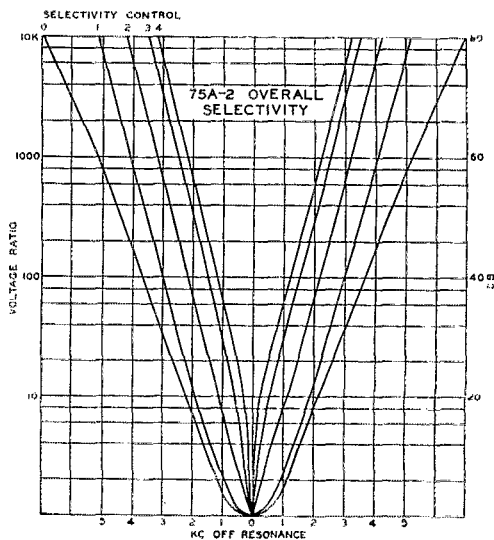
Antenna Trimmer Added, with front panel control. This trimmer corrects the tuning of the r-f stage grid circuit for detuning caused by the antenna; enables you to maintain peak efficiency.

Greatly Improved Selectivity is provided by nine tuned circuits at 455 KC i-f, plus an improved crystal filter. The selectivity of the crystal filter is variable in 5 steps by front panel control. The bandwidth in the broad position is approximately 2.4 KC at 6 db down, and 10.5 KC at 60 db down. In the sharpest position the bandwidth is approximately 200 cycles at 6 db down and 4.6 KC at 60 db down.

When this receiver is tuned the increased skirt selectivity is instantly apparent. There are interference-free holes in the crowded phone bands. High pitched heterodynes are practically eliminated. This leaves the phasing control free for use in eliminating low-pitched heterodynes — an extremely useful feature in both CW and phone operation. The range of the phasing control notch has been extended downward to approximately 200 cps.

Input Impedance is designed to a nominal value of 75 ohms, balanced or unbalanced, the actual value being between 50 and 150 ohms over the entire range of the receiver. This permits advantage to be taken of the low noise pickup of coaxial transmission lines. The popular two-wire moulded transmission lines also may be used. Mounting holes are provided for installing a standard coaxial connector on the rear of the chassis.

BFO injection is designed for optimum reduction of heterodynes between incoming signals — a



new Collins 75A-2



After giving the new 75A-2 a thorough workout, our severest critic, Art Collins WØCXX, said: "It's a hot receiver — I'll buy it." He is shown here with the 32V-2 and (right) the new 75A-2.

noticeable improvement. The stability of the BFO is also improved.

The 70E-12 VFO employs a new Collins permeability tuned two-tube circuit, which assures improved stability unaffected by variations in tubes.

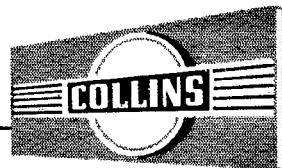
Headphone Terminals have been added at the rear of the chassis for operators who wish to avoid

having a cord across the operating desk. The headphone jack on the front panel is retained.

The Net Amateur Price of the 75A-2, complete with tubes, \$420.00; 10-inch speaker in matching cabinet, \$20.00.

Deliveries to Collins distributors will begin October, 1950.

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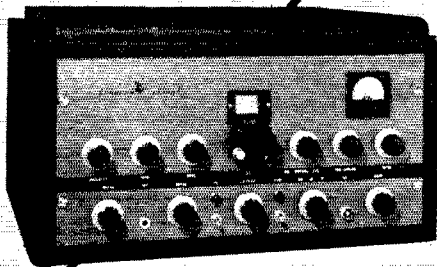


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TRANSMITTER KIT

Conservatively rated at 100 watts AM phone output, 115 watts CW. Incorporates features such as band-switching, crystal control or optional VFO input, pi-network output tuning and complete coverage of all amateur bands from 160 to 10 meters.

Recognizing the fact that many of the varied activities for which the Viking is suitable take place outside the amateur bands, we list herewith its complete frequency range.

Band	Low Freq. Limit	High Freq. Limit
160	1.8 mc.	2.4 mc.
80	2.9	4.4
40	5.2	8.0
20	9.8	15.0
15	15.0	21.8
10	21.0	30.0

VFO drive requirements are very slight. Only six volts of 7.5 mc. RF is required for full output at 30 mcs., less for the 14 and 7 mc. bands. Two volts of 1.75 mc. VFO output is ample excitation for 1.75 and 3.5 mc. output.

Delivering full output on phone with 115 volts 50/60 cycle line voltage, the transmitter's power consumption is 350 watts. With line voltage between 105 and 120 volts, performance is satisfactory.

In addition to being a completely self contained, compact, and efficient 100 watt transmitter, the Viking I can be used as a driver for a kilowatt amplifier. Full output of the modulator is available at a nominal 500 ohms impedance.

Now being displayed by most leading jobbers, the Viking I Transmitter Kit (less tubes, crystals, mike and key).

Amateur Net. \$209.50



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PACIFIC DIVISION

HAWAII—SCM, Dr. Robert Katsuki, KH6HJ—PL is back on HPN regularly and again is principal outlet to Stateside. BW is busy moving the shack to Wahiawa. We need someone to take BW's place as RM; also someone to serve as Assistant RM. Any suggestions? HARC has Brother Zapp giving math lectures. The HARC club house is being rapidly overrun by the new YMCA building. We hope Vice-President Brown will come up with other arrangements for a club house. Ham school has been progressing quietly but well under the guidance of OB. HARMC (Mobile Club) holds drills weekly, and KH6AS has been brushing up on the club's mobile trailer job. We know the 3.85-Mc. phone net handles a lot of traffic, but the members refuse to pass any dope to your SCM. HARMC meets every Tuesday at 7 p.m. on 28.6 Mc. Sixty-seven certificates already have been awarded to hams working five of its members. Traffic: KH6UL 127, AN 34, HJ 27, BW 15.

NEVADA—SCM, N. Arthur Sowle, W7CX—Asst. SCM, Carroll Short, Jr., 7BVZ. SEC: JU, ECs: LVP, HJ, MEQ, JLV, TJY, KOA, and ZT. RM: PST, OBS; MZP and JLV. A new member in the ranks, S. W. Gomish, OLF, reports from Elko. JU reports that EC activity is picking up and that he is operating all bands, 160 to 10 meters. Traffic: W7CX 22, JU 19.

SANTA CLARA VALLEY—SCM, Roy E. Pinkham, W6BPT—WGO, HC, LZL, RNG, and many more from the section attended the Fresno yearly get-together and report having the usual good time. The San Mateo Club held its annual picnic June 11th. The Palo Alto Club will hold its picnic July 16th with San Jose to follow with its get-together and barbecue on the night of July 17th. Be sure to get your tickets to this as a bangup time is assured. VIQ, NYS, RNG, MVL, ANR, and WGO are running mobile on 3.85 Mc. in the San Jose area. HC is acting as Net Control Station on the Mission Trail Net, c.w. section, one night a week. NW expects to be on with his traffic schedules now that he has his TVI cleaned by installing a Harmoniker. KDX has moved back to Saratoga from Palo Alto and can be heard on 3.85-Mc. phone. Doc is using a 32V-2, AVJ has a new rig built into a nice relay rack cabinet. TFZ reports signing up stations at the rate of about twenty a week in the AEC program in and around San Mateo. MMG is building new VFO and exciter unit for all bands so has not been very active on the air. All stations in the section are invited to check into the VN Net on 3775 kc. Monday through Friday at 7:15. This net will tie into RN-6 to give the section a good coverage in the National Traffic Plan. The Mission Trail Phone Net has changed its check-in time to 8 p.m. PDT for the summer months. Traffic: W6BPT 277, NW 89, HC 31, MMG 2.

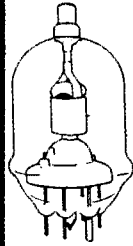
EAST BAY—SCM, Horace R. Greer, W6TI—Asst. SCM, Charles P. Henry, 6EJA. SEC: OBJ, RM: FDR. ECs: CX, AKB, EHS, NNS, IT, IDY, QDE, MLZ. The Oakland Radio Club soon will have a 7.5-kw. gasoline generator for emergency power, according to YDP, chief operator. Also a new rhombic soon will be up. The Mission Trail Net gang held its annual get-together June 17-18 at Coyote. The North Bay Amateur Radio Assn. held a picnic June 4th. BF is QRT business. DTW received his 25-w.p.m. sticker. CX has a new 144-Mc. antenna up. RRH keeps schedule with KZ5JD on 28 Mc. every Sunday. EJA reports that HYE and IPY are new hams in Richmond. YDI received official appointment to Trunk Line S. QXN is QRL TLLAP and RN6 Mon. through Thurs. JZ is Assistant Manager of RN6. ELW bought his XYL a TV set so now he can spend more time on the air. Same thing goes for OBJ. If you need your house painted get in touch with CTL. IKQ is toying with the idea of a five-element 14-Mc. beam. MEK hopes to have new QTH soon. The sooner the better since he lost his tower and does not plan to replace it at the present location. ZUI hopes to have his new 14-Mc. beam up soon. The tower, which is about 40-ft. high, is all completed. We were all sorry to hear of the passing of MFZ's dad, DEJ, on May 5th. A number of the East Bay gang dropped in on the Fresno hamfest April 29th. On June 19th the San Jose gang held a get-together. The gang is interested in bringing back the famous old tri-section meetings that were so successful years ago. MHB is looking for a good crew for a pole-raising day at his QTH. GIZ hopes to have new QTH soon. AM has not missed an NCDX Club meeting this year. DX around these parts was very poor during April and May and the DX gang had trouble in finding new ones to work. CDA still is QRL press. PB is rebuilding several new finals. SQ is QRL work. WF just can't find time to get his rig going at new QTH. We wonder if Daylight Saving Time is good for ham radio. It seems some of the gang want to stay up an extra hour for rag-chewing. They just can't get used to that extra hour of sunshine that California now has and the XYLs are keeping 'em busy in the gardens until dark. Traffic: W6JZ 1379, QXN 211, OT 137, CX 55, BF 39, DTW 35, YDI 15, RRH 10, EJA 2, TI 2.

SAN FRANCISCO—SCM, R. F. Czeikowitz, W6ATO—Phone JU 7-5561. Because of his fine work and untiring efforts in the emergency set-up for this section, NL has been appointed SEC. The dependable team of area Emergency Coordinators, BYS for the SF area, KNZ for the Marin area, and SLX for the Eureka area, are reappointed and

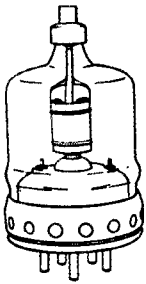
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TOP AMATEURS USE TOP TUBES . . .

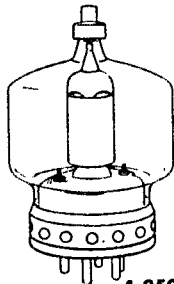
Eimac
TUBES



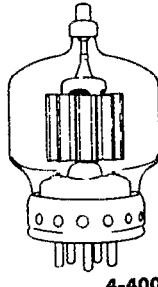
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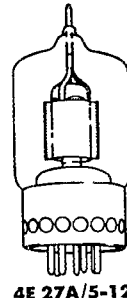
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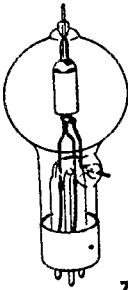
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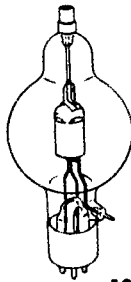
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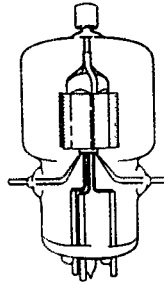
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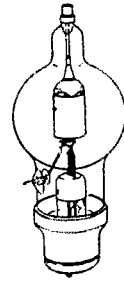
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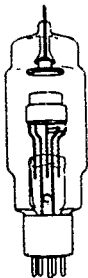
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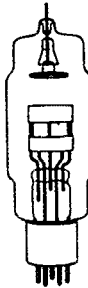
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250T



RX21A



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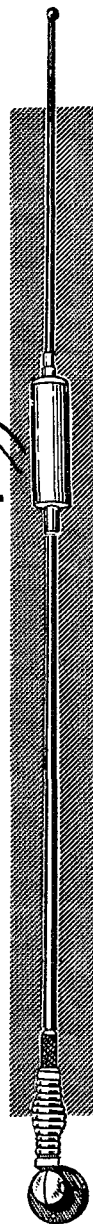
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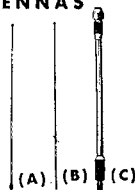
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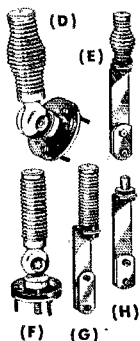
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commended for their excellent work. Official Relay Stations CXO and CWR also are complimented on their dependable work. BYS reports the EC net is active each Tuesday 8 to 9 P.M. on 147 Mc. *Eureka Area:* AUB is operating Command sets at 100 watts on 3.5, 7, and 14 Mc. and is constructing test equipment. ZZK is on 7 Mc. with crystals every 25 kc., and also is active on 14 Mc. BWV is building high-power amplifier. DQA finds the forest service is seriously cutting into hamming time. FBK needs assistance taming 807 drivers. (Suggestion: Shield grid and plate circuits thoroughly from each other.) The Humboldt State College Radio Club has been assigned the call HIQ. BME is trustee of the station. KLTAAAB is establishing his home near Arcata. Look for him on 14- and 28-Mc. 'phone. EQQ now is on 3.5- and 7-Mc. c.w. GDV is mobile on 29, 134 kc. ZSE still is troubled with power supply hookup. Congratulations to FYY, secretary, and the other officers of the Humboldt Radio Club. WJSD/W6 divides his time between b.c. operation, music studio, and hamming while GOUT tries to keep highway service from interfering with his time on the air. BJO and FYX are the pioneers of 144-Mc. work in Humboldt County. CWR is working both 'phone and c.w., while SLX continues to handle a volume of emergency traffic. ZQA and YMA are with the CAA at Arcata. NAO is rebuilding the shack. *Guam Area:* KG6DI reports that KG6GC and KG6GD fly to the Palau Islands weekly for about eight hours and sign KC6WC. This counts as a different country from KC6/Truk. KG6ED and KG6FA, president and secretary of the Guam ARL, were transferred from Guam. New countries worked by DI are YJIAA, 14,394-kc. 'phone and c.w., and KC6WC, 14,195-kc. 'phone and c.w. KG6DI handled a high traffic total and made BPL. *San Francisco Area:* WB is becoming the unofficial Collins receiver troubleshooter in the Bay area. The tape cutter of RBQ is grinding out a few of the countries Bill Ladley still is missing. The Bay Area Council of Radio Clubs proposed by the San Francisco Radio Club seems to be generally well accepted. BUR has been appointed OPS. NL has exciter on the air. CHP is moving to new QTH. BYS is building. VCG is moving to San Carlos. SWP is active on a new traffic net. WB ran up an excellent score of approximately 132,000 in the c.w. DX Contest. NGV is going 144-Mc. mobile. BIP was active in the CD Party, making 200 contacts in 51 sections. The new "Hams" Club has elected WCD, pres.; BYS, vice-pres.; ZLQ, secy.; and DZN, treas. This Club meets the second Friday of each month at the Red Cross Bldg., 450 Gough St., San Francisco. *Marin Area:* The Marin Radio Amateurs Club meets the second Friday of each month in the Engineering lecture room of Marin College, Kentfield. MRZ is president, with DNY as vice-president. The secretary is Chuck Chandler. Traffic: KG6DI 561, KG6FAA 509, W6SWP 122, BYS 33, YC 21, CHP 20, BIP 10.

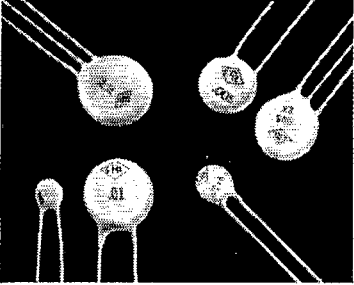
SACRAMENTO VALLEY — SCM, Ronald G. Martin, W6ZF — Asst. SCMs: *Northern Area,* 6YNNM; *Central Area,* 6CKV; *Southern Area,* 6SUP. SEC: KME, Ecs: Met. Sacramento, AUO; Walnut Grove, AYZ; Dunsmuir, JDN; Paradise (Chico Area), HBM; Roseville, GHP. RM: PIV. OBS: AF, BTY, PAM; ZYV. OBS: PIV, GHE, OOs: ZYV, YNM, BTY, GDO, YV. OPS: JDN, SAC, Emergency Net (city), NCS AUTO. SVS Traffic Net, 29.4 Mc., NCS ZYV, ANCS GDE, Mother Lode Net, WSL NCS. *Northern Area:* YNM submits the biggest activity report ever had from the area. HIQ is DXing with 100 watts and 64-ft. high 28-Mc. beam. IOI, new at McCloud, is using Silver 701, MFD has gone 'phone with 807 on 28 Mc. GOO moved to L.A. CFU has a Silver 701 and kw. rig on 28 Mc. ILY is a new ham at Dunsmuir with 500-watt n.f.m. 304TL. IEO, also new at Dunsmuir, is on with Silver 701. Dunsmuir Radio Club now has seventeen members. ARR returned to 28 Mc. 'phone. FKI is mobilizing on 28 Mc., and HRF is on 3.85-Mc. 'phone. OMR, new president of Mt. Shasta Radio Club, is behind the movement for the Fourth Annual Hamfest at Mt. Shasta Sept. 2-3-4. *Central Area:* GERC meets twice monthly, alternating business and code-theory meetings. JVF is using n.f.m. on 3.85-Mc. 'phone. BLW is back on 160, AF is on 7- and 14-Mc. c.w. with Official Bulletins. *Southern Area:* MIW is Sacramento alternate on RN6 with PIV. ASE is looking for emergency power supply for Roseville. ASI packed gear in Buick for two-months' portable work at Portland. KMB and AUO are on 144 Mc. SAC, Emergency Net. GDE is new Asst. NCS for SVS Net. AK used 3.85-Mc. mobile across the country to Washington, D. C. WLI reports the arrival of a 5-lb. daughter. RMP announces a new jr. operator and ZF has a new 7-lb. boy. SIG is conducting weekly theory and code classes for beginners. Traffic: (Apr.) W6PIV 97, ZYV 92, ZP 44, KRX 36, GDE 28. (Mar.) W6KRX 35.

SAN JOAQUIN VALLEY — SCM, E. Howard Hale, W6FYM — This is my first report as SCM so will list all of FKL's appointments to let you know who's who in the section. Asst. SCM: PSQ. SEC: JPS. ECs: PHT, WBZ, AJE. OOs: TFH, GRO. OBS: PSQ, ORS: HU, GRO. OPS: TFH, IEM, GRO. OBS: EXH, TFH, ZKD, OHT, GRO. Appointments of all types are available, so if interested please write to me. Please send all reports to me on or before the 2nd day of each month as my deadline for mailing is the 7th. It is my sad duty to report the passing into the realm of Silent Keys of CUE, Modesto. "Pick" will be

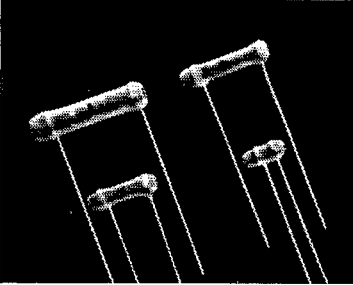
(Continued on page 82)

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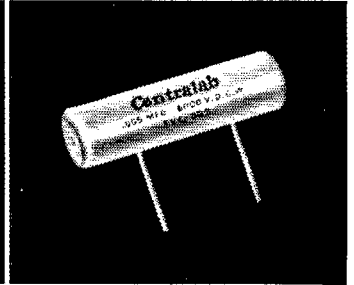
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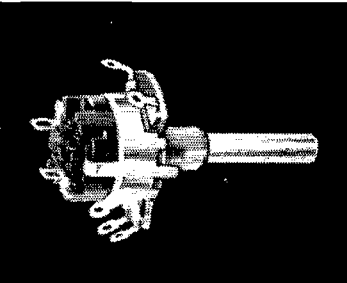
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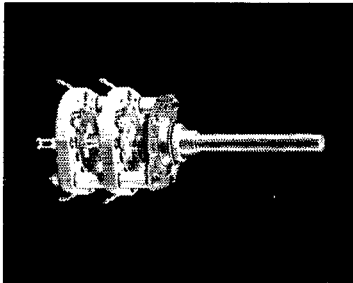
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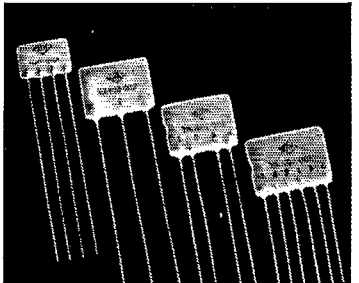
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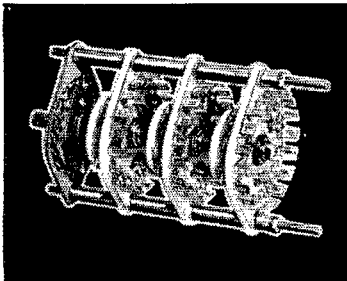
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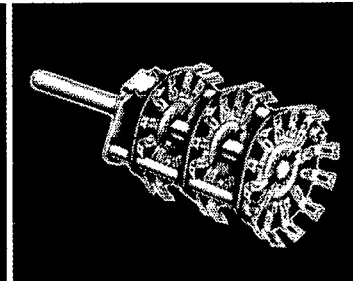
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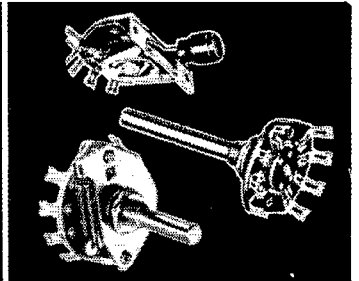
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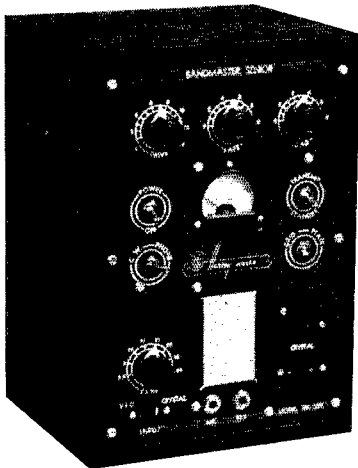


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missed as a familiar signal on 144, 3.5, and 3.85 Mc. AJE reports that the 28-Mc. emergency net is doing fine in Modesto and vicinity. They have 8 AEC members and drill once a week on 28.8 Mc. The Modesto gang is forming a new club and has 18 members to date. FIP and ERE have just received Class A endorsements. The San Joaquin Valley 2-meter emergency net picnic at Louis Park in Stockton was a huge success with EXH acting as M.C. WGM, of Vallejo, and CDT, of San Francisco, attended. The biggest and best of the postwar Fresno hamfests is now a thing of the past. Space does not permit a detailed report, except to say that I feel "mobile" is here to stay. How would you fellows and gals like to receive a monthly SCM bulletin by mail? Write and let me know your opinion and PLEASE send me your activities reports. Would especially like to hear from the Kern County gang.

ROANOKE DIVISION

SOUTH CAROLINA — SCM, Wade H. Holland, W4AZT — The spring ham picnic in Orangeburg was the largest yet. The May meet in Orangeburg and the September meet near Columbia have become the State's annual hamfests. FNC has been reappointed EC for Greenwood area, NWB for Travelers Rest area. Several EC appointments have been cancelled because of non-activity and new applications are invited. KZ and AUL are new Official Observers. HXZ, ILQ, and AIS have mobile rigs on 3.85 Mc. and ADE has converter on auto radio. (GTT, GWT, LLH, and ETF are on 160 meters. OWW, NIR, PVQ, and KTI are on 28 Mc. HHO Charleston Club station, is setting up complete 144-Mc. mobile net for emergency use. ANK has BC-654 as emergency 3.5- and 3.85-Mc. rig. OSM, CXE, FXH, and PQC are on 7 Mc. On Apr. 16th the Rock Hill Club held emergency rig drill with M YM, ONJ, NTD, CXO, PHS, Roy Randall, and Webb White taking active part. HEM has new SP-400X receiver. JEF has kw. working. MRJ is getting commercial license. MAB is studying for E.E. degree. BIZ has tape recorder. DFC is Mayor of the Isle of Palms. GCC and HIB/4 are on 14-Mc. phone. GJASCN is closed down for the summer. Traffic: W4ANK 319.

VIRGINIA — SCM, Victor C. Clark, W4KFC — Asst. SCM: Elias Etheridge, 4KYD. About 75 Virginia hams turned out for the first annual Virginia QSO Party May 7th. Among the high scorers were FV, IA, and NNN. The Virginia Net (c.w.) held the last of its formal net sessions for the season on May 5th, but will continue through the summer with an informal session at 9 p.m. BST, Mon. through Fri. on 3680 kc. VFN (phone) continues operations on 3880 kc. VFN members held a picnic at NV's farm near Charlottesville May 28th. BZE reports RIQ and RJW are new Richmond hams. PVA has battery-powered gear for emergency work. ITA has moved to Washington, D. C. JAD is prexy, manager, and chief engineer of WBLT in Bedford! FF, FV, CFV, LAP, and KFC each showed up on at least 100 nights for VFN sessions during the past season. JULY has 28-Mc. mobile in operation. BCT reports the Shenandoah Valley A.R.C. meets the 1st and 3rd Fri. at new club house in Winchester. BCT has radioteletype in operation. IPC reports the call of NCR unit in Fishersville is K4NBM. CVO de-TV'ed a BC-610 and visited KFC in Washington. CJS purchased an antenna site in Springvale. The PYN gang helped stage a physics class demonstration. PBE, in Falls Church, is ex-3GHB. PWX is moving to new QTH at 1406 N. Illinois, Arlington. MLH reports TV "closing in"! DWD operates 28-Mc. phone mobile. Belated recognition is given PYN's achievement in making BPL in February! 4PYV (ex-5CHA, 6CHA) now is 4CHA! BCI is Assistant EC for Richmond. SEC IWA has divided Virginia into six districts for emergency organization and appointed MQE as Assistant SEC for the Richmond district. MLE has worked 43 states, 20 countries, 5 continents, and has had 1000 QSOs since February! MGE has 144-Mc. mobile. NQV made 74,520 points in the CD Party. Traffic: W4MLE 381, FF 192, PYN 187, FV 91, LAP 81, KFC 66, KYD 35, NRO 29, MLH 24, NQV 16, PWX 16, CVO 13, NBA 13, CJS 2.

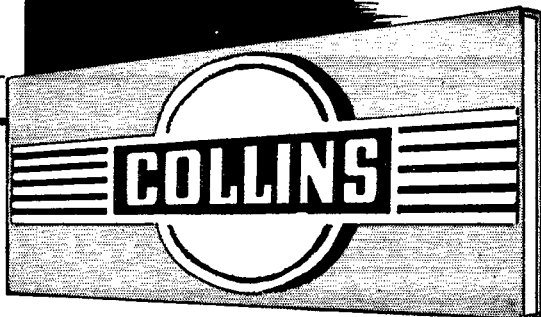
WEST VIRGINIA — SCM, Donald B. Morris, W8JM — The Blennerhassett Amateur Radio Club now is affiliated with ARRL. MIT, president of the BARC, is erecting 95-ft. tower, after wind destroyed the 55-ft. mast. FGL, a new amateur in Parkersburg, is active in CAP work. EMG's big radar scope requires three men to move it. HUG is active on the Watershed Network along with his EC work. DRU has new 807 rig and is active giving the boys Summers County. DTL has an excellent 3.5-Mc. c.w. mobile rig and supplied Boone and Putnam Counties to the gang during the West Virginia QSO Party. OXO makes BPL. PQQ was on active duty in the Signal Office, Washington, during the first part of May. DFC net operation during the traffic season included WVN, TLC, ENH, Va., Tenn., and N.C. Nets. EKF has BC-696A and finds himself busy supplying Mingo County to the gang. Ex-YCK, chief operator at IAW, plans a trip to W. Va. with mobile gear in the car. Tom will be assisted by his KYL, IRNT. WSL schedules KZ5PC on 28-Mc. phone. EUZ is active on 3.85 and 28 Mc. and can supply Nicholas County. YIY has Collins rig going on 3.85-Mc. phone. Traffic: W8OXO 608, AUJ 229, DFC 48, WSL 12, DHX 2, JM 2.

(Continued on page 84)



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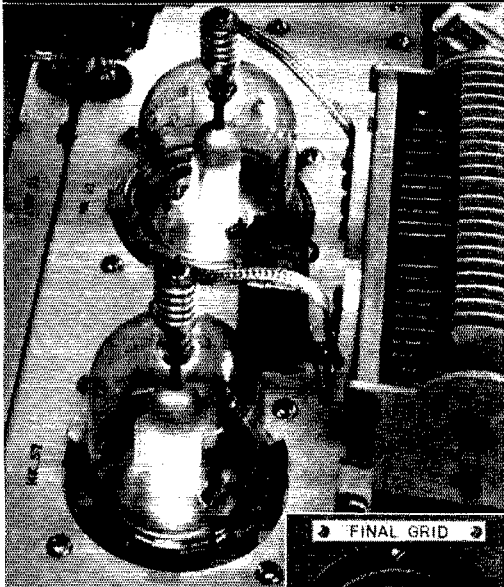
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ROCKY MOUNTAIN DIVISION

COLORADO—SCM, M. W. Mitchell, W0IQZ—SEC: KHQ, RMs: LZY, ZJO. ZJO makes BPL again this month, which makes him the Colorado section champ—almost a year straight of making BPL each month! He reports that MAN and PAN have merged for the summer and will be on 7207.5 kc. at 2030 MST. He needs help for NCS on this deal. Any volunteers? KHQ reports the Colorado Emergency Net now is operating at 0730 MST Sunday mornings on 3890 kc., as well as Tuesday and Thursday evenings at 1730 MST. From LZY we learn that the CSSN has folded up for the summer season but probably will open on 7 Mc. for TLS. OWP has mobile rig with 2E26 in final. PQZ worked ZSS on 7-Mc. c.w. with 80 watts input. SFS lost his cubical quad in recent "Real Estate" transfer, also known around these parts as a high wind. PSB has two new 52-ft. masts. Yours truly attended the quarterly meeting of the Arkansas Valley Radio Club at La Junta. Among those present were HJX, AJJ, AXJ, PGX, KHQ, and DD. MHR is experimenting with voice-controlled carrier and reports two new hams in Greeley, ATC and AZP. KHQ still is working on his new rig, and after finishing the antenna coupler can't get the darned thing to load. ULZ is QRT because of an oscillating buffer. If any of you need report cards just send me a card requesting them. I would like to receive more cards from ECs. Traffic: W0ZJO 1803, LZJ 41, OWP 17, OTG 11, MOM 10, MHR 4, KHQ 2.

UTAH—SCM, Leonard F. Zimmerman, W7SP—SSY, president of the Ogden Radio Club, reports that they have BCI, emergency and publicity committees, and also classes in radio going now. The UARC has changed meeting nights to the 3rd Tuesday of each month. The Salt Lake Emergency Corps held a test May 7th but because of rain some trouble was experienced. The mobile BC-610 Net Control Station went dead and the boys were on their own. CEI says that some valuable experience was gained. The affair was covered by local newspapers. Those known to have participated were EC CEI; RM Green of the NCR; fixed stations JOE and OOK; mobile stations JYI, LCA, NCO, OQD, QAA, ZDX, and KMR (air-borne). OKI and OKX are newly-licensed amateurs heard on 28 Mc. Members of the State 'Phone Net and the State C.W. Net have been signed up in the Emergency Corps and net certificates issued to them. Traffic: W7UTM 295, MFG 118, SP 9, ULB 4.

WYOMING—SCM, Marion R. Neary, W7KFW—K7FAO is a new station at Warren Air Base. MARS classes at Cheyenne produced a new ham, OJM. MWS acquired a new Class A ticket and is operating 3.85-Mc. 'phone. OWZ and MIV are constantly chasing 144-Mc. beams and equipment over the hills and dales. BJS moved to Laramie. The Pony Express 'Phone Net, on 3920 kc., now meets at 0730 Sunday mornings until after the fishing season. KFW has Collins 310B-1. FLO wistfully is looking over the hill for the REA line so he can retire the Diesel. JXJ is using two half-waves in phase on 3.85-Mc. 'phone. 20 watts on 3.85-Mc. 'phone does wonders for GS. GOH is operating 3.85-Mc. mobile from new Nash. IQQ is trying 3.85-Mc. mobile also. Any hints on how to eliminate dynamotor hash in a receiver? Either all of you are working on mobile rigs or fishing—there is a scarcity of activity reports. Traffic: W7DXV 70.

SOUTHEASTERN DIVISION

ALABAMA—SCM, Leland W. Smith, W4YE—The Anniston Club will hold its hamfest at Oxford Lake Sunday, July 23rd. AUP is new secretary of the Montgomery Club. MEM has gone mobile with ARC-5 sets on 4 and 14 Mc. OGW has converted BC-375E on 4 Mc. KF is building a new shack. The Muscle Shoals Club meets every Friday night at the shack of MEM. CYL has resorted to D.D.T. in de-bugging his kw. final. OKF is new EC in Oneonta. K4FAG is active on 3.5, 4, 7, and 14 Mc. FGT still has one complaint about 4-Mc. mobile—he can't work out of Selma. OEN and OZK are now Class A. KVD is experimenting with 144 Mc. EJZ is having e.o.o. trouble and is back to crystal-control. KIX is sporting new aluminum masts. OFQ has moved from Louisville, Ky., to Montgomery. RCX is new ham in Mobile. HDI, IVC, and ATF are 144-Mc. enthusiasts in Montgomery. IKM is overhauling his kw. OUW and ISD have their Class A tickets. OGL and OFM, our father and son team, are camping in their new house. NQH, the Auburn Radio Club station, has new p.p. 812 final. PDH has taken Class A and is awaiting results. MFA has QRM from new car. The Auburn Club is planning another hamfest at Chewacla. Traffic: W4KIX 56, MVM 41, BFM 31, LEN 22, JYB 15, YE 15, BMM 6, EJZ 3.

EASTERN FLORIDA—SCM, John W. Hollister, W4FWZ—About schedules with your SCM: I am on the high end of 7 Mc. Saturday afternoons and nights if in town and again on Sundays. 'Phone schedules can be made via K of KC (3910 kc.) on Sunday mornings. Every net member should hold OPS or ORS appointment. A card to your SCM will bring you the information. Daytona: QAG and ROG are on 28 Mc. MSP is using a pair of 4-250As with controlled-carrier modulation. PYB is on a Navy cruise. Jacksonville: FWZ was in Canada for a week in June.

(Continued on page 86)

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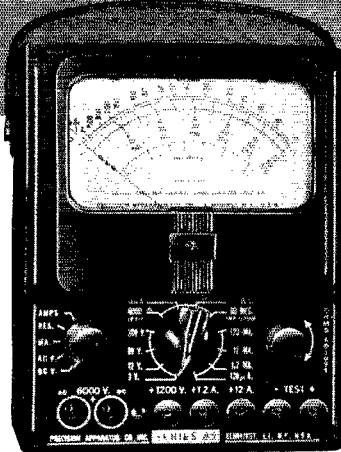


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PAE moved to France with the USN. LMZ really brags on a 4-125A bottle for less TVI. FRP is on mobile with 807 and Class B modulator. Miami: IYT schedules K3FMC and KZ5AA for traffic. JEP has new SA. He reports the 3945-kc. traffic faithfuls include LMT, JEP, IQV, MJU, HWA, EEZ, LCF, and MZH. New Port Richey: In addition to bringing back a new Packard from Detroit, KJ grabbed off a mike from IQV. Orlando: OZC was working hard in five traffic nets. He and his XYL, PK, are using 811 kicked with a Clapp VFO. Oakland: OCG was in New Jersey. Montbrook: PMN sends under a severe handicap but can take it up to 7 Mc. Punta Gorda: OGI has been appointed ORS. Ed has made an electronic key for himself. St. Pete: IK is president of the local Rotary Club. JZ is using a Collins on all bands. EZG installed a two-way in dog-catcher's wagon. FPC uses five-element beam on 144 Mc. LTE has designed what is called a cowhorn beam for 28 Mc. It has 2 "horns" 12 inches long, spaced 12 inches, connected at base with coil fed with delta match. Write him for information. KQR made WAC and WAS on 28 Mc. West Palm Beach: Welcome to the Rebel Radio Club, and also to 2RTZ/4, who was down again for short stay. Traffic: W4IQV 271, JEP 130, IYT 74, OGI 72, WS 32, LMT 23, KJ 21, FWZ 9, A YX 8.

WESTERN FLORIDA — SCM, S. M. Douglas, jr., W4ACB — What with storms and tornadoes hitting all around the section it behooves us all to look to our emergency gear and set-up. How's yours? A good idea is to take it out of the mothballs and operate it for a period. MUX and PRP have new Collins 310Bs, while SAW has new 32V-1. MS is remodeling the shack. ODO is latest recruit for 50 Mc. BKQ is reported to have high power on 50 Mc. PQW has 28-Mc. rig going FB. HJA was a visitor to Tallahassee recently but didn't get to stay long. His mobile rig works FB. MEN made Class A, FTK and VR are working 7-Mc. c.w. New hams in Tallahassee include DUE, IWN, and BCL. OGL visited Birmingham. LDT hasn't been heard much lately, while BQY, ESB, ACB, and NN keep the Fish Net hot in the evenings. ACB, OKD, KQP, and NN received Public Service certificates for their work during the 1949 hurricane. Traffic: W4AXP 70.

GEORGIA — SCM, James P. Born, jr., W4ZD — The Cracker Net now meets three times a week at 7 p.m. Tues. and Thurs. and 8:30 a.m. Sun. KIJ is attending Vanderbilt University and now is on 3.85-Mc. 'phone from Nashville, Tenn. DAL works mobile 14 Mc. and 3.85-Mc. 'phone with excellent results. FFC, a gentleman farmer, hopes to have many contacts on 27-Mc. 'phone this year with the rig he has on his tractor. QBE is a new ham in Conyers. LWP recently welcomed a jr. operator. LXE is "debugging" his rig so he will not interfere with channel 2 when the new TV station opens up. LYG, AAY, FD, IKJ, and CFJ are on 144 Mc. KWC is rebuilding after two years off the air. Our sympathies go to MMB, whose mother passed away recently. GMP is on 3.85-Mc. 'phone from Charleston, S. C. IDL and EPM are new hams in Kennesaw. The Atlanta Radio Club's 1950 Atlanta Area QSO Contest will be held July 22 and 23. The contest will start at noon Saturday, July 22, and end at midnight July 23, Sunday. Participants may, if they wish, operate the entire period or any portion thereof and choose for the contest scoring their best two four-hour periods. Any station within 25 miles airline of Five Points, Atlanta, Ga., may participate. The prize will be a loving cup engraved with the winner's name and call. KXX is on the air again with a new rig. Check your appointments, and if they need endorsement be sure to send them in. If no word is received 30 days after expiration, they will be cancelled.

WEST INDIES — SCM, Everett Mayer, KP4KD — PRARC held an election of officers April 23rd. W4ES was a visitor to KP4 on USCGA business. W4EOA and W4KGG are in P.R. with ARINC. JA moved his beam back to town. HU is near DXCC on 7 Mc. KV4AO is back in V.I., and works AEC and USCGA nets. CO2WP sends in news on the CO-CM gang. CM2WY and CM2YW are OM and XYL. CM2SR has 32V-2 on 7-Mc. 'phone. CO2RH is busy answering radio queries. CO2CT and CO2JK are out to beat CM2SW on DX. CO2WY has tube troubles and CO2FN is active on all bands. KP4ES, CO, KD, KV4AA, AO, and AP handle USCGA radio net. ES still is keeping schedules with the Puerto Rican Orinoco Expedition in YV. LP is a new ham in PAA Supply Department. FN, IN, and JI returned to U.S. DU is an unsung hero, having revived a boy who had been shocked by high tension. KZ is active on 3.8- and 29-Mc. n.f.m. 'phone. Traffic: (Apr.) KP4KD 34, KV4AO 21, KP4HU 24, LD 22, UW 14, KP 7, DJ 1 (Mar.) KP4DJ 3.

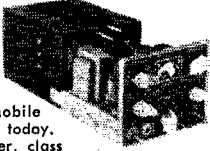
CANAL ZONE — SCM, Everett R. Kimmel, KZ5AW — This report was written by RM in the absence of AW, who is on emergency leave in the States. AW, AP, EP, TG, and BL are on leave in W-Land. GG is back on with a TB8-50. NM has regular schedule with W9PJQ/MM on board the Yacht *Askov*, headed for Tahiti. Vic, ex-MB, commutes regularly from Bogota, Col. FL, EC for the Pacific side, ran a simulated emergency drill and had eight KZ5s and four W5s check in. FJ has replaced PC as chairman of code instruction for CZARA. FB is the proud father of a male second harmonic. WA has his home-built VFO working FB. WJ has the pair of 4-65As tamed and working nicely. AU

(Continued on page 88)

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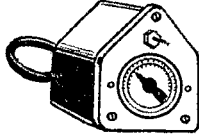
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Kit No.	Output	Price	Transformer only
HV-1500	1500 v. 350 ma.	\$29.50	\$19.50
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100 watts of audio ending in two 807's. Includes E-V 915 mike. Shpg. Wt. 35 lbs. **Kit form.....\$44.95**

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and WA have picked up Panadapters (they're 60 cycle). Does anyone know where they can find a 25-cycle transformer for a Panadapter? CG is the proud owner of a 310-B exciter. Traffic: KZ5NM 145, PA 67, WJ 44, FL 32, LR 18, OY 13, GD 12, RM 10, CG 4.

SOUTHWESTERN DIVISION

LOS ANGELES — SCN, Virge A. Gentry, jr. W6VIM — L Asst. SCM, Irvin O. Hege 6FYW. SEC: ESR, PAM: MVK, RMs: OE, CMN, DDE, IOX, and LDR. We are pleased to announce that LDR has been appointed RM in charge of the SCN. CMN requested relief from SCN leadership so that he could better serve the Los Angeles Council of Radio Clubs. RN6 went on Daylight Saving Time May 1st. AM has underlined power lines at his ranch station. AMT/6 handled 502 messages in two days at the Los Angeles Hobby Show. ANT has a TBW3 on all bands in addition to his main transmitter on 3.5-, 14-, and 28-Mc. phone. GAE and COZ are on 144 Mc. DGB is back on 28 Mc. CMN has a new 500-watt VFO rig on 3.5 and 7 Mc. JQB visited CMN. CUF is going on 3.5- and 14-Mc. phone. DCB has a self-supporting 85-ft. steel tower which is 2-ft. square at the base. CMN visited GJP in Taft. The following are active in the CARS Southern California Net: DLI, DLS, DXQ, QMV, VEQ, and WT. MYI has a new final. HJL is chasing DX on 7 Mc. with low power. HFY visited DDE. LDR is operating 813s without TVI. LYG reports that the Sawtelle Veterans Hospital amateur station is receiving a lot of visitors, some from overseas duty. MU's 75TH went South. YSK/GEAJ now has 18 states on 1.9 Mc. YVJ has a grid dip meter. New officers of the Associated Radio Amateurs of Long Beach are LSN, pres.; NSX, secy. VBI is trying to make DXCC before he moves to Sacramento in August. CE was in Los Angeles recently. NY is moving to Las Vegas. The following are active on 144 Mc. with teletypewriters: AEE, CMQ, DRL, EFE, FGS, IIV, KAT, LIZ, OQB, OZE, STA, and TD. In addition AEE and OQB have teletypewriters on 27 Mc., while STA operates his on 3.5 Mc. Anyone interested should contact CMQ. The following amateurs participated in an outing near Pearlbond, Calif., the week end of April 14th: BZH, CND, CMQ, DCS, FGS, and IWX. Bands operated were 3.5, 7, 28, and 144 Mc. The formal dedication of the Los Angeles AEC Red Cross station was held May 8th at the Los Angeles Red Cross Headquarters. The dedication was under the direction of EC MVK, SEC ESR, and Mr. Dancy of the Red Cross. Appointees whose endorsements have expired are urged to submit certificates for endorsement. VIM attended the Council of Radio Clubs meeting for the first time and visited the Southern California DX Club. If you hold DXCC you may qualify for membership in the Southern California DX Club. Contact GAL for further information. DZX visited VIM. CYI has a new "rabbit hutch" type rig. The Two Meters and Down Club new officers are RBY, pres.; MVK, vice-pres.; WKO, secy. OB has push-pull parallel 826s on 50 Mc. CTS has a new sixteen-element beam with rectangular elements. YMM left 28 Mc. for 144 Mc. to avoid TVI. YHR is on 28 and 50 Mc. with the new coax match on his beam. CGQ and DI have new "TVI proof" kilowatts. QUK is back on 50 Mc., as is ANN with his old 35Ts. MCT is on 144 Mc. with a "zig zag" beam. DQO receives the same signal reports on 28 Mc. regardless of whether he uses his three-element beam or his dipole. OGF is back from South Africa. Traffic: (Apr.) W6CE 2314, AMT/6 508, LDR 371, CMN 301, GYH 202, ANT 86, FYW 35, NAZ 32, MU 31, DGA 15, COZ 7, AM 6. (Mar.) W6LYG 328, LDR 226, YVJ 46 CUF 9.

ARIZONA — SCM, J. F. Kennedy, W7MID — Picnics at Sedona and Casa Grande were well attended. The Phoenix gang took home the baseball trophy with a 14-4 score. The Saguaro Club was the happy recipient of a cup presented by 6KW to the outstanding club in his division. FGG works KWO, MIW, and MIV in Phoenix with 15 watts. How about some more activity on 144 Mc.? LHI says "Why not check in at 7:30 P.M. on 1990 to meet the gang?" LYS gave exams to two aspirants. Results: APE and OJQ, 28-Mc. mobiles in the Valley are QJL, LHM, KRW, 9VTJ, JUT, JOK, QPI, QNO, MJN, MTZ, NAF, KWL, MID, MAL, and LQB. Mobile and emergency frequency is 29.460 kc. and the Phoenix gang meets there at 7 P.M. Tuesdays for emergency drill in conjunction with the statewide net on 3865 kc. at the same time. For c.w. operators, the AZN Net frequency is 3515 kc. nightly at 8. MLL retires as SCM, and the thanks of the Arizona gang go to him for a job well done. MIAL has new 3-over-3 beam and 40-foot tower, and now needs someone with nerve enough to climb tower while holding beam! UPR showed rare form in the Casa Grande ball game. The XYL of MOF is now OJT. A new ham in Scottsdale is OLB. Congrats. Traffic: W7MID 3, LYS 2.

SAN DIEGO — SCM, Dale S. Bose, W6BWO — DBZ has been laid up with chicken pox so has some school work to catch up on before getting back into traffic work. AD has a 14-Mc. beam ready to raise. He also has been doing some 'phone patch work for the boys in the South Pacific. FCT is QRT to paint the shack. CHV still is rebuilding but found time to snag three new countries. YYN still is busy

(Continued on page 90)

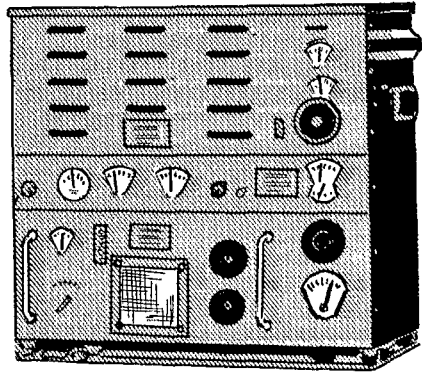
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Frequency range 300 to 18,000 kc., 125 watt output on C.W., 25 watts on phone, for operation on 230 volts D.C. power supply, complete with tubes and ready for operation. Our information indicates that these units cost the U. S. Navy \$8,000 ea. We offer them to you at a mere fraction of the original price. **\$675.00** {Complete Sales Bulletin Available.} **ea.**

Bd-72 Field Telephone SWITCHBOARDS

These sets are sold individually packed in strong, steel-strapped wooden cases, and they are ready to set up and operate. **\$37.50** {Complete Technical Sales Bulletin Available.}..... **ea.**

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with school. YYM built a Monitone and Select-O-Ject and is modifying a Q5-er. There is an FB YL net in San Diego on 7280 kc. every Monday at 9:30 P.M. All YLs are invited to check in. IGP, YYM, YX1, and ZYD are the regulars at present. IGP, the XYL of WXJ and recently received her ticket. The Soledad Club had a nice Field Day set-up under the direction of DUP. BWO finally got the bugs out of the emergency rig and is working a little c.w. on 7 and 14 Mc. BWO hopes soon to be on a ranch in Northern California raising cattle and rhombies. BFE is a proud papa again. BAM lost one of his antenna poles after it had been up for 25 years. He thinks he should get a refund as he wasn't through with it yet! Traffic: W6ELQ 136, YYN 72, BAM 10, CHV 10, CNQ 9, BWO 2, AD 1, DBZ 1, FCT 1.

WEST GULF DIVISION

NORTHERN TEXAS — SCM, Joe G. Buch, W5CDU — RJR is active on 144 Mc. GML is busy installing equipment for a new b.c. station in Paris. OYT is EC in the Bonham area. KVV now has 47 DX confirmations for 14-Mc. operation. RLM is a new ham in DeKalb. IWO demonstrated station operation to 900 high school seniors who recently visited E. Tex. State Teachers College. GML is running 75 watts input to 3.85-Mc. mobile rig. LGY and many others acknowledge receipt of Public Service certificates from ARRL Headquarters. Big Spring Club members are sporting a new HQ-129 receiver at club station JNB. BBH lost his antenna in a recent wind storm. GFL is the newly-elected president of the Abilene Club. The vice-president is MKS and the secretary-treasurer is FOQ. QMJ, of Benjamin, is a new member in the NTS c.w. emergency net. The SEC team of AAO and BKH are putting the finishing touches on a communication van consisting of 2.5-kw. gasoline generator, transmitter, receiver, and First Aid supplies. Operating desk and cot for hard-working operators are included in this super emergency unit. West Texas twisters caused the alerting of two EC areas in the past month. EC JQD, of Lubbock, and BKH, of Abilene, along with respective net members, were ready to go if needed. Traffic: W5GZU 1552, ARK 232, BKH 162, ASA 35, LGY 16.

OKLAHOMA — SCM, Frank E. Fisher, W5AHT/AST — SEC: AGM. RM: OWV. PAM: ATJ. 1,665 messages moved from the Easter Pageant at Lawton in 18 hours. Congratulations to the Lawton-Ft. Sill Club for a fine job. The circuits set up by OWV moved traffic from the Pageant simultaneously into O LZ, Oklahoma Emergency Phone Net, Fifth Regional Net, Rebel, North Texas, and New Mexico state nets. The amateur short course and hamfest of the A. & M. A.R.C. was a huge success. Attendance of about one hundred for this two-day affair and interest in the program shown may insure an annual affair. Oklahoma City had an emergency drill with eleven emergency-powered stations participating. AGM reports Comanche, Garfield, Oklahoma, Texas, Tillman, Tulsa, and Washington Counties organized for AEC. How about your county, OM? A tornado brought death and destruction to Holdenville. BXO and PGN, operating under the club call RFY, handled considerable traffic and furnished lights for a hospital for a time. Thanks to those who helped. I missed it myself, being at the Tulsa A.R.C. meeting, where NW was guest of honor. BBS and WI drive 110 miles round trip to Pryor Wednesday evenings and also Sunday afternoons to act as instructors for 18 boys between the ages of 10 and 17 who are interested in radio as a hobby and/or vocation. The Tulsa Amateur Radio Club is sponsoring a new club in this group. Traffic: W5FOM 969, K5WAH 650, W5QQD 581, FOG 543, AHT 433, FMF 341, K5NRJ 310, W5OWV 263, LHP 255, FCP 209, PA 158, OYP 113, ADB 26.

SOUTHERN TEXAS — SCM, Ammon O. Young, W5BDI — MN makes the BFL by spending 90 per cent of his operating time handling traffic. NNY is on 28-Mc. phone. IX is playing with new types of beams. ACL is trying to get his new PE-103A to run. PBX is building a new ham shack. IYR is on 14-Mc. c.w. but hopes to be on 'phone soon. ADZ worked YI and OY with his new 14-Mc. beam. AYU is able to work 7, 14, and 28 Mc. with his new TV receiver in the shack — no I.VI. JWM also has new TV receiver and hopes to have his TVI cleaned up soon. IZB is on 160 meters with a 274N rig and has been working DUK, QJD, PIO, DDC, and EZE between 6 and 7 A.M. and from 6 P.M. to closing. Traffic: W5MN 788.

NEW MEXICO — SCM, Lawrence R. Walsh, W5SMA — SEC: BYX. PAM: BW. PAM v.h.f.: FAG. RM: ZU. During this past month a number of fellows have asked about the USSR station on 7242 kc. Sorry, but outside our Region 2 such operation by a b/c service is legal. I has been since the Cairo conference. Las Cruces held its "L" Day on April 23rd. QKJ and the Las Cruces gang are to be congratulated on its success. The Los Alamos Radio Club now meets the first Friday of each month. The May Field Day at Los Alamos was cancelled because of work schedule. Our RM, ZU, reports the 40-meter traffic net disbanded the end of May because of too much QRM and QRN on 7266 kc. DWB has a new Hunter handswitching exciter. PJT, IFD, and LEH/5 are new additions to the Sunday morning

(Continued on page 92)

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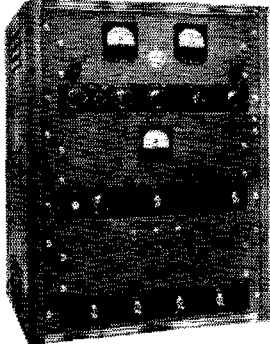


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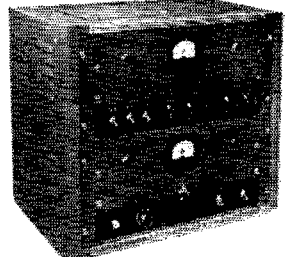
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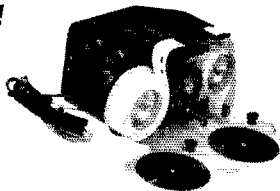
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NEW JERSEY



75-meter 'phone net. A new call at Los Alamos is RMH. JXO reports about 40 stations active in Albuquerque on 28-Mc. ground wave at night! QNQ hopes to have two members of his code class up to the required 13 w.p.m. soon. ZU has received his HRO-50. KAO has a new kw. (250THs) on 14 and 28 Mc. with a new three-element on 28 Mc. Traffic: W5ZU 337, MYM 31, JXO 21, A5ZU 13, W5SMA 10, NKG 8, NJR/5 5, KAO 4, QNQ 3.

CANADA

MARITIME DIVISION

MARITIME—SCM, A. M. Crowell, VE1DQ—The Halifax Ladies Dit and Dah Club wound up the season's activities with its annual dinner party recently. The HLD&DC is to be commended for its social and charitable work and has a paid-up membership of 22. Recent visiting hams to VE1 included 4QV and 2GQ. KS reports a bit of activity on Maritime and AARS Nets in addition to handling the Official Bulletins. EY has been on a bit with 3.8-Mc. 'phone. ET is building a low-power rig. LZ apparently has put aside his Command transmitter for a commercially-built rig. FQ holds tri-weekly schedules on 14-Mc. 'phone with the VES boys. DB still is looking for the elusive DX and pounding away on 14-Mc. c.w. OM, with low power, showed up well in the SS Contest. TA is going after Class A ticket. QZ is in the throes of changing QTH. DQ is "still rebuilding on 3.8-Mc. 'phone with low-power rig only." His QTH is Grand Lake on week ends. We hear GL recently changed QTH and will be on from Halifax. JZ has been on with a nice 3.5-Mc. c.w. signal. QG has been giving the 3.5-Mc. c.w. band a bit of a whirl. AAX also is heard on 3.5-Mc. c.w. quite regularly. Traffic: VE1MK 26, HJ 10.

ONTARIO DIVISION

ONTARIO—SCM, Thomas Hunter, jr., VE3CP—Asst. SCM c.w. W. Guillot, 3BUR. Asst. SCM 'phone, E. Kimble, 3FQ. SEC: KM. RMs: ATR, AWE, BMG, BUR, DU, GI, TM, WK, and WY. PAMs: BSA, DF, and FQ. IA again turns in an FB traffic total and WK missed BPL by one delivery. GI and WY have been endorsed for RM appointment. BMW sends in an FB report on the Sarnia gang. DGH, DDM, and BMW, all under 15 years of age, had their own Field Day. GI visited CP and BUR. DGC is new in Peterborough. VD has improved his receiver. BTE is OPS-bound. BJE, BBZ, ALU, BGI, and PH are on 144 Mc. from Kirkland Lake. BTE has WAVE and needs Asia for WAC. LU and AOT are active on 144 Mc. from Brantford. The Hamilton gang can be found on 144 Mc. daily at 8:30 p.m. ABP has 300 watts on 28 Mc. 2TH, ex-3APZ, is back in Toronto. ADN is active on the Early Bird Net. CY again is EC for Kitchener and Waterloo. Leamington now has a YL awaiting a call from the DOT. QY, ex-3GP, is on 144 Mc. AVI is on 28 Mc. with p.p. 807s. The Ontario 'phone net has QRT for the summer but the Beaver Net will continue on 3535 kc. IA now is manager of the Ontario 40 Meter Net. RL is active from Clinton. Traffic: VE3IA 206, WK 114, BUR 108, ATR 76, ADN 66, WY 58, GI 54, AYW 44, PH 43, IL 41, CP 38, RL 37, BBM 32, BTQ 32, NI 32, BL 29, BER 28, AUJ 26, BUS 26, YS 26, BVR 25, AQB 23, AKJ 20, HK 19, KM 19, YJ 18, BSA 16, DF 14, LO 14, APS 12, DD 12, BUG 9, VD 6, BCP 4.

VANALTA DIVISION

ALBERTA—SCM, Sydney T. Jones, VE6MJ—NB and his XYL proudly announce the arrival of a new jr. operator. BW gave a very interesting talk at NARC meeting on uses of Geiger counter in locating valuable ore deposits. LE checks in on Alberta 'phone net regularly and will take traffic for VE8-Land. Don't forget the Alberta Hamfest in Calgary July 29-30. An interesting program has been arranged for all. LQ is building new frequency-measuring equipment. Five new amateurs have passed the required examination in Lac La Biche under the coaching of Father McGrane. PP, PV and VJ are reported to be making favorable progress on their new home. KO has passed exam for Class A and has been heard on 3.8-Mc. 'phone. Ken also is organizing the AEC in the Lethbridge area. YM has taken over control duties on the Alberta Net. HI is reported to have run into some trouble with his VFO. VS is having good results with new speech clipper circuit. MA and the Lethbridge gang are now publishing a fine monthly paper known as RF. Write for your copy and find out what's doing in Alberta. MJ has been reelected SCM. Your support will be appreciated, gang. Traffic: VE6NB 26, MJ 18.

BRITISH COLUMBIA—SCM, Ernest Savage, VE7FB—The members of the Five O'Clock Net presented their Net Control Station, BJ, who has conducted the Net since 1932, with an electric clock which is in twenty-four hour time and shows all time zones. The presentation was conducted by Capt. AEY. After a word from DJ, FB called in all the stations of the Net for their salutation. AIC reports a new jr. operator, and a new shack. W7FRM, VE7UT, and

(Continued on page 94)



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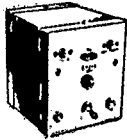
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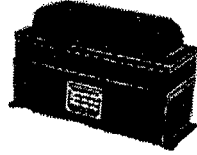
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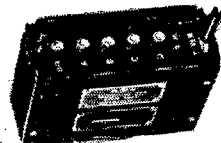
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"Your antenna is no better than its lead-line."

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AQO played hosts to the Kiwanis Clubs by holding a three-way QSO. OK, trying 8JK in the attic, finds it lights the lights in the house, but does work DX. LZ is moving QTH midway between EO and KC and hopes to intercept their DX. AX hopes his new receiver will cut out KC's c.w. EO has over 100 countries, but no cards. AJI has a baby girl and spends his time with TV. AEL is the proud owner of a Mighty Atom transmitter. WM and FB saw Seattle and attended the ARAB Hamfest, with Bill bringing home another prize. AHO now is 8OE at Eureka, N.W.T. The Nanaimo ARC really is active and has the most members on the air. AC has 25 watts ready for any emergency. TF, with new HRO, has made BPL. XA, our Route Manager, reports that he is very busy. It seems that the Totem ARC is still strong on the TV receiving. JM sends in a nice report but says many of us have had clicks and worst of all don't listen well enough on our frequencies before we start calling. Traffic: VE7TF 632, XA 42, AC 18, ID 5, FB 4.

PRAIRIE DIVISION

SASKATCHEWAN — SCM, J. H. Goodridge, VE5DW
S — SEC: SE. The SARC enjoyed movies on X-ray and its uses in industry as well as medicine, shown by KQ and JC. AB made a trip to the Coast, returning with surplus gear from Seattle and a puddle-jumper from Calgary. EY again is on the air after 18 years' silence. HI has hand-talkie. DN is interesting some of the Regina gang in 144-Mc. hand-talkie construction. New appointments: JI and IC as OPS. JH is now a daddy. LM reports making DXCC. Bob Paul, NSARC secy., now has his ticket. IC, AW, and PA, and their XYLs, raided CE's ice box. New calls on "75" are EU, GJ, GN, and KL. DR sports new home-brew converter. MA reports that HS is planning emergency power for present rig, UO is planning to try "constant modulation," BC hopes to get "phone ticket" in July, DS is interested in mobile and emergency power for rig, MA works adjacent sections with super-modulation mobile rig and has plans for s.s.s.c. RJ and FL are QRT to QSY to new QTH. GG is QSY to Dafoe. CS, the northern-most amateur in the section, is looking for contacts in the south of the section. JD, PJ, and RO keep Porcupine Plain on the map. Traffic: VE5YF 32, IC 30, JI 28, MA 14, EE 10.

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/WØTQD will be made on July 17th at 2130 EST. Identical texts will be sent simultaneously by automatic transmitters. Frequencies of transmission from W1AW will be 1887, 3555, 7215, 14,100, 28,060, 52,000 and 146,000 kc. WØTQD will transmit on 3534 kc. The next qualifying run from W6WIP only will be transmitted on July 1st at 2100 PST on 3590 and 7248 kc.

Any person may apply; neither ARRL membership nor an amateur license is required. Send copies of all qualifying runs to ARRL for grading, stating the call of the station you copied. If you qualify at one of the five speeds transmitted, 15 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, Monday through Friday, at 2130 EST. References to texts used on several of the transmissions are given below. These make it possible to check your copy. 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 May QST

- July 1st: Qualifying Run, 2100 PST, from W6WIP only
- July 5th: A Variable-Selectivity Sharp I.F. Amplifier, p. 11
- July 7th: A Low-Cost TVI Filter, p. 16
- July 11th: "Tailor-Made" Antenna Couplers, p. 19
- July 13th: Utilizing the 886, p. 25
- July 17th: Qualifying Run, 2130 EST, W1AW, WØTQD
- July 19th: Tower and Rotator Techniques, p. 34
- July 21st: A Compact 2-Meter Station. . . . p. 42
- July 25th: Future-hamie, p. 46
- July 27th: It's a Pretty Pickle, p. 54
- July 31st: An Automatic Transmitter Turner-Onner, p. 56



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CRYSTALS Low Freq.

FT-241 A holder 1/2" pin spacing, for ham and general use. Xtal controlled Signal Generators, marked in army Mc harmonic frequencies—Directions for deriving fundamental frequencies enclosed. Listed below by fundamental frequency, fractions omitted.

412	426	442	475	493	504	515	372	381	390	401
413	427	443	477	494	506	516	374	383	391	402
414	428	444	479	495	507	518	375	384	392	403
415	431	445	481	496	508	519	376	386	393	404
416	433	446	483	497	509	522	377	387	394	405
418	434	447	484	498	512		379	388	395	408
419	435	448	485	503			380		396	409
420	436	452	487						397	411
422	437	468	488						400	
423	438	472	490							
424	440	473	491							
425	441	474	492							

each **49¢**
each **39¢**
each **79¢**
10 for \$4.50

450	531,944
452,777	533,333
461,111	536,111
464,815	537,500
465,277	538,388
526,388	
529,166	
530,555	

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Frequency Standard
98.356 kc
3-pr. holder
\$3.98

SPECIAL 200 kc
Xtals without holders. 21-32" x 23-32".
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HAM CRYSTALS

FT-243 holders, 3/8" pin spacing, for ham and experimental use. Fractions omitted.

4190	6206	7906	8240	3735	5850	6425	6806	7540
5030	6773	7925	8273	5305	5873	6440	7306	7573
5485	6840	7973	8306	5677	5875	6450	7340	7640
6006	6873			5700	5900	6473	7373	7673
6040	6906			5706	5906	6475	7406	7706
6073	6973			5740	5925	6506	7440	7806
6075	7100	each		5750	5940	6540	7473	8173
6106	7740			5760	5973	6573	7506	8340
6100	7740	49¢		5773	5975	6606		
6106	7806			5775	6273	6840		
6140	7840			5806	6340	6673		
6173	7873	10 for \$4.50		5825	6373	6706		
				5840	6406	6740	10 for \$9.00	

SCR-522 XTALS

5910	6610	7580
6370	7350	7810
6450	7480	7930
6470		
6407.5		
6522.5		
6547.5		

each **\$1.29**

BC-610 XTALS

2 banana plugs 3/4" sp.

2045	2260	2415	3215	3510	3580
2105	2282	2435	3237	3520	3945
2125	2300	2442	3250	3550	3955
2145	2305	2532	3322	3570	3995
2155	2320	2545			
2220	2360	2557	each		
2258	2390	3202			

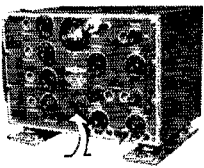
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Payments must accompany order. Enclose 20¢ for postage and handling. Minimum order \$2.00 plus postage. Crystals shipped packed in cloth bags inasmuch as they are shock mounted. All shipments guaranteed.

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Bendix TA-12 Transmitter, 100 watt.

4 separate ECO's with tubes, 3-807, 4-12SK7. Complete instructions for converting to 10, 20, 40, and 80 meters supplied. Only a few left at this low price!



Used **\$19.95** LIKE NEW **\$29.95**

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Single speed, reduced for clearance. **MODEL RC 65**, automatically mixes 10" & 12" records. High quality crystal pickup. Regular price, \$69.50. Reduced to **\$32.95**, brand new.

MODEL RC 70, similar to above but slightly smaller and does not intermix. Regular price, \$49.50. Reduced to **\$24.95**, brand new.

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Famous make, new, boxed, upright can, twist prong mounting, at 60% off List in lots of 10.

Capacity DCWV	List Price	Your Cost
20x20	150	\$1.55
20x20	150	\$1.55
20	25	2.20
20x20	150	2.20
200	25	2.65
20x20x20	150	2.65
20	25	2.85
30x20	150	2.20
20	25	2.20
40x20	150	2.30
20	25	2.30
40x30	150	2.35
20	25	2.35
40x40	150	2.40
20	25	2.40

In lots of 50 ass't additional 10% discount

SPECIAL BARGAINS IN HAM GEAR

Reduced for clearance—Display models
GONSET—6 meter converter. Reg. \$39.95. **\$27.95**
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All new, boxed, below cost, new shipment just arrived.

.500 sp. Cap. MMF	.375 sp. Cap. MMF	.250 sp. Cap. MMF
11 \$ 8.35	11 \$ 8.15	13 \$ 7.95
20 10.25	34 11.30	62 12.55
30 11.85	45 12.90	78 13.95
49 14.75	58 14.35	95 15.40
77 19.20	70 15.90	111 16.80
87 20.65	82 17.20	127 18.25
96 22.15	106 20.15	143 19.85
105 23.80	118 21.60	159 21.00
115 25.20	141 24.50	175 22.50
124 26.65	153 25.95	192 23.95
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Ready cut to four most popular ham bands broadband characteristics for transmitting and receiving—with 75 ft. lead.

Band	Antenna Length	Price
10 Meters	18 feet	\$ 7.70
20 Meters	35 feet	9.60
40 Meters	70 feet	13.50
80 Meters	135 feet	20.75

LET'S GO MOBILE

with master mobile all band, center loaded antenna—for 80, 40, 20, or 10 meters—short out coil for 10 meters—complete with one coil for 80, 40 or 20—specify which—less mount... **\$7.95**
Model 132 spring mount for above. **\$7.95**

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TELEPHONE HANDSETS, new TS-13 carbon mike and magnetic head phones with butterfly press-to-talk switch. **\$3.95**

VARIABLE CONDENSERS, as used in SCR-522, brand new, 2-gang, 220 mmf per section, **\$1.29**; 3-gang, 220 mmf per section, **\$1.59**; Variable condenser, 1-gang capacity 14-600 mmf. **\$5.99**

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PHONO ARMS, for replacements. **ASTATIC**—D-9, with 1-26A cartridge. New in original boxes. Original list price \$4.95, reduced to... **\$1.65**

PHONO ARMS, less cartridge, with all necessary hardware. Five (5) for **\$1.95**

BC-746 Tuning Units, contains antenna, oscillator coils, 140 mmf midget tuning condenser, double crystal socket, less xtals... **\$3.39**
With 2 crystals... **\$9.99**
With 2 crystals, one in 80 meter band. **\$1.29**

CQ TO ALL HAMS DE W3PPQ

Handle here is "Pick"... call or write me for anything you need in ham gear or parts—Will be happy to expedite your order with best quality merchandise.

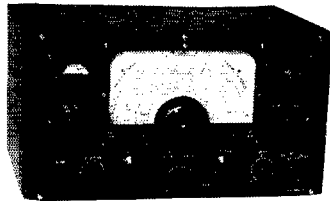
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1st FOR STABILITY!

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WRITE TODAY FOR COMPLETE FREE INFORMATION AND PHOTOGRAPHS

The VESTO Company
 101 Main St., Parkville, Mo.

Crystal-Controlled Exciter

(Continued from page 19)

mount the 80 socket to provide clearance for rack mounting, but substituting a 5Y3G rectifier would get around this problem. The tuning condensers were mounted on small insulating blocks of Lucite, and the shafts are insulated from the control-shaft extensions by solid insulating couplings. Three different types of crystal sockets, connected in parallel, were used to accommodate the various types of crystal holders in common use.

The shield on the 6AG7 plate coil, which was found to be necessary to eliminate oscillator parasitics and high crystal current, was made by soldering sheet copper purchased at a local hardware store.

Operation

With a reasonably good crystal, the oscillator should continue to oscillate at any setting of C_2 . However, best keying will result when C_2 is tuned no closer to resonance from the high-frequency side than is necessary to obtain sufficient drive for the 6L6. Key-down plate voltages should run about 200 on the 6AG7 and 400 on the 6L6. The voltage across R_4 is about 70 with the key up and somewhat more with the key down. By opening S_2 and holding the key down, a weak signal is generated that identifies the operating frequency without blocking the receiver.

A New Country

(Continued from page 26)

whereas in the Galapagos there was no such respite.

Our original plan had been to remain on the islands for 15 days. However, the suspension of the sailing schedule for April 3rd upset all our calculations and limited our time.

We did not have time to search out a Galapagos turtle and only once did any of us go fishing in this fisherman's paradise!

The return trip, which was very rough sailing from beginning to end, finished the job of wearing us out and it was difficult to distinguish between the four OMs and the 26 liberated members of the penal colony in Galapagos who returned to Guayaquil with us. But our reward was to be found waiting for us on arrival in hundreds of QSL cards and dozens of fine letters from amateurs in all parts of the world, expressing appreciation of what we had done to give them a "new one."

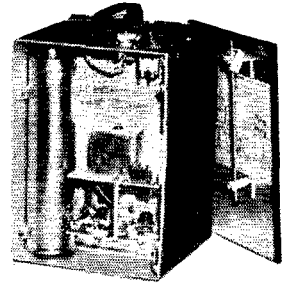
Being DX hams ourselves, we were naturally aware of the urgency with which HC8GRC QSLs were awaited. The print order was issued immediately on our arrival and in four days every amateur who had requested the special QSL service had a card on the way by air mail, addressed personally to himself. In four days more we were up to date and the rest of the cards had been air-mailed to QSL bureaus all over the

(Continued on page 28)

UNCLE SUGAR PAID \$45 BUT YOU PAY ONLY \$1.95 FOR THIS SENSATIONAL 1-METER-PLUS XMTR/RCVR

- Makes Precision Citizen's Band Freq. Meter
- Makes UHF Hi-Stability converter oscillator
- Buy 2 and Use as TV and FM Wobbulator
- Lowest Price Ever, Thanks to Special Purchase

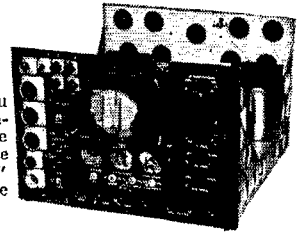
\$1.95



FCC demands frequency and stability tolerances. Avoid the "pink ticket" with this brand new cavity oscillator which makes a useful Citizen's Band (460-470 mc) freq. meter and signal generator — in fact it can measure frequency in any range harmonically related to its fundamental. Also makes a hot 1-meter-plus amateur xmtr/rcvr within the 240 mc band, or a UHF high-stability converter oscillator. Contains gold-plated resonator for stability, two 955 tubes, antenna, canvas carrying case, 9 1/4 x 6 1/2 x 6 1/2" aluminum cabinet with handle and compartment big enough to take an AC power supply. We include technical and constructional data for Citizen's Band freq. meter. Weight 10 lbs. **\$1.95.**

A FRACTION OF THEIR COST! R-7/APS-2 SCOPE CHASSIS **\$7.95**

We removed the tubes and other items from this expensive new scope and left you **\$55**-worth of completely wired parts including: complete 115 volt 400 cycle high-and-low voltage filtered power supply, numerous oil condensers, 36 octal tube sockets, mica condensers, transformers, 2AP1 scope shield, toggle switches, fuse posts, coaxial and AN connectors, etc., etc. Rugged aluminum chassis with 19" black crackle steel panel, overall 20 x 19 x 13", weight 60 lbs. A once-in-a-lifetime value for only **\$7.95.**

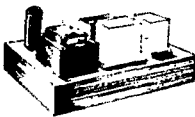


FREE! Giant 8-page rotogravure flyer! Bargain-packed! Free on request!

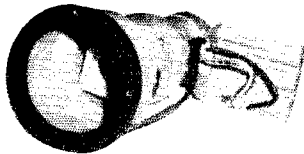
SAVE \$10 On This 400 VDC @ 200 Mils Power Supply Kit!

Should be **\$17.95**
YOURS
for only

\$7.95



Sensational value! Designed for rcvrs, xmtrs, testers, oscillators, preselectors, monitors, amplifiers, etc., requiring well-filtered supply. Kit includes: power x-former, choke, two 10 mfd at 400 V oil-filled condensers, 5T4 rect. tube, octal socket, 7 x 11 x 2" aluminum chassis, bleeder resistor, switch, and line cord! Gives a well-filtered supply of 400 VDC at 200 mils with less than 1% ripple. Has secondary voltages of 6.3 V at 4.2 amps, 5 V at 3 amps. **\$7.95.**



5FP7 SCOPE SHIELD

Worth \$7.00, but bargain-priced because we removed it from R-7/APS-2 scope. Five-inch shield with yoke coil, 360-degree thick plastic face plate, and metal panel mounting ring. Only **\$1.95.**

30 MC I.F. STRIP

Easily worth \$15 and brand new (taken from R-7/APS-2 scope). Excellent, completely wired foundation unit for 2 and 6 meter cascade converter, swell for fixed freq. 10 meter rcvr, FM rcvr or TV strip. Sockets for six 6AC7, two 6H6, 1 6SN7 tubes (tubes not included), plus 5 i.f. stages, UHF "input" and power receptacles, 13 x 5 x 2" enclosed aluminum chassis with bottom plate! **\$3.79.**

\$3.79

HOTWEATHER CHASER! 24VDC/110VAC* **\$3.75** BLOWER

*Excellent 110 VAC unit by inserting 70 ohm 200 watt series resistor (or 200 watt lamp). Brand new REDMOND blower removed from R-7/APS-2 scope for this bargain sale. Draws 1.35 amps; about 60 cfm; 4750 rpm; two 1 1/2" outlets; protective screen over 2" dia. intake; black crackle finish; 5 x 7". Ideal for darkrooms, cooling ham rig, exhaust fan, air conditioning, etc. Easily worth 2-3 times our LOW price of **\$3.75** each, 2 for **\$7.00.**

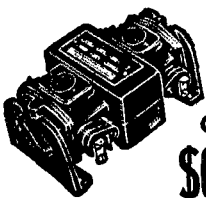
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MOTOROLA P-69-13-ARS receiver with special noise limiter for use with any converter having 1500-3000 KC. **\$60.00**

P-7253 spring base rear — mount antenna **\$22.50**

3-30 famous Gon-set converter complete to connect to the P-69-13-ARS receiver.... **\$39.95**

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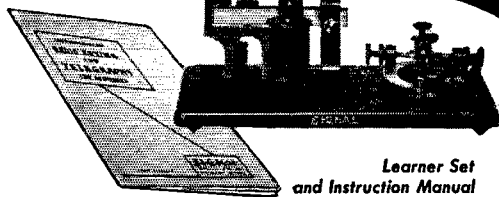
The above comes complete with all necessary accessories and mounting hardware. Order direct or through the Motorola National Service Organization member in your area.

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Signal ELECTRIC MANUFACTURING CO
DEPT. D-2, MENOMINEE, MICHIGAN

world. We did this because we felt that those who had sent their cards to us by air mail immediately after the QSO were particularly anxious to receive one and because the results of the special QSL service enabled us to go to this extra expense in getting out the cards to the bureaus.

Everyone is asking if we shall make a new trip. The XYLs say "Never." The rest of us say "Perhaps." And those who stayed in Guayaquil say "Sure, and we will go next time." Actually, the Guayaquil Radio Club has requested a license for a new member who has just settled on the islands. He is Bud Divine, owner and master of the schooner *Symbol*. Although much of his operation will be maritime-mobile, his presence at HC8GRC has made him very conscious of the demand for Galapagos contacts. Bud has promised to operate from ashore as often as possible, which should take care of the Ws. But the Guayaquil Radio Club still hopes to give the other continents a break and, incidentally, complete DXCC for HC8GRC by visiting the islands at some time when DX conditions are at their best.

Coil Design

(Continued from page 38)

appears possible using this method of design.

Sometimes it is desirable to withdraw energy from a stage in a transmitter for an auxiliary circuit without interrupting the main flow of power. A similar case in a receiver would be withdrawal of energy to supply a panoramic adapter. Either the tuned or the untuned coil can be used in this way. The coil is made up as described, and then moved up near the main circuit until the required amount of energy or signal is obtained, after which it may be fastened in place.

There appears no limit to the applicability of the described methods of selecting the proper coil size. The procedures involved are simple; consequently, it would appear that amateurs should find the method useful.

Loneliest Ham

(Continued from page 40)

when I get a QSL. Mike and MM1F exchanged reports and then chewed the fat about an ionosphere storm that was due, working fast break-in. MM1F could have been a ZL for all the difference it would have made in the procedure. I had to admire his fist, though — it sounded just like tape. Then it dawned on me that the whole thing was a rib! There was no delay in the comebacks! Some of the local boys must have planned the whole thing, to make a monkey out of the New Englander. But the op at the other end had forgotten to allow some lag time! Pretty good, I thought, but they slipped up after all the elaborate build-up. I'll just play along.

Mike signed off, there were no more pips on the screen, and he shut down and made a pot of

(Continued on page 100)

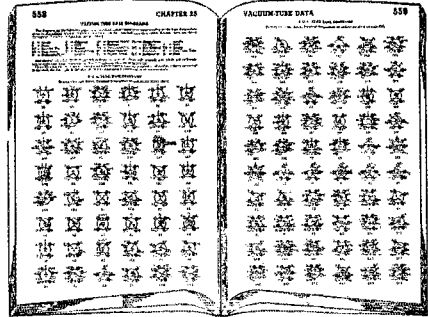
HAMS? No!



THESE MEN ARE NOT AMATEURS

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 A New Jersey radio SERVICEMAN
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 A Navy RADIO OPERATOR
 An ELECTRICIAN at Bethlehem Steel
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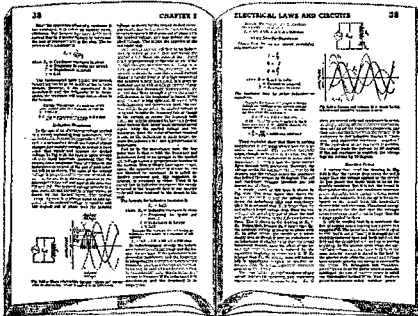
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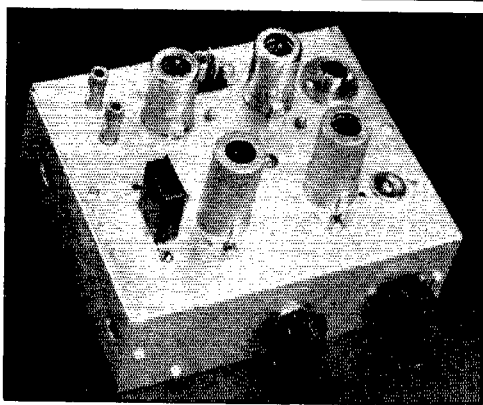


Fig. 12-10—A crystal-controlled converter for 144 Mc. Two 6J6s serve as oscillator, multiplier and mixer. The two 6AK5s are bandpass r.f. stages.

It's just one of the many pieces of VHF equipment you can build from complete directions in the 1950 Radio Amateur's Handbook. Three chapters on VHF and UHF gear and antennas with 131 photographs, diagrams, tables and drawings in the 605 page

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coffee. We chewed about receiver sensitivity, pulse techniques, beam antennas, and the usual. I had to hand it to him — he knew all the answers. Occasionally I would get around to his rig, but he would brush me off on the tough questions with the excuse that they involved the secret stuff. On the way back to the hotel it was much the same deal, but he did give me a few ideas I'm going to try. That one about compound feed-back has possibilities.

Mike made me promise I wouldn't tell a soul about his work, declined a nightcap, and then I gave him the business. "By the way, Mike," I asked, "why wasn't there any delay on that planet MM1F you worked?"

"Oh, that was no planet," Mike replied. "That was a mobile station, a space ship practically in our atmosphere. There are quite a few around these days, scouting the Earth. Look me up when you're out this way again." He drove off before I had a chance to tell him I had the whole thing figured.

But have I? I just read about two airline pilots who have *seen* the darned things!

Happenings

(Continued from page 49)

ests of unity withdrew his nomination. Mr. Griggs asked to be recorded as having voted for Mr. Dosland.

96) On motion of Mr. Griggs, and by unanimous rising vote, the Board expressed its gratitude to the retiring Vice-President, Mr. McCargar, for his long service to the League in behalf of amateur radio. Mr. McCargar spoke briefly in appreciation. (Applause)

97) Mr. Groves, as the new Vice-President, spoke briefly in appreciation.

98) Whereupon, on motion of Mr. Reid, the Board adjourned sine die, at 5:48 p.m.

99) (In the course of its deliberations the Board also discussed, without formal action, the editorial policy of *QST*, amateur call letters on automobile license plates, national electrical codes and standards, and television interference. Time in session: 13 hours, 17 minutes. Total appropriations: \$37,587.93.)

A. L. BUDLONG
Secretary

Speech Amplification

(Continued from page 51)

Automatic gain control is obtained by amplifying part of the output of V_3 , rectifying it, and applying a negative repeller voltage to the plates of V_7 . The control voltage so developed is a function of the average speech amplitude. The amount of compression is determined by the setting of the compression control, R_{12} . Time delay is accomplished with R_{19} and C_{13} in the grid circuit of V_6 . The voltage divider ($R_{16}R_{17}R_{20}$) across the -150-volt source provides a small bias for the full-wave rectifiers, thus allowing weak signals to be passed without a.g.c. action.

In constructing such a unit no special precautions need be observed other than those normal to any high-gain amplifier. No trouble should be

(Continued on page 102)

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unidirectional cardioid crystal
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Astatic's NEW SYNABAR MICROPHONE offers a new measure of clear-toned performance quality . . . and its perfection does not diminish through long service life, thanks to a new ruggedness of construction. Perhaps the outstanding engineering achievement incorporated in this newly perfected unit is the use of a special sintered metal to cancel out 15 db front to back, making the Synabar, for practical purposes, dead to sound from the rear. Excellent frequency range, from 50 to 10,000 c.p.s., is further enhanced by a Response Selector switch, which provides choice of ideal pick-up characteristics for either crisp voice or general voice and music. The Synabar's crystal element has a special METALSEAL protection against moisture or dryness. A high impedance microphone, it has an output level of -54 db. It has a satin chrome finish, is furnished with detachable concentric cable connector and 20 feet of single conductor shielded cable, and is available in models with or without off-on switch.



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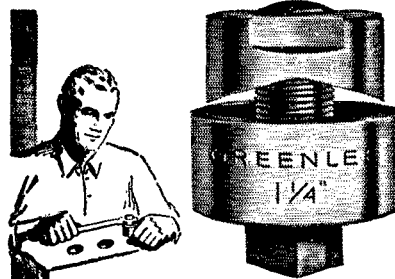
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experienced in getting the amplifier to drive such tubes as 6B4s, 6L6s, etc. Actually, more than ample gain is available for most speech-type microphones on the current market.

Adjustment is reasonably simple provided a means of measuring percentage of modulation is available. First, reduce R_{12} (compression) to zero and set R_{13} (level) approximately one-third open. Then advance R_4 (sensitivity) until 100 per cent modulation is obtained with normal talking. Talking at this same level, slowly readjust the compression control until this 100 per cent modulation is reduced to approximately 50 per cent. With this accomplished, readjust the level control again to give 100 per cent modulation, without touching the sensitivity or compression controls. The adjustment procedure is then complete. Changes in the amount of compression, as well as raising or lowering the level, will undoubtedly be necessary for some individuals; therefore, strict adherence to this procedure is not required.

Tests with the amplifier feeding 6L6 drivers to a pair of 805s showed a great improvement in the average level of modulation. The system really pays off when QRM gets tough.

Hints & Kinks

(Continued from page 87)

spacers are cut so that their length is equal to the inside diameter of the tubing used for the outer conductor. The ends of the rods are rounded smooth with a file or sandpaper. They are threaded through the holes and cemented in place.

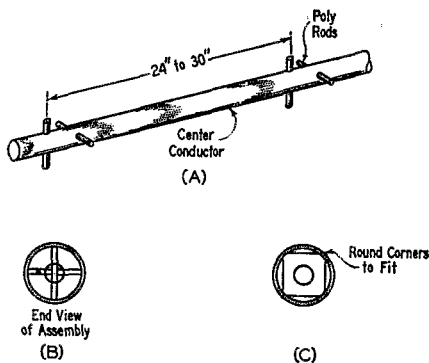


Fig. 4 — A simplified method of making your own air-dielectric coaxial lines from surplus aluminum.

If rod stock is to be used as the center conductor, the spacers are made in the form of a wafer, as shown in Fig. 4C, with dimensions adjusted to fit the inside of the outer conductor. In either case, the spacers should be arranged so that the first one is about 6 inches in from the end of the line, and the rest are equally spaced throughout the line.

Fortunately, the dimensions of much of the

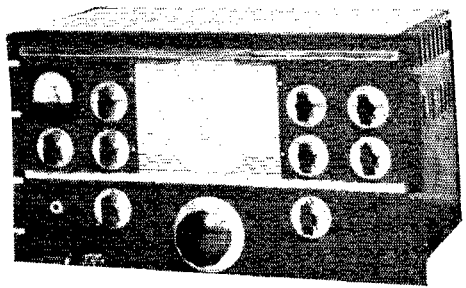
(Continued on page 104)

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D	1.7-4.0 mc	1.0-2.4 mc
C	3.5-7.3 mc	2.2-5.0 mc
B	7.0-14.4 mc	4.5-10.0 mc
A	14.0-30.0 mc	9.0-18.0 mc

13 TUBES: 6SK7 RF, 6K8 Det, 6J5 Osc, 6K7 IF, 6SK7 IF, 6C8G 2nd Det-NL, 6SJ7 BFO, 6SJ7 AVC amp, 6F8G Inverter, 6J5 1st AF, 6V6G-6V6G P-P audio, 80 Rect.

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How's DX?

(Continued from page 61)

while Siam's three remaining ticket-holders are HSs 1BJ, 1SS and 2F. Incidentally, the Inspector General of Radio in Ecuador now holds the call HC1AZ W4TM is beginning to notice the 14-Mc. r.a.c. doings to which we alluded and W8SYC wants to make clear that although he procured the grand of cards for VP7NM, the latter footed his own bill ZK2AA would prefer incoming QSLs go via the NZART bureau and Z85YF is due to propagate from G3BYF immediately if no sooner. Peter's ZS QTH mail will be forwarded to him all okay "There is good news for those who do not have a card from Cocos Island, TI9. There is another expedition to search for a fabulous treasure. Among the government inspectors is Edgar Solano, TI2ES, who is going to operate on 40-meter c.w. and 'phone and perhaps 20 also." So writes TI2HP, specifying no dates Did you notice that W6ENV's first application for a DXCC award was accompanied by 227 cards? [Boss, we should have held out for 250. — Jeeves]. Yes, and with you holding your breath, too, Jeeves Bill Dawson, who has held W calls 3EVG, 4EVG, 5FTU and 6WMP, now is sampling things from the other end as JA2CV on 10 and 20 'phone and c.w. WØTND returned from HZ1AB and is glad to report that the gang remaining at the Saudi-Arabian station intends to engage in heavy ham activity as usual henceforth. New antennae were erected after the station was moved to a less noisy spot; a BC-610 and an SX-28 keep the situation well in hand, mostly on 10 and 20 'phone and c.w. HZ1AB-destined cards should be addressed: Attn.: M/Sgt. Don Bender, % 1949th AACs Sqdn., APO 616, % PM, New York, N. Y. We regret the necessity of commenting upon the passing of two well-known DXers, EL5B and CR9AN. EL5B was killed by electric shock while on duty as communications chief at Robertsfield, we are informed by W2QKE. CR9AN died after a long illness and was universally known as the DX "twin" of CR9AG W6s LYN, SAT, W7AJS and others furnish Macau information. CR9AG is leaving to resume operation at VS6AG and CR1ØAA may replace John in Macau. The equipment of CR9AG is now owned by CR9AB who works A3 only. A new station, CR9AC, is reportedly ready to employ c.w. They'll be faced with a huge task in filling the DX shoes of CR9s AG and AN W6LRU writes of high activity in the newly-organized San Diego DX Club which has W6s BZE, CAE, CHV, EHV, GTM, ITY, KYG, LMV, LRU and OBD included among the membership.

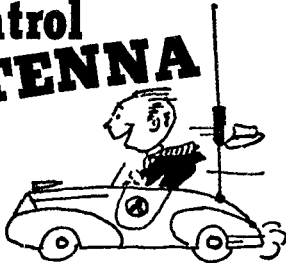
W3BXE is all set to put FP8AB on the air again this fall, around the first or second week in September. Present plans call for 14-Mc. operation only, in an effort to offer contacts with more of the world than the 7-Mc. wine-cellar work provided last year. The rig will be VFO and end up with a 4D32. Jack makes one request that doesn't sound too unreasonable — he asks that stations he worked last year do not call him, since his whole purpose is to provide as many FP8 contacts as possible. Any last-minute details on operating times will be carried in a WIAW bulletin.

We'll now cull a few of the current club periodicals for some pertinent items. In the Northern California DX Club's DXer we observe that a friend of FK8AC is about to fire up FV8AA on Wallis while ex-VK9NR totes the call ZL3OZ and is expected to radiate with a ZM6 moniker at any time now ON4QF may be able to put Andorra and/or Monaco on the air during early July and DLND still has intentions along this same line.

The Southern California DX Club's Bulletin is also interesting reading. VR3A is expected to visit San Francisco and perhaps Los Angeles but H4DW's intended operational trip to the Vatican State (HV) had to be canceled because of

(Continued on page 106)

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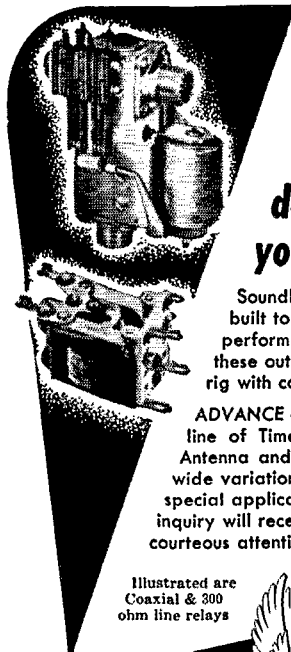
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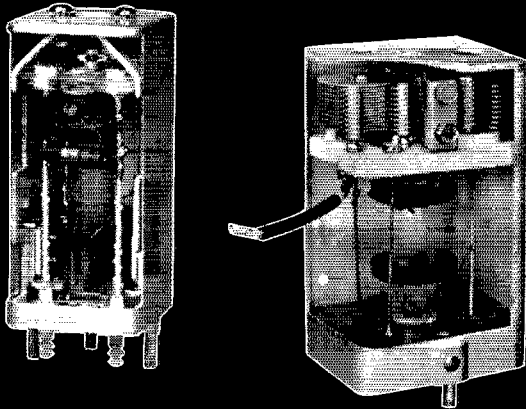
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MALDEN, MASSACHUSETTS

red tape in the station-permit department ZS8MK is ex-G5MK and ZS5MK while rumors of near-future ZC2 activity gyrate hither and thither in W6-land.

The number of JA actives is on the increase again according to the FEARL News. JAs 2MY, 2RO, 2BO and 2BI lead the DX parade over there, ranking in that order for countries worked In addition to the WAJAD sheepskin mentioned last month there is yet another certificate award available, this provided upon confirmation of five JA (no J) QSOs with different stations. Cards should be submitted to the FEARL and will be returned with the diploma.

The Tri-State Amateur Radio Society's *Sparks* contains a DX section ably manned by W9QLW, W9DGA and W9QLW are the club's DXCC members and W9s HQF, UIA and PNE are bearing down on the 100 mark. So there, you Kilofornia crackerjacks, there are W9s who can work DX!

Ah, we reach the sultry period of the year when most of the 200-country gang yawn, stretch lazily, and then head for their respective vacations. Thus Jeeves & Co. build up big ideas of sneaking down into the third layer while the cat's away, perchance to raise a brand new KP4 or something. The catch is that about 14 locals seem to have the same stunt up their sleeves, so this summer's competition may be worse than ever!

NEW CIRCULAR ANTENNA FOR 2 METER OPERATIONS

Extremely high signal output

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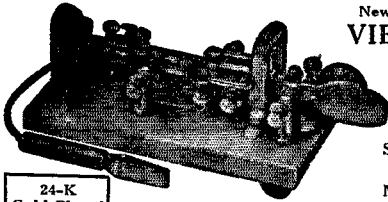
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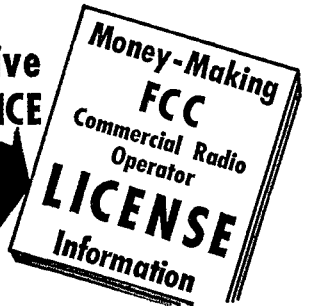
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"I have accepted a position with KWAD. I secured this position through the help of your Job-Finding Service and I had at least six other offers. I am sincerely under obligation to you." — Fred W. Kincaid, Box 241, Wadena, Minn.

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Desk QT-19, 4900 Euclid Bldg., Cleveland 13, Ohio

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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 contact 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 takes 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.

Please note the 7¢ rate on hamads is available to ARRL members only.

QUARTZ - Direct importers from Brazil of best quality ultra pure quartz suitable for making piezo-electric crystals. Diamond Drill Carbon Co., 719 World Bldg., New York City.

QSLs, 100, \$1.25 up. Stamp for samples. Griffith, W3FSW, 1042 Pine Heights Ave., Baltimore 29, Md.

QSL's, SWL's. Finest stock. Fairest prices. Faster service. Dosssett, W9RHV QSL Factory, 835 Burlington, Frankfort, Ind.

QSL'S Kromkote cards at a fair price. Dauphinee, W1KMP, Box 219, Cambridge 39, Mass.

SUBSCRIPTIONS, Radio publications a specialty. Earl Mead, Huntley, Montana, W7LCM.

QSL's high quality, fair prices. Samples? W7GPP R. D. Dawson, 1308 F Street, The Dalles, Oregon.

10-METER Beams, \$19.50. Send Card for free information, Riverside Tool Co., Box 87, Riverside, Illinois.

CRYSTALS: Bassett Type 100A precision low-drift units made to your exact specified frequency within the 80 or 40 or 20 amateur bands, at \$1.50 each, plus postage. Rex Bassett, Inc., Bassett Building, Ft. Lauderdale, Fla.

QSLs, Stationery, "etc." Taprint, Sumrall, Miss.

ZIPPO lighter. ARRL insignia and call sign, inlaid enamel. \$5.00. Ideal birthday gift. McCarron, W2BNO, 384 E. 193 St., New York 58, N. Y.

WANTED: Marconi magnetic detector, multiple tuner; DeForest responder and audio control panels; other wireless gear prior to 1925. Franklin Wingard, Rock Island, Illinois.

QSLs. Have you seen them yet? Samples today. Your best bet. Larry's QSLs. Opportunity, Wash.

FOR Sale: by estate of W0TGGZ: 100-watt cw transmitter in floor rack, BC-348-C converted, Hallicrafters SX-24, Hallicrafters S-72, BC-696, etc. All equipment in excellent condition. Send stamp for complete list. Hazel T. Lammey, Extr, 3019-54th St., Des Moines 10, Iowa.

TELEPHONE BARLEY 7-7777 any hour of the day, night, Sundays, holidays, for rush shipment of all standard parts and equipment! Lowest amateur-dealer prices. Harrison Radio, 225 Greenwich Street, New York City. "Ham Headquarters Since 1925."

QSLs of distinction! Three colors and up. Rainbow map QSLs. Special DX QSLs. Samples? Uncle Fred, Box 86, Lynn, Penna.

QSLs, SWL's. Very attractive. Best in printing and prices. Kromkote or any other stocks. Samples. W4LXJ, Roon, Radford, Va.

SALE or swap SX-23 for Ametcan 6200 V 700 Ma. W8TSD, Box 94, Oak Harbor, Ohio.

HAM'S HAVEN where amateurs fish and holiday. On Big Eagle Lake in Northwest Ontario. Family cabins. Write J. B. Connor, VE3AFH, Box 238, Dryden, Ontario, Canada.

MODERN QSLs. Sample booklet, 12¢. Stamps OK. Westerners see samples at leading ham stores, van Groops, W6GCV, 1436 No. Serrano, Hollywood 27, Calif.

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SELL BC-221 AC power supply calibration book, guaranteed perfect. SX-28A A-1 shape. New trans. 110/220, 2400 CT 1 1/2 amps. Need high power final components. Jack Watt, WBHYQ, Ontonagon, Michigan.

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QSLs? SWLs? Modernistic? Cartoons? Deluxe? Photographic? QSL specialists! Samples, 3¢. Sakers, W8DED, Holland, Michigan. QSL's unbeatable. (Veteran.)

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WILL swap or sell my commercial factory custom-built all-band (10-20 meter bandswitching incorporated with 2 complete R.F. sections!) WRL Globe King, Deluxe phone and c.w. xmitter; with push-to-talk, all-band antenna tuner, 6 ft. Deluxe enclosed Bud rack, all coils, like-new, and guaranteed perfect for Collins 32V-2 or \$500.00. Photos and complete details sent on request. Write to W9IOS, 3332 North 57th St., Omaha 4, Nebraska.

SELL QSTs, 1931 through 1946. Make an offer. Want to purchase D.C. generator, 110-volt, 5 ampere. W3BWT, 132 Tennessee Avenue Northeast, Washington 2, D.C.

WANTED: Mackay FTR-128 or similar low frequency receiver. State condition and price. Paul Kretschmer, 726 N. Gramery Place, Hollywood 38, Calif.

HARVEY-WELLS fine business Bandmaster transmitters are stand-alone stock items with W1BTF, Evans, at Evans Radio, 10 Hills Avenue, Concord, N. H.

HAVE your QSL cards unique, with picture of yourself or your rig and ask your contacts for theirs. Sample for a stamp. Tift, 501 Tift Road, Dover, N. H.

NEW 34' 4 legged self-supporting galvanized steel towers, \$69.00. F. B. Tulsa, Oklahoma. Tom Peery, W5MIS, 1524 N. Denver St., Tulsa, Oklahoma.

WANTED: Panadapter or SP-44 Panoramic. Give best price and condition in your first letter. Deilus, W4PHQ, 1200 Catawba St., Kingsport, Tenn.

SELLING out complete c.w. station: Bandswitching exciter BC-221 and FRO, 3400 watts, plug-tuned doubler, 807 turret, low voltage supply, complete in Bud 10 1/2" cabinet, \$90.00; PP 813's final with two GE meters, grid turret, BC-610 plate coils, filament transformer, 14" rack mounting, spare set of new 813's, a beauty for \$75.00; two SCR-522's unconverted, \$20.00; converted with National breadboard dial, \$35.00; original AK-7 Dynamote keyer, \$22.50; 3-element 20-meter beam antenna, \$20.00. Other bargains. Write to W5EGA, 711 N.W. 30th, Oklahoma City, Okla. Local phone: 5-6053.

PAIR 4-125A's, Never used. Not in original carton. Guaranteed perfect. First \$35.00 for pair. L. Kanoy, W4DCW, 114 Idlewild Drive, Winston-Salem, N. C.

WANTED: One Mims Deluxe rotor. State condition and price. F. M. Whitaker, W4OC, Durham, N. C.

SELL TCS-12, new, \$295.00. BC-654, PE-103A, PE-104A, cables; new \$69.00; RA-34 rectifier, \$85.00; \$22 Transformer, Dynamotor control, plugs, instruction manual, new \$49.00. T. Howard, W1AFN, 46 Mt. Vernon St., Boston 8, Mass.

FOR sale: Hammarlund HQ-129-X receiver, excellent condition, with 1000 Kc frequency standard. Best offer over \$100 takes it. Willard Hutton, W3AG, 5414 Belle Vista Ave., Baltimore 6, Md.

ROTOR or swap: Workshop 10-meter beam with Alliance rotor and thrust bearing. Robert Blaney, jr., W9FRU 616 Third, Ft. Wayne, Ind.

SELL: Rare original Army Technical Manuals on BC-221 frequency meter, 162 pages specifications, schematics, instructions for maintenance, repair, all models, \$2.00. SCR522A (BC624A-BC625A) schematic wiring diagram, 25¢ plus stamp. Want original Army Manual on BC-221, Frank Dunan, W3NB, 1717 Lang Place, N.E., Washington 2, D. C.

SAVE up to 50% on these used bargains: HT-9, \$225.00; HT-18, \$89.50; S-20R, \$37.50; SX-25, \$69.50; S-38, \$29.00; S-40, \$49.50; HQ-129-X, \$125.00; Meck T-60-1, \$99.50; Milten Exciter, \$24.00; Mon-Key, \$19.50; HRO-7, \$229.00; NC-57, \$67.50; NC-183, \$200.00; RME-45-A, \$89.50; VHF-152A, \$59.50; VFX-680, \$49.50; and BC-348 (110 VAC) \$49.50. Many others. Send card for list. Walter Ashe Radio Company, 412 Pine, St. Louis 1, Missouri.

SWAP: Sonar XE-10 NBFM exciter in excellent condition for Gonset 10-11 W1MVO.

FOR sale: Send for list of units for KW transmitter, 274N Transmitters and receivers, PE-103, beam prop-pitch motor, metal turning lathe, miscellaneous radio parts. Oscar Fov, Thornton, Iowa.

SELL: ART-13, used, but in good condition, unconverted, less Dynamotor, \$80.00. Manual is included. Will deliver up to 100 miles. W9IDX, 2206 Glenn St., South Bend, Ind.

ANTENNA 35 ft. Premax 136M with 1PG44 base insulator, like-new, \$18.00. BC-348 AC converted, \$50.00. W4MQC, 490 SE 2nd St., Hialeah, Florida.

SELL or trade: BC-603-C receiver; BC-684-B transmitter w/ Dynamotor and crystals; DC generator, 30 volts, 140 amps; inverter 28VDC, 115 volt 400 cycle. Miscellaneous items. Need parts for 50-watt c.w. transmitter or what have you? H. S. Kacy, 7750 Ensign Ave., Sun Valley, Calif.

WILL trade buffet clarinet in good condition for BC-348 II, K, L, or R, Luster Ling, W5NLL, Corning, Ark.

SELLING out: 32V2 used 40 hours, \$425.00. Also parts for 10 M.K.W. power supply, modulator, final, antenna coupler, three 250HT tubes in cabinet, ready to wire: \$200.00 (half cost of parts). W3OQS, Keast, 4845 N. 18th St., Philadelphia 41, Penna.

100' RCA anniversary model Television receiver. Will sell or trade for Meissner signal shifter, latest only, 10 and 20-meter beam and rotor, all-band transmitter, or what have you? W8DIF, 140 W. Center College St., Yellow Springs, Ohio, Call 7205.

FOR sale: RME-45 with speaker, in excellent condition. Best offer. W2SHE, 111-55 77th Ave., Forest Hills, L. I., N. Y.

SELL: BC-348Q converted with PM speaker, power supply in speaker cabinet, diagrams, \$85.00. Instructograph spring-wound cadence machine, \$10.00. Candler code course, \$10. W2DDX, 35-11 146th St., Flushing, L. I., N. Y.

SELL: Like new: BC-610E, with speech amplifier. Coils 10-20-40-75 meters. Built-in antenna change-over relay and co-ax fittings to antenna tuner, \$500.00. Write C. C. Talianero, Syosset, L. I., N. Y.

ANTIQUe collector Grebe CR-9 receiver 150 3000 meters, 1914 model, in excellent condition and Westinghouse type RA 100-700 meter receiver and DA detector and 2-stage amplifier, in fair condition. Also DeForest Audiotron, both filaments still good. Best bid over \$50.00 takes all. W2ZK.

WANTED: A 100-200 w. phone/c.w. transmitter, complete, including power supplies, modulator and etc., covering 80 through 10 meters; crystal or VFO controlled. Need not be a commercial job but must be neat. Quote price in letter. Ensis Suhanen, Trout Creek, Mich.

SOME 1000 watt, 110 volt, A.C. lighting plants at \$200.00 each. Katolight, Mankato, Minnesota.

QSLs, SWLs! Free samples. Cushing, WIHJI, Box 32A, Manchester, N. H.

LATEST Call Books, \$2.00. Mead, Huntley, Mont.

SELL: Navy TCS-5 transmitter, CW and Phone, 1.5-12 Mcs. ECO and crystal; Navy receiver RAX-1, Type CG-46117, 7-27 Mcs. Best offer. E. van derSmisssen, 935 New Hampshire, Lawrence, Kansas.

BARGAINS! New and used transmitters, receivers, parts: Globe King \$299.00; HT-9, \$225.00; Remco 75GA or Supreme AF100, \$250.00; Sonar SRT-75, \$139.00; ART 13, \$139.00; new 150-watt phone, \$199.00; HT-6, \$85.00; 60-watt phone, \$89.00; Globe Trotter, \$57.50; new Bud VFO, \$39.50; New Meissner Signal Calibrators, \$29.95; HRO complete, \$129.00; SX-43, \$129.00; NC-173, HO-129X, \$139.00; RME-45, SX-25, \$99.00; RME-69, \$75.00; S-38, \$19.95; VHF 152A; BC-610's and many others. Large stock trade-ins. Free trial. Terms financed by Leo, W0GFO. Write for catalog and best deal to World Radio Labs, 740-44 W. B'way., Council Bluffs, Iowa.

SELL: Sonar VFX-680 in excellent condition; coils for 80-40-20-10 \$55.00 Postpaid. W1QKI, 405 Lowell St., Lawrence, Mass.

MON-KEY for sale for best offer, like-new. E. Chin, W1SIE, 24 Lee St., Cambridge, Mass.

SELL Hammarlund Pro SP-400-SX with speaker, factory aligned. First \$225.00 check takes it. New BC-221 with SR power supply, original xtal, cal. book, manual, \$60.00 cash. J. Pinerio, W1OWX, 178 L Street, So. Boston, Mass.

SELLING Collins 32V2, \$495.00, also 75A1 receiver, \$275.00. Used only few hours, new condition. W5DA, 4425 Bordeaux, Dallas, Texas.

IN34 Crystals, 67¢, FL-5 filter, 89¢. Free "TABOGRAM", Sensational bargains! "TAB", 109 Liberty Street, New York City.

FOR sale: APR-4 tuning unit, 38-95 Mc, 30 Mc IF. Motor-driven auto-reversing variable speed tuning, \$20.00. ATR inverter, 75 watt, \$12.00. BC-1031A Panel adapter, 45¢ KC input, spare set of tubes, \$70.00. BC-453, osc. cut to tune 915 Kc. 6 volt tubes, \$10.00. All items brand new. Harold A. May, 1211 Harvard Terrace, Evanston, Ill.

THE new "Surecheck Test". Multiple-choice type questions with excellent coverage of the material: Class B and C. (100 questions and key), \$1.75. Class A (130 questions and key), \$2.00. Amateur Radio Supply, 1013 Seventh Ave., Worthington, Minnesota.

BARGAINS! New and reconditioned Collins, National, Hallcrafters, Hammarlund, RME, Millen, Meissner, Gonset, others. Reconditioned S-38, \$29.00; S-40A, \$39.00; SX-43, \$119.00; SX-42, \$179.00; HO-120X, \$89.00; HO-129X, \$129.00; NC-57, \$59.00; NC-173, \$139.00; NC-184, \$199.00. 32V, \$395.00; HRO5TA1, \$159.00; DB22A, \$29.00; HF-10-20, \$49.00; VHF-152-A, RME-45, \$89.00; SX-25, SX-28A, SX-62, HT-9, NC240D, HRO-7, BC-610, RC-18, RC-221, BC-342, BC-348, Meissner 9-1090 handswitching VFO, \$49.00. Others. Shipped on trial. Terms. List free. Henry Radio, Butler, Mo.

SALE: BC-221 original chart and crystal, \$75.00; BC-342, 115 volt AC 60 cycles, \$69.50; BC-348, 28 volt DC, \$75.00; BC-221, 12 volt DC, \$75.00. New condition, 1/3rd deposit, balance C.O.D. East Side Surplus, Route 6, Macon, Ga.

QSTs, 1915 through 1950. Riders 1 through 17. Other radio books, magazines. Best offer taken. Mrs. C. T. Beardsley, 103 Wythburn Wood, South Portland, Maine.

We offer a new surplus power supply unit delivering 600 v. at 350 Ma. and 6.3 VAC at 12.5A (from 115v. 60 w) fully assembled with best components (15 µd output condenser) measures 18" long x 9" wide x 11 3/4", net weight 62 lbs., gross weight 120 lbs. Constant duty ratings with less than 1% ripple assure satisfaction; fine for excitors, low powered transmitters, etc. \$30.00 F.o.b. Weston. The Overbrook Company, Overbrook 84, Mass.

PHONE patch schematics, discussion, \$1.00, Nichols, W1MRK.

"RADIO Communication Transmitters" by J. J. Hupert, M.Sc Senior Lecturer, Physics Department, De Paul University, To our knowledge this publication represents the first attempt to bridge a gap existing in the literature on the principles of Radio Transmitter design. Cloth bound, \$3.00. ATA Scientific Progress, Ltd., 63, Kensal Road, London W. 10, England.

HQ-129X, excellent condition, with bass reflex speaker. Best offer over \$100.00. W1JMY, 510 So. Quaker Lane, West Hartford, Conn.

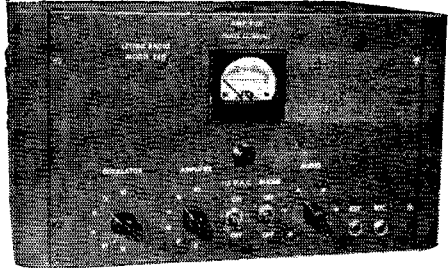
DECALCOMANIAS: Two inch gold and black, 20¢ each letter or number. B. J. Lumblad, W0BQJ, Box 331, Mason City, Iowa.

FOR Sale one each, BC-458 A, B, and C, \$12.50 each new and unused, Hammarlund HQ-129X receiver with frequency standard installed used twenty hours, \$120.00 and VHF 152A used ten hours, \$60.00, both new condition. Lew Wallace, Gowanus, N.Y.

ATTENTION New York City hams! Selling: Meissner 150B transmitter, VFO controlled, with coils for 80, 40, 20 and 10 meters, and 2E2S doubler. Some spare tubes: \$175.00. 3-element wide-spaced 10-meter beam, with T-match. Very sturdy, 25 foot mast included: \$30.00. Super Pro BC-779 with speaker and power supply: \$125.00. 10-11 meter converter, in cabinet, \$15.00. All units in good operating condition. Will not ship any units. William Versaci, W2QUD, 51-25 61st Street, Bayside, Long Island, N. Y. Phone 1L 4-6538.

SELL: BC-348M converted for 110 Ac. Perfect mechanical and electrical condition, with shock-mounted base. Best offer over, \$50 takes it. E. Fairstein, W4MXZ, 121 Hoyt Lane, Oak Ridge, Tenn. FOR Sale: BC-312D, converted, \$45.00; BC-224H, converted: \$45.00. Both units in good condition, ready to go. Also SCR-522, \$20.00 and BC-348R, \$45.00. Unconverted. Both units complete with tubes and in good condition. Clement Gouveia, 3310 63rd St., Sacramento, Calif.

40 WATTS \$69.95 PHONE-CW MODEL 240



Buy this beautiful transmitter, completely wired and ready to operate direct from our factory, with instructions for TVI reduction. Even if you already have a transmitter of your own, this rig makes an excellent standby. You can't afford to miss this opportunity.

The 240 is a complete 40 watt Phone-CW rig, working all bands from 160 to 10 meters; complete with (8 x 14 x 8) cabinet, self contained power supply, meter, tubes, crystal and coils for 40 meters.

Tube line-up: 6V6 osc., 807 final 6SJ7 mike amp., 6N7 phase inverter, 2 6L6s mod., 5U4G rect. — weight 30 lbs.— 90 day guarantee. \$20 deposit with order — the balance C.O.D. Coils for 80, 20 and 10 meters \$2.42 per set. Coils for 160 meters \$3.00. **\$69.95**

LETTING RADIO MFG. CO.

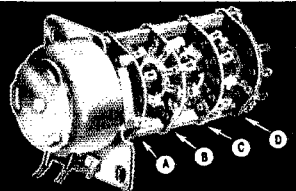
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Valley Stream, N. Y.

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With a 6-position switch mounted in the front of the car, it permits instant control of xtal, antenna or band switching. Switch deck "A" is used to control operation of the solenoid, "B" and "C" are one pole 6-position bakelite wafers. "D" is not usable but can be replaced with a 2-pole 6-position ceramic deck for antenna and RF switching. Solenoid has many other applications. Complete instructions included.

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Add 25¢ postage for each solenoid ordered.

TERMS: Cash with order, or 20% deposit, balance C. O. D.

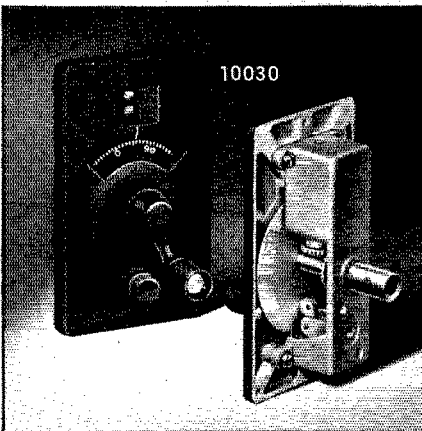
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An extremely sturdy instrument type indicator. Control shaft has 1 to 1 ratio. Vee-der type counter is direct reading in 99 revolutions and vernier scale permits readings to 1 part in 100 of a single revolution. Has built-in dial lock and 1/4" drive shaft coupling. May be used with multi-revolution transmitter controls, etc. or through gear reduction mechanism for control of fractional revolution capacitors, etc. in receivers or laboratory instruments.

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MFG. CO., INC.**

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Unsurpassed!

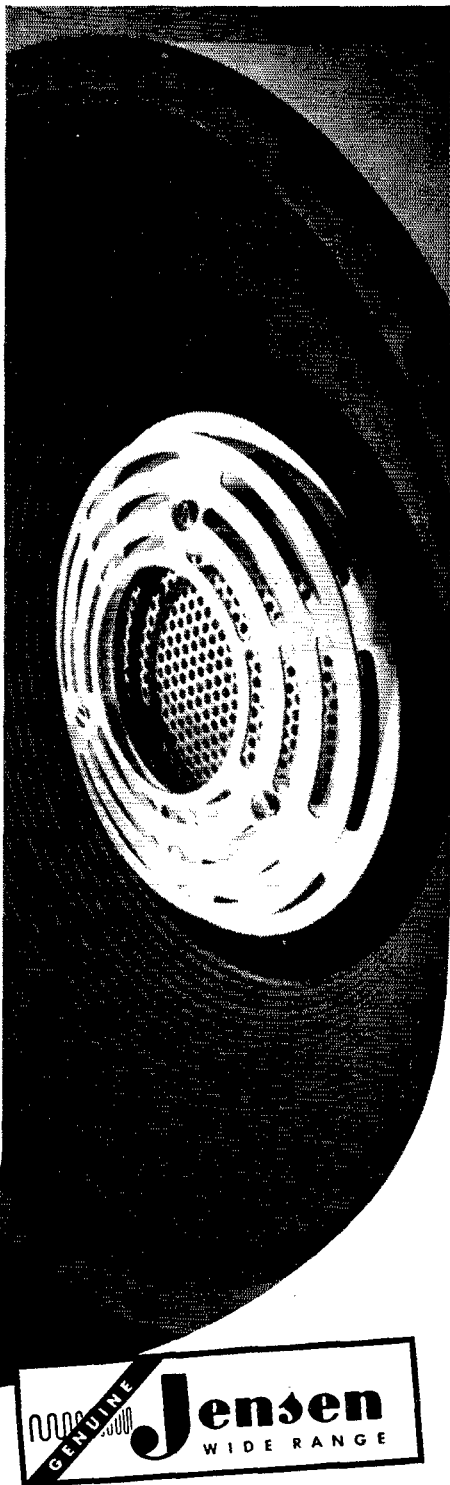
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Coaxial Speaker

With its new high frequency driver . . . new high frequency horn . . . new low frequency unit . . . plus the new Jensen Acoustic Lens—all skillfully engineered into a coordinated unit, the H-510 gives you reproduction unsurpassed by any integral two-way system regardless of price!

Comparative tests have proved this time after time. Why? Because you instantly recognize the unusually satisfying, smooth, clean high fidelity performance . . . the easy-to-live-with quality that makes you *know* you want to own it *now*.

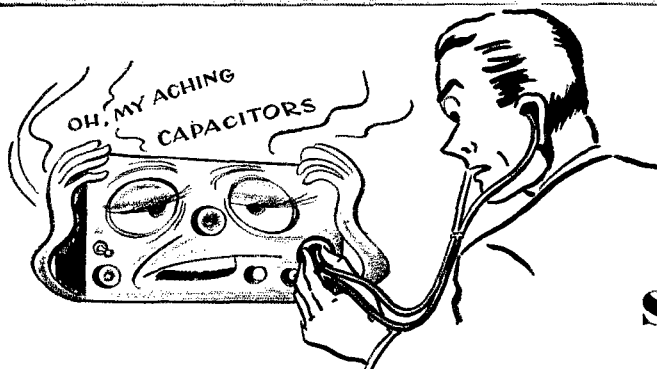
Ask for free booklet "Let Music Come to Life" and Data Sheet 152.



JENSEN MANUFACTURING COMPANY DIVISION OF THE MUTER COMPANY

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MALLORY HAM BULLETIN



ACTING SLUGGISH ?

Check The Possibility Of Improving Over-all Performance With The New Mallory Plascap*

Since the introduction of the new Mallory Plascap* plastic paper capacitor (May 1950 Ham Bulletin), we have become extremely paper capacitor conscious in our own equipment at the home QTH. Like every amateur, we have used paper tubular capacitors in our equipment for years. And like most amateurs we have taken their operation for granted. If they weren't "open", "intermittent" or "lead shorted", we left the things in our rig no matter how old they were or how inefficient their operation had become.

It is a well-known fact that a paper tubular capacitor deteriorates while in service in almost direct proportion to the amount of moisture which seeps into the cartridge through the case or at the wire lead entrance points.

Entrance of moisture into the cartridge of a paper capacitor invariably results in a decrease of insulation resistance (increase of DC leakage), and accordingly its ability to work properly as a by-pass, a coupling device or as a filter is impaired.

This was forcibly demonstrated to us recently, when we decided to investigate an annoying sluggishness which had developed in the "S" meter of our faithful old receiver. After much head scratching and fiddling around the trouble was finally traced to the three .01 paper tubulars used as filters in the AVC line.

Oddly enough, the capacity of these filters checked entirely within commercial limits and no sign of intermittents or shorts was discovered. Yet these capacitors had deteriorated as a result of age and poor initial case sealing to a point where excessive DC leakage was disturbing the AVC circuit.

Replacement of these filters with low-leakage, tightly sealed, Mallory Plascap tubulars quickly eliminated the "S" meter trouble, and the over-all performance of the receiver was greatly improved as a result.

This little lesson leads us to believe that many amateur communications receivers could be improved measurably by simply replacing the original paper by-passes, AVC filters, blocking capacitors, and coupling capacitors with new Mallory Plascaps—for Mallory Plascaps have been designed to have high insulation resistance, stable characteristics, and tight case sealing to assure long, efficient operation.

It may not have occurred to you, but the average communications receiver has more than 25 paper tubular capacitors in its circuit. The chance of one or more of these capacitors being sub-standard and reducing the over-all performance of the set is quite likely—especially if the equipment is several years old.

If there is any doubt at all about a paper tubular capacitor in a high-gain communications receiver, the safest thing to do is replace it with a new Mallory Plascap plastic capacitor of appropriate capacity and voltage rating.

Your Mallory Distributor can fix you up in short order.

*Trade Mark

P. R. MALLORY & CO., Inc.
INDIANAPOLIS 6 INDIANA



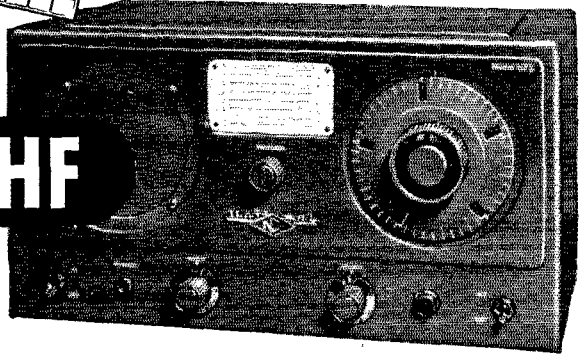
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MALLORY



THIS IS THE SEASON

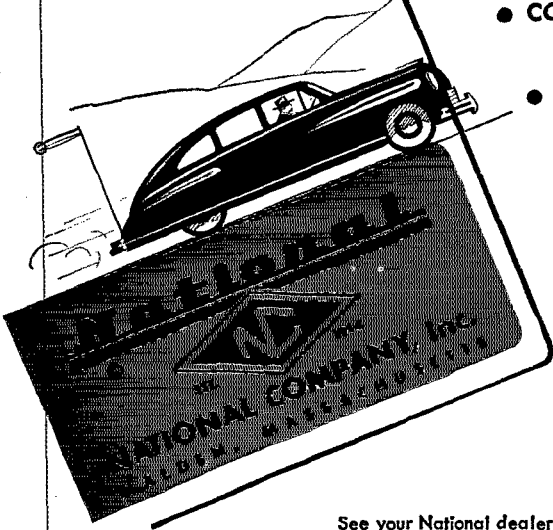
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the national HFS

Enjoy amazing VHF reception made possible by such summer phenomena as temperature inversion, sporadic E and F₂! Get a National HFS and take it with you on vacation and weekends. Check MUF and be ready for those 6-meter DX contacts while pleasure-bent high in the hills! Designed for mobile and portable use, as well as fixed operation, the HFS is ideal for both your car and your shack!



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National 686S vibrator supply — 5886 power supply—or "A" and "B" batteries.
- **RECEIVER OR CONVERTER!**
Makes features of connected receiver usable on VHF!

\$142

(less power supply)

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28 to 420 Mc..



MAXIMUM INPUT POWER VS FREQUENCY		Values given are for class C telegraphy—Amateur ratings					
RCA Type	Mc. →	28	50	144	220	420	
5763	17 watts to 175 Mc.					175 Mc.	
4-125A	50 watts to 200 Mc.			*		150 Mc.	
2E26	40 watts to 125 Mc.			#			
829-B	120 watts to 200 Mc.					250 Mc.	
832-A	36 watts to 200 Mc.					500 Mc.	
8025-A	50 watts to 500 Mc.						
* 400 watts		# 33 watts		† 107 watts		○ 44 watts	

The Fountainhead of Modern Tube Development is RCA

...the leading line for vhf

IF YOU'RE PLANNING a vhf transmitter . . . these are your tubes! You can select your complete complement of multipliers, drivers and finals from the above group to suit your power and frequency needs.

For high efficiency, low driving-power requirements and simplified circuit design, these six RCA vhf tubes are without equal. They permit compact designs, more output for your money, and unusually stable operation.

Newest addition to the family is the *miniature* transmitting type, RCA-5763. Here is a tube with high power gain and *extra* emission . . . capable of handling a full 17 watts' input up to 175 Mc . . . and highly efficient as a frequency multiplier.

Consult the table for the vhf tubes to meet your requirements. To get all the tube power, performance, and life *you* pay for . . . buy genuine RCA tubes in the familiar red-black-and-white cartons from your local RCA tube supplier.



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