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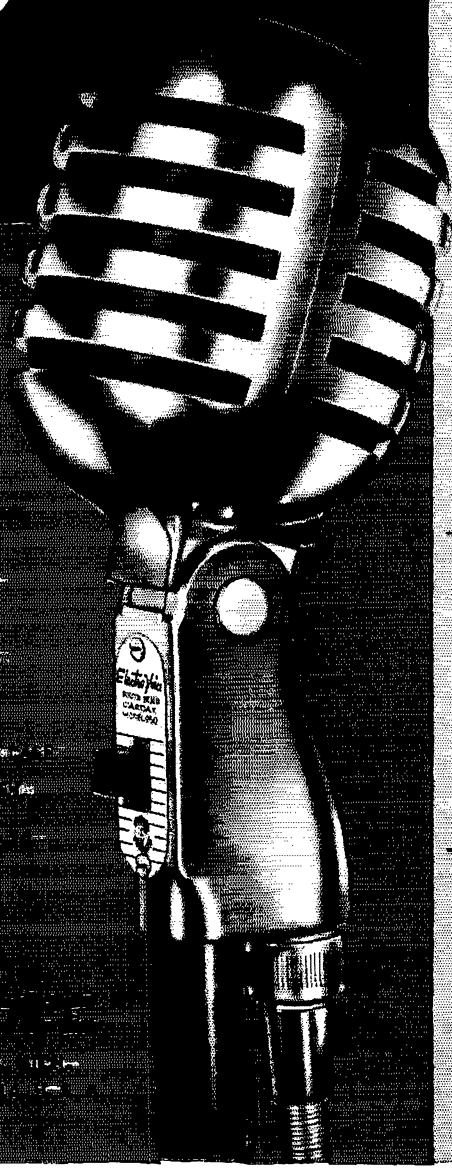
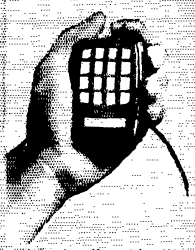
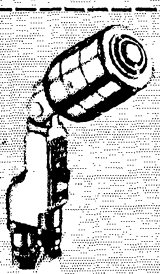


"Cardyne" Cardioid Dynamic

"Century" Crystal on Desk Stand



"Century" Mobil-Mike Carbon or Dynamic



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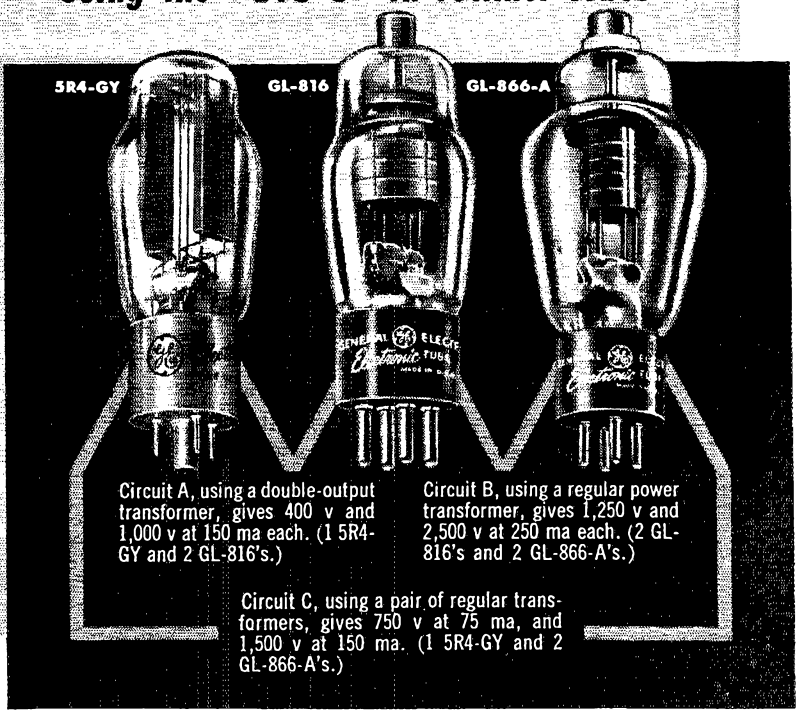

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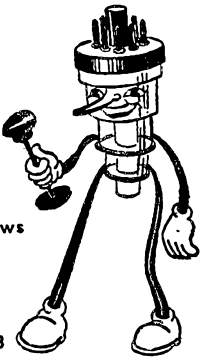

CQ . . . CQ . . .

You are cordially invited to visit the display of Ham-News devices and other up-to-the-minute electronic units at G.E.'s exhibit, 1948 national ham show —A. R. R. L. National Convention, Milwaukee, Wisconsin, September 4 to 6. C U There,

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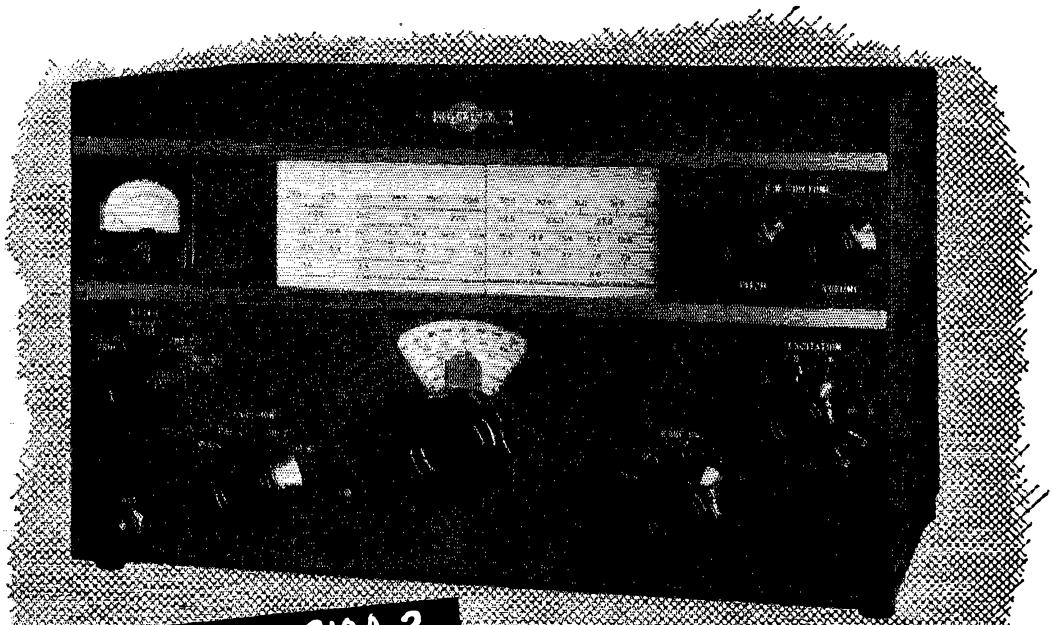
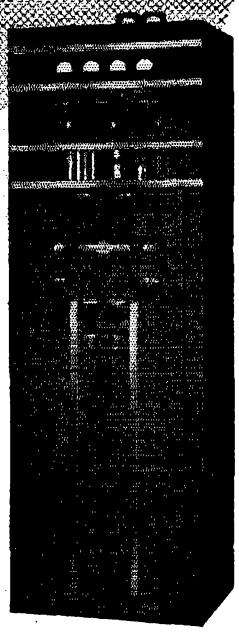


The Collins 310A-3 —the 30K-1's new exciter



The 310A-3, like its predecessor, the 310A-1, gives you all the advantages of bandswitching, and PTO control utilizing the Collins 70E-8A variable frequency oscillator.

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Your Collins dealer will be glad to give you a bulletin describing the 30K-1 transmitter and the new 310A-3 exciter in detail. If you have not made his acquaintance, write us for his name and address.

Net price, 30K-1 complete with 310A-3.....$1,450.00

Collins 30K-1 Amateur Transmitter 500 watts input c-w; 375 watts phone

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QST

AUGUST 1948

VOLUME XXXII • NUMBER 8

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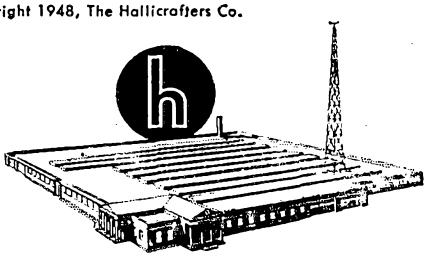

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MALLORY HAM BULLETIN

RECENTLY, we received a request from a fellow amateur for the solution of an interesting DC filter problem which involved cramming several Mfd's of filter capacity into a space already overcrowded with transformers, chokes and other components. His problem, and its subsequent solution, might prove helpful to other amateurs confronted with a similar dilemma. So we are passing along the story for what it might be worth.

Here was his problem: He had designed a 2-stage transmitter consisting of a harmonic oscillator and final amplifier, which required 2 complete DC power supplies, one delivering 700 volts for the plates . . . the other, 300 negative volts for bias and blocked-grid keying potential. His plans included making this rig completely self-contained with power supplies and RF stages mounted compactly on a single small chassis.

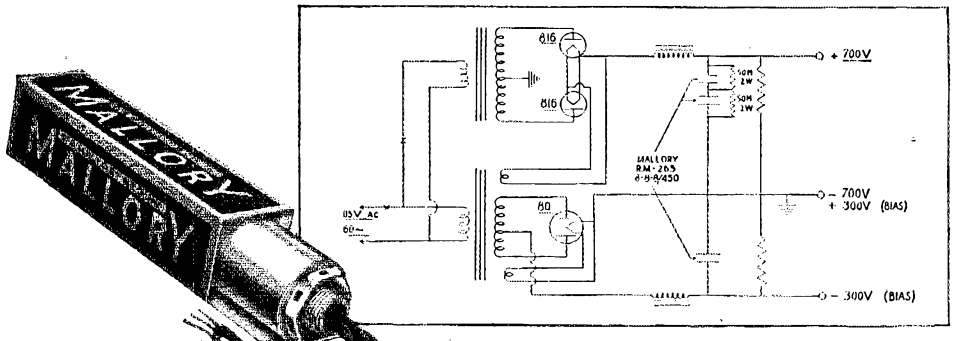
His problem arose when he discovered that it was impossible for him to arrange the other components of his transmitter to provide sufficient mounting area for the DC filter capacitance needed. The best he could do was an area roughly 2″ square by approximately 5″ in height in which to mount 4 Mfd's at 700 volts, and 8 Mfd's at 300 volts.

In pondering his problem, we thumbed through the latest Mallory Catalog looking for a capacitor which might fit his requirement. Frankly a solution didn't appear until we reached page 7. There we found the Mallory RM-265, a triple "c" separate section electrolytic. This capacitor looked as if it might have possibilities. Sure enough, it did the job!

The RM-265 is an electrolytic capacitor consisting of 3 separate 8 Mfd sections rated at 450 volts DC and is mounted in a single aluminum container measuring 1⅜″ in diameter and 4¼″ in height. For this application, 2 of the 8 Mfd sections were connected in series to provide 4 Mfd of filtering at better than 700 volts, while the remaining 8 Mfd section was used as the bias supply filter.

The basic essentials of the power supplies he used are shown in the schematic diagram. Note in particular the 50,000 ohm 2 watt carbon resistors across the seriesed sections of the capacitor. These resistors are employed as voltage equalizers and should not be omitted.

This is one of many examples of how the complete line of Mallory quality parts can help you solve unusual problems. It would pay you to become familiar with the Mallory Catalog. It contains a wealth of special capacitors, controls, resistors and vibrators for unusual applications such as this one. Your authorized Mallory distributor will gladly supply you with a copy.



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Section Communications Managers of the ARRL Communications Department

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

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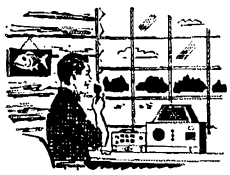
IN YOUR SHACK



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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.

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

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W5NW at Humble Pipe Line Camp, Odessa
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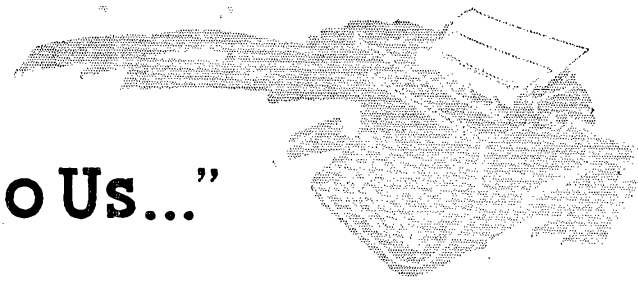


"It Seems to Us..."

"DADDY, BUY ME THAT!"

These summer months are probably as good a time as any to engage in a little personal stocktaking. This sport can range from idle dreams of a new superdooper 17-element rotary to plans for an automatic DX-tracking VFO, but the subject we plan to discuss this trip involves amateur radio as a whole and an attitude that seems all too prevalent. It isn't new, and it seems to have gained altogether too much general acceptance.

This unhealthy philosophy we're talking about is the general feeling that any new technique must come from the manufacturers, with all of the bugs worked out and with an instruction book illustrated by Walt Disney. Single-sideband-suppressed-carrier is a typical example. From some of the remarks we hear, s.s.s.c. seems to represent a technique that one might keep an eye on, because perhaps it presents interesting possibilities, but it is hardly ready for amateur radio until some manufacturer brings out a complete exciter unit. We have even heard some criticism of *QST* for publishing articles on the system when it isn't "perfected" ("perfected" probably meaning "for sale in every radio store"). Fortunately for amateur radio, there are a few intense amateurs who only need the germ of an idea to get started on a new technique, and these fellows make awful liars and procrastinators out of the mossbacks.

Take speech clipping and filtering, with their advantages in actual "communications gain" over a normal system. A few smart hams latched on to the idea at once and are today enjoying the benefits of its use, but no manufacturer has brought out a complete unit (to our knowledge) and so most stations burn up watts in their modulators instead of in the other fellow's receiver where it will do some good. It is highly unlikely that there would be so many Q5-ers in use if only the transformers were available, instead of a complete unit. Even in the v.h.f. field, where there are probably more experimenters than in any other part of ham radio, it is freely admitted that one deterrent to progress is the lack of commercial gear for those ranges. Holy saints! Where is our pride? Are we supposed to let the manufacturers tell us what ham radio is to be like, or are we going to behave like real hams and point the way?

We remember the time when hams needed only a suggestion or two about something that would improve technique and off they'd be to the junk box to dig out parts and try the gadget. Now we talk about being "mature" and too often take only an academic interest in new developments — and with a generous supply of "You've gotta show me." Sure, we know that ham radio is more complicated these days, and the new gadget is likely to have four or five tubes instead of one or two, and so it may take three weeks to build instead of three days. Is that enough to rule it completely out of the picture? Are we going to admit that radio has passed the amateur by, and that we have to "wait for the manufacturer to bring one out" before we can try something new? Do we remain completely stagnant until someone decides there are a few bucks to be made out of a new technique that is staring us in the face? Amateur radio can be full of the thrills of discovering new fields and tricks, or it can slump into the expensive but dull multiparty telephone line that seems to satisfy some people. It's up to us.

— *B. G.*

THE IMPORTANCE OF C.W.

The ARRL Board of Directors has on file before the Federal Communications Commission two requests for alterations in the operating privileges granted by amateur licenses. One of these requests is that any *new* Class B or Class C licensee be denied the right to use 'phone below 30 Mc. during his first year — i.e., that during his first twelve months of finding his way as a new amateur he shall either operate by means of telegraphy or confine his 'phone work to the bands above 50 Mc. The other request is that a *new* applicant for Class A privileges be required to pass a code examination at sixteen words a minute, three words faster than the initial amateur requirement. The two items arose quite independently of each other but unite to form, in their totality,

a discernible philosophy which it will be interesting to examine here in detail.

Right at the outset, let us clear up a matter on which some misunderstanding has arisen. If the increased code requirement is made a part of the Class A examination, it will not be retroactive upon present Class A licensees nor be required additionally of them when they come up for renewal. If the proposal is adopted to deny 'phone operation below 30 Mc. to new licensees, it will not apply to an applicant who at any previous time has held a FCC license for a year; he would be regarded as having already served his probationary year and would be eligible to employ 10-meter and 11-meter 'phone at once — in fact, he would be eligible to apply immediately for Class A. Neither proposal is to be applied to fellows at present holding the class of license involved. They are to apply exclusively to new men, future applicants for those respective classes of license. There is an excellent reason for this.

As in our discussion last month of the Board's proposals for 'phone frequencies, we shall endeavor to outline to our readers the way it seemed to us the Board viewed these licensing matters — the reasons behind the requests. They are not new 1948 concepts; the convictions that actuated the Board this year have been expressed by many amateurs in recent years. We think you'll agree that they are sound. In the first place we have to put it down that there is something basic about c.w. telegraphy. Every amateur ought to be proficient in it. It isn't so much that telegraphing skill is what distinguishes us from most other radio services — although we do think it true that the country has the right to expect each one of us to possess that skill. A more important factor is that c.w. provides more reliable communication under difficulties and that, as purveyors of communication in times of urgency, we need to have it available and to be able to use it. But even that isn't the main point. The chief factor is that c.w. constitutes the most effective use of frequencies in an increasingly-congested spectrum and that we simply must count on the major portion of our activity in our lower bands continuing by that means. It is the only method by which we can hope to accommodate all the world's amateurs in our busier bands. We couldn't possibly find room for ourselves if we were all 'phone. Because of the channel-width required, 'phone congestion is so immense, so many layers deep, that it has been argued that if the entire expanse of these amateur bands was available to that mode the improvement wouldn't be noticeable. What 'phone needs is not half again or double its present space, but many times as much — which of course simply doesn't exist. (That is why the frequency economy of s.s.s.c. holds such promise for us.) As long as our present circumstances endure, as long as our problem is to accommodate the largest possible number of stations in a limited band, 'phone operation can't be thought of as an inherent right. It has to be recognized that in actuality it is a special privilege, one that is feasible from the engineering standpoint only to the extent that it does not interfere with the rights of others to enjoy also a place in the spectrum, or to the extent that it provides occupancy of frequencies that otherwise might not be used effectively.

Another thing that deserves to be said is that the exclusive practice of telephony does not make a well-rounded amateur nor one fully capable of discharging his obligation to society and the country. An amateur who has never attained code proficiency has missed something basic, is only half an amateur. When a man has served his code apprenticeship and earned his chevrons, and knows what the game is all about, he has the right to make an election and to work mostly, or even all the time, on 'phone if he so chooses — but he should first have acquired a foundation in what is inescapably the basic form of amateur communication. That foundation is not automatically bestowed upon a new licensee by the mere passing of the code examination. It is necessary that he employ it and acquire skill and experience in actual c.w. communication. Without this he is only a demi-amateur, unable to carry his full share of our institutional load.

So much for background. Now it is increasingly being observed that a big percentage of the new fellows coming into amateur radio regard knowledge of the code purely as a necessary nuisance and master it reluctantly in just sufficient degree to obtain a license. We've all seen them; they haven't any interest in it and so it comes hard for them, and maybe they have to go up for their license a half a dozen times before they pass. Then they rush to 10-meter 'phone as fast as ever they can, and never make a day's employment of c.w. Our Board of Directors views that situation with concern and thinks it is an unwholesome one for amateur radio. Most experienced amateurs served a hitch on c.w. before they ever went to 'phone, and we believe they will agree that the present tendency of new men is not a healthy one for our art. New men ought to be obliged to attain some reasonable proficiency in the code and to learn to know their way around in that side of an amateur's life. Of more practical operating importance than that duty, however, is the hard technical fact that frequency limita-

(Continued on page 106)

807s in Push-Pull

A Shielded Stabilized Rig for the Low-Frequency Bands

BY DONALD H. MIX,* W1TS

• *Highlighted on this month's cover,* the transmitter described in this article represents application of the points discussed in the June issue in regard to transmitter stability.[1] When initially adjusted as described in detail in that article, the rig is entirely free of instability of any kind, with or without load. The enclosed construction and use of harmonic filters are measures taken to reduce TVI.

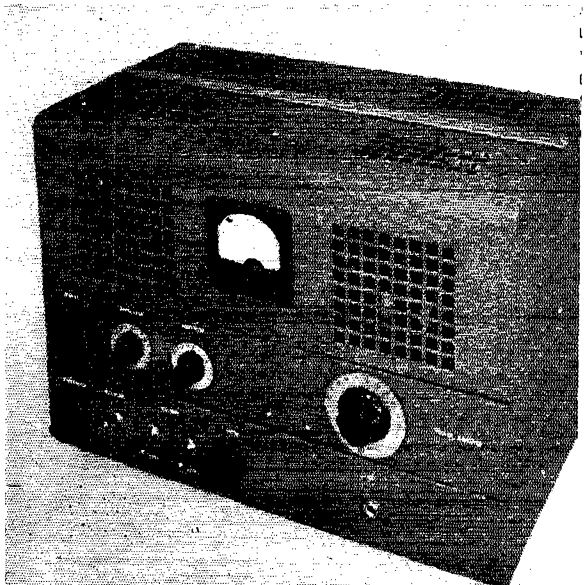
IN the mind, at least, 807s and other transmitter-type screen-grid tubes usually are associated with simplification of circuit. Therefore, it is natural that when a pair of such tubes is used, the two are most often connected in parallel, rather than in push-pull, since the parallel connection requires no departure from the simple circuits that are adaptable to single tubes. However, there are those who always insist on push-pull in the output stage, and it is true that, for the same tank-circuit Q, the losses should be somewhat less with push-pull because the tank current is less with the higher L/C ratio which push-pull permits. As a matter of fact, if the stage is to be neutralized, as seems advisable for reliable stability,[1] the push-pull arrangement adds little if any complication.

While any of a number of combinations might be used as the exciter for a pair of 807s, that shown in Fig. 1 is one logical result of certain considerations. The comparatively-low power-handling capabilities of the small present-day crystals have presented somewhat of a problem in postwar ham transmitters. You can't get 10 or 15 watts from the oscillator as we were accustomed to in prewar days and still keep the crystal in one piece. The modified Pierce oscillator circuit using a 6AG7 was chosen because it is the simplest of the crystal circuits capable of harmonic as well as fundamental-frequency output. The Tri-tet and grid-plate circuits require cathode-circuit tuning which is not always easily adjusted. However, the output from the Pierce arrangement is insufficient to drive a power doubler with good efficiency if the screen voltage is to be limited to prevent excessive crystal current. Therefore it is desirable to follow the oscillator with a stage that can be operated safely at low efficiency, if necessary, without exceeding the dissipation rating.

The pair of 6V6s may seem like a large driver for a couple of 807s, but they operate well under rating, even when doubling to 28 Mc. The push-pull arrangement provides not only the desirable "pick-up" in output when doubling, but also automatic neutralizing when the heater of one of the two tubes is turned off while the other is working straight through on bands not requiring doubling. Both the oscillator and buffer operate from a single 325- to 350-volt plate supply. The buffer as well as the oscillator is keyed so that no protective bias need be provided for this stage.

Experience has shown that it is preferable to switch both sides of the crystal in this oscillator circuit, since neither side is grounded, and trouble may be encountered if a single common lead ties one side of all crystals together. The output tank circuit, L_1C_6, is split by the dual-section condenser to provide push-pull input for the 6V6s. C_7 is a balancing condenser to compensate for the output capacitance of the 6AG7 which appears across the opposite side of the tank circuit. RFC_1 and RFC_2 are parallel-feed chokes. A separate voltage divider, R_2R_3, supplies 100 volts for the screen of the oscillator.

The output circuit of the buffer stage, L_2C_{14}, also is split to provide push-pull input to the final stage. C_{15} is a balancing condenser whose purpose is similar to that of C_7. Series grid feed and



Front view of the push-pull 807 transmitter showing the arrangement of controls.

* Assistant Technical Editor, *QST*.

[1] Mix, "Amplifier Instability in Transmitters," *QST*, June, 1948, p. 19.

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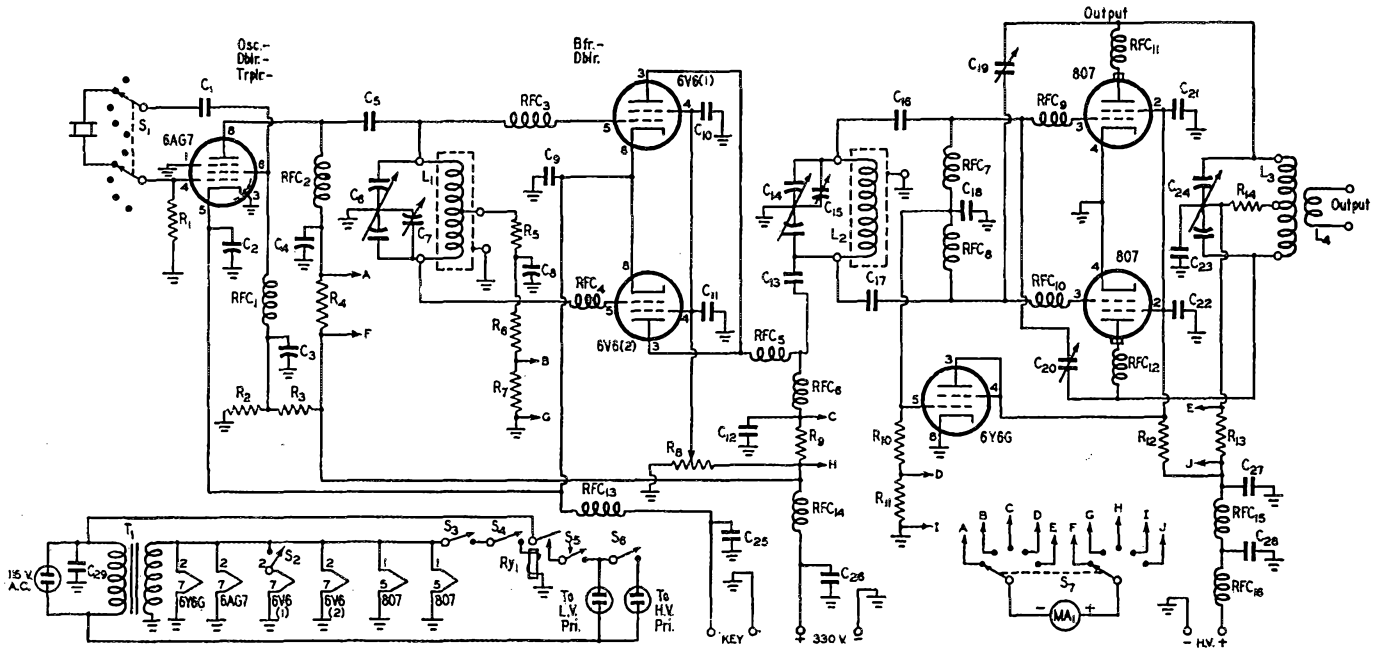


Fig. 1 — Circuit diagram of the push-pull 807 rig.

C_1, C_5, C_9, C_{10}, C_{11}, C_{12}, C_{13}, C_{18}, C_{25} — 0.0015-μfd. mica.
C_2, C_3, C_4, C_8 — 0.01-μfd. paper.
C_6, C_{14} — 100-$\mu\mu$fd.-per-section variable (Hammarlund HFD100).
C_7 — 30-$\mu\mu$fd. mica trimmer.
C_{15} — 50-$\mu\mu$fd. variable (Hammarlund HF50).
C_{16}, C_{17} — 47-$\mu\mu$fd. mica.
C_{19}, C_{20} — Neutralizing condensers (see text).
C_{21}, C_{22} — 0.0047-μfd. mica.
C_{23} — 0.001-μfd. 5000-volt mica.
C_{24} — 190-$\mu\mu$fd.-per-section variable, 0.05-inch plate spacing (Cardwell MO-180 BD).
C_{26}, C_{28}, C_{29} — 470-$\mu\mu$fd. mica.
C_{27} — 220-$\mu\mu$fd. mica.
R_1 — 12,000 ohms, ½ watt.
R_2 — 10,000 ohms, 1 watt.
R_3 — 20,000 ohms, 2 watts.
R_4, R_5, R_7, R_{11} — 220 ohms, 1 watt.
R_6 — 82,000 ohms, ½ watt.
R_8 — 25,000-ohm 7-watt potentiometer.
R_9 — Four-times shunt, wound with No. 30 copper wire.
R_{10} — 11,200 ohms, 2 watts.
R_{12} — 25,000 ohms, 10 watts.
R_{13} — 10-times shunt, wound with No. 30 copper wire.
R_{14} — 100 ohms, 5 watts.
L_1 — 3.5 Mc. — 50 turns No. 24 d.s.c., close-wound.
7 Mc. — 26 turns No. 24, 1¼ inches long.
14 Mc. — 16 turns No. 22, 1¼ inches long.
21 Mc. — 10 turns No. 22, 1¼ inches long.
All above coils are tapped at the center; 1-inch diam.
L_2 — 3.5 Mc. — 36 turns No. 24 d.s.c., close-wound.
7 Mc. — 20 turns No. 24, 1¼ inches long.
14 Mc. — 12 turns No. 22, 1¼ inches long.
21 Mc. — 8 turns No. 22, 1¼ inches long.
28 Mc. — 6 turns No. 18, 1 inch long.
All above coils are 1-inch diameter.
L_3 — 3.5 Mc. — 34 turns No. 16.
7 Mc. — 20 turns No. 16.
14 Mc. — 12 turns No. 14.
21-28 Mc. — 6 turns No. 14.
All above coils are 1⅞ inches diameter.
L_4 — Link-coupling coil to suit requirements.
MA_1 — 25-ma. d.c. meter.
RFC_1, RFC_2, RFC_6, RFC_7, RFC_8 — 2.5-mh. r.f. choke.
RFC_3, RFC_4, RFC_5, RFC_9, RFC_{10}, RFC_{11}, RFC_{12} — V.h.f. parasitic choke, 15 turns No. 20 d.s.c., ¼-inch diam., close-wound.
RFC_{13}, RFC_{14}, RFC_{16} — Ohmite Z-1 r.f. choke.
RFC_{15} — Ohmite Z-0 r.f. choke.
Ry_1 — 6.3-volt a.c. relay, 5-amp. contacts.
S_1 — 2-section ceramic rotary switch.
S_2, S_5, S_6 — S.p.s.t. toggle switch.
S_3, S_4 — Interlock switches (see text).
S_7 — 2-section bakelite rotary switch.
T_1 — 6.3 volts, 5 amp.

parallel plate feed are used in the buffer. Bias is furnished by the grid leak, R_6. Screen voltage for the 6V6s is taken from a potentiometer, R_8, which serves as an excitation control for the 807s. RFC_3, RFC_4 and RFC_5 are v.h.f. parasitic chokes.[1]

Capacitance coupling is used between the driver and final stages. As Fig. 1 shows, neutralization is introduced in this stage rather than depend upon loading as the stabilizer. Parallel grid-bias feed is employed here because direct coupling to the driver, without the coupling condensers, C_{16} and C_{17}, overloads the driver stage. The plate circuit is series fed, and screen voltage is obtained from the plate supply through the voltage-dropping resistor, R_{12}. RFC_9, RFC_{10}, RFC_{11} and RFC_{12} are v.h.f. parasitic suppressors.

The 6Y6G is a protective device to limit the input to the 807s to a safe value when excitation is removed. So long as grid current flows to the final, the bias developed across the grid leak, R_{10}, which is applied to the grid of the 6Y6G as well as to the 807 grids, is sufficient to cut off the plate current of the 6Y6G and therefore it has no effect upon the operation of the amplifier. However, when excitation is removed, the bias falls to zero and the 6Y6G draws considerable current through R_{12}, reducing the 807 screen voltage to the point where the input falls to between 50 and 70 ma. with a 750-volt supply.

Care has been taken in designing the circuit to avoid setting up conditions favorable to low-frequency parasitics.[1] Because parallel grid feed in the output stage is desirable in this case, R_{14} is used in preference to the customary r.f. choke at this point. Low-frequency oscillation in the driver stage is eliminated by the introduction of R_5, bypassed by C_8 in the grid circuit, which places a heavy load on the parasitic grid circuit but not across the normal operating circuit.

Both plate-supply leads as well as the key lead are provided with harmonic filters to reduce the possibility of TVI. A two-section filter is required in the high-voltage lead. The milliammeter is switched across the metering resistors R_4, R_7, R_9, R_{11} and R_{13} to read oscillator plate current, buffer grid or plate current, and final-amplifier grid or plate current. The shunts in the oscillator plate and the buffer and final-amplifier grid leads are sufficiently high in resistance to have no practical effect upon the meter reading. However, R_9 is adjusted to multiply the scale reading by four and R_{13} is a multiplier of ten.

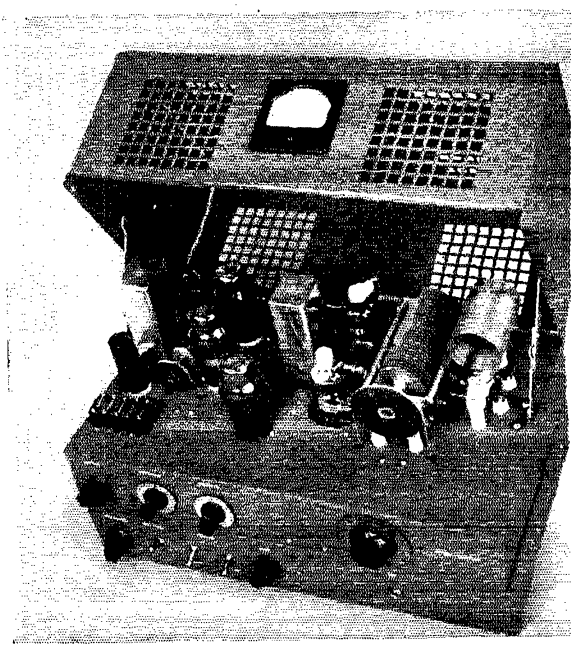
A control system is included so that the two plate supplies can be turned on and off from the transmitter panel by S_5 and S_6. The plate-transformer primaries are connected into the system through a.c. outlets at the rear of the transmitter enclosure. S_3 and S_4 are safety-interlock switches controlling the relay, R_{y1}. They operate whenever the transmitter enclosure is opened. If either of these switches is not closed, the plate supplies cannot be turned on. S_2 controls the heater of 6V6 (1) which is not used when the buffer stage operates straight through.

Construction

Aside from the factor of appearance, the completely-enclosed construction provides safety in operation and shielding against direct radiation of harmonics. A standard 10 × 17 × 3-inch amplifier foundation makes up the two top sections. A second chassis is used inverted as a bottom deck to house the control equipment, harmonic filters, the filament transformer, etc. It also permits hinging the transmitter proper for easy inspection or servicing. The top cover is hinged too, so that it may be swung open quickly for changing plug-in coils. Piano hinges extending the full length of the chassis make a good solid job.

The components on the upper deck are laid out to provide as much isolation as possible between input and output circuits. Thus the first and last tank condensers appear above the chassis, while the middle one is mounted below. The two exciter coils, both of which are on top for convenience in changing bands, are mounted in shielded plug-in units. The 807 sockets are submounted to bring the lower edge of the internal shields of the tubes level with the chassis. The sockets are fastened to a 2½-inch strip of aluminum spanning the bottom of the chassis. This strip is braced between the sockets by a metal spacing pillar running between the strip and the chassis.

Because of the hinged cover, all tuning controls must be brought out below the top of the chassis. In the case of the two tuning condensers that are mounted on top, the shafts are operated from controls below by means of pulleys. The ones shown in the photographs were made



The hinged cover opens for coil changing. The tube near the center is the 6Y6G protective tube.

from thumb dials taken from surplus equipment, but any standard dial drum which fits a ¼-inch shaft can be used, of course. A larger pair was used for the final tank condenser with the idea of reducing cord slipping, but it was found necessary to anchor the cord to the pulleys anyway, so the large size has no particular advantage.

Care should be used to keep parts on top of the chassis back far enough so as not to interfere with opening and closing of the cover. The crystal switch and sockets are grouped together at the left-hand end of the chassis, close to the front where they are readily accessible. There is room for several more crystals than the five shown, if desired. To the rear of the crystals are the 6AG7 and its output tank circuit with the 6V6s close to the tuning condenser, C_6, which is mounted directly on the chassis. The parasitic chokes, RFC_3 and RFC_4, are mounted in grommets set in the chassis alongside C_6, forming the connection between the stators of C_6 and the grids of the 6V6s. The compensating condenser, C_7, is supported underneath at the L_1 coil socket, between the prong that connects to the proper end of the coil and the prong that grounds the shield.

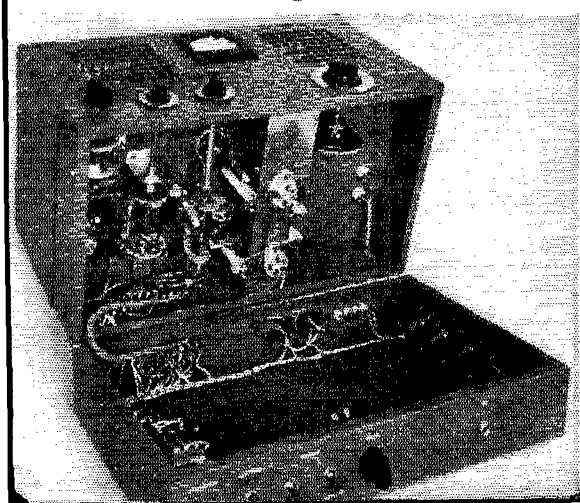
Underneath, the buffer tank condenser, C_{14}, is mounted on metal spacers to bring its shaft in line with the shaft of the crystal switch. The aluminum-strip bracket that supports the bearing for the tuning control for C_6 is then moved around until the shaft is central and in line between the shafts of the crystal switch and C_{14}. This flexibility in positioning of the control is another advantage of the pulley arrangement, incidentally. Holes are drilled in the chassis for the string connecting the two pulleys.

The balancing condenser, C_{15}, is mounted close to the right of C_{14} with its shaft pointing toward the rear so that it may be adjusted with a screwdriver through a hole from the back. National 2½-inch isolantite pillars (GS-2) are used as supports and junction points for RFC_7, RFC_8, RFC_9, RFC_{10}, C_{16}, C_{17} and the neutralizing leads. The neutralizing condensers, C_{19} and C_{20}, are made first by twisting the wire conductors out of a pair of National TPB polystyrene feed-through bushings. The holes are drilled out with a No. 35 drill and tapped for 6-32 machine screws. The bushings are then set in the chassis close to the central stator terminals of the plate tank condenser, C_{24}. Flat-head 6-32 screws, 2 inches long, are threaded into the bushings, the flat heads serving as the movable plates of the neutralizing condensers. A slot is cut in the end of the screws so that they may be adjusted with a screwdriver from the top. Connections are made by means of a soldering lug under a locking nut on top of the bushing. The necessary crossover connection is made above the chassis between the neutralizing condensers and the tank-condenser stator sections. The stationary plates of the neutralizing condensers are ½-inch washers (the top washers from the GS-2 insulators) mounted on ½-inch feed-through insulators set in the aluminum strip holding the 807 sockets.

The final-amplifier plate tank condenser is insulated from the chassis on ¾-inch cone pillars at all of the four corners except the left rear. Here a feed-through insulator, topped by a spacing washer of proper thickness, is used to provide a means of feeding the high-voltage line to the rotor of the tank condenser. C_{23} is placed immediately below, fastening it to the rear inside edge of the chassis on a metal spacer at its ground side. The link output is brought down through the chassis on feed-through insulators and then to a coaxial fitting at the rear.

All power terminations from the upper chassis are brought to a terminal board at the left. This terminal board is duplicated in the lower chassis and the corresponding points tied together through a cable, thus bridging the hinge. Along the front edge of the lower chassis, from left to right, are the excitation control, R_8, the doubler switch S_2, the plate-supply switches, S_5 and S_6, the meter switch, S_7, and the key jack. The filament transformer and the safety-interlock relay, Ry_1, are fastened along the left-hand edge. One of the interlock switches, S_4, is mounted in the front left-hand corner. It is made from the "works" of a leaf-type open-circuit jack. When the upper chassis is closed, the jack is closed by a small cone insulator fastened to the side of the upper chassis just below the crystal switch. Both sides of this jack must be insulated. The other interlock switch operates when the cover is raised and lowered. A long screw projecting on the inside of the cover at the rear makes contact with a leaf from a 'phone jack mounted on a stand-off insulator in the rear left-hand corner of the upper chassis. Thus both the cover and the upper chassis must be shut, closing the relay, before the power-supply switches will operate.

The power-input plug for the 115-volt line is at the left-rear corner of the lower chassis, below the terminal board. C_{29} by-passes the ungrounded



Bottom view showing the components located under the top deck.

side of the line to the chassis. To the right are the two outlets for the high- and low-voltage transformer primaries. D.c. input connections from the power supplies are made at the Millen terminal strip and safety terminal at the right. Components of the harmonic filters are mounted on a terminal board fastened to the right-hand edge of the chassis. The meter is connected to the switch by means of long cabled flexible leads passing to the terminal board through a rubber grommet in the rear left corner of the upper chassis. The metering resistors are mounted directly on the switch.

Coils

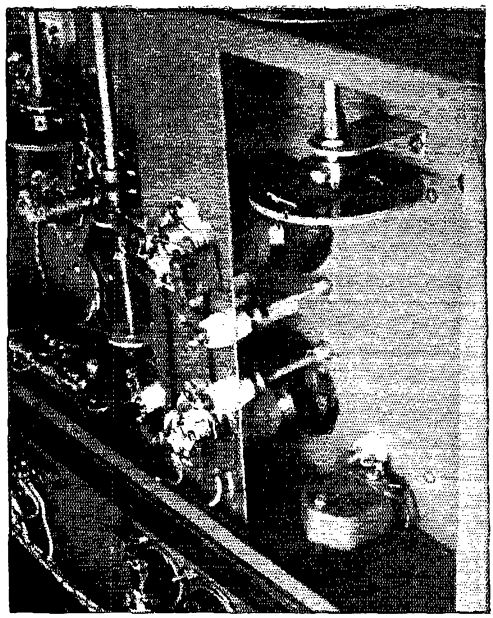
The exciter coils are wound on Millen 1-inch bakelite forms mounted in Millen octal-base shielded plug-in units, Type 64400. The forms are fastened to the base with a machine screw after drilling and tapping the octal base at the center through the locating plug. The shield can is wired to one of the prongs so that it is connected to ground when the unit is plugged in.

The output-stage tank coils are wound on Millen 44001 polystyrene forms. The link winding, L_4, is wound with No. 14 wire covered with small spaghetti, on a diameter which will fit inside the Millen coil form where it is centered and fastened with Duco cement. On the higher-frequency coils, the link leads may be brought out between the turns of the tank coil near the center. But on the lower-frequency coils, where the turns are too close together, it is necessary to bring the leads out through the ends of the form.

Adjustment

Eighty-meter output is obtained, of course, with a 3.5-Mc. crystal and all tank circuits tuned to this band. S_2 is open, since only one of the two 6V6s is used unless the stage is doubling frequency. Seven-megacycle excitation for the final may be obtained in any of three different ways. With a 3.5-Mc. crystal, L_1C_6 may be tuned to the fundamental, doubling taking place in the buffer stage with L_2C_{14} tuned to 7 Mc. and both 6V6s in use. Equivalent results should be obtained by tuning L_1C_6 to 7 Mc. with either a 3.5- or 7-Mc. crystal and amplifying straight through with a single tube in the buffer stage.

Fourteen-megacycle output may be obtained from a 3.5-Mc. crystal by doubling to 7 Mc. in the oscillator and doubling again in the buffer stage. With a 7-Mc. crystal, the doubling may take place in either oscillator or buffer as desired. Twenty-one-megacycle operation requires tripling frequency—from a 7-Mc. crystal—in the output circuit of the oscillator and amplifying straight through with a single tube in the buffer-amplifier, since the push-push arrangement cannot be used for tripling. Ten-meter drive for the final is obtained from a 7-Mc. crystal by doubling frequency in both oscillator and buffer.



Detail view showing the construction of the neutralizing condensers and the mounting of the 807s.

It is best to adjust the transmitter initially at the highest frequency at which operation is desired. With a plate supply delivering between 325 and 350 volts, the oscillator plate should draw about 15 ma., kicking upward a milliampere or two at resonance. This current remains about the same regardless of whether the oscillator is doubling or working at the crystal fundamental. Resonance in the oscillator output circuit is best determined by tuning the circuit for maximum grid current to the buffer stage. This grid current will run between 1 and 2 ma.

As soon as the buffer stage has been tuned up, the screen leads should be opened up and the individual screen currents checked for balance. C_7 should be adjusted carefully until the screen currents match when the plate tank circuit is tuned to resonance. The buffer plate current at resonance normally should run between 10 and 30 ma., depending upon the band of operation and whether one or two tubes are in use, when R_8 is adjusted to deliver required drive to the final stage. If the wiring to the buffer tubes is kept closely symmetrical and the tubes themselves do not differ appreciably, no neutralizing adjustment should be necessary when working the stage as a straight amplifier with one tube inactive, since the grid-plate capacitance of the inactive tube acts as the neutralizing condenser for the active tube. However, if self-oscillation should show up, the stage can be stabilized by introducing a small amount of capacitance, such as provided by spaced pieces of wire, between the

(Continued on page 108)

A Super-Selective C.W. Receiver

Beating the QRM with a 72-Kc. I.F. Amplifier

BY T. A. GITHENS,* W9AEH

• Many a DX man has dreamed of a c.w. receiver that has been stripped down to the bare essentials necessary for convenient operation, with the accent on superlative performance instead of fancy gadgets. Here it is. With no crystal filter, this receiver can walk right up to the strong local signals and dig out a weak one by utilizing that latest enemy of QRM, "skirt selectivity."

By the time this is in print most radio amateurs should be aware of the advantages of better skirt selectivity. Recent articles and editorials have covered the matter well enough so that it should not be necessary to go into it here. The way the local amateurs are buying up BC-453s is proof that the idea has already been sold.

The problem now is how to obtain even more selectivity. The Q5-er has almost reached the limit for 'phone reception with present-day amplitude modulation. The skirts could probably be narrowed down to about 4 or 5 kc. at 1000 times down if that were possible with no further sharpening of the nose, but that would be about the limit without loss of intelligibility.

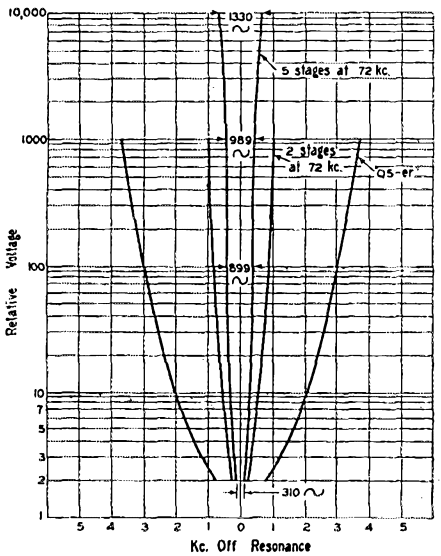


Fig. 1 — Curves of the selectivity of the W9AEH receiver when using 2 and 5 stages of 72-kc. i.f. amplification, compared with a typical Q5-er selectivity characteristic.

However, since 'phone is seldom used at W9AEH, it was decided to forget it for the present and see how much selectivity could be used for c.w. reception. As shown by the selectivity curve in Fig. 1, the bandwidth of the receiver to be described is less than one kilocycle wide at 1000 times down and we have not yet reached the limit. The receiver is perfectly stable and just as easy to tune as any receiver we have ever used, and with this degree of selectivity there are no crowded c.w. bands. Certainly, there is interference when the boys all pile on one frequency, but a few kilocycles away there are always wide-open spaces. Even the strongest local signals are tuned in and out more sharply than are distant stations on the ordinary receivers.

Since the main objective was selectivity, all of the fancy frills that would complicate construction without contributing to performance were omitted. The tuning condensers were not ganged because this luxury would have cost considerable valuable time with little gain in convenience. The c.w. bands are all narrow, and if the r.f. tuning condensers are set in the center of the band they very rarely need to be touched again except when changing bands. A.v.c. is of no use in a c.w. receiver so it was left out.

There is nothing new in the receiver except the degree of selectivity and the stability necessary to handle it. There have been plenty of articles on r.f. amplifiers, so any discussion of the receiver front end will be skipped, and the accent placed on things that effect selectivity or are affected by it.

The Front End

The receiver is a double-conversion affair, with the first i.f. at 1600 kc. and the second at 72 kc. As can be seen in the block diagram of Fig. 2, a 6AK5 r.f. stage feeds the 7Q7 mixer that is separately excited by a 6C4 high-frequency oscillator tuned on the low-frequency side of the incoming signal. The 1600-kc. output of the 7Q7 mixer goes to a one-stage transformer-coupled first i.f. amplifier using a 6BA6, and the output of this tube is transformer-coupled to a 7J7 converter. The oscillator portion of the 7J7 is tuned to 1672 kc., to give the resultant 72-kc. signal for the selective i.f. amplifier at 72 kc.

The plate voltage to the 6C4 first oscillator is

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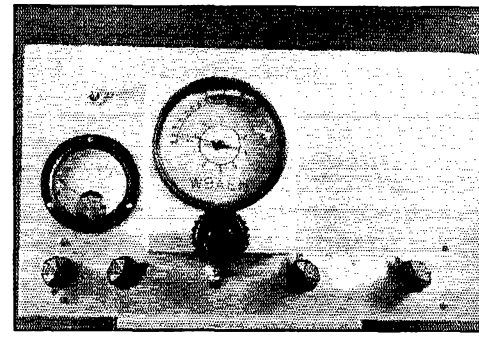
stabilized by a VR-150, and the screen voltage of the 6BA6 1600-kc. i.f. and the 7Q7 mixer is held constant with a VR-90. The r.f. gain control is a cathode control in the 6BA6 and 7J7 stages, as well as in the cathodes of the 72-kc. i.f. amplifier. A switch is used to put the 6AK5 r.f. amplifier on the gain-control circuit when conditions warrant it, or the r.f. stage can be run "wide open" when fishing for the weak ones.

However, more important than the circuit in the front end are the mechanical considerations. The first requirement for a receiver of this type is a good tuning mechanism. If the amateur c.w. bands are spread out over the whole scale, a ratio of 20-to-1 in the dial will be satisfactory. An even higher ratio is desirable if less bandspread is used. In any event, the complete absence of back-lash is a practical necessity. The dial on this particular receiver has a ratio of 23-to-1, and the widest band covered is the 500-kc. c.w. portion of the 10-meter band.

To avoid microphonic effects, the tuning condenser in the high-frequency oscillator circuit should have fairly wide spacing, small plates, and be of rugged construction. The one used here is a 35-$\mu\mu$fd. Hammarlund MC-35-S, and its plate separation is about the minimum that we would recommend.

The high-frequency oscillator must not only have low drift but must also be free of frequency shift because of such things as uncertain return paths through the chassis. This can be avoided by running the ground lead from the coil directly to the condenser rotor. Another common cause of trouble are the coil-socket contacts, and the same thing would apply if a bandswitch were used. The contacts on the socket must be good and the pins on the plug-in coil forms must be kept clean. We have considerably reduced the possibility of trouble from this source by placing the fixed capacity for each coil inside the coil form. The coil is also placed inside the coil form and should be as small as possible without too much loss in Q. This is to



The homemade c.w. receiver at W9AEH is built for the business of digging out the weak ones from under strong locals and doesn't go in for extras. The two knobs on the right are for r.f. mixer and antenna trimmer adjustments, and the other two knobs handle the r.f. and a.f. gain-control functions. One toggle switch controls the b.f.o., and the other switch puts the r.f. stage on the r.f. gain control when desired.

reduce the effect of the metal chassis and surrounding parts. We prefer to avoid trimmer condensers wherever possible. The 28-Mc. oscillator coil is self-supporting and is adjusted by spreading turns. The other oscillator coils are wound on small molded-bakelite forms that have adjustable iron cores.

The fixed capacity across the coil not only serves to stabilize the oscillator but also controls the frequency coverage. In other words, to increase the frequency range to be covered the fixed capacity is decreased and the inductance is increased, or vice versa if a decrease in coverage is desired.

As an example, the 28-Mc. oscillator works on the low-frequency side (26.4 to 26.9 Mc.) to cover the 28- to 28.5-Mc. c.w. band. The ½-inch diameter coil is self-supporting and consists of 4 turns of No. 12 copper wire. It is mounted horizontally inside a 1½-inch diameter plug-in coil form, about 1 inch from the bottom of the form, with the fixed capacitors mounted on the leads below the coil. The fixed capacity in this case is 225 $\mu\mu$fd., made up of two 100-$\mu\mu$fd. and one 25-$\mu\mu$fd. Erie zero-temperature-coefficient ceramic capacitors. The tap is in the exact center of the coil. After the final adjustment has been made by spreading the turns, a small amount of "Q-Max," thick enough to stick between turns, can be used to keep the coil from vibrating. With the fixed and variable capacities specified, this coil should cover the 28–28.5-Mc. band with about 10 degrees to spare on each end of the dial.

The position of the tap on

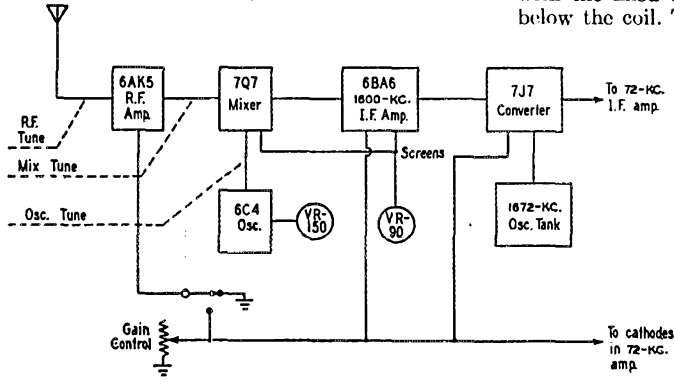


Fig. 2 — A block diagram of the "front end" of the W9AEH receiver. No gang tuning is used, and a choice of gain-control conditions is available.

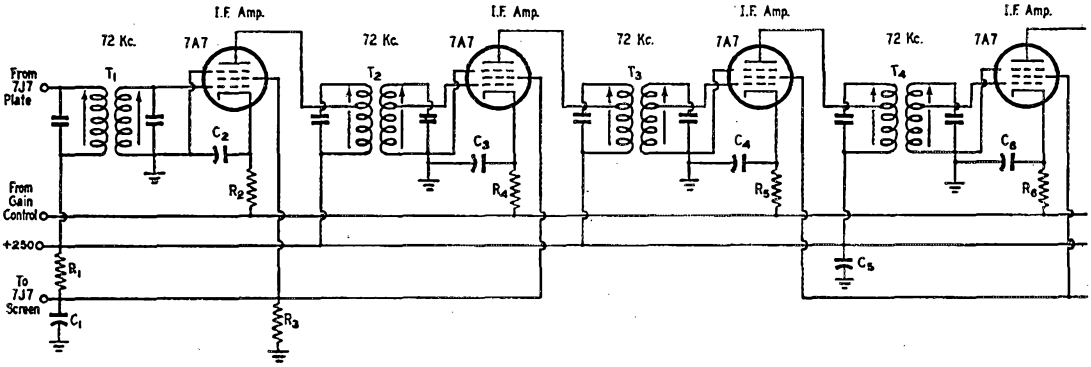


Fig. 3 — Wiring diagram of the 72-kc. i.f. amplifier.

C_1, C_5, C_7 — 0.1-μfd. 400-volt paper.
C_2, C_3, C_4, C_6, C_8 — 0.1-μfd. 200-volt paper.
C_9, C_{10}, C_{14} — 470-μμfd. mica.
C_{11} — 47-μμfd. mica.
C_{12}, C_{21} — 0.0022-μfd. mica.
C_{13} — 0.001-μfd. silver mica.
C_{15}, C_{18}, C_{20} — 0.0047-μfd. mica or 600-v. paper.
C_{16}, C_{19} — 20-μfd. 25-volt electrolytic.
C_{17} — 0.001-μfd. mica.
C_{22} — 0.02-μfd. 400-volt paper.
R_1, R_7 — 27,000 ohms, 1 watt.
R_2, R_4, R_5, R_6, R_9 — 220 ohms.
R_3, R_8 — 56,000 ohms, 1 watt.
R_{10} — 0.22 megohm.
R_{11} — 10,000-ohm potentiometer.
R_{12}, R_{13} — 0.1 megohm, 1 watt.
R_{14} — 0.25-megohm volume control.
R_{15} — 47,000 ohms.
R_{16} — 3300 ohms.
R_{17} — 0.27 megohm.
R_{18} — 4700 ohms, 1 watt.
R_{19}, R_{20} — 68,000 ohms.
R_{21} — 390 ohms, 2 watts.
R_{22} — 4 ohms, 5 watts.
All resistors ½-watt unless otherwise mentioned.
L_1 — See text.
T_1, T_2, T_3, T_4, T_5, T_6 — 72-kc. transformers, home-made. See text.
T_7 — 'Speaker output transformer.

the lower-frequency coils will depend on the *Q* of the coils, but for maximum stability it should always be as near the grid end of the coils as possible, consistent with good oscillator strength. For best conversion efficiency the tap should be adjusted to give 200 to 400 microamperes of oscillator grid current. Unfortunately, the position of the tap will also affect the frequency coverage and for this reason it may be necessary to use the cut-and-try method to find the right *L/C* ratio to give the desired bandspread.

The plate voltage for both the high-frequency and intermediate-frequency oscillators is held constant by a VR-150 regulator tube. It was also found that any change in current through the first converter tube would affect the high-frequency oscillator and for that reason the 7Q7 was removed from the gain control and a VR-90 regulator tube was connected to the screen supply.

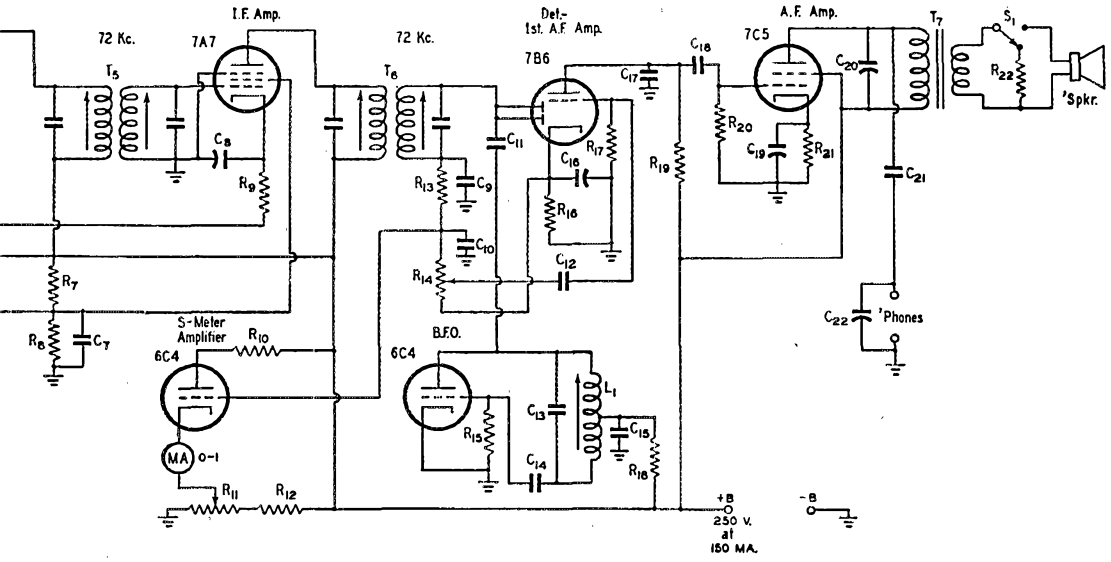
The 1600-kc. frequency was chosen for the first i.f. channel because it is high enough to make good image rejection possible at frequencies up to 28 Mc., with one good r.f. stage, and at the same time it is low enough to give enough selectivity to permit the use of frequencies as low as 40 or 50 kc. for the second i.f. channel, if we care to go that low. The selectivity must be good if images from signals at twice the second i.f. from the desired signal are to be avoided. The stage gain should be enough to give the weak signals a little build-up, but too much gain at this frequency may result in cross-modulation from strong local signals. With two 1600-kc. transformers and a second i.f. of 72 kc., the first image at 144 kc. from the desired signal is down 180,000 to 1. At 28 Mc. the second image (the one controlled by the r.f. selectivity) is down 400 to 1. This is about the same as some of the better receivers using two r.f. stages and an i.f. of 455 kc.

The 7J7 was selected for the second converter because the oscillator is a separate triode section that has good stability. Both the 7B8 and 7Q7 types were found to have some oscillator frequency shift with variations in gain-control settings. It is a good thing to remember that stability here is just as important as in the high-frequency oscillator. Not only should the oscillator tank circuit be high-*C* but it must be a stable capacity. Trimmer condensers of any sort should be avoided, and zero-coefficient ceramic condensers used for tank padding.

The 72-Kc. I.F. Amplifier

We now arrive at the heart of this receiver. The description of the front end was included only to point out some of the essential considerations if the maximum is to be realized from the 72-kc. i.f. amplifier. The wiring diagram of the 72-kc. portion of the receiver is given in Fig. 3.

The transformer assemblies are homemade and mounted in 1⅜-inch-square by 3⅜-inch-long aluminum cans. The coil forms are 3 11/16 inches long, with an outside diameter of 7/16 inch and an inside diameter of ⅜ inch. The adjustable cores are ⅜ inch in diameter by ⅝ inch long, of Z-26



iron manufactured by Stackpole Carbon Co. The iron shells which are placed over the coils are of Grade A-1 iron manufactured by the Henry Crowley Co. Similar types are also manufactured by Stackpole Carbon Co. Each half is $^{15}/_{16}$-inch outside diameter by $^{5}/_{16}$ inch wide, and when the two are placed together the cavity inside is large enough for a winding $^{3}/_{4}$ inch in diameter and up to $^{5}/_{16}$ inch wide, without crowding the leads too much. However, the center hole in this type shell is only $^{3}/_{8}$ inch in diameter and must be reamed out to clear the coil form. It was a tedious job but we managed to enlarge enough of them for this receiver by using a rat-tail file. These shells not only give us a higher-Q coil but also almost completely eliminate the loss normally caused by the shorted-turn effect of the shield can.

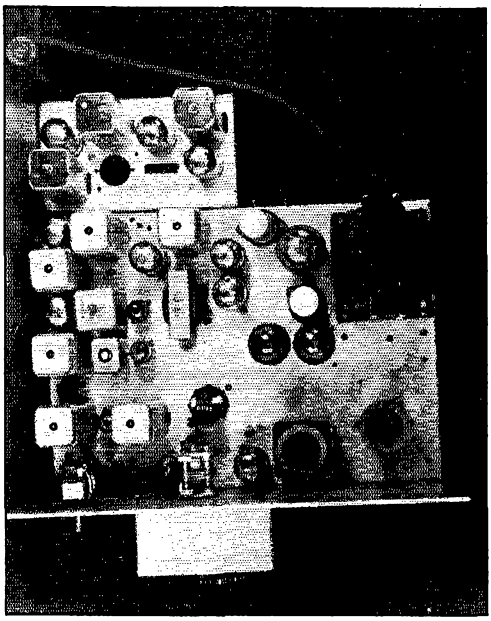
The coils are wound with 15-44 Litz wire with a single Celanese covering. The single covering is important because it is impossible to get as many turns inside the shell with a double Celanese covering. Each coil is made up of two pies $^{1}/_{8}$-inch wide with 56 turns per pie, or a total of 112 turns per coil. A single wrapping of thin paper should be placed under each coil before winding so that later on they can be moved on the form to adjust the coupling. The coils can be given a light coating of "Q-Max" or other good coil cement to hold them together. When dry the two pies can be shoved together to form a winding approximately $^{1}/_{4}$ inch wide. There is no reason why this could not be made one single winding $^{1}/_{4}$ inch wide except that we started out with two pies and later found it a convenient way to obtain a tap for the plates and grids, to reduce gain when a large number of stages is used.

With the shells in place over the coils and about $^{1}/_{2}$ inch between shells, the coupling should be about right. However, if a Q meter is available the coupling can be checked. With one coil connected to the Q meter and the other one shorted, the Q of the first coil should be 100 at 72 kc. It should drop to 90 when the short is removed and the second coil tuned to the same frequency. If the Q drops more than this the coils should be moved farther apart, and vice versa if the dip is not great enough. This is very loose coupling, but it is selectivity and not gain that we are after. The Q meter can also be used to peak the coils to frequency and simplify alignment after they are in the receiver.

After all adjustments have been made, a little wax or spot cement should be applied between the shells and the coil forms to prevent the shells from moving or slipping off the coils. The 0.008-μfd. capacitors across the coils can be ordinary good-grade mica condensers placed outside the can, since stray capacity-coupling effects are greatly reduced by the high-C circuits. We used two 0.004-μfd. condensers in parallel simply because we started out at 100 kc. with a single 0.004-μfd. condenser and then doubled the capacity to lower the frequency to 72 kc. without changing the coils.

With two stages using three of these transformers, we obtained a bandwidth of 2 kc. at 1000 times down. The additional three stages, which were built up on a small subchassis as a later addition, brought the bandwidth to just under 1 kc.

It was with the addition of the three stages on the subchassis that it became necessary to tap the grids and plates down on the coils to keep the over-all gain from becoming too great. However, with the high-C circuits and low gain-per-stage there should be no trouble with oscillation or instability.



This top view of the receiver shows that it is mostly i.f. cans and tubes. The plug-in coils for changing bands can be seen just behind the panel and near the oscillator tuning condenser. The outrigger i.f. amplifier at the rear of the chassis was added to give additional selectivity.

For the beat-frequency oscillator, we went to the war-surplus junk box and came out with a small coil having 500 turns of No. 36 d.c.c. in each of two pies. After the old capacitors were removed, this was hooked up as shown in the wiring diagram and worked out very well. Most 455-kc. oscillator coils are too low in inductance to work at this frequency, but a good permeability-tuned i.f. transformer could be converted by sliding the coils together and trying different condensers until the correct value is found.

In a receiver of this sort much more than normal over-all gain can be used, because the hiss and high-frequency components of the noise are greatly reduced by the high selectivity. However, when the gain is increased the low-frequency components of the noise become more pronounced, and some revision of the audio system to reduce the low-frequency response becomes desirable. This was done by reducing the capacity of the coupling condensers. The headphones have also been peaked to around 500 cycles. The condenser values shown in the circuit diagram are about right for Signal Corps high-impedance 'phones but may need to be changed slightly for other types. This stunt will not work with crystal 'phones. Since the receiver is already much too sharp for voice reception, an even more sharply-peaked audio system might be desirable.

The power supply must be capable of delivering about 150 ma. at 250 volts.

Alignment

The usual modulated-signal-and-audio-output-meter system is not satisfactory for aligning a receiver with this degree of selectivity. The best method we have found is to use an unmodulated signal and read the output on the S-meter. If an S-meter has not been built into the receiver, an electronic voltmeter connected across the diode load will do just as well. We used 1 volt across the diode load as standard output for measuring stage gain, selectivity, image ratio, etc.

Unless the low-frequency i.f. transformers have been accurately pretuned, a receiver of this type can be about as dead as anything you ever saw until the i.f. system is aligned. It is therefore a good idea to start with the signal generator tuned to 72 kc. and connected to the last i.f. grid. The diode transformer is peaked and the input is then moved back to the next grid and the next transformer aligned. This procedure is followed until all of the 72-kc. transformers have been aligned.

This brings us to the second-converter grid. We now shift the signal generator to 1600 kc. and peak the intermediate oscillator. If the range of the oscillator is great enough there will be two peaks, one 72 kc. above and the other 72 kc. below 1600 kc. The one at 1672 kc. was used, but there really should be no difference. Next move the input to the 6BA6 grid and peak the second 1600-kc. i.f. transformer and then go to the 7Q7 grid to peak the first i.f. transformer.

This leaves only the first oscillator and the r.f. system. Except for the oscillator stability that has been already covered, the rest can be the same as any other receiver and you can use your own pet ideas.

We skipped the beat-oscillator alignment because it is the same as any other b.f.o.

General

If some parts of this receiver seem a little unfinished or experimental, it is because they are just that. This whole thing is an idea to promote experimentation and progress, rather than a completed job to be copied in every little detail. For years we have been looking for the practical limit to usable selectivity, which we had been led to believe existed, and we have not yet found it. Until we do, our receiver will probably have to remain an experimental job. Right now we have some new samples of improved low-frequency iron cores and shells which are expected to make some even sharper i.f. transformers.

In the meantime, the smart 'phone boys are going to take this thing and build a selectivity control into it. With some arrangement for tightening the coupling, it should be possible to broaden the nose quite a bit without too much loss in skirt selectivity. Such a receiver should easily make room for four or five 'phone signals

(Continued on page 108)

The "Hammock" Beam

A Reversible 3-Element Beam for 14 Mc.

BY GEORGE B. FOSTER,* W9TOO

• We can't all have fancy rotary beams, but we can enjoy some of the advantages without using elaborate or cumbersome arrays. Here's a method that has paid big dividends for the small investment of time, effort and money required for its construction.

ANYONE who has operated as part of the "fourth-layer" QRM on 14-Mc. 'phone for an extended period will be interested in the reversible fixed beam described here, because it is a method of raising your signal to at least "second-layer" position without having to spend the time, money and effort required to put up a rotary beam. This whole antenna was constructed in less than four hours, including the time required for tuning, and it can be hung from the same supports used for a simple half-wave. At W9TOO, in the "crossover belt," where signals from both coasts pour in at the same time, its performance has been quite spectacular. With a flip of a switch, the antenna can be made to work best toward the East Coast, shoving the West Coast QRM into the background, and vice versa.

Electrical Features

As shown in Fig. 1, this antenna consists electrically of a fixed three-element beam using a multiwire dipole for the driven element and ordinary copper wire for the reflector and director. The unusual thing about it is that by simple switching, a given parasitic element is caused to become a director, or a reflector, depending upon the directivity desired. To keep the entire array physically small, the parasitic elements were spaced 0.1 wavelength each side of the driven element. If space is available and the crossarms are made strong enough the element spacing could be increased to 0.2 or 0.25 wave to obtain the added gain and bandwidth advantages of a wide-spaced beam. However, increasing the spacing would require a corresponding change in the number of radiator conductors since the radiation resistance at the wider spacing would be higher.

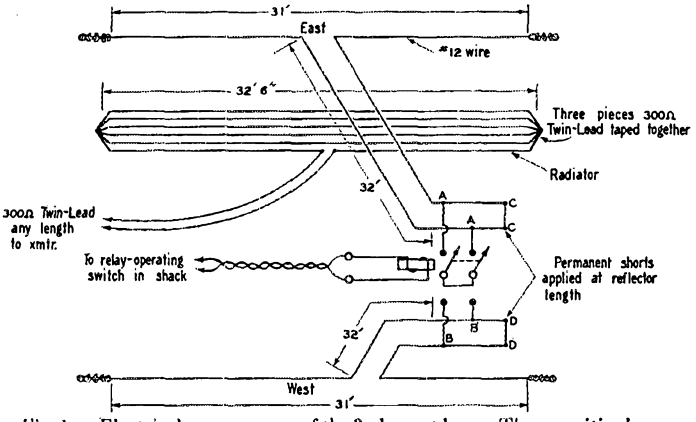


Fig. 1 — Electrical arrangement of the 3-element beam. The parasitic elements serve as either director or reflector, depending on the direction desired.

It should be noted that the two parasitic elements are exactly the same *physical* length. Their electrical length, however, is changed by the action of the d.p.d.t. relay, so that when the direction-reversing switch is thrown, the array always operates as a reflector-radiator-director aimed in the desired direction. This adjustment of electrical length is accomplished by means of the tuning stubs. Since the parasitic elements "see" any adjustment that is made a half-wave away, it is thus possible to tune the center of these elements by adjustments made from a position more accessible than forty feet in the air. They are adjusted from the ground with the antenna in its operating position, thus eliminating any worry about detuning when the antenna is raised. You know it is tuned "on the nose" because it is adjusted in the operating position.

The driven element consists of three half-wave pieces of 300-ohm Twin-Lead taped together, with the ends of all six wires shorted together to make a multiwire dipole. This matches the low radiation resistance of the array to the 300-ohm transmission line from the transmitter.[1] The impedance match seems to be good, no reflections being observed with a Twin-lamp indicator.

* R.F.D. 1, Urbana, Ill.

[1] Carmichael, "Multielement Radiators in Close-Spaced Arrays," *QST*, June, 1947, p. 24.

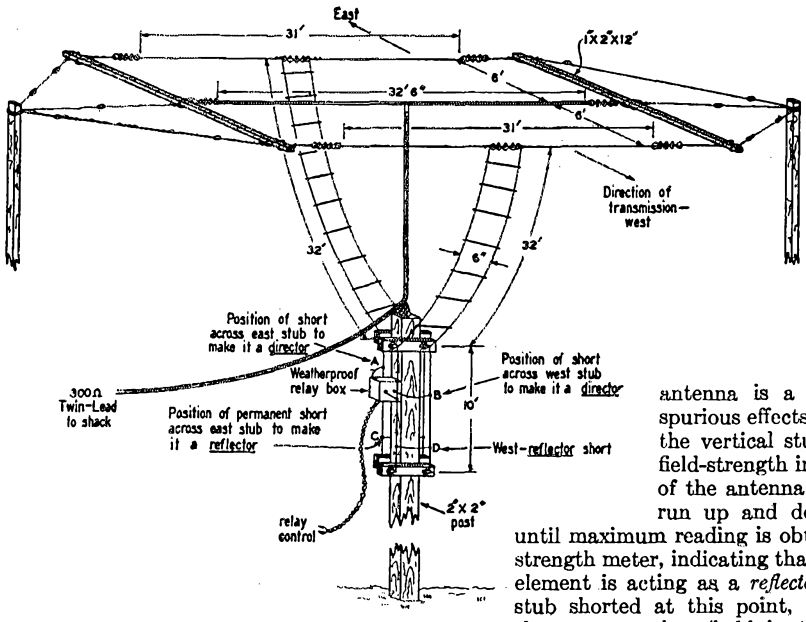


Fig. 2 — Mechanical construction of the reversible beam. The entire affair is light, requiring no special supports, and it can be suspended between the same supports used for any simple half-wave antenna.

Tuning Procedure

The tuning procedure will best explain the operation of the antenna. The two parasitic elements each have half-wave (approx.) stubs connected at their centers and running down to a point which, for 14-Mc. dimensions, brings the ends conveniently near the ground. Assume first that the antenna is supported with the wires running north and south as in Fig. 2. It is decided to tune the antenna for maximum radiation to the east first. (Note that the relay should not be fastened down until after its exact location is determined as described below.) A small amount of power is applied to the driven element through the transmission line, and a field-strength indicator with a horizontal pick-up antenna is placed at least two wavelengths away, to the east of the antenna. The horizontal pick-up antenna is a "must," to avoid spurious effects from pick-up from the vertical stub wires. With the field-strength indicator to the east of the antenna, a shorting wire is run up and down the *west* stub until maximum reading is obtained on the field-strength meter, indicating that the west parasitic element is acting as a *reflector*. Leave the west stub shorted at this point, and now take the change-over relay (held in the hand with six-inch wires attached to the two contacts that are normally closed) and use the assembly as a shorting wire, sliding it up and down the *east* stub to locate the point to make the east parasitic element act as a *director*. This will be indicated by a further increase in the reading obtained on the field-strength meter. Now go back and touch up the west stub to be sure it is shorted at the point that produces maximum indication. Solder a permanent short across the wires at this position on the west stub, point *DD*, Fig. 1.

You have now located the position of the permanent (i.e., reflector) short on the west stub, and have located and *marked* the position on the east stub that will make the east parasitic element a director. (The relay is still not fastened down.)

Now the antenna is ready to be tuned for optimum performance to the west. The same procedures are used, with the field-strength meter now located to the west of the antenna. The location of the shorting wire on the east stub to make the east parasitic element a reflector, and on the west stub to make the west parasitic element a director is determined (with the relay held again in the hand) by the same methods described above.

When this is accomplished, you should have a permanent shorting wire soldered near the bottom of each stub at the position that made that stub a reflector, and you should have located a point higher up on each stub that will make either one a director when shorted at that position. All that remains is to connect the stationary contacts of the d.p.d.t. relay with 6-inch leads,

About the Author

• George B. Foster, W9TOO, tells us that his XYL, seeing the structure described in this article, thought that (at last) the OM was building a hammock for her ease and comfort. Perhaps it was a carry-over from George's 5-year hitch in the Navy during the war, but the name "hammock" has stuck from the start. George, who was first licensed in 1935, finds time between E.E. classes at the University of Illinois to do a bit of DXing and some antenna experimenting. He is a member of the Twin City Radio Club.

duplicating the conditions that existed when adjustments were made, to each stub at the *director* position, and the moving contacts of the relay, shorted together, will apply a short across either one of the stubs, depending on whether or not the relay is energized. The other stub remains a reflector. The relay, enclosed in a weatherproof box, should now be fastened to the pole with the 6-inch leads connecting it to the stubs. The entire sequence of operations is tabulated below for convenience:

Direction of Transmission	*Condition of East Stub*	*Condition of West Stub*
East	Shorted at *AA* — director length	Open at *BB*, shorted at *DD* — reflector length
West	Open at *AA*, shorted at *CC* — reflector length	Shorted at *BB* — director length

Construction

The mechanical construction used is self-evident from Fig. 2. The pole used to support the relay and the lower ends of the stubs was a piece of 2 × 2, but even lighter material could be used because it is subject to but little strain. The 300-ohm feedline is brought straight down from the antenna to the pole. This relieves the antenna of the weight of the remaining feedline. The stubs were made of No. 14 wire, spaced 6 inches between wires, with the bottom 10 feet made from bare stranded wire supported on the sides of the pole on stand-off insulators in the manner of Lecher Wires to facilitate the tuning process. The insulators supporting the ends of the parasitic elements must be of first quality and preferably at least two in series should be used. The radio-frequency voltage appearing at the ends of these wires is quite high and even a small resistance leakage will introduce considerable power loss, while any change in this resistance will affect the tuning.

Tests with local amateurs indicate a front-to-back ratio of 3 to 4 S-points, which is about what one could expect with such an arrangement. Obviously, this is only one of a number of possibilities. The writer first came across a similar set-up during a visit to W9RUK. "Ike" used two half-waves in phase as the driven element, fed with a tuned line, and two halfwaves in each of the parasitic elements. He had a total of three such reversible antennas arranged radially to cover any of six directions! The effectiveness of his system was the inspiration for this simplified version.

In terms of on-the-air performance *versus* time and money expended, this skywire is the writer's all-time favorite. It is not only convenient to construct, but it can be supported by the same arrangement used to maintain a simple doublet.

A.R.R.L. QSL BUREAU

For the convenience of American and Canadian amateurs, the League maintains a QSL-card distributing system which operates through volunteer district QSL managers in each call area. To secure such foreign cards as may be received for you, send your district manager a stationer's-size No. 10 stamped self-addressed envelope. If you have reason to expect a considerable number of cards, put on an extra stamp so that it has a total of six cents postage. Your own name and address go in the customary place on the face, and your station call should be printed prominently in the upper left-hand corner. If you have held other calls in previous years, submit an envelope for each such call to the proper manager — there are many thousands of uncalled-for cards in the files. All incoming cards are routed by Hq. to the *home district* of the call shown in the address. Therefore, cards for portable operation in other districts should be obtained from the home-district manager.

W1, K1 — Charles Mellen, W1FH, 320 Cornell St., Boston, Mass.
W2, K2 — Henry W. Yahnel, W2SN, Lake Ave., Helmetta, N. J.
W3, K3 — Jesse Bieberman, W3KT, Box 34, Philadelphia, Pa.
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 Ave., Oakland, Calif.
W7, K7 — Frank E. Pratt, W7DXZ, 5023 S. Ferry St., Tacoma, Wash.
W8, K8 — Fred W. Allen, W8GER, 1959 Riverside Drive, Dayton 5, Ohio.
W9, K9 — John F. Schneider, W9CFT, 311 W. Ross Ave., Wausau, Wis.
WØ, KØ — Alva A. Smith, WØDMA, 238 East Main St., Caledonia, Minn.
VE1 — L. J. Fader, VE1FQ, 125 Henry St., Halifax, N. S.
VE2 — Austin A. W. Smith, VE2UW, 6164 Jeanne Mance, Montreal 8, Que.
VE3 — W. Bert Knowles, VE3QB, Lanark, Ont.
VE4 — Len Cuff, VE4LC, 286 Rutland St., St. James, Manitoba.
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 — Jack Spall, VE8AS, 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 Namauu Dr., Honolulu, T. H.
KL7 — J. W. McKinley, KL7CK, Box 1533, Juneau, Alaska.

The Dash Master

A Semielectronic Key

BY THEODORE H. GOTISAR,* W6TZK

• Here is an ingenious device that will appeal to any c.w. operator who likes to push a bug key. Used with any semiautomatic key, it makes automatic dashes without any alteration of the bug key. You just plug your bug into the "Dash Master" and key your transmitter with the output of this clever gadget. Your bug makes the dots mechanically as usual, and the dashes are made electronically.

ALMOST every amateur who works c.w. has on his operating table a semiautomatic key. It is a key that is well designed, has good mechanical construction, and for which the amateur has generally paid good cold cash.

The "old-timer" has great affection for his "bug." There is that little groove in the paddle where his thumb always smacks it. It seems indeed a shame to throw it away for some newfangled contraption like an "electronic bug."

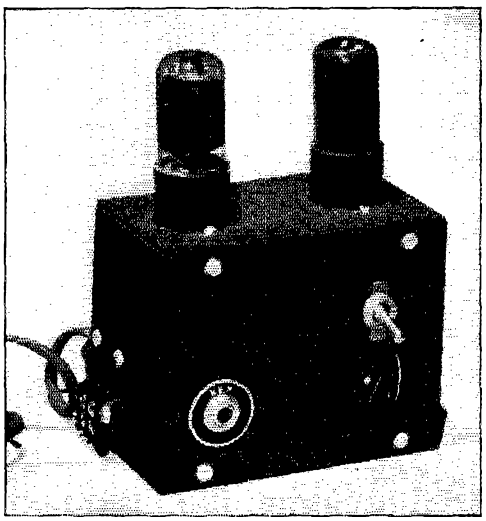
The "Dash Master" was designed around the idea that a "bug" makes perfectly good dots if the operator has the weight in the right place, and that the only thing required for precision code with least effort is automatic dashes.

The unit to be described does not require any alteration of the key such as disconnecting, reconnecting, or adding contacts. It is only necessary to plug the "bug" in, and the dashes become automatic.

The Circuit

As can be seen from Fig. 1, the diode portion of a 70L7 is used as a rectifier in a simple a.c.-d.c. power supply. A 50L6 and the tetrode portion of the 70L7 are connected as triodes and work together in a multivibrator circuit. The values of the condensers C_1 and C_2 are correct to make a relay in the "plate" circuit of the 50L6 remain closed three times as long as it remains open.

* Los Altos, Calif.

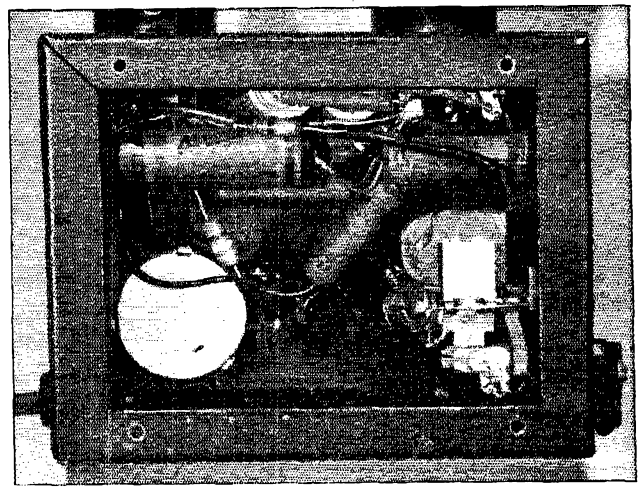


The "Dash Master," a simple unit that adds automatic dashes to your present bug key without any alteration of the key. The knob on the panel controls the speed of the dashes. The key is plugged into the jack, and the keyed circuit is connected to the terminal strip on the left.

Since a dot is obviously shorter than a dash, the relay and multivibrator simply follow the dot contact on the "bug" when making dots. However, when the dash contact closes the cathode circuit of the 50L6 long enough to produce more than one dash, the multivibrator comes into play and times the dashes according to the setting of the dual potentiometer in the grid circuits of the two tubes. The speed of the dots is determined as usual by the position of the weights on the "bug," and the dash speed is set by the knob on the front of the "Dash Master."

Rather large variations in line and plate voltage have no effect on the speed or spacing of the dashes, consequently no voltage regulation is necessary. However, r.f. will raise havoc. The "Dash Master" is a surprisingly good indicator of the presence of r.f. in the power line and key leads. Just put the r.f. in the antenna, where it belongs, and the dashes won't change speed when you turn on the final.

If for any reason the constructor wishes to change the spacing between the dashes, he can do so by varying C_1 or C_2. The slight change in speed is more than compensated for by the latitude of the dual potentiometer, R_1. Slightly closer spacing than is correct makes for more compact, "machine-like" characters. However, it should not be overdone. The correct dash-to-space ratio is of course three-to-one. The values given in the parts list produce this ratio. Additional capacitance at C_1 increases the spacing — more at C_2 decreases the spacing.



A view inside the "Dash Master," showing the relay and other components. The placement of parts and the wiring are completely non-critical.

Construction

The entire device can be built in and on a 4 × 5 × 3-inch metal box. As can be seen in the photo, the 50L6 and the 70L7 were mounted on top of the can, providing ample ventilation for the tubes and sufficient room inside for the rest of the parts. If the builder uses a larger relay than the Sigma Type 4-F indicated in the parts list, he may have trouble finding room for it. The Sigma relay is such an excellent relay for the purpose and is priced so low on the current surplus market that it seems illogical to use anything else.

The switch is located just above the speed control on the right, and the jack for the "bug" is located on the lower left. The relay contacts are brought out to the terminal strip on the left side of the box. The power cord comes through a rubber grommet on the right side, thereby leaving the back free to be removed for easy access to the parts inside.

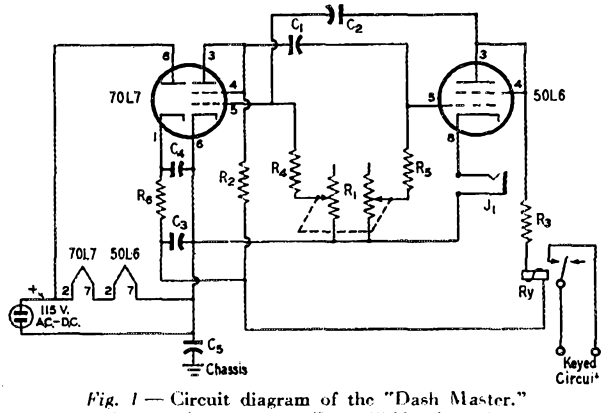


Fig. 1 — Circuit diagram of the "Dash Master."

C_1 — 0.1-μfd. 400-volt paper.
C_2 — 0.3-μfd. 400-volt paper.
C_3, C_4 — 20-μfd. 150-volt electrolytic (Sprague "Atom").
C_5 — 0.05-μfd. 400-volt paper.
R_1 — 0.5-megohm dual potentiometer.
R_2 — 47,000 ohms, 1 watt.
R_3 — 39,000 ohms, 1 watt.
R_4, R_5 — 0.1 megohm, ½ watt.
R_6 — 1500 ohms, 2 watts.
J_1 — Open-circuit jack.
R_y — Sensitive relay, 8000 ohms (Sigma 4-F).

Operation

Since the dot-to-dash ratio must be set up manually, the operator should familiarize himself with the fact that there should be just twice as many dots over a given period of time as dashes. If the operator will set the unit up for a few different speeds with the aid of the sweep second hand on the station clock, and get used to how it sounds, he will soon be tuning his "bug" and "Dash Master" as Fritz Kreisler tunes his violin, and what results will be sweet music to his and the rest of the ears of the c.w. fraternity.

It will be noticed that the speed control has quite a wide range, wider than the dot range on many semiautomatic keys. Many of the more expensive "bugs" will not slow down enough for accurate code below 25 or 30 w.p.m. This limitation has always existed in the "bug" — the "Dash Master" only brings it to the operator's attention. But no one has any business making dashes five or ten w.p.m. below the dot speed, and electronically-formed dashes offer one way to avoid this common mistake. With automatic dots and dashes, the operator has only to worry about the spaces.

In completed form, the "Dash Master" is a compact unit which will fit handily into any convenient space on the operating table. The author has used it for many months both on 7- and 14-Mc. c.w., at varied operating speeds, and has never once found it wanting.

The "Topics" VFO

Simple Construction Using the Clapp Circuit

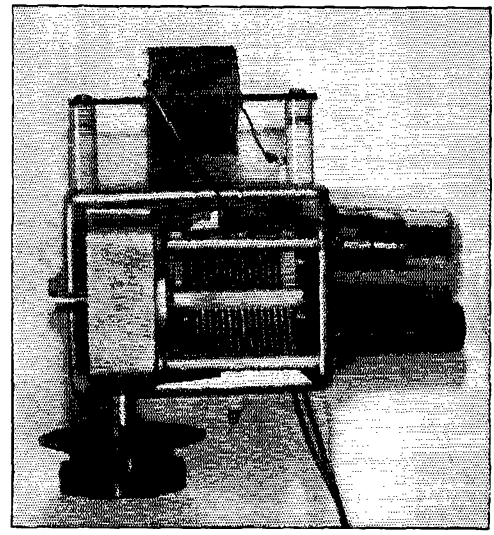
BY NICHOLAS LEFOR,* W2BIQ

THE "Technical Topics" of the May, 1948, issue of *QST* [1] was read here with more than usual interest because of recent difficulties encountered in attempting to stabilize and temperature-compensate the usual garden variety of ECO. A VFO utilizing this new information was constructed and — lo and behold! — it performed far in excess of the mild praise given it by the Technical Editor. To clarify the foregoing statement, let it be understood that no pains or extra care were taken in building this VFO, other than the use of suggested components and rigid construction.

The wiring diagram, Fig. 1, shows that the only addition we made was a 6V6 isolating stage, capacity-coupled to the cathode of the 6J5 oscillator. The plate of the 6V6 is shunt-fed, and a tank coil coupled through C_9 furnishes the resonant load.

Construction

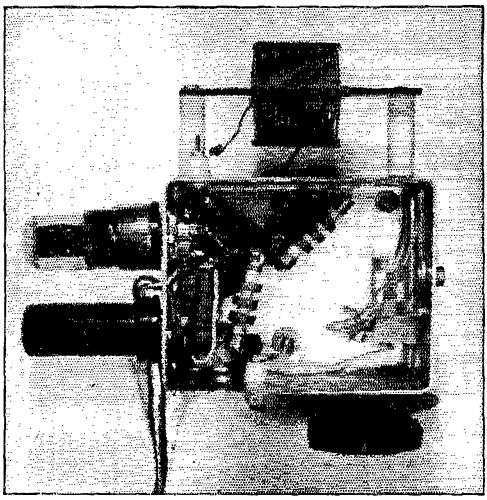
A war-surplus drawn-aluminum chassis, 2¼ inches high, 4 inches wide and 5 inches long was used to mount the components. The variable tuning condenser was also a surplus item, incorporating a 100-to-1 gear drive. The condenser and drive are exceptionally well constructed. While another type of condenser may be substituted, this particular condenser was a "buy" and had been in the junk heap here for some time just waiting for a chance to go to work.



The VFO uses a war-surplus condenser for tuning, and the entire unit is built on a small drawn-aluminum chassis.

The coil is mounted as shown in the photographs, and approximates the coil described in the "Topic." A check showed this coil to have a Q of over 300, and it is admirably suited to this application. Any doubt about the use of a coil having cellulose acetate as an insulator and support was dispelled by the performance of the circuit.

The oscillator tube and isolating amplifier were mounted outboard, and located away from the coil, to prevent any transfer of heat to the coil and components. Lead lengths and placing of components work out well with this type of construction.



An under-chassis view of the VFO. The output is taken at the small ceramic feed-through insulator.

* Airadio, Inc., Stamford, Conn.

[1] "A High-Stability Oscillator Circuit," G. G., p. 42, May 1948 *QST*.

• The description of a different approach to VFO stability given in May *QST* has aroused considerable interest among operators looking for better stability in the frequency-control department. Here is a little unit that shows how simple it is to put the circuit to work in the station.

two 0.001-μfd. condensers and the variable capacitor in series, the actual capacity required in the variable condenser is closer to 110 μμfd. In use, the unit tuned from approximately 2.9 to 6 Mc., a frequency range of over 2-to-1.

While the VFO is not keyed, a check showed the keying to be excellent. A preliminary check against the 5-Mc. signals of WWV left no doubt as to the stability of this oscillator. After being zero-beat with WWV, the monotony of waiting

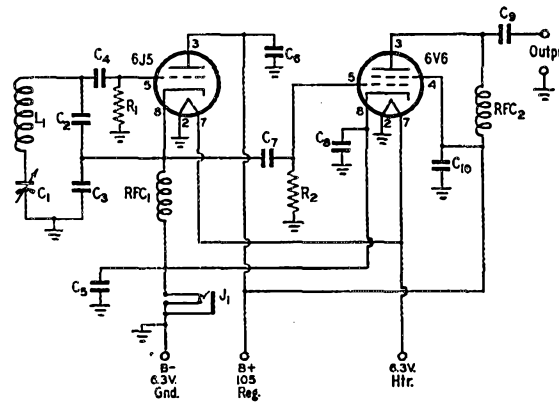


Fig. 1 — Wiring diagram of the "Topics" VFO.
C_1 — 60–270 μμfd. variable.
C_2, C_3 — 0.001-μfd. silver mica.
C_4, C_7, C_9 — 100-μμfd. silver mica.
C_5, C_6, C_8, C_{10} — 0.01-μfd. mica.
R_1 — 0.1 megohm, ½ watt.
R_2 — 47,000 ohms, ½ watt.
L_1 — B&W air-wound inductor, 1¾-inch diam., 27 turns, No. 18 wire.
J_1 — Closed-circuit jack.
RFC_1, RFC_2 — 2.5-mh. r.f. choke.

In our application the output is tuned, and more than sufficient power output is realized to drive the crystal stage, using only 105 volts on both tubes. However, it is well to load this stage only lightly, as there was some evidence of reaction on the oscillator. It might be well to add another stage to have complete isolation and eliminate this slight effect.

The coil as checked required a capacitance of 90 μμfd. to resonate at approximately 3.5 Mc. However, since the circuit is resonated by the for an off-beat drove the author to putting the unit on the air. The reports as received on the air were indeed more than gratifying.

It is doubtful if this unit will be redesigned, as it no doubt should be, because the performance is so excellent that we are hesitant to rebuild it into a cabinet. This unit was not intended for the final design, but as an attempt to check the circuit. However, we feel that this construction may suggest other possibilities to the experimentally-minded amateur.

High-Stability Oscillators

EDITORS, like elephants, are supposed to have long memories. The pachyderm may fully deserve his reputation, but editors, being human, sometimes slip. With which introduction we can go on to confessing that we missed one.

Back in November, 1941, *QST*, E. O. Seiler, then W8EB but now W2EB, described a VFO for which exceptionally high stability was claimed. You've guessed it — the circuit was basically identical with the Clapp circuit described in Technical Topics in *QST* for May of this year; same fundamental principles, the only difference being a change in the method of covering the frequency range of a ham band.

Excuses? None, except that the things that were happening around that time were enough to make anyone, even an editor, mislay a few technical advances in the welter of international complications. Renewed credit to W2EB and our apologies for a lapse of memory.

One of these days we *will* get around to digging out the sometimes-neglected meat from *QST* of a decade and more ago. There's gold in them thar pages! — *G. G.*

Strays

The new f.m. station, WFMY, has just the ticket for weary W4s who have been sitting up to all hours over a hot rig while trying to edge up on some rare DX. We quote from the Greensboro (N. C.) *Record*, thanks to W4GWW: "The station's effective radiated power of 23,000 watts gives a full, clear *massage* to the rapidly growing FM audience in this area." (Italics ours.)

Happenings of the Month

ELECTION NOTICE

To All Full Members of the American Radio Relay League residing in the Central, Hudson, New England, Northwestern, Roanoke, Rocky Mountain, Southwestern and West Gulf Divisions:

You are hereby notified that, in accordance with the Constitution, an election is about to be held in each of the above-mentioned divisions to elect both a member of the ARRL Board of Directors and an alternate thereto for the 1949–1950 term. Your attention is invited to § 1 of Article IV of the Constitution, providing for the government of ARRL by a board of directors; § 2 of Article IV, and By-Law 12, defining their eligibility; and By-Laws 13 to 24, providing for the nomination and election of division directors and their alternates. Copy of the Constitution & By-Laws will be mailed to any member upon request.

As a special case in these elections: There being a vacancy in the office of alternate director in the New England Division, and it being desirable and required that the office be filled as quickly as possible, every nomination for alternate director from the New England Division will be deemed to be not only a nomination for the 1949–1950 term but also for the unexpired remainder of the present term; and the candidate chosen will take office immediately upon his selection.

Voting will take place between October 1 and November 20, 1948, on ballots that will be mailed from the headquarters office during the first week of October. The ballots for each election will list, in one column, the names of all eligible candidates nominated for the office of director by Full Members of ARRL residing in that division; and, in another column, all those similarly named for the office of alternate. Each Full Member will indicate his choice for each office.

Nomination is by petition. Nominating petitions are hereby solicited. Ten or more Full Members of the League residing in any one of the above-named divisions may join in nominating any eligible Full Member residing in that division as a candidate for director therefrom, or as a candidate for alternate director therefrom. No person may simultaneously be a candidate for both offices. Inasmuch as all the powers of the director are transferred to the alternate in the event of the director's death or inability to perform his duties, *it is of as great importance to name a candidate for alternate as it is for director.* The following form for nomination is suggested:

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

We, the undersigned Full Members of the ARRL residing in the ..... Division, hereby nominate ....., of ...., as a candidate for director; and we also nominate ....., of ....., as a candidate for alternate director; from this division for 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; provided that if a candidate's membership was interrupted by reason of service in the armed forces of the United States or Canada between September 1, 1939, and May 3, 1947, he shall not be deemed to be disqualified so far as concerns continuity of membership if within those dates he resumed his League membership within the 90 days following his release from active military duty. He must be without commercial radio connections: he may not be commercially engaged in the manufacture, selling or renting of radio apparatus normally capable of being used in radio communication or experimentation, nor commercially engaged in the publication of radio literature intended, in whole or part, for consumption by licensed radio amateurs. Further details concerning eligibility are given in By-Law 12. His complete name and address should be stated. The same requirements obtain for alternate as for director. All such petitions must be filed at the headquarters office of the League in West Hartford, Conn., by noon EDST of the 20th day of September, 1948. There is no limit to the number of petitions that may be filed on behalf of a given candidate but no member shall append his signature to more than one petition for the office of director and one petition for the office of alternate. To be valid, a petition must have the signature of at least ten Full Members in good standing; that is to say, ten or more Full Members must join in executing a single document; a candidate is not nominated by one petition bearing six valid signatures and another bearing four. Petitioners are urged to have an ample number of signatures, since nominators are frequently found not to be Full Members in good standing. It is not necessary that a petition name candidates both for director and for alternate but members are urged to interest themselves equally in the two offices.

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

Present directors and alternates for these divisions are as follows: Central Division: director, Clyde C. Richelieu, W9ARE; alternate, Harold H. Jansen, W9DJG. Hudson Division: director, Joseph M. Johnston, W2SOX; alternate, Robert A. Kirkman, W2DSY. New England Division: director, Percy C. Noble, W1BVR; alternate, none. Northwestern Division: director, Harold W. Johnston, W7DXF; alternate, R. Rex Roberts, W7CPY. Roanoke Division: director, Hugh L. Caveness, W4DW; alternate, J. Frank Key, W3ZA. Rocky Mountain Division: director, Franklin K. Matejka, WØDD; alternate, P. Arthur Smoll, WØKVD. Southwestern Division: director, Hans R. Jepsen, W6KEI; alternate, Arthur E. Schifferman, sr., W6CGI. West Gulf Division: director, Wayland M. Groves, W5NW; alternate, Jack T. Moore, W5ALA.

These elections constitute an important part of the machinery of self-government of ARRL. They provide the constitutional opportunity for members to put the direction of their association in the hands of representatives of their own choosing. Full Members are urged to take the initiative and to file nomination petitions immediately.

For the Board of Directors:

K. B. WARNER,
Secretary

July 1, 1948

BROADCASTING PROHIBITED

Amateur stations are for communication with other amateur stations. It was never contemplated that they should serve as private broadcasting stations and our rules have long contained provisions designed to prevent this. These

rules are broadly worded and their intent clear. However, some U. S. amateurs haven't left well enough alone and have been crowding the interpretation of late, with the result that over the past year or so we have witnessed an increasing amount of stuff like "club programs" (obviously aimed at BCL and SWL audiences), "lectures" on various subjects of more or less amateur content, and outright use of amateur stations to promote drives and "causes" over the air, many with little or no relation to amateur radio.

Most of this has reached the Commission via its monitoring stations, and has been a matter of increased concern to that body, including our staunchest friends there. It was apparent that the rules needed tightening. With this aim we were in hearty accord; on the other hand we wanted to make sure that certain types of amateur operation which we regard as proper, and which might be ruled out unless wording were carefully devised, would in fact be permitted. We're talking now about such things as a station within a net making perfectly proper transmissions to all the other stations therein, or round-table discussions where they properly involve only the amateur participants, or our own special official bulletins addressed to amateurs and of interest to them, or our code-practice transmissions. Taking all this into consideration, and with our active participation, the Commission has now resolved the problem by amendment of our old rules § 12.101 and § 12.103 and the addition of a new § 12.106, effective July 14th, to read as follows:

§ 12.101 is amended by deleting the period at the end of the section and adding "and for the purposes set forth in § 12.106 of these rules."

§ 12.103. *Broadcasting prohibited*— Subject to the provisions of § 12.106 of these rules, an amateur station shall not be used to engage in any form of broadcasting, that is, the dissemination of radio communications intended to be received by the public directly or by the intermediary of relay stations, nor for the retransmission by automatic means of programs or signals emanating from any class of station other than amateur. The foregoing provision shall not be construed to prohibit amateur operators from giving their consent to the rebroadcast by broadcast stations of the transmissions of their amateur stations, provided, that the transmissions of the amateur stations shall not contain any direct or indirect reference to the rebroadcast.

§ 12.106. *One-way communications*— In addition to the experimental one-way transmissions permitted by § 12.101, the following kinds of one-way communications, addressed to amateur stations, are authorized and will not be construed as broadcasting:

(a) Emergency communications, including bona-fide emergency drill practice transmissions;

(b) Information bulletins consisting solely of subject matter having direct interest to the amateur radio service as such;

(c) Round-table discussions or net-type operations where more than two amateur stations are in communication, each station taking a turn at transmitting to other station(s) of the group; and

(d) Code practice transmissions intended for persons learning or improving proficiency in the International Morse Code.

We think all this an excellent solution to a growing problem. In addition to the experimental work authorized in § 12.101, we can continue uninterrupted those things we regard as legitimate amateur activity but which do not always involve two-way transmissions: code practice, net and emergency drills, official bulletins where they really concern amateurs, etc.; the desire to continue these shines through the obvious care with which the Commission has drafted the language. In fact, the new wording recognizes these definitively, an improvement in this respect over the old language. But the new rules also make it clear that it is not intended we should use our stations to entertain and regale the voiceless listening public. That's still the broadcasters' job.

ARE YOU LICENSED?

• When joining the League or renewing your membership, it is important that you show whether you have an amateur license, either station or operator. Please state your call and/or the class of operator license held, that we may verify your classification.

PROOF OF USE WAIVED

§ 12.27 of our amateur rules requires that an amateur renewing his operator license must show use of his station by establishing that he has communicated, by telegraphy, with at least three other U. S. amateurs during the last 6 months of the license term. But back before the war, when it was apparent to the League that such "proof of use" was soon going to be difficult or impossible, with so many fellows away from home, we moved to have this requirement waived and it has been, since December of 1940, by a succession of FCC orders. Last year the Commission issued an order (77-H) continuing the waiver until June 30th of this year. As that date approached, it seemed both to us and to the people at the Commission that it would be desirable to make one more extension, through December 31st of this year, until all prewar licenses had expired; and an order of the FCC on June 23rd accomplished this. But that will be all, gang. After that, with all U. S. amateur licenses on the 5-year basis, proof of use will again be required as a condition to renewal.

WASHINGTON MISCELLANY

Authorization of amateur mobile work on all ham frequencies is expected before July is out. Keep an ear on W1AW for news. . . . FCC has agreed to extend our temporary n.f.m. 'phone authorizations before the August 1st deadline. Again, W1AW for announcements. . . . The U. S. Government ratified the Atlantic City convention and radio regulations on June 18th. FCC

has now begun work to apply to its general rules the vast detail of technical changes brought about by ACy. You may hear reports of extensive overhauling of FCC regulations but the amateur rules, as such, are not involved and the matter is chiefly a technical editorial one, to adopt the new definitions, classifications and allocation nomenclature. It will involve applying ACy allocations above 25 Mc. but the only effect of that on us is that small shift of our 11-meter band which has long been in prospect. . . . ARRL continues participation in preparations for the Bogotá conference. . . . As you might expect, the League has liaison with the new Office of Civilian Defense Planning, established by the Department of Defense, and various of our representatives have been conferring with the Office to explain to them the usefulness of amateurs in such emergency communication work. . . . President Bailey represents us on a three-man committee of the Armed Forces Communications Assn., under the chairmanship of WØMBW, which is also studying the employment of our facilities in the event of a national emergency. . . . FCC has called an informal engineering conference to consider all aspects of harmonic difficulties and spurious emissions on all frequencies, a basic conference to be held in August a month before its formal examination of the specialized television harmonic problem. As it seems a quite important matter, the League contemplates full participation.

U. S. HAMS CAN'T OPERATE IN CANADA

U. S. hams planning vacations in Canada have been asking us lately if they can get permission to operate their ham rigs in Canada on the basis of their U. S. amateur licenses. Sorry, OMs — no can do. Under the laws of Canada only British citizens can be licensed (just as under U. S. laws only U. S. citizens can get ham tickets). As a matter of fact, the Canadian Department of Transport is anxious that we stress this point to avoid disappointment to W/K amateurs visiting Canada. They also point out that all transmitting equipment in cars entering Canada is sealed by the customs authorities at the point of entry, and have suggested that particular care be exercised to see that the seal remains intact, since otherwise the vehicle is subject to confiscation.

While on this subject we might add that ARRL had some hopes of promoting reciprocal licensing arrangements between the two countries and to that end made formal representations to the Department of State last year. But the idea of noncitizen licensing was turned down at high level as not being in the national interest at this time, and that has killed the whole thing for the indefinite future.

EXECUTIVE COMMITTEE MEETINGS

The following is an abstract of the minutes of the Executive Committee of the League during the past year between Board meetings, as ratified by the Board at its recent meeting, here published for your information by order of the Board.

Meeting No. 198, Oct. 2, 1947. Examined nominations in regular autumn elections, determined eligibility of candidates; in cases where there was only one eligible candidate, declared him elected without balloting; ordered ballots sent on others. Affiliated 30 clubs. Adopted mechanism to expedite future affiliations. Approved agreement with Milwaukee Radio Amateurs' Club governing 1948 national convention.

Meeting No. 199, Nov. 20, 1947. Opened and counted ballots in regular autumn elections, certifying winning candidates. Informed former New England Division alternate director that he could not be reinstated without reelection. Affiliated 20 clubs. Examined plans for improving emergency communication organization.

Meeting No. 200, Mar. 24, 1948. Referred to the Board's annual meeting the question of the eligibility of Director Richelieu to serve on the Board. Released Milwaukee Radio Amateurs' Club from Paragraph 10 of its agreement concerning national convention. Ratified affiliation of 26 clubs.

Silent Keys

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

W1LGY, Bruce Nevers, Lawrence, Mass.
Ex-SNW, ex-1WX, Miss Cecil Powell, Wethersfield, Conn.
W1IFZ, William Y. Baker, Newtonville, Mass.
W2INJ, George F. Brennert, New Brighton, N. Y.
W2LOO, Walter J. Parker, Valley Stream, L. I., N. Y.
W3KRV, John R. Kuhn, Pittsburgh, Penna.
Ex-4XE, Captain William Justice Lee, USNR, Washington, D. C.
W4IIS, John D. Morgan, Augusta, Ga.
W5JXZ, PFC William L. Falk, Edinburg, Texas
W6QHH, Sidney N. Fletcher, jr., Northridge, Calif.
W6UYJ-D4ASY, Sgt. Mark Wall, AACS, Compton, Calif.
W8HD, Christian S. Hoffmann, jr., Wheeling, W. Va.
W8KPH, Paul V. Luckman, Toledo, Ohio
W8WTX, Donald C. Hall, Toledo, Ohio
W9UJT, George W. Stanley, Lincoln, Nebraska
WØBNY, Archor D. Stanley, Kansas City, Mo.
WØRGX, Rev. Bernard M. Weakland, Brighton, Colo.
McMurdo Silver, West Simsbury, Conn.

• Surplus Corner —

A Modification of the PE-103-A

THE PE-103-A dynamotor is designed to provide a 500-volt output with either 6 or 12 volts input. If you are content to operate always from a 6-volt source, the unit can be modified quite simply to deliver 250 volts (for a receiver) and 500 volts (for the transmitter), with change-over controlled by a remote switch. This eliminates the need for a separate power supply for the receiver.

Fig. 1 is a simplified schematic of the unit as received, leaving out such items as circuit breakers, field windings, dropping resistors and switch contacts which are not essential to our discussion. The dual-input-voltage requirement is met by using a special three-commutator machine having windings for 6, 12 and 500 volts. Each input commutator is provided with its own starting relay. The change from 6- to 12-volt input is accomplished by a manually-operated switch which applies voltage to the coil of only one starter relay at a time. Other sections on this switch short out filament-dropping resistors, etc. A third relay turns on the heaters and actuates the selected starting relay, thus starting the machine.

Obviously, any scheme which will let us apply 6 volts to the 12-volt commutator will result in an output of about one-half normal, or about 250 volts, and will at the same time reduce the current drain from the car battery tremendously. Before the modifications described here are performed, if we switch the unit to 12 volts and put in only 6, the machine will not run because the relays will not operate.

The first step I took in the modification was to rewind the 12-volt starting relay so it would operate on 6 volts. This is a totally-enclosed relay with the cover spun on like a tin can. The relay can be opened by making hack-saw cuts through the lip of the cover at about ½-inch intervals for about two-thirds of the way around. When the resulting segments are pried up, the cover will come off and the plunger, spring, and contactor disk will fly out. After the terminals and fixed contacts are removed, the coil can be withdrawn. I unwound the coil and folded the same wire double and wound it back on, but it might be easier to wind it with heavier wire. Don't wind the coil too full as it will make it difficult to replace. It would, as an alternative, be satisfactory to replace the 12-volt starting relay with an auto-starter or horn relay, or any other heavy-duty 6-volt relay which will fit the available space.

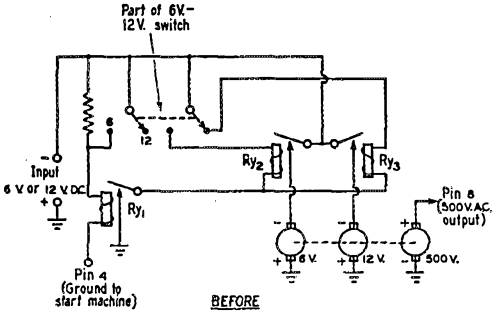


Fig. 1 — Simplified schematic diagram of the PE-103-A dynamotor before modification.

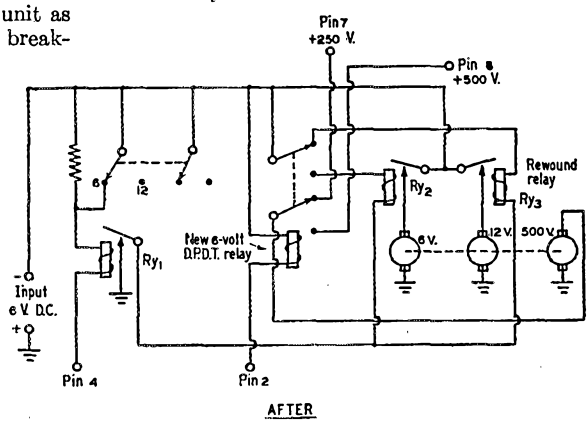


Fig. 2 — Rearrangement of the wiring of the PE-103-A dynamotor to permit both 275 and 500 volts d.c. to be obtained from a 6-volt source. Connections to the various terminals shown are explained in the text.

I unwound the coil and folded the same wire double and wound it back on, but it might be easier to wind it with heavier wire. Don't wind the coil too full as it will make it difficult to replace. It would, as an alternative, be satisfactory to replace the 12-volt starting relay with an auto-starter or horn relay, or any other heavy-duty 6-volt relay which will fit the available space.

In order to obtain remote control of the change-over from 250 to 500 volts, and to provide separate B+ output terminals for the receiver and transmitter, it is necessary to install an additional 6-volt d.p.d.t. relay. I found room for a miniature relay near the old 6-volt/12-volt switch. The original connections to Pins 2, 7 and 8 of the output socket were removed and the new relay wired in as shown, the coil between the common A — (hot) lead and Pin 2, one arm and its associated fixed contacts replacing the section of the 6-volt/12-volt switch which selected the desired starter relay (the normal contact to the rewound

(Continued on page 110)

High Power on 220 Mc.

A Driver and Amplifier for Inputs up to 300 Watts

BY EDWARD P. TILTON, * W1HDQ

• To build a medium or high-powered multiband rig capable of working on 220 Mc. would be quite a project, but if the gear is designed for that one band alone it represents no great problem. Here is a transmitter that is capable of inputs up to 300 watts or more, yet it is hardly more complicated than similar equipment for lower frequencies.

EXPERIENCE with the 220-Mc. exciter unit described recently [1] demonstrated that designing a crystal-controlled transmitter for that frequency need not necessarily be much more difficult than for lower frequencies, provided that the use of the equipment be confined to that one band. Some thought had been given to the idea of working 220-Mc. operation into a design which would be suitable for use on other bands as well, but many problems were inherent in this approach. There is little doubt that it can be done, but only with such complexity and expense as to deter all but the most ambitious workers.

By sticking to the one-band idea the cost and complexity of a high-powered rig for 220 Mc. can be held to a level comparable with that of equipment designed for use on lower frequencies. Only the final-stage tubes in the unit described herewith represent any great financial outlay, and use of these on other bands can be accomplished by removing them to another rig, if the investment involved has to be justified on the basis of a large number of contacts per tube dollar. As the tank circuits in the high-level stages are all of the linear variety, no expensive components are required, and the lines themselves are readily made by hand. Only two power supplies are needed for the entire r.f. section.

The exciter and driver are separate units and may be used independently. The 6J6 exciter, previously described, is mounted on the rear wall of an 8 × 17-inch chassis in such a manner that it may be removed, without the aid of tools, and used as a separate portable or low-powered transmitter. The driver unit, which employs an 832-A as a straight amplifier on 220 Mc., is also a subassembly and may be used in conjunction with the exciter as a 25-watt transmitter. The final stage uses a pair of the new 4-65-A tetrodes, running at inputs from 100 to 500 watts, depending on the plate voltage available.

The Driver Stage

The 832-A driver stage is a completely separate unit, and may be built and tested as such before any work is done on the final stage. Most of the details of the driver will be apparent from the photographs. It is built on a folded-aluminum chassis ½ × 2¾ × 5½ inches in size, with ½-inch edges folded over for mounting. The chassis on which the 832-A itself is mounted is 2¾ × 3¾ inches, with ½-inch edges folded over. The tube socket is approximately one inch in back of the vertical portion of the chassis, at such a height that the tube plate pins are two inches above the horizontal portion.

The driver grid circuit is self-resonant and is link coupled to the output of the exciter by means of a 12-inch piece of RG-59/U or other small coaxial line. The plate line is made of ¼-inch soft-copper tubing, the bottom ends of which are soldered to a copper plate which serves as one element of a by-pass condenser. Tuning is done with a mica trimmer condenser mounted across the line on two fuse clips, at a point about one inch up from the cold end.

The plate-line assembly is 4¾ inches high, with the two portions spaced ⅝ inch between centers. The over-all length is about 7½ inches, but it is best to cut the individual pieces somewhat longer than this, as it is difficult to bend two pieces at exactly the same point. The bending

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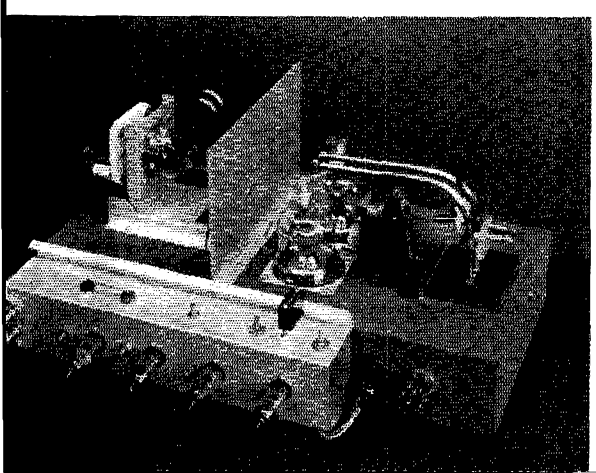


The complete 300-watt 220-Mc. transmitter. The exciter and driver stages are built as separate units and then mounted on the main chassis. The exciter may be detached from the rest of the rig and used separately as a low-powered transmitter.

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

[1] "Crystal Control on 220 Mc.," Tilton, *QST* for May, 1948.

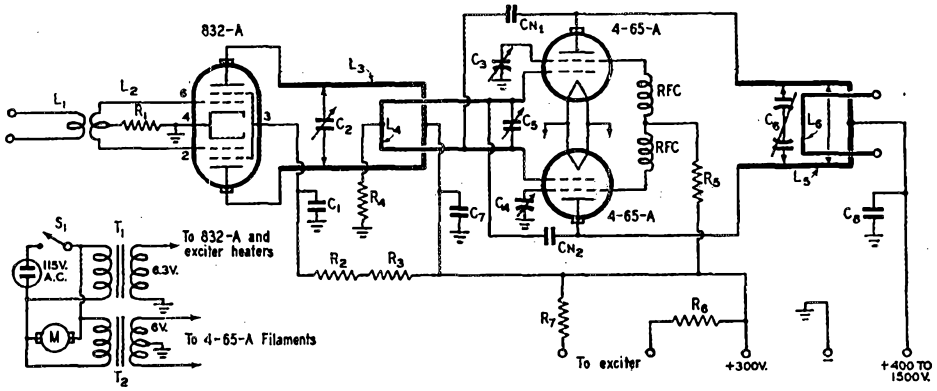


Fig. 1 — Schematic diagram of the driver-amplifier unit for 220 Mc.

C_1 — 220-$\mu\mu$fd. mica.
C_2, C_3, C_4, C_5 — 3-30-$\mu\mu$fd. mica trimmer.
C_6 — Miniature butterfly-type variable (Johnson 150-211, 2-11 $\mu\mu$fd.).
C_7, C_8 — Built-in by-pass condenser, part of plate-line assembly; see text and photographs.
C_{N1}, C_{N2} — Neutralizing wires; see text.
R_1 — 22,000 ohms, 1 watt.
R_2 — 2200 ohms, ½ watt, mounted at screen terminal.
R_3 — 25,000 ohms, 10 watts.
R_4 — 2500 ohms, 2 watts.
R_5 — 7000 ohms, 10 watts.
R_6 — 1000 ohms, 10 watts.
R_7 — 15,000 ohms, 2 watts.
L_1 — 1 turn No. 20 enamel, inserted in L_2.
L_2 — 1½ turns No. 12 enamel, ¼-inch diameter.
L_3 — Driver plate-line assembly — ¼-inch copper tubing, 7½ inches long, ⅝ inch center to center.
L_4 — Amplifier grid line — No. 12 enameled wire, overall length 4¾ inches each side including feed-through wires. Vertical portion 1¼ inches, closely coupled to L_3. Attach trimmer at top of feed-through wires.
L_5 — Amplifier plate line — ¼-inch copper tubing 8½ inches long, ⅝ inch center to center.
L_6 — Output coupling loop — No. 14 enameled wire, spaghetti-covered, 2 inches long. See text and photographs for further details of all coils and lines.
M — Fan motor — Barber-Colman Type d Yab 569-1, with Type Yab 355-2 2½-inch fan.
T_1 — 6.3-volt 3.5-amp. filament transformer.
T_2 — 6-volt 7-amp. filament transformer.
RFC — Solenoid r.f. choke — No. 24 d.s.c. close-wound on ¼-inch form for ½-inch winding length.

may be done around a one-inch pipe, after which the ends of the tubing may be cut off so that the lines are identical in height and length. Small plate clips (Millen 36021) soldered to ½-inch lengths of flexible copper or silver ribbon provide the plate connections.

The by-pass plate is made of sheet copper and is 1½ by 2¼ inches in size. In mounting the lines on the plate, ¼-inch holes should be drilled ⅝ inch apart and the lines forced into these holes and soldered in place with a blowtorch or heavy-duty soldering iron. Plate voltage is fed in at the center of the plate, the chassis underneath being drilled out sufficiently to prevent flash-over. A thin sheet of mica, lucite or polystyrene about 1/16 inch larger than the copper plate and 1/32 inch thick insulates it from the chassis, and a thick washer of a similar material is used underneath the chassis to insulate the feed-through screw.

In firing up this stage it should be tested with about 200 volts on the 832-A plates until it is determined that everything is functioning correctly. With the exciter running, but with no voltage on the 832-A, the spacing of the turns in the grid coil, L_2, and the position of the coupling loop, L_1, should be adjusted for maximum current through R_1. This should be about 3 ma. or more under these conditions, dropping to between 2 and 2.5 ma. when plate voltage is applied to the 832-A and the plate circuit loaded. The position of trimmer C_2 on the plate line should be adjusted so that resonance is found with the trimmer well open. There should be a good dip in plate current at resonance, the unloaded value with 300 volts on the plate being about 50 ma., increasing to about 80 ma. when a 15-watt lamp is coupled to the plate line. The lamp should show a nearly full-brilliance indication at 25 to 30 watts input. There should be no sign of grid current when excitation is removed.

The Final Stage

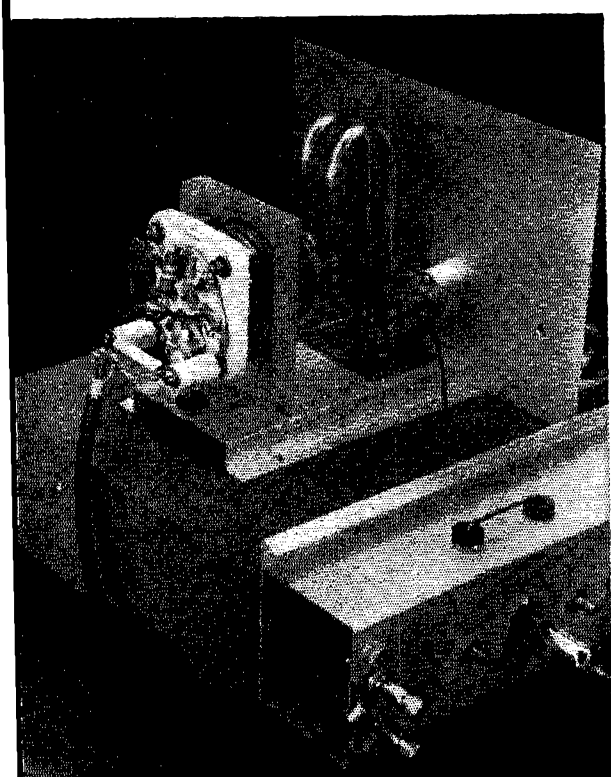
The Eimac 4-65-A tetrodes used in the final stage have the virtue of working well with a wide range of plate voltages, and good performance can be obtained with a final voltage as low as 400. By adjustment of the screen voltage to limit plate current to a safe value (250 ma. or less) voltages up to 2000 may be used, but the recommended maximum is about 1500 at this frequency. Since there is little point in running the tubes to the limit on a band that is relatively unpopulated, the amplifier can be run at conservative inputs without having to worry about damaging these choice bottles. As long as the tubes show only a slight color the cooling fan can be omitted, provided that the amplifier is mounted in such a way that free circulation of

air in the vicinity of the tube seals is assured.

Though the 832-A driver stage showed no tendency toward oscillation, the final "took off" violently until the screen-neutralization arrangement shown in Fig. 1 was tried. The screen voltage is fed through small solenoid r.f. chokes to one of the screen pins on each 4-65-A socket (the tube has two screen terminals) and the other terminal is series tuned to ground by means of a small mica trimmer connected right at the socket. With these trimmers properly adjusted there is no self-oscillation. The chokes are not critical.

An alternative arrangement, which appears in the bottom-view photograph, may be the strapping of the two screen terminals together. Both methods were tried, without appreciable difference in stability. Even with the series-resonant screen circuits there was a tendency toward self-oscillation until the cross-neutralizing wires (designated as C_{N1} and C_{N2} in the schematic diagram) were added. These should be brought up through the chassis, bent around the tube envelope, and then trimmed in length as required for best stability.

The grid circuit of the final is coupled inductively to the plate circuit of the driver stage. The grid leads may be seen in the bottom-view photograph up to the point where they go through holes in the chassis, at which point they connect to feed-through bushings which are part of the driver subassembly. The upper portion of the amplifier grid line may be seen in the photograph of the driver unit. The last 1¼ inches of the line is closely coupled to the driver plate line. Tuning of the grid circuit is done with a mica trimmer connected across the line at the top of the feed-through leads.



Detail view of the 832-A driver stage of the 220-Mc. transmitter.

Sockets which provide both shielding and ventilation (Johnson 122-101) are used for the 4-65-As, and the cooling fan is mounted in such a position that circulation of air down through the socket is accomplished. As mentioned above, the cooling fan is not necessary unless the tubes are going to be operated at high inputs, and may be omitted if the final plate voltage is not to be more than about 1200. If the fan is used, the air circulation around the tube bases may be checked by holding a lighted match under the chassis near the ventilating holes in the tube sockets. It should blow away from holes in the socket on one side and toward the holes on the other. Improved cooling may result, in some layouts, if the fan is mounted below the chassis.

Construction of the final plate-line assembly is similar to that outlined for the driver stage, except that the by-pass plate is larger (because a thicker insulating plate is required, reducing the effective capacitance) and an adjustable shorting bar is used. The latter is made from a piece of ¼-inch-thick solid copper ¾ by 1¼ inches in size. Holes the diameter of the tubing are drilled through the block, and two No. 44 holes are drilled 5/16 inch apart in a horizontal plane. The block is then sawed vertically along the center line of the ¼-inch holes, after which the surfaces are filed smooth. Next the two No. 44 holes in one section are drilled through with a No. 31 drill, and the other section is tapped for 4-36 thread. This makes a shorting bar which can be tightened in place, and also serves as a mounting point for the block of polystyrene to which the output terminals and coupling loop are attached.

The lines are tuned by means of a miniature butterfly-type trimmer which is attached to the line with fuse clips at a point about 1¾ inches above the shorting bar, which will be about 1 inch up from the end of the line at 225 Mc. Because the r.f. voltage is relatively low at this point and the rotor of the trimmer is not grounded, there is no danger of flash-over, despite the very close plate spacing in the trimmer. Plate connection is made with heat-dissipating connectors and short strips of copper or silver ribbon. The ribbon is wrapped around the tubing and soldered in place. It should then be drilled through and a bolt and nut put in to hold it in position, as v.h f. tank circuits have been known to get hot enough to melt solder.

The by-pass plate on the final-stage line as-

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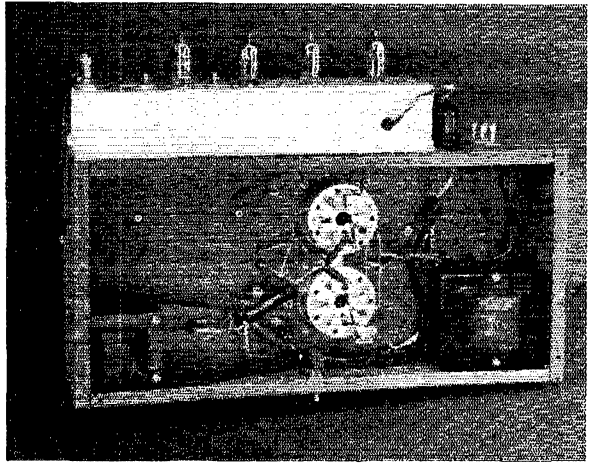

Bottom view of the 220-Mc. rig.

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sembly is 2¼ by 3¼ inches in size, but is similar otherwise to the one used in the driver line. The insulation under the plate is a piece of 1/16-inch lucite or polystyrene. The hole in the chassis for the screw which carries the high voltage should be at least ⅝ inch in diameter, and a disk of insulating material about 1 inch in diameter should be used for a washer below the chassis.

Power Supplies & Cabling

Power is fed to the unit through fittings mounted on the rear wall of the chassis. The 6-prong power plug shown is suitable for use at moderate plate voltages. If the full ratings of the tubes as to plate voltages are to be attempted, some form of plug capable of standing higher voltages should be substituted for the tube-base type. Two filament transformers are used, one 6.3-volt 3.5-amp. for the 832-A and exciter stages, and one 6-volt 7-amp. for the 4-65-As. A 6.3-volt transformer of suitable current rating may be used, if the line voltage runs toward the low side. The filament voltage should be checked *at the socket* to be certain that it does not vary more than plus or minus 5% from the 6-volt value.

Only two power supplies are needed: one capable of 300 volts at 250 ma. for the exciter, driver and the 4-65-A screens, and a high-voltage supply of 300-ma. capacity for whatever voltage it is desired to run. Reference to the schematic diagram of the exciter in April *QST* will show that plate voltages of approximately 150 and 200 volts are needed. These values are obtained from the 300-volt supply through dropping resistors R_6 and R_7.

The exciter is attached to the rear wall of the chassis by mounting it in a trough which is 2⅝ inches high, with ⅜-inch edges folded over at about a 60-degree angle. The exciter is slipped into this trough by compressing the sides of its chassis slightly. When pressure on the sides is released the unit fits tightly in place and no additional fastening is required. A short length of cable plugs onto a power fitting on the main chassis.

Adjustment & Operation

Assuming that the exciter and driver have been checked out satisfactorily, the filaments of the 4-65-As may be lighted and power applied to the two preceding units, leaving R_5 disconnected at one end so that no screen voltage is applied to the 4-65-As. Grid current in the final should be checked with a meter between R_4 and ground, adjusting trimmers C_2 and C_5 carefully for maximum indication, about 30 to 40 ma. Next a pilot lamp is connected across the output coupling loop, L_6, and the screen condensers C_3 and C_4 are adjusted for minimum r.f. in the final plate line. The pilot lamp used should be a high-current type at the start, substituting the 60-ma. type when the neutralizing adjustment is approximately correct. It will be found that this adjustment is not at all critical, and there will be a movement of perhaps one-fourth of a turn where no indication will be visible. Best practice is to start with both trimmers in the tight position, moving each a small amount at a time until the proper setting is reached, assuring that they will then be approximately the same capacity. It is possible to get a null indication with the capacitors at widely different settings, but the tubes will then show uneven loading, one running hotter than the other.

After the neutralizing adjustment is completed power may be applied to the plates and screens of the final, starting with not more than about 400 volts on the final plates. The trimmer, C_6, should be set at its midpoint, and the shorting bar adjusted (by removing the plate voltage, moving the shorting bar, and reapplying plate voltage) until the approximate point of resonance is found. The trimmer will then permit fine adjustment, and will have sufficient range to take care of detuning effects as the loading is varied. Remember the line and trimmer have high voltage on them — use an insulated screwdriver!

Some readjustment of the series trimmers may be necessary. Adjusting by the method outlined above, it was found that a slight rise in grid current occurred when plate voltage was applied, though the amplifier did not actually oscillate by itself. The setting of the trimmers was altered a small amount at a time until the grid current dropped slightly when plate voltage was applied. Under these conditions there was no tendency toward oscillation when excitation was removed.

Checking output above about 50 watts is difficult, as lamp loads are wholly unreliable. Lamps larger than about the 50-watt size will often flash over in the stem, rather than light, and they develop hot spots which may give a wrong impression of the actual output. Measurements made in the Headquarters lab with a Bird U.H.F. Wattmeter show the true facts of operation at these frequencies. They show that a considerable

(*Continued on page 110*)

How's DX?

CONDUCTED BY ROD NEWKIRK,* W9BRD

How:

Jeeves is a nervous wreck. All his sheltered etiquettish life he's been reading about Chicago mobsters and now he finds himself smackdab in the center of Scarface's old stamping grounds. It does no good to assuage him with explanations that the cinemas he's been seeing for the past many years are just part of a dead and exaggerated past. He's firmly convinced that if he doesn't raise a CM2 immediately, if not sooner, the boss will call the mob together and take him for a one-way ride. Well, we may get some results that way but he certainly is a sight sitting at the operating table in his bulletproof vest!

. . . Now, snap out of it, Jeeves. Turn off those police calls and come across with the month's mail. . . .

What:

Eighty and forty have pretty well petered out, according to the mailbag. Even such 80-meter stalwarts as W4BRB and W7KVU have put their heavy coils on the shelf. On forty,

* 1517 Fargo Ave., Chicago 26, Ill.

Chagrin caused by some 28-Mc. DX Hogs inspired ZP8AC to go out and shoot a reasonable facsimile. ZP8AC runs 40 watts on ten 'phone. The fellow on the right is Jeeves' Paraguayan counterpart. (*Photo via W9HMG*)

• DX Editor Newkirk is now conducting this department from his home-town QTH, W9BRD, 1517 Fargo Ave., Chicago 26, Ill. Please address all DX reports to Rod at his home address.

W9AND snagged VK9GW and **VK9LM** (7080) plus some VK-ZL boys . . . . . W1HOZ ran across KV4AA, VQ2T, PY2AIA, PY7WS, HH2HF, VP6SJ, **CN8BI** (7050) and a smattering of Europeans . . . . . The "Droopy-S" skywire at W3CJS accounted for many Europeans, KH6II, PY2AFS and KZ5AH . . . . . **VR2BA** (7093 t8) was a nice one for W6OJW's log and W2MEI stumbled over **OE4FR** (7040) . . . . . At W8KPL we find **CT3AB** (7030) and PY2AFX. So there's still DX around under the QRM and QRN.

Naturally, what doesn't show up on 40 and 80 can always be found on *twenty*. W3KTW chatted with **TA3FAS** (13,995) who is W4LIU and no other than ex-W8OSL . . . . . **AC2MA**, Bhutan (14,005 t9), claimed W5ACL as his first W QSO . . . . . The boys are cleaning up on C8YR, C8LS and C8YCW, according to W6SAI. . . . . W6BIL has been stalking VQ6NY but doesn't pass along the QRG . . . . . It's now 148 down at W4BRB, helped by **KM6AH** (14,035 t9x), **UF6KAB** (14,006 t9x), **UJ8AE** (14,042 t9x), **VS4BL** (14,140 t9x), **YA3B** (14,070 t9x) and **PX1C** (14,075 t9x) . . . . . In rhombic-land, W4BPD's log is chock full of **FK8AB** (14,020 t9), **CP1AS** (14,040 t7), **ZD1LQ** (14,080 t4), **VQ3HGE** (14,115 t9x), **VS6AE** (14,025 t9), **ZD2RGY** (14,050 t8), **LX1AW** (14,010 t9), **VR2AZ/VR1** (14,075 t9), and **SV1VS/MM** (14,050 t8) on a ship off Madagascar. We don't wish anyone any bad luck, but it would have been nice if this guy had run aground or something — FB8 activity needs a little push. Gus misses a few now and then: **ZC1AL** (14,015 t8), **ZD9AA** (14,000 t8), **ZK2AA** (14,010 t8), **ZA3J** (13,990 t8) and **ST4AC** (13,995 t8) . . . . . W2GUR finally got his beam back up and celebrated with **HA5EX** (14,045), **YR5T** (14,030), **YR5I** (14,000 t4), **EA5BE** (14,005), **KA1ABT** (14,080), **FT4AN** (14,030 t8), **J6DKV** (14,045) and **VR5PL** (14,005) . . . . . The Arab Legion station, ZC1AL, made itself a little less rare by moving over the border to ZC6. W4IUO worked **ZC1AL/ZC6** (14,293f) who requested QSL via RSGB or *Call Book* address . . . . . W4QT, specializing in Ethiopians, hooked **ET3AD**

(14,335f) and **ET3AJ** (14,340f) who both receive cards via Box 145, Addis Ababa . . . . . Another of those rare J6s was scared up by W6OWP in the person of **J6BMC** (14,020 and 14,050 t9) to be exact . . . . . Fellows who want to track down Trieste will find, on 'phone, **I1RC** (14,195, 310, 320, 340), **I1NU** (14,195, 340), **I1MK** (14,300), **I1MV** (VFO) and **I1ADM** (14,180); on c.w., **I1DI** (14,040), **I1BCB** and **I1MV** (VFO) plus **XAMC** and **MF2AA** (VFO) . . . . . "Hate to take my 106 cards all off the wall for DXCC," says W9AND! Wes grabbed **YI2AM** (14,135), EL7A, **VP3ACS** (14,180) and VR6AB . . . . . Doc Westervelt, W4MZ, now sports the call W4VE. Mebbe the switch is for the benefit of the local BCI! To make things even more confusing, we hear from W4EV who worked **HA4EA** (14,033), **GD2DF/A** (14,075), **UA9CA** (14,120), **UA9CC** (14,080), **YR5C** (14,000), **VP8AM** (14,065), **NY4JB** (14,030), **MI3ZJ** (VFO) and **TF3AB** (14,135) . . . . . Things aren't too slow at XE1TE. On voice, Oscar snared VP2AG, VP5AR, W6JIM/C1, C1MG, C1HY, C1HK, J5LQK, VQ8AE, VS1BG, VS2AL, VS2BN, HL1AB, HH2S and ZS6FX . . . . . With a QTH like Bourbon, Miss., W5LAK just couldn't get away from **CE4AD** (14,093), **YN1AA** (14,031) and **J2COM** (14,028), and had a confusing affair with G3LP and G5LP. John still sticks by his pair of 6L6s . . . . . Despite heckling by his two brothers, W4KUR and W6VOE, W7BE managed QSOs with FE8AB, TA1C, I1BCB Trieste, VP1AA and FM8AD for new ones. Bill reports he has new and severe competition from W7RT who has just been severely bitten by the DX bug . . . . . W9RBI has some nice voicers in **ET3AE** (14,326f), **I1AHK** Sardinia (14,295f) and **WØOZW/KS6** (14,025) on c.w. . . . . The Zepp at W4JFE was wrapped around E19AA, VQ8AF, VK9BI, CX6AD and W6ODD/YS . . . . . W5ASG bumped into GAAF, a British aircraft over Crete, and then YQ5U in Roumania. His list of Russians is huge: UG6AG, UG6WD, UG6AB, UD6AH, UQ2AE, UA6LK, UF6KAB, UH8AA, UH8KAA, UO5AC, UB5BC and VU2BX . . . . . W9PSR keeps running into **HJQ** of Cartagena around 14,125 and has done well with PK1AT, ZK1AM and SV1RX . . . . . A long 'phone listing from W2DY includes YV5AV, YV8AG, HH1LD, VP6CS, VP6MO, VP3LF and numerous Europeans . . . . . At W6OJW we have **VS6AR** (14,023), **KA1AK** (14,057), **J2BNR** (14,050), **C1JC** (14,075), **C2HK** (14,067) and **C8YR** (14,051 t8c) . . . . . W2HMJ is past 124 with CR7BB, EK1GW, CR6AU and YV5ADC . . . . . The latest at W9KOK include the receipt of his 40th zone card plus the contacting of VS2BX, VS6AC, PK2KK, PK6XA, TA1AB, KH6KH/KB6, KB6AD, I5EB and VP2GE.

Ten and its little brother, *eleven*, haven't been too wide-open of late. W9RBI came through with **UB5KAG** (28,180f), **VS7PS** (28,200f), **MI3ZJ** (28,244f) and **AR8AB** (28,495f . . . . . A look at W2GMM's log would reveal 'phone QSOs with ZB1AK, VP2KS, FF8FP, KP6AF, KG5AAF, VQ2HC, ZE1JM, OQ5HL and VP3TR. On c.w., Herb snapped up VP8AD, EA7AV and CR6AN . . . . . W5GEL made off with VP6HR, VP4TV and ZP2AC on A3 . . . . . Out in the dust bowl, WØQV messed around with OA4BX, KG6AD, HB9CX, PAØSE and a slough of G-VK-ZL men, all by voice . . . . . W1DTG sends through a few nice words about old *eleven*. His 70-watter had no trouble with TI2FG, many KP4s, VO2N, D4AVL, I1FP, XE1KE, KZ5EL, G2FLC, GW5XN, GM8MN, ON4DM, HH2CW, HB9CX, EL5A, VP6CDI, KV4AD, HR1MB and PY2AC, some of the contacts being crossband to ten. Ray also has worked several DX stations duplex and says there's nothing like it. All in all, we'd say that 27 Mc. is a very interesting band.

Where:

Perhaps one of these will strike a fancy or two:

C1KY	Box 402, Shanghai, China
C2HK	Box 73, Hankow, China
D2IA	(to GM3BQA)
EA8AN	J. R. S. Montero, Triana 76, Las Palmas, Canary Islands
EA9AA	(via EA9AI)
FA9IR	Box 38, Algiers, French Morocco
GAGSM	50 West Morland St., Barrow, Furness, Lancaster, England
HC2OL	W. Grosskruz, P.O. Box 1293, Guayaquil, Ecuador
HP1BR	R. Rowley, Apartado 1098, Panama, R. P.
HP1DJ	(via W2MGU)
I1AVE	85 Marcona, Milano, Italy
J9AAB	Route No. 7, Box 5, Terre Haute, Indiana
J9AAD	210 Elliot St., Syracuse, N. Y.
J9AAK	Box 987, Wink, Texas
J9AAM	618 Walnut St., Grand Forks, N. Dak.
J9AAO	1300 Cheltenham St., Philadelphia, Pa.
J9AAP	(via W6TI)

J9AAS	925 25th Ave., St. Petersburg, Fla.
J9AAU	Wolf Point, Montana
J9AAW	Route No. 4, Durham, N. C.
J9AAX	171 N. Front St., Steelton, Pa.
J9ABB	733 AFBU, 103rd AACS Sqdn., Wright Field, Dayton, O.
J9ABF	117 W. Witherbee St., Flint, Michigan
J9ABX	4340 Stanbridge Ave., Long Beach, Calif.
J9AFA	Box 883, Hobbs, New Mexico
J9AGT	579th AF Band, March Field, Calif.
J9AJB	Apt. 63, 240 W. 102nd St., New York 25, N. Y.
J9AJR	2317 Garfield, Clinton, Iowa
J9ANA	232 Savona Walk, Long Beach, Calif.
J9ANG	91 Antwerp St., Milton, Mass.
J9ANT	Navy 3923, FPO, % PM, San Francisco, Calif.
J9ARC	RCA Communications, APO 331, % PM, San Francisco, Calif.
KW6AG	% CAA, Wake Island, Pacific
MD5AK	Cyprus Regiment, M. E. L. F.
MI3US	Capt. Robt. Cole, USA Radio Stn., Asmara, Eritrea
OA4CJ	Panagra, Lima, Peru
OE3WX	W. L. Martin, 718 N. Lakewood Ave., Baltimore 5, Md.
OE4FR	(via HB9EU)
OX3WC	(via EDR)
PK2RK	Box 222, Soerabaja, Java
PX2A	Radio Andorra, Andorra
VO4AC	APO 864, % PM, New York, N. Y.
VP3ACS	Bill Garner, 184 AACS Sqdn., APO 857, % PM, Miami, Fla.
VQ3HGE	Gatti-Hallicrafters Expedition, Derby Line, Vermont
VQ4EHG	(same as above)
VQ5GHE	(same as above)
W5LII/KL7	APO 948, % PM, Seattle, Wash.
W5NSA/KH6	NAS, Navy 28, FPO, San Francisco, Calif.
YS1GM	Salvadore Gadala, San Salvador, El Salvador
YU7ZO	Edward, Postbox 189, Zagreb, Yugoslavia
ZD2BGY	Nigeria Signal Sqdn., Lagos, Nigeria, British West Africa
ZD2RGY	Nigeria Signal Sqdn., Lagos, Nigeria, British West Africa
ZD3A	Box 16, Bathurst, Gambia
ZD4AV	West Africa Signal Regt., Accra, Gold Coast Colony
ZD9AA	Box 4887, Johannesburg, Union of South Africa

W1s AM, QMI; W2s CWE, HMJ, JB, HAZ, CJX, MEI; W4s FU, KFC, VE; W5s JPC, LUY, OJH; W6s OJW, SAI, VFR, ZZ; W7s BMF, PA; W8s KPL, ZJO; W9YFV; J9ABX — these fellows take a big bow for the above directory of QTHs.

Tidbits:

HH2CW has become just another poor W now. Carl intends to QSL all his Contest contacts as soon as he gets himself settled. He'd like to hear from some of those Wyoming stations he worked for his HH WAS (QSL to W4HRN) . . . . . Speaking of those four-band QSOs recently publicized, G2PL has a pair of five-banders with VE1EA and W1BB, all QSYs inside of 24-hour periods. Pete is up around 200 postwar countries worked. . . . . Who needs FI8 postwar? Don't all shout at once! Well, W6ODD is on his way to Saigon and intends to get on the air or bust, to quote W4JFE . . . . . W7VY's competition has a chance to gain a few countries on him. Gene is taking a 60-day jaunt to Mexico and Cuba, intending visits with XF1A, XE1KE, CM2SW and others . . . . . A nice epistle de VO6X gives some enlightenment re the Labradorian activities. VO6EP is QRT for the purpose of beam erection. VO6Z will have a pair of 807s on 14-Mc. c.w. before long. Somebody, somewhere, is pirating VO6T's call and the boys are getting a pile of cards that cannot be answered — nobody is as-

HE1EO is a welcome addition to almost any log. An 807 at 30 watts is accompanied by a Sky-Buddy receiver. Ralph is just as well known as HB9EO and operates mostly on 14 Mc.

signed the call at present. W9UXY dropped into VO6 and is now heading for Turkey with a pair of 250THs in his vest pocket; watch for a new TA on 20. George McClelland of OX3BD passed through on his way to the States and a W8 call . . . . . PAØFV, usually on 14,000.1 kc., needs Nev., Wyo., N. Dak., Idaho, Miss., La. and N. Mex. for WAS, according to W4IMC . . . . . Here we go again on the Luxembourg deal. Via W9CFT, LX1AB says that LXs 1AX, 1HT, 1JB, 1ST and 2DN are no good. LX1AB ought to know since he's the LX QSL manager . . . . . Old I6USA is now using MI3US and will continue to be active . . . . . W4QT has it on the QT that KG6DG has been transferred to Ponape and should be active around 14,075 kc. in the near future . . . . . VR2AO is going back to New Zealand but ZL2RP will replace him. The latter intends to be quite active. VR2AQ is constructing a beam for ten or twenty and reports 28-Mc. conditions pretty moldy of late . . . . . OE3WX is under cover but 100%-QSL via the listed address . . . . . A Sunday Evening Club is in session around 14,010 kc. about 8 P.M. EST with a group of the DXCC boys swapping tall tales. W5LVD claims he's still trying to get a word in edgewise but is gleaning plenty of good info . . . . . W6AY tips us off that C8YR is going to be C8YR/1 in Nanking for a year or

less. C8KY and C8LS should continue to be quite active, plus C8YCW. _ . _ . _ VQ3EDD is temporarily G5YM and reports that VQ3PYE has gone to ZS-land. While the VQ3EDD entourage was en route to G, a menagerie broke loose aboard ship and provided some fun. No DX Hogs escaped, thank goodness! . _ . _ . _ MI3ZJ has also gone back to U. K., having left Eritrea for keeps. George would like to head for a really rare country next trip — guess he's allergic to local QRM! . _ . _ . _ Cards to XT9F and X4BHL bounced back to W9BQE — W3DPA had the same luck with OY1A's pasteboard . _ . _ . _ WØSO spent a long session making out over 2000 TA3SO QSLs and decided to have a try at 14-Mc. DX for relaxation. No sooner had he signed his call when he was deluged with calls from the W DX-chasers. While parrying these thrusts ("Where's my TA3SO QSL?") Phil's telephone started *ringing* with *long*-distance calls from all over the U. S. bearing on the same subject! He's thinking of going underground and sticking to stamp collecting . _ . _ . _ For the benefit of a few who would like to know the difference between "pirates" and those "undercover," here it is: A pirate or bootlegger is one who operates illegally in a country where hams are freely and democratically licensed. An undercover ham is one who risks his neck to operate in a country where such licensing is looked upon with disfavor or is restricted to a very few privileged characters. That's crystal-clear, isn't it? . _ . _ . _ Bearing on the preceding item, QSL ET1IR *only* via ARRL . _ . _ . _ The WIA is already planning ahead for the big VK/ZL DX contest in '49. It being the year of the Royal Tour, the test will be known as the Royal Commemoration Contest and a record entry is expected. Yearly sponsorship of the affair is alternated between the WIA and NZART . _ . _ . _ I1RC gives us the slant from FTT (Free Territory of Trieste). Active stations on voice are I1ADM, MK, MV, NU and RC; c.w., I1BCB, DI, MV, XAMC and MF2AA. 14 Mc. is used almost exclusively. The boys would give their right arms for some 813 sockets and 50–70 ohm line . _ . _ . _ YN1SG will try to clean up his QSL situation in the near future, he says. Patience, please . _ . _ . _ A nice line from J9ABX, the OJARC secretary, states that the following J9s are active on Okinawa and that cards will reach them via the APO numbers given: APO 239 for J9s AAI, ABJ, ABL, ABN, ABO, ABS, ABT, ABU, ABV, ABZ, ACA, ACS, AFM and ATT; APO 331 for J9s AAQ, AAR, ABA, ABM, ABP, ABR, ABW, ABY, ACB, ACD, ACF, ACG and AFL. The J9s listed in the "Where" column have all left Okinawa and can be reached via those forwarding addresses. J9ABX further informs us that no W/J9 calls are authorized on Okinawa and only J9 calls with an "A" after the numeral are actually on the island . _ . _ . _ There is a new KA1ABX, operated in Manila by W5LFI. The former KA1ABX is now W9GAE/4 in Florence, Ala. . _ . _ . _ Ben Hogan take note but don't let it worry you. W1DX and W6WB plan to play their annual golf game in Milwaukee at the close of the National Convention on Labor Day. [Oh, happy day! I don't have to caddy for that dub anymore. Last time he made me bring his radar and it didn't help. — *Jeeves*] At ease, Jeeves. Not many guys have made holes-in-one on their backswings like Goodman. W1DX and W6WB also brazenly challenge any other two DXCC members to a match at the same time. Preferred lies allowed on the 19th hole, where BG will also plug his new triple-sideband 'phone . _ . _ . _ W7GPP is informed that KH6PQ/KW6 is about to leave that isle . _ . _ . _ YI2AM is saying farewell to Iraq after a long session of DXing. He knows of no other YI left to carry the torch so we'll probably have to do without a rare one for a while. This from W1NMP . _ . _ . _ W4FVI drew a transfer to the Pacific and will discontinue the forwarding of cards to PZ1FM. Nice job, Bill, and we'll be watching for you from J9 or thereabouts . _ . _ . _ Cards from PJ3X have been spreading good cheer with regularity and the previously-listed QTH turned out okay. As to other legit PJs, dunno . _ . _ . _ W4BRB thinks he has the lowdown on this YA3B business. Gene says that there are two, one BL and one good. The good one has a better signal and fist — but who has a card from *any* postwar YA? . _ . _ . _ W2HMJ would like the pic on EP2BU, EP2DS and PK2AA . _ . _ . _ An inscribed boomerang and a silver spoon are on the way to W5ACL from VK2NS. Mel and Trev first worked each other on April 17, 1928, and repeated on the same date this year. . _ . _ . _ Fellows who work the same rare DX stations o'er and o'er aren't making any friends on this side, quoting W2CWE and W6SAI. Amen.

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Then there was the sad case of George Q. McWhiffletree, WØXYZ, who was tried recently for homicide. It seems that one of his local DX competitors dropped in for a moment, sat down in the shack, and raised AC4YN on a short CQ. George walked in just as his visitor sent "PSE DO NOT QSL, U PUNK."

Case was dismissed.

♦

A group of Norwegian hams in conclave at the shack of LA3Y. *L. to r.*, LA3SA, LA1CB, LA6MA, LA5S, LA5R, LA3Y, LA1M, LA5Q.

Come On to Milwaukee!

Fifth ARRL National Convention, Sept. 4th–5th–6th

BY SIDNEY R. ROSE,* W9VKC

• The Milwaukee Radio Amateurs' Club, sponsors of the 1948 ARRL National Convention, invites you — and the family — to attend an amateur gathering which they promise will be the biggest and best in ham history. Here are the highlights of a three-day meeting you'll long remember.

FORTY Milwaukee amateurs are moving down the home-stretch after a year of preliminary planning, as the first National Convention in ten years, scheduled for the 1948 Labor Day week-end at the Milwaukee Auditorium, takes final shape.

Under the direction of rotund Jack Doyle, W9GPI, the various and diverse committees set up by the sponsoring organization, the Milwaukee Radio Amateurs' Club, have lined up a program packed with activity for men and women in every aspect of the art. V.h.f., 'phone, c.w., DX, traffic, Wouff-Hong, ARRL organization, Army and Navy reserve agencies, etc., all have their respective places on the list of events. Famous hams, important hams, foreign hams, official hams — and, mostly, just plain hams — will be in attendance. The September conclave, with a continuous round of action for three days, promises to outdo anything ever before reached at an amateur convention.

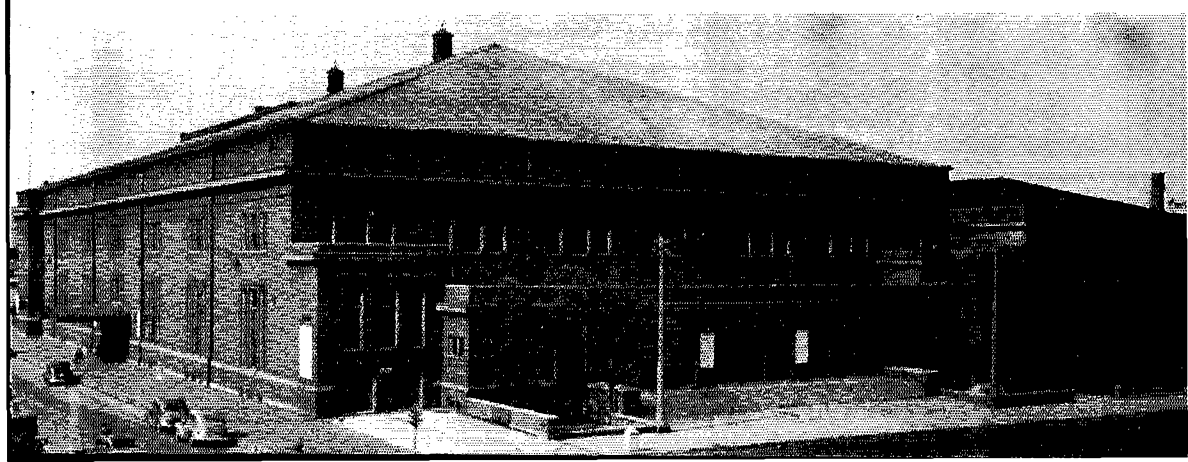
How important nationally to amateurs and the ARRL is a convention that takes up the slack of a decade was pointedly demonstrated when one of the largest affiliated clubs in the country canceled an annual affair that regularly draws more than 3000 hams to Chicago in the late summer. The famous Hamfesters of that city summarily withdrew out of deference to the Milwaukee convention and have thrown their weight behind the National. Hamfester representatives have attended National Convention Committee meetings at the Gettleman (W9IZO) Rathskeller in Milwaukee and have voiced approval of the plans afoot. The Chicago Area Radio Club Council also has a man on the over-all convention committee.

The Federal Communications Commission will hold the spotlight as the convention opens in the block-square Milwaukee Auditorium on Saturday morning, Sept. 4th. FCC personnel will be in attendance during registration to offer amateur examinations at that time. At the same hour the exhibits set up by leading manufacturers and distributors of ham gear, plus organizational exhibits by the League and the Army and Navy, will be open for initial inspection. Manned by representatives of the various organizations displaying their wares, the booths in the Auditorium's Mechanics Hall are expected to be a feature of the three-day get-together.

Besides the Navy exhibit, Rear Admiral Earl E. Stone, director of Naval communications, will be a convention guest and speaker, and the local unit of Naval Electronic Warfare is making arrangements for a conducted tour of the submarine *Tautog*, based at Milwaukee. Army officials will also be in attendance. Leading the delegation of guests from Washington will be FC Commissioner George E. Sterling, W3DF, plus George K. Rollins, W3GA, and Robert W. Percy, W4IQR, of the amateur division of FCC. Mr. Sterling will be a speaker on the main convention program and Messrs. Rollins and Percy are expected to discuss important ham problems.

* Publicity Chairman, National Convention Committee.

Exhibits and convention sessions will be in the Milwaukee Auditorium, adjacent to major hotels. Facilities include several large meeting halls, exhibit space, and cafeteria.



George Ruger, W9VWG, a Milwaukee alderman, will introduce Mayor Frank Zeidler, who will greet the convention for the city, and the Governor will offer the Badger handshake as the first afternoon's program unfolds. President George Bailey of ARRL will deliver the League's response.

A Black Forest evening in the finest tradition of Milwaukee's Old World hospitality will highlight the entertainment Saturday, and Chairman Doyle promises mountains of choice and tasty food and plenty to drink, served conveniently and pleasantly. This convention will be unique in that no formal "banquet" is on the schedule of events. The committee made the decision to hold the first social gathering of the convention as a buffet-style party because of the inadequacy and discomfiture in serving so large a group as is anticipated.

Following the satisfying of heavy appetites, Technical Program Chairman George Pfister, W9IZQ, has announced a v.h.f. "hamfest" meeting led by *QST's* Ed Tilton, W1HDQ. It seems that the nation's v.h.f. enthusiasts are also foregoing a national parley this year, and the Milwaukee convention is being touted as the "stopper" — the point where all good very-high-frequency men will have a chance to hash out their problems and review the latest improvements in the art. Mr. Pfister expects FCC-men Rollins and Percy to have a lot to say about television interference at this and the other technical meetings on the convention program. A special post on the convention committee has been allotted to Frank Maiorana, W9TPT, who will coördinate the v.h.f. activity. (Among those already under the wire with convention reservations is C. S. (Buz) Busby, OA4AE, Lima, Peru, and the Missus. Busby was the recipient of the Milwaukee Radio Amateurs' Club gold cup for the South American end of the first intercontinent contact made on 6 meters. Armando Huaman, OA4BL, representing the Radio Club of Peru, has also presented his credentials to Registration Chairman Joe Collins, W9PYM.)

Breakfast Sunday morning will include informal gatherings at the various hotel coffee shops with the Navy men, emergency-organization members, traffic men, DX exponents, v.h.f. operators, etc., arranging to talk shop while dunking doughnuts. At 9:30 Clarence Burke, W9KEU, has arranged the hidden-transmitter hunts; the search will go on for transmitters on 10, 6 and 2 meters. One of the finest technical speakers in the country will hold forth later Sunday morning. He is Jean J. Brand, a wartime consultant on radar and radio-frequency transmission lines to the Navy. Mr. Brand, born in Switzerland, will discuss antennas and his transmission-line specialty. *QST's* DX editor, Rod Newkirk, W9BRD, is expected to offer the guiding hand at the DX meeting on Sunday morning, and the best mobile installations at the convention will also be judged about this time.

Clyde Richelieu, W9ARE, Central Division director, will sound the keynote at the afternoon ARRL meeting, again introducing League President George Bailey, W2KH. Kenneth B. Warner, W1EH, will discuss "Your Organization — the ARRL"; Ed Handy, W1BDI, will talk on ARRL field organization and operating activities; ARRL General Counsel Segal will speak following the midmeeting intermission; and Byron Goodman, W1DX, will demonstrate s.s.s.c. This

Jack Doyle, W9GPI, General Convention Chairman.

series of meetings will undoubtedly be the most important of the entire convention and will serve to acquaint most of those present with the inner workings of League headquarters.

Tommy Gettleman, entertainment chairman, has a three-hour program lined up for the main Auditorium arena at 8:00 Sunday night, and Charley Meyer, W9GVL, is in charge of the famed Wouff-Hong initiation ritual due to follow the entertainment. Mrs. George Toppe, W9AYX, is chairman of all XYL activity for the convention; according to advance registrations, 25% of those in attendance will be of the fair sex.

Technical discussions are on the program for Monday, with an afternoon tour of the new television installation at WTMJ-TV scheduled to round out the three-day parley. Doyle and his two-score cohorts have assured all visitors to the Milwaukee National — Sept. 4th, 5th and 6th — a well-balanced amateur radio diet and fun and frolic from start to finish.

For reservations and further information, write the General Convention Chairman, 4331 No. Wildwood Ave., Milwaukee 11, Wisconsin. Advance registrations will insure ideal hotel accommodations. The registration fee is $7.50 per person, and club groups that plan to attend en

(Continued on page 112)

The Man Before Marconi

A Biography of Dr. Mahlon Loomis

BY JOSEPH R. LEBO,* W2OEU

THE story of a successful failure is embodied in the life of Dr. Mahlon Loomis who was born in Fulton County, New York, in 1826. His temporal span of sixty years marks an epoch in a series of events each building on the other so logically that they could interestingly be made into a movie "natural."

Little is known about the early life of Dr. Loomis save that in his youth the family moved to Virginia. One fact stands out. People said that as a youngster, "He was always inventin' things." The compliment was confirmed in later years.

In September, 1848, Loomis traveled to Cleveland to study dentistry under a local practitioner. The following winter he taught school in Cuyahoga County, Ohio, for sixty-five dollars, board and washing. By the summer of 1849 he knew enough dentistry to tour the neighboring counties and earn fifty dollars per month, a considerable sum near the half mark of the nineteenth century. Later he returned to Virginia and continued his practice.

The inventing virus of his early days could not be arrested. He patented a mineral-plate (kaolin) process for making artificial teeth in 1854. He also received a patent for his invention in England.

From "The Descendants of Joseph Loomis in America"

DR. MAHLON LOOMIS
1826–1886

Lincoln was already in the White House when Mahlon Loomis turned his attention to electricity. He was trying to force the growth of plants by burying metal plates connected to batteries. Loomis wanted to dispense with batteries. He reasoned that electrical charges — static electricity in the air — might be utilized. By means of kites carrying metal wires, he observed that electrical charges could be obtained from the atmosphere. The attempt to use this natural source of electricity to replace batteries in order to make plants grow failed. But the experiment had borne fruit.

Loomis had come upon a startling discovery! Whenever a kite wire was sent aloft in one region, a flow of electricity to ground could be detected in another kite wire some distance away! And the galvanometer proved it. Instantly the full meaning of his discovery and its implications captured the imagination of the New York-born dentist. He quickly discerned that telegraphy without wires was a distinct possibility.

But this kindly man was without adequate funds to develop fully the secret revealed to him by Nature. Loomis sought to interest people in his invention to acquire the necessary financial support. But imagine trying to convince people then that air could be a carrier for electrical impulses when such persons had been only recently converted, with difficulty, to the wired telegraph! People were incredulous and the inventor became the butt of ridicule and coarse humor.

Skeptics had to be convinced. The patient, tireless dentist managed to scrape together enough money to conduct an experiment. In 1868 (or 1866) Loomis, in the presence of scientists and others, communicated between two mountain spurs in the Blue Ridges of West Virginia, some eighteen miles apart. On each of the peaks he set up kites attached to wires and connected to the ground through galvanometers. The operators of each party were provided with telescopes so that each could sight the other's station. Loomis produced electrical discharges when he touched his kite wire to the ground, but had no means of detecting them except for the galvanometer at the far point which deflected to indicate a passage of current. He had sent out true radio waves and it was the first time that such signals had been transmitted over a distance without wires!

Scientists began to interest themselves in the field as yet unnamed radio. They confirmed the report of Loomis and looked upon his work with mixed interest. Some of them may have known that a Scotchman, James Bowman Lindsay, between 1844 and 1853 sent wireless messages short distances with the aid of batteries. Also that Professor Joseph Henry in 1842 had demonstrated the flow of electrical currents. Hence to them Loomis was confirming what they already knew. But the discoveries of Dr. Mahlon Loomis were

* 43 W. 84 St., New York 24, N. Y.

independently made and without knowledge of either man or his works.

The mountain experiment confirmed the full implications of his discovery. Now he realized and hoped that telegraphy without wires could be made a quick, cheap means of communication without the necessity of constantly repairing wires downed by storms or marauding Indians. Mahlon Loomis also spoke of utilizing this new means of telegraphy as a safety device for inter-train communication.

But this newfangled idea brought forth no financial angels. In desperation Dr. Loomis turned to Congress for $50,000 in order to continue further experimentation. It was his plan to go to two high points in the Rocky Mountains and establish stations between Mt. Hood and Mt. Shasta.

In January, 1869, Senator Sumner of Massachusetts introduced a bill in answer to Loomis's petition for financial aid. The petitioner had hoped that the bill would be sent to the Committee on Appropriations; instead it was relegated to the Committee on Patents. No action was forthcoming at that session of Congress.

The bill introduced by the Massachusetts senator roused the New York and Massachusetts press to a high pitch of skepticism and disapproval. However, the newspapers in the nation's capital were on the whole friendly to Loomis. One journal pleaded, ". . . We hope that American pride will not suffer it [Loomis's discovery] to pass out of our hands, and the credit and honor be reaped by others." How prophetic!

The American discoverer of wireless a few months later traveled to New York where he was able to interest favorably a capitalist named Austin Day and others in supporting his venture to the Rocky Mountains. He was elated at this promise of financial relief. Plans were taking form to go westward when a group of speculators in New York succeeded in advancing the price of gold, thereby creating a disastrous panic on September 24, 1869. The day became historically known as Black Friday. This debacle involved Loomis's patrons in losses so serious they were compelled to withdraw their promise of financial aid. It was also a dark day for the hopeful inventor. He returned to Washington to resume practice. But not for one moment had the persevering inventor abandoned his great enterprise.

The Senate had remained indifferent to the inventor's appeal for funds. All that had transpired in that august body with regard to his petition was its transference to the Committee on Appropriations in March, 1870, following a request by Senator Pomeroy.

Dr. Loomis rightly concluded that if Congress would not advance money for further experimentation, it would certainly grant him a charter to continue work and also to sell stock. So in July, 1870, Congressman Bingham introduced H.R. 2390 to incorporate the Loomis Aerial Telegraph Company with the right to capitalize not in excess of two million dollars. But this bill hardly fared better than the Senate's disinclination to comply with the request initiated by Senator Sumner. America was then going through the period that followed the Civil War and was primarily concerned with reconstruction. Imagine Loomis watching the spectacle of his cherished dream roving from committee to committee.

• This inspiring article on Dr. Mahlon Loomis is based on research done by W2OEU while a GI student at Columbia University. Radio amateurs, pioneers in their own right, will be quick to recognize and appreciate the early work of this overlooked but noble American.

Just as with the atomic bomb, the "mad dreamer" was called upon to show that his invention worked on water too. About 1870 Loomis communicated between two ships two miles apart on Chesapeake Bay. This experiment was rewarded with jeers, ridicule and haughty laughter by those who were determined to remain unconvinced. But the stalwart man maintained his composure and was even more convinced that his discovery was highly practicable.

By 1871 Congress still had taken no action to grant Loomis a charter of incorporation. But he still sought financial aid. A group of Chicago capitalists interested themselves in the doctor's work and communicated that information to him. Dr. Loomis hurried to the Windy City. Yes, the Chicago financiers agreed to underwrite for $20,000 the venture to the Rocky Mountains in order that Loomis could erect the stations, pay his workers, and maintain his family while away. Plans were immediately undertaken to make the project a reality. Suddenly on October 8, 1871, the great Chicago Fire unleashed its fury. The backers of Dr. Loomis were burned out. Brokenhearted, he returned to Washington.

Finally in May, 1872, the bill to incorporate the Loomis Aerial Telegraph Company reached the floor of the House of Representatives. Many congressmen were either indifferent to the proposal or amused by the thought of granting a charter to a "crazy inventor" with a still crazier scheme.

Congressman Conger of Michigan rose to champion Loomis and the bill. In a flourish of masterful oratory, only too prophetic, he cajoled and shamed the House membership into action. The House reluctantly voted and the bill was defeated because of the absence of a quorum, although a majority favored it. However, the bill automatically came up on the calendar the next day and was passed.

Loomis hoped that the Senate would act before the summer adjournment. But fate decreed

otherwise. Only one joyous note entered into the long, waiting weeks. In July, 1872, the first radio patent issued in the United States, bearing number 129,971 and titled "Improvement in Telegraphing," was granted to Mahlon Loomis of Washington, D. C. Hardly a soul recognized or appreciated the contents of that piece of paper.

In January, 1873, the Senate undertook to consider the bill to incorporate the Loomis Aerial Telegraph Company. Skeptical members with due dignity saw little merit in granting the charter to promote a wild idea still in an experimental stage.

"States' rights" argument blocked the fondly-cherished project during the first day's consideration. It seemed a staggering blow to Loomis who reeled but did not fall. Senator Anthony, in support of the Loomis bill, advised the Senate to follow an American poet's advice by quoting:

"But sneer not thou at those who rise to loftier illusions."
"Great truths are oft," the Sage replies, "foreshadowed by delusions."

The next day, as if some miraculous transformation had taken place, all objections of the previous day were suddenly withdrawn. At the conclusion of the roll call the vote was yeas 29, nays 12, absent 33. President Grant signed the bill.

Dr. Loomis, now armed with a patent and a Congressional charter, sought investors. But capital was not forthcoming. Every hope and aspiration seemed to turn into a daily repetition of Black Friday. Dark clouds were gathering over the nation. Undaunted, Loomis strove to make the charter an effective instrument.

The year 1873 looms ominous in American financial history. Debtors struggled desperately to obtain money. The pandemonium which followed is indescribable. At the end of 12 months 89 railroads had defaulted on bonds; there were more than 5000 commercial failures.

Can you picture Dr. Loomis holding the patent in one hand and the charter in the other, while all around him the financial structure was collapsing? The frenzy of speculation was reaping doom everywhere.

Loomis was steeped in gloom but not defeated. People would not buy stock. The charter for which he had valiantly struggled remained just a piece of paper.

Almost to the end of his days the mind of Mahlon Loomis remained active and creative. A patent for a convertible valise was issued to him in May, 1881. In November of the same year he received another patent for a cuff-and-collar fastening. A fourth patent for an electrical-thermostat improvement was granted to him in March, 1886.

The prophet without honor spent his declining years on a farm. Before Dr. Loomis passed away in October, 1886, this man of sanguine temperament declared, "I know that I am by some, even many, regarded as a crank — by some perhaps as a fool — for allowing myself, to the sacrifice of material advantages, to abandon a lucrative profession and pursue this *ignis fatuus*, but I know that I am right, and if the present generation live long enough their opinions will be changed — and their wonder will be that they did not perceive it before. I shall never see it perfected — but it will be, and others will have the honor of the discovery."

Perhaps Loomis rather than Marconi would have been known as the father of radio had he the coherer detector which was brought out by Professor Edward Branley of the Catholic University of Paris in 1890.

Dr. Mahlon Loomis deserves a place in the hearts and minds of all Americans. Some day, some place, a fitting monument will be erected to him and no better tribute than the words of his brother, Judge Loomis, should be appropriately inscribed thereon:

". . . He wanted mankind to enjoy the fruits of his discoveries, maintaining that it would be the means of establishing a brotherhood among the nations and races that nothing else could accomplish; and would give to the children of men grander and truer conceptions of Deity, than now prevailed."

HAMFEST CALENDAR

CALIFORNIA — You have a "sked" with W6OT at 12 noon on Saturday, August 7th. The Oakland Radio Club (W6OT) is holding its annual get-together on this date, which will consist of a Field Day at Camp Padre, Charles Lee Tilden Park, in the Oakland-Berkeley hills, and a banquet in the evening at the Scottish Rite Temple on Lake Merritt, Oakland. There'll be games, swimming, movies and numerous special doings for XYLs, YLs and Jr. Ops. So bring the family, a picnic lunch, and have the time of your life during the afternoon, a good feed at the banquet in the evening. Registration starts at Tilden Park at 10 A.M., and is $3.65 per adult, $1.75 per child, including banquet. Pre-registration tickets are available from club members, radio-supply houses, E. R. Leach, W6OLL, 15808 Via Alamitos, San Lorenzo, Calif., or D. A. Wright, 63 Chelton Lane, Oakland 11, Calif.

INDIANA — The Indiana Radio Club Council is sponsoring a Ham Picnic at Mounds State Park, Anderson, Indiana, on Sunday, August 8th. Festivities start at 10 A.M. For further information write Ted Clifton, W9SWH, Route 1, Coldwater Road, Fort Wayne 8, Indiana.

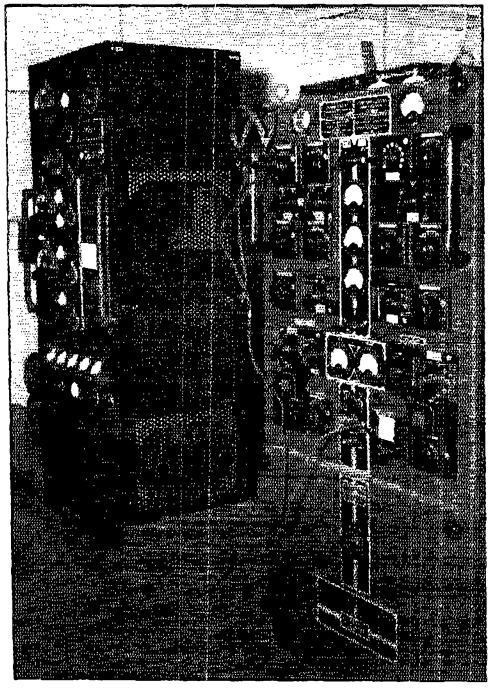
PENNA. — The South Hills Brass Pounders & Modulators of Pittsburgh will hamfest at Spreading Oaks Grove, South Park, on Sunday, August 1st, starting at 1:00 P.M. Registration is $2.00 and includes a good box lunch. For advance information contact Secy. Charles Schuler, W3MHQ, 2944 Spring St., Pittsburgh 10, Penna.

Strays

Physician and dentist radio amateurs interested in the formation of a national social organization are requested to contact W4GJW, Arthur W. Woods, M.D., 411 Woodward Bldg., Birmingham, Ala. A roster of calls and organizational notes will be published in GE *XRay News*.

United States Naval Reserve

THE flood disaster in the Pacific Northwest area was another opportunity for amateur radio to serve the emergency-communications needs of stricken communities. Naval Reservists were quick to assist. The full story is not yet available, but early reports are that K7NRV, Electronic Warfare Company 13-36, set up portable radio at Clatskanie, Oregon. Electronic Warfare Company 13-14, at Walla Walla, Washington, K7NRA, stood by ready to assist as needed. The Naval Reserve Training Center at Portland, Oregon, maintained a continuous watch at its radio station, NPD1/K7USN. On 31 May, Electronic Warfare Company 13-2, Centralia, Washington, whose amateur call is K7NRO, delivered and set up a power generator at Kelso, Washington, for lighting power on the dike work, and furnished radio gear and set it up for communications from Kelso flood headquarters to the dike patrols. The Commanding Officer of Electronic Warfare Company 13-2 was in charge of these communications and worked on the amateur bands with amateurs in that area.



A corner of the radio-transmitter room at the Naval Reserve Training Center, New Bedford, Mass. The amateur call of this station is K1NRX.

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When a tornado struck McKinney, Texas, Reservists from the Naval Reserve Training Center at Dallas, NDF3/K5NRD, hurried to the disaster area with a Naval Reserve mobile communications unit and set up a radio station on the City Square. The Mayor, Highway Patrol and Red Cross were contacted and the first casualty list was sent over this emergency station to the Red Cross headquarters at Dallas, via the Dallas Naval Reserve radio station. Another "Well done" was fully earned!

Naval Reservist Robert W. Wagner, W5KUC, of Dallas, operating a Naval Reserve mobile communications unit in McKinney (Texas) City Square during the recent tornado disaster.

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W4KYD/N5ZZD, Lt. Elias Etheridge, jr., ARRL route manager in Norfolk, Va., used amateur radio to good advantage recently when a fellow Naval Reservist, embarked on the destroyer *Hemminger* bound for the Virgin Ids., was frantically trying to get information concerning his sick child back in Norfolk. W4KYD, using the amateur station of a friend of his in the Islands, called CQ Norfolk and contacted W4JUQ, a former Navy man, and the mother of the child relayed to her husband, 1300 miles away, the good news that his son had shown improvement.

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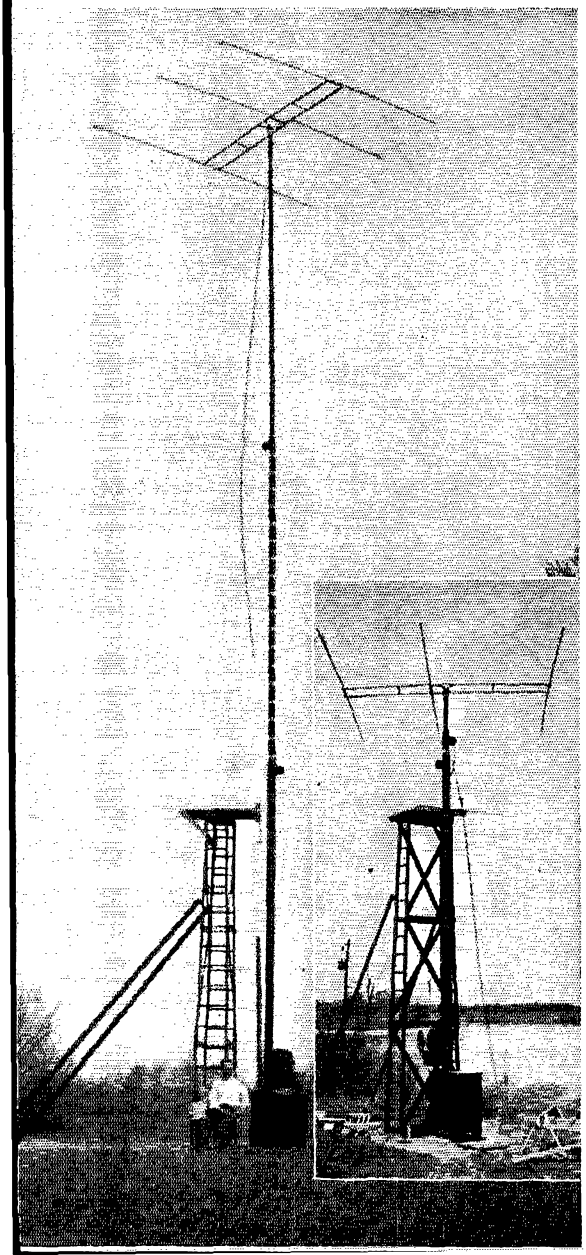
USNR Electronic Warfare Platoon 8-7, El Reno, Okla., boasts of the fact that 6 of its 9 members are amateurs: Ws 5HZD, JBT, JEA, LCN, LIA and LTB.

A Telescoping Mast

Novel Beam Support Changes Antenna Height

PROBABLY every rotary-beam owner has dreamed of some day owning a mast or tower that would enable him to raise and lower his antenna to study the effects of changes in height on transmitted and received signals. The pictures on this and the facing page show how Frank Corgiat, W9QLJ, of Centralia, Ill., made his dream come true, with a 28-Mc. rotary beam that allows both height and direction to be controlled from the shack.

The telescoping mast has a minimum height of 24 feet and a maximum of 70, and is made of three lengths of seamless steel tubing. The bottom section is 5½ inches outside diameter, the center 4¼ inches and the top section 3 inches. An elevation winch is driven by a ½-h.p. 115-volt a.c. reversible motor through suitable gearing to give a 20-foot-per-minute drive. A piece of ¼-inch 6 × 37-strand preformed wire rope from the



winch drum runs over a pulley at the top of the bottom mast section and inside this section to the bottom of the middle section. A similar piece of wire rope is anchored to the top of the bottom section and runs over a pulley at the top of the center section and from there to the bottom of the top section. Thus only one cable to the hoisting drum is required.

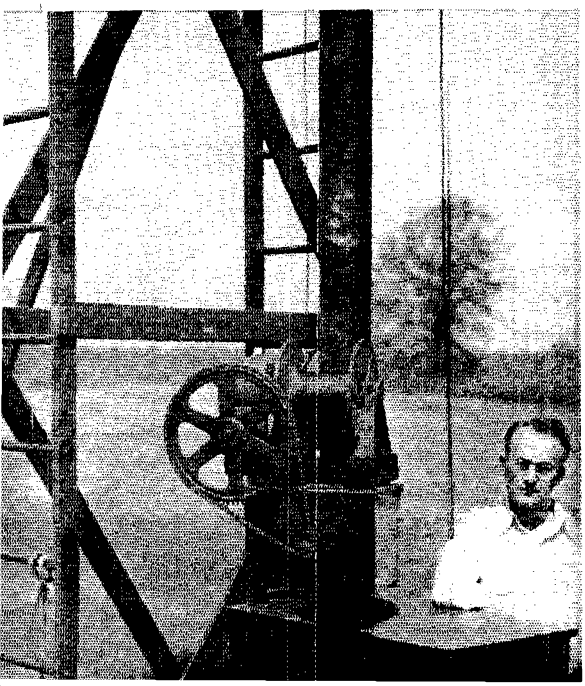
To minimize the free swing of the extended mast and to smooth out the elevation process, ⅜-inch square bar is bolted on the inside of the two lower sections. Slotted bronze bushings at the bottoms of the two top sections ride over these bars.

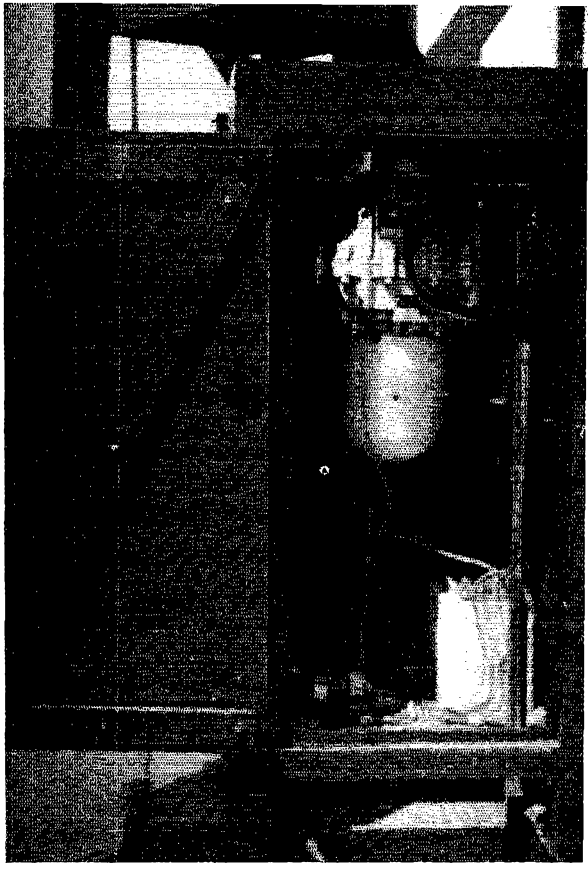
Through a chain-and-sprocket arrangement, the entire mast assembly is rotated through 360 degrees by a surplus prop-pitch motor at the base of the mast. A Selsyn-motor direction indicator is tied in through a similar chain and sprocket.

At the present time, 300-ohm ribbon is used to feed the antenna, but it is planned to replace this with coaxial line in the near future. The 300-ohm line is long enough to run from a tie-point on the ladder platform alongside the mast to the antenna when the mast is extended to its full 70 feet. When the antenna is at intermediate heights, the feedline is pulled clear of the mast by a weighted ring that rides on a sloping taut wire from the platform to a stake in the ground.

Although the 20-foot-high platform is built alongside the mast to facilitate adjustment of the antenna when the mast is retracted, the entire mast assembly is hinged at the bottom so that it can be laid on the ground if necessary.

Unfortunately, W9QLJ has not yet had much time to study the effects of different antenna heights, because of the press of personal business, but a few brief experiments have indicated that, depending upon the time of day, different heights are desirable when working any particular part of the world.





The World Above 50 Mc.

CONDUCTED BY E. P. TILTON,* W1HDQ

THE first 50-Mc. WAS has apparently been made — and the man who turned the trick refuses to claim it as such! Probably it is news to nobody by now that, on the night of June 13th, W9ZHB, Zearing, Illinois, worked W4AVT/4, at Bennettsville, South Carolina, filling what is rumored to be the last vacant space in his WAS record. Thus Ed, who was on the verge of a 56-Mc. WAS when the outbreak of war put an end to our operations, appears to have become the first to work all states on a v.h.f. band. No one could deserve the WAS award more fully; probably no operator on 50 Mc. has done more to popularize and populate the band, and even his closest rivals for the honor would be glad to see him win it — but the hero of the occasion will have nothing to do with it. Ed steadfastly refuses to claim the award, or to recognize the working of all 48 states, because the station worked was not a bona fide resident of South Carolina!

Now, we ask you, gang — what can *we* do with a guy like that?

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"Not up to last year!" This is the universal verdict of the 50-Mc. gang when a discussion of the first half of the 1948 sporadic-*E* skip season develops. Though single-hop openings, permitting contacts over distances up to 1400 miles or so, were an almost daily occurrence during June, there was a notable absence of double-hop, except over north-south paths and across the southern part of the country. By the end of June last year there had been several good transcontinental openings, but 1948 has seen only a few very minor ones, mostly W4 to W6.

Several bright spots enlivened the picture, however, helping to keep interest at a high pitch. Not the least of these was the considerable increase in activity, not only in this country, but beyond our borders. With the summer season always providing at least a few opportunities for work over distances up to 2500 miles or more, it has seemed that more 50-Mc. activity in Canada and Mexico would do much to expand our v.h.f. horizons. The year 1948 has seen this come about; contacts have been reported with all Canadian call areas except VE8, and several stations in XE1 and XE2 have brought Mexico within reach of every part of this country.

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

The early-summer season was providing plenty of interest for 144-Mc. enthusiasts also. There seemed to be no end to the resourcefulness of the 2-meter gang in their quest for ever-greater working range. More sensitive receivers and bigger and better beams were the order of the day, and these efforts were paying off. Though we have no new records to report as we go to press, the distances being covered by many of the sharper operators were stretching out, and many paths were being negotiated on 144 Mc. which would have been considered impossible even a year ago.

Though the 50-Mc. gang in Northeastern U. S. were bemoaning a lack of double-hop openings to the West Coast, the north-south circuit was doing nicely. The early-evening opening of May 31st, reported briefly last month, started things off, with XE1KE, Mexico City, working stations in Florida, Alabama, Georgia, New Jersey, New York and Washington. In the course of the month of June the band was open between Mexico City and some part of this country almost daily. June 6th provided the first break to California, New Mexico and Arizona. A three-day series of openings beginning on the 21st added Ohio, Illinois, Wisconsin, Iowa, Indiana, South Dakota, Missouri and Oregon, as well as many repeats to states already worked, moving XE1KE up the WAS ladder to the 23rd rung, and leaving him only W1 and W3 for WACA.

A number of other Mexican stations were joining the fun, including XE1A, XE1GE, XE1FU, XE1QE and XE2C. Located in Monterrey, Mexico, not far from the Texas border, XE2C occasionally showed up along with the W5s of South Texas.

Here and There on 6 and 2

Shelley, Idaho — Returning home in the middle of May after three weeks in the hospital following a heart attack, W7ACD wasted no time in getting started on 6. His wife hooked up his rig by his bedside, and he has been monitoring the band almost constantly since May 15th. He says that openings have been confined to points west of the Mississippi and the signals have come through for shorter periods than last year. From May 23rd to June 23rd skip signals were heard on all but four days, and a total of 93 out-of-state contacts were made during this period. The best openings were to California, where large numbers

of new stations have shown up, coming up to Idaho with extremely strong signals.

Windsor, Conn. — Illness of a different sort (variously diagnosed locally as 50-Mc. flu, double-hop dysentery, and sporadic-*E* sickness) kept W1LLL confined to his rig for several days, beginning June 26th. The fact that this period was approximately 27 days following 1948's first double-hop opening to W1 on May 31st may help to explain the periodicity of this dread disease, a malady not necessarily indigenous to the Connecticut Valley. Reports of impending operation of W5VV/4 in South Carolina produced similar outbreaks in Waltham and Boston, Mass., last year.

Dallas, Texas — Having to work one night when 6 looked good, W5AJG left his wife the assignment of working Mississippi. He had been trying for more than a year without success, but the Mrs. turned the trick that very night. "Just goes to show you can't trust a woman!" Leroy says.

South Devonshire, England — There was sporadic-*E* skip in evidence up to 60 Mc. in Europe and North Africa at frequent intervals during June, according to G5BY, who worked SM, OZ, OK, HB, F, I and FA8 during the month. Good openings were observed on June 4th and 10th, with minor openings on May 25th, June 3rd, 7th, 12th and 13th. Several European stations were also using 50 Mc.

What is reported as the first OK-I contact on 5 meters was made by OK2EL/3, operating a 2-watt transceiver from Big Javorina Mountain, and I1DA near Cuneo, in Northwestern Italy, on May 16th.

Schaffhausen, Switzerland — Swiss amateurs were recently given temporary authorization for operation in the 50-Mc. band, effective until January 1, 1949, according to word received from W. Salquin, HB9BX, president of USKA, our sister society in Switzerland.

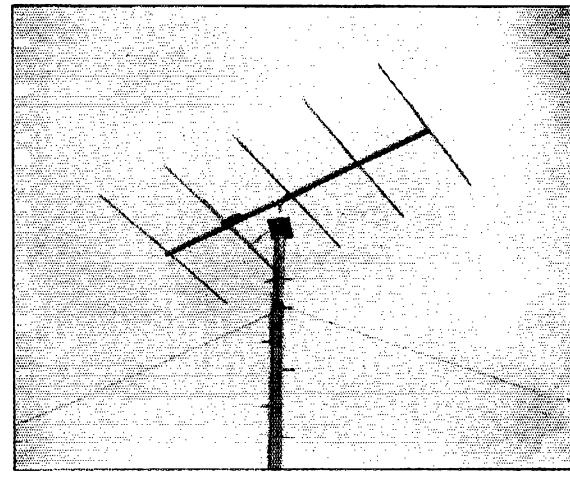
Oslo, Norway — Our IARU affiliate in Norway, the Norwegian Radio Relay League, reports increasing interest in v.h.f., though the experimentally-minded LAs are severely hampered by lack of suitable equipment. Several ex-German sets have been put to use in the temporary assignment at 47 to 47.3 Mc. Application is being made for permission to use 50 Mc. as well.

Van Nuys, Calif. — The 6-meter band was running wild all during May and June, according to W6AOR, who says that on numerous occasions the band seemed to be open in all directions simultaneously. W7s, 5s, Øs, 4s and 9s were coming in together, and XE1KE and XE2C were worked on May 31st and June 6th respectively.

Santa Clara, Calif. — Some of the shortest skip ever reported on 50 Mc. has showed up this season, with contacts being made within the state of California, according to W6BPT. W6IWS worked 25 stations in the Los Angeles area, only about 300 miles distant, on a single day.

Bothell, Wash. — While an occasional grumble is heard because of the proposed 100-kc. assignment for c.w. at the low end of the 50-Mc. band, the gang in the Seattle area have a gentlemen's agreement to stay out of the first 100 kc. entirely, in order to permit all to hear any DX which might break through in the heavily-occupied low edge. W7DYD says his 5-element array peaks at 51 Mc. with the dimensions given below, so that is where he hangs out. His beam, shown in the accompanying photograph, is an unusually neat design, and others may be interested in the electrical and mechanical details. The boom is 14 feet long and is made of 2½-inch square dural tubing. Elements are ½-inch dural and are 117, 110, 105, 103 and 101 inches respectively, with a spacing of 42½ inches. The array is fed with a "T"-match, connection being made at 20 inches each side of center for a 300-ohm feedline. It is rotated mechanically from the operating position by means of a crank which operates a steering-gear mechanism from a 1931 Chevrolet, a worm-drive unit which has an 8-to-1 reduction ratio. A pipe coupling is welded to the top of the drive unit, and this is threaded onto the half-inch pipe which serves as a drive shaft. The direction indicator consists of the letters N, S, E and W marked on the drive shaft at a point where they may be seen by looking out the window. This is illuminated for night operation. Simple, but effective and trouble-free.

Tucson, Ariz. — Though conditions have been



The 5-element 50-Mc. array at W7DYD, Bothell, Washington. Electrical and mechanical details are given in the text.

RECORDS

Two-Way Work

50 Mc.: CE1AH — J9AAO
10,500 Miles — October 17, 1947
144 Mc.: W3GV — WØWGZ
660 Miles — September 18, 1947
235 Mc.: W1CTW — W2HWX
210 Miles — October 12, 1947
420 Mc.: W6VIX/6 — W6ZRN/6
186 Miles — July 27, 1947
1215 Mc.: W3MLN/3 — W3HFW/3
12.5 Miles — September 24, 1947
2300 Mc.: W6IFE/6 — W6ET/6
150 Miles — April 25, 1948
3300 Mc.: W6IFE/6 — W6ET/6
150 Miles — October 5, 1947
5250 Mc.: W2LGF/2 — W7FQF/2
31 Miles — December 2, 1945
10,000 Mc.: W4HPJ/3 — W6IFE/3
7.65 Miles — July 11, 1946
21,000 Mc.: W1NVL/2 — W9SAD/2
800 Feet — May 18, 1946

generally poorer than last year, with no double-hop yet heard from a northeasterly direction, W7QAP experienced a notable opening on June 6th. VE7, W7, W6, W5 and XE1 were coming through all at once, and 27 stations were worked, including his shortest skip, W6JRM and W6WNN, near San Diego, only about 350 miles. Bud has also heard W5VWU and W5ELL in New Mexico, but no W1, 2, 3, 9 or Ø as yet.

Dallas, Texas — We used to place the upper limit of sporadic-*E* skip tentatively at about 70 Mc., but operation of high-powered f.m. broadcast stations in the 88–108 Mc. band is causing us to raise that figure. W5CLP reports reception of WHAD-FM, Delafield, Wis., on the night of June 9th, the occasion of a good opening on 50 Mc. as well.

Richmond, Va. — The best 2-meter opening of the summer season to date was June 14th, according to W4FJ, who worked W1s SF, MNF, BCN, ME, IYO, LKH, JKC, JFF, W2s BV, WH, AES, WHE, PEN, LEY, FI, WLS, RND, ADW, OQI, RZ, GQP, FCH, BNX, COV, OZA, WFY, FQW, FJQ, TCE, YT, WAI, TYI, and W3s LFF, BBP, EW, AD, HJY, DZD and JDP. A number of the W1s and W2s were horizontal, and their signals stood out over the vertical QRM in fine style. The first DX contact of this opening took place between W4CLY and a W1 at 5:30 P.M., and the band was still wide open when W4FJ called it a night at 1:30 A.M.! No new records are involved, but the distance to the Cape Cod W1s is close to the 500-mile mark.

Not all the 2-meter DX is following the coastline, and we should not always rely on a quick check of band conditions to tell whether DX is going to be possible. On the night of June 23rd, with conditions appearing to be on the poor side, W4CYW and W4FJ were listening for W3KCA, who was known to be operating portable in Martinsburg, W. Va., a direction in which they had previously almost never turned their antennas. At 9:05 P.M. a station was heard calling CQ with m.c.w. and W4CYW identified it as W8WJC, at Everett, Ohio, not far from Cleveland! Get out a topographical map and examine the contour of the path from Richmond to Cleveland, and then see if you are willing to say that there is any such thing as an "impossible" path!

What is believed to be the first Virginia–Ohio 2-meter contact was made on June 26th, when W8WJC worked W4BCT, Reliance, Va., at 11:08 P.M. Signals were weak and fading was bad on this occasion, but a second and more satisfactory contact was made on the 29th, just after midnight, when signals were strong enough for solid voice communication. This is not phenomenal DX in terms of miles between the two points, but it certainly ranks with the toughest paths yet spanned two-way on 144 Mc. Polarization was horizontal.

Hyannis, Mass. — W1BCN agrees that June 14th was the best yet. Ed worked W4CLB, W4JBJ, W3ENZ, W4CYW, W1MBS/3, W4FJ and W4CLY, all more than 400 miles distant. W4CLY was worked with both horizontal and vertical. W1BCN says that W1PIV, East Freetown, Mass., has a 32-element array which can be turned from vertical to horizontal, and tests with W4CLY, who also can use either polarization, showed horizontal to be one to three S-units better. The nature of the set-up at W4CLY is not known, so this should not necessarily be regarded as favoring horizontal polarization.

Oradell, N. J. — Local QRM from the hundreds of vertically-polarized stations in the New York area, always troublesome heretofore, is almost nonexistent when horizontal arrays are used, according to W2CBB and W2PJA. About the only QRM noticed on the horizontal W4s is from other horizontal W4s, a fact which W2CBB feels should not be too generally noised around! On the night of the 14th, W2PJA heard stations in 11 states, from Maine to North Carolina.

St. Cloud, Minn. — Contacts across the state into South Dakota have been made by WØSV and WØHXY on 144 Mc. WØSV has worked WØAZE at Bellingham, Minn., WØTI, Millbank, S.D., and WØBJV at Watertown, the latter being more than 150 miles distant. WØHXY has worked AZE and BJV.

Saltair, Utah — Two-way communication has been established between Ogden, Salt Lake City, and Saltair, on 144 Mc., by W7s UPI, KMR and SP. Vertical polarization has been more effective in this work, and W7SP suggests that this may be tied in with the fact that the signals have to be bounced off the mountains. The same technique is going to be tried on 420 Mc. soon.

Cedar Point, Md. — Being a native New Englander, W1MBS/3 was practically brought up with a vertical antenna in his mouth, but he changed over to horizontal in order to make contacts with the horizontally-polarized Virginia stations. He says there does not seem to be much difference ordinarily, as far as he can see. His 5-element array is only 15 feet above ground, in the middle of a Quonset-hut area, and he runs only 10 watts to his converted 522, but he has worked as far as W1SF and W1BCN, 285 and 400 miles respectively. W3OAE, Nottingham, Penna., who has a 16-element vertical array, is his best cross-polarization DX.

Schenectady, N. Y. — One of the really choice locations in Northern New York, Mt. Whiteface, in the Adirondacks, will be the goal of a two-day mobile excursion by W2VGH over the week-end of August 14th and 15th. He will have a 35-watt rig and a 16-element vertical array, and will be on the air by noon Saturday. Since this is in an area toward which beams might not ordinarily be turned, W2VGH (R. F. D. 1, Stone Ridge Rd., Schenectady, N. Y.) requests operators, particularly those in W1, 2, 3 and 8, to bear this schedule in mind.

Why 220 Mc.?

With transmitters and receivers readily available or easily constructed for 144 Mc., why should we worry about going to 220 Mc., a band for which there is little if any surplus gear, and a frequency at which it is admittedly somewhat more difficult to make equipment perform satisfactorily? Well, first of all, a new band is always a challenge; being relatively unknown, it is therefore of interest. We never quite know what to expect until we try it, and the fellows who get in the first licks have the satisfaction of pioneering in new territory, whatever its worth. But there may be much more than that.

Everyone is well aware that 50 Mc. is superior to 28 Mc. when it comes to tropospheric bending. The fellows on 6 work regularly over extended-local ranges which are considered phenomenal on 10. Even more divergent are the properties of 6 and 2 meters. The maximum range for tropospheric work on 50 Mc. is in the neighborhood of 300 miles, yet the DX record for 144 Mc. is more than twice that figure, and two-way work over distances up to 500 miles is fairly common during the peak season. It would thus seem reasonable to look for still greater distances as we move up to higher bands, with 220 Mc. holding the edge, since it is not too difficult to build stable transmitters and selective receivers for that frequency. Perhaps only increased activity is needed to find 1¼ pushing 2 in the matter of DX records. Remember the 1700-mile reports credited to wartime radar working on a wavelength of about 1.5 meters!

We also know that 2 is open for work up to several hundred miles much more frequently than is 6. Should not 1¼ be even better? The experience of W1CTW in receiving W2HWX (the current record for 1¼) on several occasions when 2 was dead over the same path is worthy of note.

With these and other considerations in mind, let's fire up on 220 Mc. and be ready to give it a real whirl when the best nights of the early-fall season are with us. Perhaps we can give the 2-meter record holders a run for their money!

Use of the 220-Mc. band paid off royally to several participants in the May V.H.F. Party. W1CTW points out that, out of his score of 2044 points, 713 were directly the result of his operation on 1¼. Those three sections worked on this band were a big help. Cal suggests that the 2-meter gang raise their sights a bit and move up to 1¼ for part of the operating time in future v.h.f. contests. The next one is scheduled for September 25th and 26th. Will *you* be ready?

420-Mc. Propagation Data Needed

At a hearing scheduled for September 20th, FCC is taking up the matter of high-band television. As very little concrete information regarding propagation in the frequency range of 475–960 Mc. is presently available, it would be a feather in the cap of amateur radio if we could supply such information. An appeal has already been sent out by mail to a limited number of amateurs who are known to have been active on 420 Mc., but everyone who has done serious work on the band is invited to take part.

Data required would include distances covered regularly, regardless of conditions; distances covered under abnormal conditions; nature of the paths (line of sight, beyond line of sight, indirect, i.e., by reflection from mountains, etc.); details of equipment used; and the character of reception with respect to fading, freedom from noise, etc.

It is in line with the best amateur tradition that we should be able to supply useful information of this nature. We have done it many times before. If you have had 420-Mc. experience which would help us to repeat, please send along as much information as possible at your earliest convenience.

Strays

The antenna-switching relay of the "Command" (SCR-274 series) transmitter may be made to operate on 6.3 volts if the two solenoids are connected in parallel instead of in series, as they are in the original. The magnetizing-current polarity must be kept the same, as determined by trial and error. On some models the coiled armature return spring must be stretched slightly to lessen the tension and allow positive action at 6 volts. The inductance of the coiled contact arm must be taken into consideration at the higher frequencies. Current drain of the relay after modification is about 145 ma. — *W4NET*

I Married a Hobby

BY HELEN McKEE,* XYL OF W9ARK

AMATEUR RADIO is the hobby I married. Mac and I were introduced over the air, so I should have known from the very outset that there would always be a ham rig in our home. Now, after a quarter of a century of registering the gamut of emotions over this obsession, I know that Mac and I are not tuned to the same wavelength.

Before the wedding day, I made rash promises to knuckle down and master the code; a husband, home and babies mastered me. The ink was not yet dry on the marriage license when our honeymoon began to resemble a radio tour. Instead of tea for two, we indulged in endless hamfests with strangers in stranger cities. It dawned on me that I had a definite problem on my hands.

Back home, the first marital snag was over where to put the rig. Our love nest boasted two bedrooms and I could see right off that W9ARK had his eye on that extra room while my dreams of a ruffled guest room vanished. Almost overnight a work bench was installed, wires began dangling out of the windows, and I didn't dare clean the place for fear of mixing up some of the junk.

But we had to move soon enough. The hobby was installed in what should have been the nursery. Subsequently, as time wore on and we outgrew one house after another, W9ARK set up his shack in practically every room in the house. When the outfit was in the basement, the laundress couldn't wash without getting caught in the motor generator. The attic was a good place to admit the lead-in, but the chief op couldn't keep himself warm. When the rig was in the bedroom, the XYL couldn't sleep for the visiting hams in her boudoir. Finally Mac built an addition to the living room to house his hobby, but I soon found that soldering irons and screwdrivers in the middle of the parlor floor were not in the best taste as bric-a-brac.

It was during the period when the shack was in the bedroom that the doctor, who was also a ham, dropped in from Crawfordsville to chin with W9ARK. I, blessed-eventing again, by dusk was dead on my feet. But could I go to bed with a strange man at the microphone in my bedroom? Wearily, I fought the tiger of fatigue, longing, with a hope beyond understanding, that the extra man in my life would clear out and let me find rest. At 2:30 A.M., belligerently, I approached the intruder. "Doctor," I said, "you have seen many women in bed and now you are going to see another." Exhausted, I shed my robe and sank between the sheets.

Tragedy came close while the set monopolized our bedroom. The stork was expected momentarily and I busied myself with the mending basket while Mac, in his corner of the room, enjoyed a QSO with a fellow ham. A tube burned out in the transmitter and, absent-mindedly, Mac put his hands into the back of the set to remove the offending part. He forgot to turn off the power supply. A thousand volts burned into his right wrist and emerged from his left forearm, more than enough to electrocute. He was squatting behind the set at the time and the contraction of the muscles caused by the impact of the current picked him up and tossed him, leap-frog fashion, into the corner of the room. When I reached him his tongue was thick and hanging out. Such thoughts as "Don't touch him!" and "I am a widow with four children!" raced across my mind. After what seemed a lifetime, garbled mumbles came through his swollen lips. Hysterically, I ran for the aromatic spirits of ammonia — for both of us! The doctor explained that if Mac's heart had not been on dead center at the time of contact, St. Peter would have ushered him through the Pearly Gates.

During our married lifetime we have visited hams from coast to coast; also in Cuba, Panama and Mexico. And one time an amateur from Mexico City came to visit us, bringing his wife along. The Mexican XYL and I had to converse in sign language.

One of our favorite travel experiences concerns the little lady ham down in Port Arthur, Texas. Over the air she is known as "Little Dew Drop." Mac had met her at a hamfest in Chicago, so, as we were driving into Port Arthur, he suggested that we look her up, which we did. In answer to Mac's knock at the door, a baby voice in that irresistible Southern drawl said, "Why, Mac!

* 4510 Park Ave., Indianapolis, Ind.

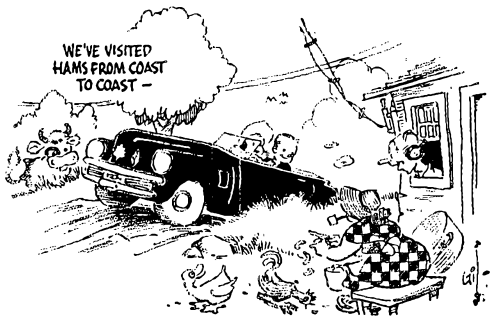
Is this *you?*" And old Mac responded with, "Is dinner ready?" True to Southern hospitality, we were ushered into the house and right back to the room where the rig was located. Dew Drop, instead of doing her housework, had been on the air exchanging the time of day with Sally up in New Jersey. Undaunted, she sat W9ARK down at the mike and turned him loose.

While we were busy on the air, Little Dew Drop dropped into her own kitchen and soon announced fried oysters. Was my face red! Mac was literally the man who came to dinner but I also laughed up my sleeve because one of his pet peeves is oysters, especially fried oysters. He asked for and ate a second helping!

And then there is Katherine out in Cheyenne, Wyoming. Katherine is the gal who told my husband that he had microphone appeal. From all I hear she puts out a mean signal. She certainly can put out delicious homemade chocolate creams, too. We know! She has sent Mac three boxes.

In Indianapolis there is a certain camaraderie among the hams; also a spirit of rivalry as to who shall work the farthest DX. They spurn publicity, or seem to. Before the war, whenever one of their number received mention in the press, a dinner was held and a trophy presented to the notable ham. But this trophy was in no way a loving cup. Call letters of the recipients were inscribed on a small wooden box, inside of which was the south end of a horse going north. Upon the first presentation, Mac ordered a bale of hay sent to the winner. For that gesture all the local hams were out to "get" Mac, who proved to be cagey, so much so my help was enlisted to frame him.

On the night before Mother's Day, Mac happened to take a message from a lad in the Byrd Expedition, near the South Pole, to his mother in Indianapolis. I tipped off a fellow ham and reporters were soon on Mac's trail. On the front page Sunday morning was the news that W9ARK had received by short-wave radio the Mother's Day message from the greatest distance around the earth. Mac was furious and still is. The war came along, amateur radio shut down, and W9ARK has had to keep the horse all these years, until someone else makes the papers.



MAC WAS FURIOUS OVER THE NEWS STORY OF HIS SOUTH POLE QSP

In retrospect, I have decided that marrying a hobby has added zest to what might otherwise have been a humdrum existence. By sending our signals into the air to fall to earth, we knew not where, our own horizons receded. A few acquaintances became treasured friends. Some experiences, mellowed by time and memory, became priceless. A sense of humor, sprinkled with tolerance, has saved the day. At long last, home serenity is established, a philosophy achieved, Mac and I synchronized.

WEST GULF DIVISION CONVENTION

Houston, Texas, August 20th–22nd

A somewhat novel convention plan has been arranged for the 18th Annual West Gulf Division ARRL Convention in Houston, with headquarters at the Rice Hotel. An "unofficial" day, August 20th, is included for those who wish to make tours of the city, go shopping, and still not miss out on any of the official functions. A small party and buffet dinner will be held for those who wish to attend that evening. Official sessions are scheduled for the 21st and 22nd, with emphasis on technical features. Comprehensive exhibits of equipment are planned. Representatives from ARRL (Communications Manager Handy), FCC, Army, Navy, and the University Research Department will be present. A grand ball and dinner will conclude Saturday's events, while a formal banquet will be held on Sunday. While the OMs are in technical session, fashion shows and teas will entertain the ladies.

The tariff is $7.50 including the banquet, $5.00 without the banquet; the "unofficial" buffet dinner Friday is $2.00 additional. Registration and hotel reservations in advance are strongly urged. Write W. Leo Havard, W5BKW, Houston Amateur Radio Club, Box 907, Houston, Texas. The keynote of this convention is "amateur radio fraternalism." See you there!

I.A.R.U. News

FRANCE

Robert Larcher, F8BU, has resigned as president of the *Reseau des Emetteurs Français*. The presidency has been resumed by G. Barba, F8LA, who held that office during the ten years prior to the war.

The Council of R.E.F. paid tribute to the meritorious efforts of Larcher during the trying years of the war and, as a token of appreciation for his years of leadership, unanimously named him honorary president of the association.

The *Reseau des Emetteurs Français* is arranging an annual competition among I.A.R.U. member-societies under the jurisdiction of countries of French culture. These include the *Reseau des Emetteurs Français*, *Union Belge des Amateurs-Emetteurs*, *Reseau Luxembourgeois*, and the *Union Suisse des Amateurs d'Ondes Courtes*. Each association will sponsor an operating contest among its members, on the same date and under similar rules. The score of each association will be determined by dividing the total points obtained by its members by the square root of their number. The contest will be judged by a committee composed of the president of R.E.F. as chairman and presidents of the other competing associations as committee-members.

A suitable trophy will be presented by R.E.F. to the winning society, which will retain custody of the cup until it is won by another association in a succeeding year.

SOUTH AFRICA

The *South African Radio League*, under authority delegated by the Postmaster-General, has established an official-observer service to maintain a careful check on the operations of amateur radio stations in South Africa. Although the official-observer service is operating under due authority, it is instituted and conducted by amateurs for self-policing for the good of amateur radio.

The chairman of the Observer Committee, on behalf of the Council of the S.A.R.L., will appoint observers from the membership of the League. Such appointments will be for a period of one year and may be terminated or renewed at any time at the discretion of the Council.

The elaborate system of the new monitoring service parallels that of the U.S.A. Federal Communications Commission. Observers noting violations of amateur radio regulations or ethics will report such aberrations to the Committee. The offender then will be requested to take necessary steps to avoid a repetition of such improper operation and to advise the Headquarters, within 7 days, of the action taken. If an offender persists in his illegal transmissions, the Postmaster-General may then be requested by the Council to take official action.

CHILE

The *Radio Club de Chile* has announced the inauguration of a WACE (Worked All "CE") award. A suitable certificate will be awarded to each amateur who submits QSLs or other written verifications confirming two-way telephonic or telegraphic contacts with at least one amateur station in each of the seven radio districts of Chile. Application for the WACE certificate, with supporting proofs, should be mailed to Radio Club de Chile, Post Office Box 761, Santiago. Any of the amateur frequency bands may be employed for contacts used in qualifying for the award but only contacts effected after November 19, 1945, may be counted toward the award.

POLAND

We learn, by indirection, that the *Polski Zwiazek Krotkofalowcow* was reorganized in October, 1946, with Mieczyslaw Kapczynski, prewar SP3AE, as secretary. The only amateur stations permitted on the air in Poland, our informant tells us, will be operated at the various branches of P.Z.K. and then only under the supervision of a "specialist." The headquarters club is located in Warsaw and there are, in addition, nine branches situated in various parts of the country.

♦

Georges Barba, president of the *Reseau des Emetteurs Français*, at the operating position of his amateur station, F8LA. The close liaison between R.E.F. and the A.R.R.L. is exemplified here by the copies of *Radio REF* and *QST* side by side.

25 Years Ago
this month

"KANGAROO Outclassed as American Amateur Radio Signals Leap to Antipodes." Thus *QST* for August, 1923, enthusiastically records the hurdling of the Pacific Ocean barrier. As in the successful trans-Atlantics, organized amateur effort has scored again, this time putting signals down under to Australia and New Zealand from almost every U. S. and Canadian district. The successful trans-Pacifics, sponsored jointly by the Long Beach Radio Club, the Radio Association of Southern California, and the *Radio Journal*, have resulted in outstanding performances by 6JD, Los Angeles, 9AUL and 9ZT, Minneapolis, 6AWT, San Francisco, 6XAD-6ZW, Catalina Island, 7BJ, Vancouver, 5AEC, Oklahoma City, and 3YO, Easton, Penna. Much credit is also due the able Australians and New Zealanders for their highly-proficient receiving techniques. Coming up! — fall and winter attempts at *two-way* contact with Europe and the Antipodes.

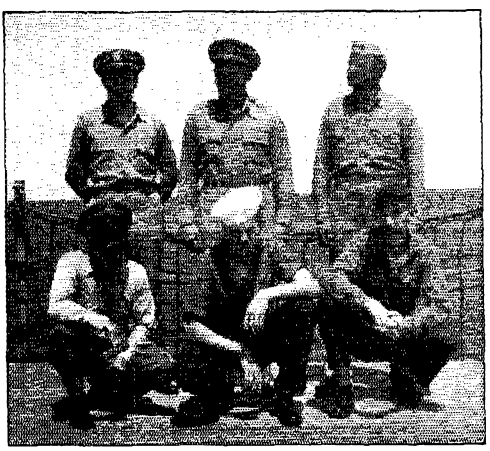
League activities are receiving favorable notice on all fronts: Latest word is that the MacMillan Arctic Expedition *Bowdoin*, with ARRL Operator Don H. Mix, 1TS, aboard, has reached Nova Scotia. . . . The new ARRL Publicity Department under the managership of J. K. Bolles is hard at work telling the rapidly-growing broadcast-listener audience "the truth about the ham." . . . The Bureau of Standards Fading Tests, run in coöperation with the League, have turned up valuable information on short-wave transmission. A total of 17 sending stations and 243 recording stations have participated, according to the final report published this month. . . . An expanded technical information service for members has been set up at Headquarters.

Professor F. S. Dellenbaugh of MIT rounds out his series of articles on electric filters, this month's offering bearing strongly on circuit and choke design. Also in the technical line, "Resonance Wave Coils" — antenna-coupling devices which eliminate static and interference — are described by Dr. Louis Cohen, consulting engineer for the Signal Corps.

We have new regulations, providing in the main for our operation in a band of wavelengths, 150 to 200 meters, and for the observance of quiet hours, 8:00 to 10:30 P.M. daily and Sunday mornings during church services. Editorially, *QST* calls for full support of the Department of Commerce's new orders, and expounds the need for a transmitter whose frequency can be shifted quickly and easily within a band, at the same time causing a minimum of interference to radiophone listeners and other services.

Random gleanings: Don H. Mix, 1TS, and Norman R. Hood, 7ZO, Rocky Mountain Division manager, are saluted in the "Who's Who" section. . . . Denton, Texas, is very much on the traffic-handling map nowadays, thanks to the efforts of Wayland Groves and Edgar A. Fain. . . . Don't forget the *Second* National ARRL Convention, to be held in Chicago next month.

Strays



Back in the States to thaw out, these are the amateurs who participated in the recent Navy Antarctic Expedition. Collectively they represent twenty expeditions either to the Arctic or Antarctic, and should be able to qualify as charter members of the Frozen Stiff Radio Club. *L. to r., front row:* O. M. Perry, W3NOT (ex-W1HVM), K. L. Cox, amateur operator license only, G. L. Johnson, W6VKY; *back row:* J. W. Fitzpatrick, W2POW, F. L. Dawley (will be sporting a W1 call this summer), V. D. (Buck) Boyd, ex-KC4USA. In February these amateurs participated in what is believed to be the southernmost hamfest on record, as guests of W3LYK of the Ronne Expedition at Marguerite Bay, Antarctica.

COMING CONVENTIONS

August 21st–22nd — West Gulf Division, Houston
Sept. 4th–5th–6th — NATIONAL CONVENTION, Milwaukee
Sept. 17th–19th — Delta Division, Biloxi, Miss.
Sept. 19th — New Hampshire State, Concord
October 2nd–3rd — Hudson Division, Albany
October 2nd–3rd — Southwestern Division, Los Angeles
October 8th–9th — E. Canada, Montreal
October 16th–17th — Midwest Division, Wichita

Hints and Kinks For the Experimenter

ADAPTING THE CATHODE-COUPLED PREAMPLIFIER TO 144-MC. WORK

THE cathode-coupled preamplifier circuit described in a recent issue of *QST* * can be used on 144 Mc. with good results with only slight modification. The original circuit is retained, but the values of a few components, and the coils, are changed. The circuit is shown in Fig. 1.

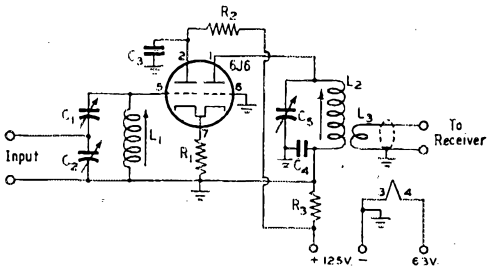


Fig. 1 — Circuit diagram of the cathode-coupled preamplifier adapted for use in the 144-Mc. band.
C_1 — 3-30-$\mu\mu$fd. mica trimmer (National M-30).
C_2 — 75-$\mu\mu$fd. midget variable.
C_3 — 680-$\mu\mu$fd. ceramic.
C_4 — 100-$\mu\mu$fd. ceramic.
C_5 — 20-$\mu\mu$fd. midget variable.
R_1 — 470-ohm ½-watt carbon.
R_2, R_3 — 1500-ohm ½-watt carbon.
L_1 — 3½ turns No. 20, ¼-in. inside diam. with 1/16 inch between turns.
L_2 — 4 turns No. 20, ¼-inch inside diam. with 1/16 inch between turns.
L_3 — 3 turns No. 18 flexible hook-up wire, close-wound over ground end of L_2.

The amplifier was built on a small aluminum chassis with a copper shield extending across the center of the tube socket. Pins 4 and 6, and the center extension of the socket are grounded directly to this shield, which is mounted on the socket screws by means of soldering lugs. The coils are made of No. 20 bare tinned wire, and are ¼ inch in diameter, spaced about 1/16 inch between turns. The rotor of C_5 is grounded directly at the center of the tube socket and the copper shield, as is the rotor of C_2 on the opposite side of the shield. The input and output portions of the circuit are carefully shielded from one another to prevent self-oscillation.

This circuit was used ahead of an SCR-522 receiver with excellent results. Signals that were audible but unreadable without the amplifier became R5. Although the noise comes up somewhat with the signal, there is a definite improvement in signal-to-noise ratio and the over-all gain is equivalent to about three S-points. The input from the antenna in the case described is 300-ohm Twin-Lead, and the output to the 522 is a short length of 72-ohm coaxial cable. The entire unit can be enclosed in a small cabinet with its power supply, and is a worth-while addition to any receiver.

— *Roy R. Marson, W6DEY*

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

BALANCED FEEDLINE WITH COAXIAL CABLE

THE system shown in Fig. 2 has been used at this station to obtain a balanced line while still retaining the advantages of coaxial cable in shielding the feeder from pick-up. Two lengths of 52-ohm cable are used, with the shield braids soldered together at the top and the bottom of the line, and grounded to the transmitter and to the electrical center of the driven element. The resulting line impedance is about 104 ohms. This can be matched to the driven element of almost any beam antenna by the simple "T" match as shown.

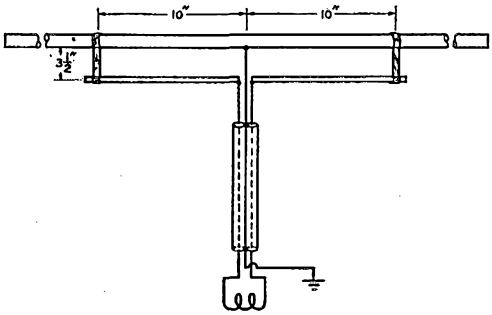


Fig. 2 — A balanced feedline using coaxial cable. Two lengths are used, series-connected as shown. A "T" is then used to effect the required match to the driven element of the beam.

In my particular case, the reflector and driven elements are each 16 feet 5 inches, and the director is 15 feet 2 inches. Spacing between elements is 0.2 wavelength. The "T" bar is located 3½ inches below the driven element, and connection from the "T" to the driven element is made 10 inches each side of center.

No detuning is noticed when this line is run in close proximity to the beam elements, and it is unaffected by weather conditions. Pick-up (of man-made QRN) is reduced several decibels, and the line may be located at any convenient place. — *William W. Bailey, W9AO*

MINIMIZING HUM IN SPEECH AMPLIFIERS

AN EXTREMELY simple yet effective way to minimize hum is apparently overlooked or unknown to most amateurs. If you have an audio unit plagued by 60-cycle hum, place approximately 10 volts positive bias on the heater or filament circuit. This can be accomplished in the following typical manner:

Across the 300-volt d.c. plate supply place a 0.3-megohm ½-watt resistor in series with a 10,000-ohm ½-watt resistor as shown in Fig. 3.

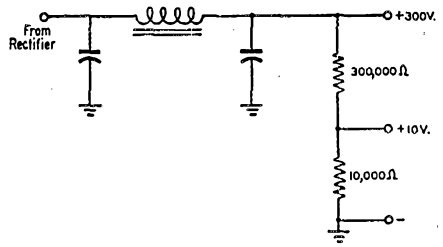


Fig. 3 — Method of obtaining a small positive bias for use in hum reduction.

Where the resistors join, the potential is 10 volts positive. Connect this point to either side of the filament circuit after making certain that neither side of this circuit nor the center-tap of the filament transformer is grounded. Larger resistors than ½-watt are not needed because the current drain through the bleeder is slight.

If it is desirable to tap across a d.c. source of different voltage than that used in the example above, merely keep the ratio of resistance values so that from 10 to 12 volts positive results at their junction.

In several cases this simple and inexpensive method completely solved the hum problem after all other means had failed. — *Karl Dreher, WØWO; Charles Murray, WØNWU*

CURING UNBALANCE IN PUSH-PULL AMPLIFIERS

IN many instances it seems difficult to obtain exact balance in both tubes of a push-pull r.f. amplifier. One tube will show color while the other runs cool. A simple rearrangement of the wiring of the filament circuits will sometimes effect the desired balance when nothing else seems to do the job. The arrangement used at W2MFS and W2HFS to correct unbalance in push-pull 810 stages is shown in Fig. 4.

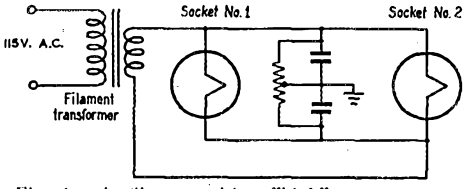


Fig. 4 — A filament-wiring "kink" to correct unbalance in push-pull amplifiers.

An *exact*-center-tap-and-by-pass arrangement is used, with the by-pass condensers located midway between the two sockets. A center-tapped resistor is used rather than the usual center-tapped filament transformer. In addition, the filament leads are wired from opposite ends, as shown. In this manner any possible voltage drop in the wires themselves is equalized so that both tubes will operate at identical filament voltage. — *Herb Spohn, W2GMM*

JUNK-YARD BEAM ROTATOR

A VERY satisfactory beam-rotating mechanism can be made from an old screw jack by the method shown in Fig. 5. The jack can be obtained for next to nothing in almost any junk yard or auto-wrecking lot.

Have a welder cut the casing at point *A*, and discard the portion that is shaded in the side view. Then have him cut screw *B* so that it can be threaded out through the bottom of the casing.

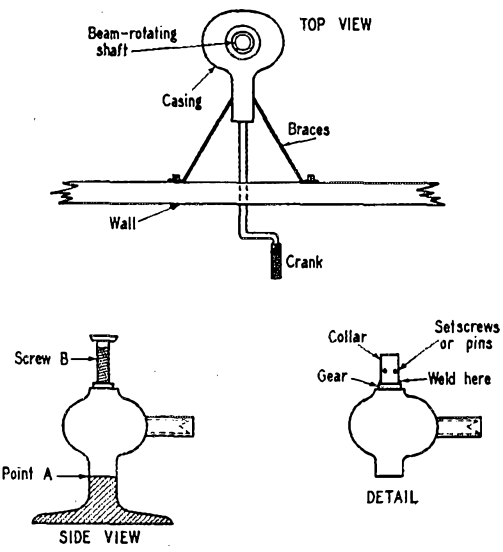


Fig. 5 — Here's the novel beam-rotating gadget used at W1OPW. Made entirely of junk parts, it can be assembled and installed in a few hours.

This leaves the gear structure intact. One gear protrudes through the top of the casing and rotates 360 degrees in the horizontal plane when the crank handle is turned. Have a collar made from a piece of pipe welded on this gear as shown. It will then serve as a socket for the base of the shaft that rotates the beam. The shaft should be pinned inside of the collar to prevent slippage.

Braces to provide mounting supports are then welded to the outside of the gear casing as shown in the top view. The crank handle may be run

(*Continued on page 112*)

Correspondence From Members-

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

U.S.A.F. COMMUNICATIONS NEEDS

Headquarters, U. S. Air Force,
Washington, D. C.

Editor, *QST:*

We in communications of the United States Air Force have been watching with great interest the postwar development of amateur radio. We all remember how many fine Air Force officers and men we drew from the ranks of the radio amateurs in the last war. Among the most interesting phases of the postwar amateur picture has been the increasing interest in the technical advancements in the communications field. Our technical advancements have been numerous, and we can look forward to many more in the future.

There has been, however, one phase of this postwar preoccupation with the technical advances in communications which is not considered by us to be sound. There has grown up among a few zealots a conviction that c.w. radiotelegraphy is passé, that the day of the International Morse operator is gone. Nothing could be farther from the truth.

No technical advances have eliminated the need for the manual radio operator. To date, we have no automatic method that can in size, weight, frequency economy and simplicity compare with c.w. telegraphy; we have no system which will discriminate against accidental or intentional interference to the extent possible with a trained operator. There is no electronic substitute for an operator's brain. We in the Air Force have many communications circuits which operate under marginal conditions; under such conditions the additional flexibility, simplicity, and reliability of a c.w. circuit frequently mean the difference between having communications and not having them. Where we can use them, we will employ the latest advancements in radio communications including radioteletype, facsimile, and television techniques; in the foreseeable future, however, we see no replacement for the manual radioteletype operator in the field for which he is peculiarly adapted.

We feel that the continued interest of the ARRL in the maintenance of a high standard of radiotelegraph operating ability among radio amateurs has been most helpful. As the result of your program, which includes the reservation of a proportionate share of amateur frequencies for exclusive c.w. use, we feel that the cause of national defense has been materially advanced.

— *F. L. Ankenbrandt,*
Major General, USAF,
Director of Communications

UNDERGROUND ANTENNAS

Engineering Products Dept., RCA, Camden, N. J.

Editor, *QST:*

Two wars ago, I had the pleasure of supervising the installation of the largest underground antenna system ever devised. It was for good old Uncle Sam and was buried on the grounds of the New Orleans Naval Station, NAT, just prior to the end of hostilities in the year 1918. Yes, underground antennas did exist and they were very efficient. They worked exceptionally well in areas where static was most bothersome. My work on this project resulted in several improvements covered by patents Nos. 1,372,658 and 1,429,240. Known as the Rogers system, it was designed to function on wavelengths ranging from 600 to 14,000 meters — the latter so that we could copy OUI and POZ, the two German propaganda stations in operation at that time. This was accomplished by burying three different lengths of wire in each of four directions: N, E, S, and W. A clever switching unit permitted the operator to select any two sets of wires. We read many a station signal on the mill when these same signals were unintelligible at the main receiving station where an overhead antenna was employed. On the overhead antenna all they heard was a continuous stream of growling and howling static. We actually 'phoned many an important message to the regular operating station when they found it impossible to copy because of heavy static.

These buried wires displayed directive characteristics. If an east wire and a south wire were selected, reception was best from a northwesterly direction. In fact, we employed our underground system to locate a suspicious station that opened up every night at a definite time and sent a long string of Ds. Soon after he shut down, OUI would come back with a long mess of NDs. Our underground "direction-finder" antenna system pointed its finger to Mexico. Sure enough, the station was located and the Mexican government was forced to silence the transmitter. It was reported at the time that the equipment had been shipped by submarine from Germany.

In the December, 1919, issue of *Radio News*, I presented a complete story on underground antennas. More data in their September, 1925, issue. I also published a complete series of articles on the subject in *Radio Digest Illustrated* — June 28, July 5, July 12, Aug. 16, 1924 — and in the March 28 issue, 1925.

Several years prior to the war, we (W. E. Beakes, E. L. Commagers and I) had tried underground antennas with little success. We employed a crystal detector without amplification. Years later, vacuum-tube amplifiers made it possible to obtain sufficient signal strength, and with a very favorable signal-to-static ratio. So, the truth of the matter is that underground antennas did exist, worked very well, and then, with the introduction of h.f. and v.h.f., *they went underground.* It was surprising as well as interesting to learn from W8EFW, in March *QST*, that the underground antenna has been "dug up," so to speak.

Since I have never attempted to employ buried antennas on wavelengths shorter than 600 meters, I cannot predict how well they will behave for the amateurs on their short-wave bands — but, we can all hope and await progress reports with much interest.

— *E. T. Jones, ex-5QW*

[EDITOR'S NOTE: Hq. and W8EFW have received numerous letters on the intriguing subject of underground antennas. While some are from amateurs currently experimenting and showing promise of results, most are second-hand or "hear-say" reports about what someone else has done, or hazy recollections of the writer's own experiences many years ago. Printing them all would only serve to highlight a controversy of opinion without providing any definite answers. So we prefer to let the matter ride until someone comes up with an account of tangible and supportable facts after time has permitted a more thorough investigation.]

SIX

R. D. 3, Ashland, Ohio

Editor, *QST:*

Although in recent months six meters has received much publicity, I believe it has been mostly the wrong kind. Too many of us regard it as a sort of unreliable DX band, and we neglect the possibilities it has for rag-chews and short-haul work. This is especially true during the winter.

Six gives us more operating room than all our lower-frequency assignments combined. It is comparatively free from QRM, QRN, BCI, antenna space problems, and so on. Unfortunately, it is also comparatively free from hams!

Probably a third of our 75-meter contacts could be made as well on six; and if QRM is considered, they could be made better. It is a better ground-wave band than ten, and extended local contacts can be worked on six when ten is open for skip. It is an excellent substitute for 160, with some DX thrown in. It is less removed from the low-frequency assignments than other v.h.f. bands, and much of our regular equipment will, or can be made to, work there. In addition, many stations already have the receiving equipment. Still, six is not bearing even a small fraction of the load which it could and should be doing.

Let's look at the situation from my QTH in north central Ohio. The everyday ground-wave range of a hundred-watt rig with a fair beam is about 75 miles. A circle of that radius drawn about my location will take in over half the population of Ohio, or more than three million people, and of these I suppose over two thousand are hams. Within that radius, and of a possible two thousand or more stations, I have heard just 14 in the last six months. After a sorry record like that for the use, or disuse, of four megacycles of good operating territory there should be few remarks about the loss of frequencies. It is true that six is of little interest to the DX man, or those in sparsely-populated sections of the country. But if those of us who can use the band do not make some use of it we have little room for complaint, either as to frequencies or QRM.

Why the band is not used more, I don't know. I suppose the reason so few stations operate six is because so few stations operate six, silly as it sounds. Or perhaps it is because all hams have so many things of vast importance to talk about that they can not risk having no one to tell it to. But seriously, if a fair number of stations will get on the band and spend a part of their operating time there, the timid souls will follow. Uncle Sam helped us to put two meters across with his 522. Can we put six across with our own efforts, or shall we wait for another war and hope for a six-meter 522?

— *T. M. Stence, W8NQD*

BEAM PATTERNS

66-B Elizabeth Road, Hampton, Va.

Editor, *QST*:

I would like to question a misleading conclusion in W3QP's letter published in May *QST*, and expand on your comment on the letter. "While the geometry of Mr. Morgan's letter is correct . . . ," the results he has got from it are not. As you pointed out, " . . . in practice, dispersion effects tend to reduce the strict accuracy of the beam and it never does focus back to a pin point at the antipode." That point is correct, but it is not the main error in W3QP's result.

The beam pattern *is* "as advertised" past the 6250-mile point. Even though the beam-width may become narrower (dispersion neglected) as regards its linear width in miles, spherically it has the same angular width all the way around the globe, exactly the way the longitudinal lines are the same number of degrees apart at every point. Therefore, a slight error in training will be the same angular error and the same percentage error at all points.

Now back from pure theory to practice — dispersion effects will reduce the beam's accuracy and would probably make the error even less noticeable.

— *Rabun M. Wood, jr., W4GWM*

THE BLESSINGS OF QRM

3667 Elm St., Hapeville, Ga.

Editor, *QST*:

I am practically new as a ham, having received my call about last August, but have been operating since 1930. At any rate, the gripes about the QRM have got me sounding off. What is the matter, anyway? Why does an amateur gripe so about QRM when it has been the QRM that is the direct cause of so many of the world's good operators coming from the ranks of the amateur? When an operator can battle ham-band QRM and come up with a perfect copy, then with a lot of practice he might be able to copy half the stuff on 500-kc. commercial frequency. I don't know for sure, but I will bet that almost all of the major developments that have helped to insure communication in spite of QRM have come from this same QRM condition. We started at spark gap — which has been copied just as far as any signal today — came through MOPA, single-wire antennas, right on up to today with xtals, rotary directional beams, xtal filters; and now we are heading into s.s.s.c., etc., etc. The thing for the ham to do is to get busy and figure out a way to put 100 conversations on the same channel such as they have done on landline. The same QRM condition that is so berated today will probably lead to QRM-free perfect transmissions at some future date, with different methods, equipment, etc. But, of course, then the "ham" is a gone gosling. . . .

— *E. F. Hunt, W4MOS*

643 Bird St., Parkersburg, W. Va.

Editor, *QST*:

As a fairly old-timer, I would like to put in my say in this QRM problem.

Most problems can be licked by equipment, frequencies, and coöperation. If a newcomer reads *QST* he can have sufficient knowledge to apply these three. However, I think many of us can profit from commercial and military practices

I have seen some pretty difficult tasks accomplished by low power when identical offices could not do as well with greatly increased power — specifically, 100 watts *vs.* 2 kw. on 3 and 8 Mc., both stations using the same frequencies. This settles the power question. Be able to QRO or QRP.

The amateur has a wealth of frequency space, wonderfully divided. How many of us use the frequencies available for a certain type of amateur service? To work 100 miles at a specific time economy demands that the frequency employed be usable only up to 100 miles. To work a station at 1000 miles, use a frequency good for 500–1500 miles at that specific time. To work 100 miles, use v.h.f. Why stay on one or two bands? The result is unnecessary QRM to all parties trying to use those two bands. This sums up frequencies.

I can see no reason why the amateur should not restrict his transmitter to 3-kc. audio, and there are too many good reasons to be enumerated here. Methods of obtaining modulation are many; economy demands that the method needing the least space normally be used. Why use single sideband to work a guy across town on a v.h.f. band clear of QRM? Why try to work a guy 500 miles away on 80 with a transmitter that occupies 10 kc.? Use sense.

We must have the equipment for what we want to accomplish, and we must use that equipment in a sensible manner. Our frequencies would carry much more traffic if we used the correct frequency for the job and the correct equipment for the frequency.

I think we could do the job profitably if we would coöperate. We have the job half licked when we realize that the other ham has the same problem you and I have. Don't tear your hair out; try another of our many bands; one other band probably will do what you want.

— *Lt. Cmdr. F. D. Masters, USNR, W8DNN*

A BIT OF HISTORY

R. D. 1, West Middlesex, Pa.

Editor, *QST*:

In the history of amateur radio in the 25th edition of the ARRL *Handbook*, particularly pages 9–10, I find that no mention is made of an outstanding act on the part of *QST* and ARRL. I refer to the republication of *QST* after World War I, in that the unexpired subscriptions (prewar) were honored and fulfilled. I had the pleasure of being one of the subscribers of *QST* at the time of its discontinuance. When I received a notice that it was necessary to discontinue publication because of the war, I was dubious as to whether it would be republished and if so if I would receive the remainder of the copies. When War I was over I received all the *QST* unexpired subscription. I have often felt that this act should receive a little more publicity.

— *Carl E. Herr, W3LIE, ex-9AJS (1916)*

(*Continued on page 102*)

Operating News

F. E. HANDY, W1BDI, Communications Mgr.
J. A. MOSKEY, W1JMY, Asst. Comm. Mgr.
ALBERT HAYES, W1IIN, Natl. Emerg. Coördinator

GEORGE HART, W1NJM, Communications Asst.
A. F. HILL, JR., W1QMI, Communications Asst.
LILLIAN M. SALTER, Communications Asst.

Planning and Rebuilding Time. Summer is traditionally the time for continued use of portable equipment when visiting the mountains or seashore. It is likewise the time for relaxation and planning home-station arrangements for the busy fall and winter season. If one is going to have an up-to-the-minute 'phone transmitter, this is a good season for reviewing all the *QST* articles on s.s.s.c. telephony with a view to getting started right on the project. For OES appointees, the completion of equipment for the next-higher v.h.f. band and its preliminary testing will be in order. ORS appointees, traffic men and DX operators craving increased versatility in their station arrangements are in many cases installing their independent emergency-station equipment (transportable separate low-power transmitter-receiver and power supply, etc.) right in their shacks. This permits the DX man to connect into traffic networks and support the section program at the same time his high-power rig is available for picking up casual opportunities at rare DX. 'Phone-operating members can likewise keep their hand in 3.5- and 7-Mc. c.w. The v.h.f. specialist can have full use of the "d.c. bands" for sending messages and lining up v.h.f. tests and schedules, using the reliable ranges of h.f. equipment to do so. The old-line traffic gang might be surprised at the amount of DX their "emergency" rig can work on 14 Mc. In earlier years, we often put our emergency equipment away in mothballs awaiting FD and summer uses of the next season. This year including our entire battery-powered station within the main station gives instant coverage of an additional frequency band. Why use high power for any job that a 30- to 50-watt power input will accomplish so handily?

Keying Sense. W2WTJ forwards a copy of a praiseworthy letter which was formulated for assisting a fellow operator whose keying was poor. Some excerpts from this letter may well point the way to some generally-needed improvement. The know-how comes from *experience*. Now if only the *right* operators will read, and study their own technique. . . . We'll quote and let readers draw their own conclusions. "W—— was considerate in offering *noise* as an excuse, but much of the trouble was really due to your inability to send correctly on this occasion. Your bug, by the way, was so out of adjustment that it in part accounted for your apparently sloppy sending. The dahs were so clipped that it was impossible, with the setting at your present speed, to get uniformity between your dits and dahs. The maladjustment was proved when you tried to slow down. Your sense of rhythm appeared too slow for bug operation. A bug cannot be set for 40 w.p.m. when the rhythmic experience of the man behind it is geared to 18 or 20. It would have been better to have shifted to a straight key instead of trying to make the other fellow think you were able to handle any stuff at any speed.

"Manual operation is a prime requisite before attempting to handle a bug. Sending that *sounds* fast to the person transmitting doesn't always mean it *is* fast. If you will make a recording or tape of your sending and listen to it, it will be the best thing you ever did for yourself. Please take all this in the light of constructive criticism. . . ."

For Shorter CQs. A communication from W4IPC invites attention to the practice of some amateurs in sending unnecessarily long CQs. "Immediately after signing with me W—— called CQ for three minutes. That's making mighty poor use of our amateur frequencies. Incidentally, I could exchange only a few remarks with him as he was one of these 'GE QRU BCNU' boys."

QRRR — New Emergency-Call Designation. The meanings assigned to Q-code abbreviations are always reviewed on the occasion of the International Telecommunication and Radio Conferences. The decision of conferees that QRR in

the future will question and affirm whether one is "ready for automatic operation" precludes continued use of this signal for our emergency call after ACy determinations are in general effect. To

avoid possible confusion, ARRL has adopted for understanding and general use in connection with amateur emergency work the following new special call and assigned meaning:

QRRR Official ARRL land "SOS." A distress call for emergency use only by a station in an emergency situation.

All amateurs identified with the ARRL Emergency Corps should make note of the above modification. Effective at once QRR will no longer be used; instead, QRRR. In the event of necessity in emergency situations, QRRR will be the official ARRL distress call. QRRR calls should never be made by amateur stations *outside* an emergency zone. The call is authorized only for those in difficulty and needing outside assistance, and is to be used only by stations in a zone of disrupted or nonexistent communications.

OBS Certificates To Bear New Designation. By August, section communications managers will have available the new certificates identifying OBS appointees as Official Bulletin Stations. The words *Official Bulletin* are those under which ARRL information bulletins of interest to the amateur service have been issued for several years. They avoid any confusion with the term broadcasting. It is suggested that all amateurs review the prohibition against broadcasting contained in FCC's revised §12.103; also the four *authorized* types of one-way transmissions (§12.106). See "Happenings of the Month" elsewhere in this issue for the text. The prohibition against "broadcasting" is not new and FCC is merely clarifying our rules to protect our type of service! Most hams are familiar with FCC practice in citing amateurs who have mistakenly addressed one-way transmissions to unlicensed persons or short-wave listeners who wrote them, or if they emulated broadcast stations dedicated to public-entertainment features! Amateurs should keep in mind that their service is primarily one of intercommunication, point-to-point, with similarly-licensed amateur radio stations!

About the OBS Certificate reissue: SCMs are instructed to issue Official Bulletin Station Certificates to those operators who resubmit directly to them information on *current* OBS schedules for sending official information addressed to all amateurs. Each SCM will prepare a new endorsement-appointment card to be forwarded to Headquarters as each reissue is completed. Outstanding OBS Certificates will be automatically canceled as of September 7th for stations not applying to SCMs for the new certificates. *Only* active appointees can be kept in the OBS system. Maintaining OBS appointment requires showing a minimum of at least three scheduled transmissions per week.

ARRL's mailing list will be revised completely during September to eliminate mailings to all OBS from whom new schedules (through SCM channels) have not been received. All amateurs please note that effective with this announcement all references to OBS refer to the appointment known as Official Bulletin Station.

Code-Practice Station Volunteers Wanted. It is requested that amateur operators who are willing this September to establish a voluntary schedule of transmitting code-practice information to assist beginners and aid in improving general proficiency in code drop a line to Headquarters, setting forth their proposed schedules and effective date in September or October. There is always a keen demand for information on stations sending alternately on code and voice at different code speeds and we would like to present in *QST* in an early fall issue such a list of CP stations. Our Training Aids section will be pleased to send some information helpful to the conduct of such programs on request. The new FCC §12.106 authorizes transmissions addressed (QST) to amateurs intended for persons learning or improving efficiency. ARRL centralizes its program to give preference in listings to 28–29.7 Mc. band stations so that this valuable training work can go forward with minimum interference to general amateur work in the lower-frequency amateur bands. Can you help by taking on a schedule, please? Drop a line to ARRL today.

KLPO off to Arctic. Our best wishes for successful communications accompany Operator Bill Deutsch, W2VVV, who sails with Commander Donald B. MacMillan on this year's Arctic quest. KLPO is licensed by the FCC for two-way work with amateur stations. It is believed most amateurs will be able to work KLPO if they conscientiously look on 8250 kc. or 12,480 kc. while the S.S. *Bowdoin* is adventuring in the North. Many postwar hams who have never had the thrill of working an expedition may also be able to contact W2VVV/MM, if special FCC authorization is granted for use of his personal equipment on the regular ham bands. — *F.E.H.*

A.R.R.L. ACTIVITIES CALENDAR

Aug. 19th: CP Qualifying Run
Sept. 14th: CP Qualifying Run
Sept. 25th: V.H.F. Party
Oct. 16th–17th: Simulated Emergency Test.
Oct. 18th: CP Qualifying Run
Oct. 23rd–24th: CD QSO Party
Nov. 13th–14th, 20th–21st: Sweepstakes Contest
Nov. 17th: CP Qualifying Run
Dec. 17th: CP Qualifying Run

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Jan. 1st–Dec. 31st: Most-States V.H.F. Contest
First Saturday night each month: ARRL Officials Nite (Get-together for SCMs, RMs, SECs, ECs, PAMs, Hq. Staff, Directors, Alt. and Asst. Dirs.)

WITH THE A.E.C.

W8ARP, EC, pulled what seems to us to be a clever recruiting stunt during the Field Day operations of the Central Ohio Radio Club. As each operator not already an AEC member prepared to take his shift, W8ARP signed him up in the Corps before he was permitted to handle the controls.

—...—

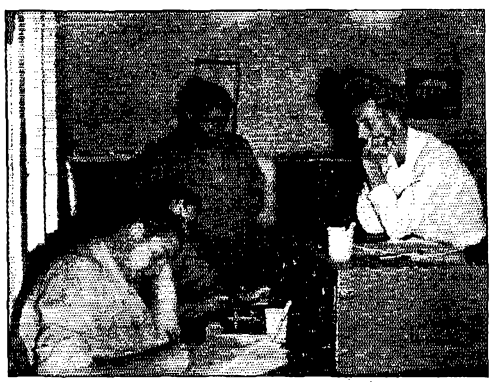
The Maplewood (Mo.) Chapter, Order of DeMolay, was treated to a demonstration of AEC work by the Egyptian Radio Club on June 8th. Equipment used comprised a master control station set up in the Masonic Temple and mobile units both in automobiles around town and afoot. Under conditions of simulated disaster, messages were handled from the City Hall, Fire and Police Departments, and other strategic locations.

—...—

Preliminary reports received at ARRL headquarters from the flood area in Oregon and Washington indicate that the AEC in that region has been doing a bang-up job in supplying communications for the Army Engineers, Red Cross and others. A complete report of amateur contributions will appear in an early issue.

—...—

When a tornado struck McKinney, Texas, on Monday, May 3rd, the hams in the immediate vicinity and those as far away as Dallas and Fort Worth jumped to the rescue. W5ENE and W5NEO set up a portable transmitter in the building occupied by the McKinney Police Headquarters, and W5HBE got his BC-610 in operation with power supplied from the emergency generator of broadcast station KMAE. In addition, the Dallas Amateur Radio Club moved into McKinney with portables which were made available in the event that either of the already-operating stations needed assistance. Approximately thirty messages were handled between McKinney and the outside world over these circuits, and operations ceased at 4:00 A.M. on the morning of the 4th. The following are among those who assisted in the success of this operation: W5s ALA, ARK, AST, ATM, AVG, CDU, CJJ, DAS, DXR, EVI, FDI, GZU, HJX, JNN, KUC, LSN, LTP, MA, MIY, MXV, RG and WZ.



W5NEO (front) and W5ENE, shown at the controls of W5ENE/5, operating under emergency conditions at McKinney, Texas, immediately after the tornado. Two members of the Texas National Guard are observing the proceedings.

PRIZE-ARTICLE CONTEST

• The article below by W. J. Wilkinson, jr., W5VT, wins a prize in the CD Article Contest.

You are invited to submit entries in this contest. The author of each article used is awarded a $10 prize, consisting of $5 in U. S. Savings Stamps and $5 in ARRL supplies or publications (except *QST*). Contributions may be on any subject of interest to amateur radio operators. Articles are selected on originality and value to the fraternity.

Give this contest a try. You may wish to write on *Emergency Corps planning work and drills*; 'phone or c.w. operating procedures; work on radio-club committees; organizing or running a club; the most interesting band for you; code-proficiency techniques; DX activities; traffic work; getting the most out of ham radio; or some subject we haven't mentioned. You are not limited; make your contribution on any topic of interest to radio amateurs. Please mark your contribution "For the CD Contest."

EMERGENCY PREPAREDNESS

W. J. Wilkinson, jr.,* W8VT

Much has been said and much has been done about our ARRL Emergency Corps, but some concerted effort is still necessary on the part of all Section Emergency Coördinators to overcome some glaring defects. Much of the confusion and misunderstanding is not the fault of any particular SEC but is primarily because of the participation of amateurs who have had no training for the job which they undertake.

If there could be some way devised to eliminate operation in an emergency zone by other than regular emergency-net members the task of establishing a dependable communications circuit in time of disaster would be simplified. Since it is practically impossible to make such distinction, however, the next best thing is to educate all amateurs in emergency operation.

Have you noticed the great amount of QRM from thoughtless fellows calling "CQ emergency zone" or "CQ emergency traffic"? This practice causes much waste of time and useless congestion of traffic channels. Why is all this commotion necessary? Because there is no organized emergency set-up. No system has been outlined which allows traffic to flow smoothly both to and from the center of the emergency.

Why isn't there such a system? Because few amateurs will take the initiative in organizing section emergency nets. The hardest problem for an SEC or SCM is finding someone who is

* Room 313, Jefferson Hotel, Shreveport, La.

willing to serve as Emergency Coördinator for his district. But, when the emergency hits, everyone is ready and willing to stand long watches in order to be of service to his community in time of need. How much easier it would be if these same fellows had offered their services beforehand and worked with the SEC and SCM in establishing a net within their own Section.

There is no substitute for organization. An organized net functions more efficiently than does one "arranged for the occasion" because those fellows who drill and practice message handling learn the faults of others, and through periodic exchange of ideas and observation of the methods used by their fellow AEC members they tend to accept the good traits and reject the bad. Proficiency is the ultimate aim.

After the section net has been thoroughly trained, try joint operation with an adjacent net. Have each operator designated for a specific duty at which his training or experience has made him proficient. Conduct intersection drills only with adjacent section nets.

After your net members become proficient as operators, either by voice or c.w., originate traffic and send it via the regularly-established traffic routes. More than likely several of the AEC members are also on traffic nets, such as the Rebel, TLAP, Pine Tree or Pelican. They want traffic and at the same time want to have local outlets for their traffic.

Who will profit from this experience? Our own game, ham radio, will receive most of the credit. You, the AEC member, will profit in knowing that any job which you undertake will be done systematically. Your community will profit in knowing that in times of disaster its welfare is in the hands of the best-trained operators available. The SECs will profit by knowing that their time has not been wasted.

Moral: Volunteer as Emergency Coördinator for your community right now. Your SEC's address can be had by writing the SCM of your section or directly to ARRL Headquarters.

[NOTE: Mr. Wilkinson's emphasis of the importance of section-wide AEC organization hits the nail on the head, but it should be remembered that the all-important foundation for an effective Emergency Corps is the local organization, directed by the EC in each community, with its liaison between the AEC members and the many local civic and relief organizations which must depend on the assistance of amateurs in time of communications emergency. — *A. H.*]

♦

The operating position at W6CRG, located in the chapter house of the Santa Monica (Calif.) Red Cross, showing (l. to r.) Emergency Coördinator W6QJG, G. H. Briggs, chairman of Communications Section, and Assistant EC W6PTR. Seven mobile units in cars of AEC members, in conjunction with W6CRG as message center, will provide Santa Monica with local emergency communication service when disaster strikes.

♦

FIELD DAY — MID-HUDSON STYLE

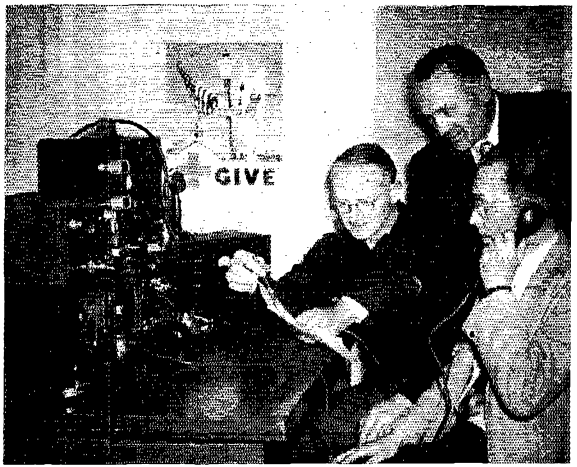
June 12 and 13, 1948, may live in the minds of many hams as the dates of the 1948 FD, but in the eyes of amateurs of the Mid-Hudson Amateur Radio Club it may well have been a Fiasco Day, for many unexpected things happened.

Sunday, June 13th, was not only the date of the Field Day, but coincidentally the date of the annual Albany-to-New York Motorboat Marathon. The amateurs' part in this race was to furnish communications along the course of the event.

It all started on the Saturday prior to the race date when the equipment was set up and tested. Our 28-Mc. net from Poughkeepsie worked reasonably well from the Poughkeepsie Yacht Club to a point three miles upstream. This was a warning net to notify the Yacht Club of the identity of the passing boats so that the men on the 7-Mc. net could relay the information to both Albany and New York.

Then came Sunday, June 13th. The weather, as described by one of the race officials, was "Heavy rain; water flat [if you could find the line of demarcation]; and visibility — fooey!" As if this weren't bad enough, we tried to raise Albany on the 7-Mc. c.w. net. After giving W2AAO and W2SUL a try, we listened and the results were amazing to say the least. We could just barely hear Albany, when suddenly a guy pipes up with CQ CQ CQ DE W7 ——. Then immediately the whole band fell in on him; W6s, W4s, WØs and just about everything but locals. Our long-planned net had become a victim of an unexpected change in skip. Things looked bad until two in the afternoon, when we heard New York calling us. We received the New York stations, W2ALH, W2VHS and K2NAR, well enough to get reports on the first ten racers to cross the finish line. In the meantime our 28-Mc. spotting net with W2LDS, on a small yacht, reporting the passing boats to W2CGT at the Yacht Club, was working to perfection.

The 7-Mc. circuit to Albany and New York was handled by W2IXK, W2HES, W2NCI and W2TDT. W2NCI's rig, with an 813 in the final, was used for this purpose, and even with the 250 watts we found out that you can't overcome skip with power. — *Secy. R. H. Ward, W2TDT*



BRASS POUNDERS LEAGUE

(May Traffic)

Call	Orig.	Del.	Rel.	Extra Del. Credit	Total
W7CKT	11	18	1191	16	1236
WØHMM	4	41	938	39	1022
W2RUF	38	40	402	27	507
W2UZX	11	56	425	12	504

The following make the BPL with over 100 "deliveries plus extra delivery credits":

W3DQE/3 150 W5KTE 109
W2VOS 138 W3FBF/3 100

A message total of 500 or more, or 100 "deliveries plus extra delivery credits," will put *you* in line for a place in the BPL. The Brass Pounders League listing is open to all operators who qualify for this monthly "honor roll."

TRAFFIC TOPICS

The Eastern Shuttle Net has inaugurated an evening schedule. This group meets Monday, Wednesday and Friday on 7120 kc. at 6:30 P.M. EST. Daylight operations are conducted at 9:30 A.M. EST on 7120 kc. All stations interested in becoming members of this net are cordially invited to write or call W3MWD.

—•••—

As the new traffic season approaches, it is time to start making plans for net openings. Send your tentative net schedules and coverage to Headquarters as soon as possible, in order that we may compile a new net directory. This directory will be as accurate as possible and ready for distribution early in the season. Even if your net was registered previously, please submit the information requested so that your group will be maintained on the active list.

—•••—

Operators trained in handling traffic can be very helpful in time of emergency. Each net member should be a member of the AEC. Contact your local EC and offer your outlets to the emergency organization of your community.

—•••—

The Southern Border Net has been formed in Southern California to cover the Mexican border states. The net meets nightly on 3550 kc. at 8:00 P.M. PST. A drill on procedure is held each Wednesday to improve the operating ability of the members. Stations in Arizona, New Mexico and Texas are urged to join. All interested contact W6BGF or W6LYF.

—•••—

Traffic Outlet Net has supplemented its summer schedule with periods on 7150 kc. as well as 3705 kc. The times for the 7-Mc. periods are Mondays and Fridays at 9:00 P.M. EST and Wednesdays at 9:15 P.M. "TO" covers the eastern portion of the country with connections into nets active during the summer season.

CORRECTIONS — SWEEPSTAKES RESULTS

In the 14th SS results appearing in June *QST* the score of W6WNI, 78,472 points, was incorrectly listed as that of the c.w. winner in the San Francisco Section. The rightful winner is W6MHF, who scored 75,375 points. W6WNI should have been listed as the third highest scorer in the Santa Clara Valley Section. . . . The c.w. score of W2TUK was inadvertently listed as the highest 'phone entry in the N.Y.C.-L.I. Section; 'phone winner in that section was W2EGG with 35,979 points. . . . In the tabulation of club scores, W6TT was credited with winning the c.w. certificate award for the Northern California DX Club; W6MVQ, with 95,200 points, was the winner for that group. Similarly, WØEQN was incorrectly listed as the c.w. winner in the Sioux City Amateur Radio Club; WØFZO was the club winner with 71,840 points. . . . The Arlington Radio Club station, W4LOI, was listed as second-place c.w. scorer in the Virginia Section. It should be noted that this station was manned by three operators, hence its score should not have been compared with those of single-operator entrants. W4KFT should receive credit as c.w. runner-up in the Virginia Section. . . . Under "Leaders in Sections Worked" the call of W3GAU was omitted as one of those entrants who worked all 71 sections in the SS. We hasten to extend our belated congratulations to W3GAU on a fine operating performance. . . . Typographical errors were responsible for the incorrect listing of the following: The call of the Rhode Island Section 'phone winner, W1BFB, was erroneously listed as W1BIB. The 55,688-point score credited to W3MSK under the Md.-Del.-D.C. Section listing was that of W3MSR. The Mississippi c.w. winner's call should have read W5LAK, not W5LAR. Oregon 'phone winner was W7GVX, not W7GUX. . . . Sorry, OMs.

This isn't the K9 frequently reported in DX circles to be active from Dog Island. It is, however, a real live c.w. hound in action! He's Scotty, code-practice partner of Edna Mae Summers, Newcomerstown, Ohio, ardent follower of the ARRL Code Proficiency Program.

DX CENTURY CLUB

Here is a listing, complete as of June 15th, of those who have qualified for the postwar DXCC award. Figures in parentheses following each call indicate order in which awards were issued.

The next complete DXCC listing is scheduled for December *QST*. Award holders who wish their countries-confirmed totals as up-to-date as possible in that issue should submit additional confirmations no later than October 10th.

DX CENTURY CLUB AWARDS

DXCC Certificates based on postwar contacts with 100-or-more countries have been issued to the amateurs listed below. The countries-worked totals indicated have been certified by examination of written evidence under the award rules as published in March 1947 *QST*.

W1FH.....(1)..189
W6VFR.....(3)..181
G2PL.....(90)..179
W8HGW.....(7)..175
W4BPD..... (4)..171
G6ZO.....(10)..171
W2BXA.....(6)..170
W3BES.....(16)..170
W3GAU.....(15)..169
W2HHF.....(14)..165
W6SAI.....(17)..164
W8RDZ.....(20)..164
W1TW.....(11)..162
W1CH.....(5)..160
W1IAS.....(8)..160
W2QKS.....(25)..160
W6GAL.....(18)..157
W2AGW.....(29)..157
W9ANT.....(32)..157
W3JNN.....(48)..157
W6GHU.....(23)..156
W5ASG.....(26)..154
W6QJU.....(70)..153
WØYXO.....(60)..151
ZS2X.....(28)..150
W2GWE.....(37)..150
W4CYU.....(53)..150
PAØUN.....(30)..149
W4AIT.....(35)..149
W8NBK.....(46)..149
W7FZA.....(85)..148
W6DI.....(164)..148
ZL1HY.....(12)..147
W1AXA.....(9)..146
W2GUM.....(39)..146
W1ME.....(44)..146
W3RCQ.....(67)..146
W2CYS.....(2)..145
W1ADM.....(22)..144
W7AMX.....(42)..144
GW3ZV.....(84)..144
W6SN.....(72)..143
W3IYE.....(94)..143
W3KT.....(57)..142
HB9CE.....(19)..141
W6TT.....(43)..141
WØNUC.....(50)..141
W2DS.....(122)..140
LU6DJX.....(135)..140
W2AQW.....(184)..139
W6FSO.....(138)..138
W3GHD.....(65)..137
WØNTA.....(79)..136

W6MEK.....(105)..136
W5KC.....(36)..135
VE7ZM.....(161)..135
W2COK.....(40)..134
W6WKU.....(113)..134
W3EPV.....(56)..133
HB9CX.....(13)..132
W8LEC.....(24)..131
W9RBI.....(62)..131
VE3QD.....(91)..131
W4PN.....(45)..130
W8FJN.....(49)..130
WØGKS.....(71)..130
W6LER.....(109)..130
W3JTC.....(112)..130
PY1AJ.....(124)..130
W2CZO.....(144)..130
W3EVW.....(51)..129
W4MR.....(54)..129
W4BRB.....(38)..128
G2AJ.....(100)..128
W2HZY.....(139)..128
LA7Y.....(59)..127
NY4CM.....(75)..127
W3FGB.....(148)..127
ON4JW.....(156)..127
W2NSZ.....(157)..127
W5FNA.....(61)..126
W9KOK.....(73)..126
W1JYH.....(82)..126
W2BRV.....(114)..126
W7DL.....(118)..126
W3DRD.....(63)..125
PAØJQ.....(86)..125
W2ALO.....(103)..125
W2MEL.....(88)..124
OK1FF.....(130)..124
ZL1BY.....(169)..124
W8FJL.....(83)..123
W3KQF.....(117)..123
W9NDA.....(93)..122
W2LJR.....(125)..122
W1DX.....(138)..122
G5OO.....(145)..122
W3BXE.....(64)..121
W4DKA.....(76)..121
W1BIH.....(111)..121
W6GFE.....(115)..121
W3CPV.....(116)..121
CE3AG.....(123)..121
W2AFU.....(128)..121
W2PWP.....(153)..121
W8JIN.....(27)..120

G8KP.....(66)..120
W6ANN.....(120)..120
W3DKT.....(131)..120
W1ENE.....(133)..120
W5LGG.....(152)..120
W9UIG.....(182)..120
W6RBQ.....(188)..120
W2CWE.....(195)..120
W4JXM.....(92)..119
W2IOP.....(34)..118
W6KUT.....(159)..118
W1CLZ.....(171)..118
W3DPA.....(47)..117
W4FIJ.....(110)..117
W1ZL.....(186)..117
W7BD.....(33)..116
W3TIF.....(68)..116
W6OMC.....(127)..116
W2QHH.....(134)..116
OK1LM.....(154)..116
W6RDR.....(200)..116
W6MHH.....(98)..115
W6BAM.....(119)..115
W6AM.....(210)..115
W3LNE.....(58)..114
W8CVU.....(69)..114
W2SAI.....(97)..114
HB9DO.....(151)..113
W2RGV.....(155)..113
W4OM.....(89)..112
W7GUI.....(189)..112
W1FJN.....(196)..112
IIKN.....(208)..112
W9ERU.....(80)..111
W6PB.....(132)..111
W1KFV.....(175)..111
W5BGP.....(201)..111
W7BE.....(204)..111
W2ITD.....(205)..111
W6TI.....(77)..110
W8FGX.....(78)..110
IIIR.....(96)..110
W6BPD.....(99)..110
W5CPI.....(108)..110
W2GNQ.....(141)..110
G8IL.....(142)..110
KP4KD.....(167)..110
W1LOP.....(183)..110
ZS6DW.....(55)..109
W6CEM.....(176)..109
W6PUZ.....(185)..108
W1WK.....(197)..108
ZL2QM.....(166)..107

W8SDR.....(207)..107
W4FPK.....(147)..106
G8TD.....(202)..106
W9DUY.....(52)..105
ON4MS.....(174)..105
W6KRI.....(81)..104
G3FJ.....(104)..104
W2TQC.....(136)..104
WØSQO.....(162)..104
W6NNV.....(180)..104
W6EBG.....(181)..104
W6LDJ.....(192)..104
J2AHI.....(193)..104
W2UFT.....(206)..104
W6WB.....(106)..103
W7DXZ.....(129)..103
W8ERA.....(158)..103
VK2DI.....(168)..103
W8UAS.....(173)..103
W1BLO.....(178)..103
CM2SW.....(190)..103
WØAIW.....(191)..103
W8LYQ.....(31)..102
EI9J.....(177)..102
PAØGN.....(179)..102
W1JLT.....(194)..102
W6AMA.....(41)..101
W8HRV.....(74)..101
W2QKE.....(95)..101
W6SC.....(102)..101
W4JV.....(107)..101
W9TWC.....(121)..101
G4JZ.....(140)..101
W9FJB.....(149)..101
W6POZ.....(160)..101
W3OP.....(163)..101
W1NMP.....(165)..101
WØDAE.....(198)..101
W3ZN.....(203)..101
W6MJB.....(21)..100
W1BUX.....(87)..100
W6DUC.....(126)..100
W3FJU.....(137)..100
W5ENE.....(143)..100
W4KIT.....(146)..100
W6VBY.....(150)..100
IIIV.....(170)..100
W2BZS.....(172)..100
W8WZ.....(187)..100
W6TZD.....(199)..100
W1HRI.....(209)..100

RADIOTELEPHONE

W1FH.....(1)..152
W6DI.....(14)..135
W1JCX.....(2)..133
W4CYU.....(5)..132
W1HKK.....(3)..124
G2PL.....(7)..124
W6VFR.....(24)..118

W2BXA.....(6)..117
W1NWO.....(9)..114
VQ4ERR.....(10)..114
W1MCW.....(18)..112
W2AFQ.....(16)..111
W1FJN.....(21)..111
W2ZW.....(4)..110

W1ADM.....(22)..110
XE1AC.....(26)..108
TI2OA.....(12)..106
SU1HF.....(13)..105
G3YM.....(11)..104
G6WX.....(15)..101
W8BF.....(17)..101

W2RGV.....(20)..101
ZL1HY.....(25)..101
W9NDA.....(8)..100
W4EWY.....(19)..100
W5BGP.....(23)..100

HAMS AT HEADQUARTERS
W1AW, ARRL Headquarters Station

The following calls and personal sines belong to members of the Headquarters gang:

W1BAW	R. T. Beaudin, "rb"
W1BDI	F. E. Handy, "fh"
W1BUD	A. L. Budlong, "bud"
W1CEG	H. M. McKean, "mac"
W1DF	George Grammer, "gg"
W1DX	Byron Goodman, "by"
W1EH	K. B. Warner, "ken"
W1FTX	R. M. Smith, "rs"
W1FWH	W. E. Bradley, "wb"
W1GS	F. C. Beekley, "beek"
W1HDQ	E. P. Tilton, "ed"
W1IIN	Albert Hayes, "mx"
W1JEQ	C. V. Chambers, "vc"
W1JMY	J. A. Moskey, "joe"
W1LVQ	John Huntoon, "jh"
W1MFA	H. K. Isham, "hk"
W1NJM	George Hart, "geo"
W1ODY	E. E. Miner, "em"
W1PEK	L. T. Waggoner, "roy"
W1QMI	A. F. Hill, jr., "al"
W1QVF	T. F. McMullen, jr., "fm"
W1TS	D. H. Mix, "don"
W1VG	L. A. Morrow, "pete"
W2MHW	R. N. Eidel, "re"
VE3BLZ	J. W. Paddon, "jack"

TRAINING AIDS

New Quizzes. A new quiz is available and should have considerable use among affiliated clubs. Q6, "General," consists of twenty multiple-choice questions and covers a broad range of amateur subjects. While the previous quizzes have been aimed at testing your club members' knowledge of specific phases of amateur radio, this one is designed for testing general knowledge of amateur radio subjects, including DX operating, traffic handling, operating procedure, emergency operating, public relations and BCI, technical radio and ARRL organization.

By the time this reaches print, there will also be available a quiz on "Public Relations and BCI," an increasingly important subject to amateurs. This quiz (Q7) consists of twenty questions of the true-false type. We guarantee that some of these questions will provoke interesting and educational discussions among club members.

Active Season Coming. It is time to start thinking about the active season approaching. Your club members will be coming back from their vacations and your ranks will begin to swell. Some sort of club program will be expected, such as code training, technical training, entertainment features, speakers, operating contests and activities, emergency program, etc. If you plan to use Training Aids this season, you would do well to get signed up for them ahead of time.

This applies particularly to motion picture films, which seem to be quite popular. Many clubs request a motion picture film only a week or two ahead of time, and then are chagrined when they find the film they wanted is not available It is recommended that clubs who plan to use ARRL Training Aids motion pictures (1) read the rules *carefully*, (2) plan your showings at least three months ahead (see p. 81, Nov. 1947 *QST*, if you wish to plan farther ahead than this), (3) make your request on request form No. 1, definitely stating your preferences but *giving as much latitude as possible as to film subject and date*, and (4) obtain reviews of each film you request so you will know what to expect. If you do not have a copy of "Rules for Use of ARRL Training Aids" and a complete list of the Training Aids themselves, you should get this for your club's files. If the list you do have is over six months old, there have probably been additions and changes, and you should get a new list.

Recorders & Keyers. Because of a current lack of demand for the two BC1016 recorders and the three TG-10 keyers available through ARRL Training Aids, we are *temporarily* extending the term of use of these equipments in the hope that clubs will thereby be encouraged to conduct continuing code training sessions for their members. Temporarily, until the demand makes it necessary again to restrict term of use to the period specified in the rules, BC1016 recorders are available to affiliated clubs for a term of two weeks, TG-10 keyers for a term of two months. The term of use may be longer if no other club is waiting after a term has expired. Application for use of recorders and keyers should be made on request form No. 2, a copy of which is available for the asking. Other rules pertaining to the use of these equipments remain unchanged.

Instruction Programs. ARRL Training Aids has available three courses of instruction which we shall gladly send free of charge to any club. One is a suggested outline for a course in radio fundamentals which was designed to follow the ARRL *Handbook*, editions 1942 to 1947 inclusive, but which can also be used to advantage with other texts. There are also two code training courses: a prewar version in four parts, including lessons in sending and receiving — old but not obsolete; and an outline for a code training course which makes full use of ARRL Training Aids including code records, a recorder, a keyer, several tapes and two motion picture films. Clubs who are putting on training courses for their nonlicensed members would do well to get copies of this material.

CODE PROFICIENCY PROGRAM

Once each month special transmissions are made to enable you to qualify for an ARRL Code Proficiency Certificate. The next such qualifying run will be made on August 19th at 10:00 P.M. EST. Identical texts will be sent simultaneously by automatic means from W1AW, W6OWP and WØCO. Frequencies of transmission from W1AW will be 3555, 7215, 14,150, 28,060, 52,000 and

146,000 kc., from W6OWP 7248 kc., from WØCO 3534, 7053 and 14,040 kc. Any one of the three stations may be copied. You are invited to send your copies of the qualifying run to ARRL headquarters for grading. If you qualify, 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 indicating progress above the first certified speed. Please mail your copies of the August qualifying run no later than August 31st.

Code-practice transmissions are made from W1AW each evening, Monday through Friday, at 10:00 P.M. EST, on the frequencies listed above. Tuesday and Thursday transmissions are made at speeds of 15 through 35 w.p.m. in 5-w.p.m. steps. On Monday, Wednesday and Friday, practice is at 9, 12, 18, 25 and 35 w.p.m. References to texts used on several of these practice transmissions appear 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 the W1AW automatic transmissions.

Date:	Subject of Practice Text from June *QST:*
Aug. 4th:	*A Detector for Single-Sideband Reception*, p. 11
Aug. 6th:	*Amplifier Instability in Transmitters*, p. 19
Aug. 10th:	*A Coaxial-Line Receiver for 220 and 235 Mc.*, p. 25
Aug. 12th:	*A New Approach to Single Sideband*, p. 36
Aug. 16th:	*A Transportable 10-Meter Beam*, p. 44
Aug. 18th:	*The World Above 50 Mc.*, p. 47
Aug. 19th:	Qualifying Run, 10:00 P.M. EST
Aug. 24th:	*Tripling to 420*, p. 52
Aug. 27th:	*How's DX?*, p. 55
Aug. 30th:	*A "Q5-er" for BC-348 Owners*, p. 59

ELECTION RESULTS

Valid petitions nominating a single candidate as Section Manager were filed in a number of Sections, as provided in our Constitution and By-Laws, electing the following officials, the term of office starting on the date given.

Arizona	Gladden C. Elliott, W7MLL	April 1, 1948
Indiana	Charles H. Conway, W9FSG	April 15, 1948
San Joaquin Valley	Ted R. Souza, W6FKL	April 15, 1948
Maritime	Arthur M. Crowell, VE1DQ	April 15, 1948
Missouri	Ben H. Wendt, WØICD	April 17, 1948
Alberta	Sydney T. Jones, VE6MJ	May 1, 1948
Eastern Massachusetts	Frank L. Baker, jr., W1ALP	May 15, 1948
Montana	Fred B. Tintinger, W7EGN	June 1, 1948
Virginia	Victor C. Clark, W4KFC	June 14, 1948
Idaho	Alan K. Ross, W7IWU	June 17, 1948

In the Santa Clara Valley Section of the Pacific Division, Mr. Roy E. Pinkham, W6BPT, and Mr. George R. McKercher, W6MLY, were nominated. Mr. Pinkham received 141 votes and Mr. McKercher received 41 votes. Mr. Pinkham's term of office began April 30, 1948.

In the Louisiana Section of the Delta Division, Mr. W. J. Wilkinson, jr., W5VT, and Mr. Robert E. Barr, W5GHF, were nominated. Mr. Wilkinson received 78 votes and Mr. Barr received 71 votes. Mr. Wilkinson's term of office began May 31, 1948.

In the Vermont Section of the New England Division, Mr. Burtis W. Dean, W1NLO, and Mr. Gerald W. Benedict, W1NDL, were nominated. Mr. Dean received 46 votes and Mr. Benedict received 19 votes. Mr. Dean's term of office began May 31, 1948.

In the Sacramento Valley Section of the Pacific Division, Mr. John R. Kinney, W6MGC, and Mr. Irving Astmann, W6OMR, were nominated. Mr. Kinney received 105 votes and Mr. Astmann received 32 votes. Mr. Kinney's term of office began June 10, 1948.

CANAL ZONE AMATEURS

Last month we welcomed the new Canal Zone Section to the ARRL field organization. Note below the legal notice soliciting a leader (SCM) for your section for whom petitions should be filed at once. As soon as elected we shall be able to present news of your Station Activities as given to him monthly.

ELECTION NOTICE

(*To all ARRL Members residing in the Sections listed below:*)

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

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

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

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

The following nomination form is suggested:

Communications Manager, ARRL (Place and date)
38 La Salle Road, West Hartford, Conn.

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

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

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

— *F. E. Handy, Communications Manager*

Section	*Closing Date*	*SCM*	*Present Term Ends*
Arkansas	Aug. 16, 1948	Marshall Riggs	June 14, 1948
Rhode Island	Aug. 16, 1948	Clayton C. Gordon	Resigned
Alaska	Sept. 15, 1948	August G. Hiebert	Jan. 15, 1948
Colorado	Sept. 15, 1948	Glen Bond	April 17, 1948
British Columbia*	Sept. 15, 1948	W. W. Storey	May 1, 1948
Western Massachusetts	Sept. 15, 1948	Prentiss M. Bailey	Sept. 30, 1948
Illinois	Sept. 15, 1948	Wesley E. Marriner	Sept. 30, 1948
Canal Zone	Sept. 15, 1948	.....	.....
Northern Texas	Oct. 1, 1948	N. C. Settle	Oct. 15, 1948
Eastern New York	Oct. 1, 1948	Ernest E. George	Oct. 15, 1948
Mississippi	Oct. 1, 1948	Harold Day	Oct. 15, 1948
Saskatchewan*	Oct. 1, 1948	N. E. Thompson	Oct. 15, 1948
Oklahoma	Oct. 1, 1948	Bert Weidner	Oct. 15, 1948
Kansas	Oct. 15, 1948	Alvin B. Unruh	Oct. 29, 1948

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

Station Activities

SCM — AEC — ORS — CP — SEC — OBS — TLS — OO — RAM — WAS — OES — A1 OPR — EC — DXCC — CLUBS — RM — OPS — RCC — BPL — WAC

• **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 — The Haverford Township Emergency Net served the Valley Forge Council Boy Scouts with communication during the camporee at Camp Delmont over Memorial Day week end. Five of the nine districts had 144-Mc. stations on the net and one ARC-5 was used for communications out of the area. Since there was only one land line for use at the camp the VHF circuit was essential to try to keep this one line open for important messages. TR-4s ran for 12 hours from a single storage battery charge and 522s performed well from gasoline-driven generators. The antennas used for area communications were folded dipoles made of solid No. 12 wire and a five-element beam took care of the communication with outside stations. FBF was net control and acted as leader of the expedition, assisted by DQE, WW, MYQ, KAB, AJV, NWN, and BES. The highlight in point of service was the summoning of a doctor and an ambulance by radio when a lad was run over by an automobile. BBV is helping the FCC eliminate interference from commercial induction heating equipment. The Delco Club is now affiliated with the ARRL. The summer schedule of the EPA Net is Thursdays at 6.30 P.M., 3785 kc. during June, July, and Aug. ALX now boasts a Collins transmitter and receiver. AQN recorded the York Amateur Emergency drill for the ARRL. York, Lancaster, and Harrisburg had 18 stations tied in on a 28-Mc. emergency net drill. MAC, Easton, works into Connecticut on ground wave on 50 Mc. NNV lost a 250TH and two 100THs. The South Philadelphia Amateur Radio Club has applied for ARRL affiliation. Anyone wishing to join the club may call the secretary, Fred Craven, ERV, phone HOward 8-4713. OY, secretary of the Lancaster Radio Transmitting Society, reports as follows: CXE has been appointed EC for Lebanon and Lancaster Counties with LN as assistant EC in charge of Lancaster County. The Lancaster emergency group has offered its facilities to the local spon ors of the Soap Box Derby. The 144-Mc. transmitter hunt sponsored by the Lebanon Amateur Radio Society on May 16th was won by GJA, KBZ, and HOV in that order. OLT and OLV are new Lancaster hams. Members of the LTRS raised a new 60-ft. tower for FMZ. EU schedules BQ Mon., Wed., and Fri. at 9:30 DST on 3503 kc. Traffic: W3VMF 259, DQE/3 212, FBF/3 198, DZ 139, KFA 101, AJV/3 95, NWN/3 63, EM 61, MYQ/3 58, ELI 57, BES/3 44, CUL 43, BBV 18, OML 16, AQN 10, CAU 2.

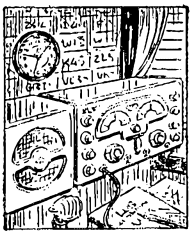
MARYLAND-DELAWARE-DISTRICT OF COLUMBIA — SCM, Eppa W. Darne, W3BWT — The Baltimore Area is the first area in the section to have a complete complement of activity appointments. VT is Emergency Coördinator, MJQ is Route Manager, and EQK is Phone Activities Manager. Radio Maryland, the Radio Club of the University of Maryland at College Park, now has the call EAX, uses a BC-610 rig, and is mostly on 14 Mc. The Washington Radio Club, at its first May meeting held an antenna symposium. At the second May meeting the annual election of officers was held with the following results: EIS, pres.; AM, vice-pres.; HHN, corr, secy.; AKB, rec. secy.; JDL, treas. The membership also talked over final plans for the June Division Convention. The Delaware Amateur Radio Club had a booth at the Wilmington Hobby Show May 21-22, including a station on 28 and 144 Mc. Many contacts were made and the entry was awarded a blue ribbon as first prize in its class. The U. S. Naval Academy Radio Club is again in full-time operation. With the same call, ADO, the group has 150 watts on 3, 5, 7, and 14 Mc. and lots of DX has been worked. A 28-Mc. three-element beam is under construction, and considerable improvements are in progress for next fall radio season. JCR is on 28-, 14-, and 3.9-Mc. 'phone regularly. KRJ has been appointed OES, and is the only one in the section. Jack is on 7 and 144 Mc., and is attempting to determine causes of 144-Mc. band openings. AFU is working lots of DX on 14-Mc. c.w. AKR is on 7- and 14-Mc. c.w. JVG is on 3.5- and 7-Mc. c.w. GZH has been appointed Emergency Coördinator for the Wilmington, Delaware, area. EYX visited 4DBG in Alabama for a week. BWT is installing a third rig so as to have separate rigs for 3.5, 7, and 14 Mc. DVW, ex-1DVW, at Rockville, Md., is on 3.5-Mc. c.w. and 28-Mc. 'phone. IL has made WAS and recently received a 30-w.p.m. Code Proficiency Certificate from ARRL. 1LNC/3 is now located in Clinton, Md., and works on 3.5, 7, and 50 Mc. LYV is building a single-sideband transmitter. JHW is on 3.5 and 14 Mc. PV is making lots of out-of-town contacts on 144 Mc. During May BDU motored to the West Coast, carrying 28-Mc. mobile gear. VT has a 9-watt rig using 7, 14, and 28 Mc. which gets out well using an 18-foot vertical antenna. EFZ tried narrow-band f.m. and is also on 14-Mc. c.w. with 8JK antenna. CJS now has 100 watts to his final using an 829 and gets out remarkably well. MUU has a portable-mobile rig for 28 and 50 Mc. EQK has received WAC; he has been appointed Phone Activities Manager for the Baltimore Area, and is installing new coils in final. AFR is new chairman of BARCS nominating committee with HJY, JE, EQK, and BII as members. FRD is back on 28-, 14-, and 7-Mc. 'phone and c.w. He worked 17 states using 2 watts to a VFO. OMJ is using 50 watts on 28-Mc. 'phone. GBB is on 3.5 and 7 Mc. with 50 watts. Traffic: (April) W2NDL/3 364. (May) W3AKR 29, AKB 16, BWT 10, CJS 7, EFZ 6, JZY 5, JHW 3.

SOUTHERN NEW JERSEY — SCM, G. W. (Bill) Tunnell, W2OXX — This section was well represented at the Atlantic Division Convention in Washington, which was an excellent example of coöperation among various clubs for a common cause. PAU is now sprouting an OES Certificate. RG says the tentative opening date for the 3700-kc. net is September 8th at 7.30 P.M. ORS schedules OQS daily on 420 Mc. SXK is using a BC-696 on 3.5 and 7 Mc. BEI is running tests on his two-element 14-Mc. beam. We welcome HAZ into the A-1 Operator Club. ZQ, the DVRA club transmitter, is making progress with 7-Mc. DX. The Hunterdon County Amateur Radio Association has a two-kilowatt 120-volt gasoline motor generator which was put to work on Field Day with the club's five-band set-up which includes plenty of emphasis on u.h.f. WTJ soon will have a BC-645 on 420 Mc. in his car. Best of luck to our old friend CFB, who has now moved to the Northern New Jersey section. We welcome the following new hams: YGU, in Trenton, and YRY, in Ocean City. QZF is a new OPS who also wishes to hear from anyone interested in frequencies above 3000 Mc. The 75-Meter Emergency 'Phone Net has 24 active members under the capable direction of QEM. Traffic: W2ZI 52, RG 22, ORS 19, SXK 15, BEI 12, HAZ 6, HV 6.

WESTERN NEW YORK — SCM, Harding A. Clark, W2PGT — SEC: SJV. RM: FCG. The Rochester Amateur Radio Association elected the following new officers: TTQ, pres.; VEW, vice-pres.; WFU, secy.; NES, treas.; QY, OWF, RSL, and ZS, executive committee. The first fall meeting is scheduled for Sept. 2nd at Rochester Museum with all hams in area invited to attend. Mark your calendar now. The RARA is planning a picnic for early August. For details contact WFU. OWF, UTH, and SZL are new holders of Class A licenses. RMS and VBH have new mobile equipment to ease monotony of field trips. RUF makes BPL this month. Congrats and keep up the fine work. Can't anybody stop the XYLs? Another Syracuse-Colgate rivalry was started recently when VIQ and WEN handled a chess match by radio assisted by SFZ and 8GJG. Two nights of playing resulted in a draw! QHH still schedules VE8MA and is handling plenty of traffic. BLP says 3.85-Mc. 'phone DX is still holding up. VUE has received KZ5 certificates for home QTH and also from portable QTH in Florida. WEN has new "V" beam on 14 Mc. working fine with 25 watts. YLM is new ham at Endwell and is operating on 3.5-Mc. c.w. RTW and PUG handled v.h.f. communications for National Soaring Contest at Elmira. The Elmira Amateur Radio Association meets the third Wednesday of each month. A picnic is being planned for August. Contact PVG for details. In spite of a snowstorm 200 hardy souls attended an FB hamfest held by the Rochester club. AW and PGT attended Atlantic Division Convention and renewed acquaintances with several of the old Western New York gang now living in W3 and W4 Land. Traffic: W2RUF 507, WFU 275, SJV 126, BLO 108, VIQ 88, QHH 77, PGT 66, UYG 54, AOR 28, WOE 28, WZQ 10, BLP 2.

WESTERN PENNSYLVANIA — SCM, Ernest J. Hlinsky, W3KWL — In the Smoke City area UVD reports WESCO doing FB. NJH has new Collins receiver. GRZ is using BC-453A as a Q5-er. FIH is converting 459A for 14 Mc. SCH is switching over to 'phone. KQU is burning out 'scope tubes. QDN is working 7-Mc. c.w. LWW is using vertical rain spout antenna. FIH has NC-2-40 receiver.

(*Continued on page 70*)



PRACTICALLY every mail brings us numerous letters suggesting changes or improvements in our receivers. We welcome letters of this type for they help keep us informed of the needs and desires of the fellows who use what we make.

Many of the letters received request the inclusion of some additional feature which is of particular interest to the writer. If we were to include all of the extras asked for, the resulting receiver would be bulky and expensive — and also somewhat of a monstrosity! Some of the extras would be of interest to only a few, being a fifth wheel to many; we have, therefore, equipped several models of National receivers with accessory connector sockets so that the user can add whatever item is of interest to him at the moment.

For example, NFM discriminators are available which can be plugged into the accessory socket to provide for NFM reception. There is also available the type SA:4842 NFM discriminator transformer for the amateur who wants to build his own 456 kc. limiter-discriminator; a typical circuit is provided with each transformer. Incidentally, we have heard the comment that many amateurs delay using NFM because so few amateur stations are properly equipped to receive this mode of transmission. A given transmitter on NFM may therefore get a poor signal report, compared to the same rig on AM, because of the other fellow's receiver. Perhaps you are not interested in NFM; nevertheless, the addition of a discriminator to your receiver will give an even break to the fellow who is using NFM for the fun of it or because of BCI troubles with AM.

While on the subject of NFM, we note that the latest amateur regulations permit FM or carrier-shift telegraphy on quite a few bands. Apparently there has not been much activity along this line but, if amateur technique is to be at all like commercial practice, the receiver must have a discriminator of some sort in order to make use of both the key up and key down frequencies. The 456 kc. NFM discriminators for phone use are not suitable for use with the narrow shifts that might be used for telegraphy; the discriminator has to work at a very much lower frequency to give good output with small deviation. For the amateur who wants to experiment with FM telegraphy, the accessory connector socket provides a convenient means of feeding the 456 kc. signal to another mixer and lower frequency IF channel and discriminator.

The possibility of pioneering in amateur radio is, fortunately, not a thing of the past, thanks to the many different signalling methods we are permitted to use. If amateur transmissions were limited to straight CW and AM phone, the game would not be half so much fun for those of us who like to experiment.

RALPH S. HAWKINS, W1OEX

UVD is new secretary for WESCO. NJH has a new Mon-Key. SCH is planning new 'phone rig with p.p. TZ40s. KKA is rebuilding. LGM expects 500 watts on 3.85-Mc. 'phone. OLX is conducting code and theory classes on 28-Mc. 'phone. New additions to Pittsburgh Weather Net are OMA, OOB, and OOD. MHE is building 304TH final. TGP has 800 watts on 14 Mc. Congrats on new radio club in New Kensington. OLM is now in Tokyo, Japan. PJJ is rebuilding entire rig. KOB is back on 28-Mc. 'phone. PY still is taking ye ole traffic. AER schedules Australia and England each day on 14 Mc. NUG is moving to new QTH with shack wired to 220 volts a.c. OIT is active again using 100 watts on 14 Mc. Up Erie way our ace reporter, TFX, sends the following: NEK is working plenty of DX with 20 watts on 28 Mc. LIT was in charge of Field Day plans at Conneaut. JCY was visitor at Conneaut meeting. MZI, at new QTH, wants 522. ONC is building 300 watts for 28 Mc. RED gets nice results on t.v. WBM is heard nightly on 144 Mc. New officers of the RAE are: BHN, LTN, QN, KLD, and Bill Jant, directors; TXZ, chairman; RHK, treas.; TFX, secy.; AQY, GV, and BHN, trustees. NGB worked California with 4 watts input. NCJ claims he worked 2 states with 1 QSO. Yes, it was California, Pa. The Conneaut Radio Club will meet once a month during the summer. In Sharon, the Valley boys did fair work in VHF Contest. KQA has 32-element beam for 144 Mc. ODB is on 144 Mc. LNA is running 80 watts on 144 Mc. 8SFG piled up over 400 points in the VHF Contest. GEG and OAJ are QRL at WPIC-f.m. NDD has a new HQ-129A receiver. Remember the Brass Pounders and Modulators Hamfest in Pittsburgh this August. Traffic: (April) W3MJK 142. (May) W3NCJ 60, KKA 38, AER 37, MJK 31, PY 28, NUG 20, LGM 4, KWL 2, VNE 2.

CENTRAL DIVISION

ILLINOIS — SCM, Wesley E. Marriner, W9AND — Quincy hams affiliated with ARRL as the Western Illinois Radio Club. BIQ broke the ice on 50 Mc., working three W5s in Texas. KNH completed a steel windmill tower to support three three-element beams for 14, 28, and 50 Mc. He will feed the array with a kw. ØMFB, ØARH, ØZKY, and ØCBL, from Kirksville, Mo., attended a recent meeting. AEG was surprised no end to tune across the 28-Mc. band and hear someone sign W9AEG. (No doubt a reflected skip or something.) GQB got the steel tower bug and is elevating his beam from garage to a tower. QHF and AEX want to know how to work 3.85 Mc. with their antennas draped over each other. OAB is knocking the pins off the local S meters with a high power of 4 watts on 3.85 Mc. 'phone. WWO is busy with Naval Reserve Training Center. MTO has a 3.85-Mc. 'phone rig to give away cheap since he is unable to get it to operate on 28 Mc. GQK is on with a kw. on all bands. 5KRC/9 sent in the above information. Club officials are TMI, pres.; AEX, vice-pres.; GQB, secy.; KDO, treas. Oglesby: NOO passes on the sad news of the passing of BZT on May 10th. Joe was extremely well known in the Chicago area, and was a past-president of the Society of Radio Operators. Chicago: New Official Observer WEA has a Collins 75A 100-kc. check bar. NN is trying six-watt aircraft 'phone job on 3.85 Mc. A recent copy of *The Trib*, a Tribune employee monthly magazine, devotes three pages to photos and news of hams on the Chicago Tribune and WGN. This includes a photo of the shack of JGL, WGN newscaster, also shack photos of GLM and NXC, and a very interesting story of the activities of the above and LI, YMI, NN, GDI, YLU, CKU, BBU, WEA, and RV. Freeport: Your SCM visited the Freeport club as the guest of President ZRB. An interesting talk was given by the program director to WFRL. Several of the Rockford boys attended. Chicago: NQL now is JIE. He is on 14-Mc. 'phone with a Collins 30K and a Collins 75A receiver. KA took part in ARRL FMT. Another new Official Observer is HPG. Elgin: Chief RM EVJ had some molars yanked. ZPC attended SRRC Hamfest. Evanston: CMC is on ILN frequency nightly at 8 P.M. looking for traffic for Evanston, Wilmette, Kenilworth, Winnetka, or Glencoe. DUA, the Amateur Radio Emergency Assn., is new ORS and OBS. The DUA Red Cross mobile rig, 200-watt Collins and Kohler unit, is going out with North Suburban Club to sign TO. DUA will be contacting field stations. This information came via BUK. East St. Louis: EBX is on 7 Mc. mostly. He had a bigger job than he expected in putting all switches on one control panel. Wheaton: BRX has acquired a Windmill tower. NIU, at Tonica, received an SWL card reporting him on the air when he wasn't. A few hams seen at Camp Ki-Shau-Wau, Starved Rock, Hamfest were: NN, TO, WEA, ZPC, JIE, UQT, FST, BPU, UIJ, ZHB, EDW, AHI, CEO, FKI, VOA, GPI, HB, 8TBP, 1LVQ and about 300 others. NUF now is 6BES, and is settled in California. Look for him in CD Parties. With 70 watts and a 3.5-Mc. Hertz antenna, APK works nice DX on 14 Mc. The Effingham Radio Club has become affiliated with ARRL. YFV not only hooked AND up with YI2AM but a week later forwarded the QSL. KOK is busy with OO work but works plenty DX. The Illinois Valley Radio Assn. had ØMCX at a recent meeting. IQC is busy building tower for 28-Mc. beam. The Society Radio Operators held Open House April 23rd with over 200 attending. 1PBG, 9DPY, ZDQ, JNP, DYV, and SHP were there. The Austin Park Radio Club, including GGW, BCB, JIO, IKS, DNS, NUX, and K9AAU, turned out in full force. Traffic: W9VOA 28, CMC 22, ASN 12, ZPC 8, BUK 7, NIU 7, EBX 2, YTV 1.

INDIANA — SCM, Charles H. Conway, W9FSG — WSF worked his first ZS6, KL7, and OH2, with 30 watts. Indiana's WWV, UKT, worked PY and KH6 with 10 watts to a BC-459. YB has a new 1-kw. Temco. FJI leads pack 51, Cub Scouts, when not scouting for 50-Mc. DX. EGQ schedules Ether's Golden Voice at Logansport. The Tri States Amateur Radio Society expanded its *Tri States Sparks* into a very good club paper. GFO leads the Evansville DX gang with 78 countries. QLW is right behind with 76. AZU made several contacts with the Hallicrafters Expedition. WBW is proud possessor of WAC Certificate. DDV is new in Evansville. 2RYT, better known as "Light House Larry," demonstrated one of his brain children to the Fort Wayne Radio Club. The transmitter is about the size of an ice cream cone, and operates on 420 Mc. BKJ has new 50-ft. steel tower with a 10 over 20 on top of it. IDZ raised VE2RM for VE2VP, who is attending school in Fort Wayne. ENB and PMT renewed ORS appointments. CQH has a 522 on 144 Mc., an APT-5A on 420 and 1215 Mc., and Klystrons on 2300, 3300, 5650, and 10,000 kc. For receiving he has a BC-1267 feeding the i.f. of the 522 on 144 Mc., a converted APS-13 on 420 Mc., and an APR-5A for the higher frequencies. Horizontal, vertical, parabolic reflectors, and corner reflectors are used for antennas. DHJ received a heard card from England on 3.5 Mc. The Indianapolis Radio Club visited the CAA facilities at Indianapolis. CKP has organized an emergency net with one fixed, three mobile, and two pack stations. GCZ, ZSO, AB, VDD, and BYK are active on 144 Mc. in the Mishawaka-South Bend area. Elkhart and vicinity has BHE, FNP, BKT, and MLX on the ultra highs. RCB, RM for QIN, is rag-chewing on 7 Mc. until QIN opens in September. Appointment as OPS is available for qualified 'phone men. Write your nearest PAM, UGH, or BKJ, or the SCM for further information. WNM, the SEC, needs reports from clubs on what emergency equipment is available and what the club emergency organization is planning for community coverage. TT has switched to safety. Traffic: (April) W9DHJ 15. (May) W9NH 104, TT 55, PMT 15.

WISCONSIN — SCM, Reno W. Goetsch, W9RQM — AFT has SCR-522 installed in his car and has had a perfect QSO up to 10 miles on 144 Mc. BDQ is working on a 900-watt rig for 144 Mc. LZU, our SEC, reports all AEC units worked on Field Day with local newspaper publicity in most cases. In addition to his traffic activity, LFK now is spending some time as OO. 9ESJ/9 operated on Field Day with 5 transmitters. CIH says it will be a busy summer outside the radio shack! NJT has 150 watts to a pair of 24Gs on 50 Mc., and is devoting his time to this band. The Wisconsin Valley Radio Assn. provided radio communication to time the Soap Box Derby runs on Rib Mt. UMX has been appointed as publicity chairman for the Milwaukee County AEC. The Wisconsin State Net continues operation through the summer months on 3775 kc., with DND, CBE, LFK, IQW, and MRY alternating as NCS. The Central Wisconsin Radio Club was active in Field Day under the call W9DQA/9. Also participating were club groups at Madison — W9SWQ/9, Green Bay — W9GFL/9, Manitowoc, Wausau — W9RQM/9, Milwaukee, LaCrosse, Eau Claire, Chippewa Falls, Racine, and Stevens Point. RLB lights his landlord's porch light when he goes on the air. RRA received his radiotelephone 1st-class ticket. We will be seeing you at the ARRL National Convention in Milwaukee, September 4, 5, and 6. If you have not already made plans to attend, write GPI at 4331 N. Wildwood Ave., Milwaukee 11, Wis., for details and registration. Traffic: W9LFK 128, ESJ 110, CBE 24, DND 14, IQW 9, MUM 9, SIZ 8, RQM 7.

DAKOTA DIVISION

NORTH DAKOTA — SCM, Paul M. Bossoletti, WØGZD — BCH is operating portable from Detroit Lakes. CAQ has new NC-173. JNP has n.f.m. on. HSR radiated a brand-new YL harmonic. YSJ figures on making WAS on 50 Mc. this summer. WFO is pushing to make first North Dakota WAS on 50 Mc. before YSJ does. Both Fargo and Forx Clubs had an FB time on Field Day. FST does great on the bedsprings on 28-Mc., 'phone. GHN has Class A ticket and fondles the idea of joining pot-bellies 3.85-Mc. 'phone gang. HIV has new S-40 receiver and TUF connected with an SX-24. North Dakota 3.5-Mc. c.w. net comes back on the air Sept. 1st on 3525 kc. Send a line if you want to join the gang. You all want a 3.85-Mc. 'phone net? Let's hear from you. NDAC's new call is HSC. RGT and power company boys got his beam up to 60 ft. Is there a gang at Dickenson, Williston, and the western part of the State? Traffic: WØBCH 7.

SOUTH DAKOTA — SCM, J. S. Foasberg, WØNGM — HDO, the SEC for Eastern South Dakota, reports that he is lining up ECs in his area and will have drills early this fall. He would like to have all the clubs in his area and individual stations contact him if they have not done so. The same goes for GLA in the western section. QVY now has WAS on 28-Mc. 'phone. 5KVW/Ø is now the chief at KGFX. The Sioux

(*Continued on page 78*)

Whether you're stalking an Asian or probing for a W6 . . . you'll find that PRs pay big dividends. Today's crowded bands emphasize more than ever that it PAYS TO STAY PUT. It's no fun to drift on the sea of QRM . . . unknown, unloved, un-QSOed. It's a lonely life at best. More and more, smart operators are sticking to crystal control for all but special occasions. Pick your favorite frequencies . . . buy inexpensive PR Precision CRYSTALS to cover them. You'll find that life on the bands isn't so bad after all. USE PR and KNOW WHERE YOU ARE! Get the exact frequency (integral kilocycle) at your jobber's. PRs are unconditionally guaranteed.—Petersen Radio Company, Inc., 2800 W. Broadway, Council Bluffs, Iowa. (Telephone: 2760)

SINCE 1934

PR Precision CRYSTALS

10 METERS PR Type Z-5.	Harmonic oscillator. Ideal for "straight through" mobile operation. High activity. Heavy drive without damage in our special circuit $5.00
20 METERS PR Type Z-3.	Harmonic oscillator. Low drift. High activity. Can be keyed in most circuits. High power output. Just as stable as fundamental oscillators $3.75
40 & 80 METERS PR Type Z-2.	Rugged, low drift fundamental oscillators. High activity and power output with maximum crystal currents. Accurate calibration. . $2.75

Falls Radio Club held its annual picnic and old-timers' get-together. There was a fine turnout and a fine time was had. The Mitchell gang went over en masse. Interest in Field Day was very high and most of the clubs in South Dakota had at least one station on the air. The c.w. net will be off the air except in case of emergency until September. Let's have the club reports in on time if possible. GCW has a kw. final with p.p. 450THs on 'phone and c.w. GLA recently was married. Traffic: WØGCP 8, UVL 6.

MINNESOTA — SCM, Walter G. Hasskamp, WØCWB — RJF again takes traffic honors. BGY has a BC-457 with an 815 modulator on 3.85-Mc. 'phone. Five months after fire destroyed his rig, EHO again is on 3.5-Mc. c.w. from Blue Earth, his new QTH. EG, our Class I OO, reports much out-of-band operation on 14 Mc. It seems the attraction of DX draws many operators out of our lawful territory! Don't let the possibility of DX draw any of the Minnesota gang astray. LSC is building a rig for 144, 50, and 28 Mc. using VT-127As in the final. IAW is a new call at Albert Lea. FIT has a new Collins ECO and is trying to work WAS on 28 Mc. To all of you wondering how to contact our director via radio — TSN has a 3.85-Mc. 'phone final running 1 kilowatt under construction and should be on by the time you read this. BOL needs only Utah for WAS on 3.5-Mc. c.w. Our director attended a meeting of the Arrowhead Radio Amateurs and appointed NRV as assistant director. GKP got his HY-75 perking on 220 and 420 Mc. KYE's pole walked off his garage roof in a wind storm. Moral — guy your poles properly. That's another "Switch to Safety." BBN uses his sixteen-element beam designed for 144 Mc. and reports 8 f.m. stations, all over 100 miles, putting R9 signals into Grand Marais. BBN also had 28 stitches put in his scalp by his OW after a party of four crashed in a plane at Grand Marais and BBN, the only doctor for 100 miles around, happened to be one of them! WSB is building a house. It'll be a ham's paradise he says, with a kw. final on each band and no BCI! On March 17th GKO, of Duluth, and KPQ, of Robbinsdale, in the twin cities area, made the first known contact between those two points on 145 Mc. They also worked again on schedule the following Friday evening. KPQ also worked GDD in Superior. KPQ has 20 watts to an SCR-522 and a sixteen-element beam while GKO had 75 watts to an 829B and a twelve-element beam. QVU also has an SCR-522 on 145 while BBN has 200 watts with a twelve-element beam. Any other good VHF achievements? Traffic: WØRJF 73, BGY 34, HEO 16, CWB 10, FAH 10, BOL 2, EG 2, EPJ 1.

DELTA DIVISION

LOUISIANA — SCM, W. J. Wilkinson, jr., W5VT — I wish to extend my appreciation to the gang for my reëlection as SCM for another two-year term. During that period the PAM, SEC, and RM will work closely with me in trying to build up the section. BSR also will have his shoulder to the wheel in promoting the activities in the Delta Division. Let's have more news from all the gang. Drop a card or message to the SCM and he will be appreciative of your interest. In all probability KTE soon will visit your QTH to assist in emergency organization. CEW has enough QSLs to complete DXCC. IUW has schedule with HL1AE. BAF has been rebuilt. EM, ex-HOU, has been on 144 Mc. Bob is setting up 400-watter for 28- and 3.85-Mc. 'phone and c.w. JFO, KMN, LQV, MEJ, MFS, and LQO are active in USNR in Shreveport. K5NRS is the amateur call of this unit. LYP reports on Field Day activity for the Reserve group. NAL worked 144-Mc. rig on Field Day. NRA is with CAA in NOLA. NBK is handling schedules from Crescent City. 6DK paid the SCM a surprise visit and met some of the gang. 6VWF, ex-5HSH, sends regards to the boys back home. GND really puts out a signal with his rebuilt rig and is looking for a good rag-chew with you. QH has been active on the air and with EC duties. TI2OA and TI2EV schedule KTE. FYS says 14 Mc. is hot these days. FJW is active in Monroe. AXU is on 14 Mc. from Alexandria. VT is moving around 7 Mc. and will QSP anywhere, anytime. Traffic: W5KTE 168, VT 10.

MISSISSIPPI — SCM, Harold Day, W5IGW — SEC: JHS. DNS has overhauled his 3.5-Mc. c.w. rig, and DEJ his 14-Mc. c.w. rig and worked five antennas during Field Day. JHS reports that AMR, Sunflower County EC, has a swell layout in medium low-power emergency equipment. NRM has new Globe King. OIX is doing swell with his new Sturba Curtain. JHS and VS have a 522 working FB on 144 Mc. Biloxi High School call is OKE. OMK has an HT-9 and a three-element beam. MJL and NRM worked the Gatty Expedition, MJL on 28-Mc. 'phone, NRM on 28-Mc. c.w. 6ABL/5 has new three-element beam. NYV is flashing a 25-w.p.m. Code Proficiency Certificate around. Gulf Coast Radio Club members were guests of the Keesler Field Club. New officers of the GCRC are IBO, pres.; HAV, vice-pres.; NYV, secy. HRW is back on 28 Mc. 7KHC/5 is Keesler Field Club call. Approximately 217 hams and XYLs attended the State-wide convention at Jackson.

TENNESSEE — SCM, Ward Buhrman, W4QT — The Jackson AEC group is off to a good start, with equipment built for emergency operation and arrangements have been made for coöperation with Red Cross, railroad, and other agencies in event of need. The Amateur Radio Society of Union University has been declared an affiliated society. AQV is new member of Tennessee 'Phone Net. The Oak Ridge club was visited by out-of-town LOs at June 1st meeting. FLW has a VHF-152A and an 829B on 28, 50, and 144 Mc. NNJ lives in a house trailer equipped with Super-Pro and Collins 32V1 operating on all major bands. EBQ keeps schedule with brother, 3NFL. HOJ reports that work hours conflict with ham activity. HHC has dressed up his shack. FLS is building new shack. ILZ has returned to Nashville and has dusted off the 3.85-Mc. 'phone rig. GER, only YL in Chattanooga, is active on 28-Mc. 'phone. ENL attended NAB Convention in Los Angeles. He is active OO. IKG moved from Atlanta to Nashville and is active on 3.85-Mc. 'phone. MB has a kw. under construction. BD, CZL, and ETN are getting Command transmitters and receivers together for portable and emergency work. Form 1 report cards are available upon request. Please use them to mail reports not later than the first of the month. Traffic: W4PL 189, ETN 69, BAQ 9, EBQ 8, NNJ 2.

GREAT LAKES DIVISION

KENTUCKY — SCM, W. C. Alcock, W4CDA — All licensed amateurs are urged to join the Emergency Corps. Make application to BEW and register now! The KYN Net leaves 3810 kc., worked 7200 kc. during the summer, and will be on 3600 kc. this fall. See BAZ for trunk line work. KKG has sixteen-element beam, was heard in Indianapolis on 144-Mc. and is now 98 per cent VHF man. FBJ worked Indiana, Ohio, and Illinois on 144-Mc. FKM still has perfect attendance record on the KYP 'phone net, which continues during summer. See TXC, our PAM, for KYP work. OGP, new KYN member, wants to sell his 3810-kc. crystal. JCN plans schedule with Brazil to contact his son. VP and KFI are new OES. MWX keeps Henderson represented on the net. BPE announces KYE Net (145.8 Mc.) operates Monday, Wednesday, Friday at 8 P.M. CST and has IUP and MKJ as new members. FBJ worked LU6BO on 50 Mc. JQY and YNQ both get excellent newspaper write-ups on their stations. Others should do likewise and send SCM clippings. FR will give you frequency check any time you need it. EDV reports regularly to SCM. Others please do likewise, mailing your cards on the last day of the month. The 144-Mc. gang is going strong, seeking to set new records, and other u.h.f and v.h.f. men are competing for KKG's trophy cup for best DX this summer on 144 Mc. Send your news items to *Ether Clippings* when you send monthly reports to SCM. Traffic: W4KKG 41, JCN 29, TXC 14, MWX 13, FKM 12, FBJ 11, CDA 10, EDV 5, OGP 2.

MICHIGAN — SCM, Joseph R. Beljan, jr. W8SCW — SEC: PVB. RMs: NOH, PVB, and UKV. OCE has been appointed OBS. Congrats to the Catalpa Amateur Radio Society on its affiliation with the ARRL. The Motor City Radio Club elected the following: PYW, pres.; FJL, vice-pres.; YDR, secy.; and CHJ, treas. The Genesee County Radio Club now holds the call ACW and has transmitters on 3.5 and 144 Mc. in its club house in the Red Cross Headquarters. The Allegan Area Radio Club has been issued the call CMA. The Annual Michigan Hamfest was held at Ypsilanti on May 23rd with another fine turnout. A fine program was enjoyed. The principal speakers were "Lighthouse Larry" of G.E. and our director, Mr. Hal Bird. Plenty of prizes, eats, and rag-chewing made it an enjoyable day for the nice crowd. Congrats to the DARA for another successful hamfest. NQ is QRL converting surplus transmitters for 3.5, 7, 14, and 28 Mc. TNO is brasspounding again and is working out nicely. CNC is ex-ØUFO from East Lansing. The MSC Radio Club operated portable at Grand Ledge on May 1st. YCT added a preamplifier to his receiver and is scouting for Asia to complete his WAC. KOS is now Class A but still pounds brass. The Charlevoix gang has organized a 28-Mc. 'phone net under the guidance of DQF. YLS is building a new house. PJM is inactive at present but is planning on a lot of activity this fall. CSL cleaned out the bugs in his rig but developed new ones in his beam rotator. IWG is running fifty watts on 28-Mc. mobile. MTF also is on 28-Mc. mobile. PUV has new all-band rig with an 813 final. Ex-VDC now signs JN. TIJ is an old-timer relicensed. EYD has new f.m. rig on 28 Mc. SMO is on all bands with his new transmitter. YOU is on 3.85-Mc. 'phone. AXP is planning a new rig with a pair of 813s in the final. TZT and ZBH are n.f.m. RKE moved to new QTH. Congrats to ZHB, who recently middle-aisled. MRK is increasing power to two hundred watts. We regret to announce the passing of BBM, of Grand Rapids. Traffic: (April) W8LU 33, YNG 28, CNC 8, LR 6. (May) W8ARJ 128, TRN 112, SCW 96, TBP 78, NOH 42, UUS 39, WOV 13, SH 8, UFH 6, FX 4.

OHIO — SCM, William D. Montgomery, W8PNQ — Our AWARD OF THE YEAR goes to five Ohio ARRL appointees who have not missed a monthly report to this office since Feb. 1947. (A new system of tabbing reports was started then.) They are: RN (our RM), PUN (our PAM), EBJ (Asst. RM), JFC (OO and OPS), and DAE (ORS). Honorable mention goes to WRN (OES) who only missed one month (June '47) during this time. Fine business, fellows — I wish we had more like you. To those of you who only missed a few during this period: My thanks for a

(Continued on page 74)

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good job. Keep it up. From the Columbus gang via *the Carascope*, we see that the June 4th meeting was unusual as well as interesting. Talks were given on the Fire and Police Dept. radio systems, followed by an inspection trip of all the interesting points in the system. APC is moving West for his health. The AEC net in Columbus is working on 29,200 kc. AUB is in Boston working for a broadcasting station. YAU now is 3OJQ in Washington, D. C. The Springfield Amateur Radio Club now is an ARRL affiliated club. WRN now has a sixteen-element horizontal beam 40 ft. off the ground for 144 Mc. use. ZHS has moved to Florida, and will be missed on 144 Mc. around Columbus. RPT reports from Cleveland that AOZ replaces TNB as secretary of the Northeast Amateur Radio Club, and that WDX is convalescing from an attack of acute appendicitis which was caught just in time. ZEI has a new five-element beam in use, along with a converter from a BC-1068 radar set working into a BC-312. CFY has moved to Painesville, according to BBA. DAE worked 160 stations in 48 sections in the last CD Party. LBH (Akron) worked two WØs and a VE1 on 50 Mc. in the May band opening. WSC has a new RME-45. YFJ now has a Class A ticket and is on 3.85-Mc. 'phone. He will graduate from high school this year. YGH is apparently the only operator who has not missed a Monday QCEN AEC 28-Mc. drill during the past 2 years of operation. 4KFV won the May 144-Mc. Hidden Transmitter Hunt of the Queen City Emergency Net, coming in in 42 minutes. The Greater Cincinnati Amateur Radio Assn. held a joint meeting with the Institute of Radio Engineers in May to hear T. A. Hunter speak on Permeability Tuned Oscillators. From the *Mike and Key* we see that TPG is now chief engineer at WEOL, that ex-PPA now is 5NOH, and that DJB now is RJ. Traffic: W8GZ 97, EBJ 47, PZA 34, DAE 33, WAB 14, ZAU 13, VWX 11, CBI 6, DZO 4, QIE 4.

HUDSON DIVISION

EASTERN NEW YORK—SCM, Ernest E. George, W2HZL — New York State Traffic Net, along with many others, is closed down for the summer. It will start up again the 1st of October. Union College Amateur Radio Club at Schenectady has been rejuvenated. GSB is the call. Code and theory classes three times a week should keep the boys on their toes. A spring picnic at Thatcher Park with a little portable activity gave all who attended a good time. TZN is secretary. With most of the bands folding up, the nets closing down for the summer, and everyone working for Field Day, reports this month from the section have been very scarce, so no news, fellows. Traffic: W2TYC 166, LRW 73, BXP 26, BSH 5.

NEW YORK CITY & LONG ISLAND — SCM, Charles Ham, jr., W2KDC — The summer doldrums are coming over us but the summer heat still is to be felt. The good old AEC carries on, however, and in Brooklyn the Monday night activities are always attended by the old guard. TCE recently was welcomed to the net. OHE worked Summit, N. J., on his walkie-talkie. JSJ has 24-element beam. AUF is recording net operations. VHK carried his walkie-talkie to K2NAR's 167-ft. tower. NXT again is active. KU and HG are going sky-high and are now on 420 Mc. C.w. operators interested in the AEC should contact VHS. In Nassau, an average of 21 stations have participated in the past five drills, contacts being made as far as Monmouth County, N. J. TUK is Assistant EC. ORZ, FQW, and PCV are rebuilding. FI has 17-tube super. YKM is welcomed to the net. In Suffolk, plans are under way for portable operation on 3.5-Mc. c.w. for regular AEC drills. Western Union cooperation has been offered. PIA and MZB have portable generators. VZR is on 28 Mc. with 300 watts. DOG upped power to a pair of 35Ts. UGH has 522 for 144-Mc. mobile. OQI is off mobile work until holes are drilled in new car. OBW is on 28 Mc. with a 522, as is CJZ. ZV also is heard from Port Jefferson. TWF is QRL building his new home. OEO has new Collins exciter. YLF, ex-1PSQ, has joined the 3.8-Mc. 'phone gang. Suffolk County RC is running a QSO contest until September 17 — any power and band, 'phone or c.w. An excellent dinner was enjoyed by the NYC-LI gang and OBU did a bang-up job as toastmaster. QBS is putting up a ten-element beam for 144 Mc. MUY, the Hempstead High School RC, can be found on 3510 kc. UNL is on 420 Mc. using a BC-645. In the Queens AEC, NZJ has been doing a fine job as NCS for the southern sector while SIJ and PQJ take care of the north. Contact has been established with the local representative of Western Union and good coöperation is expected. JBL, on 144 Mc., works 30 miles with his converted DK-3 on the roof of his five-story apartment using 4 watts. George also works 14- and 28-Mc. c.w. SHE has new coaxial antenna atop his seven-story apartment house. (Sam must have fixed the super's b.c. set.) ACZ has new Collins exciter. VKF has a twin-lead folded dipole. JLC is attempting to cure TVI by shielding. VHS really enjoys and appreciates his radio activities. AIQ has added a Panadaptor to his OO gear. Joe now is keeping his eye on the 'phone boys. ZV is winner of the Inter-County Contest in Suffolk with 14 contacts. YOM, on the air a month, worked KH6 on 7 Mc. using a BC-459A. BO spent a month on the West Coast. JFE wants to hear from the boys who have converted 522 receivers for 50 Mc. PF is in Mexico City. TUK finally worked KZ5, his old home. Harry also is working GG's high power rig on 14 Mc. KV4AF/2 is QRL moving. PZE operated in the CD Party, his total month's activity. OUT finally received Class A ticket. LWB is very popular and an FB operator. VNJ reports to SSN, as does OUL and TUK. LWB is FB NCS. VOS keeps quiet hours because of TVI. PRE is upping power to 250 since school is over. RQJ wants schedules on 3.5 Mc. Joe still uses the BC-696A. KDC is QRL — outboard motor time. Traffic: W2UZX 504, TUK 223, VOS 162, BO 126, OBU 112, RTZ 93, QBS 81, OUT 53, PRE 50, VNJ 33, BGO 17, JBQ 17, RQJ 14, PF 2, KV4AF/2 2.

MIDWEST DIVISION

IOWA — SCM, William G. Davis, WØPP — DIB has his 'phone WAC. He also worked YI2AM on 14-Mc. c.w. The Tall Corn Net had a get-together June 19th. AUL again is risking Iowa 75 'Phone Net. UAD now is a graduate E.E. HMM continues his high traffic reports. Midwest Division Director DEA, Alternate Director KTQ, SCM PP, and SEC FP met with the Cedar Rapids radiomen May 12th. ZWI and ICW, of Missouri, want 144 Mc. contacts with the Iowa gang. BEN, with 75 watts on 7 Mc., was heard in London RST 459. ASJ is on 7-Mc. c.w. with Meissner Signal Shifter driving an 811. The ham club at Sioux City holds meetings the 1st and 3rd Sunday of each month. EQN is the new president. The club was active Field Day with four transmitters on four different bands. POY has new shack, garage and radio shop combined. He also has 80-ft. windcharger tower with a swell beam for 28 Mc. KLC found a stranger cavorting on the top of his 40 windcharger tower. DPB will be inactive until September. OSG is a resident of Trear and not of Storm Lake as reported. DCK is EC for Marshalltown. QVA renewed ORS appointment. DCK, IGL, HQA, SQF, SVS, and ANU are members of Iowa 75 Net. NTA worked zone 23 for WAZ award. NUC needs zone 23 for WAZ. RSI and BZE worked 3 states on 144 Mc. NFM and IFB work Wisconsin and Illinois as fast as they can work the switches. UTX and TWX work Illinois on 144 Mc. WML was active on Field Day with DWO and JDV. Traffic: WØHMM 1022, SEF 26, QVA 19, WML 11, PP 10.

KANSAS — SCM, Alvin B. Unruh, WØAWP — Plans for the Midwest Division Convention, to be held in Wichita October 16–17, are going full blast. Among the many fine speakers will be "By" Goodman, 1DX, Assistant Technical Editor, *QST*. "By" will lecture and demonstrate new s.s.s.c. techniques. Two banquets are included on the program. CQC gave an excellent lecture and demonstration at Wichita club meeting on VFO-n.f.m., exciter as constructed from BC-696 surplus transmitter. The meeting also featured a drawing for an SX-43 receiver. OKD has new antenna, with improved results. BSX has 304TH final. IZJ reports OUU has new f.m. mobile with Gon-Set converter and Sonar transmitter. AHA is going strong with traffic schedules. NKD, scoutmaster, took a group on a week's camping trip. With the aid of HT-18, Super-Pro receiver, and gasoline-driven power, daily schedules were kept with CUL for home traffic. AHM was QRL with work and graduation from school. He reports ZAX has ARC-5 for emergency work. HVL joined the AEC. He uses BC-459 transmitter and BC-224 receiver. QV reports a long list of juicy DX worked on 28-Mc. 'phone. The MO-KAN Radio Assn. (Pittsburg) elected the following: EOD, pres.; TTF, vice-pres.; and CMV, secy.-treas. Most members of the club are on 28- and 3.85-Mc. 'phone, with a few on c.w. 2AEV and ØTTU were recent visitors. See you in Wichita Oct. 16–17! Traffic: WØCUL 29, NKD 25, AWP 3, AHA 2, AHM 2.

MISSOURI — SCM, Ben H. Wendt, WØICD — All amateurs are invited to join the ARRL Emergency Corps. Application blanks may be secured from the Emergency Coördinators, the Section Emergency Coördinator, ZAO, or the SCM, as well as directly from ARRL. Be prepared; join the AEC. New appointments: JRJ, Assistant SCM; OMG, OPS. WØINK was heard in England on 3755 kc. after a new antenna was erected. MTB was heard in Holland on 28 Mc. running 60 watts with practically no sky hook. ZAO, the SEC, reports VRF is doing very good work in AEC and VMO, TZP, ECE, VMI, SKA, ARH, YSM, and GNX are all in there pitching strikes for the various nets. The AEC is in better shape than the reports indicate. No recess for MON 3755 kc. this summer. GCL is using a doublet on 3.5 Mc. and has changed to e.c.o. QMF is working with emergency equipment on 3.5, 7, and 14 Mc. ZZW now is with General Electric at Schenectady. OUD moved the rig about 6 feet and now gets S4 instead of S8 reports. Traffic: WØQXO 157, YSM 136, ARH 80, GEP 42, KIK 41, VMO 18, QMF 14, OUD 13, ZZW 11, EEE 3, DU 2, KSR 2.

NEBRASKA — SCM, William T. Gemmer, WØRQK — MGV was appointed EC. AYO now is OBS and will be on 29 Mc. OZC says that he, LJO, and YCG officially closed the c.w. net; YCG has 80 watts into a pair of 807s; and OZC is using portable emergency rig on net. MGV is on 3.85 and 14 Mc. for the summer. FQB says "CZK rebuilt into a pair of 8005s. QUA and FQB have new Workshop three-element 28-Mc. beams. MKP rebuilt to a pair of 809s in final with 807s as modulators. RQS added more sections to his Sterba. HZE installed 28-Mc. mobile rig." AYO has new Class A.

(Continued on page 76)


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FHJ and TLS are new hams. DI is using a Meissner Signa Shifter as a transmitter. VEC reports, "LTE is on 14 Mc. KAL had 28-Mc. mobile on tractor. IGK/Ø is on 28 Mc. with 36 watts to converted 522." FHJ, CME, VEC, HQQ, GTZ, LTE, and BDO are stirring up activity on 144 Mc. HLX says the Grand Island gang is reorganizing. HLX has new three-element 14-Mc. beam. GJM says, "SNRC has 3 new members. GFQ demonstrated new transmitter and television receiver." DJB worked 4 continents his first night on 14-Mc. c.w. RUG is on 7 and 3.5 Mc. from new QTH, Grand Island. VPR has pair of 812s in final and is building 811s in a modulator. The Hastings Radio Club meets the 1st and 3rd Wednesdays of each month. The NPARC was host to 133 guests at its second annual hamfest. ZTE and VME displayed their less-than-1-watt 3.85-Mc. NVE had SCR-284 in his Studebaker. Traffic: (April) WØTCG 27, EUT 3. NVE 3. (May) WØDI 6, DJB 5, FQB 2.

NEW ENGLAND DIVISION

CONNECTICUT—SCM, Walter L. Glover, W1VB—The Nutmeg Net held its annual spring meeting on May 15th in Southington. Those present were BDI, DAV, EFW, FTX, LHE, LKF, NJM, ORP, QMI, QVF, VB, and VW. General activities and plans for next season were discussed, and a turkey dinner was enjoyed by all. IKE received ORS and Class I OO appointments. FC went on a fishing trip to Maine recently. GVK is on 144 Mc. with new antenna. OPG has a new car. KUO is plenty busy with summer school. The Manchester club is having housing troubles. GWT has a BC-459A as VFO. EJI and FSH also are doing a little fishing. LMK is working on a 733D conversion job for 144 Mc. The Meriden club has its new charter from ARRL. Ex-IOS now is ØIOS in Omaha, Nebr. SJ is on the air again with new Collins 32V-1 and 75A-1. OS/1 operated from the Boy Scout Scoutorama in Bridgeport. 2MRU visited LGN and VB. BDI has new 50-Mc. three-element beam and worked 19 in the May VHF Party. QVF is rebuilding for a kw. final, and also is messing around with real h.f. He talks about 10,000 Mc. 9BRD/1 has left AW and ØBRY/1 is taking his place temporarily. AW is QRX for traffic after code practice on 3555 kc., although traffic schedules are off for the summer. RIO, of Norwich, just received his Class B ticket. APA is much pleased with his success in the CD Party with only 40 watts. EFW is going after that squeak in his note. AH schedules VKs on 14 Mc. IED now is EQ. The SCM wishes to acknowledge receipt of the excellent EC bulletin sent out to all Connecticut ECs by VW, our SEC. It is hoped all will profit by his suggestions so that we may start off with a bang next season. For your information EFW, as RM, is in charge of c.w. nets and traffic schedules, and VW, as SEC, takes care of emergency matters. They will be glad to furnish any dope needed. A new PAM for 'phone activities will be appointed shortly. Traffic: W1LKF 134, AW 127, EFW 125, VB 67, INF 63, KUO 55, BIH 54, IIN 20, BDI 16, QMI 14, HYF 12, QVF 5, APA 3, TD 2, DWP 1.

MAINE — SCM, F. Norman Davis, W1GKJ — SEC: LNI. RM: NXX. PAM: FBJ. LKP renewed ORS, OPS, and OBS appointments. JRS renewed EC appointment. GKJ and MXT renewed OPS appointments. LKP and NXX are trying 144 Mc. this summer. OGZ is working in a broadcast station in Concord, N. H. While on his vacation MXT operated portable with a BC-696 on 3.85-Mc. 'phone. The first good opening of the 144-Mc. band the last of May and the first of June gave the gang a chance to work all the New England States although no reports of a Vermont contact were received. GE now is Class A. RJL is new ham in Portland and is on 3.5-Mc. c.w. RHR and RJQ, in Portland, also are newly licensed. Traffic: (April W1KYO 32, OHY 29. (May) W1NXX 47, LKP 32, JAS 20, QUA 6, AFT 3.

EASTERN MASSACHUSETTS — SCM, Frank L. Baker, jr., W1ALP — New appointments: QIU, EC for South Boston; QQL, Asst. SEC to BL; AF, new OES; QQJ, OBS; RBK/3HH, OO, Class 4. The following renewed their appointments. MPP and HUV as OPS; LMU and HUV as OBS; LMU as OES; HUV as OO; OGP as OO; BBL as EC for Manchester. 3VUA is going back to Washington, D.C. HJ is moving. More on 144 Mc.: JLR, GNK, FKV, AWO, RAI, BDF, and LOV. QQW is on 14 Mc. RER, in Weymouth, is on 7 Mc. We recently bumped into DBD, who has been living in New Hampshire, but is going to work down in South America. On the last monthly test the following reported in: MCR, HIL, BKR, DW, HJ, QNJ, and BVL. BIA will be down in Brewster and wants QSOs on 144 and 7 Mc. In July and August he worked 2BAV and HDQ. A lot of the gang worked Portland, Me., on 144 Mc. QQJ works 28 Mc. HXK has been sending code practice twice a week. NBV has a new fishing boat. BHD built a t.v. receiver. RIP is new ham in Malden. HKG, KNA, QQR, and NBV joined QFI, the Coast Guard Auxiliary in Winthrop. HXK has new convertible car. RFE has new three-element beam. HUV is going to move to Arizona and will be looking for the gang in the East. Lots of luck and a good ripe age to you, Skipper. The South Shore Amateur Radio Club held its annual banquet with more than 100 present. WU is back on c.w. now. QJB has a BC-453 as Q5-er and ARC5 for 14 Mc. JDP still is on the night shift. The Eastern Mass. ARA was

(Continued on page 78)

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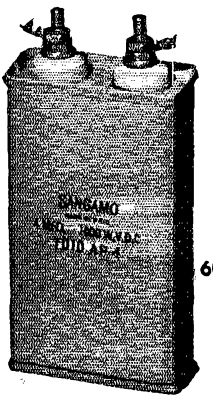

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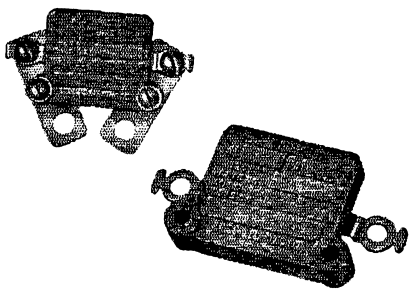

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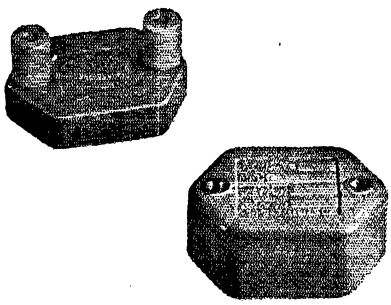

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SC472

given a talk by DX, of ARRL Headquarters, on 88 Transmission. The T-9 Radio Club held a meeting at ALB's QTH. WI is teaching again. NF is doing lab work on 420 Mc. MRQ has been on 3.9 Mc., and got QSL cards from UA and UQ hams. AYG is building a junk box t.v. receiver. BGW has 28-Mc. mobile rig. LQQ writes in. LVZ is in the hospital. VO2AP, ex-1PEJ, is on from Newfoundland. DJ reports many new stations on 50 Mc. He worked Vermont for first QSO, also ØKPQ in Minnesota, and has 26 states and 9 districts. HPV, in Attleboro, is on 50 Mc. JEL is at new QTH in Saugus. AF worked his 28th state on 50 Mc. QMJ has BC-696A and 348N. OMP has rig on 144 Mc. in his car. WK and OLP have rigs on 28 Mc. in cars. EKG now has a car. JCK renewed his ORS appointment. Traffic: W1JCK 154, EPE 127, EMG 87, TY 75, LM 71, NBS 27, QJB 27, DWO 23, QMJ 16, BB 15, PYM 10, WU 4, OBN 3, JDP 2.

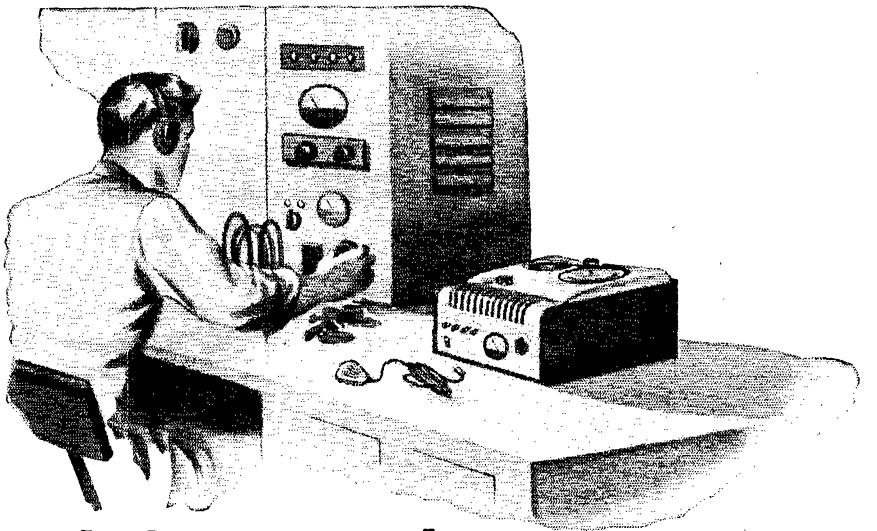
WESTERN MASSACHUSETTS — SCM, Prentiss M. Bailey, W1AZW — RM: BVR. SEC: UD. PAM: NY. A very successful AEC drill was held between the Western Mass. and NYC-LI sections on May 25th. 2WFL and 1BVR were the sponsors and wish to thank all members who took part. UD alerted all of his ECs and a good turnout resulted. The Western Massachusetts Net went on a three-day-a-week schedule on the first of June. The Worcester County Radio Assn., using the call LTA/1, participated in Field Day. LTA was in charge of the arrangements. LSZ is fed up with cathode modulation. HFO participated in Field Day. He also is trying to squeeze in some DX on 14 Mc. when the kw. boys will let him. IHI is chasing DX on 14 Mc. AMI is on 3760 kc. looking for traffic. JE's Swing Shift Net has had an increase in traffic since the 3.5-Mc. nets have closed for the summer. JE is trying to decide whether it will be an HQ-129 or an NC-173. BDV is enjoying the summer at York Beach, Me. The Fitchburg Radio Club held open house on May 27th with all the fixings. A talk on t.v., door prizes, and movies made the evening complete. D4AC is receiving a box of food, thanks to the Fitchburg Radio Club. QLT is operating portable outside of Northfield. We have a new ham in Springfield and he is only 13 years old. RHU is the call. CCH has been appointed OES. We are sorry to hear that NY has been ill. We all hope for a speedy recovery. Hank. The Western Mass. H. F. Net, on 29,500 kc., will operate during the summer at 9 P.M. on the last Thursday of each month. The Pittsfield Radio Club, using the call OSA/1, took part in Field Day activities using 3.5, 7, 14, and 28 Mc. LKO is slowly going crazy with T.V.I. Traffic: W1BVR 98, JE 85, IJT 29, AZW 14, BDV 6, QLT 6, RHU 4.

NEW HAMPSHIRE — SCM, Gilman K. Crowell, W1AOQ — Congratulations to KEX for a fine job in organizing the 144-Mc. net. FTJ and BFT have a brand-new YL operator. RHW and RIS are new hams in Manchester and Concord. PVF is having trouble getting his new final on 28 Mc. AVJ and AVL can be heard on 14 Mc. every morning working DX. CRW has his A1 Operator Certificate. LSN and his 50-Mc. gang will continue throughout the summer on their regular schedule. We are looking for more 50-Mc. net outlets in our larger cities. The 3.5-Mc. c.w. net is operating on summer schedule, i.e., Mon., Wed. and Fri. at 9 P.M. EDST. The 3.85-Mc. 'phone net still operates Sundays at 9:30 A.M. GQV is on 50 Mc. RAI is on 144 Mc. OFR is heard nightly working DX. QJY has joined the East Coast Shuttle Net. OCV is working 28-Mc. mobile. AUY has a new 28-Mc. beam. QJX has forsaken a key for a bug. GWY claims that his new Q5-er is the best piece of equipment in his shack. QCY has his Class A ticket. GEY is back on the air with a new final. TA is operating in the c.w. net. Don't forget the convention at Concord on Sunday, September 19th. Traffic: W1CRW 315, QCY 102, IJB 77, BWR 66, AOQ 36, QJY 33, MXP 27, PVF 26, PFU 18, ANS 3, GEY 3.

RHODE ISLAND — SCM, Clayton C. Gordon, W1HRC — Add to list of 28-Mc. portable-mobilers: ARK and OHR. JAC joined the ranks of 420-Mc. experimenters. BTV advises the Rhode Island Net officially closed June 1, 1948. It will resume Sept. 1, 1948. BTV is conducting a code class at his home three nights a week and has three prospective hams in it now. He also says he will give his time "gratis" to any other men who are interested. That is one way for the RM to build up his traffic nets, although you might say it is the hard way, but I understand he is selling the c.w. angle plenty hard to his prospects. The PRA had a very successful get-together at Johnson's Hummocks recently, with an attendance of approximately 250 hams and XYLs. There were door prizes, turkey dinner, "internal-transformer-oil," and such sort of stuff, and everybody said it was the best time PRA has held in years. The club made a little money and garnered in some nice new-member prospects. Traffic: W1BTV 95.

VERMONT — SCM, Burtis W. Dean, W1NLO — High scorers in the Vermont QSO Party April 10th and 11th sponsored by the BARC were: C.W.: KRV-1677, EZ-1651, BJP-1248, OKH-1224, FPS-1089, and QMM-850. 'Phone: QVS-105, OKH-102, and QHT-50. C.W. and 'Phone: OKH-1989, IT-640. Outside Vermont C.W.: BFT-2175; PZI-1610; GKJ-1260, QYZ-990, 3AIZ-880, and CNX-440. 'Phone: BFT-45, CNX-20, and KP4FN-5. C.W. and 'Phone. BFT-2560, CNX-650. Thanks, gang, for the FB support in the recent SCM election. AVP has 144-Mc. beam. GMARC

(Continued on page 80)



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has Hallicrafters transmitter and new headquarters at Reformatory Building. 2OFN visited AVP recently. QV8 is building 144-Mc. transceiver. OKH has three-element beam on 50 Mc. CUN is operating portable on 28 Mc. from Grand Isle during the summer. MCQ passed away at his home June 8th. Dan was EC for Lamoille County and an active member of the Green Mt. Net.

NORTHWESTERN DIVISION

ALASKA — SCM, August G. Hiebert, KL7PQ — A recent control cable failure at CAA's Moses Point station killed all transmitters except the radio range until BD fired up A3 on his ham rig, followed by JI who worked c.w. out of the control station. W2JIP, W7AS, QO, and NK are on 14-Mc. c.w., and W8TDP is on 14-Mc. 'phone. JS reports operation of the Norton Sound Net on 3860-kc. 'phone, with DJ, LN, QL, JS, AO, and AH participating. MX is on 28-Mc. 'phone and 14-Mc. c.w. DU has been working stateside DX on 3.85-Mc. 'phone. AR is working on a rig with two 250THs in the final. OW is using a surplus receiver and an 811 in the final. W7ABQ, retired Army old-timer from Skagway, was recently worked by GV. New call for ex-CBF is PQ. W7HMA reports that W6CSR is the new commanding officer of KL7NR, Warfare Electronics Unit; KL7OQ, on 28 Mc., is the proud owner of Collins 32-V; MO is on all bands c.w.

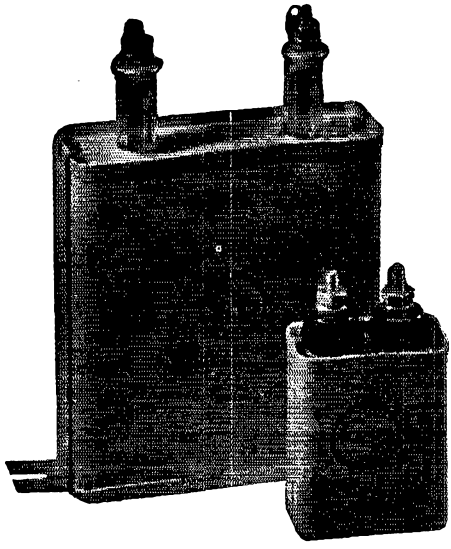
IDAHO — SCM, Alan K. Ross, W7IWU — Kuna: EMT is running BAA, of Firth, a "Granddad" Race. Carl is leading 5 to 3. Weiser: We are sorry to report that CG joined Silent Keys. Twin Falls: EC KEK is conducting drills on 4, 3.5, 7, 14.2, and 29 Mc. with the following participating: JMX, LNC, BZJ, IOA, KRK, and JPD. Their club is building a complete emergency station in coöperation with the Filer High School. New call is MHI. JMX suggests 7270 kc. for a 7-Mc. emergency net to supplement 3745 kc. Perhaps we can meet and work more Idaho fellows with a common 7-Mc. frequency. What say you 7-Mc. men? JPP has new YL jr. operator. Boise: LQU, of Shelley, visited me at WU. I am planning on 50 Mc. with an SCR-522 soon. No one else in Boise is on 50 Mc. at present. Traffic: W7IWU 23, EMT 10, BAA 9, KEK 3, JMX 2.

MONTANA — SCM, Fred B. Tintinger, W7EGN — SEC: EMF. CT schedules ØYOS and 7BNU and is completing a 1-kw. all-band rig. COH is RM and schedules CAP and Wyoming Nets. BSU worked 24 c.w. and 6 'phone DX stations in the contest. FTX is making good use of her new Class A on 3.85 Mc. A3. FQA Q8Yed from Missoula to Kalispell and is active on all bands with new Collins equipment. GBL reports the Glacier Radio Club met at KAR's and elected EGN, pres.; HMT, vice-pres.; and GBL, secy.-treas. Schedules of future meetings are available from KAR, LOB, or GBL, on duty at KGEZ transmitter. BHP, BLU, KAR, HXC, LOB, and GBL are 28-Mc. mobile with rigs using converted BC-454 receivers and 6V6 transmitters. IWC and HMT work KH6 Land on 3.85 Mc. A3. GBL Worked All States on 7 Mc. with old 10 tubes in parallel (10-watt plate variety). BNU is active after ten years' absence and has new NC-57 and Harvey Wells TB-50 transmitter. JCU is using s.s.s.c. 'phone and is continuing research in that field. He has a British SWL card for 3.9-Mc. 'phone. AFM completed building a stable VFO using a 6SN7 Franklin oscillator. LOB is QRL with EC preparations. Traffic: W7EGN 85, CT 15, COH 2, BSU 2.

OREGON — SCM, Raleigh A. Munkres, W7HAZ — At the time this was written, June 7th, the emergency conditions brought on by the extreme flood conditions reached by the Columbia River were still existent. Vanport, one of the largest cities in Oregon, was completely demolished. The few minutes warning given the residents when the dikes gave way was enough to prevent the loss of life from reaching staggering totals. Thousands of acres of rich farm land were flooded in Oregon and Washington. Hundreds of homes were completely carried away and demolished by the onslaught of water from the Columbia and lesser rivers. For at least two weeks the various emergency groups functioned in all their capacities. In Portland, under the able leadership of Emergency Coördinator DIS, a half dozen separate nets operated twenty-four hours a day; river flood control, dike control, Red Cross Liaison, and inquiry messages being but a few. It would be far less than their just due if each station taking active part could be listed in these columns. With about one hundred stations known to be on the job that becomes impossible. Suffice it to say for the moment that you've stood the test of a real ham! We in Oregon desire to thank those amateurs in neighboring states who were so helpful in handling traffic, those who assisted in clearing the channels being used for emergency work, and those who were QRT on the bands but standing by, just in case.

WASHINGTON — SCM, Clifford Cavanaugh, W7ACF — GP, our Section Emergency Coördinator, reports great satisfaction in the way the 'phone and c.w. nets handled the flood of emergency traffic along the Columbia River during the big June high water. CWN thinks the fellows on WSNET are losing most of their outlets to the WARTS. KNV, EC for Olympia, has a new BC-474A for his emergency rig and reports trial emergency tests were FB. GHI, Asst. EC for Seattle, is interested in contacting hams with mobile equipment for emergency purposes. IJY, secretary of

(*Continued on page 84*)



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2	5000	18.73	11.25	7.48

Above are typical examples.

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MFD.	Volts DC	*Approx. Weight*		*Approx. Cubic Dimensions*	
		Paper Capacitors	Plasticons	Paper Capacitors	Plasticons
10	1000	1.95 lbs.	1.7 lbs.	31 cu. in.	30 cu. in.
4	2000	2.0	1.23	31	23
2	3000	2.0	1.21	31	19
1	4000	1.77	.94	28	19
2	5000	5.2	2.9	70	60

3. Better Electrical Characteristics

	Paper Capacitors	*Plasticons*
Power Factor at 85°C 60 cycles	0.7%	0.3%
Resistance at 85°C megohms per Mfd.	40	100
Capacitance Temp. Coefficient 100% at 25°	−40°C = 73% +85°C = 97%	−40°C = 94% +85°C = 103%

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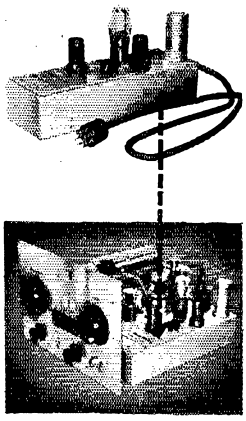
Tubes — 6V6GT/G oscillator-doubler, 807 amplifier-doubler.

Power Supply — VR-150 and VR-75 voltage regulators, two 5Y3 rectifiers.



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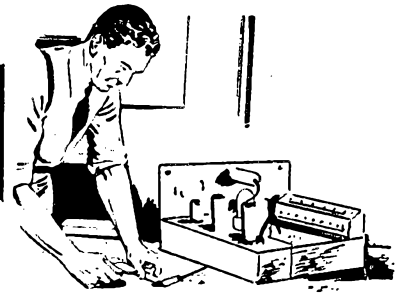

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(Continued from page 80)

the Cascade Radio Club of Everett, reports the following news: IOQ has a new 14-Mc. beam. (Leo, we hear you handle enough traffic to make the BPL regularly. Drop me a card and get your totals where the gang can see them.) IXT is moving to Baker, Ore. HWB is building new 14-Mc. beam. JIQ left CAA to work for Northern Commercial Co. IZV is putting up new 28-Mc. beam. BLX, DYD, DF, and BTN have 522s going. CSK has been appointed EC. KYZ is back handling traffic after a sojourn in the hospital. CZY, at Aldercrest Sanitorium, would like to chin with the gang afternoons on 3.5-, 7-, and 14-Mc. c.w. Wish other clubs would send in reports like this! BE received his DXCC Certificate with 146 countries worked with 350 watts. DGN is back from Wichita with a big stock of new gear bought with his overtime. KWC is busy with a big stack of Red Cross traffic. DXZ still tops the list as the State's best observer. FRU received his 35-w.p.m. Code Proficiency Certificate. RAO, WSNET manager, has his hands full trying to please all hands on change of schedules due to daylight saving time. CKT hands in the largest traffic report received since the war. BG reports his first month in thirty years of brasspounding with no c.w. contact. BTV got ready for Field Day with a balloon on the end of his skywire. FWD also got all tuned up for Field Day. ZU is new ORS. ETO visited LEC. Both are mail carriers. HGC is on the air again as the shack no longer is a bed room. ETK sent in nice OO report. Traffic: W7CKT 1236, FRU 134, RAO 92, ACF 88, ZU 78, FWD 59, BE 15, KWC 13, BTV 11, ETO 11, HGC 8, CWN 6, KNV 3.

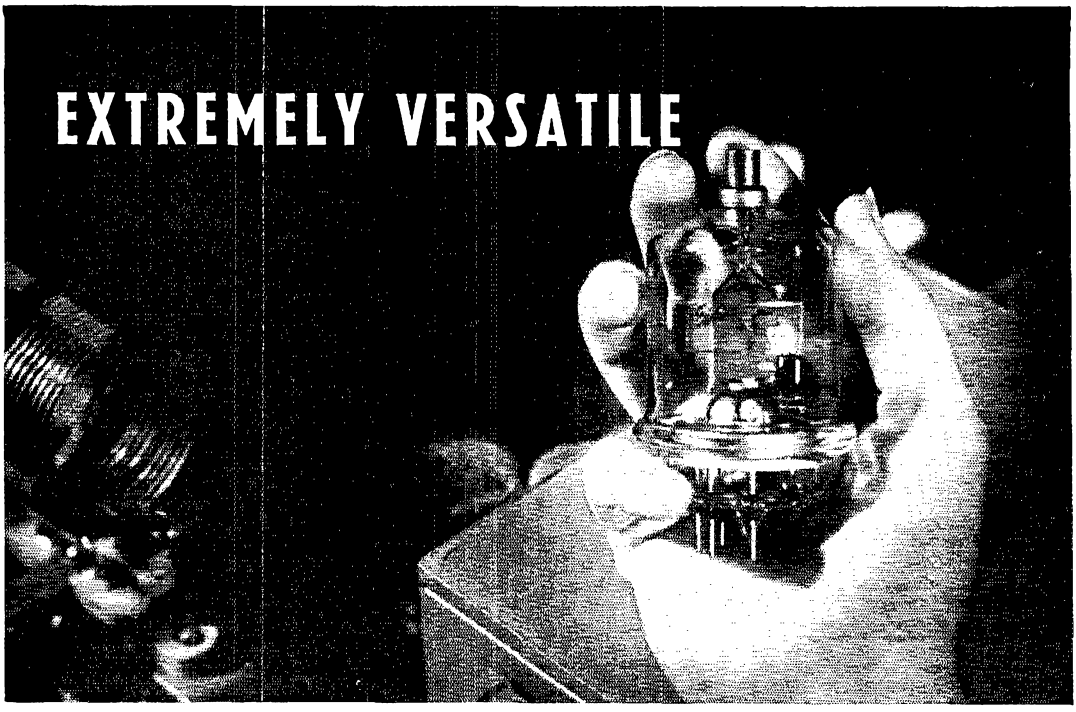
PACIFIC DIVISION

HAWAII — SCM, John Souza, KH6EL — BW is proud owner of LM-7 frequency meter. Andy expects to retire from the Navy soon and probably will pound brass for CAA. New operator at DF is W6CGS. The Honolulu Radio Club had a trial run on the June Field Day on May 23rd with quite an elaborate set-up. LF still finds time out of his many duties to hold down a very active traffic station. PY, ex-W1DCE, ex-W6YYW, is using a pair of 35TGs into folded doublet on 14 Mc. knocking over 30 zones and 41 countries. PX is having good luck with TCS on 7 Mc. RS is new call assigned to Maui Amateur Radio Club station, with EL as trustee. DK is nursing a few more grey hairs getting his new super bandswitching exciter in service. MG is giving the European "Wolf Pack" a merry time with his long wire antenna. Traffic: KH6LF 87, BW 20, PY 18, PX 17, DF 4.

SANTA CLARA VALLEY — SCM, Roy E. Pinkham, W6BPT — The Mainliner Amateur Radio Club has been formed for the employees of United Airline at South San Francisco. Present at the first meeting were JSR, BFS, RFF, CVQ, WYI, BIX, ZBU, APK, QEJ, ØOHQ, 6YFN, PXW, LIF, YHL, and VCK. Meetings will be held every other Thursday starting June 3rd. HC reports MUR returning to San Jose on June 15th. Harry has an outlet for traffic going east and wishes contact with some Pacific Coast net. VZE is a member of the Mission Trail Net. DZE is moving to Lakeview, Ore. Good luck to you, Byron. We hate to lose you from this section. The San Mateo Club held an auction at its May 26th club meeting and turned much gear to profit for its members. EJS has made WAC on 14-Mc. 'phone using a new 14-Mc. beam. VWF, in South San Francisco, has been appointed OBS for that area. OG/KG6 and his XYL were visitors at the shack of ZZ. ZUJ is driving a new car, which takes him away from 28-Mc. part of the time. It has been reported that Bob is thinking of installing his HRO in the instrument panel to keep a check on the band. VHE has joined the Naval Reserve and is getting a taste of operating in that group here locally. YRB and ONL are new on the 50-Mc. band in Sunnyvale. OVK is out of town and is missing some very good openings on 50 Mc. ZIO is new station on 50 Mc. in Santa Cruz. Traffic: W6WJM 155, HC 34, VZE 10, MMG 9, RFF 4, SYW 2.

EAST BAY — SCM, Horace R. Greer, W6TI — Asst. SCM, C. P. Henry, 6EJA. SEC: OBJ, EC: AKB, EHS, NNS, IT, IDY, QDE, ZB, WGN. The Pacific Northwest flood disaster has kept the Mission Trail Net and the Pioneer Net very QRL handling traffic. According to FDR, the Pioneer Net Control lost plenty of shut-eye handling about 150 messages nightly. He has a direct hook-up with 7VT, the chief station in the flood area in Portland. ZM is in Veteran's Home in Yountville, Calif., and is now on the air using BDG's rig at times. On May 31st 95 stations checked into the Mission Trail Net. RRG is new president of the North Bay Amateur Radio Assn., and reports that MLZ is being maintained 24 hours a day in coöperation with local Red Cross on Portland disaster. OT the Oakland Radio Club-Red Cross station, handled plenty of traffic in connection with this same disaster. YDI is QRL traffic. BF has the new 350-watt rig on the air. LMZ is building up country list. PB has new Collins receiver. EJA finally got zone 23. San Leandro Radio Club is planning a picnic to be held in August. YQB put up new 14-Mc. rotary with the help of GIZ, MRM, SAC, ZB, and ZUL. In addition to being known as a DX man, IKQ also is a radio designer and constructor. VDR states that when the 3.85-Mc., phone band is changed the Mission Trail Net will operate on 3804-kc. 'phone and 3754-kc. c.w. The Net held its annual get-together at Coyote

(Continued on page 88)



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D-C Grid Voltage (Approx.) - - - - -	—85	—85	—90	Volts
Zero-Signal D-C Plate Current - - - -	30	30	20	Ma
Max-Signal D-C Plate Current - - - -	170	180	170	Ma
Zero-Signal D-C Screen Current - - - - -	0	0	0	Ma
Max-Signal D-C Screen Current - - - - -	24	14	17	Ma
Effective Load, Plate-to-Plate - - - - - -	9000	15,000	20,000	Ohms
Peak A-F Grid Input Voltage (per tube)	85	85	90	Volts
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Max-Signal Plate Dissipation (per tube) -	45	63	62	Watts
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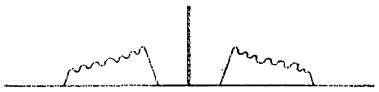
SINGLE SIDEBAND RADIO SYSTEMS...

How single sideband conserves power



THIS IS DOUBLE SIDEBAND

Voice modulation of carrier produces two beat frequencies—the sum and the difference of carrier and voice frequencies. Transmitter is called on to produce both sidebands in addition to carrier. This is inefficient in use of frequency spectrum and wastes power.

THIS IS SINGLE SIDEBAND (carrier reduced)

One sideband is suppressed by filters and carrier is reduced. Power thus saved is available for remaining sideband. This method of transmission conserves space in frequency spectrum, requires only a fraction of the power of double sideband, provides *improvement of 9 db in signal-to-noise ratio.*

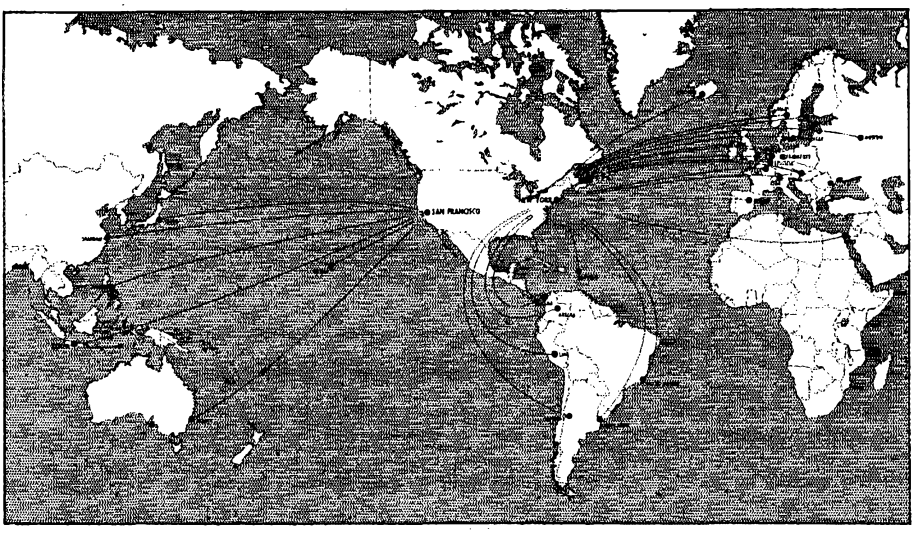
This system was originated and perfected by Bell Telephone Laboratories and Western Electric

THE RESEARCH that resulted in single sideband started at Bell Telephone Laboratories as early as 1915, when speech was first successfully transmitted overseas by radio. To improve the quality of voice reception, Bell scientists began studies of the fundamental nature of voice modulation. They proved that the radio transmitter was handling two similar versions of the voice (the sum and difference beat frequencies) in addition to the carrier.

Question: ***Could one of the sidebands be suppressed—thereby increasing efficiency?***

For the answer, new tools were needed and were forged by other Bell scientists: a balanced modulator that will reduce the carrier to any desired degree; an electrical wave

Single Sideband is used on these Bell System overseas circuits



BELL TELEPHONE LABORATORIES

World's largest organization devoted exclusively to research and development in all phases of electrical communications.

Bell System Voice Links with the World

filter that could accurately select one sideband and suppress the other; a very stable carrier frequency source and many other devices were originated. This accomplished, first transatlantic test of single sideband radio was carried out January 14, 1923.

1927 marked the entry of single sideband into commercial two-way long-wave radiotelephony, and the development by Bell Laboratories of crystal-controlled oscillators soon made possible its extension to short-wave communications.

Today one single sideband transmitter can simultaneously transmit as many as three separate radiotelephone conversations, using but little more frequency space than would be required for one double sideband voice transmission. Now, single sideband equipment—originated and perfected by Bell Laboratories, built by Western Electric—joins the U. S. with practically all major points throughout the world by radiotelephone.

The birth and growth of single sideband

1915. Bell engineers analyze nature of frequency band fed into antenna in voice-modulated transmission.

1918. Bell System makes first commercial application of single sideband, in carrier telephony.

1923. Bell System makes first transatlantic single sideband voice transmission.

1927. Single sideband enters radiotelephony field with opening of long-wave U.S.-England link.

1928. First commercial short-wave transatlantic single sideband radiotelephone circuit opened.

1930-1939. Single sideband service to South America, Honolulu, Paris, Manila.

1941-1945. Single sideband equipment built by Western Electric extensively used by Armed Forces, as well as government agencies.

1945-1948. Many more Western Electric single sideband radio systems put in service throughout the world.

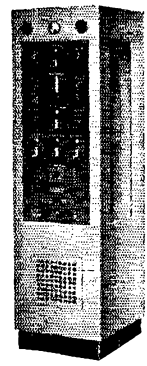
Now...NEWEST IN SINGLE SIDEBAND
the economical, low-power LE System

LATEST development in single sideband is the compact, low-power Western Electric LE System. Like the higher-powered LC now in wide use, the new LE is built to Bell System specifications for operation with a minimum of maintenance.

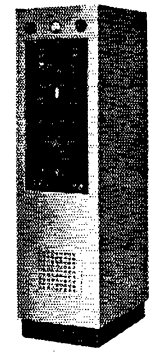
The LE System consists of three self-contained units: transmitter, receiver and control terminal. New electronic speech privacy equipment is incorporated into transmitter and receiver.

With the LE System, the Bell System now makes use of the demonstrated advantages of single sideband in medium-distance radiotelephony.

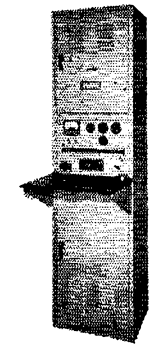
— QUALITY COUNTS —



LE-T1 Transmitter



LE-R1 Receiver



B4 Control Terminal

LE Single Sideband equipment is distributed outside the U. S., Canada and Newfoundland by Westrex Corp., 111 Eighth Ave., New York, N. Y.

Western Electric

Manufacturing unit of the Bell System and the nation's largest producer of communications equipment.

(*Continued from page 84*)

July 4th. QXN is building up traffic each month. OJW is busy with the arrival of a new YL operator. We understand the father is holding up remarkably well, while the mother and Shiela are doing FB. The East Bay Radio Club is going FB. When in El Cerrito pay the gang a visit. MFZ is slowly getting back on the air. Guess the honeymoon is not over yet. OBJ always can be found over the week-ends in the hills or on top of one with his gear. TI is giving some thought to a new antenna system as he is stuck with 131 postwar countries. TT now has DXCC on 'phone. The SARO was too busy to report this month because of Field Day activities. The NCDX Club reports that DX has been rather spotty. What this section needs is a good PAM. Anyone interested? Some of the ORS and OPS are not reporting. What's the matter, gang. Has the summer bug got you down? Traffic: W6FDR 164, VDR 132, QXN 80, YDI 59, BF 24, TI 17, EJA 10, YQB 10, OJW 1.

SAN FRANCISCO — SCM, Samuel C. Van Liew, W6NL — Phone — JU7-6457. DIX has new rig on 50 Mc. During freak opening of 50 Mc. on April 24th he worked three states. BCC has new rig and rotary perking on 28 Mc. Best DX to date is that rare FF8 (Dakar, French W.A.). WDG has forsaken 7 for 28 Mc. and is going to town with the 2E25 mobile rig. HVX, after years of inactivity, is planning a new rig. PPL had his "Fishpole Special" antenna bent double in the high winds and is now putting up a beam, but guyed. BCM, who has the prettiest 28-Mc. beam in town, just worked the first African he ever heard. AIW takes a "Postman's Holiday" from the FCC to punch large holes in the San Anselmo ether on 14- and 28-Mc. 'phone. YME, with four-element on hilltop, fed with a thousand feet of open line, is undoubtedly the outstanding Marin County signal — and with only 150 watts. VEJ is getting his feet wet in n.f.m. RAK threatens to get back on the air. PVC already is beginning to quail. TIJ, with his cage beam and dial-less converter, is knocking over the DX with sweet signal on 28 Mc. JB sold his little rig and was forced to revert to his earth-shaking kw. On the other hand DXA is astounding the boys with the work he can do on 28 Mc. with his new fractional-watt midget. WCW forsook ham radio for flying, but he is back and rebuilding his HT-9 rig. He also is active on mobile. CYO has come out of many years retirement and is again active on 28-Mc. 'phone. Thanks to MHZ for the above items from Marin County. Gene is planning to return to active duty with the Air Force overseas soon. The best of luck from all the gang and a safe return. His old friend ØQWV is coming out here next month to take Gene's place in the store. An amateur radio club has been established at Heald's Engineering College of San Francisco, and has received the call DAB for the club station. Hams attending the college are LG, OUK, WCA, WOW, YZP, ZKS, CJG, and CWL. At the present time DAB is on 14-Mc. c.w. running forty watts to an 807. HJP is eagerly anticipating his forthcoming visit to San Francisco with his new Frazer-Manhattan automobile. Many of the gang around the Bay Area were very active during the Portland disaster, some staying on all night. The Mission Trail Net, the Pioneer Net, and the American Legion Net all were very active with relief work. A full report of the splendid work accomplished in handling disaster traffic will be forthcoming as soon as all the details are available. The May 28th meeting of the San Francisco Radio Club was given to final preparation for the forthcoming Field Day. The speaker for the evening was Professor O. G. Villard, QYT, electrical engineer of Stanford University. His subject was "New Developments in Single Sideband Transmission and Reception." A fine demonstration was given with portable s.s.b. equipment. The San Francisco Naval Shipyard Radio Club devoted its June 4th meeting to final check-up on Field Day equipment and plans.

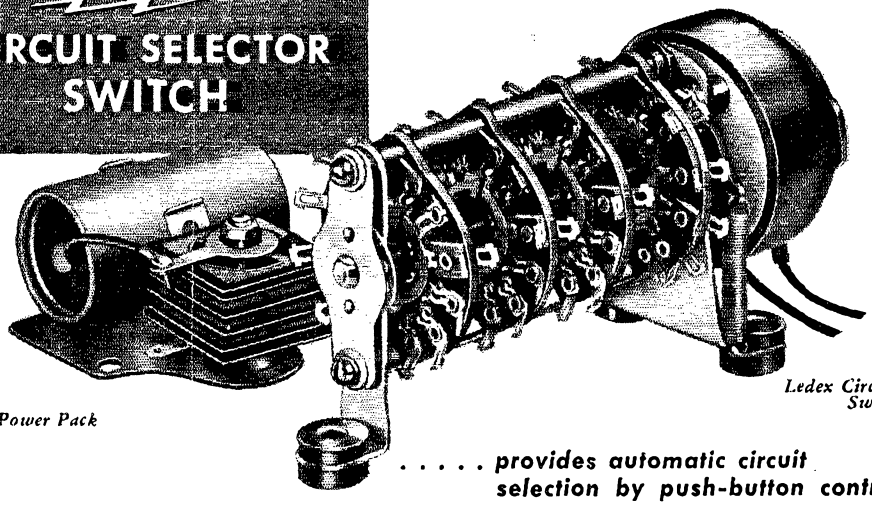
SACRAMENTO VALLEY — SCM, John R. Kinney, W6MGC — Asst. SCM, R. G. Martin, 6ZF. SEC: KME. RM: REB. Through the efforts of AFL, instructor of radio and electronics, a new station, CKF, at the Grant Union High School is now operating with 250THs in final p.p. 'phone and c.w. BTY, ex-9OCT, reports receiving a new license and an 8-lb. 5½-oz. daughter at the same time. The rig is 6L6, 807 into 811s p.p. with 126 watts. He has a four-element beam, HRO-5, Millen R9-er and RME 10-20 converter, and has worked all continents, 26 countries, and 27 states, recent DX being KG6AW/VK9, XE1GQ, EX5AP, WØEJG/KL7, PAØPN, G2MI, LX1BT, C1CH, VK3ADF, and PY5AL. ZF will have new QTH at Beverly Way and 13th St. in Sacramento and expects to use a 3.5-Mc. vertical. WTL reports DX worked as W6YOT/C6, VP3TR, CE3AB, and LU7FW; that he has received his 28-Mc. 'phone WAC Certificate and is very proud of it; that RMT has new rig on 'phone with 250 watts and that WHG, in Hood, is working DX on 28 Mc. with a kw. SLS, in Oroville, a new licensee, is operating on 7225 kc. with an 807 with 15 watts. AF reports receiving his WAC Certificate for c.w. operation on 14 Mc. and that a radio club is being formed in Oroville. Field Day activities for the SARC on June 12th and 13th were held at Forest Hill, near Auburn, Calif., operating as JN. The following members were in control positions: ASI, 3.85-Mc. 'phone; ZF, 3.5-Mc. c.w.; MIW, 7-Mc. c.w.; WLI, 14-Mc. c.w.; AK, 28-Mc. 'phone and KME, 144 Mc. Traffic: W6ZF 56, WTL 4, BTY 2.

SAN JOAQUIN VALLEY — SCM, Ted R. Souza,

(*Continued on page 90*)

LEDEX CIRCUIT SELECTOR SWITCH

- REMOTE CONTROL
- ROTARY SOLENOID OPERATED



Power Pack

Ledex Circuit Selector Switch

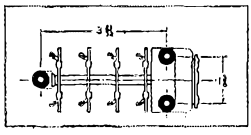
. . . . . provides automatic circuit selection by push-button control

The Ledex Circuit Selector Switch was designed to provide dependable, automatic, circuit or band selection by remote control.

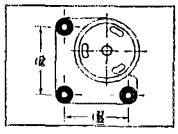
The rotor assembly of a gang of rotary or "wafer" switches is driven by a Ledex Rotary Solenoid. The solenoid is converted to a rapidly oscillating motor by means of a commutating switch and return spring. Power is transmitted to the wafer switch rotors by means of a unique end-engaging ratchet. The #1 "wafer" controls the solenoid which "homes" the switch to the selected circuit.

Four models are now available from stock; either six pole, six position or three pole, twelve position. Both types are furnished with either the standard or panel mountings. The six pole, six position switches have contacts for circuit indication lights.

The entire unit is unusually powerful, compact and rugged. Each circuit selector is carefully assembled and is given thorough mechanical and electrical tests before shipment.



Standard Mounting



Panel Mounting

G. H. Leland INC.

DAYTON 2, OHIO

G. H. LELAND, INC., *157 Webster Street, Dayton 2, Ohio*

Please check the following. If more than one is desired, write the number in square.

MODEL: *6 pole, 6 position* ☐ *or 3 pole, 12 position* ☐

MOUNTING: *Standard* ☐ *or panel* ☐

Deliver Postpaid to:

NAME .....

STREET .....

CITY ..... STATE .....

☐ *Check here for information on 6, 12 and 24 Volt D.C. Models and models employing ceramic wafers.*

GET YOUR SELECTOR SWITCH PACKAGE

MAIL COUPON WITH CHECK OR MONEY ORDER FOR $9.75

PACKAGE INCLUDES:

SOLENOID POWERED SELECTOR SWITCH
6 Pole, 6 Position
or 3 Pole, 12 Position
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115 V.—A.C. to D.C. POWER PACK
COMPLETE WIRING DIAGRAM

IMMEDIATE SHIPMENT FROM STOCK $9.75 NET
(Postpaid anywhere in U. S. A.)

NOTE: Residents of State of Ohio add 3% Sales Tax

W6FKL — MEY is QRL Mission Trail C.W. Net. KUT rebuilt final and is now back digging for more DX. Fresno State College donated part of a building at the college farm for SJVRC station; TO is the call and KUT will be in charge. Emergency preparedness will be the byword. PHL reports he is all set up for emergency work in Merced with solid tie-in between local sheriff's office, police and taxi cab services. LTO is happy to report the power company adjusted his line voltage from 85 to 105 volts. He'll be on again soon. JWK built new n.f.m. exciter and now has it in operation. FSD is doing some aeronautical-mobile work on 28 Mc. from his own plane. QOS is rebuilding. ZKD put on fine operating display for Boy Scout Jamboree. She is San Joaquin Valley's youngest ham. FYM is QRL Mission Trail Net and keeps daily schedule with KG6CZ. BHI applied for ORS appointment. PSQ has new pair of HK54s running 400 watts and new NC-183. PCS is second Fresno station to make DXCC. SRU is almost DXCC — but not quite. JPU has completely rebuilt with 813 final. He also is quite active on 144 Mc. IFE is on the staff at Fresno State College. AHO is preparing for summer operation at Huntington Lake. FKL's new shack is finished. Appointments are now open in all classes. All those interested should write the SCM for application blanks.

ROANOKE DIVISION

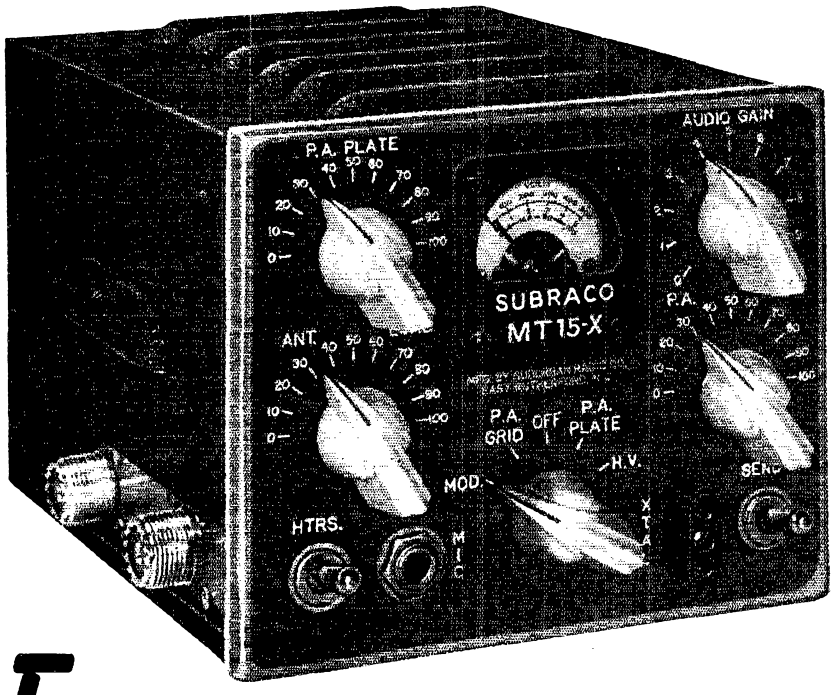
NORTH CAROLINA — SCM, W. J. Wortman, W4CYB — Many thanks to the Greensboro gang for the swell hamfest on May 30th. MFK reports that only LR kept the town of Washington on the map for the past fifteen years. LVT now is on, as well as JOS and MFK. JOS joined the staff of WRRF from his old QTH on South Hill, Va. MOC is going strong on 7 and 14 Mc. HUL now is painting, under the direction of his XYL. MYO is purchasing a new home. DGV is on 28-, 14-, and 3.85-Mc. 'phone and is working some DX on 14-Mc. 'phone. BFQ/4 is working at the Winston Salem YMCA with three watts. NGT reports DX as VK3. JQO is cleaning up BCI for someone else, while awaiting modification of his ticket. LAH is very close to DXCC and is sweating out the QSLs. BCS is on 28 Mc. working lots of short skip. NI has a kw. on 28 and 3.85 Mc. IZR is working on 14-Mc. grid drive. DCW is disgusted with QRN, but managed a 25-w.p.m. Code Proficiency Certificate. The North Carolina Emergency Net now operates nightly on 3865 kc., with DLX as NCS. The following stations are listed at present: AAU, ANU, BYA, CVQ, CYB, DGU, DKB, DLX, DST, DXG, GJS, GKG, HGC, HUL, IOH, IPO, JVL, KHR, KYH, LDJ, LKI, LR, TS, and KYI, with CEL and CXO associate members in South Carolina, 8HUK in West Virginia, and BQU in Georgia. C. E. Beard, KJS, has been appointed as Section Emergency Coördinator. Your coöperation will be appreciated we feel sure. How about more and more EC work, gang? Traffic: W4CFL 186, IMH 83, KJS 63, CYB 18, DLX 15.

SOUTH CAROLINA — SCM, Ted Ferguson, W4BQE/ANG — NLX has 100TH on 28-Mc. 'phone and so has new beam. KIE is EC for Greenwood area. BSS reports that he has a new four-element 50-Mc. and three-element 28-Mc. beam. CE has T-55 on 3.85- and 28-Mc. 'phone. MRJ is active in the South Carolina 3.5-Mc. C.W. Net. CZN keeps busy with radio work for EAL. IYA confines his operations to 3.85-Mc. 'phone and 3.5-Mc. c.w. week ends only. HTR works 3.5, 7, and 14 Mc. and takes part in the South Carolina Net. DNR says it will be 14-Mc. c.w. for him for the summer months. DAW reports operations on 3.5, 7, and 14 Mc. MSN is on 3.5-Mc. c.w. but hopes to be on 28-Mc. 'phone soon. DFC has a new 3.5-Mc. c.w. portable emergency rig and also works 7- and 14-Mc. c.w. BR has been appointed EC for the Chester area. T. H. Woods, ANK, has been appointed Section Emergency Coördinator to succeed BFQ, who has moved from the section. BAT has been appointed EC for the Greater Charleston area, succeeding ANK. BJE has been appointed EC for the Walterboro area. Congrats ANK on your *South Carolina Net Bulletin*. Every c.w. man should write for a copy. I would like more reports, please. I cannot mention you here unless you report. Traffic: W4CZN 11, CE 3.

WEST VIRGINIA — SCM, Donald B. Morris, W8JM — It is with deep regret that I report the passing of one of West Virginia's outstanding amateurs, HD. Active in ARRL and AARS work and well known to many State amateurs whom he visited as SCM, Pat will be greatly missed. The Charleston Radio Club has received the club call, COE. DFC is raising new poles for more effective fall net operation, and also plans increase in power. JM and ESQ, active in CAP operation, have received the calls WSYQ and WSWG for 2374 CAP operation. EBG, MARA member, has been transferred to Lima, Ohio, by his company. KWI now leads West Virginia DX amateurs with over 160 confirmed, the latest being MD7 and ZC6. PQQ has a Mon-Key to help him in snagging DX. YGL has installed 28-Mc. beam 40 feet in the air and now works into Pittsburgh on ground wave. MARA, using club call BIA, had the most successful Field Day ever from Halleck Mountain. The West Virginia Net is considering changing from 3770 to 3585 kc. this fall. Your comments for or against the change will be appreciated. I will tabulate the results and

(Continued on page 92)

"DASHBOARD" MOBILE



EVERYTHING AT YOUR FINGERTIPS

With this, completely new, compact, efficiently designed mobile transmitter, small enough to mount in the average glove compartment or under dash. Only the "SUBRACO MT-15X" offers you these outstanding features!!!

● Ultra compact, measures only 5½" wide, 4½" high by 6½" deep weighing only 6 pounds. ● Complete with a specially designed, MINIATURE, ILLUMINATED, meter with three different scales to read all stages. ● All controls, including xtal jack, are on the front panel directly before the "operator-driver" to facilitate quick QSY. ● Built-in antenna change-over relay. ● High level class "B" modulator capable of delivering 17 watts of audio. ● Push-to-talk operation as well as a SEND switch for lengthy transmissions or tuning up. ● Audio gain control. ● Can be used as a portable or main station standby transmitter.

The "SUBRACO MT-15X" incorporates the use of a 6V6 "tritet" oscillator quadrupling from 7 to 28 megacycles, that drives a 2E26 plate and screen modulated, class "C" amplifier with a tuning range from 27 to 30 megacycles.

The modulator section consists of a carbon mike input to a 6V6 as a speech amplifier that drives a zero bias class "B" modulator which is essentially flat from 250 to 3000 cycles.

The "SUBRACO MT-15X" is designed to operate at approximately 30 watts input, AM PHONE, from any AC, Vibrator, or Dynamotor power supply that delivers from 300 to 400 volts at 160 MA. The heaters require 6 volts, either AC or DC. No internal changes are necessary regardless of what type of power supply is used, since the antenna relay and mike will operate in any case.

The "SUBRACO MT-15X" comes complete, ready to operate, encased in a handsome two-tone green, slide-on, cabinet, with chrome trimmed and embossed panel markings.

ONLY $79.95 less tubes and accessories

Kit of tubes $8.00, complete with tubes and two male antenna connectors $87.50

All transmitters require deposit of 20% bal. COD. FOB E. Rutherford, N. J. except when paid in full. Transmitters shipped prepaid.

SUBRACO MT-15X

SUBURBAN RADIO COMPANY

82 Herman Street • East Rutherford, New Jersey

turn the report over to the NCSf or the net. Traffic: W8GBF 59, DFC 11, JM 9, PQQ 4.

On May 17th West Virginia amateur radio lost one of its staunchest supporters, C. S. Hoffmann, jr., W8HD, former SCM and old-time assistant division manager. His earlier calls were W8AKZ, W8QY, W8BSU and W8NS. During his notable ham career, "Pat" served actively in Army-amateur nets, emergency work and ARRL organization. In 1946 Mr. Hoffmann was honored with the nomination for Roanoke Division director, losing the election by a small margin.

West Virginia has lost a leading citizen, an ardent amateur.

ROCKY MOUNTAIN DIVISION

COLORADO — SCM, Glen Bond, WØQYT — 5EHC, ex-WØEHC, in Oklahoma City, sent a card and advised he completed a new transmitter, 813 in the final modulated with a pair 811s. Hope to work you some time on 3.85 Mc., Carl. ECN has been handling traffic in and out of Denver with LZY in Colorado Springs. Allen is collecting parts for a kw. using 304TLs in the final. From the sound of the QRM on 7 Mc. he needs it. LZY is operating with Slow Speed Trunk Line No. 4 and will be in the field with two or three c.w. rigs under the call RPA. The Denver Radio Club had a very fine set-up for Field Day with two 5-kw. a.c. power plants to supply power. The antenna crew strung wire, etc. The committee deserves a lot of credit for its work. The AAROD set up southeast of town and the Electron Club was at the Boy Scout Camp again. SGG, in Colorado Springs, has built up a VFO with break-in for 7 Mc. Otto has received his A-1 Operator, RCC, and 20-w.p.m. Code Proficiency Certificates. WAP has returned from sea duty and has settled in Harrisonville, Mo. Mac will be on the high end of 7 Mc. soon. HMM, in Davenport, Iowa, is eager to schedule some Colorado stations as outlet for Colorado traffic, 3565 or 7275 kc. Traffic: WØLZY 32, ECN 26, SGG 25.

UTAH-WYOMING — SCM, Alvin M. Phillips, W7NPU — UTM used emergency battery power during his Field Day activity. DLR is preparing to move to Santa Barbara, Calif. All members in this section are urged to send their monthly activity reports to the SCM via the FARM Net, which in turn will relay to the SCM. The net meets Mon. through Fri. at 1930 on 3935 kc. SP reports that "Doc" Boyle, an OT, has returned to the air as JVA. Other new calls are MHA, MFQ, and MGA. SP received his OES appointment. He is doing a swell job on the 144-Mc. band and is fixing to go on 420 Mc., crystal-controlled. NPU was presented with a new YL harmonic on May 10th. FST is back at the rig after spending a few days in the hospital. LLH is working in the Electronics Shop at the NSD in Clearfield, Utah.

SOUTHEASTERN DIVISION

ALABAMA — SCM, Dr. Arthur W. Woods, W4GJW — SEC: KCQ. PAM: BA. Eight hams and several non-licensed members comprise the club at Muscle Shoals prexied by KF, with MXT as secretary and treasurer. CDC is active on all bands, including 50 Mc. EVJ is reworking a Federal transmitter. MXT uses a BC-459A and MEM confines his work to 7 and 14 Mc. CYL directs AEC in the Muscle Shoals area. AUP/HVY had pre-Field Day workout on Dewberry Island near Montgomery. MXU is preparing to install p.p. 811s following a newly-completed 6V6, 6L6, 807 exciter. MUW is using a 458 converted for 7 Mc. at present. In Anniston, LEN worked Haiti on 3.85 Mc. BCU has finished his all-band ART-13. BA has been working more 14- than 3.85-Mc. 'phone lately. HA finds unexpected response to airing of Official Bulletins. MEP is using p.p. 810s on 28 Mc. Everyone is requested to cooperate in Emergency Net drills and to write KCQ for full information concerning this vital activity. The net is well established and needs expansion to all corners of the section.

EASTERN FLORIDA — SCM, John W. Hollister, W4FWZ — Attention ECs: Have you completed your AEC membership check-up? Wanted: More stations are invited to apply to your SCM for appointment as OBS, ORS, OPS, and OES, and AEC membership. Get a card off to the SCM now. Get listed with ARRL for special bulletins and publications. Appointments qualify you for participation in ARRL CD and LO Parties. Traffic: Clear Canal Zone direct on Gator Net, 7290 kc., every night at 7 P.M. The Palmetto Net is on Tuesdays only for the summer. DX: BVX reports new stations on about 28,450 kc. are FQ8SN and MD4JG. VHF: K4NAR, Jax, is on 144 Mc. with 50 watts and four-element beam. EID, Jax, works HAD, Tampa. HAD runs 20 watts to six-element beam. GYO, Gainesville, upped a notable square corner reflector. News of the month: Director Shelton's fine discourses on the last ARRL Di-

(*Continued on page 94*)

rectors' meeting. The ARRL National Emergency Communications Manual is available. Field Day: JKI, HRB, and ATM, of Jax, reported activity. Gator Net line-up: 7290-kc., 7 P.M., Mon.-Fri. NCS: IKI. ANCS: GIP, MKP, MNT. Active: AK, AKV, DFU, GIP, IKI, LVV, MKP, MNT, ZC, NAA, and KZ5MB. Associates: BYF, FGC, GCH, FNR, HRB, IMI, MJV, SI, OO, W3UF, and KZ5AX. OB schedules: GIP, 7042 kc., 8:30 P.M., Mon., Wed., Fri. BYF and others on 7170 kc., 8:30 P.M. EYI on 14 and 28 Mc., 7:30 P.M., Tues., Wed., and Thurs. See *QST* for W1AW OB schedules on all bands. One more reminder: Get in touch with your local Western Union manager and get dope on its tie-in with AEC for handling W.U. traffic when lines are out. Read article in *QST* about it. There is opportunity for worthwhile activity in handling W.U. traffic plus a nice certificate award if you report it. Here's to a bigger and better AEC. Traffic: W4MNT 45, BYF 24, GIP 18, MVJ 11, FWZ 2.

WESTERN FLORIDA — SCM, Luther M. Holt, W4DAO — AXP bought emergency a.c. power plant. NOG, NOX, and NQU are new Pensacola calls. NAA is heard in Crestview. PARC held big banquet at Harborview. DLO worked SM on 7 Mc. ACB visited Washington on business. Tallahassee boasts the Talaflo Radio Club with ACB, pres.; GQM, vice-pres.; TL, treas. LDT has rig at WTAL, where he works. FVN and LDT used mobile rigs to phase WTAL towers. MAX keeps 7- and 14-Mc. c.w. hot. Your SEC would like to hear from all 7-Mc. fellows interested in emergency work. BFD built a.m. modulator. DXQ needs two states for WAS. KIK has kw. on 28-Mc. 'phone. DZX changed his QTH. EQR, CNK, LCY, HIZ, NDB, FIH, and MS have rigs on 50 Mc. FIH built Q5-er. NDB wants more power. NGS works 28-Mc. DX. QU built new final. BCC works mobile. QK is building 'scope. SAA visited St. Louis. NJB bought three-element beam. Traffic: W4AXP 24, BGI 2, NGS 2.

GEORGIA — SCM, Clay Griffin, W4DXI — SEC: BIW. We regret to report the death of IIS, a well-known 3.85- and 28-Mc. Augusta ham. The c.w. section of the Cracker Net now meets on Mon., Wed., and Fri. nights on 3705 kc. CBR took a trip to Dahlonega and tried his emergency equipment while there. He made 22 contacts. We are sorry to lose MWF, who is moving to North Carolina. EV, Decatur, is back on the air with p.p. 810s and 8JK, chasing DX on 28- and 14-Mc. c.w. Some will remember Ben as APU. Welcome to MCM of Marietta. He moved into this section from South Carolina and operates on 7 and 14 Mc. FKE has almost completed 28-Mc. mobile rig. The Fulton DeKalb 28-Mc. net control station should have been reported in June *QST* as HDC instead of LNG. LMF has worked Tennessee and South Carolina on 144 Mc. He also was heard in Alabama and North Carolina. Charlie claims the Georgia 144-Mc. DX record with his Chattanooga contact. More reports are needed to fill our column. If the news in the column seems old, remember it is published six weeks or more after being sent to West Hartford. Traffic: W4BOL 30, MWF 4, DXI 4.

WEST INDIES — SCM, Everett Mayer, KP4KD — AM rag chews and works LU. OA worked PY after two years trying and worked VP5 giving him two new countries. BE says he had a few rag chews. AM's XYL is the proud possessor of a brand-new ham ticket with the call KP4HR. She started off with four watts, worked 7 U.S. call areas four countries, two continents, and 26 KP4s her first twelve days on the air. FZ is working DX on 7 Mc. He has new three-element rotary beam and made first QSO on 28-Mc. 'phone. AC has 150 watts to 813 now. WITA is 100 per cent ham, the staff being AU, AC, CU, and BX. EZ is up to 46 countries with VQ2, ZP8, PZ1, VP4, and ZE. W4GPO/KP4 is active. PRARC had an exhibition at Munoz Rivera Park with KP4DU/KP4 on the air for public demonstration. Club officers are: CL, pres.; CI, vice-pres.; CB, secy.; BL, treas.; AM, CK, DP, DV and KD, directors. Traffic: KP4HR 2, EZ 1.

CANAL ZONE — The following was reported by KZ5AW: We were gratified by the Board's action in designating Canal Zone a separate ARRL section. The Canal Zone Net can take traffic direct from the Gator Net on 7290 kc. AW, AX, FS, and MB are plugging the 7-Mc. nets with AX and MB carrying the traffic load from the Gator Net. Transisthmian short-skip 28-Mc. 'phone contacts were frequent this month, with distances ranging from 22 to 50 miles across the Continental Divide. AX, 40 watts, 40 meters, surprised himself with a VK6 contact. WG worked a VK on 28-Mc. 'phone with 8 watts. Jet pilot ED is revamping the Army rig to get into 7-Mc. net. AK is QSL Manager and Canal Zone Certificate Dispenser. JM is confounding engineers with 28-Mc. beam that works 18 inches above tin garage roof! CG is back from stateside leave with new gear. GD is building to higher power. Traffic: KZ5AW 5, AX 5, MB 5, WG 3.

SOUTHWESTERN DIVISION

LOS ANGELES — SCM, Vincent J. Haggerty, W6IOX— Asst. SCMs, W. J. Schuch, 6CMN, and Irvin O. Hege, 6FYW. CMN put in some long hours during the Oregon flood keeping his SCN on the alert. Bill has rigs on 3.5, 7, and 14 Mc. KP works 28 Mc. MYH is mobile on 28 Mc.

(Continued on page 96)

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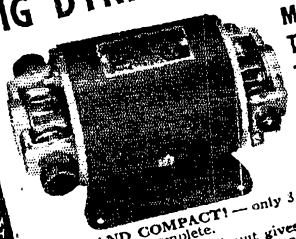

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POWERFUL! — 12 volt input gives 680 volts at 210 ma; 6 volt input gives 300 volts at 210 ma or 265 volts at 300 ma.

Ball bearings insure high efficiency operation. Build your mobile rig around this husky dynamotor. FB for running rating.) Built in RF hash suppressors.

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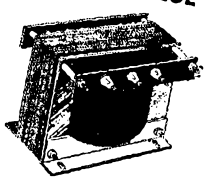

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PSX continues to rebuild. Ex-9DDE now is 6DDE and works traffic on the Pioneer and Southern California Nets. Ed visited the SCM and took home a brand-new ORS ticket. RXT complains that traffic was light, but he turned in a good report. The SCN needs a traffic outlet for Riverside. APH is working on 14- and 28-Mc. beams. GAL has several new antennas strung from 60-ft. poles. FMG turned in traffic report and headed for vacation land. FYW joined the AEC. LKF is new EC for Northern San Luis Obispo County. AKS works traffic on SCN and has been heard on 7 Mc. AEE works on Mission Trail Net and schedules CE7AF on 14 Mc. QIW, CIC, and DDE reported by amateur radio. WOO has been active on 7 Mc. AM now has 12 directions available on rhombics by means of a small rotary switch. DQZ handled traffic from China. MU is getting ready for fall activity. VAQ has been DXing. BCT is interested in radio experimenting, has applied for OES appointment, and promises some interesting reports. BUK reported for Pasadena Short Wave Club. CPU is moving to Spokane, Wash. III has a new beam working. SMI is on after a long rebuild job. MFK acquired BC-610 and NC-240D. AAE has been DXing. 6DGA, Barstow, was 9DZR in Joliet, Ill. twenty years ago. Welcome back to hamdom: CPI, MIO, TSN, and OHM are working 420 Mc. The Mike and Key Club meets at 33rd and Pico in Santa Monica every other Thursday night. Those interested in AEC work in the Bay Area Net may contact QJG or OHM. OHM has a television set free from ham interference and is eager to contact hams in his area who are interested in television construction. Officers of the Two Meters and Down Radio Club in Los Angeles are: ZUX, pres.; MJV, vice-pres.; CRV, secy.; and WKO, treas. The club plans to hold meetings every other Wednesday. The SCM plans to be on vacation during September so it is suggested that traffic reports for August be mailed in the first week of September to Asst. SCM W. J. Schuch, W6CMN, 6707 Beck Ave., North Hollywood. Traffic: W6IOX 284, CMN 156, DDE 111, RXT 81, FMG 42, FYW 28, AKS 24, AEE 17, QIW 15, BCT 14, WOO 13, CIC 12, AM 10, EYH 8, DQZ 3.

ARIZONA — SCM, Gladden C. Elliott, W7MLL — The ball game and picnic at Casa Grande was a big success with QKR, KAG, MEK, KAC, SGG, JGB, MII, and MAM doing a wonderful job as hosts. Final score: Tucson 12, Phoenix 3. UPR, KWW, PEY, KWU, and HYQ got their Class A licenses. MIL, LHI, LYR, MII, and LIH made the Class B rating. UPR is on 3.85- and 50-Mc. 'phone. LLO is on 50 and 144 Mc. UPM is operating separate rigs on every band. JJN has a new kw. on the air. JXL is operating on 28 Mc. while attending the University in Tucson. KGT is using a metal roof as part of a ground plane on 28 Mc. KPM has a three-element beam on a 45-ft. tower on top of the mountains at Bisbee. DFE and MLL handled blood bank flight data traffic between Ajo and Tucson. The 3.85-Mc. 'phone gang in Phoenix journeyed to MIO's location at Pinetop for a week end of operating. KWJ is on 14-Mc. 'phone and 7-Mc. c.w. JGU/6 is on 3.5 Mc. at Bishop, Calif., and wants Arizona contacts. PEY is trying out 14-Mc. 'phone. JGF has a new HT-9 on 14-Mc. 'phone. MWQ boasts one of the best fields of antennas in the State. FGG is on 50 Mc. EAW makes recordings of the boys. LUK is radio operator while on a two-months cruise to South America.

SAN DIEGO — SCM, Irvin L. Emig, W6GC — Asst. SCM and SEC, Gordon Brown, 6APG. New ORS is OBD. NF/CFN is active on American Legion Net and reports the highest traffic score for the section. CNQ was promoted to Patrol Inspector with Immigration Service. BAM reports the Orange County Amateur Club now meets the first and third Wednesdays and that a new club, the Harbor Area Club, is forming. LYF is active in the Southern Border Net on 3550 kc. at nine each evening with BGF, BAM, BKZ, CNT, VTS, AD, ZSF, CGF, and CNQ. Ex-4TZ now is 6YK. News from the S. D. YLRL: YXI, YZV, and AWW operated 28-Mc. 'phone for Palomar Club during Field Day. ZYD covered 144 Mc. for San Diego Club while BLF and BCU operated 28-Mc. 'phone. BGC needs only Arizona for WAS. BLF was chairman for YLRL picnic held at El Monte Park. AQL soon will be back on the air. CPJ, a YL M.D., is heard on 3.5 Mc. YYM now is settled in Hawaii. BGF is holding down spots in Southern Border Net, Pioneer Net, and Southern California Net and reports traffic scarce. ZSF, a new reporter, handled QRR traffic from Oregon during the flood. ØYHZ, now 6BYX, is heard on 3.5 and 7 Mc. The Imperial Valley Amateur Radio Club held its first annual banquet at the California Hotel in El Centro with 28 amateurs and wives in attendance. LVN, who now has a 75-A receiver, sends in news from Imperial Valley. BEY will give a talk on mobile transmitters at next meeting of IVARA. DLN handled arrangements for Imperial Valley Field Day activities. RDI, who never exceeds 8 watts, won an 814 at club raffle. CQW is building a new "lean to" to accommodate ham radio. WHW is pounding away on 14-Mc. c.w. OBD sends in one hundred QSLs for DXCC. NCS is back getting his Ph.D. in physics. CCK bought Collins 75-A receiver and 32-V transmitter. Traffic: W6NF/CFN 96, BGF 34, LYF 15, ZSF 12, BAM 6, MI 6, GC 4.

(Continued on page 98)

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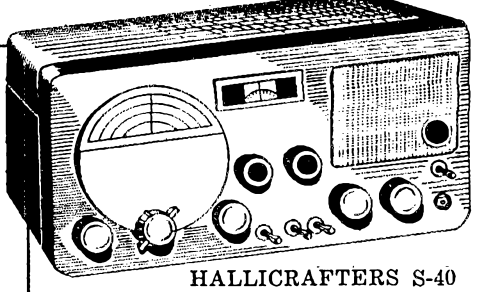

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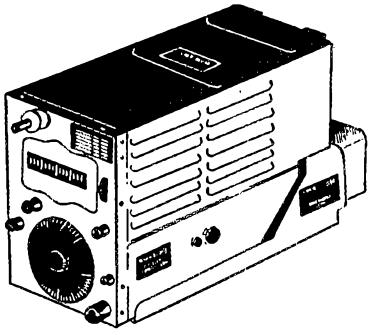
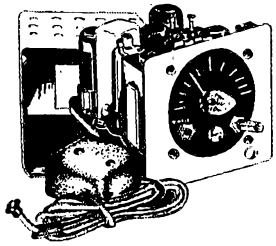


For 4-5.3 mc band. Complete with calibrated crystal, magic eye 1629, two 1625's, and one 1626. Shipping weight 15 lbs.

BC-1206 RCVR $4.95



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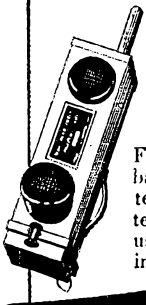

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WEST GULF DIVISION

NORTHERN TEXAS — SCM, N. C. Settle, W5DAS/MNL — GZU heads the list of traffic handlers for the month. In spite of vacations, spring fever, and QRN, the North Texas emergency and traffic nets are maintaining schedules. ARK has been doing a fine job as Alternate NCS with NTX C.W. net. JFF, of Shreveport, visited old friends in Dallas recently. CJJ is capably handling the 'phone emergency net and is custodian for the Dallas Radio Club emergency equipment. From current reports, there was plenty of activity on Field Day. GBN is active on 3.85-Mc 'phone. NPU is on 7-Mc. c.w. After a long wait, GYW finally got his new Chevvy. AYC and EYU, of Ft. Worth, are working 3.85-Mc. 'phone these days. HBE has moved into his new home and should have his kw. back on the air very soon. KYR, of Borger, is getting ready to help with NTX traffic. Traffic: W5GZU 448, ARK 40, ASA 16, ILZ 5.

OKLAHOMA — SCM, Bert Weidner, W5HXI — Asst. SCM and PAM, George Bird, 5HGC. SEC: AST. RM: IGO. HGC has recovered from a serious illness. MDO is off the air since school is out. OLZ will operate all summer as a directed net. LHP was married in June. NHD's bew cooker with 400 watts may be heard from 3.5 Mc. to 50 Mc. EAK visited HXI and put new life in 144 Mc. BBS is off the air with his 300-watt final but still takes out locals with his 10P. CKQ is building band switch into a console. EHC has a new rig with 813 final modulated by 811. HXT is the proud papa of a baby boy. There still is considerable activity on 144 Mc. in Tulsa and Oklahoma City with outlying amateurs reporting in. 50 Mc. was hot on May 31st. Traffic: W5MBV 110, IGO 102, NMM 75, AST 37, NLO 36, JKS 20, IOW 9, ADB 8, KDH 7.

NEW MEXICO — SCM, Lawrence R. Walsh, W5SMA, — SEC: ZM, RM: HJF. PAM: FAG. The call W5ZA has been reassigned to Eunice Falconi, widow of Louis Falconi. Welcome to a new ham in Portales, OLE. He is a 25-w.p.m. man and runs 20 watts to a 6L6 oscillator. He operates on 3.5 and 7 Mc. A couple of rousing cheers to JYW upon receiving WAS Certificate from ARRL. JYW occasionally is operated by ØCAG, who is visiting in Hobbs from Kansas City. HOX has accepted a job as radio engineer with the Army. He will be moving into W8 territory, Ohio, but hopes to continue with traffic schedules and says he will be seeing the New Mexico gang on 28 Mc. Sorry to lose you, Rusty, but best wishes and lots of luck in your new position. NKG sent me a copy of the oath of a ham. Anyone desiring a copy, please drop me a line. SMA has returned from a month's vacation with an NC-183 receiver. UFA is spending several weeks in Galveston. Please let me know how you feel about the Board of Directors' proposals as given in May *QST* as I plan to see NW in Houston at the Division Convention. Traffic: (April) W5ZU 73, HJF 32, HOX 28. (May) W5ZO 47. KAO 10, NJR 9.

CANADA

MARITIME DIVISION

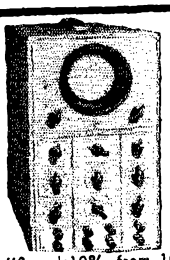
MARITIME — SCM, A. M. Crowell, VE1DQ — The HARC station, FO, manned by a crew of 20 members, operated on 3.5-, 7-, and 14 Mc. VFO during Field Day. The Dartmouth Club, LCARC, VARC, and Yarmouth Club also had rigs in operation. DQ and FQ recently visited VARC. BW seems to be going high power. MA has nice emergency gear, including gas-driven generator. An interesting talk was given the HARC members recently by Prof. Douglas — subject "Labrador." ME has moved to Wallace. FB also has moved to new QTH. WD is new call in Halifax. QZ is keeping watch on 50 Mc. as well as working the 120-watt rig on 28, 14, and 7 Mc. NQ is getting out and has the cards to prove it. MZ got the new exciter going. DS is selling out. FN now is in Ottawa with his powerhouse. TA has the mobile rig on 28 Mc. GR is back on the job again after an illness. ET is on 3.5-Mc. c.w. ZZ is a new-comer on 3.5-Mc. c.w. GK and QK are active as usual on 14 Mc. NZ is on 28 and 14 Mc. IB, KN, and CB are in various stages of rebuilding. The grapevine says that the HARC will announce a club DX contest shortly. The OMs had a fine time at the Dit and Dah Club Banquet. DB is batting 'em out and knocking off the odd bit of DX. Flash! FQ is going VFO. and has been caught on c.w.!

ONTARIO DIVISION

ONTARIO — SCM, David S. Hutchinson, VE3DU — The Beaver Net is functioning with AWJ, AWE, AHL, BCS, BMG, DU, ATR, APS, BNC, GI, BUR, and XO showing up fairly regularly. Hamilton Club reports that BNQ, ABP, and BQF worked considerable short skip on 28 Mc. recently. BNQ worked ZS1-2-4-5-6 one noon on 28-Mc. 'phone. QU has 20 countries on 7 Mc. FT has BC-459A. KM and AQG have 3 states on 144 Mc. and KM has 18 states on 50 Mc. On 28-Mc. 'phone BNQ has 76, ABP 49, and AQA 45 countries, with QU having 38 on 28-Mc. c.w. On 14-Mc. c.w. BHX has 48 countries and QU 43. JU has 28 countries on 14-Mc. 'phone. BHX has 18 on 7-Mc. c.w. BMG, BQG, and BNQ attended meeting of Galt-

(Continued on page 100)

MIDSUMMER SAVINGS AT NEWARK



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3C24/24G	.67	838	3.95
5BP4	3.95	843	.45
6AK5	.89	845W	3.45
10Y	.59	872A	1.75
211	.69	931A	2.39
304TL	1.39	954	.49
316A	.49	955	.49
705A	2.95	957	.49
717A	1.65	958A	.49
801A	1.49	959	.49
803	8.95	1619	.49
804	8.95	1625	.49
805	4.95	1626	.49
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809	1.65	9002	.49
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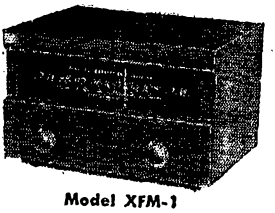

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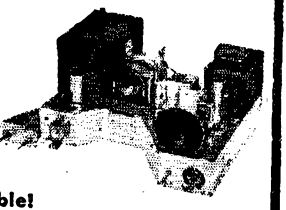

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Kitchener-Guelph Club. BQM is on 7-Mc. c.w. and 50-Mc. 'phone. VD schedules VE2BB on 7 Mc. BUR is using BC-457 on 3.5 Mc. and BC-459A on 7 Mc. AYE's new call is VO. AIB is active on 144 Mc. IZ is on 144 Mc. with a 522. BIF reports KH6FF on 27 Mc. BIG works Gs on 3.5 Mc. with 25 watts. GE claims lowest DX record for a year — one ZL, one F, and six Gs. AII is active in RCCS(R) and on 235 Mc. AHA is keeping nightly schedule with G6BY, and QSOed AC4GD in Tibet. APS is active on BN. JX has 20 watts on 7 Mc. BAJ and BCP keep the QDT Net going on 7167 kc. at 7 P.M. EST. ANH completed new rig for 7 and 28 Mc. PH is experimenting with flat-top square-folded dipole beam on 14 Mc. AKH is putting Bendix TA12G on the air. BXO is putting BC-458 on 7-Mc. c.w. AQW has 15 watts on 28-Mc. 'phone. BUE has new AR88. AZN has 250 watts to 813 on 14-Mc. 'phone. BGI has new rig with 811 on 28 and 7 Mc. NI and OT are on 3.8- and 14-Mc. 'phone. AUI is on 7-Mc. c.w. and 3.8-Mc. 'phone. HG is active on 14-Mc. 'phone. HI has 14-Mc. beam. Traffic: VE3ATR 77, APS 49, BMG 40, GI 36, DU 28, BUR 20, VD 17, CP 10, XO 8, AWE 7, BCP 7, BCS 6, WK 5, AWJ 4.

QUEBEC DIVISION

QUEBEC — SCM, Gordon A. Lynn, VE2GL — ZO rebuilt using a pair of 813s in final but is still chasing bugs. XX also has rebuilt and is heard on with the new rig. DD has a pair of 814s with two-element beam on 50 Mc. EC has 522 on 144 Mc. QJ has new 3.8-Mc. antenna. ACD has a pair of 807s on 3.8-Mc. c.w. BC is back in Shawinigan Falls. LP, AI, EK, and UM were recent visitors at St. Maurice Valley Amateur Assn. meeting. New-comers in St. Maurice Valley district include AEK, AFU, and AEM. ABI, an XYL, is doing swell on 144 Mc. OD is now operating from Champlain. PV is in Abitibi temporarily. BB is doing a good job organizing traffic net and is looking for stations interested in ORS and SSTL. TM is maintaining schedules with BB, LO, and ACI. LA is heard on 28- and 3.8-Mc. 'phone and is getting ready for 144 Mc. with 32-element beam! Former NW now is ZN. HB built FB 50-Mc. rig. IW is heard on 28-and 3.8-Mc. 'phone as well as on 7-Mc. c.w. TN hopes to have antennas up soon. LZ continuous very active with the assistance of his XYL. LO's activities are more or less devoted to traffic hunting. TD, in Drummondville, is on 7-Mc. c.w. JI, also in Drummondville, continues activities on 14 Mc. and is coaching Rover Scouts in mysteries of ham radio. KG has confirmed WAC now on 28-Mc. 'phone. He received QSL from J3GNX. ADK plans to rebuild receiver. EM reports that several of the gang in Montreal on 144 Mc. are looking for out-of-town contacts and other Montrealers. Traffic: VE2BB 71, EC 37, LO 5, DD 4, TM 4.

VANALTA DIVISION

ALBERTA — SCM, Sydney T. Jones, VE6MJ — EL is new OBS. LL works out well on 28-Mc. 'phone. FB announces arrival of his third jr. operator. VQ moved to new quarters. RP is working on new 28-Mc. beam. IR claims his 16-month-old jr. operator keeps him busy. IB is back on 3.5-Mc. c.w. LQ is building grid dip meter. NARC purchased Micro Match for use of club members. CJ has new shack under construction. QE is operating from new QTH at Bassano. GD reports plenty of surplus equipment available. KM operates with RCAF Net on 3.5 Mc. EY has new 12-watt rig perking. MJ is busy on his half-acre farm. JP has increased power. BM visited Edmonton to see his family doctor. HM made a good showing in recent Frequency Measuring Test. AH has returned to work after an illness. EA has new Austin car and is busy installing new f.m. rig for CKUA. AL has converted 28-Mc. beam for 14-Mc. operation. AT carried major responsibility of NARC during the illness of President Makepeace. IX works out well with low power. JJ took care of details for erection of plaque in memory of the late Bill Collins, VE6WC. The Northern Alberta Radio Club held a very successful picnic on May 30th. Traffic: VE6MJ 9, CJ 3.

BRITISH COLUMBIA — SCM, W. W. Storey, VE7WS — The Nanaimo Amateur Radio Association is setting up permanent club rooms, instructional periods, and code practice sessions. We had the privilege of a visit from Alex Reid, Canadian General Manager, June 16th to 19th. NY is operating a new three-element 14-Mc. beam antenna. Collingwood Club News: AJR is running 3 watts on 28-Mc. and an 807 on 3.8-Mc. 'phone. VF is operating a superregen, on 144 Mc. ABP is going crystal control on 144 Mc., as AME already is, and AZ is building a VFO for 28 Mc. AKK and OJ are sporting new all-metal three-element wide-spaced beams. LF is building all-metal tower to support a stacked ten over twenty beam. On May 28th the Victoria Short Wave Club had a ham get-together at the club shack. The Fraser Valley Net, composed of ACV, AEY, AH, OQ, ER, ADZ, W7JNU, and W7LZZ, carries on consistently on 28-Mc. ground wave. ADZ is on the portable end of 144 Mc. and has a new 28-Mc. beam. WI is punching holes in the 3.8-Mc. band. On May 30th the Orchard City Amateur Radio Club turned out for an emergency meeting at which ways and means of assisting in local flood control were discussed. The gang consisted of VI, ACL, TA, VE, ALO,

(*Continued on page 102*)

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AAJ, FS, SC, DK, and others. The Second Annual Vernon Okanagan Industrial Exposition called for another spurt of activity on the part of the Vernon Amateur Radio Club, under the able chairmanship of FT, with the coöperation of SO, VT, AJF, JW, KQ, and associate members. Traffic: VE7ID 10.

PRAIRIE DIVISION

MANITOBA — SCM, A. W. Morley, VE4AM — The visit of 2BE, our CGM, was welcomed by Winnipeg amateurs. GQ now is OBS and bulletins are sent on Tuesdays and Thursdays at 9 P.M. on 146.73 Mc. FU is Winnipeg District EC. SS is working for CBC. FW is with DOT and has left for VE8 district. AM/JM blew the high-voltage power supply. 3AZA visited Winnipeg. KF and JE are on holidays. LC has tubing for three-element 14-Mc. rotary. The Governor-General of Canada was introduced to ham radio by DN at Shilo and CI at Brandon. Ex-SO now is 2BX. The Above 100 Club is making week-end trips to points throughout Manitoba experimenting on 144 Mc. AD has n.f.m. With summer here activity is low, but it isn't too early to start planning for the fall season. Wanted — an OBS for 28 Mc.

SASKATCHEWAN — SCM, Norman Thompson, VE5CO — Many thanks to BF for his report on the Saskatoon gang. FY is on 3.85-Mc. 'phone and is building an 813 c.w. rig. RF is on 3.5- and 7-Mc. c.w. FG is on 7 Mc. UC has 300 watts to 813. DO is a new ham building and experimenting with 144-Mc. gear. BF also has 144-Mc. gear. BG is a new ham. JF is improving his portable on 50 Mc. XU has a new super-dooper receiver. GR is collecting parts. DR is on 14-Mc. c.w. FL is on 3.5- and 7-Mc. c.w. and 28-Mc. 'phone. RC is putting final touches on portable rig for 50 Mc. KQ will have 375 watts on 14-Mc. c.w. n.f.m. FD is on 14- and 3.85-Mc. 'phone, 300 watts. EE is on 3.85-Mc. 'phone having trouble with antennas. He is interested in 50 and 144 Mc. BF is using both a.m. and n.b.f.m. and has BC-625A and ARC-4 144 Mc. MQ copped the Saskatchewan Sweepstakes. Twelve Saskatoon hams attended the Regina Hamfest. We are very sorry to report an accident to EK while he was working as linesman on a pole which snapped off close to the ground. Latest reports are that John is resting nicely. Two new calls are IA and CQ. HR has been kept quite busy on the emergency traffic net out to the West Coast.

Correspondence

(*Continued from page 59*)

BEGINNERS

2008 N. Cleveland St., Arlington, Va.

Editor, *QST:*

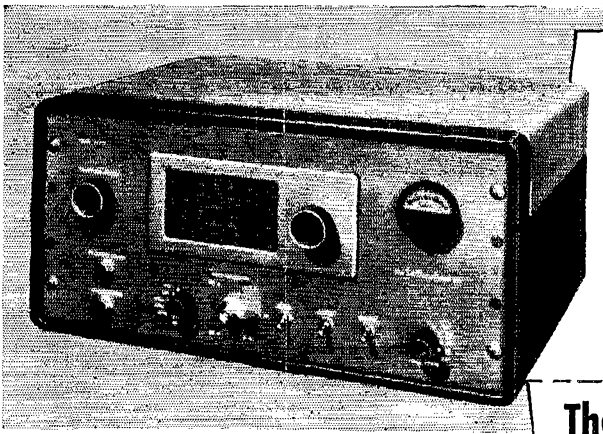
Present-day conditions in the c.w. bands must prove rather discouraging to the beginning operator. In most cases he has just squeezed by the 13-w.p.m. code test. He has just begun to crawl, so to speak. We all crawled before we walked, and we walked before we ran. The beginner today is no different from the rest of us at the time we started. But he is faced with quite a different problem from that which greeted us when we proudly called our first CQ. He is embarking on much more crowded bands, filled with faster operators than ever before. He finds fewer moderate-speed operators than ever before. He finds fewer moderate-speed operators than welcomed you and me.

I have listened to many of the newly-licensed lads courageously bucking the QRM and standing up to the speed merchants. It is unfair to think of these new, faltering hams as "lids"; they are merely inexperienced. They have the same inherent desire to make good that developed our present faster operators. They have the same ambitions in our brass-pounding fraternity that spurred the old-timers to greater effort. But they need encouragement — the same kind of encouragement that helped the rest of us get started on the right foot.

Yet it is not uncommon to hear beginners comment in this vein: "I find very few stations to work at my own speed. I dare not answer the fast operators, and when I call CQ the answers I usually get are from other beginners. It's like the blind leading the blind. When I am lucky enough to raise a more experienced operator, he drops me like a hot potato. I can't get him to chew the rag."

Without a healthy and continuing input of new hams, our hobby will die out at the top. Old-time brass pounders outnumber beginners on the bands today. Let's not permit the new lad to feel submerged in a mass of experts. Help him to become an expert also. Here's how: (1) Work beginners; don't exclude them from your contacts. (2) Don't think of a

(*Continued on page 104*)



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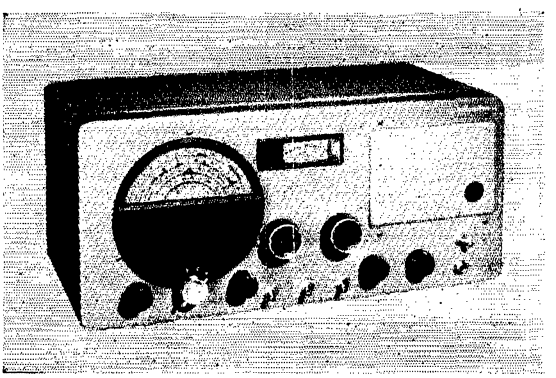

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beginner as a "lid"; remember your own early days on the air. (3) Keep your speed at a reasonable level; ask the new operator if he wants you to send more slowly, or faster; watch the quality of your sending; your transmissions are, in a sense, "code practice" for the beginner, and his pattern of operating will be built upon what he learns from you and other experienced operators. (4) Be patient if he has trouble copying through the ever-present QRM; encourage him in every way possible. (5) Don't withhold a word of praise when due; if he is using good procedure, tell him so; if he forms clean characters and spaces well, tell him. (6) Explain to the new brass pounder that his code speed will increase with usage and that his enjoyment of amateur radio will increase with his speed. Urge him never to despair, even if progress seems slow. (7) Chew the rag with each newcomer you work; give him an insight into amateur radio; tell him of your experiences and activities and of the many opportunities in ham operating; tell him of your own early days in the game; leave him with the feeling that he is "one of the gang," for that is what he is as soon as he gets his ticket.

Let's do all we can to help the new operators through their period of "buck fever." Help them to enjoy the thrills and satisfaction awaiting them in ham-radio brass-pounding.

— *Everett L. Battey, W4IA*

527 Bedford Ave., Brooklyn, N. Y.

Editor, *QST:*

At last it came through and my long waiting was over — I joined the finest group of men and women; I became a ham. Yet before any time passes, I want to establish a code of ethics — for myself! Above all I want never to forget the embryo years, along with the helping hands of some hams and the disdain of others. God grant me that never will I be guilty of malice, scorn or bias; rather that in every way I will do my best to spread good fellowship. In this way I will see each year adding friend after true friend, and indeed ham radio will have been for me the greatest hobby of all.

— *Gerald Samkofsky, W2YSF*

WHERE SOME QSL CARDS GO

Farnam at 18th, Omaha, Nebr.

Editor, *QST:*

Yesterday I registered my station call letters at the post office and was surprised to learn that only about ten other Omaha amateurs had taken the same precaution. More important still, I learned that many QSL cards are sent to the dead-letter office because of inaccurate addresses, names, calls only, etc., making them undeliverable. Several each week find their way into the official waste basket of the Post Office Department.

I don't know whether it could be worked out or not, because of postal regulations, but it seems to me that in the larger cities at least some effort might be made to induce the officials to consult with prominent amateurs or the secretary of the radio club in an effort to identify addresses of QSL cards which appear to be undeliverable and are thus destined for the dead-letter office. Or perhaps the club would equip the main post office in its city with an annual subscription to the *Call Book* at a total cost of $6, and assess the cost among its members. Almost anything is worth trying, to the end that the long-awaited QSL card from that distant land ultimately reaches the ham for whom it is intended.

— *Sewall P. Smith, W9GMZ*

TNX, A.R.R.L.

P.O. Box 176, Auburn, Ind.

Editor, *QST:*

About a year ago I became interested in amateur radio. I have followed the ARRL course in getting my amateur's license. That is, I studied the *License Manual* and other ARRL publications. For code practice I listened to W1AW. It is almost entirely attributable to this that I received my ticket; I did consult a ham two evenings on theory, but in doing so used the ARRL books for the basis. I had my ARRL Code Proficiency Certificate, and with that I had confidence in my code reception which I could not have had without it — and consequently I wasn't very nervous during the test.

So, friend SWLs, keep plugging and it won't be long. And to ARRL, thanks a lot.

— *Pete Fribley, W9DKV*

(Continued on page 114)

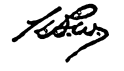
"It Seems to Us . . ."

(Continued from page 10)

tions will not permit all of us to go on 'phone. Some of us will remain on telegraphy, part or all of the time, by preference. But if the frequency situation *requires* anybody to stay off of 'phone in the congested bands for a while, obviously it ought to be the newcomers who aren't yet well-rounded amateurs and who haven't yet earned special privileges. And so, says the Board, let newcomers earn their stripes during their first year. All the bands will be open to them for c.w., and the attractions of DX and traffic work will probably lead them to proficiency in code. If they insist upon going immediately to voice work, the more congested 'phone bands will be spared and they will contribute substantial occupancy to the v.h.f. bands, with increased probability of contributions to that specialized field.

And now about the Class A code exam. The 'phone assignments in the 4- and 14-Mc. bands are frightfully congested. For a great many years the right to operate in them has been the earned right of those who show special qualifications, an artificial restriction created to limit the number who enjoy a privilege too small to share with all. But consider this: A new Class B man goes 'phone and lets his c.w. slide. In a year, knowing enough more about 'phone to pass the special theory examination, he can get on the Class A bands, and still without ever having diddled out a single dit or dah. Again that situation appeals to our Board as being unwholesome, and wrong in a system intended to award a restricted operating right only to those of superior qualifications. The good amateur also knows his c.w. Just as the Board's first proposal is intended to increase the probability of a new man attaining normal code proficiency, so this second one is intended to insure that the candidate actually did maintain his beginning proficiency during that first year and in fact made a slight improvement in it. In short, the philosophy is that the most restricted privilege in all amateur radio ought to be limited to those who have first done their fundamental duty to the game, proved their proficiency in our basic art.

It can all be summarized this way: Beyond the duty of every amateur to maintain proficiency in the code lies the technical fact of allocations insufficient for a frequency-consuming type of emission. That makes 'phone operation a special privilege. The newcomer must *earn* it.



FEED-BACK

W6QYT, coauthor of June *QST*'s "A Detector for Single-Sideband Reception," regrets that his manuscript was in error in specifying a value of 0.00892 μfd. for the capacitor in the lower left-hand corner of the wide-band phase-shift network, Fig. 4. Mr. Villard asks that this be corrected to read 0.000892 μfd.

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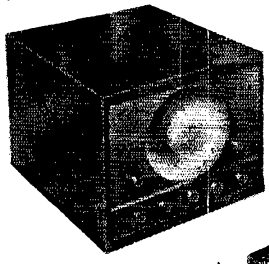
TRANSVISION TELE KITS

Everything included except tools. Cabinets not included except as noted. Deluxe models have FM radio as well as TV

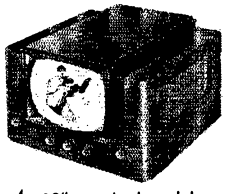


Model 7BL with cabinet and lens, electrostatic picture tube.

$189.00

Model 10BL with cabinet and lens, electromagnetic picture tube.

$299.00



12" standard model, 13 channels (7 wired), high fidelity FM sound reproduction, FM radio (88-108 mc)

$246.00

12" deluxe model, with 50-216 mc continuous tuning, covering FM band and all TV channels.

$299.00

15" standard model, 13 channels, etc., **$325.00**

15" deluxe model, continuous tuning, **$359.00**

NOTE: **All prices are Net, F.O.B. N.Y.C. and are subject to change without notice. 20% deposit on C.O.D. orders.**

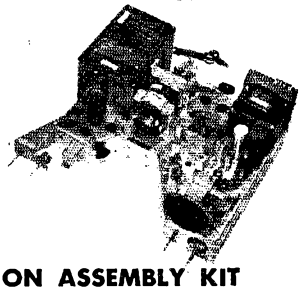
Telephone: LOngacre 3-1800

HARVEY RADIO COMPANY INC.

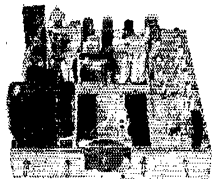
103 West 43rd St., New York 18, N. Y.

TECHMASTER TV KIT

Exactly the same as the RCA 630TS chassis, complete kit of parts, including all hardware, pre-wired and aligned RCA front end, condensers, resistors, punched chassis, all tubes including kine, complete manual with service notes, all RCA..... **$198.50**



TELEVISION ASSEMBLY KIT



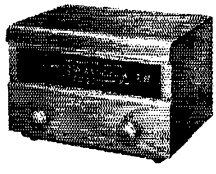
10-12-15 inch kits with the sensational completely wired IF Picture and Sound Strip. Supplied with 13-channel front end, wired for 7 channels, or with continuously tunable duMont Inputuner in Champion models.

10" standard model.....**$229.50**; Champion.....**$273.10**
12" standard model..... **259.50**; Champion..... **303.10**
15" standard model..... **349.50**; Champion..... **393.10**
IF strip, alone.....**$77.25**; Inputuner, alone.....**$58.65**

OTHER HARVEY BUYS

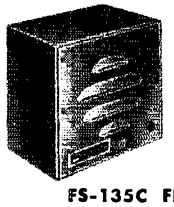
GE XFM-1 FM TRANSLATOR

Covers 88-108 mc range, tuning dial 12" long, uses guillotine tuning for highest efficiency, high stability. Designed for export and tropicalized, has power inputs for 110 to 250 volts, 60 cycle. Quantity limited. Shipping weight 30 pounds.



HARVEY SPECIAL PRICE.....$49.50

LS-3 SPEAKER



Signal Corps speaker, 6" PM in rugged, crackle finish steel case, complete with self-contained output transformer to match 4000 ohm load. Speaker voice coil impedance 6-8 ohms. Brand New, in original overseas packing. Shipping weight 15 lbs. **Harvey Special.$4.95**

FS-135C FREQUENCY STD.

Hammarlund FS-135C makes your receiver an accurate frequency standard with marker signals every 100KC, includes low-drift 100KC crystal, 6AU6G tube, complete instructions.

Brand New $6.95

Order spare tubes, 6AU6G, each.....65¢

807s in Push-Pull

(*Continued from page 15*)

grid and plate terminals of the socket of one tube or the other, bending as required to make the neutralization complete.

Neutralization of the final amplifier is best checked with an indicator consisting of a bypassed 1-ma. meter, a 1N34 crystal detector and a link coil in series coupled to the output tank coil.[1] Unless the stage is already close to neutralization, a considerable reading on the indicator will be obtained when excitation is applied and the output tank circuit tuned to resonance with no screen or plate voltage applied. The neutralizing condensers should be kept at equal settings and adjusted for minimum feed-through of exciter energy as shown by the indicator. The output tank circuit should be kept tuned to resonance during the neutralizing procedure. A point in the adjustment of the neutralizing condensers should be found where both decreasing and increasing the capacitance causes an increase in the indicator reading.

When neutralizing is complete, the plate and screen voltages may be applied and the amplifier loaded up to rated input with a dummy load (a 100-watt lamp makes a good load). The next step is to balance the 807 screen currents by inserting milliammeters (or switching a single meter) in the two screen leads and adjusting C_{15} until the screen currents are equal when the plate tank circuit is tuned to resonance.

By adjusting R_8, it should be possible to set the 807 grid current to the recommended value of 8 ma. for 'phone operation. Higher grid current than this should not be permitted, since it drives the screen dissipation up unnecessarily. For c.w. operation, a total grid current of 4 to 6 ma. is sufficient for good efficiency.

The size of the output link winding will have to be determined experimentally to give proper loading with the antenna system in use.

Super-Selective Receiver

(*Continued from page 20*)

in the space now taken by one signal on the average receiver of today.

As for performance, all we can say is that no other receiver has ever been inside our radio room since the war and, besides building the receiver and revising the i.f. system several times, we have found time to work 141 countries, with cards from 100. If you have been reading the DX Century Club list, you will agree that this is no record even for this part of the country. However, this was not done with California kilowatts and rhombics. We are located in the congested Chicago area. The transmitter input is 400 watts, and the only antenna we have room for is a 20-meter W8JK and even this hangs a foot over the neighbor's backyard.

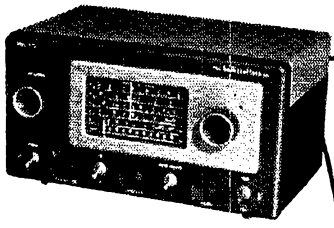
[EDITOR'S NOTE: It should be understood that when the author speaks of the c.w. bands, he means the portions of the bands assigned *exclusively* to c.w. operation. Actually the full widths of all the bands are available for c.w.]

IT PAYS To Buy Hallicrafters

From The Worlds Most Personalized

RADIO SUPPLY HOUSE

LARGE STOCKS



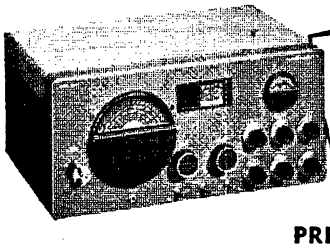
Hallicrafter S-53

$79.50

$15.90 Down

PROFESSIONAL PERFORMANCE

World wide domestic and short wave reception. It's sensitive, powerful, completely dependable. SIMPLIFIED control—anyone can operate the S-53. 540KC to 54.5MC—5 Tuning ranges. Electrical Band Spread-Series Noise Limiter, 2.5 watt audio output. Complete with 7 tubes and built-in speaker.



Hallicrafter SX43

$169.50

$33.90 Down

PREFERRED BY AMATEURS

Hallicrafters SX-43 is designed for the discriminating amateur and short wave fans who demand the finest reception of standard A.M. F.M. Broadcasts. AM 540 KC—55MC.—FM. 44-55 MC; 88-108MC. 6 Frequency Bands—tuned RF stage—High fidelity audio-Automatic Noise Limiter.

Hallicrafters Model No.	Your Price	Down Payment
S-38 540 KC to 32MC in 4 bands. Self contained speaker.	47.50	9.50
S40A 540 KC to 43MC 9 tubes built-in speaker.	89.50	17.80
SX-42 540 KC to 110MC 6 bands FM, AM, CW—15 tubes less less speaker	275.00	55.00
S51 140 KC to 12.0MC 4 bands complete with 9 tubes, built-in speaker	129.50	26.00
HT-17 Crystal controlled 10 watts output, CW Xmtr	49.50	9.90
HT-18 Variable Master Oscillator Quality AM with narrow band FM	110.00	22.00
S.P. 44 Panoramic adapter	49.50	9.90
S-47 New FM-AM Receiver, tunes 535 to 108 MC. Push Button Control. 12 watts output, 15 tubes—in cabinet	200.00	40.00

Leo I. Meyerson WØGFQ

Get Acquainted Offer
New up to date Giant Radio Reference Map
Just right for your control room wall. Approximately 28"x42". Contains time zones, amateur zones, leading shortwave stations, monitoring stations, **Mail coupon today & 25c.**

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Fellows—BIGGER TRADE INS—let me know what you have to trade—use as down payment on my personalized payment plan to fit your budget. Get acquainted with me. I have a WORLD REPUTATION for square dealing and hosts of satisfied customers and friends. Ask anyone who has dealt with me—write me today for a PROMPT PERSONAL REPLY.

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- ☐ Radio Map
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Name.....Call Letters.....

Address .....

City.....Zone.... State.....

Surplus Corner

(Continued from page 81)

12-volt starter and the off-normal contact to the 6-volt starter relay). The other arm is connected to the +500-volt brush and its normal contact to Pin 7 and off-normal contact to Pin 8. After these changes the terminals on the output socket are as follows:

1 — A− (hot), protected by circuit breaker. Turned on all the time.

2 — Ground to transmit.

3 — A− (hot), protected by circuit breaker. Controlled by starter relay so it is on only when dynamotor is running.

4 — Ground to start dynamotor.

5 — Ground, A+, B−.

7 — B+ 250 to receiver.

8 — B+ 500 to transmitter.

Thus the transmitter and receiver filaments should be connected to Pin 3, the receiver B+ to Pin 7 and the transmitter B+ to Pin 8, the on-off switch between Pins 4 and 5, and the transmit-receive switch between Pins 2 and 5. — *William L. Smith, W8GKP*

High Power on 220 Mc.

(Continued from page 36)

amount of power is radiated by the lines, and that the useful output (that actually delivered to the load) represents an efficiency of only about 45% at 1000 volts on the plate. This decreases slightly at higher voltages, indicating somewhat higher radiation and insulation losses.

So great is the radiation from the line that inputs up to 600 watts or more failed to color the plates to a point indicating excessive dissipation, even at a measured *useful* output of only about 250 watts. Shielding of the plate circuit would undoubtedly help some in this respect.

It was necessary to run the screens somewhat below the ratings given in the manufacturer's data, in order to hold the plate current within reason, because of the lower over-all efficiency at this high frequency. Several values of dropping resistor were tried at R_5, the 7000 ohms given being selected as a good compromise for operation over the range from 600 to 1500 volts on the final plates. If operation is contemplated only at low plate voltages, the value of R_5 could be decreased. If high plate voltages are to be used, it should be raised, to hold the loaded plate current below 250 ma. With the values given, all voltages and currents, with the exception of those relating to the 4-65-A screens, closely approximate the manufacturer's recommendations for operation at 600, 1000 and 1500 volts.

Our 26th Year

LEEDS
The Home of RADIO

QUALITY—PRICE DEPENDABILITY

VARIABLE CONDENSER

6 Gang; 1 section of .00025 Mmfd, 4 sections .000035 Mmfd, 1 section of .00005 Mmfd; with 5 air trimmers of 15 to 25 Mmfd capacity. This condenser is all silver plated.
Each Only.. **95c**

METERS

100 amp.—6 volt D.C., 3 inch scale, 4½" square, Grey finish, supplied with 100 amp. shunt. Brand New. Each..... **$2.95**

0–100 Ma 2" Round McClintock, **$1.95**

0–1 Amp. RF 2" Round General Electric..... **$2.45**

5–0–5 Amp. Charge & Discharge 2" Round..... **69c**

PLATE TRANSFORMERS

For Small Transmitters. DC Voltage Ratings are Approx. Values Obtained at Output of a 2 section Choke Input Filter. Using Mercury Vapor Rectifier Tubes. Pri. is for 115 V. 60 cy.

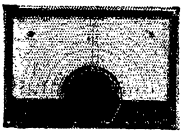
Type No.	Sec. Rms. Volts	Sec. DC Volts	DC Sec. MA.	Dimensions H.	W.	D.	Price Each
P 57	660–660†	500	250	4⅜	3 13/16	4⅜	$ 5.55
	550–550	400					
P 58	1080–1080	1000*	125	4⅜	3 13/16	5	7.20
	500–500	400	150				
P 59	900–900	750	225	4⅝	3 13/16	5⅛	6.00
	800–800	600					
P 67	1450–1450	1200	300	5¾	6⅛	4	17.85
	1175–1175	1000					

*For dual operation with simultaneous use of both sec. ratings. †Has 40-volt bias tap.

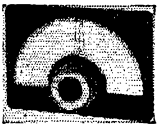
NATIONAL COMPANY DIALS

Direct Calibration Dials—5:1 Drive Ratio

ACN—7¼" W. x 5" H. **$3.30**



ICN—7¼" W. x 5" H. with illuminated scale **$6**



NPWO Gear Drive 20:1 Ratio: Shaft perpendicular to panel with Micrometer Dial..... **$9.00**

PWO Gear Drive 20:1 Ratio: Shaft parallel to panel with Micrometer Dial..... **$9.90**

We Carry a Complete Line of National Parts and Receivers

SELSYN MOTORS

Just Arrived

115 Volt AC 60 cycles. Transmitters only. Can be used to turn small beam antenna or as indicators only 3½" Diameter x 5½" High. Shipping Weight 10 lbs. Per Pair. Special Per Pair..... **$5.95**

Selsyns Type 2J1G1 and 2J1H1. 57.5 Volts AC, 400 cycle. Make excellent beam indicators when used on 6 to 12 Volts AC, 60 cycles. A Real Buy. Each..... **95c**

WIRE WOUND POTENTIOMETER

100,000 ohm, precision made. G.R. type, 25 watt, 6" diameter. Brand New. **$1.95**

FILAMENT TRANSFORMERS

2.5 Volts @ 5 Amps. 7500 Volt RMS..... **$2.10**

2.5 Volt @ 10 Amps. 7500 Volt RMS..... **$2.40**

POWERSTAT VARIABLE TRANSFORMERS

Type 20: 115 V. input, 0-135 V. output @ 3.0 amps. 0.4 KVA **$12.50**

Type 116: mounted; 115 V. input, 0-135 V. output @ 7.5 amps. 1.0 KVA..... **$23.00**

Type 116U: unmounted; 115 V. input, 0-135 V. output @ 7.5 amps. 1.0 KVA..... **$19.00**

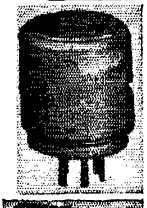
Type 1126: 115 V. input, 0-135 V. output @ 15.0 amps. 2.0 KVA. **$46.00**

Type 1226: 230 V. input, taped at 115 V. 0-270 V. output @ 9.0 amps. 2.4 KVA..... **$46.00**

Type 1156: 115 V. input, 0-135 V. output @ 45.0 amps. 6.1 KVA. **$118.00**

RELAYS

G.E.; 2500 Ohm, 4 Ma. SPDT, 5-prong plug in type, hermetically sealed. Brand New..... **95c**

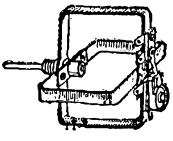


CS DIFFERENTIAL

Dual coil with armature pivoted between calls. All contacts normally open. Operates 220-250 Volts. 8000 Ohms each coil, contacts S.P.D.T. Controls rated 2 amps. at 110 VAC. Ideally suited for balanced or bridge type circuits where limited current or power is available. Will withstand 12 G Vibration up to 60 cycles at 35,000 feet altitude. Special low price..... **95c**

H. F. TUNING LOOP

Built in by-pass condenser, and 1.5–7 Mmfd. ceramicon Trimmer. Will hit 2 Meter Band. Silver Plated. Special..... **49c**



2 x 2/879 Half Wave Rectifier Tube. 2.5 Volts @ 1.75 Amps, 4500 Volts Per Plate @ 7.5 Amps. Special..... **49c**

5BP1 CATHODE RAY TUBES

5" Green Screen in original Cartons. Each..... **95c**

COAXIAL Cable Connector

PL-259 low loss connector for RG-8/U and RG-11/U silver plated with low loss mica inserts. Each 19c—100 for..... **$15.00**

If not rated 25% with order, balance C. O. D. All prices F. O. B. our warehouse New York. No order under $2.00. We ship to any part of the globe.

LEEDS RADIO CO.

75 Vesey Street — **Dept. QS8**

COrtlandt 7-2612 — **New York City 7**

National Convention

(Continued from page 41)

masse can obtain blanket hotel reservations by notifying the Housing Chairman early. The Badger Emergency Net meets each night from 6:00 to 7:00 CST on 3950 kc. and any message to convention headquarters will be expedited to destination via this medium.

This is also Wisconsin's centennial year, with special entertainment and celebrations going on throughout the state. Both before and after the convention period the fish will be hungry and waiting for visitors to the land of a million lakes. A note to the convention committee will get the dope to you on where they're biting best.

See you in Milwaukee over Labor Day, OM!

Hints & Kinks

(Continued from page 57)

through the wall to the inside of the shack where a direction indicator may be attached if desired.

This mechanism has been in use for several months and has provided trouble-free operation, even when it was covered with a thick coating of ice and snow. In addition to the low cost and simplicity of construction, it is superior to many motor-driven systems because it permits the speed of rotation of the beam to be changed to suit the operator's convenience. All he has to do to get the beam around in a hurry is crank a little faster! — *George Rossetti, W1OPW*

A VERSATILE PORTABLE ANTENNA SYSTEM

THE antenna "system" shown in Fig. 6 was developed for portable use as a means of avoiding antenna troubles that had been encountered in considerable experience operating as a portable station. It has proved to be quite versatile, and saves a great deal of the time usually consumed preparing the antenna required for a particular site.

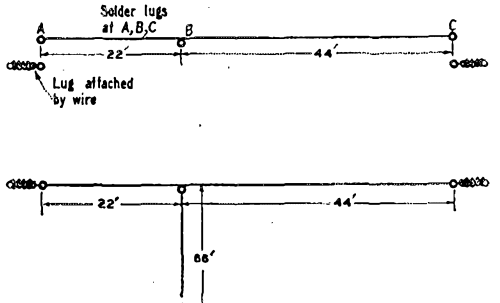


Fig. 6 — A timesaving portable antenna system. Three 66-foot lengths of wire are prepared in advance, making it possible to put up an antenna in jig time.

The system makes use of three 66-foot lengths of rubber-covered "lead-in" wire. Soldering lugs are attached to each end of each length, and a third lug is connected to a point 22 feet from one

(Continued on page 114)

CRYSTALS!

In the greatest purchase of radio transmitting crystals ever made by one wholesaler in the history of the Radio Parts Industry, Sun Radio acquired title to over a half million dollars ($500,000.00) of Army Surplus, precision built, exactly tooled crystals in moisture proof holders which are shock mounted. Please note that crystal shipments of 6 or less are packed in cloth containers to expedite handling. . . . No worry because all crystals are shock mounted and guaranteed delivered perfect. All crystals have Army MC harmonic ratings but Sun encloses directions for deriving the correct fundamental frequency in kilocycles.

CRYSTALS WITH A MILLION USES

Fractions Omitted

kc	kc	kc	kc	kc	kc	kc	kc	kc	kc	kc	kc
412	420	429	437	445	459	470	479	490	497	506	516
413	422	430	438	446	466	472	481	491	498	507	518
414	423	431	410	447	468	473	483	492	501	508	519
415	424	433	441	418		474	484	493	502	509	522
416	425	434	442	451		475	485	494	503	511	523
418	426	435	443	453		477	487	495	504	512	
419	427	436	444				488	496	505	515	

49¢ each

I.F. Frequency Standards

kc	kc	kc
450	454.166	461.111
451.388	455.556	464.815
452.777	459.259	465.277

99¢ each

Crystal Frequency Standards

98.356kc

Easily altered for 100 kc Standard Mounted in low loss 3 prong holder.

$3.89 each

For Crystal Controlled Signal Generators

525kc

526.388	531.944	536.111
527.777	533.333	537.500
529.166	534.722	538.888
530.555		

99¢ each

ASSORTED MISCELLANEOUS CRYSTALS

Fractions Omitted

372kc	376kc	381kc	384kc	387kc
374	377	383	386	388
375	379			

39¢ each

priced at a fraction of the cost of their holders alone.

FOR HAM AND GENERAL USE

Fractions Omitted

390kc	395kc	402kc	405kc	408kc
391	396	403	406	409
392	398	404	407	411
393	401			
394				

79¢ each

CRYSTALS FOR SCR 522

5910kc	7350
6370	7480
6450	7580
6610	7810
	7930

$1.29 each

CRYSTALS FROM BC 610

¾" Spacing—2 Banana Plugs

2045	2258	2360	2532	3250
2105	2260	2390	2545	3322
2125	2282	2415	2557	3510
2145	2300	2430	3202	3520
2155	2305	2435	3215	3550
2220	2320	2442	3237	3570
				3580
				3945
				3955
				3995

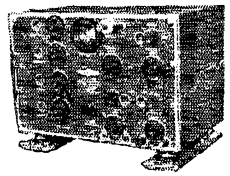
$1.29 each

- Payments must accompany order. Enclose 20¢ for postage and handling. Minimum order — $2.00 plus postage.
- Crystals are shipped packed in cloth bags inasmuch as they are shock mounted. All shipments guaranteed.

"Hot Radio Values" AT SUN RADIO

100 WATT BENDIX TRANSMITTER

4 Separate E.C.O.



These can be easily converted to 20–40–80 meters. Crystal required for 10 meters. Each electronic coupled oscillator dial has 3000 divisions enabling quick precision shifting. This transmitter was constructed of the highest quality of precision parts, with laboratory precision. Four separate output tanks; one 4-position selector channel switch having seven sections which changes the ECO, IPA and output tanks simultaneously.— BRAND NEW, complete with tubes... **$49.95**

Attention: Closeout Specials on Parts Kits

KIT 1 Asstd Mica Condensers—Unmarked
100 for....**$1.50**

KIT 2 Asstd Resistors ½W-1W
100 for....**$1.00**

KIT 3 Asstd Condensers—Tubular Bypass
25 for.....**$1.00**

KIT 4 Asstd Condensers—Electrolytic
25 for.....**$2.00**

KIT 5 Asstd Potentiometers—with or without switch
10 for.....**$1.00**

KIT 6 Asstd Ballast Tubes—Line Ballasts
10 for.....**$1.00**

KIT 7 Asstd Hardware—Screws, Rivets, Nuts, etc.
10 lb. for..**$1.00**

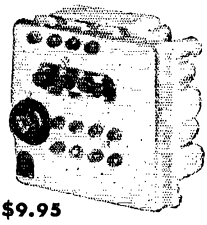
KIT 8 Octal Sockets—Wafer
25 for.....**$1.00**

KIT 9 Octal Sockets—Plastic with Flange
20 for.....**$1.00**

SPECIAL!! All 9 Kits for $9.00

BC-728A

6 tubes (3-1T4, 1-1R5, 1-1S5, 1-3S4). 2–6 MC in 4 bands. Easily converted to Broadcast band with instructions furnished by us. Push button controlled, has R.F. stage and audio output stage to drive speaker. Complete with 4" speaker and schematic.



$9.95

BC1068A—Radar & Television Receiver (G)	$39.95
BC684—35 W FM Trans. 27–38.9MC (N)	24.95
TS13—Handset with 6' cord and plugs (N)	2.95
T17—Shure Mike with push to talk (N)	.99
TU6–10B—Tuning Units from BC375 (G)	2.89
Tuning Unit from BC312 (G)	1.29
Portable Amplifying Megaphone (G)	39.95
BC1073A Wavemeter, 150–210MC, 19 tubes (G)	17.95
P20—Magnetic 2000 ohms Headphones (N)	2.49
Sperry Amplifier—4 tubes—Servel Amplifier (N)	3.95
SCR195—Walkie Talkie with spare parts (N)	69.95
CW3—110V AC Receiver with extra tubes & coils (N)	24.95
SCR522—Complete with all cables, Dyn., crystals (E)	39.95
Rhombic Antennae—2200' No. 14 Copperweld, 50' 200 ohm line. Everything complete except poles (N)	24.95
3" Round foundation meter calibrated in micromhos to build into Dynamic Mutual conductance Tube Tester—with Schematic	9.50

(N) Brand New (E) Unused and guaranteed perfect

(G) Used but guaranteed good

- **TERMS: All items F.O.B., Washington, D. C. All orders $30.00 or less, cash with order. Above $30.00, 25 per cent with order, balance C.O.D. Foreign orders cash with orders, plus exchange rate.**

PANEL METERS

ALL BRAND NEW AND GUARANTEED

GE	2" Round	0-500 D.C.-M.A..	$2.97
Simpson	2" Round	0-15 D.C.-V....	2.97
Triplett	2" Square	0-40 D.C.-V....	2.97
Sun	2" Round	0-300 D.C.-V....	2.97
GE	3" Square	0-150 A.C.-V....	3.49

SUN RADIO

OF WASHINGTON, D. C.

938 F STREET, N. W. WASH. 4, D. C.

end. Two ordinary glass insulators, each fitted with a lug at one end, and a few 6-32 nuts and bolts complete the equipment required.

If a 40-meter end-fed wire is desired, an insulator is fastened to one end of one of the 66-foot lengths by bolting the lug to the lug on the insulator. The other end of the wire is connected to the transmitter. If an off-center-fed antenna is called for, both ends of one 66-foot length are connected to insulators, and one of the other wires is connected to the lug that is 22 feet from one end of the piece used as the flat top.

For 80-meter operation, two lengths are connected end-to-end, and the feeder connected as described above. The fact that all wires are equipped with lugs makes for rapid installation and insures good contact without soldering. The flexible wire is preferred, as it is almost kinkless, a great help when you are throwing an antenna up in a hurry. The wire should be well stretched before it is cut. — *E. G. Brooner, KL7GC/7*

Correspondence

(Continued from page 104)

ON THE BEAM

4818 Greenspring, Baltimore, Md.

Editor, *QST:*

Last October I put up a four-element wide-spaced beam, cut to work the 10-meter band. Prior to that I had been working 80-meter 'phone with rather modest power — 75 watts. Naturally, I didn't look for much in the way of real DX on this band with this power and didn't get it. Then, with the advent of the beam, an entirely new world opened to me, and I mean that both literally and figuratively. For the first few days of early-morning contacts with Europe, I was too thrilled to pay attention to other than my signal report. An S8-to-9 signal report from France or Italy made me feel like the fellow who had just placed his money on a 100-to-1 shot and was watching it cross the finish line first. Then as time wore on and I had more and more contacts, the conversation began to flow a bit more freely and I spent more time asking the fellow on the other side about himself, his family, his job, his country, its customs, etc. And much to my surprise I found him very willing to talk about things other than his power pack, his close-spaced beam, or the 6L6 driving his 807 final.

One morning I hooked up with a fellow in Denmark. He spoke perfect English — in fact, with an Oxford accent. We talked back and forth for almost half an hour, and when I made ready to sign I thanked him for a most enjoyable contact, and told him that over here we had only the warmest feelings for his little country. When he came back to that transmission, he told me that the feeling of Denmark for America was equally as warm. And he added, "Things look very dark here in Europe right now, but we look with great hope to America to keep peace throughout the world." That afternoon, I had lunch with several friends. During the course of the meal, I told them of my conversation with the chap in Denmark. They were most interested — especially in his attitude toward America. I cite this incident, because I feel certain that the Danish ham did the same thing as I. In all probability he told some of his friends about the conversation he had had with an American, and repeated to them the good will which I had expressed for Denmark.

Quite soon after that I had a contact with a fellow in Great Britain, during which we discussed our two countries and their feelings for each other. This too was a most enlightening contact. Since then, whenever conditions on the band have permitted any kind of a satisfactory QSO, I have wasted an absolute minimum amount of time discussing technicalities and devoted a maximum to understanding and good will. Now don't get the wrong idea. I'm not a clergyman, nor am I an idealist. I am simply a businessman who for a long time has been convinced of the fact that human

(Continued on page 118)

TURRET ASSEMBLIES
PIONEERED BY B & W
Still Preferred by Discriminating Amateurs

Through the years, the Turret line, as first developed and introduced by B&W, has been improved and enlarged—and has consistently grown in popularity! If you are building a new rig or revising your present one, start by selecting the B&W Turret that offers all these advantages and more!

- Pre-assembled, pre-wired and tested at the factory. Quick to install and quicker to shift bands for you after installation.
- Select 80, 40, 20, 15, 11 or 10 meter band by the flip of a switch. (11 and 10 meter bands covered by 10 meter coil.)
- Switch design shorts unused coils—eliminating absorption effects.
- Complete assembly arranged for 3/8" hole panel mounting—provides panel control for quick, positive band switching.
- All B&W Turret types may be tuned on all bands by condensers having an effective capacity of 50 mmfd.

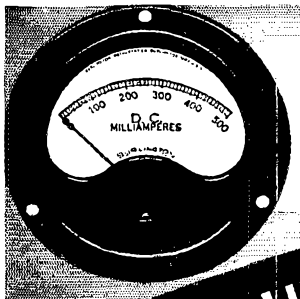
WRITE FOR BULLETINS giving full details on:

B&W "Baby" Turrets (up to 35 watts)
B&W "Band Hoppers" (up to 75 watts)
B&W 75-watt Turrets
B&W 150-watt Turrets

B&W

BARKER & WILLIAMSON, Inc.
DEPT. Q-88, 237 FAIRFIELD AVENUE • UPPER DARBY, PENNA.

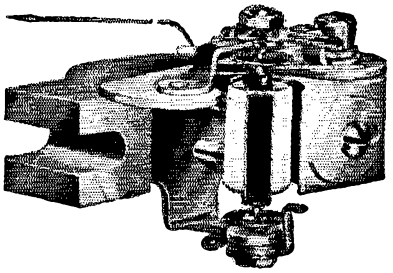
ONE OF A SERIES



CERAMIC POINTER STOPS

WHY BURLINGTON PANEL INSTRUMENTS PROVIDE UTMOST RELIABILITY . . .

CERAMIC POINTER STOPS are used to prevent damage to the pointer due to accidental application of sudden overloads. All ranges AC and DC available in 2½", 3½", 4½" rectangular or round case styles and are fully guaranteed for one year against defects in workmanship or material. Refer inquiries to Dept. J88.



Burlington INSTRUMENT COMPANY
BURLINGTON, IOWA

(*Continued from page 114*)

nature and natural impulses are pretty much the same the world over. Taken by and large, the natural impulses of most people are decent and kind.

Recently, I received a circular letter from Professor Albert Einstein. It was a lengthy letter, soliciting funds to finance the dissemination of information regarding the civilization-demolishing potentialities of the atom bomb. In it, the writer set forth the thought that in his estimation there was no effective military defense against the atom bomb. This, of course, is out of my realm. But I do sincerely believe that if all the little people, the plain people, the so-called common people of the world were able to get together and talk among themselves — there wouldn't need to be any defense against the atomic bomb — there'd never be another war. Of course such a thing is geographically and linguistically impossible. But ham ops throughout the world possess the most positive means of spreading good will from country to country. It only remains for them to realize it and to make use of it. I'm not thinking in terms of propaganda. Far from it. That's all part of international diplomacy — I suppose. I wouldn't know. I've never been a diplomat. But I do know that when I am sitting in my shack here in Baltimore, talking with a fellow sitting in his shack somewhere in Europe and we are able to have a friendly heart-to-heart chat about my family and his family, and about the world in general — I feel as though I've made another friend. He feels as though he's made another friend. I like him. He likes me. And there you have it. The formula is a simple one. Just multiply it a thousandfold and another thousandfold and see how much good-will building it can accomplish. Maybe that's the answer to the problem of the defense against the atom bomb — just plain man-to-man understanding — internationally, of course.

The late Sir William Osler, a truly great and beloved physician, used to say: "What this world needs is more 'taffy' and less epitaphy." All of which, paraphrased, can be taken to mean: If you like someone — don't write it on his tombstone. Tell him about it while he can still enjoy the compliment.

The tube manufacturers and component manufacturers manage to do all right for themselves when it comes to advertising their own products. They don't need us to do it over the air. So when we throw the big switch and start putting out the r.f., let's modulate it with more international good will and less technical talk. How about it?

— *Marx S. Kaufman, W3IUC*

. . . AND THAT'S THAT!

P.O. Box 735, Dixon, California

Editor, *QST:*

My first letter to your mag! But in 15 years of hamming I have finally decided to reply to your readers who write gripe letters and complaints about the following:

1) Short CQs
2) Long CQs
3) No CQs
4) Traffic methods
5) DX methods
6) Codeless tickets
7) Articles that are too complex
8) Articles that are too simple
9) Etc.

NUTS!

— *Ed Dold, W6KCS*

FLEA POWER ON TEN

10810 Garber Lane, Houston 15, Texas

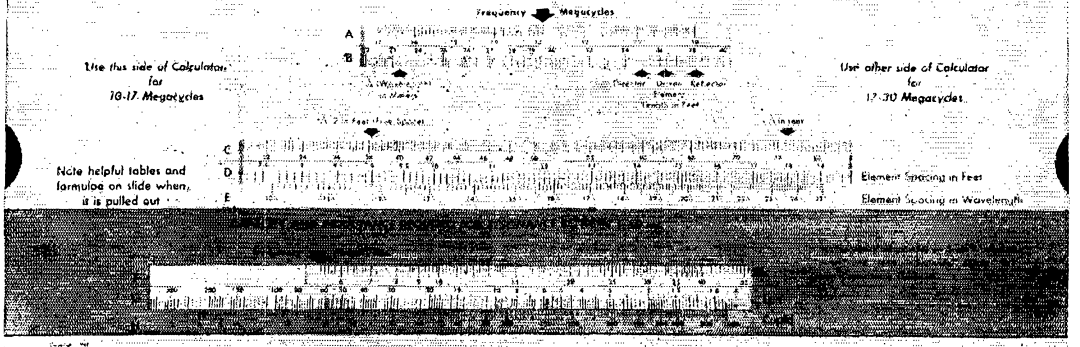
Editor, *QST:*

I realize there has been a lot said about the capabilities of the 10-meter band. This incident is much too important to by-pass, however. This evening I was in contact with KL7LO on Adak. His power input is about 85 watts. He told me about a flea-power rig in his shack and I asked him to put it on the air. It came riding in peaking at S3 and very Q5 — I dumped it back and repeated his call to him and he was so excited he could hardly speak.

The input to his final-doubler: 5 ma. at 90 v. or 0.45 watt! Tuning the rig was done by using the S-meter on his receiver!

— *C. E. Sharp, W5NMA*

ROTARY BEAM ANTENNA CALCULATOR



GORDON SPECIALTIES COMPANY — CHICAGO, U. S. A.

For the "Ham" who has a beam or contemplates one, or the professional engineer interested in antennas, this new calculator is a MUST. It is invaluable not only as a time saver, but because it also completely eliminates mathematics or computations. One merely sets the frequency desired opposite the arrow marker and then reads:

- **Wavelength in meters.**
- **Director, driven element and reflector lengths in feet.**
- **Half wavelength in feet.**
- **Full wavelength in feet.**
- **Element spacing in feet from 0.10 to 0.25 wavelength.**
- **Capacity and inductance for resonance between 5-60 mc.**

One side covers 10–17 mc; other side, 17–30 mc. Spread out scales together with large size — 13″ wide — results in readings of high accuracy. Get one at your jobber for $1.50 or direct from us $1.60 postage paid.

GORDON SPECIALTIES COMPANY

542 S. Dearborn Street — *Manufacturers of rotary beam antenna equipment, relays, nameplates and dials.* — Chicago 5, Illinois USA

PREMAX

Corulite Elements for Light-Weight Arrays

Premax Corulite Elements meet the need for light-weight but sturdy elements for horizontal arrays and similar applications. Exceptionally light in weight yet they provide the needed strength and rigidity so essential in horizontal installations — and at extremely low cost. The special steel tubing used in these elements is a Premax development to insure unusual stiffness and strength. Heavily electroplated to insure corrosion resistance and high electrical conductivity. Fully adjustable to any desired length. A special locking clamp assures rigid joints and positive electrical contact. A "hairpin" tuning bar provides ease of adjustment.

No.	*Description*	*Extended Length*	*Collapsed Length*	*Base O.D.*	*Recommended For*	*Weight Per Pr.*
105-M	1-section	5′ 0″	5′ 0″	.625″	6-meter	1 lb.
108-M	2-section	8′ 2″	4′ 7″	.750″	10-meter	2 lbs.
113-M	3-section	12′ 4″	4′ 8″	.875″		3½ lbs.
618-M	4-section	17′ 0″	5′ 3″	1.000″	20-meter	5½ lbs.

(Sold only in pairs, complete with Premax "Hairpin" Tuning Bar)

Three-Element Corulite Kits for 10 or 20 meters, with mounting clamps and details drawings for building wood frame and support.

Four-Element Corulite Kits for 10 or 20 meters, with mounting clamps and detailed drawings for building wood frame and support.

Rotary Beam Kit RB-6309 for 6, 10 and 20 meters, includes frame, 3 pr. Elements, hardware, T-Match accessories. Weight 30 lbs.

See your radio jobber. If he cannot supply you, write direct

Premax Products

DIV. CHISHOLM-RYDER CO., INC.
4812 Highland Ave. Niagara Falls, N. Y.

WWV Schedule

STANDARD-FREQUENCY transmissions are made continuously, day and night, as a public service by the National Bureau of Standards over its standard-frequency station, WWV, on the following frequencies:

Mc.	*Power (kw.)*	*Audio Freq. (cycles)*
2.5	0.7	1 and 440
5.0	8.0	1 and 440
10.0	9.0	1, 440 and 4000
15.0	9.0	1, 440 and 4000
20.0	8.5	1, 440 and 4000
25.0	0.1	1, 440 and 4000
30.0	0.1	1 and 440
35.0	0.1	1

A 0.005-second pulse may be heard as a faint tick every second, except the 59th second of each minute. These pulses may be used for accurate time signals, and their one-second spacing provides an accurate time interval for physical measurements.

The audio frequencies are interrupted at precisely one minute *before* each hour and each five minutes thereafter (59th minute; 4 minutes past hour, 9 minutes past hour, etc.), resuming after an interval of precisely one minute. This one-minute interval is provided to give Eastern Standard Time in telegraphic code and to afford an interval for the checking of radio-frequency measurements free from the presence of the audio frequencies. Ionospheric-disturbance warnings applicable to the North Atlantic path are given at 19 and 49 minutes past each hour. If a disturbance is in progress or is anticipated within 12 hours, the time announcement is followed by 6 Ws; if conditions are quiet or normal, the time announcement is followed by 8 Ns. The announcements of the station's services and call are given by voice at the hour and half hour.

The accuracy of all the frequencies, radio and audio, as transmitted, is now better than a part in 50,000,000. Transmission effects in the medium may result in slight fluctuations in the audio frequencies as received at a particular place; the average frequency received, however, is as accurate as that transmitted. The time interval marked by the pulse every second is accurate to 0.000001 second. The beginnings of the periods when the audio frequencies are resumed are synchronized with the basic time service of the U. S. Naval Observatory.

Strays

Collecting picture postcards is a hobby which has helped keep up the spirits of Joyce Nelms, Indianapolis, despite the fact she is confined to a wheel chair. A friend, W9CKP, learning that the girl lacked a picture card from Vermont, contacted his friend, W1PTB, in Rutland, and asked him to send Joyce a postal. The result was gratifying and totally unexpected. W1PTB gave W9CKP's request to a local newspaper, and within a few days Joyce's mailbox was flooded with 356 Vermont cards, including a missive from the Governor.

MID-SUMMER BARGAIN SPECIALS

LOOK! CRYSTALS

EXTRA BONUS VALUES EXTENDED ON SURPRISE TRADE-IN ALLOWANCES

Surplus quartz xtals mounted in standard FT-243, ½", spacing holders. Have many uses, Transmitting, Receiving, Frequency Standards, etc.

5675 kc	5925 kc	8150 kc	8400 kc
5700	5950	8175	8425
5725	5975	8200	8450
5750	6000	8225	8475
5775	6025	8250	8500
5800	6050	8275	8525
5825	6075	8300	8550
5850	6100	8325	8575
5875	6125	8350	8600
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only **25c** each

6 for $1.00

Shpg. Wt. 1 lb.

Quantity Limited, So Don't Delay

GOOD LISTENING!

Hear Siebens' TRANS-AMERICAN ADVENTURES on the HAM BANDS

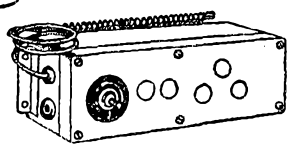
When Harold Siebens decided to outfit his "Trans - American Adventures" with portable Ham Gear for his trailer he came to Walter Ashe Radio Co. for the best in equipment and service. Excitement, thrills, the fascination of far off places, are all yours when you're tuned to Trans-American Adventures. For details check and mail the coupon below. Meanwhile take a tip from Harold Siebens whose dramatic experiences from Alaska to Guatemala will be the source of many an interesting QSO. Equip at Walter Ashe!

Enthusiastic response greeted last month's announcement of bigger-than-ever trade-ins. This has prompted Walter Ashe to continue his unusual offer on your used, factory-built Communication equipment. Take advantage now of this greatest of all opportunities to trade old for new at tremendous savings. Fill out and return the coupon today!

Number 1 Values in Used, Reconditioned, "Good-as-New" Communication Equipment. For complete list of these bargains check and return the coupon.

Big, new 1949 Catalog now in production. Reserve your Free copy right now!

BOMBSHELL SPECIAL!



Reversible Motor

Originally used for heat control on Douglas Bombers. Ideally suited for rotation of lightweight Amateur, FM or TV beams. Geared down to ½ to 2 RPM with max. torque rating of 50 inch pounds. Size 2¾"x3¾"x9". Simple instructions included. Shpg. Wt. 6 lbs.

LIMIT OF ONE TO A CUSTOMER.

ONLY **$7.45**

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All the big name brands of New Communication Equipment in stock

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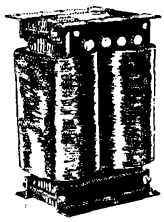
Real GALLON Transformers

TYPE E-5707

3000 Volts D. C. out of filter at 650 MA. (ICAS). Pri: 115/230 VAC 60 Cy.

Shpg. Wt. 47 lbs.

ONLY **$48.00**



TYPE E-5706

2500 Volts D. C. out of filter at 500 MA. (ICAS). Pri: 115/230 VAC 60 Cy.

Shpg. Wt. 33 lbs. ONLY **$33.00**

TYPE E-5105

2000-1750-1500 Volts D.C. out of filter @ 500 MA. (ICAS) Pri: 115/230 VAC 60 Cy.

Shpg. Wt. 30 lbs.

ONLY **$30.00**

WALTER ASHE RADIO CO.
W. H. DuBord, WOQDF, Mgr., Amateur Div.
1125 Pine St., St. Louis 1, Missouri Q-8

Gentlemen:

☐ Rush bigger-than-ever "surprise" trade-in allowance on my ..... for .....
(describe used equipment)
.....
(show make, model of new equipment desired)

☐ Send bargain list of reconditioned, good-as-new Communication Equipment.

☐ Mail my FREE copy of descriptive folder titled "Siebens' Trans-American Adventures."

☐ Put my name on your "Priority" list to receive your Big, New 1949 Catalog.

NAME.....
ADDRESS.....
CITY.....ZONE.....STATE.....

Since 1922 one of America's leading suppliers of Amateur Radio Equipment.

Walter Ashe RADIO CO.

THE HOUSE OF "SURPRISE" TRADE-INS

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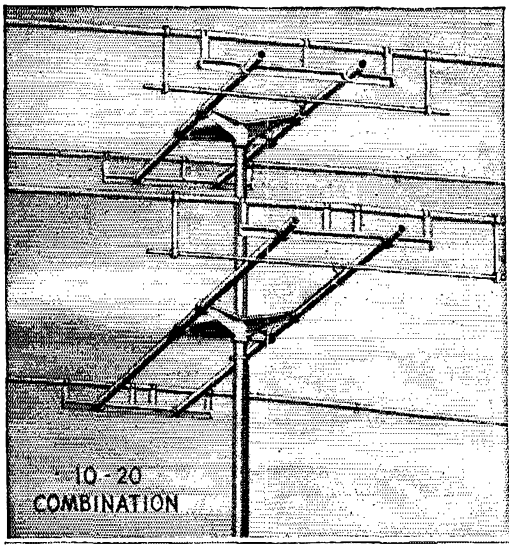
2 ELEMENT 10-11
2 ELEMENT 20

3 ELEMENT 10-11 WITH A 2 ELEMENT 20 AND 2 T MATCHES $72.50

STACKED

FOR ONLY $65.00

WITH 2 T MATCHES



HY-LITE now offers the ham a stacked 10-11, 20 meter rotary combination beam, built of the same rigid, high quality, all aluminum construction that has made HY-LITE the choice of discriminating hams everywhere.

The illustrated version is equipped with 2 T matches and full instructions for tuning. The 10-11 meter section can be had with extra elements at an additional cost, either at the time of purchase or at any later date. (Available to HY-LITE owners only.)

HY-LITE Beams stacked are so constructed that a 6 meter and/or a 2 meter beam can be stacked on top. This is only one of the many fine features of the HY-LITE Rotary Beams.

The 10-11 meter beam uses 5/8 and 3/4 inch telescopic elements with 1 inch supporting tubes. The 20 meter beam uses 7/8 and 1 inch telescopic tubing and 1 inch supporting tubes. The rigid, all aluminum castings are provided with lock screws and are insulated from the elements with heavy Steatite insulators.

Write for further information on this and other HY-LITE Beams.

HY-LITE Antennae INC.

Makers of Fine Antennas for AMATEUR · FM · TELEVISION

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A RADIO TRAINING CENTER FOR 28 YEARS

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Literature upon request. Veteran training

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Prepare now to accept a responsible position in Commercial Radio. New developments will demand technicians with thorough basic training, plus a knowledge of new techniques discovered during the war. Training open to high school graduates, or those with high school equivalency. Courses 6 to 18 months' duration in *RADIO AND ELECTRONICS*. Approved Veteran training in Radio. **Write for Particulars.**

VALPARAISO TECHNICAL INSTITUTE
DEPT. TN Valparaiso, Ind.

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ALUMINUM CALL PLATES

Your call cast in aluminum with black background and polished 1¼" letters. Plate size 2" by 6½". 3 styles: P for panel mounting, L for car license and D for desk use. $1.75 each postpaid.

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Western Electric vacuum tubes. Types 101F, 102F, 272A, 274A or B, 310A or B, 311A, 313C, 323A, 328A, 329A, 348A, 349A, 352A, 373A, 374A, 393A, 394A, 121A Ballast Lamps.

Box 110 • *QST*

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Advance your hobby or prepare for a career in a radio school run by radio men for almost a decade.

Frank Melville, W2AQK

MELVILLE RADIO INSTITUTE

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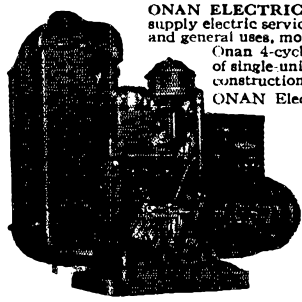
Send for Bulletin "B" or call LUxemburg 2-0440

ELECTRICITY

FOR RADIO AND ELECTRONIC APPLICATIONS



ONAN ELECTRIC GENERATING PLANTS supply electric service for electronics applications and general uses, mobile or stationary. Driven by Onan 4-cycle gasoline engines, they are of single-unit, compact design and sturdy construction.

ONAN Electric Plants are available in many sizes and models. ALTERNATING CURRENT: 350 to 35,000 watts in all standard voltages and frequencies. DIRECT CURRENT: 600 to 15,000 watts, 115 and 230 volts. BATTERY CHARGERS: 500 to 6,000 watts; 6, 12, 24, 32 and 115 volts. Write for detailed literature or engineering assistance.

D. W. ONAN & SONS 4674 Royalston Ave. Minneapolis 5, Minn.

HAM-ADS

(1) Advertising shall pertain to radio and shall be of nature of interest to radio amateurs or experimenters in their pursuit of the art.

(2) No display of any character will be accepted, nor can any special typographical arrangement, such as all or part capital letters be used which would tend to make one advertisement stand out from the others.

(3) The Ham-Ad rate is 30¢ per word, except as noted in paragraph (6) below.

(4) Remittance in full must accompany copy. No cash or contract discount or agency commission will be allowed.

(5) Closing date for Ham-Ads is the 25th of the second month preceding publication date.

(6) A special rate of 7¢ per word will apply to advertising which, in our judgment, is obviously non-commercial in nature and is placed and signed by a member of the American Radio Relay League. Thus, advertising of bona fide surplus equipment owned, used and for sale by an individual or apparatus offered for exchange or advertising inquiring for special equipment, if by a member of the American Radio Relay League 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 75 words in any one issue.

Having made no investigation of the advertisers in the classified columns, the publishers of QST are unable to vouch for their integrity or for the grade or character of the products or services advertised.

QUARTZ — Direct importers from Brazil of best quality pure quartz suitable for making piezo-electric crystals. Diamond Drill Carbon Co., 719 World Bldg., New York City.

QSLs. 100, $1.50 up. Stamp for samples. Griffeth, W3FSW, 1042 Pine Heights Ave., Baltimore 29, Md.

COMMERCIAL radio operators examination, question-and-answers. One dollar per element. G. C. Waller, W5ATV, 6540 E. Washington Blvd., Tulsa 15, Okla.

WANTED: old wireless gear from 1905 on up. State condition, price, details. W1CPI.

SELL perfect Temco 500GA commercial kilowatt, complete for all-band operation, fone or cw, $1000. No lower offers, please. Reason: marriage. W3ILD, 4912 Quebec NW, Washington, D. C.

BEAMS pre-focused and matched to typical lines. Large diameter duro-aluminum tubing for elements and boom. Peter C. Houskeeper, 956 Paulding St., Peekskill, N. Y.

AMATEUR radio licenses. Complete theory preparation for passing amateur radio examinations. Home study and resident courses. American Radio Institute, 101 West 63rd Street, New York City.

HAMS: Experiment 7" Transvision kits, ready wired, $159. Radio Hospital, 113 Factory St., Trenton 9, N. J.

FREE QSL-SWL samples! Cushing, W1HJI, Box 32, Manchester, N. H.

WIRE Recorder: Webster Model 80. Record your QSOs, parties, anything. Write Estes, WØFVM, Brunswick, Missouri.

WANTED: BC-348 receiver, preferably new. W2AQK, F. Melville, 15 West 46th Street, N. Y. C.

QSLS SWLS, newest designs, finest stock, Fairest prices. Fastest service. Write W9BHV, Dossett, QSL Factory, 857 Burlington, Frankfort, Ind.

NC-240D, perfect condition. $180. C. E. Tucker, W3KXY, 317 North 16th St., Allentown, Penna.

SURPLUS: Deluxe crystal finishing kits containing holders, quartz blanks, abrasive, etching fluid, complete instructions. Only few hundred left at $2.00 each postpaid. Formerly sold $8.75. Vesto Company, Parkville, Missouri.

QSLS. High in quality, low in price. Colonial Press, 22 Jackson St., Cambridge 40, Mass.

BC-348 E,H,K,L,M,O,P,R,S, owners. Plans and schematic for changing 200-500 Kc band for 10-meter operation. $2.00 or we will do conversion for you. Write for price, stating model number. Luster U. King, W5NLL, King's Radio & Photo Shop, Corning, Ark.

DON'S QSLS: "Leaders in the Field." Samples. 2106 South Sixteenth Ave., Maywood, Illinois.

WANTED: Early wireless equipment, and literature prior to 1925. Franklin Wingard, Rock Island, Illinois.

CRYSTALS: Precision low drift units. Type 100A in 80, 40, and 20 meter bands. Two units plug in one octal socket. Plus or minus 5 Kc. One dollar each. Exact frequency. $1.95 ea. Rex Bassett, Inc. Ft. Lauderdale, Fla.

10-METER Beams, $19.50. Send card for free information. Riverside Tool Co., Box 87, Riverside, Illinois.

ERECO Beam Rotator. 110v Ac., heavy duty, variable speed, selsyn indicator, weatherproofed. Complete indicator and rotator ready to plug in, $69.95. Satisfied users all over the country. Buy from your dealer or direct. Free literature. Dick Rose, Ereco, 2912 Hewitt, Everett, Washington.

WE rewind burned-out transformers reasonably. Guaranteed. Frampton Transformer Shop, Box 109, Blackwell, Oklahoma.

QSLS. Samples. Albertson, W4HUD, Box 322, High Point, N. C.

BEAM control cable, new material. 2 #16; 6 #20 rubber insulated, coded, tinned conductors. Weatherproof rubber jacket. Heavy armor shield. ¼" diameter. Price 10¢ a foot. F.o.b. Chicago. Trans-World Radio-Television Corp., 6639 S. Aberdeen St., Chicago 21, Illinois.

SACRIFICE: Latest model Meissner signal shifter 20, 40, 80 coils, $79.50. Sonar XE10 NBFM exciter, $29.50. Final amplifier 250TH single-ended rack mounting HDVL coil, 2-meters, all best parts, 750 W. input, $29.50. Eimac 4-250-A used ten hours, $25.00. W9ABA, C. P. Ross, 1606 Lake Ave., Wilmette, Illinois.

SEE Doc and save! Atlas Radio Jobbers, Nashville, Tenn. Tel. 6-3800.

QSLS-SWLS. Meade, WØKXL, 1507 Central Ave., Kansas City, Kansas.

IDEAL small station. Stancor 60-P complete for ten. Needs little work on modulator. $30.00. S-38 like new, $35.00. Both $60.00. Wm. J. Kiewel, Crookston, Minn.

FOR Sale: 1 S-36A in excellent condition. $125.00. Guaranteed. F.o.b. Manhattan, Kansas. O. Ward, WØZZL, 427 Colorado St.

BEST offer takes: Hallicrafters S20-R, 40-watt modulator, voltage regulated power supply, 350 v., 150 Ma., all parts for 780 v. 260 Ma. power supply. Philip Rust, W2UNM, 235 Grant Ave., Highland Park, N. J.

URGENTLY wanted: special cw communications receiver, complete with S meter and call-lamp. Will also exchange for stamps. Roger Decamps, Rue du Lievre, 8, Malines, Belgium.

SELLING out: table rack, 350-watt xmttr with NBFM exciter, S-40 rcvr with S meter and 2-meter super attached. Abbott TR4 with AC and 6 volt DC supplies. Mikes and spare parts. Offer over $325. W1KLN.

CRYSTALS: Fine commercial units for SCR-522s, Police, Taxi, Aircraft, Marine, Geophysical, and other services, except amateur. Commercial regrinding; many crystals can be economically reground to new frequencies — inquire. Over twelve years of satisfaction and fast service! Try us first. Eidson Electronic Company, Temple, Texas.

SELLING QSTS: 1927 through 1947 inclusive for best offer. W1LM.

HALLICRAFTERS S-22-R, excellent shape, cost $75.40, sell for $39.00. George Slossman, 2523 No. 30th St., Philadelphia 32, Penna.

MARCHANT calculator, electric, $175.00; 125-watt, custom-built, cw xmttr with voltage reg. ECO, $135.00; BC-342; S-9; 10-meter converter; 10 years' accumulation of parts. Make an offer. Enclose addressed postcard. W9NVC, 1161 Eaton, Beloit, Wisc.

QSLS for discriminating hams. Distinctive! Colorful! New! Satisfaction guaranteed! Stamps for samples. Firman, W7JPX, 6338 23rd St., S.W., Seattle, Washington.

SELL: Abbott TR4, tubes, $20.; SW-3, coils, 160-20, tubes, fones, $15.00; Power supply 600 V. 200 Ma., $10.00; Transformer 1800 CT, 225 Ma., $8.00; 5 mfd 2000 V., $1.50; Xmttr 6L6 osc 6L6 final, $8.00; BC454, $3.50. All plus shipping. Stolberg, 1024 E. Knapp, Milwaukee 2, Wisc.

VIBRATOR "B" supplies. Used $1.89; Simpson 2" square 0-5 milliameter, $2.25; 117 v. circuit breakers 7a or 1.5a, 98¢; 832a, $2.39; RG-8/U Coax, 35', 65', 100' lengths 4¢ foot; fittings, 23¢; prices F.o.b. Alco, Box 214, Lawrence, Mass.

NATIONAL HRO-5-AI receivers with 1.7-30 Mc coils, power supply and speaker. Brand new, regularly, $274.35. Close out: $179.50. Welch Radio Supply, 408 9th Street South, St. Petersburg, Florida.

LOOKING for Feb. '35 and '36; April, May, Oct. '36; Sept. '42 and Feb. '47 QSTS. Singles or duplicates, in good clean condition. Write E. D. C., c/o QST, 38 LaSalle, W.Hfd., Conn.

COMPLETE station for sale. Going overseas soon. ART-13 transmitter 110v supply. BC-348 converted for 110v. limiter, phasing control. 8" speaker. Mike, bug, bushel parts. Sacrifice at $150.00. Lt. Gould, VMFN114, MCAS, Cherry Point, North Carolina.

BARGAINS: New and used transmitters, receivers, parts: New 150-watt phone, $199.00; 60-watt phone, $99.00; Signal Shifter, $39.00; Abbott TR-4, $29.50; NC-173, SX-28, HRO Senior, HQ-129X, $149.00 each; RME-45, SX-25, $99.50 each; NC-81X, S-40, $65.00 each; S-20R, S-15 $49.00 each; NC-45, $42.00; S-38, $35.00; many others. Large stocks. Trade-ins. Shipped on approval. Terms financed by Leo, WØGFQ. Write for bargains and best deal to World Radio Labs, 740-42-44 West Broadway, Council Bluffs, Iowa.

A-C Instructograph, 10 tapes, oscillator, phones, key, never used. $30.00. M. Saltz, 1681 Prospect Place, Brooklyn, N. Y.

COLLINS MBF, converted to 6, two crystals, $75.00. LM-14 frequency meter with Navy power supply, $99.00. GO-9, 3-18 Mc, power supplies built, audio unwired, $250.00. Photos if interested. Keith LaBar, W6KX, 1278, North Harvard, Hollywood, California.

SELL transmitter, kilowatt, all bands, rack mounted, six feet tall, grey wrinkled panels, meters mounted behind the glass on top section. Final stage employs mechanical coil switching for three (3) bands. Tube compliment: 6L6 oscillator, 812 buffer, and 300 TL final amplifier. W. Silveira, 1848 Franklin St., San Francisco, Calif.

SELL: Electro-Tech 7" teleset. Complete with all tubes, parts and cabinet. Hardly used, $100.00. S. Semel, 433 Broadway, New York 13, N. Y.

OSCILLOSCOPE: DuMont 224 precision oscilloscope. Swap for SX-42, NC-240-D or similar receiver, or will sell. W4JRL, 2117 Ginter Street, Richmond, Virginia.

SELL "Mon-Key", $20.00. Also sell or trade back copies of IRE Proceedings, "Electronics", "Aviation". Redford C. Fleming, W80CA, 17172 Santa Barbara, Detroit, Mich.

SELL: HRO, jr. (war model) complete set coils, power supply, speaker, $75.00. 1 Kw power supply, $75.00. W1QML, 25 Barnesdale Road, Natick, Mass.

TRANSMITTER, 250 watts, 10-meter phone, complete in metal cabinet, good condition. Must sacrifice. $100.00. W4DOF, N.A.O.T.S., Chincoteague, Virginia.

SELL SX-43 matching speaker. Almost new. $140.00. Robert Gaiser, W2PRF, Butler, New Jersey.

SELL: NC-2-40C used only few hours: $150.00. F. L. Guertin, 93 Garden Street, Needham 92, Mass.

NEW BC-348 receiver completely converted: self-contained power supply; speaker, plus BC-458 transmitter. $80 complete. W9LSY, 6440 N. Nordica, Chicago 31, Illinois.

RECONDITIONED BC610s, complete with tubes, speech amplifier, coils for 10-20-40-80, $545.00. New and used Collins, National, Hallicrafters, etc. Reconditioned S-40s, $59.00; S-22Rs, $9.00; S-49s, $77.50; Pierson 4kP81, $199.00; VHF152A, $69.00; Super-Pro, $89.00; NC-240D, $139.00; HROSTA, $159.00; SX-25, SX-28A, S-47, SX-42, SX-43, NC-173, NC-183, HRO7, HT9, many other receivers and transmitters cheap. Time payments. Shipped on approval. Write for list. Henry Radio Store, Butler, Missouri.

BARRELS of radio parts, mostly new. Surplus and commercial: Bliley and Petersen xtals; transformers, condensers, relays, tubes. Bargains all! Send for list! Chuck Mowat, W7MDG, 817 No. Virginia, Reno, Nevada.

PRESELECTOR for sale: Browning type 5DX. Coverage 1.6 to 64.0 Mc. Band switching. Electrical bandspread. Calibrated dial. Regenerative circuit with 1852 tube. Good condition. $25.00. F.O.B. W5KYK, 1707 Nashville, New Orleans, La.

PANELS: Dowmetal, sheared to size. Gilpin, Box 638R4, Mt. Clemens, Michigan.

HALLICRAFTERS S-40A. Used one week. Must sell. $65. M. Saltz, 1681 Prospect Place, Brooklyn, N. Y.

QSLS? SWLS? QSLS? Made-to-order! "America's finest!" Samples, 10¢. QSL printer Sakkers, W8DED, Holland, Michigan. One-Day QSL Service!

MUST sell my Meissner 150-B transmitter, beautifully rebuilt on separate panels in 66-inch enclosed rack. 300 watts input phone or cw, 80 through 10 meters. Speech amplifier for xtal mike added, also other units including Millen exciter, 750 volt power supply, 300 watt Thordarson modulation transformer, etc. Local buyer preferred, no reasonable offer refused. W1OAX.

HAMMARLUND 4-20 with coils for 4 bands and 6 crystals, $40; A.c. converted BC-454B, $12.00; both above with keys, phones, and spare parts (complete station) $50. W2YMT, 339 New York Ave., Brooklyn.

SALE: Collins 32V-1 transmitter, slightly used, $400.00. John Ditmer, W3KFA, R.F.D. 2, Mechanicsburg, Penna.

FOR Sale: BC-348 receiver, converted. Excellent condition, $65.00 S. Cavalier, 311 Columbia Blvd., Woodridge, N. J.

SELL: Supreme AF-100, A-1 condition, complete with all bands, coils, D-104 mike, spare final tube, xtal 3625 Kc, $400. HRO-5TAI complete, A-1, with all bands, coils, broadcast coil, speaker, power supply, $260.00. F.o.b. W1NMZ, Ertman, 646 Garden St., Hartford 5, Conn. Tel. Hfd. 5-5589.

FOR Sale: New Hammarlund HQ-129-X. Used less than 10 hours. Complete with speaker. $155.00. Reason: need the money. M. G. Ehrlich, 541 N. 6th St., Philadelphia 23, Penna.

1916 QSTS. Desperately needed to make po' ole Uncle Vern happy. Single issues or the works. Few later ones, too. W6ERS, 700 Rolph St., San Francisco 12, Calif.

FOR Sale: ART-13 with 1250 V., 600 V., 28 V. selenium rectifier, power supplies on chassis in tall metal rack. Run from 110 V. line. Complete, $225.00. Bargain for someone in my area. Used Comet-Pro receiver with crystal, $20.00. Thordarson audio amplifier, 6-watt output, $15.00. TR-4, like new, with power supply, $20; Triumph 333S volt-ammeter, new, $18. Dr. William Kruger, W2HBN, 10 Fairview Terrace, Maplewood, N. J.

THREE BC-348-H, converted AC, outrigger BC-453-B "Q-5'r" per June QST, R-meter, noise limiter, improved IF-RF gain. $100 ea F.o.b., or trade. Also one BC-348-J as above, plus grounded-grid 6J6 1st RF, $125. W6HCX.

SELL: BC-459A, BC-696 converted for VFO, with power supply, brand new. W2BIV.

FOR Sale: XE-10, NBFM exciter, $30.00; SX-43, $150.00, both very slightly used. E. Campaine, W3KWP, 22 D Scott Drive, Dravosburg, Penna.

QSTS: January 1933 through December 1937, 10th, 12th, and 13th editions Handbook. Best cash offer, whole or in part. W9VXF, 3839 South 14th Street, Milwaukee, Wisc.

WANTED: Final amplifier, power supply for 1000 watt Utah xmttr. UAT-4. Will swap DB-22A for same. R. Smith, Rt. 1, Box 485-B, Concord, No. Carolina.

SELL: Assorted transmitter parts which I acquired in the process of buying parts for a rig. All new, nationally advertised brands. Includes chassis, cabinet, panels, dual freq. 1000-100 Kc. Xtal, etc. Prefer to sell entire lot, but will consider selling individual items. Write for list. W9VDP, Green, R.R. No. 1, Butlerville, Indiana.

COLORTONE QSLS!! Thanks, fellows, for the overwhelming response that has made Colortone QSLs famous. Modern designing! Quality craftsmanship! Reasonable prices! Samples? Colortone Press, Tupelo, Miss.

S-40A, 9 months old. Perfect condition. Best offer. Wanted SX-28 or A. Charles A. Worssam, Jr., Prides Crossing, Mass.

WANTED at once: Hallicrafters HT-6 transmitter. Send description to Cyril Hoyler, W2VM, 45 Harold Ave., Princeton, N. J.

FOR Sale: 1 Kw Cw transmitter; 810 driving pair 250THs, 10-80 meter bands. Constructed with highest quality parts. B & W butterfly condensers and coil assembly, B & W turret, etc. New condition. A really superb job. Best offer over $400.00. H. A. Wark, 2 Thompson St., Newton, N. J.

BC-610E converted and reconditioned by Hallicrafters. Complete coils, antenna, tuning unit, BC-939A, and exciter units ECO or crystal on all bands 10-11-20-40-80. Spare new 250TH, pair of 100THs, microphone Technical Manual. All excellent condition and working, $700. W8ZET, Ashland, Ohio.

SELL: Navy HRO, complete, pwr supply, speaker, coils, 190-30,000 Kc, in good condition. $95. McReynolds, 794 Inwood Terrace, Cliffside, New Jersey. Tel. Cliffside 6-7497.

SELL new Hallicrafters SX-43 receiver with original guarantee card, $135.00. BC453 (Q5'er) new condition, $6.00. 300-watt Navy GO-9 3 to 18 Mc bandswitching transmitter, with VFO, tubes and manuals; weight only 137 lbs. Finish on aluminum cabinet chipped, $59.00. UTC 300-watt, VM4 Varimatch modulation transformer, $19.00. Stancor Class B variable input transformer $3.00. New beam rotator motor with top and bottom mounting plates, $14.00. Joe Harms, W2JME, Box 416, Morris Plains, N. J.

WANTED: SX-24-25 or 28. State price, condition, etc. McPherson, 85 Stewart Ave., Mansfield, Ohio.

WEBSTER Model 80 wire recorder, used only few hours, perfect, $115.00; 50 watt phone/cw transmitter 80 through 10, Millen exciter 807 circuit, PP 6L6 modulators, antenna network and relays, in black crackle cabinet, $95.00. Hickok tube tester, $95.00; Triumph 'scope $80.00. Send for list of panel meters and test equipment. W2YHO, 71 Crosshill Street, Staten Island, N. Y.

OSCILLOSCOPE wanted: Dumont 208B, 241, GE CRO-8S, or equivalent. Advise price, condition. Box 1526, 23 Lexington Ave., New York 10.

HAMMARLUND Four-20 transmitter kit with all coils and crystal. Four-11 modulator kit, and Weston 0-1 milliameter. All new. All for $75.00. C. N. Robeson, jr., 300 River Road, Hilton Village, Virginia.

SELL: I.R.E. Proceedings, 1944 to 1947 inclusive. QSTs 1928 to 1933 inclusive. Radio, 1940 and 1941. Thiede, W2EC, 169 Buckingham Road, West Hempstead, L. I., N. Y.

SELLING BC-454 power unit, $6.50. Nichols, 60 Ellsworth St., Hartford, Conn.

SELL perfect Temco 500GA commercial kilowatt, complete for all-band operation, fone or cw. $1000. No lower offers, please. Reason: marriage. W3ILD, 4912 Quebec NW, Washington, D. C.

SELL BC610 transmitter. Prefer buyer within 150 miles of Richmond. Also SX-25. W4KCT.

HRO-5 TAL latest model, $225.00. NC-200, $159.00. W8RM.

QSLS-SWLS; For the best, C. Fritz, 1213 Briargate, Joliet, Illinois.

NEW XTR-1 45-watt 80-40-20 meter band-switching CW transmitter, wired, tested, $37.50. Described QST March 1948, Page 125. W2AYN, 8343 255th Street, Floral Park, N. Y.

HT-9 TRANSMITTER with coils, microphone, Meissner signal shifter, with FM, Hallicrafters SX-25 receiver, 200 radio tubes. All for $450.00. Herb Cooper, W10CL, 104 Wayland St., Roxbury, Mass.

FOR SALE: BC-348-H, converted for 110 volt 60 cycles, new condition, $60. Cecil Nelin, 1203 N. Walnut, Brady, Texas.

BEST Buy! Food! Fun! A Bang-up program for you and your XYL! Midwest Division ARRL Convention, Oct. 16-17. Hotel Broadview, Wichita, Kansas. Register early and save! Write Wichita Amateur Radio Club, Box 3, Wichita, Kansas.

NC-101X, $60. Super-pro, $250.00. Albert P. Schlacter, 7724 Kelly St., Pittsburgh 21, Penna.

WANTED: BC-610D or E complete cabinets or parts. Need top and bottom front panels, lower front and side skirts, side handles, back covers. Also final power supply chassis. W. E. Straesser, W8BLR, 15384 Birwood Ave., Detroit 21, Michigan.

ALUMINUM antenna wire, No. 14 gauge, high strength, 45¢ per 100 feet. M. H. Gould, W10S, R.F.D. 3, Bridgeport, Connecticut.

AGSX receiver wanted. Send replies to E. D. C., c/o ARRL, W. Hfd. 7, Conn.

BC-696A transmitter 3 to 4 meg., aluminum case. Good condition, $11.50. Lazy man Q-5'er wired with voltage doubler and output transformer all ready to hook up to PM speaker, $12.50. BC-522 completely changed over to 2 meters. Receiver section really hot. Complete with 110 volt AC pwr supply all ready to go on the air on 2 meters, complete with crystal, $3500. Kenneth Deal, W8THJ, 104 East Greene, Piqua, Ohio.

TRADE DeForest training, complete course, radio, sound pictures, television. Want small low power cw. phone xmttr. 10 meters or sell. William Tietz, 1610 Mahan Avenue, Bronx 61, N. Y. C.

WANTED: Two RCA power packs, Model AVA-120-A; one 12 volt, one 6 volt model in good condition. L. B. Cox, W7ACD, Shelley, Idaho.

HAMMARLUND HQ-120-X receiver complete with matching speaker, recently realigned, $125.00. Leo Wachsteter, 37-21-80th St., Jackson Heights, L. I., N. Y.

BC-640A Bendix VHF transmitter (100 to 155 Mcs. at present modified for 28 Mcs. This transmitter is complete with receiver type BC-639A and frequency meter BC-638A. Complete with power packs, etc. A superb outfit. What offers F.o.b.? Would trade: wanted tape or wire recorders. RX, etc. Mortimer, Dore, Sheffield, England.

QSTS: All issues before 1922; Radio News, first 18 issues; Wireless Age, first issue Oct. 1913 through May 1921. Send for list. Mark Potter, East Ave., Park Ridge, Illinois.

BC-459 Transmitters (7-9 Mc) New, original cartons. $9.95. Al Williams, 31d Victory Heights, Spokane, Washington.

SELL: Super-pro BC-1004 complete, used 10 hours. Many extras, $210.00. J. E. Bright, 33-17 84th St., Jackson Heights, L. I., N. Y.

BC-610E wanted. State condition, price. WØER, LaCrosse, Kansas.

HT-9 with 10-20 coils, $235.00. Workshop rotator, like-new, $115.00 Browning 5-band preselector, $15.00. William Bates, W8FGG, Reynoldsburg, Ohio.

FOR Sale: SX-28 with speaker, good condition, $135.00. W7LRN. 1022 Elrod Avenue, Coos Bay, Oregon.

FONE MEN: A peak indicating modulation meter, frequency meter, field strength meter and monitor combination, all in one unit. $14.95. Write M & N Radio for full details. 914-C Maple Lane, East Lansing, Michigan.

HALLICRAFTERS S-820R very good condition, including transmitter RF protector, $45.00. W1MVV, 107 White St., Springfield 8, Mass.

HALLICRAFTERS S-39 Sky Ranger receiver w/batteries. Last model, $65.00. Morton Goldman, 262 West Chester St., Long Beach, New York.

BC-610-E converted all bands, new B & W coils, extra 250 Th. Dumont 5 Inch scope, HF-10-20. Relays and foot pedal switch turns on all. $900.00 F.o.b. Bonman, W8VLV, R.R. 10 Box 416, Cincinnati 27, Ohio.

SALE: All like-new condition. Temco 75GA, $350.00; Hammarlund HQ129X, $100; Sonar XE10, $26.00. Will take $450 for the works. W2MKH.

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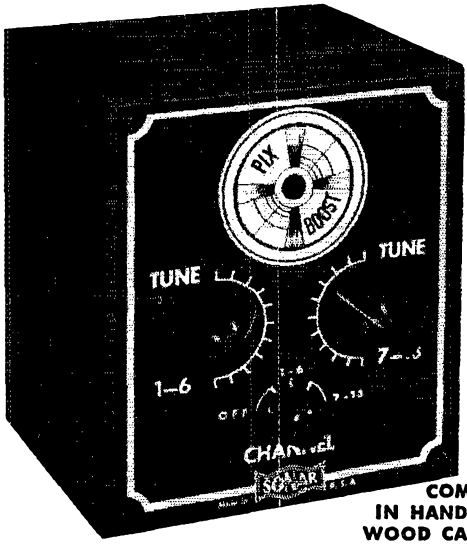

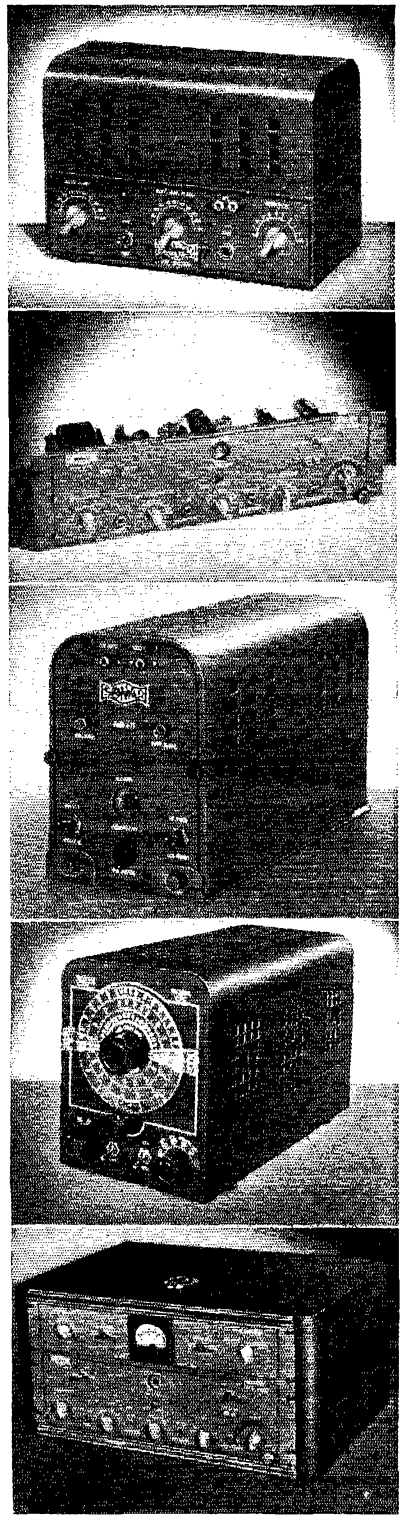

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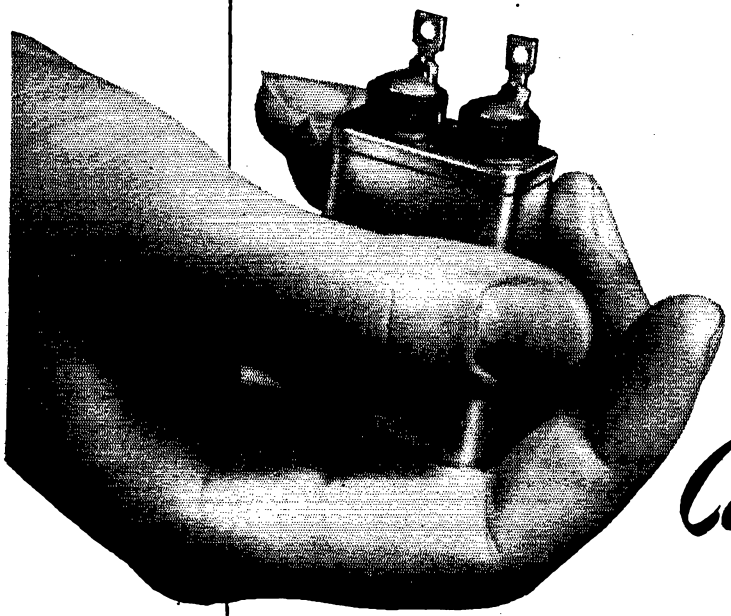
MB-611 $72.45 CFC $59.75 SRT $203.67



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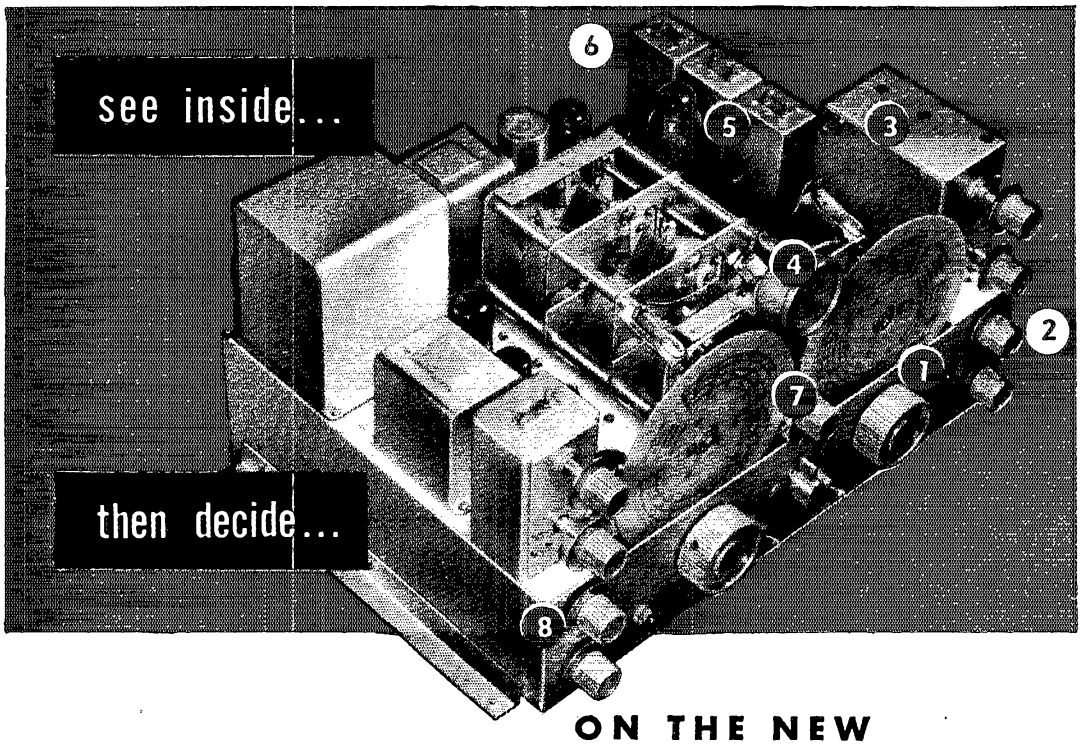

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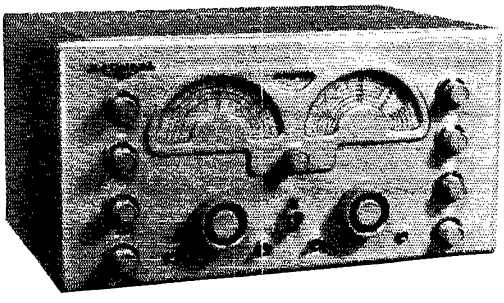

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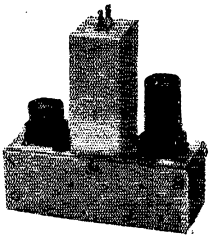

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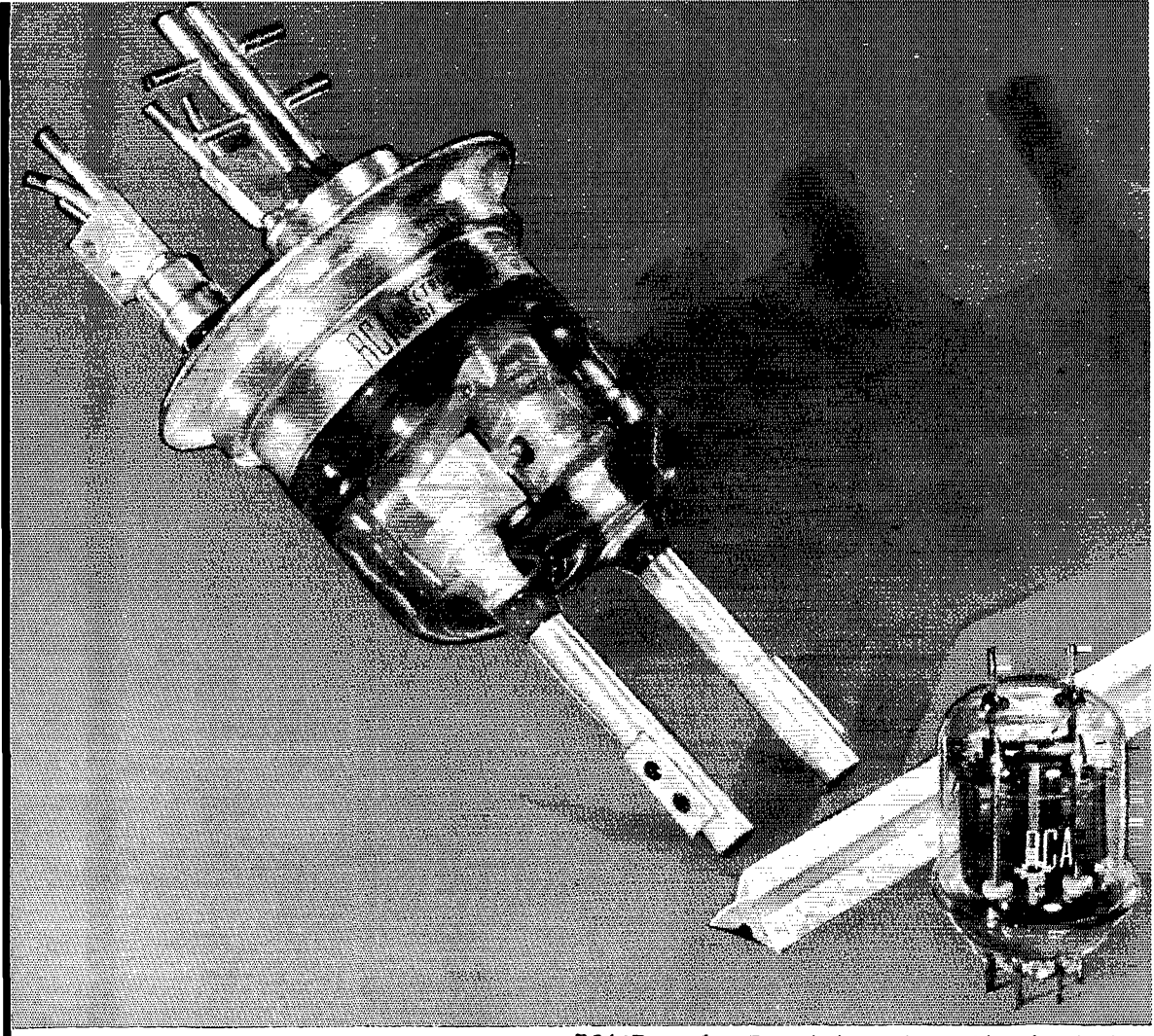

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