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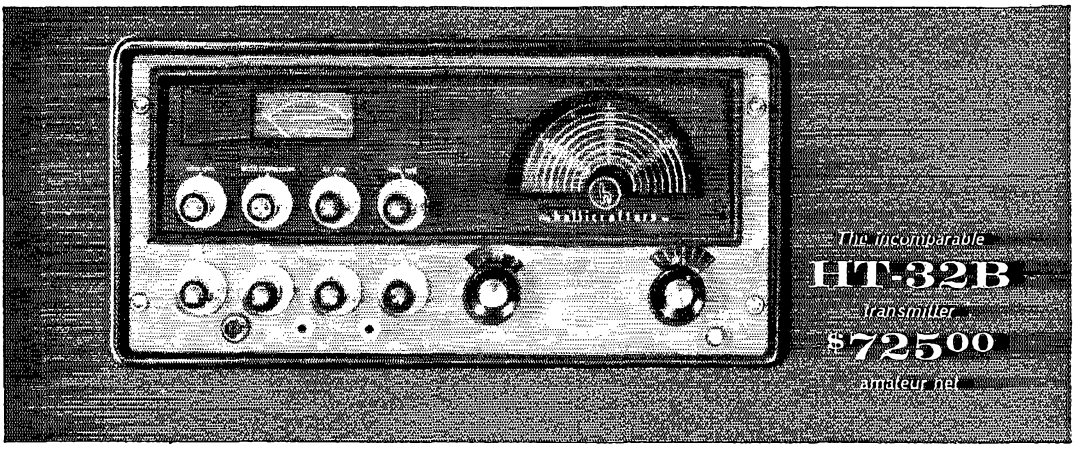

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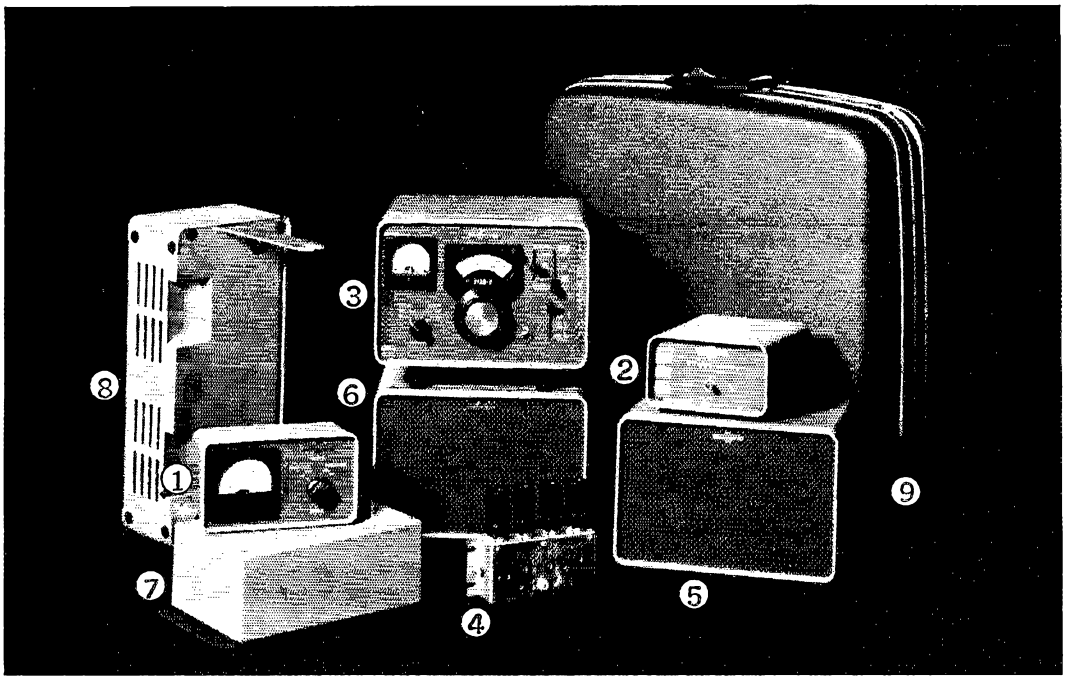

1. 302C-3 Directional Wattmeter — For fixed or mobile applications. Measures forward and reflected power on 200- and 2000-watt scales accurately (3.4 to 30.0 mc) without calibrating adjustments.

2. DL-1 Dummy Load — A 100-watt resistive load for all HF frequencies. Connects permanently in antenna coax line, with in-out relay switching. Provides easy comparison of antenna SWR and nonband interference tune-up. Type N and RCA antenna connectors are provided.

3. 312B-5 Speaker Console and External PTO — For use with KWM-2 in fixed station operation. Provides limited separation of receive and transmit frequencies, speaker, directional wattmeter, and switching for functional control system.

4. 136B-2 Noise Blanker — For use with KWM-2 in mobile operation. Effectively reduces impulse-type noise in the transceiver. Requires separate antenna resonance at 40 mc.

5. 312B-3 Speaker — Contains a 5″ x 7″ speaker and connecting cable. Styled to match S/Line and KWM-2.

6. 516F-2 AC Power Supply — Operates from 115 v ac, 50-60 cps. Provides all voltage for 32S-3 and KWM-2.

7. MP-1 Mobile Power Supply — Transistorized inverter powered from a 12 v dc automobile, aircraft or boat storage battery to the voltages required for operating the KWM-1, KWM-2 or KWM-2A.

8. PM-2 Portable Power Supply — Compact, lightweight and supplies all voltages needed for KWM-2. Operates from either 115 v ac or 220 v ac at 50-400 cps to give you a completely portable SSB station. An auxiliary speaker is included.

9. CC-2 Carrying Case — Specially designed Samsonite Silhouette case for KWM-2/PM-2 or 30L-1. Molded Royalite interior protects equipment against rough handling. Also available in model CC-3 for accessories.

These are just a few of the Collins accessories which can help you improve your rig. There are many more... mounts, microphones and adapters, to mention a few. Ask your authorized Collins distributor to demonstrate the advantages of Collins accessories. A new Collins book, *Amateur Single Sideband*, will be an invaluable addition to any ham's library.

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JUNE 1963

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—CONTENTS—

NEW IDEA FROM EIMAC: power tetrodes with twice the transconductance.

Eimac introduces two new radial beam power tetrodes with twice the transconductance of the 4CX250 series: the 4CX350A and 4CX350F. These new tubes have a transconductance of 22,000 umhos. This higher figure, with the resulting easily realized higher gain, can often eliminate an amplifier stage in practical circuit design. The 4CX350 types were designed for linear drive applications. They are the same size as the familiar 4CX250B, have the same rugged metal-ceramic construction, use the same socketry and other hardware. But they offer superior electrical performance. The Figure of Merit, often used as a criterion of r-f amplifier performance, is significantly higher with the new tubes. The rated heater voltage of the 4CX350A is 6.0 volts and for the 4CX350F it's 26.5 volts. They're especially recommended for new equipment design. For data write: Eitel-McCullough, Inc., San Carlos, Calif. Subsidiaries: Eitel-McCullough, S.A., Geneva, Switz.; National Electronics, Geneva, Ill.

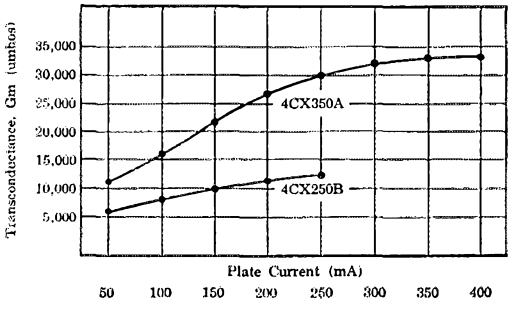
COMPARATIVE RATINGS

Max. Ratings—Class AB Service	4CX250B	4CX350A
dc Plate Voltage	2000	2000
dc Screen Voltage	400	400
dc Plate Current	250 mA	300 mA*
Plate Dissipation	250 w	350 w
Screen Dissipation	12 w	8 w
Grid Dissipation	2 w	—
Capacitances (Grounded Cathode, Average)		
Input Capacitance (Grounded Cathode, Average)	15.7 uuf	24.0 uuf
Output Capacitance (Grounded Cathode, Average)	4.5 uuf	5.5 uuf
Mutual Transconductance (Eb=2000, Eg2=300, Ib=200mA)	12,000 umhos	26,700 umhos
Amplification Factor (Grid Screen)	5	13
Figure of Merit†	95	144

†Figure of Merit $= \frac{Gm}{2\pi Ct}$ where Ct = Ci + Co and Gm = Mutual Transconductance

*In class A Service, this value may be raised to 400mA.

TRANSCONDUCTANCE VS. PLATE CURRENT



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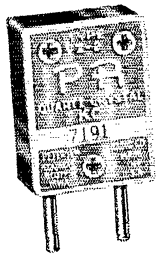

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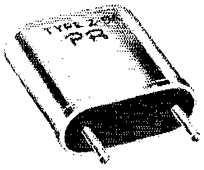

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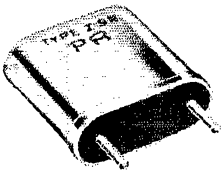

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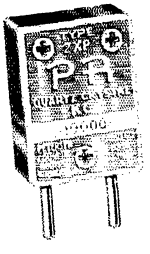

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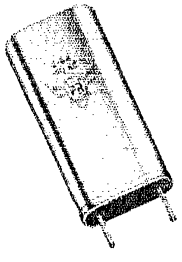

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The AMERICAN RADIO RELAY LEAGUE, Inc.
WEST HARTFORD 7, CONN.

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

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

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

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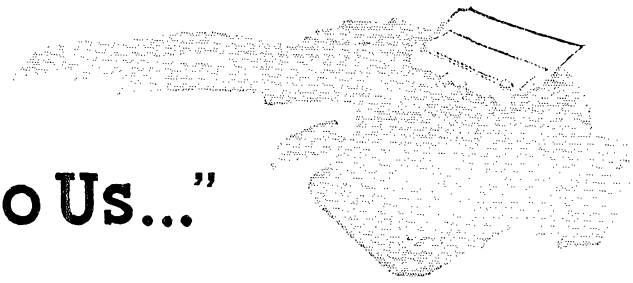

"It Seems to Us..."

League Goals

The ARRL Board of Directors at its 1963 meeting focused principal attention on expansion of its continuing program to enhance the performance of the amateur body in the "public interest, convenience and necessity." In recognition of the need for increased proficiency in our ranks, and thus a stronger and more effective amateur service in justification of continued retention of amateur frequencies, the Board after exhaustive examination and extensive discussion unanimously adopted several major policies to help carry out this objective. (See page 63 for highlights of the meeting.) These, and previous actions of the Executive Committee, comprise an over-all program which is summarized on the next page.

Officers and directors of the League have become increasingly concerned over recent trends in the amateur service. We seem to be gradually drifting away from the basic principles on which our proud records of achievement have been founded. The amateur service is defined in international law as one of "self-training, intercommunication and technical investigations carried on by amateurs, that is, by duly authorized persons interested in radio technique solely with a personal aim and without pecuniary interest." The rules of the Federal Communications Commission governing our activity include the following objectives: "Continuation and extension of the amateur's proven ability to contribute to the advancement of the radio art; encouragement and improvement of the amateur radio service through rules which provide for advancing skills in both the communications and technical phases of the art; expansion of the existing reservoir within the amateur radio service of trained operators, technicians and electronics experts."

Note well the repeated emphasis on technical proficiency: "advancement of the radio art... self-training... technical investigations ... advancing skills ... electronics experts." Are we — *as a group* — today fulfilling this objective adequately? The Board thinks not — at least by no means as well as we could. The Board feels a definite obligation to see that this phase of our amateur activity is considerably improved.

A number of persons highly-placed in the communications regulatory field, thoroughly experienced in international conference matters, and amateurs themselves, have joined League officials in expressing concern over the recent trends in amateur radio. They agree we must adhere to our basic principles more closely if we are to keep any semblance of our present frequency assignments. They confirm that pure operating pleasure alone is no justification for continuance. They feel that amateur radio has been built on a sound basis, and is largely in a healthy condition, but *is tending to move in the wrong direction.* They predict that a continuation of the present trend will most certainly cause us severe difficulty. And it is significant that many other amateurs are showing similar concern, as illustrated by the results of a 1962 survey (see separate article on Page 75 of this issue) where nearly two-thirds of those responding with an opinion indicated they expected stricter licensing requirements in the near future.

"It's only a hobby," perhaps, but it is a scientific avocation using a priceless part of the public domain: portions of the radio spectrum. Our rights and privileges are not inherent or on a first-come, first-served basis. They are subject to periodic review at international radio conferences, to weigh the value to each nation of its amateur activity *vs.* commercial circuits vital to its commerce, public safety communications, television and aural broadcasting for its people, safety-of-life communication for its ships and aircraft. As "only a hobby" of personal pleasure and with no demonstration of contributions to the public interest and welfare, amateur radio as we know it would have long ago disappeared. Our continued existence depends on adherence to the principles which have just been stated.

Officially it is the task of government people to present the amateur case to international regulatory bodies. In practice, it is the amateur organization itself which must provide the record of performance and thus the supporting arguments which our official delegates need to accomplish their aim. It is thus the responsibility of the League to see that this record is adequate; and it is the aim of the League to make it absolutely superb.

The Board thus faced a real challenge at its 1963 meeting. It carefully and exhaustively examined this matter. The directors had each

received hundreds of letters from members in their respective divisions, or relayed from Hq. Most of the members fully agreed that "something should be done," but there were almost as many variations on what that "something" should be as there were letters. Many expressed vociferous objections, some alleging that neither the Editor nor the Board had even the right to bring up the subject. The Board was fully aware, therefore, that positive corrective action providing for a real program of incentives to upgrade our technical standards might cause some dissension among the membership. It was still willing to take that risk, convinced that its action was in the long-term interests of amateur radio.

It would have been so much easier to simply do nothing. We think that had individual members of the League been able to monitor the Board's deliberations, they would have been mighty proud of their elected representatives.

In what is undoubtedly its most important action, the Board indicated its determination to achieve improvement in the amateur license structure by tightening some examination procedures (which in the past have sometimes been abused), by revising the written examinations to fit modern techniques, and by re-establishment of an advanced grade of license — with no additional code test but with a written examination substantially more difficult than that for the General Class, and eventually to carry certain additional operating privileges. The latter are as yet unstated; in this respect, therefore, the Board's action is a "declaration of intent."

The final results of the Board's action will not take effect next week, nor next month. It will take time to go through the administrative process, during which some variations in details of the basic objective may well be found desirable. As subsequent decisions are made, the membership will be advised. Assuming the FCC adoption of some plan such as the Board proposes, ample time will be allowed the amateur body to adjust itself to the new rules. Any effective date, therefore, is considerably in the future. But the course has now been charted.

The League's goals at present are increased amateur technical proficiency, more efficient use of amateur frequencies, and more effective performance in the public interest, convenience and necessity. The Board has set these goals and provided us with a practical program for their achievement. We think posterity will record the 1963 meeting as one of the most significant in the history of our ARRL.

The ARRL Program

—for more efficient use of amateur frequencies

—for increased amateur technical proficiency

—for more effective performance in the public interest, convenience and necessity

1. A complete review and revision of the present written examinations for various classes of amateur license to conform more closely with modern techniques.
2. Reinstatement of an advanced grade of license, with appropriate frequency privileges, to provide an incentive for improved technical knowledge.
3. An expanded educational program in operating and technical fields through:
   a. *QST* and other League publications.
   b. Encouragement to affiliated clubs in planning worthwhile programs for regular meetings.
   c. Enlargement of the club Training Aids project administered by Hq.
4. A more effective Official Observer system.
5. Combining the Amateur Radio Emergency Corps and the National Traffic System to constitute an Amateur Radio Public Service Corps for maximum effectiveness in the public interest.
6. Limiting the term of Conditional Class licenses and making them non-renewable except in cases of genuine hardship (*i.e.*, the handicapped).
7. An educational program in *QST* to better acquaint members with the League's history, accomplishments and goals.
8. Strict observance of the following operating principles:
   a. To make proper choice of bands below 30 Mc. appropriate to the distance to be covered.
   b. To achieve equipment flexibility so that an adequate choice of frequency bands and powers may be available.
   c. To use minimum bandwidth, consistent with good engineering practice and compatible with the mode of transmission being employed.
   d. To expand the use of v.h.f. for local contacts wherever possible, with the ultimate aim of conducting all short-distance communication in this portion of the spectrum.
   e. To use the minimum power necessary for each communication.

Remotely-Tuned Mobile Antennas

Flexibility and Convenience in Mobile Antenna Tuning

BY ALBERT H. JACKSON *, W1NI

Using a salvaged motor drive from a car broadcast antenna for motive power, W1NI has come up with an inexpensive and easily-built method for tuning the mobile antenna from the driver's seat. Two versions are described. See also our cover this month.

A FINE job has been done by both hams and manufacturers to make our mobile equipment compact, v.f.o. controlled, and with bands easily changed. The ultimate in flexibility, yes, but when you want to change bands you still have to stop the car, get out, change coils and adjust sliders and taps. Finding the resonant point of the coil at a given frequency is also a nuisance — and time consuming when trying to get tuned up in a hurry to contact a station calling CQ.

Suffering from this inconvenience long enough, I determined to try to build an antenna that would change bands and tune within the limits of each band at the flick of a switch on the dash. At the time, I was using a Master Mobile center-loaded antenna that tuned all bands by moving a sliding contact up or down the coil. This arrangement worked very well, but the problem was how to move the slider from the driver's seat. There are probably many ways that this can be done, but after some thought I came up with an idea that is simple, practicable and uses parts available in most auto junkyards.

Get yourself an old electrically-operated automobile antenna — $4 to $6 depending on the condition. They are available in both 6- and 12-volt models. Couple this antenna to the slider of the Master Mobile coil and wire the motor to a switch on the dash in accordance with the following constructional details.

Electric antennas are made so that the three sections telescope into the base. The motor drives a flexible nylon rod that is attached to the bottom of the top section. First remove this top section so that the nylon rod will push through the top of the middle section when power is applied to the motor lead that drives

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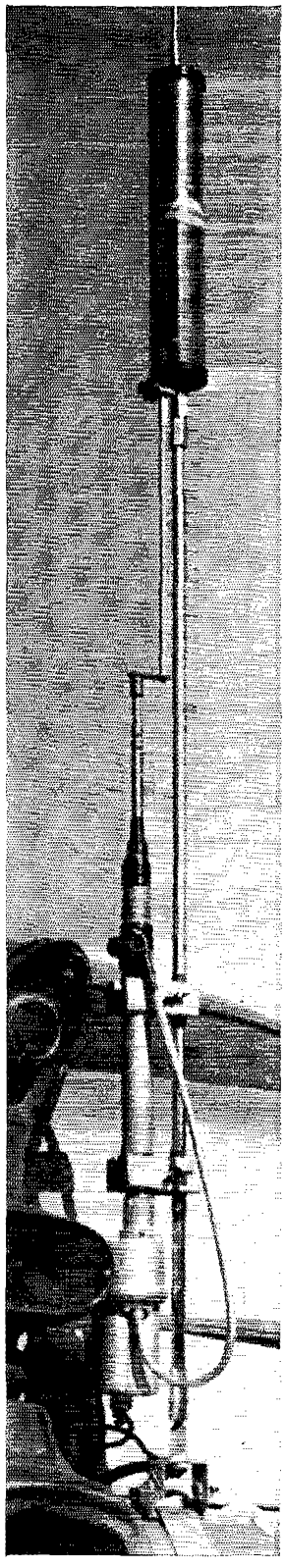

Fig. 1—The original installation, using a motor-driven car b.c. antenna to move the slider contact on a Master Mobile loading coil. »»»»

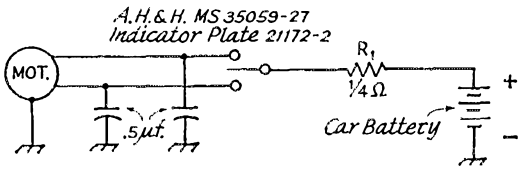

Fig. 2—Electrical control connections, including hash filter capacitors and series resistor, R_1, for adjusting motor speed.

the antenna up. This operation can easily be done by using a sharp-edged file and cutting the top of the middle section just below the indented bead. After the nylon rod has been driven up a few inches, remove the top section from the brass coupling that attaches the nylon to the top section. This will leave about $\frac{3}{16}$ inch of the brass coupling that can be tapped for 8-32 thread. Use a bottoming tap in order to get as much thread as possible.

When this has been done it will be necessary to make a small brass cap to fit over the top of the middle section with its center drilled for an 8-32 brass screw. This screw should be a binding head type about $\frac{3}{16}$ inch long. Run the nylon rod back into the antenna and solder the cap in place. Remove the chrome plating around the top of the antenna section before attempting to solder. Now make two clamps to hold this whole antenna assembly to the portion of the Master

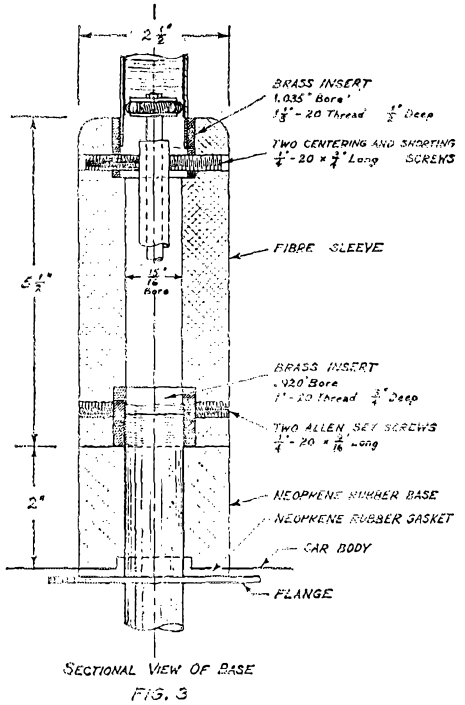

Fig. 3—Rear-deck mounting for the Band Spanner antenna and tuning drive. The fiber sleeve is made from a length of 2½-inch diameter linen-base phenolic rod, usually available from plastics suppliers (consult the Yellow Pages of the local telephone directory).

Mobile antenna below the coil. Clamps can be made of hardwood or any insulating material such as bakelite or fiber. Carriage bolts with wing nuts work well to hold the clamps together and make for easy adjustment.

When the motor drive has been clamped in place, measure the distance between the coil slider rod and the brass cap on the motor drive. Cut apiece of flat $\frac{1}{16} \times \frac{1}{2}$-inch brass stock and drill a hole in each end in order to connect the drive rod and slider together. The 8-32 $\times \frac{3}{16}$ brass binding-head screw passes through both the flat brass stock and the brass cap, and screws into the brass coupling at the top of the nylon rod. When this whole assembly has been mounted to the bumper mount on the car bumper (see Fig. 1), run two control wires to the front of the car and mount a single-pole double-throw momentary-contact switch on the dash and connect as shown in Fig. 2. The two leads should be bypassed with 0.5-μf. capacitors to eliminate hash in the receiver, and a $\frac{1}{4}$-ohm or larger resistor can be connected in the motor hot lead to reduce the speed of the slider, if necessary. The size of this resistor depends on the voltage and current of the motor used. I have found that the 12-volt models usually run from 5 to 8 amps.

Your remote-control antenna is now ready to operate. The momentary switch will practically control your antenna coil tuning turn by turn, as desired, by a slight touch of the finger. An indicator plate is used on the switch. This plate reads Hi in the up position and Low in the down position, which corresponds to the inductance position of the slider on the coil. When the switch is held down the push rod moves to its lowest position, which is the maximum number of turns on the coil. Stops are unnecessary when the end of travel is reached because the nylon rod is driven by a slip clutch arrangement.

An Improved Version

This antenna worked very well and gave a great deal of satisfaction but, as is always the case, improvements can be made on any idea. Plans were made for a new and improved antenna. The requirements to be met in the new one were that the antenna should be mounted on the trunk deck so that the drive motor and all moving parts and electrical connections would be protected from water, dirt, ice and snow; and also that the antenna should be quickly and easily removable so that the car could be driven into auto wash and parking garages. With these thoughts in mind, I decided to see what could be done with the Webster Band Spanner mobile antenna.

This type of antenna is quite rugged in construction, meets the waterproof requirements and lends itself quite readily to trunk-deck mounting. However, its sliding contact has considerably more friction than the Master Mobile type previously used, and there was some doubt as to whether the drive mechanism would be powerful enough to operate it. One of these antennas was obtained and tests made

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Fig. 4—Close-up of the below-deck installation, showing modified cable connector. The housing shown in detail in Fig. 3 is immediately above the car deck.

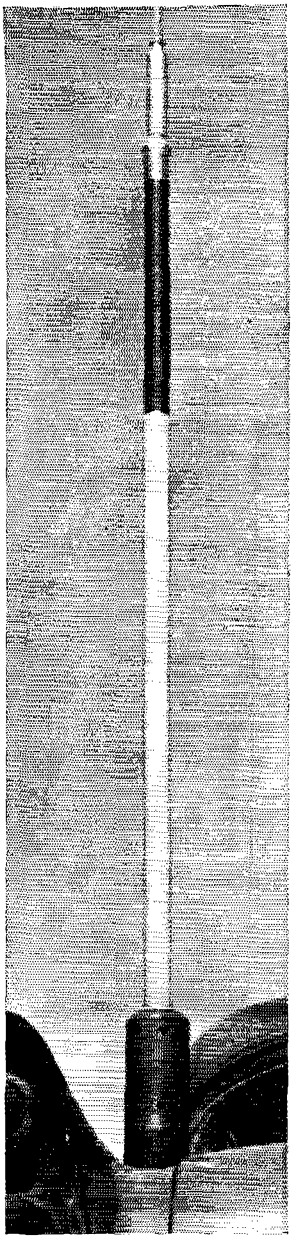

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Fig. 5—W1NI's mobile now uses the Band Spanner and the mounting shown in Figs. 3 and 4. The spring mentioned in the text is at the top in this picture; the whip section, not visible in this view, extends above it.

which proved that my worries concerning driving power were unfounded.

Construction of this antenna involves quite a little more time and cash outlay, but the results are well worth the effort. The drive mechanism is modified in the same manner as previously described, except that the circular contact from the Band Spanner antenna push rod is attached to the brass coupling instead of the small piece of brass stock. A slightly longer 8-32 binding-head screw is used. The Band Spanner antenna is modified as follows: unscrew the top cap from the coil and pull the whole rod and slider assembly completely out of the coil tube. Place the rod in a vise and unscrew the brass nut to remove the circular contact assembly. When this has been done, remove the ball from the top of the rod (this is a compression fit), slide the cap assembly from the rod, replace the ball, thread the brass stud at the end of the rod from which the contact was removed with a $\frac{3}{8} \times 24$ thread, and screw on a female coupling. This rod now becomes the top section of the antenna and is attached to what was originally the bottom part of the coil. The coil section has been inverted in order that the threaded end now at the bottom may be attached to the drive motor.

To complete the next step, a friend with a lathe is a big help. It will be necessary to make an insulated coupling in order to connect the two units together. Details of this coupling are shown in Fig. 3.

After the four separate parts of the antenna have been completed and a suitable location on the car trunk deck or cowl has been decided on, a rubber base and sleeve must be made so that the antenna, when mounted, will sit vertically on the car body for good appearance. When the proper size hole has been punched in the car deck and the complete antenna assembly installed, connect the motor leads to the switch on the dash as described in Fig. 2.

The coax connection to the antenna is made to the original electric antenna connector by making an adapter. This can easily be done by cutting the plug from the lead-in wire which came with the electric antenna and connecting it to a Type S3-1SP (PL-259) coax connector (see Fig. 4).

To relieve the strain on the coil section of the antenna, a small spring (Antenna (*Continued on page 154*)

A.C. in Radio Circuits

Part IV — Coupled Radio-Frequency Circuits

BY GEORGE GRAMMER * WIDF

A SIMPLE tuned circuit such as was discussed in Part III (May *QST*) is rarely useful by itself. It has to be used *with* something — tubes, transistors, other circuit components — in order to play its part in handling radio-frequency energy. The several schemes by which that energy can be introduced into the tuned circuit or taken from it are known as **coupling** methods.

Coupling to a tuned circuit always modifies the circuit's *Q*. The reason for this is the energy transfer itself. For example, when energy is taken from the circuit it is lost, so far as the circuit is concerned. It is just as though resistance were added to the circuit, because the basic property of resistance is that it uses up — in technical language, "dissipates" — energy or power. The object of the circuit design is to convey power to a device — the **load** — where some desired use can be made of it. In the tuned circuits so far considered, all the power put into the circuit stayed there. It was used up in the resistance of the circuit itself.

Sometimes the circuit itself actually is the desired load. This is the case with many receiver circuits, where — as in supplying signal voltage to a vacuum-tube amplifier — no power is *required* from the circuit. In a case like this the best use is made of the available power when all of it is used to generate the maximum possible resonant rise in voltage.

However, this is seldom the case in a transmitter. Here we want to get power *out* of the circuit. Part of the circuit's job is to see that an amplifier tube is given the kind of resistance load it wants. The actual load — such as an antenna or transmission line — seldom has the value of resistance that the tube would like to see. We'll take just one simple case at this juncture.

*Technical Director, ARRL.

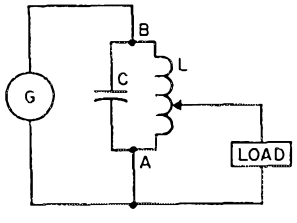


Fig. 1 — A tuned circuit with load connected. The circuit Q can be changed by moving the tap on the coil.

Load Resistance and Circuit Q

In Fig. 1 the generator *G* represents a vacuum-tube amplifier connected to a resonant circuit, *LC*. The generator sees a resistance of a value determined by the *Q* of the circuit and the reactance of *L* or *C*. If the *Q* is low this parallel resistance (between *A* and *B*) will be low, as you have seen in Part III. Low resistance means that more current will be taken from the generator, assuming that its voltage output is more or less constant. So the lower the *Q* of the circuit the more heavily the generator is loaded, and vice versa.

Obviously, if we can vary the circuit *Q* we can adjust the load on the generator to any value we want, within practical limits. An easy way to vary the circuit *Q* is to connect the actual load across only part of the coil, as shown. If the number of coil turns between *A* and the tap is small compared with the number between *A* and *B*, the current going into the load will be small. As we move the tap up the coil the load takes more current. This has the effect of lowering the circuit *Q* and thus lowering the resistance between *A* and *B* as seen by the generator.

This is only one of many ways in which a load can be introduced into a circuit to vary the *Q*, and with it the parallel resistance or impedance of the circuit. One of the important ones is based on the kind of coupling next considered.

Inductive Coupling

We saw earlier (in Part I) that a changing magnetic field, such as is set up by the r.f. current flowing through a coil, induces a voltage in the coil. This voltage distributes itself on a per-turn basis, if the field around all turns is the same. (It isn't *always* the same, in the kind of coil used in r.f. circuits, for a number of reasons — one of which is the fact that there is no way to keep the field from spreading out in the air.) But here is the interesting thing: the field doesn't care whether the turns in which it is inducing a voltage are all part of the same coil or not. We can have two or more coils in the same field and the voltage in each will be in proportion to the number of turns it has.

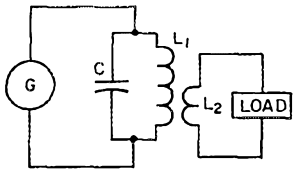


Fig. 2—Inductive coupling between the tuned circuit and load. This method also offers a way of changing the circuit Q.

This means that a load can be connected to an entirely separate coil, L_2, as in Fig. 2. The second coil could have about the same number of turns as the number across which the load was connected in the tapped circuit, Fig.1. However, in that case it would be necessary for L_2 to be just as close to L_1 as its own turns. This might be done by winding L_2 right over the lower part of L_1, for example.

The advantage of the two-coil arrangement is that there is no direct connection between the load and the power source. This is often convenient in working with vacuum tubes that have to have large d.c. voltages applied to them.

A coil **coupled** to a tuned circuit is often called a **link.** It doesn't have to be wound right over the main coil, actually. If the two are somewhat separated and the link is movable with respect to L_1, the voltage induced in it will be smaller as we move the link farther away. This is called "varying the coupling." It gives smooth adjustment of the loading on the circuit.

Coupled Tuned-R.F. Circuits

In Fig. 2 one r.f. circuit, that formed by L_1 and C, is tuned. The second, L_2 and the load, isn't. The secondary circuit *can* be a tuned one, however. When both circuits are tuned to the same frequency more current will flow in the secondary, because the reactance of the capacitor cancels the reactance of the coil.

One result of this greater current flow is that the two coils do not have to be so near each other for transferring a given amount of r.f. power from the primary to the secondary. That is, **loose coupling** can be used. Another is that two tuned coupled circuits are more selective than one. Both of them have resonant Qs and thus both will respond most strongly to just one frequency. This gives us a way of increasing selectivity in receivers. Extra selectivity is often useful in transmitters, too, because transmitters are prone to generate frequencies we don't want along with the one we do want. These spurious frequencies can't be allowed to go out with the intended signal.

Two common types of inductively-coupled resonant circuits are shown in Fig. 3. The arrangement at the top is almost universally used in receivers, where the load often is a very high — almost immeasurably high — resistance. Here we are interested in getting the largest possible voltage from the secondary circuit. The lower circuit is used when the load is a low resistance. It is often found in transmitting circuits.

Coupling and Q

The way these circuits operate depends principally on their individual Qs, including the effect of loading on the Qs. If both circuits have high Qs — 50 or 100 or more — the coupling between them can be very loose indeed, even when the maximum power is being transferred from the primary to the secondary. The resulting selectivity will be quite high. On the other hand, if the Qs are low — say in the neighborhood of 10 each — the coupling between the two coils must be much tighter for optimum power transfer, and the selectivity will be lower.

The high-Q **tuned transformer** is the kind we want for our receivers. The low-Q one is more useful in transmitters, where large amounts of power must be handled and we can't afford to lose much of it in the circuits themselves. A circuit loaded by a useful resistance such as an antenna has to work at relatively low Q so that most of the power will go into the load instead of being burned up in heating the coil.

Coefficient of Coupling

The degree of coupling between two coils is expressed by a number called the **coefficient of coupling.** It isn't essential for you to know its technical definition. It is sufficient to note that a very small coefficient of coupling will suffice for maximum power transfer if the two coupled circuits have high Qs. That is, the coils can be relatively well separated. If the circuit Qs are low, the coupling coefficients must be larger, meaning that the two coils will have to be rather close together.

Selectivity of Coupled Circuits

What happens if we vary the coupling between two tuned circuits? If the coupling is very loose, varying the frequency applied to the primary circuit will cause the secondary response to go through the values shown by curve *A* in Fig.

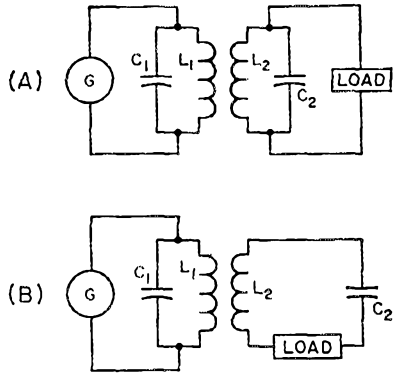


Fig. 3—Inductively-coupled tuned circuits. Circuit A is used for coupling to high values of load resistance—of the order of thousands of ohms. B is used for low load resistances—100 ohms or less, usually.

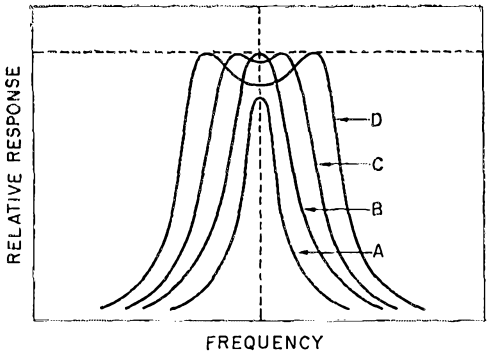


Fig. 4—Typical response curves obtained at several degrees of coupling when the frequency applied to two coupled circuits is varied. Both circuits are tuned to the same frequency, indicated by the vertical dashed line. The actual shapes of curves like these depend on the circuit Qs.

4. The curve is sharp — good selectivity — but we haven't transferred all the possible r.f. energy from the primary to the secondary.

If we now increase the coupling to the point where the secondary response is as shown by curve *B*, we are getting the maximum possible energy transfer. This is called the point of **critical coupling.** The curve has the same general shape as *A*, but is less selective. If the coupling is increased still farther the circuits are said to be **overcoupled.** An overcoupled response, shown by curves *C* and *D*, always shows two "humps," or points of maximum response. These are about equally spaced from the true resonant frequency. The dip in the center of the curve is small if the circuits are just beyond critical coupling, as in *C*. The more the circuits are overcoupled, the deeper the dip and the farther apart the humps become.

Overcoupling gives a **bandpass** effect that is often useful. The response curve is approximately flat-topped if the circuits are not too badly overcoupled. This is fine for passing signals that have appreciable bandwidth.

Other Types of Coupling

In some receivers you may find circuits similar

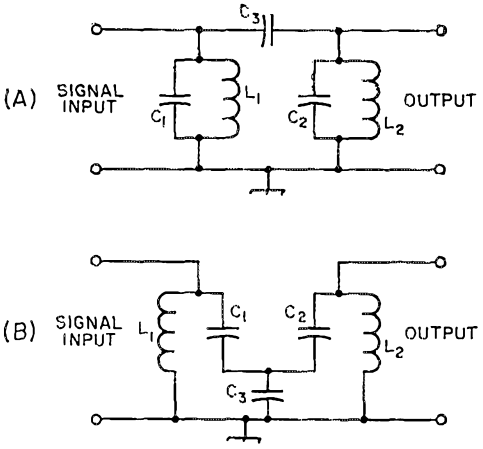


FIG. 5—Capacitive coupling between tuned circuits. A and B are frequently called "top" and "bottom" coupling, respectively.

to those shown in Fig. 5. There is no inductive coupling between the tuned circuits L_1C_1 and L_2C_2. In fact, they may be shielded from each other. The coupling is through a capacitor, C_3, connected between the two circuits.

In A, C_3 connects the "hot" sides of the two circuits. The coupling coefficient depends on the value of this capacitance. If the circuit *Qs* are high, C_3 will be quite small when the coupling has its critical value. At even very low radio frequencies just a few picofarads will suffice.

In B, the circuits are coupled at the low-potential side. C_3 is common to both circuits, and the voltage developed across it by current flowing through it and C_1 introduces energy into the circuit completed by C_2 and L_2. Only a very small voltage is needed for critical coupling, so the capacitance of C_3 in this circuit is very large compared with the capacitances of C_1 and C_2.

Fig. 5B is probably the one more frequently used. By switching in various values of C_3, the coupling — and thus the bandwidth — of the tuned transformer can easily be changed to suit the bandwidths of various types of signals.

(Part V of this series will appear in an early issue. — *Editor*). QST

Strays

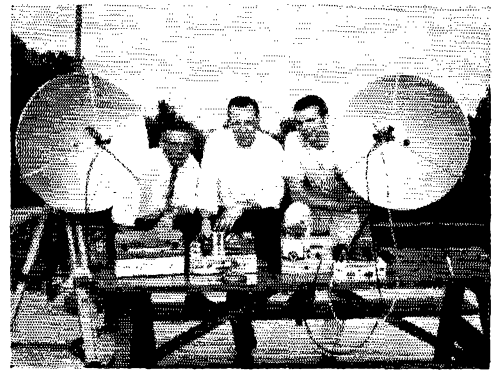
Look for "Operation Nova Scotia," a group of Boy Scouts and Explorers touring the Eastern United States and Canada. Radio equipment for the trip is presented by WØBQO and WAØADV to second op WNØFIS and Jack McComb. The boys will leave Denver June 14, returning July 14. Of special interest will be periods of operation from Prince Edward Island, about June 24, and from VE4 around June 30. Frequencies for s.s.b. will be 3.9, 7.23, 14.28, 14.325 and 21.3 Mc., and for c.w., 7.175 and 14.05 Mc. The call of the chief op, KØIIX, will be used, along with the special events call KØBSA and the call assigned to Troop 62 Radio Club, WAØBRE. Special QSLs will be issued; incoming cards should be addressed to Chuck Lackey, 1475 Monaco Parkway, Denver, Colorado.

QST for

Practical Gear for Amateur Microwave Communication

Equipment for 3300 Mc. and Other Microwave Bands with a Minimum of Hard-To-Find Components

BY KARL E. PETERSON,* K3KRU



That the equipment described in this article really works is shown by the record of W3WJC/3 in a June V.H.F. Party. The author is at the left, with W3WJC, center, and K3ABS, right, between two microwave setups that helped them to post one of the country's top scores in that affair. Units shown are for 10,000 Mc., but are built according to information given for the 3300-Mc. equipment described here.

As the number of amateur radio operators increases by leaps and bounds each year, more and more operation is evident on the higher frequencies. Although this article is written primarily for the experimenter who may want to try his hand at microwave work, it may shed some light on possibilities of operating space for scheduled contacts.

The communication system consists of using polaplexers [1] at the microwave frequencies. Each system has one reflex klystron operating into circular waveguide, for both transmitting and receiving. In receiving, the klystron acts as the local oscillator, with the difference frequency deviation detected by means of a 30-Mc. i.f. strip. During transmission, the klystron is frequency modulated by applying audio voltage to its reflector element. Since no circuit changes are required between transmit and receive, the system is applicable to duplex operation.

This article includes the necessary data and formulas for determining the position of components and length of guide with respect to the diameter of guide being used. Previous articles have been written on operation at the higher frequencies, but it may be difficult to obtain cylindrical tubing of a specific diameter, and therefore we have included the necessary information so that no specific waveguide diameter is required. Sample calculations will be given using a 3-inch diameter can for operation on 3400 Mc.[2]

In operation with polaplexers, the transmitter frequencies are adjusted so that they differ by the amount to be used for the receiver i.f. In receiving, this difference frequency is slope-detected, using the transmitting klystron as the local oscillator to supply the necessary injection for mixing. Frequency modulation of the transmitted signal is obtained by varying the reflector voltage by approximately 6 volts peak to peak for a variation in frequency of 5 megacycles. A regulated reflector supply is preferred, but it is not absolutely necessary. Contacts were made with and without reflector voltage regulation, with no appreciable drift problem.

Following are the equations relating free-space wavelength, cutoff wavelength, guide wavelength, and waveguide radius for operation of circular waveguide in the $TE_{1,1}$ mode.

$$\lambda_o = \text{Free-space wavelength in inches} = \frac{3 \times 3.938 \times 10^3}{F_{\text{Mc.}}}$$

$$\lambda_c = \text{Cutoff wavelength} = 3.41 \times \text{radius}$$

$$\lambda_g = \text{Guide wavelength in inches} = \frac{\lambda_o}{\sqrt{1 - \left(\frac{\lambda_o}{\lambda_c}\right)^2}}$$

Cutoff wavelength is the longest wavelength the waveguide can transfer. Guide wavelength is the actual length of one wave as it travels through the waveguide.

The transmitted wave and the received wave planes are at 90 degrees with respect to each other. The klystron is placed at the ¾ guide-wavelength position and the diode tuning arrangement is placed at the ¼ guide-wavelength position, but at right angles to each other. The

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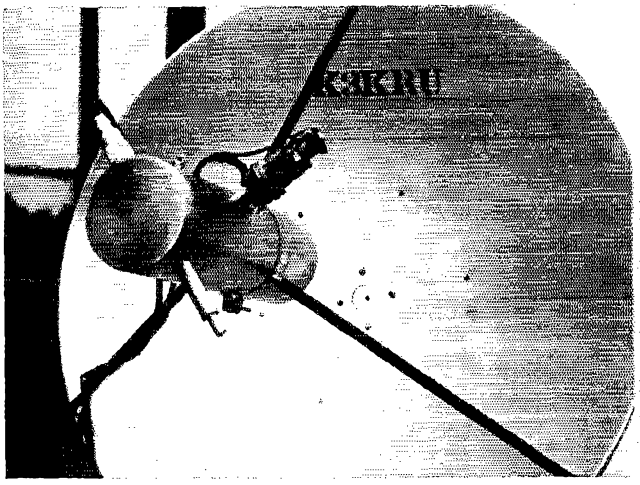
[1] Baird, "A Radio Club for Microwave Enthusiasts," *QST*, December, 1959.
Bredon, "Let's Go Microwave," *QST*, June, 1958.

[2] The band formerly was 3500 to 3700 Mc. It was changed back to 3300 to 3500 Mc. in April, 1962.



Closeup of the 3300-Mc. polaplexer Klystron mount, i.f. takeoff, injection control and tuning slug are all clearly visible.

transmitted wave and the received waves are now at 90 degrees and electrically independent. To obtain the necessary injection current required for mixing, a screw is projected into the guide at $\frac{3}{8}$ guide wavelength and at an angle of 45 degrees with respect to the klystron. If the following sample calculations are followed for operation at 3400 Mc., using a 3-inch inside-diameter can, the formulas relating guide wavelength to free-space wavelength should be self-explanatory. Assume the diameter of our future waveguide to be 3 inches; the cutoff wavelength is then calculated to be 5.115 inches. Assuming to operate at 3400 Mc., the free-space wavelength approximates 3.475 inches. The guide wavelength is then calculated to be 4.73 inches. The klystron is placed at $\frac{3}{4}$ guide wavelength from the closed end of the guide, or 3.55 inches, and the tuning arrangement at $\frac{1}{4}$ guide wavelength position or 1.18 inches. The injection is placed at the $\frac{3}{4}$ guide-wavelength position or 1.775 inches. The total length of the guide should be equal to or greater than two guide wavelengths. Longer waveguides can be used, for ease of mounting the guide in front of a parabolic reflector. If the waveguide is very short, the system becomes critical to adjust. One note of caution: as the

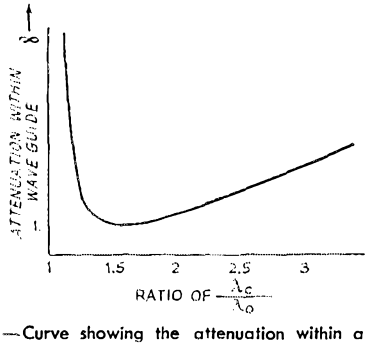


Fig. 1—Curve showing the attenuation within a waveguide for various ratios of cutoff wavelength to free-space wavelength.

value of free-space wavelength approaches the cutoff wavelength, guide wavelength becomes extremely large and attenuation within the guide becomes excessive. For this reason the ratio of cutoff wavelength to free-space wavelength should be within the limits of 1.4/1 to 2/1. Note the curve of attenuation *vs.* ratio of cutoff to free-space wavelength, Fig. 1.

Guide Construction

The waveguide is constructed from 3-inch inside-diameter copper pipe with one end sealed. The tuning arrangement consists of a $1\frac{1}{2}$-inch piece of $\frac{1}{2}$-inch copper tubing (C in Fig. 2) soldered onto the guide at the $\frac{1}{4}$ λ_g position. (The hole for tuning slug will be drilled later.) The tuning slug, D, is approximately $\frac{3}{4}$-inch diameter and $1\frac{3}{4}$ inches long. The slug is hollow with an octal socket pin connector soldered in one end. It should be a snug fit in the housing. Previous to soldering, the pin connector should be formed to fit the tuner stem, E, which connects onto the mixer diode. The diode is placed within an SO-239 coaxial receptacle which has been drilled to allow the 1N21B diode to fit freely, as seen in Fig. 2 at A. The inner conductor is first removed from the receptacle. The hole in the insulation is then drilled out to $\frac{1}{4}$-inch diameter, and countersunk to a depth of $\frac{1}{32}$ inch with a $\frac{9}{16}$-inch drill, to allow the flange of the diode to seat properly against the insulation.

The receptacle is soldered onto the waveguide opposite the tuning-slug arrangement, with its axis perpendicular to that of the guide. The guide is now drilled with a $\frac{1}{4}$-inch drill to allow the tuner stem (E) to pass through the u.h.f. receptacle, guide, and into the socket contact on the end of the slug.

The injection control, B, consists of a 6–32 screw, approximately 1 inch long, protruding into the guide. If the walls of the guide are thick enough to allow tapping, this procedure is excellent, otherwise a 6–32 nut should be soldered onto the guide to provide the necessary thread.

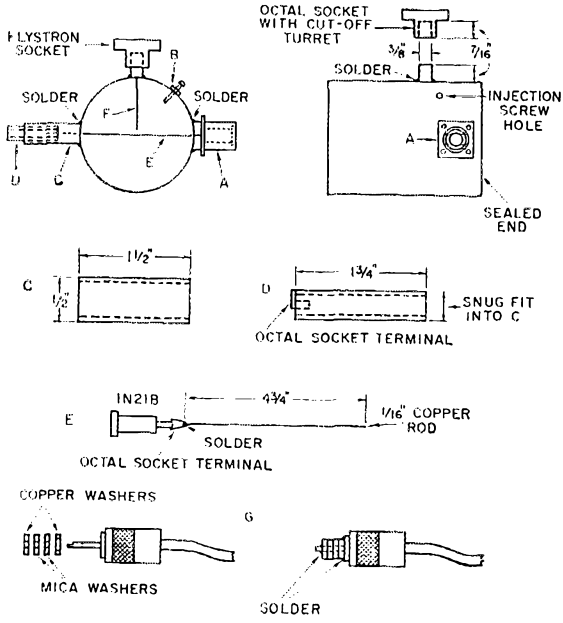


Fig. 2— Principal details of the polaplexer assembly. The complete unit is shown, looking into the open end, at the upper left, and from the side, at the upper right. Parts C and D are the tuning slug and sleeve. The wire attached to the crystal (assembly E) slips into the socket terminal on the end of Part D. The i.f. output connector with its u.h.f. bypass assembly is shown at G.

It is important that the interior of the guide be free of excess solder, indentations, and other roughness which will disturb the field.

Mounting the klystron is simplified by using a Vector octal socket with turret mount, with the turret cut to 7/16 inch and then placed over the 3/8-inch bushing which is soldered onto the guide. The octal socket must be modified to accommodate the klystron by removing Pin 4 and drilling with approximately a 3/32-inch drill to take the output pin of the 2K29. The sleeve of the output pin of the klystron must be insulated from the waveguide because the shell operates at 300 volts positive. The location of the 3/8-inch bushing is determined by the position of the klystron. It is preferable to mount all parts with bolts and fixtures before heating the guide for soldering. If all parts are not rigidly fastened in place, a nightmare of falling parts is likely to follow. An extension rod, F, 1 1/8 inches long, is soldered onto the output pin of the klystron for improved match to the waveguide.

The bypass capacitor (G in Fig. 2) is placed within a PL-259 coaxial connector. It consists of two copper washers and two mica washers. The first copper washer is drilled to clear the connector stem, and soldered to the rim of the connector. The two mica washers (Teflon or other good heat-resistant insulating material may be substituted) are then placed over the stem for insulation. The other copper washer is soldered to the stem. The portion of the stem now extending should be cut off and filed carefully to present a smooth surface. In soldering, be sure that solder does not run down the stem inside the insulating washers, in a position to short the inner washer to the stem. The capacitance should be sufficient to bypass the microwave energy, but not the 30-Mc. i.f. output used in receiving.

Reflex Klystron

A surplus 2K29 is operated at a resonator voltage of 300, nonregulated. Resonator current is approximately 34 ma. and is independent of the cathode connection. The reflector operates between 90 and 150 volts negative, at 7 μa. under normal use. A regulated supply is preferred, due to the high frequency deviation with voltage change, but satisfactory results were obtained under both regulated and unregulated conditions.

I.F. Requirements

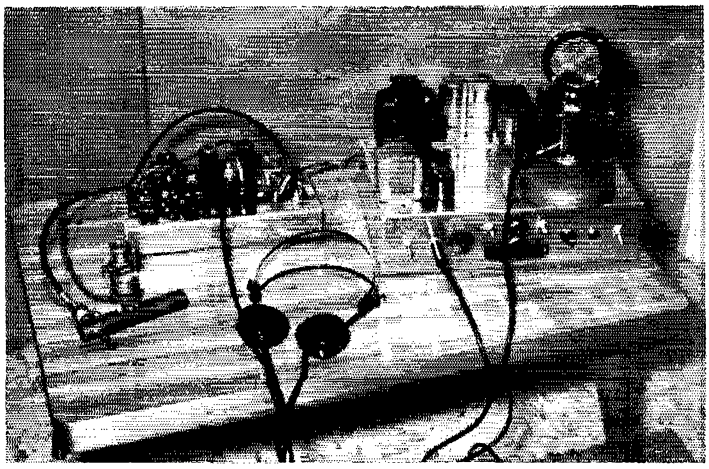
The i.f. strip was obtained from a discarded TV set. It has three stages of video, followed by two triode audio stages. The strip was realigned for slope detection over a 4-Mc. bandwidth at 30 Mc. It has ample r.f. gain, as well as audio gain for operation into earphones. Any receiver capable of handling wideband f.m. may also be used for the i.f. system, if transmitter deviation is held down accordingly. Examples are the S-27, S-36 and SX-42, 43 and 62.

Parabolic Antenna

The parabolic antenna must be fed at a point from which all reflected waves from the antenna will be parallel. The waveguide mouth is placed at a point separated from the antenna surface by half the distance to a fixed point in front of the parabola, which is approximately equidistant from all points on the surface to the antenna. A dish of 20-inch diameter will have a theoretical 23-db. gain at 3400 Mc.

Tuning

Measuring the klystron wavelength may be done with a reflector to set up standing waves, and a diode detector to indicate positions of



A 10,000-Mc. station, minus only its parabolic reflector, is shown here. The polaplexer is at the left front. In back is the i.f. system for receiving. Power supply and klystron modulator are at the right.

additions and subtractions of the reflected waves. The diode is placed in front of the waveguide to monitor current and the reflector is moved several wavelengths away. The position of the reflector is used as the wavelength measuring device. The distance between minimum diode current points as the reflector is moved away from the diode will be half the free-space wavelength.[3] For 3400 Mc., this distance should be 1.73 inches. The band, 3300 to 3500 Mc., represents 1.79 to 1.69 inches. Coarse adjustment is made with the mechanical tuning strut of the klystron and fine tuning is done by varying the reflector voltage. The klystron may operate within the band at three different settings of the cavity opening. It is desirable to tune the cavity to several different points to find the one that gives maximum output at the desired frequency. In the final procedure the diode tuning should be adjusted for maximum crystal current and the injection screw then varied to obtain approximately 500 μa., which is ample for proper mixing.

Microwave gear was designed and built by R. S. Swavely, K3KLQ, and the author. Scheduled contacts were made during recent v.h.f. contests on both 3500- and 10,000-Mc. bands. The calculation data and procedure specified in this article were used extensively.

In brief conclusion, this article was written primarily for the building enthusiast, a person who enjoys learning by doing and takes pride in his work. Included is all the necessary information for design and construction of microwave gear for amateur communication purposes.

QST

[3] A variation of this technique is pictured on the cover of *QST*, September, 1948, and described on page 10 of that issue.

• New Apparatus

W8IYK

Call Sign Rack

Here is an item to impress shack visitors, a call letter sign made of 2-inch die-cut letters. The letters are made from showcard paper stock silvered on one side. It's up to the owner to assemble the sign; the letters are inserted in the proper order into a slit that runs the length of the finished wood base. The outfit is made by New Products, Box 481, Grand Haven, Michigan. — *E. L. C.*

Ham Tape Recorder

The Rheem Califone AR-300 tape recorder has been designed with use in an amateur radio station in mind, in addition to the usual home applications. It can record 4 monaural tracks, play prerecorded 4-track and 2-track stereo tapes, record 4-track stereo, and record sound on sound — that is, transfer information from one channel to the other, and add more information from any program source. Transport speeds are 7½ and 3¾ inches per second.

Included with the recorder are instructions on how to integrate the tape recorder into the amateur station, operating instructions, schematic diagram, and a brief discussion of the technical aspects of the unit. — *E. L. C.*

Hamfest Calendar

California — The Microwave Society of Long Beach, Inc., will sponsor the first annual Southern California V.H.F. Jamboree June 14-16 at the Lafayette Hotel in Long Beach. There will be manufacturers' exhibits, outstanding speakers, contests, awards, YL program, and a banquet. Registration is $2.50 at the door, or $6.00 including the banquet. Hotel reservations may be obtained directly from the Lafayette Hotel, Long Beach, mentioning the Southern California V.H.F. Jamboree. Further info on the Jamboree may be obtained from the Microwave Society of Long Beach, Inc., P. O. Box 3303, Long Beach 3, Calif.

Colorado — The annual informal ham party will be held at Estes Park on July 6 and 7. There will be a dinner on Saturday night and a breakfast on Sunday morning. There is no registration fee, but you *must* sign up ahead of time if you plan on attending. Contact William J. Finlay, WØJR, Box 447, Estes Park, Colo., or Dean W. Hagemeister, WØKQX, Box 1877, Estes Park. Let them know also if you need hotel or motel reservations.

Illinois — The annual Mississippi Valley hamfest, sponsored by the Quad City ARC, will be held at the Rock Island County Fairgrounds, on routes 2 & 80, East Moline, on June 30. Rain or shine. Food will be served. For further info, contact John E. Greve, W9DGV, 711 44th St., Rock Island, Ill.

Kansas — The 15th annual hamfest of the Central Kansas RC will be held in Salina on Sunday, June 2. Some 400 hams and their families are expected to be on hand. For further info, contact Greg Hibbard, WØENW, 2318 Mayfair Drive, Salina, Kansas.

Maine — The seventh annual Augusta Hamfest, sponsored by the Augusta RC, will be held on Sunday, June 16, at the Calumet Club, West River Rd., Highway 104 North, Augusta. The doors open at 0900, and a turkey dinner will be served at 1230. Advance registrations $3.00, at the door $3.50, children under 12 $2.00. There will be contests and awards, net meetings, mobile hunt, swap table, and a Saturday night dance. Tickets and info from Wilfred E. Lemieux, W1VXU, 15 Cony St., Augusta.

Maryland — A Surfside Hamfest will be held on Saturday, June 29, beginning at 1000, at Kurtz's Pleasure Beach, on the Chesapeake Bay near Pasadena, Md., sponsored by the Anne Arundel RC. Registration adults $1.00, children 6 – 12 50¢, children under 6 free. Swimming, contests, auction, rummage sale, mobile judging. Food available at the beach, or bring a picnic lunch. Talk-in frequencies 3820, 28.8, 50.4 a.m., 50.44 n.f.m., 145.52. For further info and tickets, contact R. Gary Hendrickson, W3DTN, 823 Dale Road, Glen Burnie, Maryland.

Mississippi — The Biloxi ARC is holding its 6th annual hamfest on July 6 and 7. No other details at hand. Write to the Biloxi ARC, P. O. 1602, Irish Hill Station, Biloxi, Mass.

Montana — The North East Montana RC will hold its annual picnic at the Kiwannas Park, Fort Peck, Mont., on Father's Day, June 16. Talk-in frequencies 3910 and 7230. For further info contact Charles O. Smith, W7FUM, Box 689, Glasgow, Montana.

Nebraska — The Tri-City ARC will hold its 6th annual hamfest picnic at Riverside Park (home of Nebraska's largest free zoo), Scottsbluff, Nebr., on Sunday, June 30. Bring your own picnic lunch. Mobile hunt. Monitor 3850 for directions, or follow capacitor signs. For further info contact Ira Cartwright, KØDZG, 2002 Avenue E, Scottsbluff.

Nebraska — The Pine Ridge ARC is holding its annual hamfest on June 2. Transmitter hunt. No registration fee. For further info contact Dave Hood, KØEMU, 913 King St., Chadron, Nebr.

North Carolina — The 9th annual Charlotte hamfest will be held Sunday, June 30th, at the National Guard Armory Municipal Airport, Charlotte, N. C. A fine program is planned, and a delicious barbecue lunch will be served. For further info contact, Reagen Rowe, W4FHI, 412 McAlway Road, Charlotte 7, North Carolina.

Ohio — The annual Lancaster hamfest will be held at the County Fairgrounds in Lancaster on June 15-16. A family affair. The Fairgrounds are about 30 miles southeast of Columbus on routes 33 and 22. FCC exams on Saturday, at 0930. No other details at hand, so contact Carl Smithfield, WA8CVC, 620 Lincoln Ave., Lancaster.

Ohio — The Northeastern Ohio V.H.F. Group will hold its 8th annual picnic on Father's Day, June 16, at Maca Park, 2 miles east of Tallmadge on state route 18. For further info contact E. E. Millard, K8TZ, 356 Grand Ave., Akron 2, Ohio.

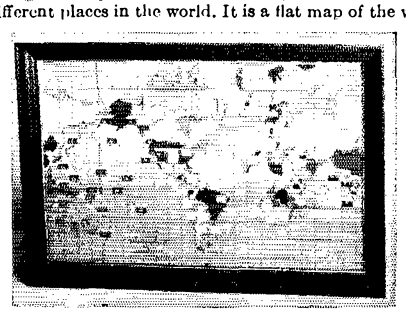
Pennsylvania — The Eastern Pennsylvania ARRL Section picnic, sponsored by the Pennsylvania Phone Net, will be held on Father's Day, June 16, at Hershey Park, Hershey. Group registration at Pavilions 7 and 8, at $1.00 per ham call. Bring your own basket lunch, or buy it at the park. Advance registrations and info from George Powell, K3CAH, Church and Pikeland Ave., Spring City, Pa.

Pennsylvania — The Penn-York Hamfest will begin at noon on June 15 at the Ingersoll-Rand Recreation Hall, Athens, Pa. Speakers, swap table, new equipment display, AREC, ladies program, swiss steak dinner. Advance registration $4.00, $6.00 at the door. Send your registrations to Ticket Committee, Box 301, Corning, N. Y.

• New Apparatus

World Time Clock

This giant map clock instantaneously shows the time in 70 different places in the world. It is a flat map of the world



measuring about 15 inches high, 22 inches wide and 5 inches deep. At selected geographical spots, small square cut-out windows are backed up by a clock-driven moving time belt. A.M. is indicated by black letters on a white background and P.M. is shown with white letters on a black background. Above each cutout is an identification as to the location of that particular time read-out. Dominating the top of the map is a plastic slide-rule map section with an extra large time window. By moving this section to the right or left, the window can be calibrated to show any one of the four United States time zones. The movable map section does not line up with the big map except when it is in the central time zone.

The clocks is simple to set; there is only one motor and it powers the continuous belt that moves behind the map face.

The world clock is printed in five colors and has a finished wooden frame. It is available from the House of Clocks, 411 West 7th, Los Angeles 14, California.

— *E. L. C.*

1963 ARRL Field Day Rules

Annual Test for Emergency-Powered Stations, June 22-23

FIELD DAY TIMETABLE

Time	*Start*	*End*
	June 22	June 23
GMT	2100	2100

(Operate no more than 24 *consecutive* hours out of the total 27-hour period)

GET ready for Field Day, June 22-23. Thousands of amateurs in the ARRL Field Organization are busily readying generators, planning operating schedules, allocating assignments and otherwise impatiently awaiting this official radio-amateur way to start the summer.

With emergency preparedness the theme, clubs and groups will take to the field and set up and operate stations independent of normal power facilities. You can participate with a club or non-club group portable; one- or two-man portable station; mobile, emergency powered home station or as a regularly powered home station. Whatever your class of participation, you're sure to gain valuable operating experience under field conditions as well as have a grand time. The only rule modification this year is noted in the last paragraph concerning entry classification, Rule #4. Pick any consecutive 24-hour period from the Field Day timetable. Call "CQ FD" on c.w. or "calling any Field Day station" on phone, then swap signal reports and ARRL sections or specific locations.

Here are examples to assist score calculations:

Example 1

Assume a 25-watt rig wholly on batteries, not originating or relaying any messages, and not having more than two operators.

40 points (40 stations worked)
× 3 (power below 30 watts)

120
× 3 (*all* radio equipment independent of commercial mains)

360
× 1.5 (If Class B or C and everything on batteries)

540 claimed score

Example 2

Same as Example 1 but one Field Day Message to the SEC or SCM is originated and passed in good form.

65 points (40 QSOs + 25 points for FD message)
× 9 (3 × 3 = power multiplier multiplied by independence-of-mains multiplier)

585
× 1.5 (everything on batteries)

877.5 claimed score

(*Copies of all messages originated and relayed must accompany Field Day reports.*)

Example 3

The Podunk Hollow Radio Club (or any group of three or more licensed operators), portable at its FD site, operates two transmitters simultaneously. Each rig runs 75 watts input and batteries or generators furnish power. One message is started in good form (25 points), 1 is received and relayed onward (2 points), and 230 stations are contacted.

257 points (230 QSOs + 25 + 2)
× 2 (power input over 30 and under 150 watts)

514
× 3 (all gear independent of mains)

1542 claimed score

(*No battery multiplier for either clubs or groups.*)

Mobiles are an important part of Field Day too, and clubs should strive to get all member-owned mobile units on the air during Field Day and report their mobile scores for the mobile aggregate scores to appear in the final results. Mobile units are the key to any emergency work.

Log forms and summary sheets are now available on request from ARRL. Your best bet is to send for some, but the sooner the better. You may also use the summary on the next page, or prepare a facsimile. All reports should include starting and ending time of operation, bands used, dates and contact times, calls of stations worked, signal reports sent and received, and locations of stations worked, as well as power sources and inputs, location and call of station, number of transmitters in simultaneous operation, number of persons participating, club name (if any), and score computations. Results must be postmarked no later than July 22 for *QST* listing.

Portable stations are reminded to be sure they comply with FCC regs in signing portable. C.w. stations follow their calls with a slant bar followed by the numeral of the area in which they are operating; phone stations follow their calls with their geographical location. See Sec. 12.82 2(b) of the amateur rules for details.

Check these FD rules, which follow below, very carefully; a scan of last year's FD results (December, 1962, *QST*) may give you some hints.

Rules

1. Eligibility: The Field Day is open to all radio amateurs in the sections listed on page 6 of this issue of *QST*.

2. Object: For portable and mobile stations to work as many stations as possible; for home stations to work as many portable and mobile stations as possible.

3. Conditions of Entry: Each entrant agrees to be bound by the provisions of this announcement, the regulations of his licensing authority, and the decisions of the ARRL Contest Committee.

4. Entry Classification: All entries will be classified according to number of transmitters in simultaneous operation. They will be further classified as follows: "A," club or nonclub group portable stations; "B," unit or individual portable stations; "C," mobile stations; "D," home stations operating from emergency power; "E," stations operating from commercial power sources. Thus a club or group running three transmitters simultaneously will be in the 3A classification, or a mobile station with one transmitter will be in the 1C classification.

Portable stations are those installed temporarily, for FD purposes, at sites away from customary fixed-station locations. Portable equipment or units must be placed under one call and the control of one license, for one entry. All control locations for equipment operating under one call must lie within a 1000-foot diameter circle.

Group participation is that portable-station work accomplished by three or more licensed operators.

Unit or individual participation is that portable-station work accomplished by either one or two licensed operators.

Mobile stations are complete installations including power source and antenna, mounted in or on vehicles and capable of being used while in normal motion. If they utilize antenna supports not normal or suitable for use during motion, installations must be classified as portable instead of mobile. Each mobile entry call must be different from any other FD station participating.

Home station participation is that work by fixed amateur stations not operating portable or mobile.

A transmitter used to contact one or more stations may not subsequently be used under any other call during the Field Day period) with the exception of family-type stations where more than one call is assigned to one location by FCC).

5. Field Day Period: All contacts must be made during the period indicated elsewhere in this announcement. An entry may be operated no more than 24 consecutive hours of the 27 hours available.

6. Bands: Each phone and c.w. band is regarded as a separate band. A2, radio-teletype and frequency-shift keying are grouped with A1, in the bands where they are allowed. All forms of voice transmission will be grouped with A3, in the bands where they are allowed. (In Canada the respective phone bands apply.)

The use of more than one transmitter at one time in the same band is not allowed.

7. Exchanges: Signal reports and ARRL section (or specific location) must be exchanged in proof of contact.

8. Valid Contacts: In Class A, B and C, a valid contact is a complete exchange with any amateur station. In Classes D and E, a valid contact is a completed exchange with any station in Class A, B or C. Cross-band contacts are not allowed. Contacts by mobile stations may be made in motion or from any location(s). A station may be worked more than once only if the additional contacts are made on different bands.

9. Field Day Message: A Field Day Message is one originated by a Class A, B, or C station and addressed to the SEC or SCM (see address in *QST*, p. 6) stating the number of operators, the field location, and the number of AREC members at the Field Day station. Only one Field Day Message may be originated.

10. Scoring:

Message Credit: Credit for handling messages may be obtained only as follows: 25 points for originating one Field Day Message to SEC or SCM. In addition, each Field Day Message received for relay will score 1 point when received by radio and 1 point when sent onward by radio. No FD Message may pass through the same station twice. There will be a deduction of 10 points for omission of handling data or for defects in form. Copies of all messages originated and relayed must accompany Field Day reports.

Multipliers:

Power: Output-stage plate input 30 watts or less: 3. Output-stage plate input between 30 and 150 watts: 2. Output-stage plate input between 150 and 1000 watts: 1. The plate input of a grounded-grid amplifier is its plate input plus the plate input to the driver stage.

Independence-of-Mains: All radio equipment independent of commercial power source: 3. All radio equipment not independent of commercial power: 1.

Battery Power: (applies to Class B and C only): 1.5. The battery capacity or size shall in all cases be adequate to permit one hour's continuous operation of the station. Charging batteries from commercial mains while batteries are connected to transmitter or receiver voids the "independence-of-mains" and "battery power" multipliers.

Multipliers do not apply to Class D and E entries.

Final Score: The final score equals the total "points" multiplied by the "power multiplier" multiplied by the "independence-of-mains" multiplier (multiplied by the "battery power" multiplier, if applicable.) Where different multipliers apply during the Field Day period, points are multiplied by the multiplier in effect at the time the points were earned.

11. Club Aggregate-Mobile Scores: Entries under Class C may be combined to form a "Club Aggregate-Mobile Score." The club name must be noted on the individual reports, and the club secretary must submit a claimed aggregate score. Credits to the extent supported by the reports submitted to ARRL will be allowed. Only bona fide members of the club, residing in the club territory, may contribute to the aggregate-mobile club listing.

12. Reporting: Mail reports or entries on or before July 22. Reports must show starting and ending time of FD operating period, bands used, dates and contact times, calls of stations worked, signal reports sent and received, and ARRL sections or locations of stations worked. Reports must also show power inputs and sources of power, number of transmitters in simultaneous operation, location of station, number of persons participating, class of entry, and score computations. QST

Entries must be accompanied by this summary sheet. You may obtain the summary shown here plus log forms free on request from ARRL. Or you may use the very one shown here or prepare a facsimile. Attach logs of all Field Day contacts and copies of all messages originated and relayed with your entry.

ARRL FIELD DAY SUMMARY

STATION CALL..... FD LOCATION.....
(Indicate / where applicable)

CLASS OF ENTRY (check only one)

- [ ] A. Club or group portable.
- [ ] B. Unit or individual portable.
- [ ] C. Mobile
- [ ] D. Home -- Emergency power.
- [ ] E. Home -- Commercial power.

ENTER NUMBER OF TRANSMITTERS IN SIMULTANEOUS OPERATION IN THIS BOX: [ ]

If club entry, name of club.....

If Class B entry, call(s) of operator(s).....

Number of people participating at this station.....

Period of FD operation: Starting time..... Ending time.....

POWER SOURCE (check)

[ ] Generator. [ ] Commercial Mains. [ ] Battery. [ ] Other.

Description of power source (generator type etc.).....

Bands	Nr. stns. worked	Multiplier	Score	Transmitter	Input
3.5 Mc. CW		X			
3.5 Mc. A3		X			
7 Mc. CW		X			
7 Mc. A3		X			
14 Mc. CW		X			
14 Mc. A3		X			
		X			
		X			
		X			
FD message points	[2]	X			
TOTALS	[1]	X	CLAIMED SCORE	Enter total number of stations worked here (should equal box [1] minus box [2])	

This certifies that the station whose call appears above was operated in accordance with the current Field Day rules and that, to the best of my knowledge, the points and score as set forth in the above summary are correct and true.

..... (Date)

..... (Signature of club secretary or licensee of station whose activities covered in this FD entry)

• Beginner and Novice

The Scotsman's Delight

A 15-Meter Beam for Less Than $5.00

BY LEWIS G. McCOY* W1ICP

YES, the title is correct. This is an article describing a beam antenna for 15 meters that can be built for less than $5.00. Actually, the one shown in the photographs cost less than $3.50. However, we are allowing a "cushion" for higher prices in different parts of the country. The antenna is not a makeshift but is actually a high-performance beam that will give a very good account of itself. The detailed description given in this article is for a 15-meter beam, but dimensions for 10 and 20 meters are also included for those interested.

The beam is not a new design, being similar to the antenna popularly known as the "ZL Special."[1] However, the constructional approach in this model is different. Also, the total construction time, from raw materials to completed installation, was only two and a half hours in our case.

Fig. 1 shows a sketch of the antenna. It consists of two folded dipoles spaced a little over 0.1 wavelength and fed approximately 135 degrees out of phase. The feed-point impedance makes a passably-good match for either RG-11/U or RG-59/U coaxial cable.

Materials

The beam elements and the phasing line are made from 300-ohm twin line. When purchasing the twin line, by all means get a reputable brand. There is a considerable amount of poor-quality line on the market, so you should be careful when buying it.

Bamboo poles are used to support the elements. One source of these is sporting-goods houses that sell fishing poles. However, most furniture dealers who sell rugs usually accumulate a supply of bamboo poles, because it is customary for rug manufacturers to roll the rugs on bamboo poles for shipping purposes. We called several local dealers and found that all of them had poles which they were willing to sell for practically pennies. In fact, some of the dealers give the poles to Boy Scouts for scouting projects. (Dress up the jr. op. as a Scout and send him out collecting poles!) The poles usually come in 12- to 15-foot lengths, which is more than adequate for our purpose.

The poles are supported on 2 × 3s, 8 feet long, which are mounted on a boom made from a 2 × 4. The poles were secured to the 2 × 3s with plastic electrical tape. One large roll of electrical tape is sufficient for the entire project. Taping the poles to the supports may seem like an insecure method of mounting, but we had one such antenna up for over a year and didn't experience any trouble with it. If desired, the poles could be secured with some homemade metal clamps.

The method of mounting the beam will depend on your own preference. However, we'll pass along our system for those that are interested. The boom of the beam was mounted on a 5-foot length of 1-inch pipe, and a 4-inch floor flange was used to hold the boom on the pipe. The pipe was mounted on two wall-type standoff brackets commonly used for TV antenna installations. These brackets are available from any radio distributor, and the type we used provided a 12-inch mounting distance from the wall. An-

* Technical Assistant, *QST*.

[1] The ARRL *Antenna Book*, ninth edition, second printing, page 214.

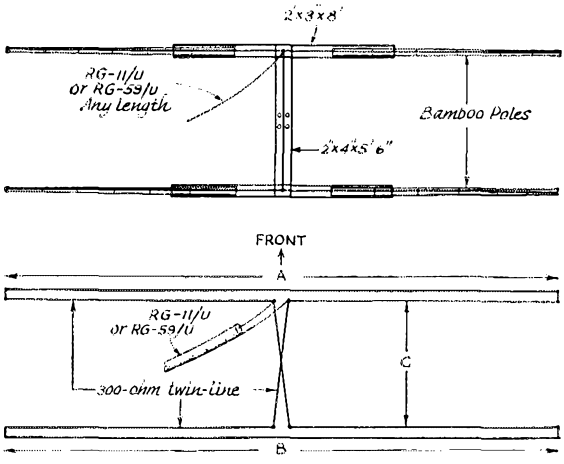
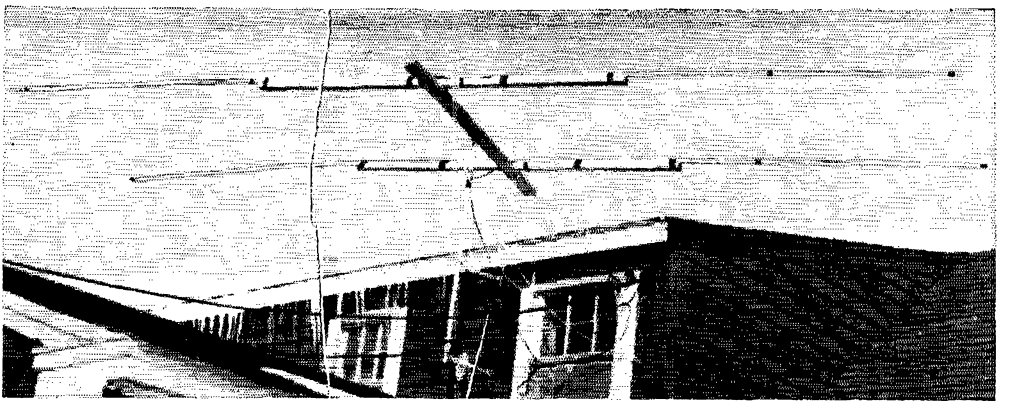


Fig. 1—Shown at the top are the mechanical details for constructing the beam. At the bottom is the electrical circuit. The element and phasing line lengths are given in Table 1.



Here is the completed installation. The boom was made slightly longer than required, to provide for the future installation of a 20-meter beam.

other piece of pipe, about 4 inches long and large enough to slip over the mast, was used as a bearing. A hole was drilled through the mast large enough to take a ¼-inch-diameter bolt 3 inches long. This rested on the bearing. A nylon cord was tied to each end of the boom and brought into the shack through a hole in the wall, and the beam was then rotated by the "armstrong" method. If desired, a TV rotator could be installed to rotate the beam as the entire assembly is light enough for such a rotator.

Construction Details

Table I gives the dimensions for the elements and phasing line for c.w. and phone frequencies in each of the bands for 20 through 10. If you make a beam for the c.w. frequencies, or vice versa, it doesn't mean the beam won't work at the other end of the band. The antenna will work across the entire band, but will give optimum performance at the frequency it is cut for.

When cutting the 300-ohm twin line into element lengths, allow about one inch extra for each element. At each end of the element skin back about ½ inch of insulation and solder the two leads together. Cut one of the conductors at the exact center of the element and carefully remove the insulation about ½ inch either side of the cut. When making the phasing section, also allow an extra inch for lead lengths. The coax line was skinned back about an inch to give sufficient lead length to connect to the beam. Solder all connections together and then tape the joints.

Table I

Mc.	*A*	*B*	*C*
14.05	31′ 2″	31′ 10″	7′10″
14.25	30′ 9″	31′ 5″	7′ 9″
21.1	20′ 9″	21′ 2″	5′ 2½″
21.3	20′ 7″	21′ 0″	5′ 2″
28.1	15′ 7″	15′ 11″	3′ 10″
28.7	15′ 3″	15′ 7″	3′ 10″

The above lengths are obtained from the following formulas, which apply to any frequency:

A = 438 ÷ Mc.; B = 447 ÷ Mc., C = 110 ÷ Mc.

Mount the 2 × 3 crossarms on the boom, using nuts and bolts to secure them. Two bolts are sufficient for each crossarm. The bamboo poles can then be taped to the crossarms. After the poles are mounted in place, the antenna elements can be taped to the poles. Be sure to have the half twist in the phasing line before taping the elements to the poles.

The antenna can now be mounted in its permanent location. We mounted the wall brackets and pipe mast in place first and then bolted the floor flange to the boom. The accompanying photographs show the installation.

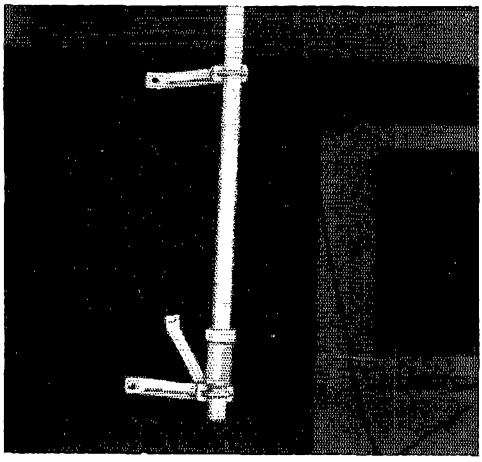
Performance

After the antenna was installed we made several contacts with both local and distant hams to check the front-to-back ratio, and were pleasantly surprised to find that the beam was as good or better in this respect as many other antennas we have tried. One station about 20 miles away gave us S9 on the front of the antenna and down in the noise level off the back. S-meter readings don't necessarily provide any conclusive decibel figures, but the readings can certainly be impressive. What is more important, several local stations all gave strong reports off the front with

Table II

S.W.R. Readings on 21 Mc.
Using dimensions for 21.3 Mc. shown in Table I

21.0 Mc.	— 4.5 to 1
21.1	— 3.8 to 1
21.2	— 3.5 to 1
21.25	— 2.7 to 1
21.3	— 1.9 to 1
21.35	— 1.75 to 1
21.4	— 2.3 to 1
21.45	— 4.7 to 1



This photograph shows the mounting details of the mast which supports the boom. TV mast stand offs are used for the purpose. The standoffs come in various sizes but it was necessary to use the 12-inch size in order to clear the eaves of the house.

extremely weak signals off the back. On distant or skip stations, the front-to-back ratio wasn't as pronounced, running 2 to 3 S-units.

One word of advice to the newcomer who has never used a beam before: local checks with an antenna can show extremely good front-to-back, but skip signals usually don't show the same ratio. Depending on the angle at which a skip signal reaches the antenna, the front-to-back ratio can be considerably less than with local stations.

We haven't said anything about forward gain of the antenna because it is difficult to make gain measurements that mean anything. The power gain of this type antenna is probably in the neighborhood of 3 db. If, for example, you have a Novice input of 75 watts and are getting 50 watts output from the rig to the antenna, a 3-db. gain would mean the equivalent of 100 watts in the antenna. You can't hardly beat that kind of signal improvement for less than $5.00! QST

Strays

Looking for "rare" Washburn County, Wisconsin? K9YRA and WA9ENA will be operating from there 20 and 40 s.s.b., June 8 to Aug. 16. QSL to K9YRA.

—•••—

More about W6TC. May 29th was his 65th birthday, whereupon he promptly retired from the TV station where he has labored. His new QTH is 352 Crosby Drive, Sun City, Calif. To top it all off, he won the *QST* Cover Plaque Award for March.

—•••—

W3OR, Glenn Mills, Pa., makes a specialty of working 50-Mc. mobile stations. As of the end of March, he had run his total up to more than 1500 different mobiles on 6. (From *Cheese Bits*, published by the Mt. Airy V.h.f. Club.)

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This is True

Butch Morgan, W1FEA, working on a new project in the lab, needed a 160-meter crystal in a hurry. Checking by telephone with a local "ham-radio" store, the following conversation took place:

Butch: Do you stock 160-meter crystals?

Clerk: Sure, we have all kinds. What channel do you want?

B: No, you don't understand. I want a crystal anywhere in the 160-meter ham band.

C: Oh, yes, I understand. How about one for channel 11? That's very popular.

B: You're sure you stock 160-meter crystals?

C: We have the best supply around here.

B: Fine, I'll drop by and pick up one.

Anyone who can't guess how many 160-meter crystals Butch got at that store?

W4HTF was in charge of a Navy unit in the Antarctic which was engaged in communications and electronics work. All twenty-seven men participated in code and theory classes, and now all of them are licensed hams. W4QVJ, who sent us this info, thinks this may be the only military unit ever to have every man in it, including the c.o., be a ham.

25 Years Ago *this month*

June 1938

. . . There was an article describing the work of OE3AH (Anton Hapsburg) in the 1938 DX Contest. His rig was described and there was a photo of the airplane from which he made his in-flight 28-Mc. DX record in December, 1937.

. . . W1GBE described a light-weight, battery-operated transmitter which he carried along on a hunting trip in the Maine woods! He and his party used a Philco two-volt broadcast set covering the short wave bands as a receiver, and 120 feet of No. 20 enamelled wire and 2 ten-cent insulators for the antenna.

. . . W9RSO was announced as the 1937 winner of the Maxim Memorial Award.

. . . Results of the Fourth ARRL Copying Bee were reported. There were 240 copies of the 25 w.p.m. transmission submitted, but only 4 of these were perfect copies of the text, which consisted of trick letter combinations, misspelled words, punctuation, plain language groups, figure groups, and unusual word combinations!

. . Technical articles included an extended double Zepp antenna, a c.w. and phone station freqmeter-monitor and modulometer with cathode ray tube, a new type of frequency-checking device for use in the high-frequency spectrum, and a gang-tuning system for the multi-stage transmitter. QST

Compact Unit for the 14-Mc. Band

A Solid-State S.S.B. Transceiver

BY BENJAMIN H. VESTER,* W3TLN

Although this unit was constructed for the 14-Mc. band, the author points out that the design is readily applicable to other bands. Good stability results from the use of crystal control in the two oscillator circuits, the VXO principle being used to obtain the desired tuning range.

For some years, I've had a hankering to try my hand at a transistorized s.s.b. transceiver. Being somewhat prejudiced toward the single-conversion approach with a relatively high i.f., I've had to wait until the transistor art boiled out some good units for use in the h.f. region. At the same time, miniature low-voltage capacitors and other components have been developed and are now readily available at low prices. After surveying a recent wholesale flier, I decided the prices were now reasonable enough to start building. For reasons which are somewhat fuzzy now, I settled on 20 meters as the best band, although the design is suited to other bands as suggested later.

The basic arrangement of this transceiver is almost identical to that of the tube model described earlier,[1] the key features being (a) use of a high-frequency crystal filter to allow single conversion and (b) use of a VXO for the tunable oscillator. The transmit-receive switching is accomplished manually with a miniature wafer switch which interrupts the B+ to stages which are inactive for the mode in use.

With an eye toward future installation in my Volkswagen, I restricted myself to a single 6-volt power supply. As will be noted, this somewhat limits the amount of d.c. stabilization one can use, and also limits the power output obtainable.

Receiver Front End

The schematic starts in Fig. 1. The r.f. amplifier, Q_1, is in a standard neutralized grounded-emitter circuit with double-tuned input. With the poor intermodulation characteristics of transistors, as much selectivity as practical should be inserted "up front." L_1 and L_4 are wound on separate link-coupled powdered-iron toroids with an electrostatic shield between them. The whole r.f. stage is mounted in one of the Command-set i.f. cans with the two capacitors therein being used to tune L_1 and L_4. L_2 and L_3 are each a single turn which is slid around the toroid until proper coupling is obtained; *i.e.*, until a passband of about 500 kc. is obtained. The electrostatic shield is the same shielding disk found in the i.f. cans.

The collector coil, L_5, is wound on a CTC LS-9 coil form. The LS-9 is a completely-shielded, ferrite-loaded form which is quite small. Having a group of these forms salvaged from a surplus military receiver, I used them throughout the unit. A small, tunable coil like this is, of course, a key factor in achieving miniature design.

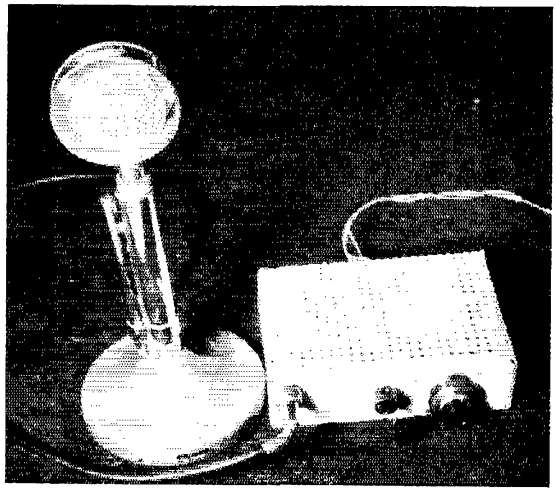
The receiver mixer, Q_2, is conventional, capacitor C_4 being chosen empirically to give the maximum mixer efficiency. L_7 and L_8 are wound on another LS-9 form with the appropriate impedance step-down for the crystal filter which follows in Fig. 2.

VXO

The VXO with transistors is slightly different from the tube type. The crystal operates in its

*601 Wallerson Road, Baltimore 28, Maryland.

[1] Vester, "Mobile S.S.B. Transceiver," *QST*, June, 1959.



This complete 14-Mc. transistor transceiver is contained in an enclosure measuring 5 by 7 by 2 inches. The vernier tuning dial controls the VXO frequency by adjustment of C_5. Of the two smaller knobs to the left, the lower one operates the transmit-receive switch, while the upper one is the r.f. gain control.

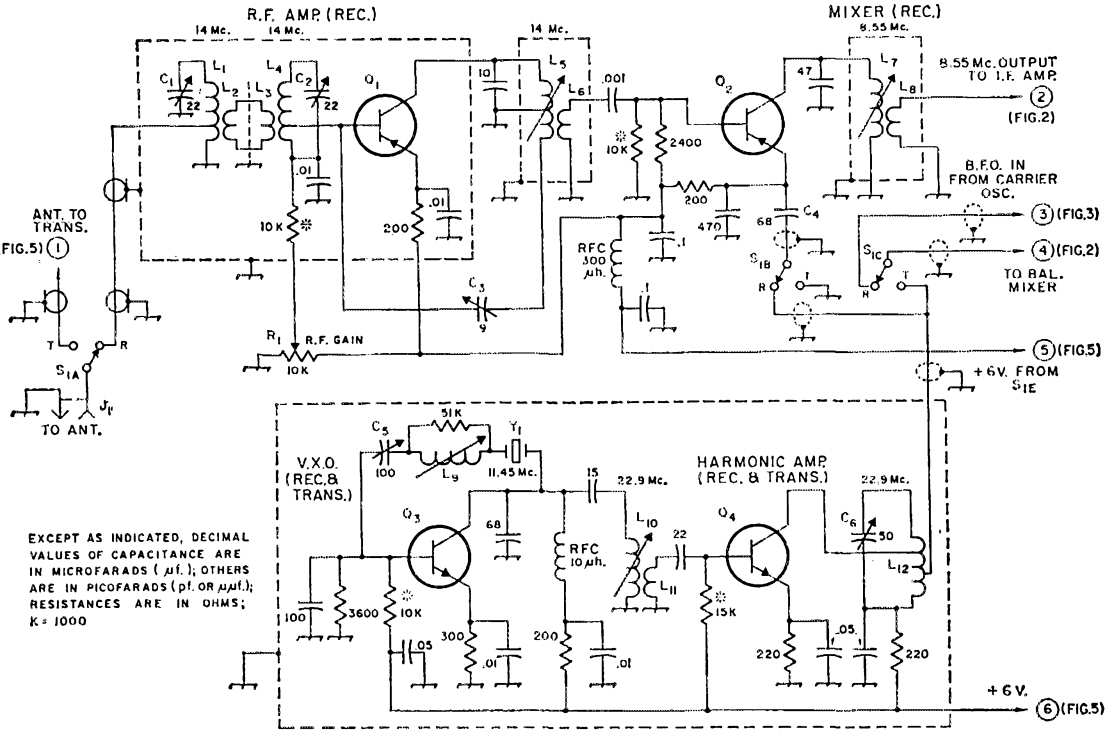


Fig. 1—VXO and high-frequency receiver circuits. The 22.9-Mc. VXO signal mixes with a 14.35-Mc. incoming signal to produce an 8.55-Mc. i.f. signal. On transmit, the 22.9-Mc. signal is transferred to the balanced diode mixer of Fig. 2. Fixed capacitors of decimal value are miniature ceramic or paper with a minimum rating of 6 volts. Others are NPO ceramic or dipped silver mica. Resistors are ¼ watt. Resistors marked with asterisks are bias resistors (see text).

C_1, C_2—Air trimmer from Command-set i.f. cans.

C_3—0.1–9-pf. trimmer, or "gimmick."

C_4—Nominal value; see text.

C_5—Air variable (Hammarlund APC-100B).

C_6—Ceramic trimmer.

J_1—Phono jack or chassis-mounting coax receptacle.

L_1—40 turns, tapped at 2 turns from ground end, on powdered-iron toroid (Stackpole D-1 iron) ½-inch outside diameter, ¼-inch inside diameter, circular cross section (Henry L. Crowley Co., West Orange, N. J., part No. C-2776).

L_2—Single turn on L_1; see text.

L_3—Same as L_2, wound on L_4.

L_4—Same as L_1, tapped at 4 turns.

L_5—21 turns of double-strand No. 34 enameled (bifilar-wound) on CTC LS-9-5S shielded ferrite-slug form. Finishing end of one strand is connected to starting end of other strand to form center tap; two remaining ends connected to circuit as shown.

L_6—3 turns over L_5.

L_7—25 turns on CTC LS-9-4S shielded ferrite-slug coil form.

L_8—6 turns over ground end of L_7.

L_9—48 turns close-wound on 1-inch ceramic iron-slug form (National XR-60 form).

L_{10}—Inductance 3.5 μh., scramble-wound on CTC PLST-2C4L/N iron-slug form.

L_{11}—4 turns over ground end of L_{10}.

Note: Above coils are close-wound with No. 34 enameled wire.

L_{12}—12 turns No. 24, ½-inch diam., 32 turns per inch (B&W 3004 Miniductor), tapped at 4 turns and 7 turns from ground end.

Q_1, Q_2—2N700, or similar u.h.f. p.n.p. transistor (see text).

Q_3, Q_4—2N706, or similar u.h.f. n.p.n. silicon transistor (see text).

R_1—Linear-taper control.

S_1—Subminiature ceramic rotary switch, 2 sections, 5 poles, 2 positions (Centralab PS-117, 1 pole and 1 position not used). See Figs. 2 and 5 for remaining poles.

Y_1—11.45-Mc. crystal.

series-resonant mode instead of parallel resonance. The VXO crystal, Y_1, was one of several given to me by W3BWK; its fundamental frequency (11.450 Mc.) was half of the desired frequency (22.9 Mc.), so some harmonic selection and amplification was necessary. This was not quite so easy as with pentode tubes, and another transistor, Q_4, was required. Prior to putting in this stage, with its associated tuned circuits, the 11.45-Mc. signal leaking into the receiver mixer was enough to allow high-power teletype signals just below 20 Mc. (11.45 + 8.55 = 20 Mc.) to be heard in the receiver. If you can get a crystal whose fundamental is at 22.9 Mc., you can avoid the extra stage.

Of course, the tuning range of the VXO depends on the inductance of L_9. I put on just enough turns to make the VXO cover the most

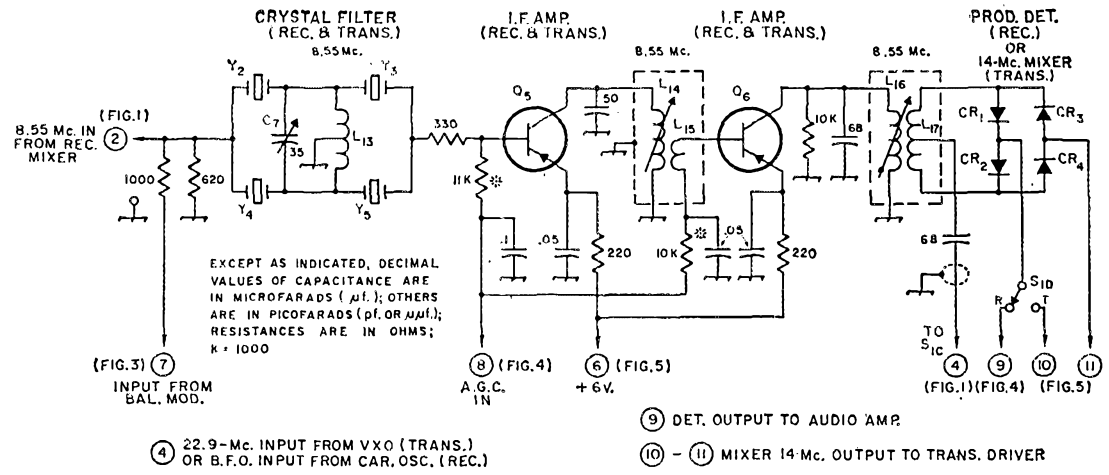


Fig. 2—8.55-Mc. i.f. circuit. On receive, the diodes in the output circuit operate as a product detector, the carrier oscillator (Fig. 3) serving as the b.f.o. On transmit, the 8.55-Mc. suppressed-carrier signal from the balanced modulator (also Fig. 3) passes through the crystal filter which strips off the unwanted sideband. The remaining sideband passes through the i.f. amplifier to the diode network, which now operates as a balanced mixer, where it mixes with the 22.9-Mc. VXO signal to produce a 14.35-Mc. signal for the transmitter (Fig. 5). Fixed capacitors of decimal value are miniature ceramic or paper with a minimum rating of 6 volts. Others are NP0 ceramic or dipped silver mica. Resistors are ¼ watt. Asterisks identify biasing resistors (see text).

C_7—Ceramic trimmer (Centralab 827D).

CR_1, CR_2, CR_3, CR_4—Germanium diode (CK706, 1N34A or equivalent.)

L_{13}—20 μh., center-tapped, bifilar-wound on ¾-inch ferrite toroid core, and connected as described for L_5. Cores available from same source as L_1. See references 1, 2.

L_{14}—21 turns on CTC LS-9-4S, shielded ferrite-slug coil form.

L_{15}—4 turns wound over ground end of L_{14}.

L_{16}—24 turns on CTC LS-9-5S iron-slug form.

L_{17}—8 bifilar turns, wound over L_{16} and connected as described for L_5.

Note: Above coils are close-wound with No. 34 enameled wire.

Q_5, Q_6—Same as Q_1.

S_1—See Fig. 1.

Y_2, Y_3—8550.3-kc. crystal.

Y_4, Y_5—8551.5-kc. crystal.

active part of the s.s.b. portion of the band with the slug all the way out. With the slug advanced to a preset stop, the VXO tunes all the way down to the bottom end of 20. There is some loss in v.f.o. stability at this setting, but with the "cool" transistor circuits, the stability is still as good as that of a number of commercial receivers.

I.F. Filter and Amplifier

The crystal filter (Fig. 2) has been covered before [1,2]; capacitor C_7 and coil L_{13} are chosen to resonate approximately (disconnected from the circuit) at the passband frequency of the filter. Adjustment of C_7 and the slug of L_7 (Fig. 1) can then be made to optimize the filter passband.

The i.f. amplifiers, Q_5 and Q_6, are conventional, with coils wound on LS-9 forms being used for interstage coupling. These stages were not neutralized, and some intentional interstage impedance mismatch was used to keep the circuits noncritical.

The diodes fed by Q_6 serve both as a product detector for receiving and as the transmitter mixer, where the 8.55-Mc. i.f. signal and the 22.9-Mc. VXO signal are mixed to produce 14-Mc. output. The diodes are in a balanced arrangement so that both the VXO and the 8.55-Mc. signals are suppressed when transmitting. The diodes are garden-variety germanium with no particularly good balance requirements on them.

Carrier Oscillator and Balanced Modulator

The carrier oscillator and balanced modulator (Fig. 3) are conventional, and are both stuffed into the same Command-set i.f. can to contain the carrier leak-through. Both the fixed and variable capacitors already mounted in the i.f. can are used. L_{18} and L_{19} are wound on another miniature powdered-iron toroid which is supported by plastic tape wrapped around two of the posts in the i.f. can. Crystal Y_6 is similarly supported on the other two posts. C_9 was tried on both ends of the balance pot to obtain the best carrier suppression.

The audio amplifier used in the receiver could have been switched into use as a microphone amplifier, of course, with some small saving in parts. The additional switch contacts required didn't justify it with the parts and space I had available. As shown in Fig. 3, the addition of a feedback path around the microphone amplifier is a handy technique for generating a tone for both tune-up and c.w. operation.

Receiver Audio and A.G.C.

The audio amplifier (Fig. 4) was built around a couple of transformers I salvaged from a hearing aid, and transistors from the junk box. Anyone

[2] Arnold and Allen, "Some New Ideas in a Ham-Band Receiver," *QST*, May, 1960.

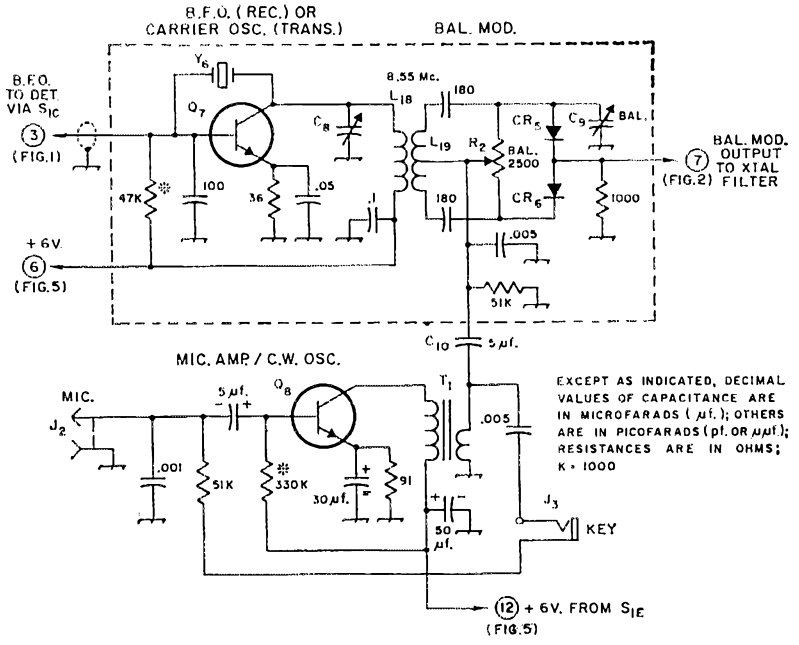


Fig. 3—Carrier-oscillator (b.f.o.), balanced-modulator, and transmitter audio circuits. A feedback, circuit is provided to cause the microphone amplifier to oscillate for c.w. operation. Fixed capacitors of decimal value are miniature ceramic or paper. Except as listed below, others are NP0 ceramic or dipped silver mica, except where polarity indicates electrolytic. All capacitors have a minimum rating of 6 volts. Fixed resistors are ¼ watt. Biasing resistors are identified by asterisks; see text.

C_8, C_9—22-pf. air trimmer from Command-set i.f. can.
C_{10}—Ceramic or paper.
CR_5, CR_6—Same as CR_1.
J_2—Microphone connector.
J_3—Miniature open-circuit phone jack; both sides must be insulated.
L_{18}—60 turns No. 34 enameled, close-wound on toroid form same as described for L_1.
L_{19}—10 bifilar turns over L_{18}, wound and connected as described for L_5.
Q_7—Same as Q_3.
Q_8—2N170 or similar.
R_2—Linear control.
T_1—Subminiature interstage audio transformer, 4:1 turns ratio, low-impedance winding in output.
Y_6—8553.0-kc. crystal.

considering building a unit like this would do well to copy the audio circuits from Priebe's excellent receiver article,[3] or buy one of the packaged units available from Lafayette Radio.

The a.g.c. rectifier and amplifier feed directly off the output transformer. As can be seen, this will provide a.g.c. to maintain the same audio level at all times. Having only enough panel space for a single gain control, I chose to make it an r.f. gain control. Of course, the audio level that the a.g.c. tries to hold could be adjusted by running R_3 to a potentiometer similar to the r.f. gain control. The "hang" action of this a.g.c. is not as good as with similar tube circuits, but it seems to be a reasonable compromise with miniaturization since it uses only four tiny parts.

Transmitter Output Stages

The transmitting amplifier, Q_{13}, in Fig. 5, is a straightforward Class A stage, The "final," Q_{14}, is a high-frequency silicon switching transistor which is run Class B, with the emitter grounded directly. The bias resistor, R_4, must be empirically chosen for any particular transistor to give a static collector current of 3 to 5 ma. Since the switching transistor has a very low collector-saturation resistance, it has considerable peak-current capability and makes an excellent s.s.b. linear amplifier.

Constructional Details

The general layout of components is shown in the photographs and the sketch of Fig. 6. As already noted, the miniature LS-9 coil forms are used wherever practical, with fixed miniature mica capacitors added for resonant tanks. Additional shielding is provided by using the two Command-set i.f. cans for critical circuits, and by enclosing the complete VXO in the smallest-size Minibox. The remainder of the r.f. circuits are mounted on subchassis made of copper-clad perforated boards. Since many of the components connect to ground, they can be soldered directly to the board, providing a good low-inductance path. These boards are very easy to work with and simplify construction and assembly considerably.

The filter crystals squeeze in between the r.f. amplifier can and an under-chassis shield, and are held in place with a drop of glue. C_7 is a Centralab

[3] Priebe, "All-Transistor Communications Receiver," *QST*, February, 1959.

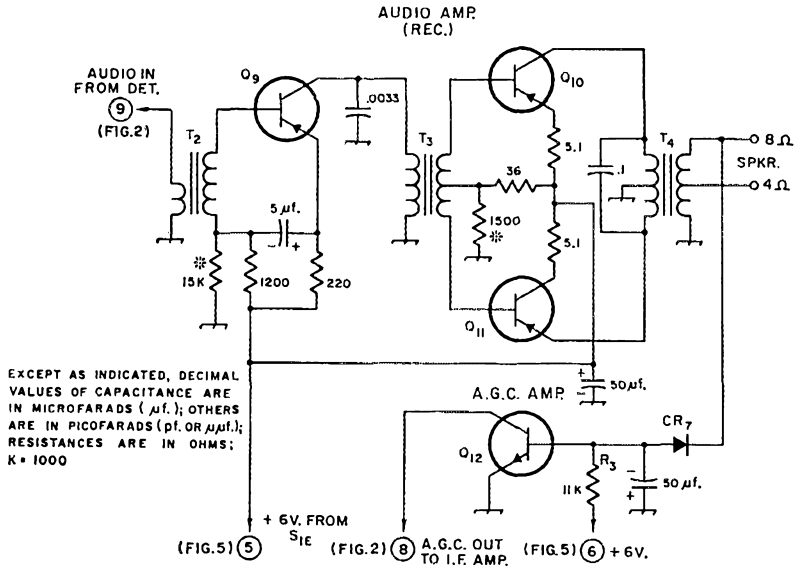
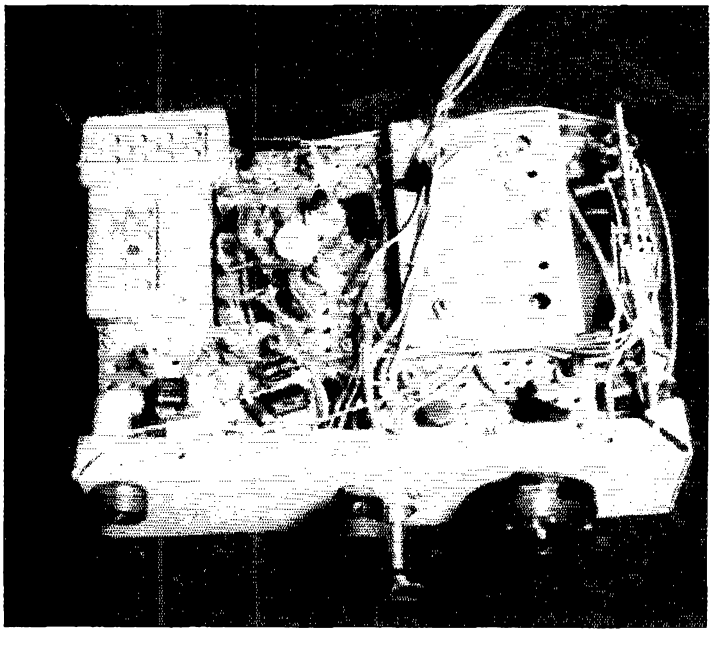


Fig. 4—Receiving audio circuit. An a.g.c. signal is obtained by rectifying and amplifying a signal taken from the audio output. Capacitors of decimal value are miniature ceramic or paper. Others are electrolytic. Boty types have a minimum rating of 6 volts. Resistors are ¼ watt. Bias resistors are identified by asterisks; see text.

CR_7—Silicon junction diode, 50 p.i.v., 1N599 or equivalent.
Q_9—2N653 or similar.
Q_{10}, Q_{11}—2N586 or similar.
Q_{12}—Same as Q_8.
R_3—See text.
T_2—Same as T_1; low-impedance winding in output circuit.
T_3—Subminiature interstage transformer, 4:1 turns ratio, secondary center-tapped.
T_4—Transistor output transformer, 400 ohms, c.t., to 8.4 ohms, tapped at 4 ohms (Thordarson TR-22).

type 827 ceramic trimmer capacitor. When Y_2 and Y_3 are placed end to end, the mounting-hole spacing of the capacitor matches the spacing of adjacent pins of the two crystals. The capacitor is slipped over the crystal pins for support. L_{13} is glued in place close to the capacitor. Other parts which are too heavy to be supported by their leads are glued in place.

To make assembly and disassembly possible with the crowded chassis, a number of captive nuts were used, fastened to the chassis and mounting brackets with epoxy (a two-tube mix-



Top view of the transceiver. The two rectangular speakers in the upper left-hand corner are flat dynamic microphones taken from junked hearing aids. The microphone-amplifier board is immediately to the rear of the microphone connector. It is mounted on top of the can containing the carrier oscillator. The basic chassis is a standard 5 × 7 × 2-inch unit with back apron sawed off.

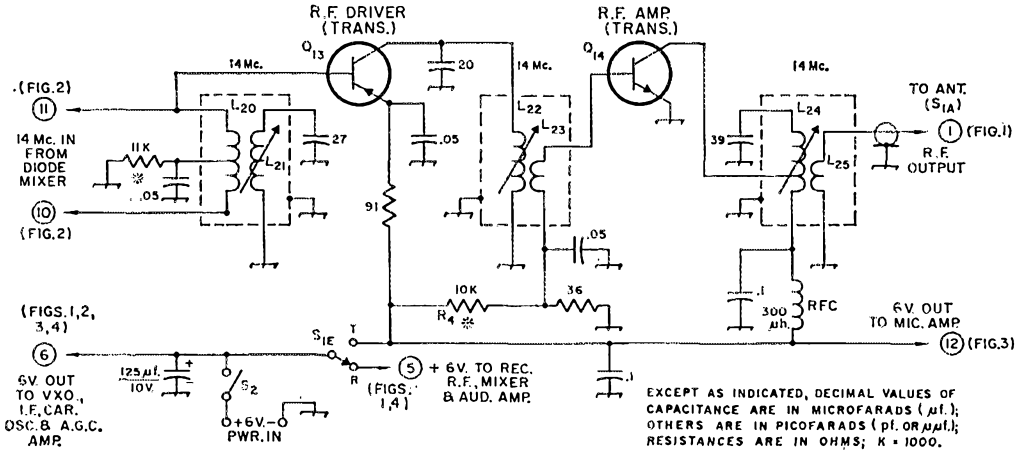


Fig. 5—Transmitter output circuits. This section receives 14-Mc. drive from the diode balanced mixer of Fig. 2. Capacitors of decimal value are miniature ceramic; others are NP0 ceramic or dipped silver mica, except polarity indicates electrolytic. Capacitors have a minimum rating of 6 volts. Resistors are ¼ watt; asterisk indicates bias resistor see text

L_{20}—4 bifilar turns, center-tapped, wound over L_{21} and connected as described for L_5.
L_{21}—21 turns on CTC LS-9-5S iron-slug form.
L_{22}—21 turns on CTC LS-9-4S iron-slug form.
L_{23}—6 turns wound over ground end of L_{22}.
L_{24}—16 turns on CTC LS-9-5S iron-slug form, tapped at 4 turns from low-potential end.
L_{25}—6 turns wound over low-potential end of L_{24}.
Note: Above coils are close-wound with No. 34 enameled wire.
Q_{13}—Same as Q_1.
Q_{14}—Same as Q_3.
R_4—Nominal value, see text.
S_1—See Fig. 1.
S_2—S.p.s.t. slide or toggle switch.

ture is now available in most hardware stores). The cover was made from perforated aluminum sheet with the corners folded over and epoxyed together. After filing the corners smooth, several coats of spray paint were added to give a fairly professional-looking cover.

Components

Up to now, we have ignored the types of transistors used. The audio-transistor choices were made straight from my particular junk box. If your junk box is emptier, the Japanese units with matching transformers are an excellent choice.

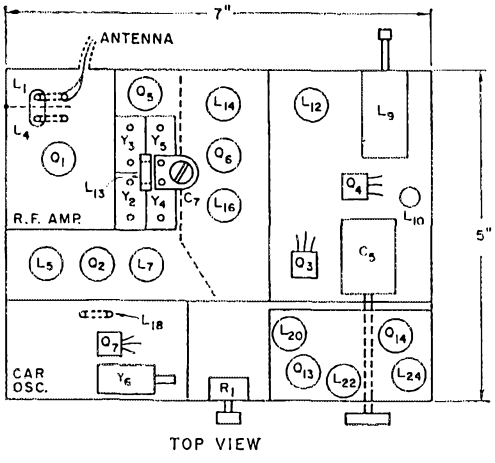


Fig. 6—Sketch showing lay-out of principal components.

For Q_1, Q_2, Q_5, Q_6 and Q_{13}, I used some available 2N700s. The 2N1742 will serve in these circuits with essentially the same performance, and is somewhat cheaper. For Q_3, Q_4, Q_7 and Q_{14}, I used 2N706s. Actually, Q_{14} is the only stage that requires a silicon transistor of this quality. Any of the u.h.f. transistors will serve for Q_3, Q_4, and Q_7. In fact, if these circuits are adapted for p.n.p. transistors, the 2N1742 will work fine.

Regardless of what transistor is used for each stage, it is wise to adapt each stage's bias resistor (all bias resistors are identified with asterisks) to the particular unit to give a collector current equal to that recommended for the transistor used. The 2N1742, for example, will require a bias resistor of considerably higher value.

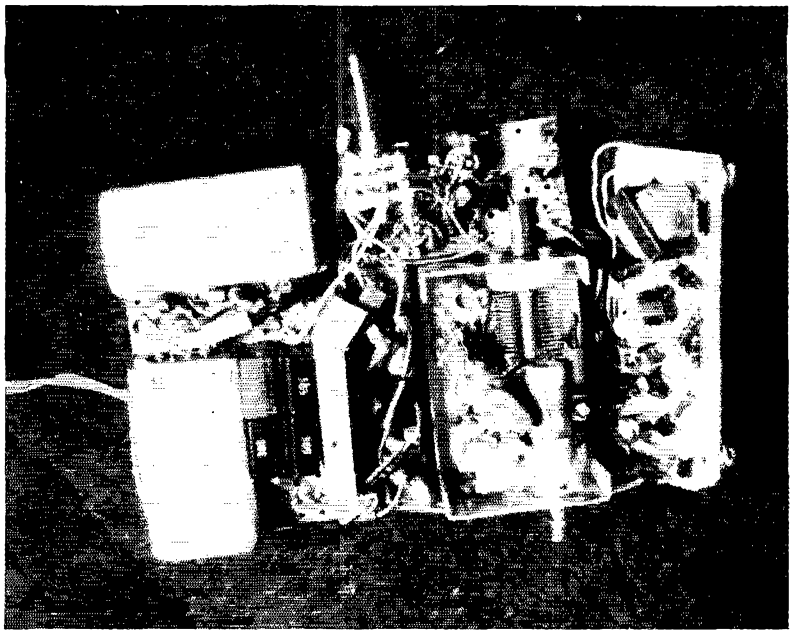
Actually, there is little to be gained by neutralizing the receiving r.f. amplifier if a 2N700 is used. However, if a lower-frequency transistor is used, neutralizing may yield a sizable increase in gain.

The electrolytic capacitors used throughout were obtained from the C-923 assortment and the ceramic bypasses from the AS-510 assortment, both from Olson Radio. These are good-quality Japanese parts and quite cheap.

The transmit-receive switch is the latest Centralab subminiature wafer switch.

Other Bands

It is pretty obvious that by rewinding a few coils and using different VXO crystal, you can adapt the unit for operation on other bands. The carrier oscillator, i.f. circuits, and audio circuits remain as is. The VXO frequency should



Bottom view of the transceiver. The VXO is in the Minibox to the right of center. The carrier oscillator and balanced modulator are in one of the shielding cans to the left. The other, adjacent to the four crystals of the i.f. filter, contains the receiver r.f. stage. The receiver audio section is assembled on the perforated board to the right.

be chosen to be 8.55 Mc. *above* the highest frequency to be covered so as to get maximum tuning range. Of course, L_{10} and L_{12} must be rewound to resonate at the new VXO frequency. Similarly, L_1, L_4, L_5, L_{21}, L_{22}, and L_{24} must be rewound to resonate on the new band. The same approximate turns ratios should be used for each transformer.

Results

With all such rigs, some mention of results is in order. First, the receiver is stable and selective, but is not very good as far as intermodulation is concerned. This is one respect in which transistors are inferior to tubes. The audio quality is limited by the small speaker. (I always demonstrate it with an external speaker.) On transmit, the carrier suppression is 45–50 db., and the other sideband is about 40 db. down. Local reports indicate that the signal is clear and clean. Since the "final" runs a puny 250 mw. p.e.p., I haven't worked much DX (Florida, Louisiana, Nebraska, and similar), but it is a dandy "local" rig. It's been running off a 6-volt lantern battery for several months now. It has made several trips cross country in my briefcase, and provided an excellent way to keep in touch with what the 20-meter s.s.b. gang is up to

Of course, I intend to add a linear amplifier to bring the transmitter up to a reasonable output, but haven't definitely decided yet whether to succumb to tubes or wait for the price break on high-power h.f. transistors. QST

Strays

WA6PMZ lost a roll of movie film – it not coming back from the processor. But someone found it on the street (the mail man dropped it?), ran it through their projector, spotted the call letter license plates, and returned the film.

—•••—

VE1PV and VE1ZZ have been conducting some underground transmission tests on 1823 kc. First VE1ZZ took a 50-watt transmitter and a receiver down to the 600-foot level of the Pugwash Salt Mine, and worked VE1PV at the surface with signals loud and clear. While he was down there, VE1ZZ heard many low frequency stations (10 to 500 kc.) with good strength. Later equipment was taken down to the 1150-level, and again excellent communication was established with the surface. On this second test the subsurface transmitter was of one-watt power. At the 1150-foot level, the surface transmitter was more than 7000 feet away, with a 35-foot layer of salt water in between. Other hams participating in the tests were VE1NV, VE1AFY, and VE1AIJ.

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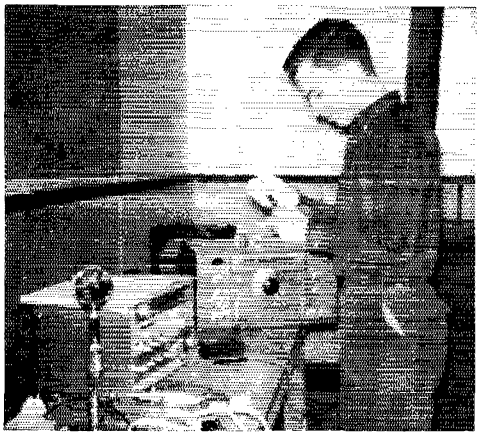
You a coin collector? So is DJ0CL, and he'd like to hear from you. Walter Snyder, 17a Karlsruhe/Baden, Karl-Schremppstrasse 37, Germany.



On the left, setting up the 2-meter position of WA2VLR, Bayonne, N. J., one of the higher-scoring multioperator stations in the 1963 V.h.f. SS, is WA2UOX. On the right, this picture of the 6-meter position of WA2VLR was shot at 4:45 A.M. Sunday, but operator WA2UZI appears to be going strong. 8 members of the Peninsula Amateur Radio Club took part.

1963 VHF Sweepstakes Summary

Individual and Club Scores Set New Records January 5–6

Participation in the ARRL VHF Sweepstakes appears to have reached a plateau of around 1500 entries per year, but individual and group scores in the 16th running show no signs of leveling off. Despite lack of long-distance propagation of any kind that would encourage reporting from areas remote from large population centers, geographical distribution remains good. There appears now to be almost no corner of the country that does not respond when the VHF SS weekend rolls around.

The contest becomes more like its h.f. counterpart every year, as evidenced by the massive scores turned in by "sleepless wonders" in some of our major activity centers. For the first time in v.h.f. contest history, single-operator contact totals went over the 600 mark. W3KKN, Willow Grove, Pa., exceeded his previous records by a wide margin, putting in an iron-man effort that netted 666 contacts on 50, 144 and 220 Mc., in 14 ARRL Sections, for 31,968 points. Not far away, K3IPM ran up 643 in 14, for 30,864.

How does one manage 666 v.h.f. QSOs in a single weekend? A look at the log of W3KKN is revealing. Ernie worked 50 stations the first hour, 46 in the second, and 40 in the third, before switching from 50 to 144 Mc. the first time. He averaged 35 per hour for the first 6 hours, and passed 300 before midnight. Changing bands was done without losing time. Sleep? That must have been taken care of some time between 0435 and 0635 EST, the only noticeable break in the W3KKN log. Though Ernie must have been top man at any point in the party, he was going strong right up to the end. From 2200 to midnight he picked up 33 new contacts!

Scoring records like this, or anything approaching it, require much more than endurance. To be near the top in a competitive area calls for constant study of every facet of contest operating. You waste no effort or motion, and you make sure your station works properly every time you call on it. Nobody has yet admitted reaching anything like the ultimate, and this year's best may be next year's also-ran. Not so long ago we were hailing 400 contacts as phenomenal. Next year someone may go over 700 — but to turn the trick will take more than just happening to live in the Philadelphia area, much as that may help.

Remarkable totals were recorded in other sections of the country. K9PRB and W9ROS ran neck and neck in Illinois, with 406 and 404 contacts, respectively. K8REG found 366 within reach from Dayton, Ohio. W4RJC/4 ran up 182 - 5 - 5460 in Tennessee, KØREE 119 - 5 - 3555 in Kansas, K7IQI 209 - 3 - 5434 in Washington, W4ACY 124 - 4 - 3472 in North Carolina, WØDK/Ø 137 - 5 - 4110 in Colorado, and K4YSN 114 - 1 - 2508 — all evidence of the universality of v.h.f. interest. We even have 18 144-Mc. contacts reported from Fairbanks, Alaska!

Pushing hard for rare sections is still a good way to come out on or near the top. W2BLV used c.w. effectively in catching 18 sections, enabling him to place 4th in the country with a contact total of 442, quite a few less than some stations much farther down the list. This also won George the Southern New Jersey Section Award, no mean accomplishment in this activity hotbed.

Activity on 6 was phenomenal, and K3LOM, K8NYM, K8UQA/8 and WB2CZI all went over the 300-contact mark on that band. WB2CZI

won the NYC-LI award with his 356 - 16 - 18,382, the top one-band effort. Other section awards were won on 6 by K1NTC (Maine), K4VWH (Virginia), WA6BYJ and K6JQB (tie, Los Angeles), W5EFH (North Texas), and K4RZK (Kentucky).

Lack of skip propagation on 6 gave 2-meter men an opportunity to give the 6-meter operators a good run. As he has several times previously, W3IBH, Philadelphia, led the 2-meter pack, this time with a whopping 305 - 11 - 12,810. Section certificates were won on 2 meters only by W6OVR/6, San Joaquin Valley, and VE3EZC, Ontario, the latter knocking off 205 stations on that band alone. Top effort by a Novice was the 144 - 11 - 6048, well up in the standings in the competitive Connecticut Section.

Once again, we remind readers that scores rating high on a nationwide basis are quoted only to accent outstanding work in a given area. There is no national award, other than a gavel to the leading club, because there is no way to score an activity of this kind nationally in a way that would be fair to all. You compete only with your neighbors, and a Section Award is recognition of the fairest kind we know. Why not check through the tabulation and see who were the top people in your Section? Maybe you could be up there among them, another year!

Club competition was fierce, as always. For the second time in a row, the Mt. Airy VHF Club of Philadelphia beat out their long-time rivals, the South Jersey Radio Association, both clubs far exceeding their best previous efforts. The Mobile Sixers, also of the Philadelphia area, moved up from 7th to 3rd, pushing the 6-Meter Club of Chicago back to 4th spot. A dark horse to watch is the Midwest VHF-UHF Association, up from 11th last year to the Number 5 spot in 1963.

One outfit that does not even show in the club tabulation made plenty of noise. The Twin City Radio Club, of New Haven, combined forces to operate W1GB/1 as a practice workout for the June and September contest. Their 725 - 15 - 32,240 total gives some indication of what can be expected from this up-and-coming outfit this summer! At that, they just shaded K2RRM, whose multiop 594 - 18 - 33,264 was quite a splash in the Western New York Section.

— *E. P. T.*

CLUB SCORES

Club	*Aggregate*	*Valid Entries*	*Certificate Winner*
Mt. Airy V.H.F. Club (Pa.)	804,846	87	W3KKN
South Jersey Radio Assn.	507,727	87	W2BLV
Mobile Sixers Radio Club (Pa.)	169,303	40	W3AWA[1]
6 Meter Club of Chicago	154,106	52	W9ROS
Midwest V.H.F.-U.H.F. Assn.	100,108	39	K9ZPS
Rochester V.H.F. Group	93,634	61	W2UTH
Dayton Amateur Radio Assn.	91,066	37	K8REG
Central New Jersey V.H.F. Society	71,899	20	W2GKR
Waltham Amateur Radio Assn. (Mass.)	62,240	14	K1QNQ
National Capital V.H.F. Society	52,147	16	K3LNZ
Germantown Radio Club (Pa.)	47,845	10	K3DUW
51-30 Club (Mass.)	45,224	23	K1PLA
Keystone V.H.F. Club (Pa.)	40,350	17	K3CXV
Fox River Radio League (Ill.)	38,230	16	K9WED
Skokie Six Meter Indians (Ill.)	35,224	18	K9RRF
Valley V.H.F. Club (Ill.)	33,602	17	K9DWR
Central Michigan Amateur Radio Club	32,314	31	K8BGZ
Scarborough Amateur Radio Club	30,502	21	VE3EZC
Lake Success Radio Club (N. Y.)	29,890	14	K2JWT
Syracuse V.H.F. Club	28,909	21	W2UFI
Dutchess County V.H.F. Society (N. Y.)	28,255	6	K2GCH
Nipmuc Emergency Radio Corps (Mass.)	27,824	15	K1ZNU
Rock Creek Amateur Radio Assn. (Md.)	27,591	26	W3RE
Gloucester County Amateur Radio Club (N. J.)	27,276	9	W2LVW
Michigan City Amateur Radio Club	24,486	14	W8BPG
Oh-Ky-In V.H.F. Radio Society	24,188	4	K8TOH
Greensboro Radio Club (N. C.)	23,640	15	W4ACY
Hamden County Radio Assn. (Mass.	20,252	7	W1RFU
Souhegan Amateur Radio Assn. (N. H.)	20,102	5	K1PSR
6 Meter Club of Dallas	19,852	14	W5EFH
Joliet Amateur Radio Society (Ill.)	18,990	7	K9PRB[2]
Quinebaug Valley Radio Club (Mass.)	18,978	8	K1HDM
Southern California V.H.F. Radio Club	17,604	8	K6JQB WA6BYJ
Greater Pittsburgh V.H.F. Society	17,304	10	K3JTH
Delaware 6 Meter Net	16,136	5	W3CGV
Marion V.H.F. High Banders (Ohio)	15,734	6	K8ZES
Argonne Laboratory Radio Club (Ill.)	15,068	9	W9LGI
1200 Radio Club (Mass.)	14,680	7	K1CHY
Springfield Amateur Radio Club (Ohio)	12,982	5	K8MHJ
Cowtown 6 Meter DX Club (Tex.)	11,534	6	K5RWR
Kansas City V.H.F. Club	10,768	3	W0KMV
Air Capital Amateur Radio Assn.	10,660	12	K0JQV
Auburn Amateur Radio Assn. (N. Y.)	10,630	4	WA2NDG/2
Seneca Radio Club (Ohio)	10,386	7	K8YWF
St. Lawrence High School Radio Club (Ill.)	10,383	8	WA9EBD
East Coast V.H.F. Society (N. J.)	9944	4	K2HHS
La Porte Amateur Radio Club (Ind.)	9912	6	K9CIF
North Penn Amateur Radio Club	9732	3	K3HLN
Fulton Amateur Radio Club (N. Y.)	8404	7	WA2AND
Suffolk County Radio Club (N. Y.)	7916	4	W2GLU
Reading Radio Club (Pa.)	7700	3	W3WJC
Scioto Valley Amateur Radio Club	7588	3	.....
Greater Pittsburgh Teenage Amateur Radio Club	5360	4	K3UQD
5 Towns Radio Club (N. Y.)	4914	3	K2RPW
Nittany Amateur Radio Club (Pa.)	4632	9	W3ZZO
Nortown Amateur Radio Club	3926	3	VE3DUU
Germantown High School Radio Club (Pa.)	3694	3	K3TUX
Palmetto V.H.F. Club (S. C.)	3654	5	K4JQY
Colonie Central High School Radio Club (N. Y.)	2848	5	WA2PZB
Centreville Net (Va.)	2834	3	.....
Whitman Amateur Radio Club (Mass.)	2778	6	W1IAU
Arlington Sr. High School Radio Club (N. Y.)	2756	3	WA2HAQ
Panama City Amateur Radio Club (Fla.)	2500	10	WA4FIJ
Brighton High School Amateur Radio Club (N. Y.)	2024	3	WA2WGI
Bishop Stang High School Radionauts (Mass.)	1518	3	K1RMO
Santa Fe Radio Club (New Mex.)	1298	7	K5KJW
Arctic Amateur Radio Club	1056	3	WL7ELJ
Forest City Amateur Radio Club (Ill.)	1018	3	W9BQC
Northern V.H.F. Society	996	7	K8IFL

[1] W3HFY, opr. [2] K9HUY, opr.

SCORES

In the tabulation on the next pages, scores are listed by ARRL divisions and sections. Unless otherwise noted, the top scorer in each section receives a certificate award. The highest-scoring Novice also receives a certificate in each section where at least three such licensees submitted valid contest logs: footnotes denote these winners. Columns indicate final score, number of contacts, number of different sections worked, and the bands used. A represents 50 Mc., B 144 Mc., C 20 Mc., D 420 Mc., E 1215 Mc. Multioperator stations are shown at the end of each section tabulation.

ATLANTIC DIVISION

Eastern Pennsylvania

W3KKN 31,968-666-14-ABC
K3IPM/3 30,864-643-14-AB
W3HYJ 26,592-554-14-ABC
W3HFY 20,424-444-13-ABCD
K3KMN 20,412-486-11-ABC
W3AWA 20,378-443-13-ABCD
K3IUZ 19,320-403-14-AB
W3CL 19,068-454-11-ABC
K3IUV 18,964-431-12-ABCD
W3TYX 16,100-350-13-AB
K3ESL 16,002-381-11-AB
W3FSC 15,540-370-11-AB
K3JJZ 15,162-361-11-ABC
K3HCA 15,078-359-11-ABC
K3ECF 14,800-370-10-AB
K3LOM 14,070-335-11-A
K3HWZ[2] 14,040-351-10-ABC
K3EOD/3 14,028-334-11-AB
W3OR 13,902-331-11-AB
W3SMK 13,552-308-12-AB
W3AJF 13,398-319-11-ABC
W3FQD 13,320-333-10-AB
W3IBH 12,810-305-11-B
K3EMR 12,480-312-10-AB
W3ETB 12,400-310-10-AB
K3BHK 12,080-302-10-AB
W3CXU 12,033-287-11-AB
W3GEC 12,012-286-11-AB
W3GXB 11,840-297-10-AB
K3HNP 11,484-261-12-A
W3GEW 11,020,290- 9-AB
W3UMI 10,752-256-11-AB
K3GAS 10,506-309- 7-ABC
K3KVS 10,440-290- 8-AB
W3BRU 10,360-259-10-AB
K3MSV 10,260-270- 9-A
W3NSI 10,240-256-10-ABC
W3GLI 10,038-239-11-A
W3ZEY 10,000-250-10-AB
W3IZU 9800-245-10-AB
K3HNJ 9680-220-12-ABC
K3DUW 9576-252- 9-A
K3IGX 9560-239-10-A
K3PAT 9462-249- 9-A
W3BVR 9082-239- 9-A
W3JSD 8862-211-11-AB
K3ACR 8740-230- 9-AB
W3MVF 8676-241- 8-ABC
K3DAQ 8360-209-10-A
K3JXC 8240-206-10-AD
W3CFS 8040-201-10-AC
K3ALK 8000-250- 6-AB
W3ZOR 8000-200-10-A
W3BAH 7888-232- 7-AB
W3CLQ 7866-207- 9-AB
W3HYO 7640-191-10-B
W3AYG 7072-208- 7-AB
W3UKG 7068-186- 9-A
K3HSS 7040-220- 6-ABC
K3EHQ 6528-192- 7-AB
K3AQH 6120-171- 8-AB
K3EPB 5848-172- 7-A
W3IXL 5824-182- 6-AB
K3GOZ 5808-182- 6-A
K3RCV 5760-192- 5-AB
K3CIV 5760-180- 6-AB
K3CXV 5720-143-10-AB
W3QXV 5715-191- 5-AB
K3KKM 5644-166- 7-AB
W3QAS 5616-156- 8-ABC
K3JNZ/3 5568-174- 6-A
W3KXH 5348-191- 4-A
W3HAB 5250-175- 5-A
K3NMN 5226-201- 3-AB
W3TXO 5054-133- 9-A
W3FOZ 5004-139- 8-AB
K3ABK 4920-164- 5-A
W3WJC 4840-121-10-AB
W3ZRR 4256-152- 4-AB
W3TTL 4200-150- 4-ABC
K3EMA 4186-161- 3-AB
K3IFH 4160-130- 6-A
K3DMA 3978-153- 3-A
K3CJV 3930-131- 5-A
W3IHT 3910-115- 7-AB
K3QMK 3808-112- 7-ABD
K3TPS 3718-150- 3-A
K3HLN 3640-140- 3-A
W3JSA/3 3584-128- 4-AB
W3HKZ 3536-104- 7-A
W3BBC 3434-101- 7-ABD
K3CHN 3420-114- 5-AB
W3WIJ 3380-130- 3-A
K3CFO 3332-119- 4-A
K3JFL 3312- 92- 8-AB
K3TUX 3276-117- 4-A
K3JRO 2924- 86- 7-AB
K3IWK 2880- 90- 6-AB
K3JNP 2856-102- 4-A
W3BYB 2772- 99- 4-A
K3ATL 2772- 77- 8-AB
K3HQA 2678-103- 3-A
K3RTR 2522- 97- 3-A
W3BUR 2508- 66- 9-AB
K3RSA 2352- 74- 6-AB
K3OBY 2340- 78- 5-A
K3PVK 2184- 78- 4-AB
W3DYL 2176- 68- 6-AB
W3DJV 2128- 76- 4-A
W3GOB 2106- 81- 3-A
W3EDO 2080- 65- 6-AB
K3VPP 2054- 79- 3-A
K3MBR 1944- 54- 8-AB
K3CZI 1938- 57- 7-ABC
K3GZU 1860- 62- 5-A
K3OAU 1836- 54- 7-AB
K3GXV 1764- 63- 4-AB
K3MBO 1742- 67- 3-A
K3GJL 1652- 59- 4-AB
K3MGO 1600- 40-10-AB
W3TJQ 1560- 60- 3-A
K3JWI 1560- 60- 3-A
W3MXW 1547- 46- 7-A
W3KPK/3 1482- 57- 3-A
W3AMO/3 1400- 50- 4-A
K3JYN 1380- 46- 5-A
K3SEH 1378- 53- 3-AB
W3SXD 1376- 43- 6-AB
W3ZIE 1372- 49- 4-A
K3GZT 1326- 51- 3-A
K3RYR 1260- 45- 4-AB
W3BQU/3 1204- 43- 4-AB
K3NJF 1140- 38- 5-A
K3IOK 1072- 34- 6-A
K3HJA 1040- 40- 3-A
K3EGP 1024- 32- 6-A
K3QJS 1008- 42- 2-A
K3MUT 988- 38- 3-A
K3MBQ 924- 33- 4-A
K3BPK 912- 38- 2-A
W3KLL 884- 34- 3-A
K3TAS 858- 33- 3-A
K3GYS 702- 27- 3-A
K3GFC 696- 29- 2-A
W3ZRQ 660- 22- 5-A
KN3TZF 648- 27- 2-B
K3POR 576- 24- 2-AB
W3BJG 546- 21- 3-AB
W3CPT 520- 20- 3-B
W3UQJ 506- 23- 1-A
K3BKH 484- 22- 1-A
K3JLG 484- 22- 1-A
K3TIB 484- 22- 1-A
W3VGN 448- 16- 4-B
W3AXC 384- 16- 2-AB
WA2NGS/3 352- 16- 1-B
W3LRH 336- 14- 2-A
K3SMZ 286- 11- 3-AB
K3LWY 264- 11- 2-A
K3NII 242- 11- 1-
W3TXQ/3 240- 10- 2-A
W3AMO/3 198- 9- 1-A
K3SRO 154- 7- 1-A
W3TJQ/3 154- 7- 1-A
K3BRJ 132- 6- 1-B
W3UGA/3 132- 6- 1-A
W3SAO (K3HJA, W3SAO) 16,254-387-11-ABC
W3HZU (16 oprs.) 14,766-321-13-AB
W3 CCX/3 (K3HJA, W3SAO) 12,012-286-11-ABC
K3MBS (4 oprs.) 10,908-303- 8-AB
K3KUB (K3s KUB LWR) 5920-148-10-AB
K3MHD (K3s MHD PWM) 5032-148- 7-A
K3MTK (K3s DVS RHC SYV) 4545-153- 5-A
W3JUZ/3 (W3s QFN JUZ) 4012-118- 7-ABC
W3MKA (4 oprs.) 2208- 92- 2-AB
W3AEQ (5 oprs.) 2074- 61- 7-AB
K3TDJ (K3DVT TDJ) 1980- 55- 8-AB

Delaware

W3ASD 9920-248-10-AB
W3IGM 5320-140- 9-A
W3CGV 4356-121- 8-ABCD
K3AZH 3840- 96-10-AD
K3MPZ 3800-100- 9-AB
K3RRT 3600-100- 8-AB
K3OBU 2880- 80 8-ABD
K8SXA 1260- 43- 5-A
KN3TNG 110- 5- 1-B
W3AMO/3 72- 3- 2-A
K3QZC (K3QZC W3AMO) 9880-247-10-A

Md.-D.C.

W3NG 6728-179- 9-AB
W3BDK 6384-152-11-AB
W3JWY 5880-140-11-A
W3JZY 5334-127-11-AB
K3RGA 4512-141- 6-AB
W3LCC 3816-106- 8-ABCD
W3MMC 3232-101- 6-AB
K3NXH 3180-106- 5-A
K3QOY 2618- 77- 7-AB
K3RPI 2550- 85- 5-A
W3ZSR 2240- 70- 6-AB
W3RE 2080- 65- 6-ABCD
W3CPM 2070- 69- 5-B
K3UMV 1856- 58- 6-AB
W3PIH 1664- 64- 3-B
K3PPB 1560- 60- 3-B
K3CWK 1508- 58- 3-B
W3BNL 1400- 50- 4-B
W3HB 1368- 57- 2-B
KN3UST[2] 1120- 40- 4-B
W3UCR 1080- 45- 2--
K3PEZ 1056- 44- 2-A
W3LUL 1053- 41- 3-B
K2CYQ/3 1036- 37- 4-A
K3GMB 984- 41- 2-AB
W3SFY 884- 26- 7-B
W3AIR 868- 31- 4-BCD
K3DRR 816- 34- 2-A
W3YAG 806- 31- 3-B
W3OBR 744- 31- 2-A
W3MHB 696- 29- 2-B
K3PRP 672- 28- 2-B
K3BEG 624- 26- 2-B
W3GCO 600- 25- 2-AB
W3PZK 528- 22- 2-ABCD
KN3VGX 520- 20- 3-B
KN3TUJ 506- 23- 1-B
K3EIW/3 480- 20- 2-A
W3FWP 480- 20- 2
K3OXL 408- 17- 2-B
K3CRD 312- 13- 2-B
K3NKH 216- 9- 2-A
W3BNE 176- 8- 1-B
W3AX 154- 7- 1-B
K3LFN 144- 6- 2-B
K3LNZ/3 22- 1- 1-A
K3LNZ (K3LNZ, K4LHB) 8082-225-8-AB-
K3HFV (K3s HFV IXQ) 7518-179-11-AB
K3LUK/3 (4 oprs.) 5696-178- 6-AB

W4FDO/4 was "hospitalized" for the V.h.f. Sweepstakes, making use of the fine location of the North Carolina Memorial Hospital, at Chapel Hill. Operators were W4FDO, W4YBN and WA4BBY. K6EWO operates while K6TMU keeps the log of K6EWO/6, Sacramento Valley multiop entry.

W3RCN/3 (4 oprs.)
4608-128- 8-AB

Southern New Jersey

W2BLV
24,752-442-18-ABD
W2EIE
22,260-530-11-ABC
WA2EMB
20,520-430-14-AB
WA2KOK
16,100-404-10-AB
W2OSD
16,016-364-12-AB
W2NSF
15,972-364-12-AB
WA2GSO
14,700-350-11-AB
W2RV 14,400-300-14-AB
W2HBE
14,238-342-11-AB
WA2JNA
13,230-315-11-AB
WA2WUN
12,642-301-11-AB
W2AXU
12,188-277-12-ABC
WA2EIY
12,160-320- 9-AB
WB2CDP
11,740-294-10-AB
WA2KRX
11,592-276-11-AB
W2LVW
11,153-294- 9-AB
WA2DWT
11,040-276-10-AB
W2ZUL
10,754-283- 9-AB
WA2TQI
10,500-250-11-AB
K2BPX
10,290-245-11-AB
W2JAV
10,120-253-10-AB
K2KCI 9291-246- 9-AB
W2OQN 8930-235- 9-AB
WA2GJE
8820-210-11-A
W2LBX 8680-217-10-AB
K2QOS 7410-195- 9-AB
W2QRH 7360-230- 6-AB
WA2WNY
6600-165-10-A
WA2ONB
6080-160- 9-AB
K2KTS 5928-156- 9-A
W2EWN 5882-173- 7-AB
K2EP 5678-167- 7-A
WB2BNE
5712-168- 7-A
K2EGH 5624-148- 9-AB
K2OHM 5576-164- 7-A
WA2NWX
5544-154- 8-A
WA2PHY
5502-131-11-A
WA2BLV
5120-160- 6-A
K2MKD 5088-159- 6-AB
K2QPN 4940-130- 9-A
WA2WCT
4864-152- 6-AB
K2QOK 4788-133- 8-A
K2TYW 4788-126- 9-AB
K2HJY 4437-131- 7-AB
W2ORA 4240-106-10-AB
WA2LJR
4200-140- 5-B
WA2MTU
4200-140- 5-AB
K2MZP 4160-160- 3-A
WA2HJG
4104-108- 9-B
WA2WWF
4004-143- 4-A
K2SQM 3944-116- 7-A
WA2SFY
3757-112- 7-A
W2VX 3672-108- 7-B
K2GCD 3496- 93- 9-AB
WA2NXB
3304-118- 4-A
WA2TDR
3211- 85- 9-B
K2HZK 3136-112- 4-A
WA2TRC
2786-100- 4-A
WA2WMA
2688- 84- 6-A
K2ODZ 2652-102- 3-A
W2ADA 2584- 68- 9-AB
K2RKC 2550- 75- 7-B
K2SXN 2424-101- 2-A
W2UEH 2400- 75- 6-B
K2EJW 2160- 90- 2-A
K2MGZ 2156- 77- 4-A
WA2MGV
1950- 75- 3-A
W2EXB 1932- 69- 4-AB
WA2IDT
1820- 70- 3-A
WA2TDI
1820- 70- 3-A
K2DEI 1560- 65- 2-AB
WA2IEK
1530- 51- 5-B

WA2UOF
1488- 62- 2-B
K2JVX/2
1456- 56- 3-A
W2SDR 1440- 60- 2-A
WA2WUJ
1332- 37- 8-A
W2NSJ 1170- 45- 3-A
W2APD 1128- 47- 2-AB
WA2ABF
1104- 46- 2-AB
W2DMU 1014- 39- 3-A
WN2EQH 960- 40- 2-B
K2SEV 884- 26- 7-A
W2MEO 840- 30- 4-A
W2SDO 806- 31- 3-AB
WA2NGS 720- 30- 2-B
W2TAV 702- 27- 3-B
WA2UHQ 650- 25- 3-A
W2BAY 624- 26- 2-AB
WB2EGZ 600- 25- 2-B
K2HDX 576- 24- 2-B
K2HBY 572- 26- 1-A
WA2MES 504- 21- 2-B
WA2TOW/2
468- 18- 3-B
K2PMT 312- 13- 2-AB
W2QDY 288- 12- 2-A
W2MMD 88- 4- 1-AB
WA2NPD 88- 4- 1-A
W2REB (K2IWV W2-REB)
19,866-473-11-AB
K2UDA (K2s GSJ UDA)
12,840-321-10-AB
W2FYS/2 (W2FYS, WA2s KWS OAA)
10,040-251-10-AB
K2HOD (K2s BG HOD)
9660-230-11-AB
WB2EFL (WB2s EFL EIY) 7524-198- 9-A
K2BWR (K2s BWR ZRJ)
6204-141-12-A
WA2NGI/2 (2 oprs.)
5248-164- 6-AB
K2PWK (WA2s KBI VWZ) 2261- 68- 7-A

Western New York

W2UTH 8128-254- 6-AB
W2UFI 7560-189-10-A
WA2NDG/2
6468-147-12-A
K2YCO 6060-202- 5-AB
K2ERQ 5890-155- 9-AB
WA2YUE
4862-187- 3-AB
WA2KND
4342-167- 3-AB
WA2DVB/2
4228-151- 4-AB
K2QWD 3876-114- 7-A
W2TKY 3770-145- 3-
ABC
WA2KUJ/2
3150-105- 5-AB
WA2YRH
3068-118- 3-AB
K2ZFV 2990-115- 3-AB
WA2RDE
2884-103- 4-B
WA2GCF
2782-107- 3-AB
K2TXG 2743-106- 3-A
W2UAD 2520-105- 2-B
W2MPM 2496-104- 2-A
WA2YTK
2256- 94- 2-AB
K2RSY 2436- 87- 4-A
WA2LHM
2200-100- 1-A
W2IYR 2080- 80- 3-AB
W2CTA 1820- 70- 3-AB
WB2DRN
1820- 70- 3-AB
WA2HWC
1752- 73- 2-AB
WA2AND
1704- 71- 2-A
WA2JMH
1680- 70- 2-A
W2WZQ 1620- 54- 5-B
WA2JGG
1568- 56- 4-B
K2ISP 1560- 65- 2-A
WA2OXJ
1540- 70- 1-AB
K2ZRX 1512- 63- 2-A
WA2MLV
1488- 63- 2-AB
W2PFG 1488- 62- 2-A
WA2GRQ
1464- 61- 2-A
WA2KVN
1464- 61- 2-AB
W2QY 1464- 61- 2-B
WA2CJL/2
1392- 58- 2-AB
WV2ZLK
1368- 57- 2-B
WA2OXL
1342- 61- 1-A
WA2ADG
1298- 59- 1-A
VE3DFY/W2
1296- 54- 2-B
K2TDQ 1224- 51- 2-A

WA2EIX
1222- 47- 3-A
W2DBS 1200- 50- 2-A
WA2YCM
1188- 54- 1-A
WA2ZWO
1188- 54- 1-A
WA2DAC
1170- 45- 3-AB
WA2ENW
1128- 47- 2-A
K2YQT 1128- 47- 2-A
WA2JMR
1100- 50- 1-A
WA2WGI
1100- 50- 1-A
WA2UGE
1056- 44- 2-A
WA2OXK
1034- 47- 1-A
K2DPW 984- 41- 2-B
WA2YSC 968- 44- 1-A
W2RUJ 960- 40- 2-B
K2YMM 960- 40- 2-B
W2DJL/2 924- 42- 1-A
WA2UTM
924- 42- 1-A
WA2DVI 880- 40- 1-A
K2QWC 880- 40- 1-A
WA2AQW
858- 39- 1-A
K2EAY 814- 37- 1-A
K2BPV 770- 35- 1-A
K2OPC 744- 31- 2-A
WA2ZXT 704- 32- 1-A
WA2HUW
660- 30- 1-AB
K2OIG 660- 30- 1-A
K2TXX 660- 30- 1-A
W2SSC 650- 25- 3-B
W2HZN 636- 27- 2-AB
K2OUE 616- 28- 1-A
K2RHS 616- 28- 1-A
WA2YEK 616- 28- 1-A
W2YBK 600- 25- 2-B
K2AVA 572- 26- 1-A
K2SKO 550- 25- 1-A
WA2GVH 506- 23- 1-AB
K2RTG 504- 21- 2-A
WA2FYH/2
484- 22- 1-A
K2OEP/2 462- 21- 1-A
W2PED 462- 21- 1-A
WA2SPT 462- 21- 1-B
WA2YVJ 462- 21- 1-A
WA2YSA 440- 20- 1-
W2PQP 396- 18- 1-A
WA2USH 352- 16- 1-A
K2YFY 330- 15- 1-A
WA2GRT 312- 12- 3-B
W2PJO 308- 14- 1-A
K2ZIP 308- 14- 1-A
WA2ZHT 286- 13- 1-A
WB2ETZ 264- 12- 1-A
WA2STJ 264- 12- 1-A
K2UCS/2 242- 11- 1-A
WA2JRH 220- 10- 1-A
WA2YFM
220- 10- 1-A
K2BYU 198- 9- 1-A
WB2ARH 154- 7- 1-A
K2KLP 110- 5- 1-AB
WA2UAU 110- 5- 1-A
W2PGR 88- 4- 1-AB
WA2EHS 66- 3- 1-A
K2RRM (8 oprs.)
34,264-594-18-ABC
WB2DLQ (K2s JSL OES, WB2DLQ)
4004-143- 4-AB
K2DUR (7 oprs.)
2856-119- 2-AB
WA2CJK/2 (WA2s CJK UJM) 2800-100- 4-AB
WA2RBJ (WA2s QVX RBJ) 1089- 50- 1-AB
WA2ZEW/2 (WA2ZEW W3LBM)
22- 1- 1-B

Western Pennsylvania

K3JTH 6800-200- 7-AB
K3NNZ 4536-126- 8-A
W3HWU 4318-127- 7-AB
K3UQD 2912-104- 4-A
K3UQO 1680- 70- 2-A
KN3VOR
1386- 51- 4-B
W3CSA 1300- 50- 3-AB
W3DJM 1092- 39- 4-A
K3QHR 996- 55- 2-A
K3NOA 864- 36- 2-AB
K3QBI 816- 34- 2-A
W3ZZO 780- 30- 3-AB
K3ULC 744- 31- 2-A
K3EDO 728- 28- 3-AB
K3POG 728- 28- 3-AB
K3PCE 720- 30- 2--
K3LVO 636- 27- 2-A
K3AKR/3
600- 25- 2-A
W3KJM 576- 24- 2-AB
W3SLX 552- 23- 2-A
K3ILD 520- 20- 3-B
K3CTI 504- 21- 2-A
K3VIC 456- 19- 2-A
K3LWT 432- 18- 2-A
W3EJA 360- 15- 2-A

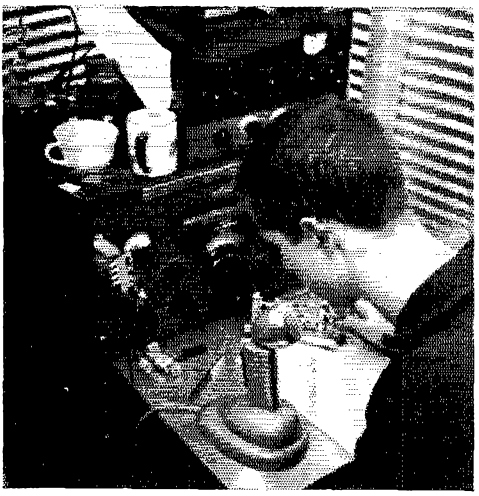
K3MOQ 312- 13- 2-A
K3VCS 312- 13- 2-A
K3ONK 88- 4- 1-A
W3GQT (4 oprs.)
8100-225- 8-A
W3QZF/3 (4 oprs.)
3136- 98- 6-AB

CENTRAL DIVISION

Illinois

K9PRB§
13,804-406- 7-AB
W9ROS
11,312-404- 4-ARC
K9LTC 9630-321- 5-AB
K9EVA 8280-276- 5-AB
K9RRF 7896-282- 4-AB
K9DWR 7560-252- 5-
ARC
K9IOG 6468-231- 4-A
K9DTB 6210-207- 5-AB
K9ZWU 5790-193- 5-
ABC
K9ZPS 5684-203- 4-A
K9WED 5340-178- 5-AB
K9WFA 5280-176- 5-AB
K9TUL 5166-185- 4-AB
WA9FGW/9§
5068-181- 4-AB
K9QKB 4832-151- 6-AB
WA9FUO
4650-155- 5-B
W9AFD 4620-154- 5-AB
K9ZWV 4560-152- 5-
ARC
K9RBI 4480-160- 4-AB
W9TOY 4470-149- 5-
ARC
K9ERG 4424-158- 4-AB
K9ZFX 4416-138- 6-B
K9YOA 4396-157- 4-AB
W9AA/9§
4110-137- 5-B
W9EET 3976-142- 4-AB
K9PIZ 3948-141- 4-A
W9EHN 3920-140- 4-AB
K9USV 3836-137- 4-AB
K9DCZ 3810-127- 5-AB
K9MDO 3780-135- 4-AB
WA9EBD
3770-145- 3-A
K9DRC 3752-134- 4-A
W9QKM
3744-117- 6-B
K9TYH 3724-133- 4-A
K9COU 3696-132- 4-AB
WN9EYJ§
3682-137- 4-B
W9FVB 3640-130- 4-A
K9CNN 3600-120- 5-AB
K9ZUF 3570-119- 5-AB
WA9AYM
3500-125- 4-A
K9ARA 3416-122- 4-AB
K9UZL 3416-122- 4-AB
W9LGI 3390-113- 5-B
K9PAJ 3344-123- 4-AB
W9CEJ 3300-110- 5-B
K9YHH 3192-114- 4-A
K9WNX 3150-105- 5-B
K9RRO 3080-110- 4-A
K9ZAM 3066-110- 4-A
K9YHF 3060-102- 5-AB
K9VSN 3000-100- 5-B
K9AMG 2884-103- 4-A
K9QGM/9
2856-102- 4-AB
K9F8W 2800-100- 4-A
WN9EOD
2744- 98- 4-B
K9OOG 2744- 98- 4-B
W9DBJ 2660- 95- 4-A
K9PUJ 2632- 94- 4-A
K9VKW 2632- 94- 4-A
K9BDJ 2576- 92- 4-
ABC
WA9EYT
2576- 92- 4-AB
WA9BDI
2520- 90- 4-B
WA9AST 2464- 88- 4-B
K9ZPY 2436- 87- 4-AB
WA9AHZ
2268- 81- 4-A
K9CZH 2250- 75- 5-B
WA9DYW
2156- 77- 4-B
K9LCR 2054- 79- 3-AB
W9CRB 2010- 67- 5-AB
W9ANT 1980- 66- 5-B
K9GIS 1976- 76- 3-A
WA9BWR
1950- 75- 3-AB
WA9DUP
1924- 74- 3-A
K9QLC 1896- 79- 2-A
K9OSR 1876- 67- 4-A
K9KMK 1820- 65- 4-A
K9DKI 1768- 68- 3-A
K9FFR 1768- 68- 3-A
K9GRH 1768- 68- 3-AB
W9CRN 1750- 63- 4-B
K9FGV 1704- 71- 2-A
W9AVE 1680- 56- 5-B
WA9FXX
1660- 65- 3-A
K9ZFS 1638- 63- 3-A
K9UFD 1632- 70- 2-A

K9BAO 1624- 58- 4-B
W9VPU 1620- 54- 5-BC
K9PBN 1612- 62- 3-A
K9UXQ 1612- 62- 3-A
K9FZB 1599- 62- 3-A
K9TSU 1586- 61- 3-A
K9WNQ 1560- 65- 2-A
K9CTH 1536- 64- 2-A
WA9AKQ
1530- 51- 5-B
W9ZHR 1512- 54- 4-A
W9BYD 1456- 52- 4-B
K9GUB 1428- 51- 4-AB
K9REN 1372- 49- 4-A
W9AVB§ 1352- 52- 3-AB
K9VVZ 1352- 52- 3-AB
WA9BMU
1326- 51- 3-B
K9DJW 1260- 45- 4-B
K9MEB 1260- 45- 4-A
K9URR 1260- 45- 4-AB
K9UFA 1248- 48- 3-A
WN9FEF
1204- 43- 4-B
W9MRC 1204- 43- 4-B
WA9CXB
1200- 50- 2-A
K9LUW 1170- 39- 5-B
K9SZT 1170- 45- 3-AB
K9CYO 1144- 44- 3-A
WA9EEG
1120- 40- 4-A
W9BHP 1118- 43- 3-A
K9RHC 1092- 42- 3-A
WA9BLP
1056- 48- 1-A
WN9CWJ
1050- 40- 4-B
WA9CUB 960- 40- 2-B
K9HMB 960- 30- 6-AB
K9SLT 960- 40- 2-A
K9QDU 936- 36- 3-A
W9BQC 924- 33- 4-AB
WA9EME 912- 38- 2-A
WA9BXT 888- 37- 2-A
WN9BQA 858- 33- 3-B
K9IOA 858- 33- 3-AB
WA9BOQ 858- 40- 1-A
WA9HND 832- 32- 3-A
K9YEN 784- 28- 4-AB
W9ZEW 780- 30- 3-B
K9ASK 756- 27- 4-B
WA9CNR 754- 29- 3-A
K9WSZ 750- 25- 5-B
K9VWJ 744- 32- 2-AB
W9SOO 726- 33- 1-A
W9IUX 720- 30- 2-AB
K9RGH 720- 30- 2-A
K9CCN 704- 32- 1-A
K9VKM 704- 32- 1-A
WN9FGK 700- 25- 4-B
WA9FIH 682- 31- 1-A
WA9HTV 660- 30- 1-A
W9CPG 660- 30- 1-A
W9EPJ 648- 27- 2-A
K9JSG 600- 25- 2-A
K9GWQ 572- 22- 3-A
WA9ASH 561- 26- 1-A
K9DLV 528- 24- 1-A
K9KWE 528- 24- 1-B
WA9DKM/9
504- 21- 2-A
K9KRH 462- 21- 1-B
K9VLW 448- 16- 4-B
K9LGF 432- 18- 2-A
K9HPW 420- 15- 4-B
K9OZF 108- 17- 2-A
K9QDO 408- 17- 2-AB
WN9ERH 403- 25- 3-B
W9DWE 390- 15- 3-A
W9WJL 384- 16- 2-B
W9BOD 374- 17- 1-A
W9YOW 338- 13- 3-B
K9YNB/9
330- 15- 1-A
K9ATK 312- 13- 2-A
W9CHT 308- 14- 1-A
K9EFR 308- 14- 1-AC
WA9CZS 288- 12- 2-AB
WA9AFO 286- 13- 1-A
WA9BWO
286- 13- 1-A
WA9FTJ 286- 13- 1-A
W9CMD 242- 11- 1-A
WA9DAV
242- 11- 1-B
WA9EJT 242- 11- 1-A
WN9BLH
240- 10- 2-B
WN9ETX
234- 9- 3-B
W9DRY 220- 10- 1-B
W9OKM 198- 9- 1-A
W9REP 192- 8- 2-A
K9CHW 192- 8- 2-A
WA9EKD 176- 8- 1-A
K9MYP 168- 14- 2-A
WN9GAG 168- 7- 2-B
WA9ANJ 154- 7- 1-A
W9HPG 154- 7- 1-
WA9BKT 72- 3- 2-B
WN9EHM 72- 3- 2-B
K9UIM 66- 3- 1-AB
WN9ANV 44- 2- 1-B
W9UVE 44- 2- 1-A
K9IAR 22- 1- 1-B
K9TWF (K9s TMN TWF, W9CHR)
12,420-418- 5-AB



Not exactly roomy, but it was warm and supplied with electric power—the Lee Hill location of WØDK/Ø, station of the Boulder Amateur Radio Club. Operating WØDK/Ø on 6 and 2 is KØETN.

K9RVG/9 (K9s RVG UYG VUX) 11,104-347- 6-AB
K9VHC (K9s DOC VHC, W9NZF) 7672-274- 4-ABC
W9VXE (W9s MEC VXE, WA9DTI) 6720-240- 4-AB
K9GBG (K9s EMT GBG) 5600-200- 4-A
K9VBB (2 oprs.) 5012-179- 4-AB
K9FKA (K9FKA, WA9FUW) 3472-126- 4-A
K9EIJ (K9EIJ, W9DJK) 3248-116- 4-A
WA9BGU (WA9s BGU B8A) 2220- 74- 5-A
WA9EWC (K9ZFS, WA9EWC) 744- 31- 2-A
K9LGE (2 oprs.) 506- 23- 1-A

Indiana

K9YXK 6180-206- 5-A
K9VTT 5628-201- 4-B
K9OYD 4424-158- 4-AB
K9KGI 3290-118- 4-A
K9LZV 3136-112- 4-A
W9TWU 3000-100- 5-B
K9HYV 2912-104- 4-AB
W9OSB 2940- 97- 5-A
WN9CVD 2652-102- 3-B
K9RBN 2268- 81- 4-AB
K9CIF 2100- 70- 5-A
K9DZE 2016- 72- 4-
K9MZU 1820- 65- 4-A
K9ZNK 1764- 63- 4-B
K9TTX 1708- 61- 4-A
K9SGZ 1664- 52- 6-AB
K9JSI 1484- 53- 4-AB
K9ZUH 1456- 52- 4-AB
K9MZV 1372- 49- 4-ABCDE
WA9AUS 1148- 41- 4-B
K9JTZ 1066- 41- 3-AB
K9EEE 952- 34- 4-B
K9SFY 616- 22- 4-A
W9JIY 578- 26- 2-ABCDE
W9MHP 120- 15- 4-ABCDE
W9BUM 314- 12- 3-B
WA9BCJ 288- 12- 2-B
W9DMM 156- 6- 3-A
K9IDE 132- 6- 1-A
K9FTO 120- 5- 2-
W9FJI 96- 4- 2-A
W9BRF 88- 4- 1-A
W9CSN 44- 2- 1-A
W9BZN/9 (7 oprs.) 10,778-317- 7-AB
K9VPE (K9s QCR VPE) 9864-274- 8-AB
WA9ADT/9 (5 oprs.) 8490-283- 5-AB
W9BF (WA2VCM, K9IOS) 6000-201- 5-A
K9RMJ (2 oprs.) 2464- 88- 4-AB
WA9FLH (W9FWK, WA9FLH) 288- 12- 2-A

Wisconsin

W9JFP 8512-266- 6-AB
W9DHQ 4740-158- 5-B
W9JCW 3180-106- 5-B
K9VNM 2828-101- 4-AB
W9JOT 1932- 69- 4-AB
W9TQ 1568- 56- 4-AB
K9HBT 1274- 50- 3-A
K9FPM 1008- 36- 4-A
W9WAQ 930- 31- 5-AB
WØTKX/9 264- 12- 1-B
W9HHJ 120- 5- 2-B
W9AJU 96- 4- 2-B
W9VFO 96- 4- 2-B
K9VVR (K9VVR, W9AEM) 912- 38- 2-A

DAKOTA DIVISION

Minnesota

KØDTA 2132- 82- 3-AB
WØIRO 1284- 54- 2-A
WØTKX 154- 7- 1-B

DELTA DIVISION

Tennessee

WA4JFB/4 4680-130- 8-A
WA4AJC 3616-113- 6-A
W4RJC/4 (4 oprs.) 5460-182- 5-AB
WA4EPY (K4VMO, W4SAN, WA4EPY) 4200-140- 5-AB
WA4GNU (WA4's BNF, CGO, GNU) 1316- 47- 4-AB

GREAT LAKES DIVISION

Kentucky

K4RZK 6624-207- 6-A
WA4AAJ 5542-163- 7-AB
WA4CQG 1904- 68- 4-A
W4KZF 1690- 65- 3-A
WA4AXM 728- 28- 3-A

Michigan

K8NOS 5202-153- 7-AB
K8ZQE 4980-166- 5-B
W8BPG 4320-144- 5-B
K8BGZ 4192-131- 6-AB
K8HNW 3780-105- 8-B
W8CKK 3750-125- 5-AB
W8HJR 3480-116- 5-AB
W8LJV 3220-115- 4-AB
W8VRH 3192-114- 4-B
K8OID 2990-115- 3-AB
W8CVQ 2940-105- 4-AB
WA8CEJ 2544-106- 2-A
K8VEX 2478- 89- 4-A
K8IXU 2366- 91- 3-AB
K8LIO 2352- 84- 4-A
WA8DRZ 2236- 86- 3-A
W8BCI 2100- 70- 5-B
W8ZGW 2072- 74- 4-B
K8NWD 1599- 62- 3-B
K8DHN 1554- 56- 4-AB
K8DIU 1232- 56- 1-AB
K8TCU 1066- 41- 3-B
K8IVW 1032- 43- 2-AB
K8LXF 960- 40- 2-B
K8ZLP 840- 35- 2-A
W8APC 825- 38- 1-A
K8HZV 704- 32- 1-AB
K8IQW 660- 30- 1-B
W8AHV 650- 25- 3-B
K8ZNP 648- 27- 2-AB
K8EAC 638- 29- 1-B
W8MIGH 624- 26- 2-B
K8ZKM 552- 23- 2-AB
K8TUL 550- 25- 1-A
WA8DVD 506- 23- 1-A
K8CEB 480- 20- 2-B
K8HVF 440- 20- 1-B
K8ZKH 374- 17- 1-A
K8IFL 312- 12- 3-B
W8SSK 308- 14- 1-A
W8RXY 264- 12- 1-B
W8SQP 264- 12- 1-B
W8FSZ 220- 10- 1-B
K8HXW 220- 10- 1-A
W8KWO 220- 10- 1-B
W8VFM/8 198- 9- 1-B
WN8EHM 156- 6- 3-B
W8VVR 154- 7- 1-B
K8JWE 144- 6- 2-B
K8ACO 132- 6- 1-B
W8EEV 110- 5- 1-B
W8PZ 72- 3- 2-B
K8KYM 72- 3- 2-B
K8TTD 66- 3- 1-A
W8BQD (W8s BQD TJQ) 4480-160- 4-AB
K8JZP (K8s DVR JZP SBH) 3360-120- 4-AB
K8WUZ (2 oprs.) 2080- 80- 3-A
K8BZY (K8BZY, WA8EAL) 2028- 78- 3-AB

Ohio

K8REG 11,680-366- 6-AB
K8NYM 10,914-321- 7-A
K8TOH 10,332-287- 8-AB
K8ZES 7452-207- 8-AB
K8UOZ 5406-159- 7-AB
W8ENH 4740-158- 5-AB
K8MIK 4590-153- 5-AB
W8JKN 4420-170- 3-AB
K8YWF 4224-133- 6-AB
K8MHJ 4140-138- 5-AB
K8PNV 3952-152- 3-AB
W8LOF 3920-140- 4-AB
K8JXE 3692-142- 4-AB
K8KNU 3562-137- 3-AB
K1CRQ/8 3520-110- 6-B
W8MOW 3360-120- 4-AB
W8KPZ 3276-126- 3-AB
K8HRR 2940- 98- 5-ABDE
W8IPT 2860-110- 3-AB
W8PBX 2834-109- 3-AB
W8LDZ 2828-101- 4-AB
W8DPW 2736-114- 2-AB
W8MIO 2704-104- 3-AB
K8GDV 2704-104- 3-A
W8ZOE 2704-104- 3-AB
K8OWB 2676-112- 2-A
WA8AEY 2626-101- 3-AB
WA8BAW 2600-100- 3-AB
K8VFG 2587-100- 3-AB
W8VCP 2470- 95- 3-AB
K8PXX 2240- 78- 5-A
K8ALO 2250- 75- 5-B
W8ZSK 2156- 98- 1-AB
K8WGJ 2090- 95- 1-AB
K8KDW 2028- 78- 3-AB
K8UGI 1924- 74- 3-AB
K8DQW 1876- 67- 4-AB
W8MCW 1870- 85- 1-AB
K8TUY 1752- 73- 2-AB
WA8DSN 1728- 72- 2-AB
W8EVE 1638- 63- 3-A
K8ZTV 1632- 68- 2-A
W8EHW 1512- 63- 2-B
K8UWZ 1512- 63- 2-A
K8ZCT 1456- 56- 3-A
W8DWT 1440- 60- 2-B
K8TFL 1344- 48- 4-AB
W8AJ 1315- 51- 3-B
W8TYL 1300- 50- 3-B
K8IIS 1224- 51- 2-B
K8PBE 1222- 47- 3-A
W8JFC 1014- 39- 3-A
W8GVQ 984- 41- 2-AB
K8KFY 756- 27- 4-B
W8KSE 748- 34- 1-AB
K8HZD 676- 26- 3-AB
K8EJI 638- 29- 1-A
W8BTW 600- 25- 2-AB
WA8BZT/8 594- 27- 1-B
K8UYU 528- 22- 2-AB
K8VZG 480- 20- 2-AB
W8VKB 442- 17- 3-B
K8LEA 384- 16- 2-A
WA8DON 374- 17- 1-AB
K8BSO 360- 15- 2-AB
W8LGY 360- 15- 2-AB
WA8AFI 324- 14- 2-AB
WN8CJJ 286- 13- 1-B
W8ZOF/8 264- 12- 1-B
WA8EGP 242- 11- 1-A
K8UZE 224- 8- 4-B
WA8BUL 110- 5- 1-B
K8KNU/8 22- 1- 1-A
K8PNV/8 22- 1- 1-A
K8UQA/8 (5 oprs.) 15,840-396-10-A
W8CCI (multiopr.) 15,390-405- 9-ABC
K8ZQQ/8 (K8ZQQ, WA8CME) 8204-293- 4-AB
WA8AKK (K8HNU, WA8AKK) 6272-196- 6-AB
W8ID (5 oprs.) 4088-146- 4-AB
WA8EFX (2 oprs.) 3904-122- 6-A
K8SUB (K8SUB, W8NTL) 3360-112- 5-AB
K8WPF (K8s WPF WTM) 3120-120- 3-AB
K8WTO/8 (K8WTO, WA8s EIF EIG) 2448-102- 2-B
K8BHH/8 (4 oprs.) 2280- 76- 5-B
WA8CNV (WA8s AGV CNV) 1440- 60- 2-A
WA8BOG (WA8s BOG BOH CRG) 840- 35- 2-A
K8DOC (K8s DOC TVD SZT) 676- 26- 3-A

HUDSON DIVISION

Eastern New York

K2GCH 12,528-261-14-AB
WA2FYF 9246-201-13-AB
WA2ROJ/2 8442-201-11-AB
K2CVG 6116-139-12-AB
WA2TFC 4770-135- 8-AB
WA2QGS 4000-100-10-A
W2HJO 3400- 85-10-B
W2HZZ 3400- 85-10-B
WB2DQO 3348- 93- 8-AB
WA2REO 2176- 64- 7-AB
K2UKE 2080- 52-10-AB
WA2HAQ 2040- 51-10-AB
W2RHQ 1704- 71- 2-AB
WA2PZB 1140- 38- 5-A
K2LXY 1008- 36- 4-A
WA2LPG 864- 36- 2-B
W2CTH 840- 30- 4-AB
W2HF/2 800- 25- 6-B
WA2SYH 744- 31- 2-A
WN2DEV 559- 30- 3-B
W2IP 578- 17- 7-B
WB2BZE 546- 21- 3-B
WA2SYE 480- 20- 2-A
WA2RWU 408- 17- 2-B
K2OZT 390- 15- 3-AB
WV2WYY 308- 14- 1-B
WA2LBO 242- 11- 1-A
WA2LVD 242- 11- 1-A
W2LWI (W2s JFB LWI) 7803-145-17-B
K2KTJ (4 oprs.) 4158- 99-11-A
W2YPM (2 oprs.) 2774- 73- 9-B
WV2ZOQ (3 oprs.) 1470- 49- 5-B
WA2UZH/2 (WA2UZH WN2s ADM ADN) 72- 3- 2-B

N. Y. C.-L. I.

WB2CZI 18,382-356-16-A
WA2JSC 16,224-338-14-AB
K2SWI 12,096-252-14-A
K2JWT 6762-161-11-ABC
WA2YXS 6720-140-14-B
WA2FUZ 5400-150- 8-AB
W2TUK 4760-140- 7-AB
W2KXG 4320-108-10-B
K2PQY 3984- 83-14-AB
K2ETI 3638-107- 7-A
W2GLU 2940- 70-11-B
WA2GCL 2754- 78- 8-A
K2RPW 2618- 77- 7-A

(*Continued on page 154*)

V.H.F. QSO Party Announcement

June 8-9

HERE's your chance for real v.h.f. fun in the June V.H.F. QSO Party, scheduled for June 8 and 9. This gala operation, open to all amateurs who can work any band or bands 50 Mc. or above, gets under way at 2 P.M. (1400) your local standard (*not* daylight) time Saturday, and continues until 10 P.M. (2200) local standard time Sunday.

To raise other participants just call "CQ VHF QSO Party" or "CQ Contest." The only exchange required during contact is ARRL Section (see page 6, this *QST*). Score one point for completed exchanges made on either 50 or 144 Mc., two points or exchanges on 220 or 420 Mc., and three points for exchanges on higher v.h.f. bands. To derive final score, the sum of these points is multiplied by the number of different ARRL Sections worked per band. You may work the same stations on different bands to increase both your contact points and multiplier.

A certificate will be awarded to the top scorer in each ARRL section, plus VE8, as well as a certificate to the highest scoring Novice, and multiple-operator station in each section from which at least three entries in that special category are submitted.

Please follow the log and summary form as shown in the example. You can get these logs free by writing to the ARRL Communications Dept., 38 La Salle Rd., West Hartford 7, Conn. Reports should include your call and ARRL section, as well as times, calls, and sections of stations worked. Your entry must be postmarked by July 1, 1963, for *QST* listing.

Rules

1) The contest starts at 2:00 P.M. Local Standard Time, Saturday, June 8, and ends at 10:00 P.M. Local Standard Time, Sunday, June 9. All claimed contacts must fall within this period and must be on authorized amateur frequencies above 50 Mc., using permitted modes of operation.

2) Name-of-section exchanges must be acknowledged by both operators before either may claim contact point(s). A one-way exchange, confirmed, does not count; there is no fractional breakdown of the 1-, 2-, or 3-point units.

3) Fixed-, portable- or mobile-station operation *under one call*, from one location only, is permitted. A transmitter used to contact one or more stations may not be used subsequently under any other call during the contest period (with the exception of family-type stations where more than one call is assigned to one location by FCC).

4) Scoring: *1 point* for completed two-way section exchanges on 50 or 144 Mc.; *2 points* for such exchanges on 220 or 420 Mc.; *3 points* for such exchanges on the higher v.h.f. bands. The sum of these points will be multiplied by the number of *different* ARRL sections worked per band; i.e., those with which at least one point has been earned. Reworking sections on additional bands for extra section credits is permitted. Cross-band work does not count. Contacts with aircraft mobile stations cannot be counted for section multipliers.

5) A contact *per band* may be counted for each station worked. Example: W2BLV (S.N.J.) works K1CRQ (Conn.) on 50, 144 and 220 Mc. for complete exchanges. This gives W2BLV 4 points (1 + 1 + 2) and also 3 section-multiplier credits. (If W2BLV contacts other Connecticut stations on these bands, they do not add to his section multiplier but they do pay off in additional contact points.)

6) Each section multiplier requires completed exchange with *at least* one station. The same section can provide another multiplier point only when contacted on a new v.h.f. band.

7) Awards: A certificate will be awarded to the high-scoring single-operator station in each ARRL section. In addition, the high-scoring multi-operator station will receive a certificate in each section from which three or more valid multiple-operator entries are received. Certificates will also be given to the top Novice in each section where three or more such licensees submit logs. Award Committee decisions will be final.

8) Reports must be postmarked no later than July 1, 1963, to be eligible for awards. Follow the sample log for correct form, or a message to Headquarters will bring printed blanks for your convenience. QST

SUMMARY OF CONTACTS, V.H.F. QSO PARTY

STATION...W1AW.....ARRL SECTION...CONN.....

Freq. Band (Mc.)	6/9 EDST Date	Time	Station Worked	Section	Record of new Sections for each band 50	144	220	420	other 1215	Contact Points
50	1501		W1MEH	CONN	1					1
	1505		WA2BAH/2	ENY	2					1
	1515		W1MHL/1	NH	3					1
	1520		W1YDS	CONN						1
144	1600		W2GKR	NNJ		1				1
	1605		W1MHL/1	NH		2				1
420	1800		W1YDS	CONN				1		2
1215	1900		W1HDQ	CONN					1	3

(Enter below on last sheet used)

Band	Contacts	Points	Mult.
50 Mc.	4	4	3
144 Mc.	2	2	2
220 Mc.			
420 Mc.	1	2	1
Other	1	3	1
TOTALS	8	11	7

Check one: [✓] Single operator [ ] Multiple operator

Calls of operators having a share in above work.....

Power input.....

Transmitter.....

Receiver.....

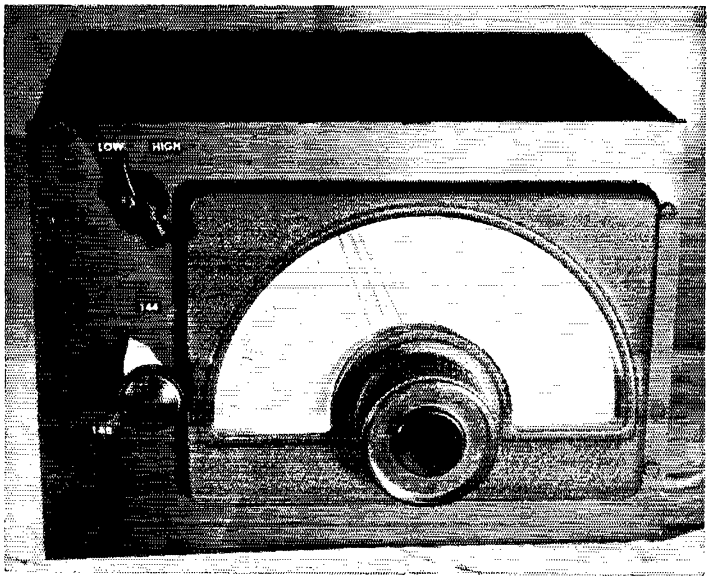
Antenna.....

CLAIMED SCORE: 11 (Points) × 7 (Mult.) = 77 FINAL SCORE

I hereby state that I have abided by the rules specified for this contest and that, to the best of my knowledge, the points and score as set forth in the above summary are correct and true.

Signature ..... Call ..... Address .....

Sample log and summary form giving an example of how to score. Count one point for contacts on 50 and 144 Mc., two points for 220 and 420 Mc. contacts, and three points for higher v.h.f. bands. Multiplier is sum of sections per band. You can obtain these log forms free by writing to ARRL Communications Dept., 38 LaSalle Rd., West Hartford, Conn. Logs must be postmarked by July 1.



Tuning system for use with v.h.f. crystal-controlled converters. Range is two megacycles counterclockwise and another two clockwise. Throwing the switch (marked "low" and "high") keeps the reception frequency going up continuously. Control at the lower left is for trimming the mixer input circuit.

Full-Band V.H.F. Coverage with Amateur-Bandspread Receivers

Tunable I.F. Device of Novel Design

BY ROBERT M. FORSTER,* W2DVG

THE ham-bands-only receiver offers many advantages to the amateur as compared with the general-coverage receiver, but in terms of the needs of the v.h.f. operator it leaves much to be desired. It has no continuous coverage of 4 megacycles for tuning an entire v.h.f. band, and none of the usual alternatives are entirely satisfactory. With crystal switching in the converter, to use one of the lower bands as a tunable i.f., the amount of dial cranking becomes inordinate. Translation of the dial markings into 2-meter or 6-meter equivalents is difficult and confusing. The crystal oscillator tank (and possibly its frequency-multiplier stage tank) may require adjustment. Changing crystals in the receiver (on the few models where this is possible) ties up too many receiver crystal positions.

Both methods require that a choice be made between staggered tuning (for example, 144 to 145 Mc., then 146 to 145 Mc., etc.) and double dial cranking. Of course, these latter disadvantages can be eliminated by selecting crystals ground for alternate sides of the band segment, but this widens the range over which the crystal oscillator has to function and increases the chance that oscillator retuning will be needed.

Introduction of a second crystal-controlled converter between the v.h.f. converter and the receiver will eliminate a few of the disadvantages. The relationships can be so arranged that in place of high-frequency overtone crystals, lower-frequency cuts are used in a grid-plate oscillator, and these crystals can be selected for high-low, low-high beating. Thus the operator can tune, say, clockwise from 144 to 145 Mc., counterclockwise from 145 to 146 Mc., etc. This method still leaves us with the possibility of interference from the stronger signals in the tunable i.f. range.

If the receiver is set on some quiet spot and the tuning done in the v.h.f. range, this disadvantage is overcome, but we are all too familiar with the oscillator instability troubles that this involves. At this point a second converter suggests itself — one which is tunable over a 4-Mc. range at the chosen i.f. It should solve most of the problems. Dial cranking can be kept within reasonable limits, the dial scale can be calibrated and read easily, crystals need not be switched in either the receiver or the converter, and the receiver can be set on a quiet spot.

With some misgivings (based on the possibility of spurious beats, of conversion and detection of unwanted signals by the second converter, etc.) an experimental model was made up to test this idea. It was intended for use with a 2-meter crystal-controlled converter having an output

* c/o Adelphi Electronics, Inc., Jericho Turnpike, Westbury, Long Island, N. Y.

from 7 to 11 Mc. Its fixed output frequency is 3.55 Mc. The tunable converter oscillator tunes from 10.55 to 14.55 Mc. (10.55 minus 7 and 14 55 minus 11 = 3.55). The basic circuit was copied from that shown on page 125, Fig. 5-40, 39th edition, *ARRL Handbook*, and only the tuned circuit values were changed, to cover the desired ranges.

The results were more than gratifying. No spurious responses were evident and the conversion efficiency was excellent. A comparison of the results achieved (as measured by the receiver's S meter, and by ear) disclosed no discernible difference in signal strength or background noise between the signals when passed through the tunable converter and when fed directly into the 7–7.6-Mc. range of the bandspread receiver. Nevertheless, some bugs had developed. The converter was microphonic and hum modulated. Tuning was much too critical. The instability factors could be disposed of by sturdier construction, higher C in the oscillator tank and better filtering in the plate supply, but the tuning problem was another matter. Consider that when a tuning capacitor is rotated through a half circle to cover a 4000-kc. range, each degree of rotation covers in excess of 20 kc.! Since the typical receiver band-pass is of the order of 3 kc., it is difficult to tune in signals with any precision.

A little experimentation with receiver tuning showed that if the converter covered no more than about 10 kc. per degree of rotation, tuning would be reasonably comfortable. It follows that if the converter dial can be tuned 360 degrees instead of 180, the tuning problem will be solved.

The simple way to obtain 360 degrees rotation is to cover the 4-Mc. band in two steps; i.e., to band-switch the converter. This can be done by either shorting out coils or by using padder capacitors, but this necessitates staggered tuning, one of the objectionable features discussed above.

If a way could be found to flip-flop the tuning capacitor 180 degrees at the end of its half-circle rotation, the staggering would be overcome. While it may be possible to do this by mechanical means (perhaps with clutches), the technique would appear to be beyond the capabilities of the home-workshop craftsman. On the other hand, electrical flip-flop is feasible; the only requirements being the addition of a switch and use of a differential capacitor.

Consider an oscillator tank of the following basic design: in Fig. 1, C_1, C_2 is a dual capacitor of value X per section. C_3 is a fixed capacitor of the same value. This value is such that when C_2 and C_3 are switched across L, and C_2 is at maximum, the tank will tune to the low end of a desired frequency range. Now, when C_1 is switched across L, and is set at minimum, the tank will tune to the high end of the desired range. C_1 and C_2 are so arranged that their minima are 180 degrees apart.

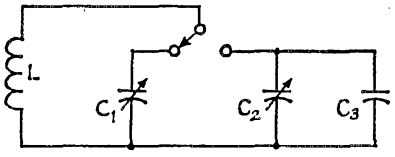
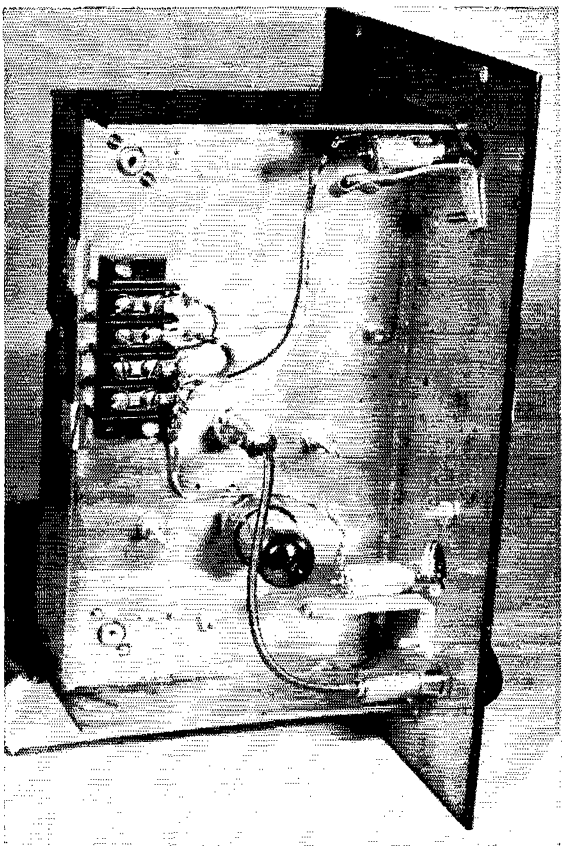


Fig. 1—Basic tank circuit used in the tunable oscillator in the converter described. C_1 and C_2 are the two halves of a differential capacitor. Operation of the circuit is explained in the text.



Top view of the tunable i.f. system. The flexible shaft running to the middle of the chassis actuates the low-high switch from the front panel. Mixer-oscillator tube is a 6U8.

If tuning is started with C_1 in the circuit (at minimum), the frequency will be 14.55 Mc. When C_1 is turned to maximum capacity, the frequency will be, say, 12.55 Mc. When the switch is thrown to the other position, connecting C_2 and C_3 into the circuit (remembering that at this point C_2 is at minimum and C_3 equals C_1 at maximum), the frequency will again be 12.55 Mc. When C_2 is turned in the opposite direction to its maximum setting, the frequency will decrease to 10.55 Mc. By this technique, a v.h.f. band can be spread over two 180-degree rotations of a dial (one clockwise and the other counterclockwise) without reversing the direction of frequency change. A practical application of these principles is shown in the photographs and in Fig. 2.

For purposes of good stability the oscillator tank should have a reasonably high minimum

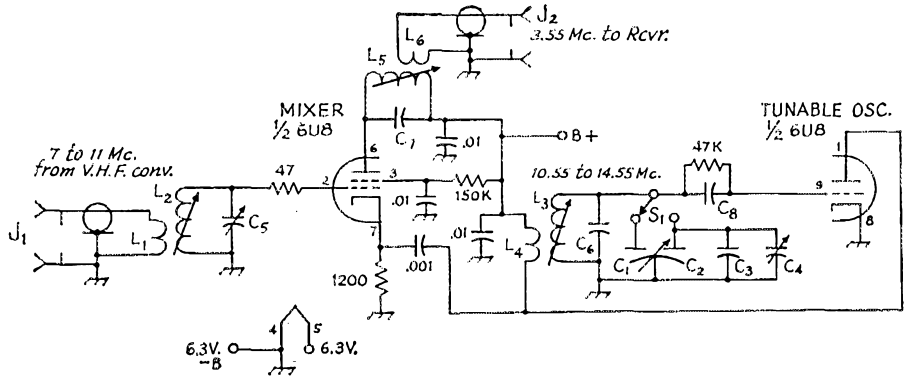


Fig. 2—Schematic diagram and parts information for the tunable system for use with crystal-controlled v.h.f. converters. Resistors are ½ watt. Capacitors are disk ceramic, values in μf. unless specified below.

C_1, C_2—Two halves of differential capacitor, labeled separately for purposes of description, 51 pf. per section (Johnson 167–33 or 50LA15).
C_3—43-pf. silver mica.
C_4—10-pf. cylindrical trimmer (Erie 532–10).
C_5—140-pf. miniature variable (Hammarlund APC-140B).
C_6—75-pf. silver mica.
C_7—82-pf. silver mica.
C_8—270-pf. silver mica.
J_1, J_2—Coaxial chassis connector.
L_1—6 turns No. 28 enam. over cold end of L_2.
L_2—9- to 18-μh. slug-tuned coil (North Hills 120D).
L_3—1.1- to 1.7-μh. high-Q slug-tuned coil (North Hills 1300E).
L_4—4 turns No. 28 enam. at cold end of L_3. See text.
L_5—18- to 36-μh. slug-tuned coil (North Hills 120E).
L_6—8 turns No. 28 enam. over cold end of L_5.
S_1—Two-position ceramic wafer switch. Turned from front panel by flexible shaft.
Cabinet—10 by 7 by 8 inches (Bud C-993).
Chassis—5 by 7 by 2 inches, steel (Bud CB-629).
Dial—National ICN.

capacitance. As a practical matter the minimum will have to be determined by the capacitance change available in the differential capacitor. The largest one readily available is the Johnson 167–33 (4.6 to 51 pf.), having a change per section of approximately 46 pf., and a total change of approximately 92 pf. For tuning from 10.55 to 14.55 Mc. with a change of 92 pf., a fixed padder of 75 pf. and a coil of 1.5 μh. works out about right in practice.

If C_3 is exactly the same size as C_1 (taking into consideration stray capacitances, etc.), switching from C_1 to C_2, C_3, when C_1 is at maximum will not change the resonance of the tank. Such exactness cannot be attained in practice with a fixed value. Therefore, in the actual unit, C_3 is a fixed value smaller than the maximum of C_2, and a variable padder, C_4, is connected in parallel with it.

The converter shown was built on a chassis and panel made of heavy brass. However, the panel supplied with the Bud CB993 cabinet and a 5 × 7 × 2-inch steel chassis should be satisfactory, provided that they are securely bonded at four points. Do not depend upon the capacitor shaft to supply one of the bonds. No attempt was made to gang-tune the mixer. The tank L_2, C_5 has a relatively low Q and therefore tunes quite broadly. C_5 can be set at about midpoint in the low and high bands, respectively, and need not be adjusted except possibly for very weak signals.

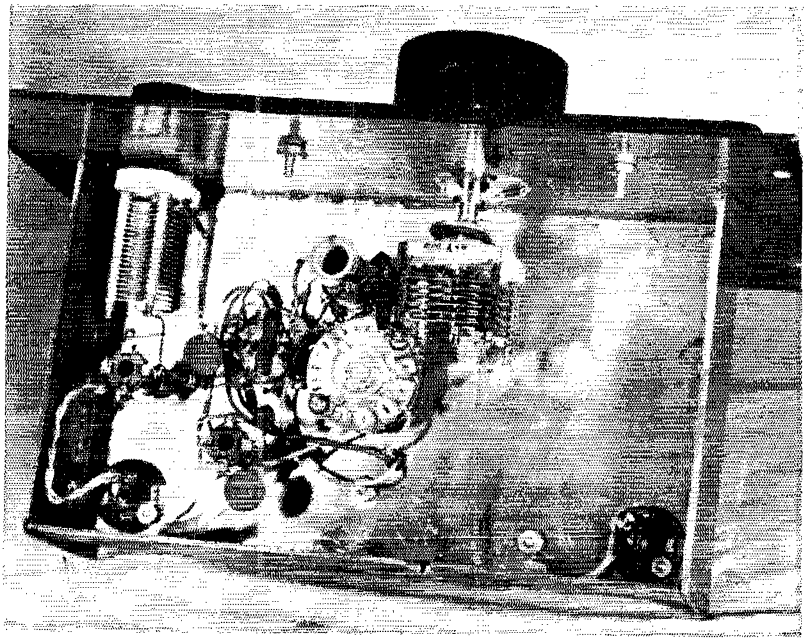
A word about tickler coil L_4. This should be wound in the same direction as L_3. The end of L_4 adjacent to L_3 is the one that is placed at ground r.f. potential by C_{10}. If the tickler winding is reversed, the oscillator will not function. The switch S_1 is so positioned on the chassis that the lug which connects to C_1 acts as a mechanical support at the rear end of C_1, C_2.

A well-filtered power supply should be used. A half-wave, *RC*-filtered supply that was satisfactory for a 2-meter crystal-controlled converter introduced hum modulation at 10 to 14 Mc. This was corrected by substituting a bridge (four "high hat" silicons) for the original rectifier and by replacing the filter resistor with a small choke.

A 2-meter converter (in this case an Ameco CN 144) fits into the back of the tunable-converter case, and is held in place by sheet-metal screws going through the case from the outside, into the holes provided to secure the top and bottom pieces of the converter case. The remodeled power supply is built into a small Minibox fastened outside the back of the Bud case.

An easy way to calibrate the tunable converter is to calibrate its oscillator by means of a general-coverage receiver of known accuracy. The following procedure is based on a crystal-converter output of 7 to 11 Mc., and the use of 3550 kc. as the fixed i.f. for the bandspread receiver. However, the principles can be applied to whatever combination suits the user's equipment and preferences. The calibrating receiver preferably should have a crystal calibrator. Set the converter switch in the *high* position (C_1 connected to L_3), and set C_1 at minimum. Set the calibrating receiver at 14.55 Mc., with the b.f.o. turned on. Adjust the slug of L_3 until the oscillator signal is zeroed in on the calibrating receiver. This fixes

the desired range. C_1 and



Bottom view exposes most of the tuning system. The differential capacitor, right center, is driven from the vernier dial. The mixer trimmer is at the left.

the high-frequency edge of the oscillator range at 14.55 Mc. Turn C_1 to maximum. Tune in the oscillator frequency on the calibrating receiver. It should be in the region of 12 Mc. Turn the switch to the *low* position, without disturbing the converter or calibrating receiver dials. Tune C_4 until the oscillator is again zero beat. At this point one frequency near the middle of the desired range is produced with the switch in either the *high* or *low* position, and band switching causes no interruption in the tuning. However, it is desirable to allow a little overlap on the off-chance that in use an unstable signal may be received at the change-over point. Therefore increase the calibrating receiver frequency by about 10 kc. and again zero in with C_4. This establishes the 10-kc. overlap.

Turn C_2 to maximum and check the resultant frequency. It should be lower than 10.55 Mc. At this point you might want to "center" the oscillator range. For example, if the minimum frequency is 10.45 Mc., you have 100 kilocycles of extra range. To put 50 kilocycles of this at each end of the dial (in terms of two half-circle rotations), set the calibrating receiver at 10.50 Mc. and adjust the slug on L_3 for zero beat. Tune to 14.60 Mc., switch from *low* to *high* and tune the converter for zero beat. If the amount of such tuning is small (under 5 degrees), the tuning is nicely centered over the dial.

Calibration of the oscillator by reference to the borrowed receiver may now proceed. Points 100 kc. apart are adequate for this purpose. To convert the oscillator calibration into 2-meter readings, for entry on the dial scale, simply add 133.45 to the oscillator frequencies.

The foregoing technique presupposes that the crystal used in the v.h.f. converter is of correct frequency (that it will convert a 144-Mc. to 7 Mc., etc.). If this is not the case, a reasonably-satisfactory over-all correction can be made by tuning in one signal of accurately known frequency in the v.h.f. band and then adjusting the slug on L_3 until that signal falls on the proper dial setting on the tunable converter.

With this setup it is a pleasure to tune a v.h.f. band. Mental gymnastics formerly needed to ascertain the frequency of the incoming signal are a thing of the past. Stability and sensitivity are excellent and single sideband can be copied as easily as on 20 meters.

The writer wishes to express his thanks to Hugh Neely, WN2BPK, for taking the photographs, and to Ed Stetzer, K2BZA, for assistance with the mechanical layout.

QST

Strays

More about that Scout Jamboree scheduled for October. *Any* ham, Scout or not, can participate by opening his station to visiting groups of local Scouts, so that the boys can have an even better conception of the world-wide nature of both ham radio and scouting.

The ARRL Net Directory is now available in Braille from the Clovernook Home and School for the Blind, 6990 Hamilton Avenue, Cincinnati 31, Ohio. It may be purchased in one volume, loose leaf, for $2.30, or in two volumes, magazine style, for $1.

A 50-Mc. Hand-Carried Transceiver

Effective Local Communication in One Small Handful

BY DAVID J. LIGHT,* K4IQU

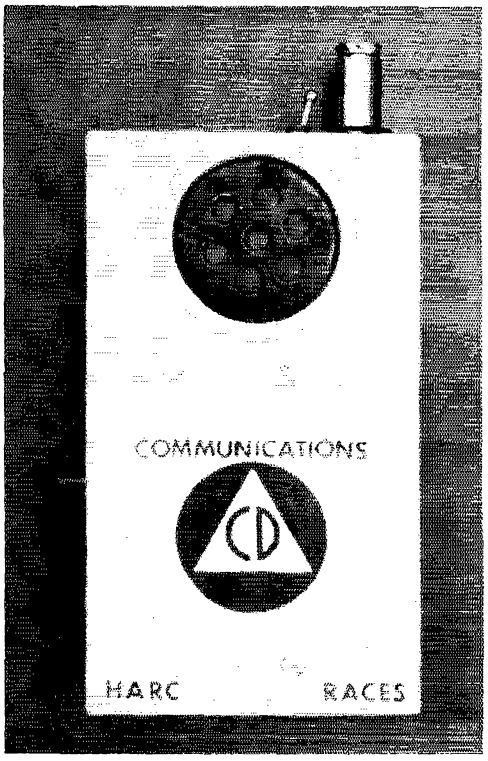


Fig. 1—A complete 50-Mc. transceiver, antenna and all in a 3 × 5 × 1 ¼-inch case. Whip extends to 52 inches total, giving good range with only a 9-volt battery for power.

In case of local communications emergencies, you can't beat the small self-contained battery portable for usefulness. This transceiver was designed for such work, and in addition it can be the means of having plenty of fun on 50 Mc. It is light in weight and small enough to be carried in a coat pocket, antenna and all, yet two of them will cover up to a mile or more over average terrain. One will work several miles in conjunction with a good mobile unit, and up to 15 miles or so with well-equipped base stations. Construction is well within the capabilities of the average amateur.

The sensitivity of the superregenerative detector, Q_1, more than matches the limited range of the low-powered transmitter. The two audio stages, Q_4 and Q_5, function on both *transmit* and *receive*. The transmitter has a 50-Mc. crystal oscillator, Q_2, and a straight-through amplifier, Q_3. Choice of suitable transistors is very wide. The Philco 2N1745s are among the less expensive types that work well at 50 Mc. The main considerations in the audio stages are high gain and adequate voltage rating. The r.f. amplifier and the second audio transistors are subjected to approximately twice the supply voltage, with modulation. There should be little change in the audio circuit for such inexpensive audio transistors as the 2N109, for example. The audio stages operate Class A.

Current drain on *receive* is about 10 ma. Total transmitting drain is about 25 ma., at 8.2 volts, the nominal voltage of a rechargeable "9-volt" battery. These batteries can be purchased complete with charging unit for a moderate price, and are recommended over dry batteries for long-term economy. You can make your own charging device if you like, following the information of Fig. 4. Up to 16 hours of operation is possible per charge. Charging time is also about 16 hours at the 12-ma. rate that this charging system provides.

Construction

Building will be easy if you have worked with transistors before, and not too bad even if this is your first venture with them. The main consideration is to provide heat sinking in soldering. Holding the lead with long-nose pliers between the transistor and the point being soldered will do it. Be careful about identification of transistor leads, and watch the polarity of the electrolytic capacitors.

*3805 Lakewood Drive, N.W., Huntsville, Alabama.

The main chassis is perforated circuit board, 2¼ by 3 inches in size; the type with the small ¼-inch-spaced holes. Mounting the large parts first helps to make things fit together well. Put in the send-receive switch first. Lay a piece of bus wire on the bottom of the board in U shape, following the outline of the switch, with the open end of the U toward the button end. Use this as a ground bus. Run another along the end of the board under the transformer, seen at the bottom of Fig. 3.

Use subminiature electrolytics, the ones with both leads coming out the same end. A working voltage of 10 is good enough for all capacitors except for C_6 and C_9, which should be 25. Arrangements of parts is not particularly critical.

The case was made from a standard aluminum box, 3 by 5 by 2¼ inches in size, the last dimension being cut down to 1¼ inches. A piece of the aluminum so salvaged is used to make a mounting bracket for the battery. This is fastened to the back cover of the case, as seen at the right side of Fig. 3. The send-receive switch projects out of the left side of the case in the front view, Fig. 1. It is the spring-return type. At the top are the on-off switch and the antenna, the latter shown in its all-down position. A sound-powered phone unit which serves as both earphone and microphone is mounted in the upper portion of the front of the case. The phone unit used here has high impedance (about 400 ohms) and matches the receiver output well. It is very thin and may be fastened in place with epoxy glue. Not the least of its advantages is price — two for 99 cents, surplus!

The antenna is a collapsible whip of the type sold for battery portable receivers and TV sets. Extended, it is 52 inches long, which is close enough to a 50-Mc. quarter wavelength to give good radiation characteristics. Use of a long whip of this kind helps to give good range with very low power, and is considerably more effective than the base- or center-loaded whips often used for hand-carried portables. It is mounted on a

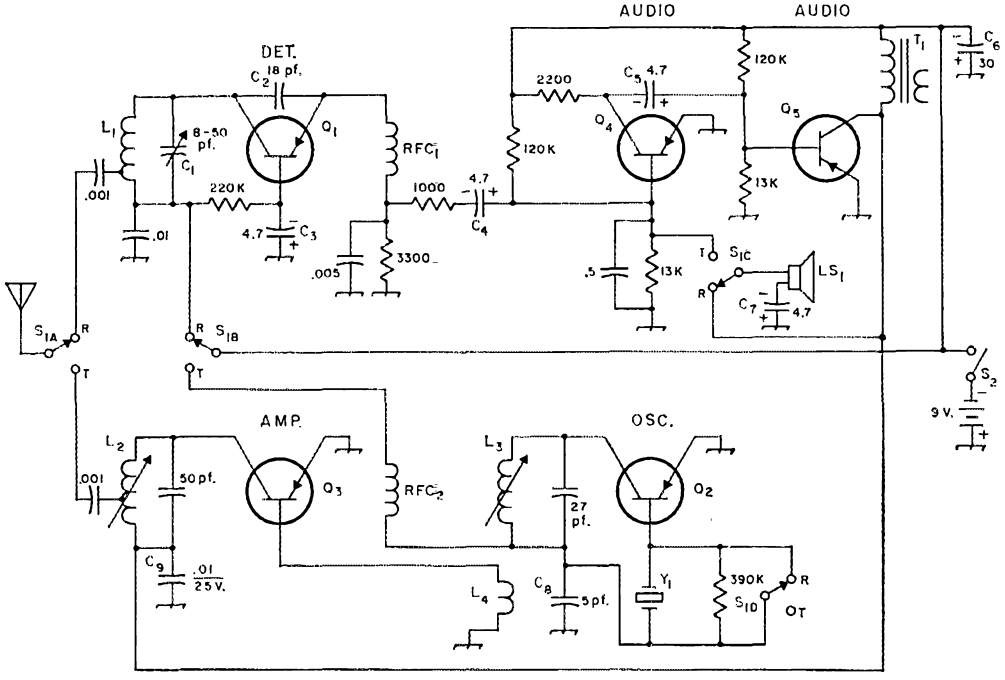


Fig. 2—Schematic diagram and parts information for the 50-Mc. transceiver. All parts should be the smallest available size. Unless otherwise indicated, capacitor values are in μf., working voltage 10. Those with polarity indicated are electrolytic.

C_1—8–50-pf. miniature ceramic trimmer.
C_2—18 pf. (See text).
C_3, C_4, C_5, C_7—4.7-μf. 10-volt electrolytic.
C_6—30-μf. 25-volt electrolytic.
C_8—5-pf. (See text).
C_9—0.01-μf., 25 volts.
L_1—8 turns No. 28 enam. wire, close-wound 3/16-inch diam. tapped at 1 turn.
L_2—7 turns No. 20 enam. wire, close-wound on 3/16-inch diam. iron slug, center-tapped.
L_3—7 turns No. 28 enam., close-wound on 3/16-inch diam. iron slug.
L_4—2 turns No. 28 enam., wound over low end of L_3.
LS_1—Sound-powered phone; surplus.
Q_1, Q_2, Q_3—2N1745. (See text.)
Q_4, Q_5—2N43A. (See text.)
RFC$_1$, RFC$_2$—75 turns No. 36 enam., scramble-wound on high-value ½-watt resistor or other similar form. Cement turns in place.
S_1—4 p. 2 t. pushbutton spring-return switch.
S_2—S.p.s.t. toggle switch.
T_1—50-mw. Class A output transformer, 500 to 8 ohms; secondary not used. Primary d.c. resistance 50 ohms max. (Lafayette TR-109).
Y_1—50-Mc. 3rd-overtone crystal. (Must be higher than 50.1 Mc.).

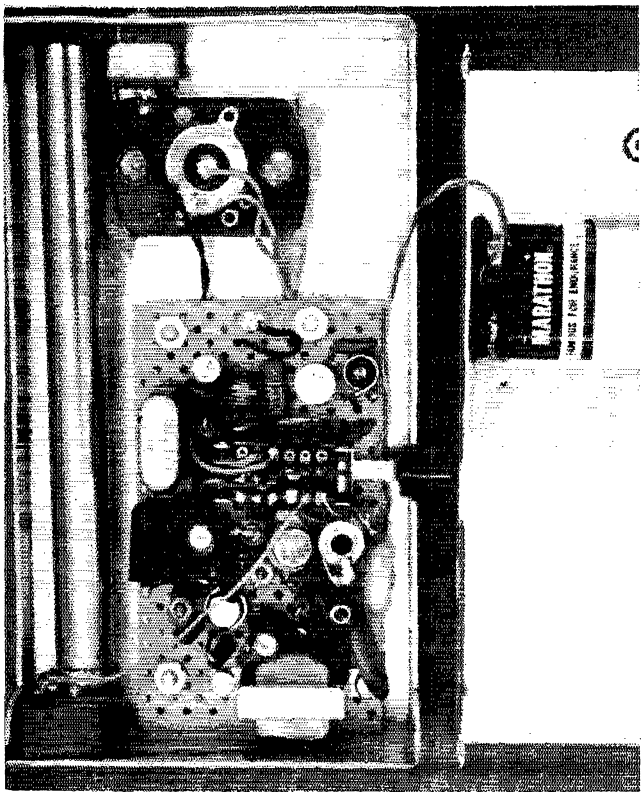


Fig. 3—Interior view of the 50-Mc. transceiver. All small parts are mounted on perforated circuit board. Antenna collapses into cylinder at the left. The 9-volt battery is clipped to the back cover of the case, right.

piece of bakelite or hard wood in the bottom of the case. The antenna may have some form of insulating mount. If none is supplied, a grommet in the top of the case should be satisfactory, if the base of the whip is firmly anchored.

Adjustment and Use

The output amplifier, Q_3, of the transmitter is cut off with no drive, so it can be left connected to the modulator, simplifying switching. Feedback in the crystal oscillator is controlled by the value of C_8. Try a trimmer to determine the value which gives the most output with the least collector current, and then install a fixed capacitor to match. Collector current will be around 4 ma. at 9 volts, and at full drive the amplifier will draw 8 or 9 ma. The transmitter may be tuned for maximum output by adjusting turn spacing in L_6, using the S meter on a receiver as a field-strength meter. Be sure that the antenna is at full length when this adjustment is made. Then, if only one transmitting frequency is to be used, the slug may be glued in place. Output is 30 to 40 milliwatts.

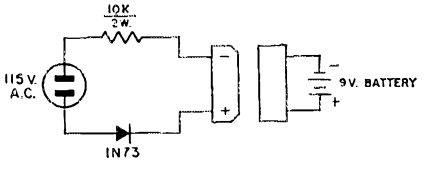


Fig. 4—Charging circuit for use with 9-volt battery. In normal use, a full charge will run the transceiver for about 16 hours. Recharging time is overnight, or up to 16 hours.

Smooth superregeneration in the detector is achieved by experimentation with the antenna tap on L_1 and the value of C_2. Coupling to the antenna is critical, and the tap may have to be set at a point somewhat below that which gives maximum weak-signal sensitivity, in order to make sure of having superregeneration at all battery voltage levels, and with a full-length whip. Temporary use of a 25-pf. trimmer for C_2 will enable the user to find the optimum value, after which a fixed capacitor may be installed at this point.

Usually equipment of this kind is employed in fixed-frequency service. Receiver tuning is broad enough so that no retuning is needed for appreciable changes in received-signal frequency, but if the user wishes to tune the entire band a shaft-type trimmer may be used at C_1. Mounting the crystal externally will permit changing the transmitter frequency readily.

Coverage with these units has already been described. The writer has built two of them, and the longest distance worked two-way has been with W4YFN, Madison, Ala., about 15 miles, over hilly terrain. This was with the beam at K4IQU in use on the transceiver. During this

(Continued on page 162)

Building Fund Progress

RESPONSIVE to the generous challenge of a group of prominent amateurs to complete the Building Fund drive ahead of schedule by offering to match contributions dollar-for-dollar, League members went to work to produce in April the largest single month's growth since the start of the campaign just a year ago. Our current flow of correspondence indicates that May will also be a banner month. Division percentages of quotas accomplished accordingly rose substantially during the month, as shown below.

Hudson	69.0%	Roanoke	46.6%
New England	63.2	Atlantic	39.4
Northwestern	63.1	Canadian	37.1
Dakota	57.9	Delta	35.9
Southwestern	56.7	West Gulf	34.0
Midwest	51.2	Rocky Mt.	33.0
Pacific	48.5	Great Lakes	31.0
Central	48.0	Southeastern	28.2

Because of some excellent promotional activities led by W1KKP at the division convention, a generous response from attendees moved New England from the middle of the pack to the #2 spot. These standings may change again next month as more conventions are held, or as members in a particular area undertake special projects for the benefit of the fund. Have you helped *your* division in its path to 100% completion?

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At its May meeting the Board of Directors expressed sincere thanks to every member who had shown his ardent support of the League by becoming a participant in the building fund drive, and urged that efforts be continued so that the goal may be reached as quickly as possible. We still have a long way to go; your help is needed! Remember — with the challenge of dollar-matching funds your $5 means a $10 growth in the fund; $25 means $50, and so on. Make your check payable to the ARRL Building Fund and mail it today! (Contributions are U. S. tax-deductible).

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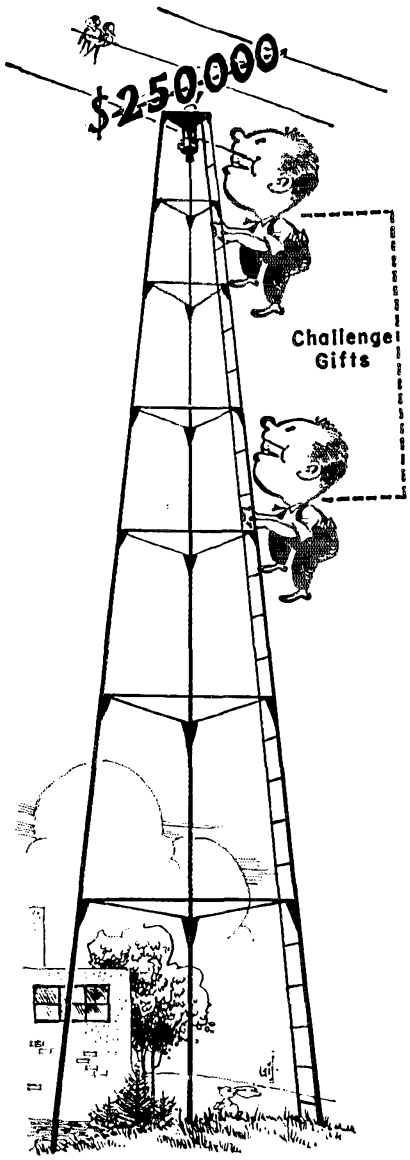
Officers and directors of the League inspected the new structure the day prior to their May meeting, found it nearing completion, and generally expressed thorough satisfaction with the adequacy and quality of its construction (see photo below). A small note of gloom was caused by an imminent strike of carpenters, especially with much of the remaining finishing touches in that field, which matter at press time had not been settled. Barring some such difficulty, however, by July 1st, the new address of the headquarters operations of the American Radio Relay League will be 225 Main Street, Newington 11, Connecticut. Come and see us! QST



A.M. for Collins with Front Panel Control

BY FRANK A. HAYES,* K2VVL

An ingenious circuit arrangement adds a.m. to s.s.b. transceivers with no effect on the normal operation. By moving the headphone jack and making use of the hole thus vacated, full panel control is achieved in a "no-holes" modification.

The a.m. control replaces the phone jack in the lower right-hand corner of the panel. No structural changes are made.

CONSIDERABLE interest has been displayed recently in modification of the Collins amateur s.s.b. transmitters to permit transmitting a.m. signals, and this interest seems likely to increase with the advent of the Collins 62S-1 Adapter, since the number of s.s.b. stations on 6 and 2 meters is likely to prove somewhat limited.

Two previous articles have appeared in *QST* on this subject[1,2]. The writer tried both of these suggested hookups successfully on a KWM-2, but they cause some derating of the transceiver on s.s.b. and in other respects leave a good deal to be desired, particularly in regard to operating convenience. In line with this experience the following objectives seemed desirable: front-panel control to match the other Collins controls, adjustable a.m. output, no reduction in sensitivity or output on s.s.b., and construction without mechanical changes to the equipment. With these objectives in view I began casting about to find some convenient location for the a.m. control, which would be a permanent feature and should have a built-in and workmanlike appearance, and in the process came to the jack in the front panel of the KWM-2 marked PHONES. This looked like the solution to the location problem.

I think that it can be assumed that very few operators of this equipment use headphones, at least with fixed station equipment, but anyone requiring their use would find it a simple matter to install a phone jack in the output lead to the speaker.

I found that an a.m. control with switch, as suggested by W6BNK,[2] would just fit in the space left when the phone jack was removed. This jack, incidentally, was not disconnected but was wound with tape to prevent shorts and tucked behind the lower chassis rail.

In order to use as much of the Collins construction as possible, the initial stages of the transmitter are left intact through the mechanical filter. Since at this point the signal is s.s.b. with no carrier, for a.m. transmission it is necessary to inject a carrier, i.e., an intermediate-frequency signal from the output of the beat-frequency oscillator. Guarding against loss in receiver sensitivity and or transmitter output, which have beset previously-suggested hookups, requires injecting this carrier in such a manner as not to disturb any of the existing s.s.b. circuits.

This problem is solved by injecting the 455-kc. first i.f. frequency from the b.f.o. into the 2.5- to 2.6-Mc. output of the v.f.o. These two frequencies then follow the v.f.o. circuit to the grids of the first transmitter mixer. It is thus not necessary to make any new connection to this mixer and the mixer balance is not disturbed. This proved to be a highly effective method for injecting an a.m. carrier. Not only is the carrier output ample for all emergencies but there is no derating of the transmitter on s.s.b. It will be seen from Fig. 1 that the means adopted for combining these two frequencies includes a relatively large r.f. choke, L_1, and a small capacitor, C_1. This combination is near series resonance for the low b.f.o. frequency, but since the self-resonant frequency of this choke is approximately 2.6 Mc., it completely blocks the v.f.o. frequency. Results of tests show no loss of either voltage with the a.m. control fully open.

The Collins schematics and, in the case of the KWM-2, the Collins "Information Letter"

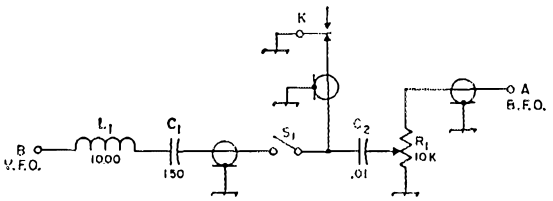
* Red Hill Road, Middletown, N. J.

[1] Popkin-Clurman, "A.M. with Collins S.S.B. Units," *QST*, September, 1961.

[2] McCollister, "Clean A.M. with S-Line Units," *QST*, April, 1962.

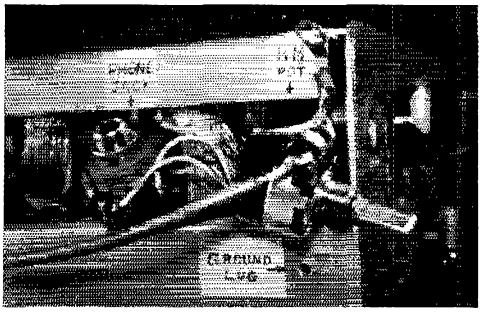
Fig. 1—Circuit for introducing carrier in output of Collins s.s.b. transceivers.

C_1—Silver mica.
C_2—Disk ceramic, 600 volts.
K—Existing relay in transceiver.
L_1—1-mh. r.f. choke, self-resonant at approx. 2.5 Mc. (see text).
R_1—Linear control.
S_1—S.p.s.t. toggle, mounted on R_1.



dated 11-15-60, page 2, should be kept in view in making the changes shown in Fig. 1. The "Information Letter" provides a diagram of the underside of the KWM-2 chassis locating all of the various components, including the connection turrets, which are given "E" numbers.

The components in Fig. 1 which comprise the a.m. control are R_1, S_1 and C_2. R_1 is an ordinary 10K control, and S_1 is a conventional control-mounted switch. C_2 is a 0.01-μf. ceramic-disk 600-volt blocking capacitor. L_1 and C_1 are common to all modes but are not a part of the a.m. control assembly. L_1 is a 1-mh. r.f. choke with a self-resonant frequency close to 2.5 Mc., such as the J. W. Miller "Micro Mite," type 9220-28.



The phone jack is not disconnected but simply moved out of the way.

C_1 is a 150-pf. silver-mica capacitor; the Elmenco D10 or D15 type is recommended. As applied to the KWM-2, points lettered A and B in Fig. 1 correspond to connection points E_{40A} and E_{40H}, respectively. The relay K is K_4 in the KWM-2. The leads and components connected to arm 10 and contact 9 in this relay should be disconnected and taped and the arm connected to ground. The normally-closed contact 11 is the one connected to S_1. We are indebted to W6BNK[2] for calling attention to the possibility of utilizing the contacts of relay K_4 associated with arm 10, although the use of these contacts in Fig. 1 is quite different.

The adjustment of the a.m. control is as follows: with R_1 counterclockwise so S_1 is off, (s.s.b. position), tune and load the transmitter in the normal manner, with the r.f. gain full clockwise. Set the "emission" switch to either sideband and the meter switch to "plate." Short the p.t.t. to put the relays in the transmit position and turn the a.m. control slowly clockwise (thus closing S_1) until the meter shows approximately 120-ma. plate current. Set the gain at about 1 o'clock and transmit. No change in setting is required to receive. If the exciter is connected to a linear amplifier such as the 30S-1, set the control to give about 175 watts output.

We have used this a.m. control at K2VVL for about a year, chiefly on MARS nets, and have received many favorable comments on the quality of the signal. QST

Strays

Amateurs attending the West Gulf Division Convention June 7-9 may receive temporary permission to operate in Mexico the week following. Write the McAllen Radio Club, Box 3589, Station 1, McAllen, Texas.

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Want to join the QRP Amateur Radio Club? At the present time there are about 600 members in 25 countries. Anyone running less than 100 watts c.w. or a.m. or 200 watts p.e.p. is eligible. For info send an s.a.s.e. to Jim Perry, K4WVX, 2691A 56th St., North, St. Petersburg 10, Fla.

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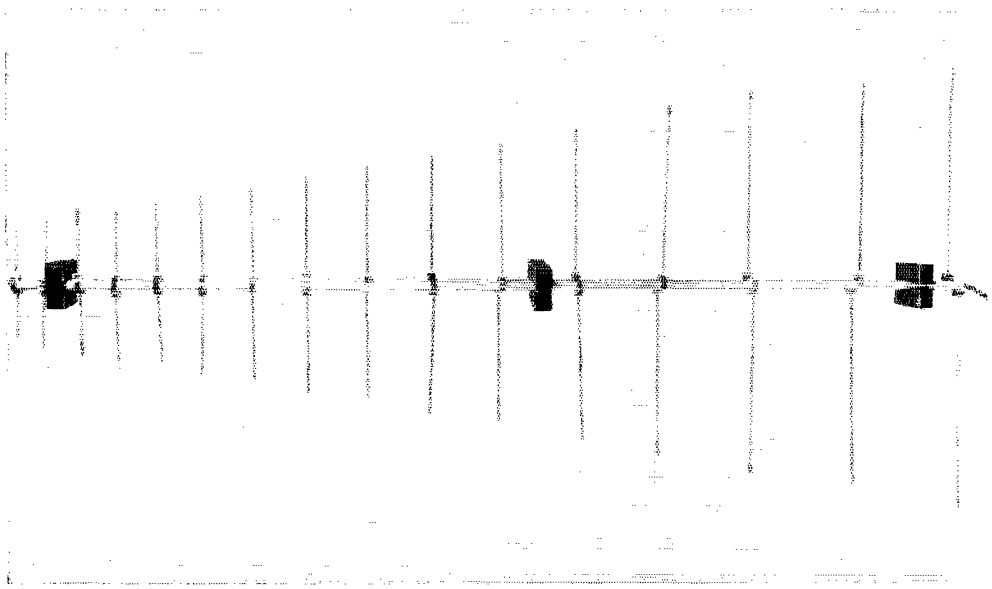
W1SNN authored "Single Sideband Package Plus" in the January, 1960, issue of *QST*, and at that time he offered layout data to those interested. Since then he has sent out over 2500 size D ozalids. However, he now finds it impossible to continue this offer, and wants everyone to know that this layout data is no longer available.

Governor George C. Wallace signed a proclamation declaring the week of April 15 Amateur Radio Week in Alabama. Looking on at the signing are Montgomery ARC President Bob Kinsaul, K4UJH; Betty M. Collier, K4ZNK; and Steve Godwin, WA4LYJ. Activities during Amateur Radio Week in Alabama included a QSO party and the Montgomery hamfest. *(Photo by K4DOL)*



Top view of the three-band log-periodic antenna. The three black objects on the booms are the wood block spacers. From this angle only one boom is visible; the other is directly below it.

Three-Band Log-Periodic Antenna

BY ROBERT F. HESLIN,* K7RTY/2

ONE problem confronting the amateur who works several different v.h.f./u.h.f. bands is that of finding room for all the necessary antennas. The antenna described here is simple to construct, inexpensive, requires only one feedline, and covers three amateur bands. In addition, it will give approximately 6.5 db. gain over a dipole, with constant impedance and radiation-pattern characteristics *versus* frequency. The antenna can be fed by either 52- or 75-ohm coax line and will produce a standing wave ratio of under 2.4:1 over the entire frequency range from 140 to 450 Mc. The antenna can also be fed with open-wire line but with a high s.w.r., which would make it essential to use an antenna coupler at the input end of the line.

This type of antenna is not new; it is being used both commercially and by the military in many different forms. The correct name for this type of antenna is "transposed log-periodic dipole array" [1]. The term "log-periodic" simply means an antenna whose electrical characteristics vary periodically with the logarithm of the fre-

* 28 Eagle Lane, Hauppauge, New York.

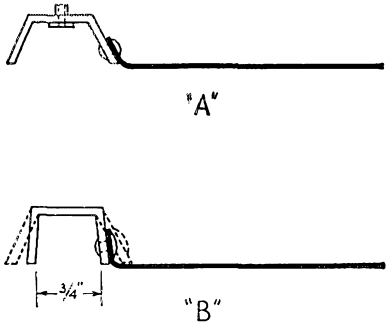


Fig. 1—TV strap-type stand-off insulators "A", are modified by removing the threaded insert and by bending the assembly to the dimensions shown in "B".

[1] Isbell, P.G.A.P., *IRE Transactions*, May 1960.

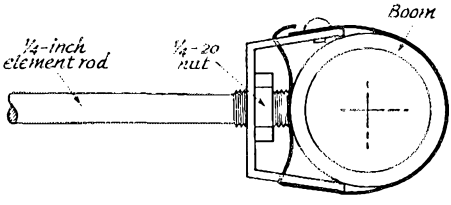


Fig. 2—This sketch shows how the elements are attached to the boom.

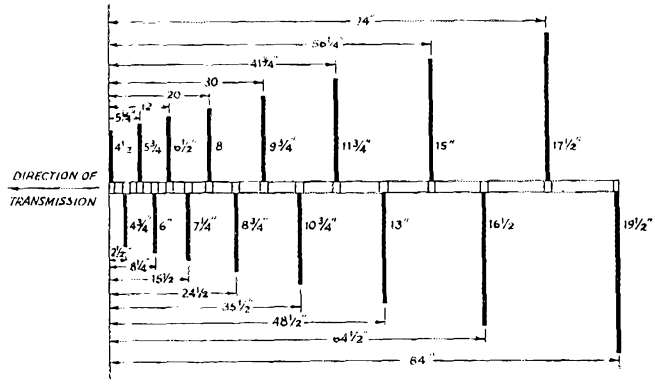


Fig. 3—Dimensions for one section of the log-periodic antenna. Dimensions along the boom are between element centers. The finished antenna consists of two of these sections, mounted one above the other as shown in the photograph.

quency. In other words, it is an antenna whose resonance transfers smoothly from one element to the next as the frequency is varied.

Several methods of construction were tried before the configuration shown here was obtained. The method described may not be the best, but it was felt that this was an antenna that could be built for a minimum of cost, time and effort. The only non-household tool required to build the antenna is a ¼–20 die.

Construction

The first step in constructing the antenna is to modify some stainless-steel TV strap-type single stand-off insulators. These will be used to hold the antenna elements to the booms. The sketch in Fig. 1 shows how the straps are modified. The small threaded insert in the stand-off usually comes spot welded in three places. If the strap is clamped edgewise in a vise and the insert given a sharp rap with a hammer, the insert will fall out without damaging the clamp. Thirty-two straps will be needed for the antenna.

Next, two standard 10-foot lengths of aluminum conduit, ½-inch in diameter, are cut to obtain two 7-foot sections. Aluminum rod, ¼-inch in diameter, is cut to give the required number of elements as shown in Table I. Each rod is then threaded with the ¼–20 die for a distance of about 1 inch on one end.

Fig. 2 shows the method of attaching elements and clamps to the booms. Fig. 3 shows the layout of one section. The complete antenna is made up of two of these sections, one above the other. Any convenient method of clamping the sections together can be used, as long as the booms are insulated from one another. The booms in the antenna shown here were held apart by three wood blocks, shown in Fig. 4. Two identical blocks are constructed of 4-inch pieces of 2 × 4

TABLE I

Parts list for the Three-Band Antenna

2 10-foot lengths of ½-inch rigid aluminum conduit
32 stainless-steel TV strip-type single stand-off insulators (Channel Master 9662)
2 12-foot lengths of ¼-inch diameter aluminum rod *
1 43-inch length of ¼-inch diameter aluminum rod *
32 ¼-20 aluminum or cadmium-plated nuts

* Place both 12-foot sections of ¼-inch aluminum rod together and cut in accordance with the following list so that two pieces of each length are obtained (dimensions are in inches): 19½, 17½, 15, 13, 11¾, 10¾, 9¾, 8¾, 8, 7¼, 6½, 6, 5¾, 4½. The 43-inch piece is cut to obtain two 16½ and two 4¾ inch pieces, a total of 32 elements.

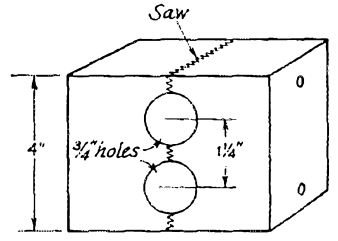


Fig. 4—The wood spacer-blocks maintain the proper spacing between the booms. Three blocks are required.

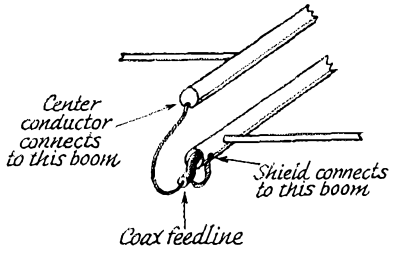


Fig. 5—The three-band antenna is fed at the short-element end of the boom. The coax shield connects to one boom and the center conductor connects to the other. The center conductor should be made as short as possible. It is shown here longer than necessary, in order to clarify the connections.

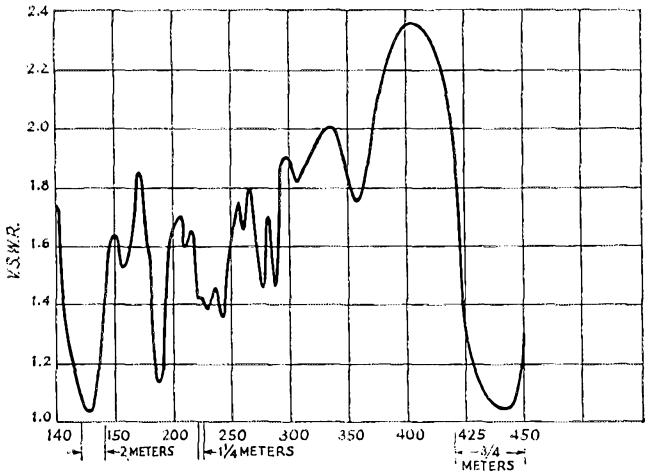


Fig. 6—Voltage standing wave ratio on a 50-ohm line does not exceed 2.4 to 1 over the entire frequency range of the antenna.

lumber. Two ¾-inch holes are bored through the blocks and then the blocks are sawed down through the center as shown in Fig. 4. The 1¼-inch spacing (between centers) between the two booms should be adhered to as closely as possible. These two blocks are placed near the ends of the antenna booms and clamped together with long bolts or wood screws. The third block is identical to the first two, except that 4 × 4 lumber is used. This permits the use of a mast which can be attached to a suitable coupling mounted on the 4 × 4 center block to support the antenna. All of the blocks should receive several coats of varnish to prevent warping and water absorption.

In assembling the antenna the second section is rotated 180 degrees about the boom axis before it is attached above the first section so that, looking at the completed antenna from the top, the elements of the same length will appear to be end-to-end.

Fig. 5 shows the method of feeding the antenna. The coax cable runs through the inside of one boom and is attached to the antenna at the short-element end, as shown. The shield of the coax is folded back and tightened under the clamp which holds the first short element. The center conductor is then run over to the other boom and it, too, is tightened under an element clamp. This method of feeding provides an "infinite balun" and presents a good match to either a 50- or 75-ohm coaxial line.

Performance

After construction of the antenna, it is only necessary to raise it to a suitable height; no final tuning should be necessary. As mentioned earlier, the antenna will give a gain of up to 6.5 db., and radiation patterns measured with the antenna on top of a 50-foot tower show a pattern similar to that of a Yagi with the main lobe off the short element end of the antenna. Impedance data for the antenna is given in the chart in Fig. 6.

The assistance of Mr. R. Logan, Section Head of Microwave and Antenna Laboratories, Fairchild Electronics Systems Division, Wyandanch, New York, in the preparation of this article is appreciated.

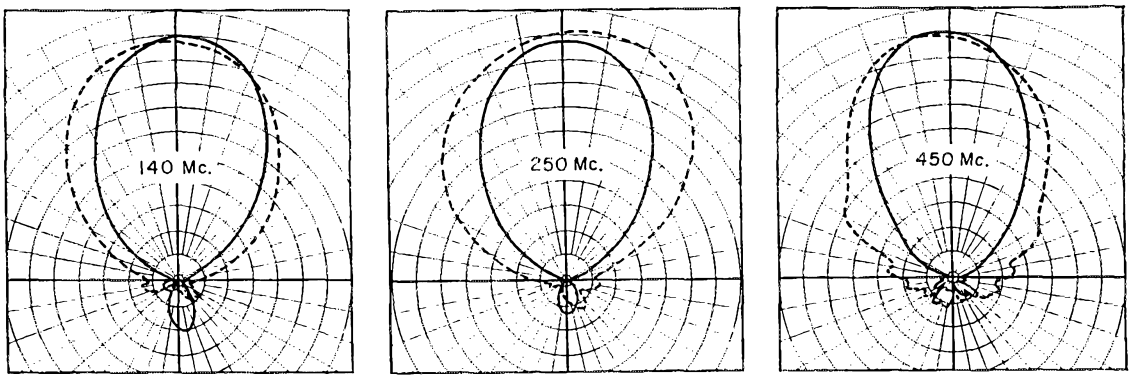


Fig. 7—Relative field strength for three frequencies covered by the log-periodic antenna. The solid lines are the horizontal and the dotted lines are the vertical field patterns.

Criticizing C. W. Signals

How to Tell a Dah from a Chowp

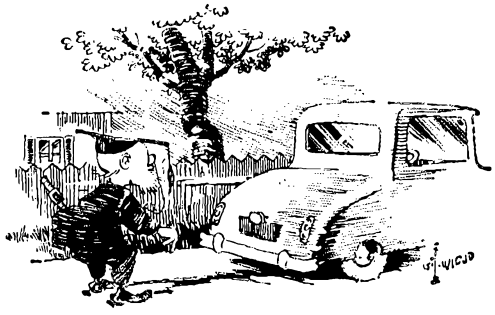
BY BYRON GOODMAN,* W1DX

One of the recurring suggestions for improving amateur radio in general is an expanded monitoring program with teeth in it, manned by the FCC or a volunteer or appointed group of amateurs. With the exception of the perennial offenders, everyone seems to be in favor of such a move. It would seem logical, however, to have this group confine its work to observations and citations of more serious violations (off-frequency, excessive power), and leave the remainder to the amateurs themselves. To use an important group like this to make observations of signal quality makes about as much sense as expanding our police-cruiser forces to tell motorists when their headlights are on during the daytime. Motorists tell each other about daytime headlights; why can't hams tell each other about poor-quality signals? Every QSO is an opportunity to comment on the other station's signal; who needs a formal monitoring system for routine work like that?

Two probable reasons for not criticizing the other station's signal come to mind. First, there seems to be some deep-rooted reluctance to tell another man about his signal's defects, for reasons ranging from "I don't want to hurt his feelings" to "Gee, maybe he won't QSL!" (If any reader thinks this latter reason is not a factor, let him consider the ludicrous strength reports given a weak-but-desirable DX station.) Let's be honest; a motorist doesn't get teed off if you flash your lights to signal him that his headlights are on, any more than he flares up if you tell him he has a stop light that doesn't work or a tire that is low. He may very well get angry if you tell him he's a jerk for having bought a Viber Eight, but this is because you are attacking his judgment, not just alerting him to a technical fault that can be corrected. Let's get away from this soft-soap kid stuff, and if the other fellow's signal has something obviously wrong with it, say so. You help the other fellow and you help the band.

The second reason for not criticizing another's signal is one of personal doubt. You ask yourself, "How do I know if I'm right about this? Maybe there's something wrong with my receiver. What if this other guy is a wheel or an engineer or something? Or what if he comes back and says he has a 100-percent manufactured station, installed and tuned by a field engineer?"

Considering the last doubt first, manufactured gear can get out of kilter just like anything else. Even the most highly-touted equipment can develop a leaky capacitor or a faulty tube; just because a piece of gear has a revered nameplate on it is no guarantee that it can never go sour. (Need we mention the possibility of misadjustment by the operator?) Much ham gear has been designed by engineers who weren't experienced hams, or who were all-phone no-c.w. (or vice versa) types, and the gear came on the market with *built-in* faults. (If this situation ever changes, *QST* will have a much smaller *Hints & Kinks* section.) If the other guy is a wheel or an engineer or something, so what? *His* stop lights burn out just like anyone else's.



HIS STOP LIGHTS BURN OUT JUST LIKE ANYONE ELSE'S

Yes, there could be something wrong with your receiver, and if that were the case *all* signals of similar strength would show the same fault. It doesn't take very long to check around the band and see if suddenly a lot of signals are distorting or have hum or are drifting badly (all in the same direction).

Finally we come to the heart of the matter: "How do I know I'm right about this?" Here there is only one answer: you know you're right because you know the differences between a good signal and a poor signal. You know how to check, and you're sure of your ground before you say anything. You may not know the cause, but you are sure of the effect. Occasionally you will get into an area of *opinion*, where it is impossible to draw a sharp line between acceptable and not, as in the case of the exact sound of the make and break of a c.w. signal or the audio bandwidth of a phone signal, but when you get to such fine points as these the signals are likely to be quite good already. The points we plan to discuss are outside the area of opinion; they include such things as unnecessary key clicks, chirps, drift and modulation on a c.w. signal; phone faults were discussed a few months ago.[1]

Checking the Receiver

Some receivers that are quite satisfactory on

* Assistant Technical Editor, *QST*.

[1] Grammer, "Looking at Phone Signals," *QST*, December, 1962.

the low-frequency bands will have a local oscillator that has some frequency modulation on the higher bands. If *none* of the c.w. signals (or unmodulated carriers) sound as clean (single, pure tone, no detectable low-pitched modulation) on 10 and 15 as they do on 40 and 80, you can be sure it is the fault of your receiver. On these higher bands you are in no position to judge whether a signal is T7, T8 or T9, and you had best confine your observations to a juicy S report that will surely net you a QSL card.

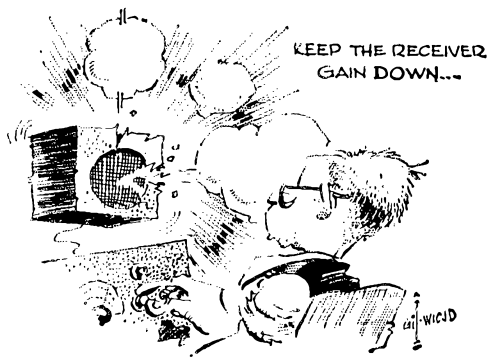
Similarly you should be a little cautious about reporting a signal drifting in frequency, because here again it can be a fault in your receiver. If on a particular band (again it is usually a higher-frequency one) you have to retune the receiver at the beginning of the other station's transmission, no matter who you work, you can begin to suspect the receiver, especially if the required retuning is always in the same direction. Sometimes the drift comes from the dropped line voltage when the transmitter is running; the lowered voltage allows the receiver tube heaters to cool off a bit. When the transmitter is turned off, the heaters warm up and change the receiver temperature. A check with an a.c. voltmeter will quickly show if this is a possibility, and a possible solution is to plug in the receiver at another outlet where the line-voltage variation is less. Check the receiver drift on a signal that runs continuously and should be stable, such as one from a commercial short-wave station or a battery-powered crystal oscillator. Here again, if you find that your receiver drifts, you are in no position to give an accurate report on the drift of another's signal. But *you are if you have established that your receiver is stable*, so don't be chicken!

Checking the Operator

Assuming your receiver has been checked for drift and for frequency modulation and has come through with flying colors, you are now ready for the more difficult tests. Does the *operator* know his stuff? Can he recognize overloading of his receiver, or will he blame spurious signals on the transmitter when actually they exist only in his receiver? Does he check for key clicks with the noise limiter on and by listening right on the signal? Does he appreciate the effects of high selectivity on the envelope of a c.w. signal?

Never make any checks on a c.w. signal with the receiver a.g.c. system turned on. If there is no provision for switching off the a.g.c., install one, or at least remove the a.g.c. rectifier temporarily.

Always make checks with a minimum of r.f. (and i.f.) gain, to insure against overloading. If the receiver manual gain system is such that the r.f. stage runs wide open, detune the antenna trimmer if necessary to reduce gain. Whenever you *begin* to approach a condition where the signal output doesn't increase as the gain is increased, you are too close to overload. Obviously you don't want a limiter in the circuit; its job is to keep everything at the same level. With the b.f.o. on, one symptom of overload (at the detector) is a change in character of the c.w. signal (if you have an oscilloscope on the audio output of the receiver, you can see the harmonics come up as the detector starts to overload). With the b.f.o. off, any c.w. (or unmodulated carrier) signal should *increase* the level of the background noise if the signal plus noise is below the overload level. The main check to make (continuously) on the operator is: does he know enough to keep the receiver gain down? A nearby signal might be checked with no antenna connected, or with only a paper clip for an antenna, and a 50-ohm resistor across the antenna terminals just in case the r.f. stage might be regenerative otherwise.



Sometimes an extremely strong signal may appear to have parasitic signals in and out of the ham band. To insure that this is indeed a transmitted signal and not something generated in the receiver, reduce the antenna size and the receiver gain.[2] If when reducing the antenna size other signals are still there but the "spurious" has disappeared, the "spurious" was most likely a receiver-manufactured signal. If the "spurious" disappears suddenly as the receiver gain is reduced, while other signals remain, the spurious existed only in the receiver. Take note of the frequency of the "spurious" with respect to the main signal; on the higher frequencies the "spurious" may be an r.f. image, a result of insufficient image rejection in the receiver. In checking this, make sure the antenna trimmer is peaked in the ham band and not on the image frequency.

Chirps and Clicks

The FCC regulations say the stability of a signal shall be as "constant as the state of the art permits" and, let's face it, that's pretty constant in 1963 A.D. There's about as much excuse for a chirpy signal these days as there is for high button shoes. However, there still are chirpy signals and we might as well describe them, for the one ham in a thousand who isn't sure. If you hear a slow CQ that sounds something like "Chowpy-chowpit chow-chowpy chow," you have heard the grandpappy of all chirpy signals. Most won't be that bad. A good ear for music will probably help you detect chirp more readily at any pitch, but if you aren't Leonard Bernstein you can still

[2] Or perhaps use a 20-db. pad, as described by Andrade, "Recent Trends in Receiver Front-End Design," *QST*, June, 1962.

listen carefully, at a low beat note, to see if you can detect any change in frequency of the signal. Sometimes a heavy click can mask a chirp, but if there is no click you can tell if there is a frequency change or not. If you are working the other station, ask the operator to send some slow dashes, during which time you can examine the signal carefully at a low beat note. A good signal will come through with flying colors, but a signal with chirp can't pass this close scrutiny. With single-signal c.w. reception, try the b.f.o. in the two possible positions so that you can examine both sides of zero beat. A good signal will sound the same on either side.

Incidentally, if you check your own signal on your own receiver (preventing overload by shorting the input or pulling out the r.f. amplifier tube), set the b.f.o. so you can tune through zero beat with the main tuning dial. Listen on both sides of the signal. In some cases keying the transmitter may change the line voltage enough to cause a *receiver chirp*; listening on only one side of zero beat, if this receiver chirp should just happen to match the transmitter chirp, you might think you have a clean bill of health or *twice* the chirp you really have!

The FCC is quite clear on the subject of key clicks. The regulations (12.133) group key clicks with spurious radiations and says they ". . . shall not be of sufficient intensity to cause interference in receiving equipment . . . tuned to a frequency outside the frequency band of emission normally required for the type of emission . . ." The receiver has to be one of good engineering design, including adequate selectivity characteristics, and it would seem reasonable to expect the receiver to have a bandwidth of from 2 to 4 kc. If the skirt selectivity is adequate, the b.f.o. can be offset and the receiver is set up for "single-signal c.w. reception"; under these conditions a reasonable signal should certainly have no clicks beyond the beat-note range, provided there is no overloading in the receiver or other technical or operator fault. In other words, when you can no longer hear the signal, you should no longer be able to hear thumps and clicks. You may run into a few speed merchants who will insist they send so fast they need clicks; the answer to them is, "You don't need *that* many!" Actually any hand sending (including the best electronic keys) can be carried by a signal that will pass the test outlined above, and don't let anyone con you into thinking otherwise.

Listening to a clicky signal with a truly high-selectivity receiver (250 cycles or so), it is difficult or impossible to tell if the signal has clicks. Clicks are side frequencies generated at "make" and "break"; if the receiver can't pass them (as it may not when tuned *on* the signal), the signal you hear in the receiver output has no clicks. But the clicks *are* there in the band, unnecessary QRM enjoyed by no one, and you can hear them off the signal.

If you take pride in your own signal and would like to know more about checking and modifying, see the chapter on keying in the *Radio Amateur's Handbook*. In the meantime, get busy and lend a helping hand on the bands! QST

Strays

Have you done your part in connection with the bill for reciprocal operating privileges? Take a look at page 92 of May *QST*.

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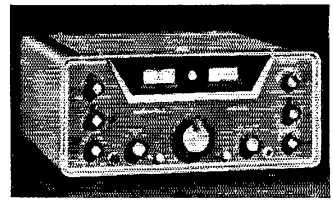
The Amateur Radio Editors Association (AREA) is attempting to compile a comprehensive list of amateur radio publications. If your club publishes a newsletter or bulletin of any sort, send the info to E. C. Pressler, Jr., W3ZXV, 2105 Weber Lane, Norristown, Pennsylvania. Include name of sponsoring club, name of publication, and name, address and call of editor.

These lovely girls are (l. to r.) Kay Mellberg, daughter of W8QPO; Susan Gough, daughter of K8OIC; and Carol Thomas, daughter of W8SZY. Miss Mellberg was chosen queen of the Michigan State Amateur Radio Convention held in Saginaw on March 16. The lucky guy at the left is Don McMillan, K8KWG, representing the Saginaw Valley Amateur Radio Association. Lucky too was Lew McCoy, W1ICP, of the ARRL Hq. Staff, who served (willingly) as one of the judges.

• Recent Equipment —

Hallicrafters SR-150 Transceiver



THE Hallicrafters SR-150 is a compact, lightweight, s.s.b./c.w. transceiver that will operate on the amateur 80-, 40-, 20-, 15-, and 10-meter bands. Power supplies are not included, but are separately packaged accessories so that the unit can be operated either from the 117-volt mains or from a 12-volt d.c. source. A mobile mounting rack is also available to facilitate installation and operation in a car, boat or other mobile platform.

The SR-150 includes a "receiver incremental tuning" (r.i.t.) feature which allows the operator to unlock the transceiver frequency control and tune the receiver, independently of the transmitter, about two kilocycles either side of the transmitter frequency. Technical details are covered later.

Although the SR-150 is a transceiver — that is, several of the same tubes and circuits are used for both transmitting and receiving — it is easier when discussing the circuits to treat the receiver and transmitter sections separately. The block diagrams in Figs. 1 and 2 show the transmitter and receiver sections, respectively, with stars to indicate the tubes that are used for both.

Transmitting Circuits

The transmitter starts off with a carrier frequency of either 1648.1 or 1651.7 kc., depending upon whether upper or lower s.s.b. is desired. The carrier is combined with audio from the speech amplifier in a crystal-diode balanced modulator. The resulting d.s.b. suppressed-carrier signal is amplified in V_{17A} and then fed to the 1650-kc. crystal lattice filter where, depending upon the carrier oscillator frequency, one sideband is suppressed. The filter bandwidth at the 3-db. points is 2.1 kc., and the rated carrier/unwanted-sideband suppression is 50 db.

Output from the crystal filter is added to the output of the v.f.o., which covers 4350–4850 kc., in a 12BA7 mixer, V_2. The mixer output signal is in the 6- to 6.5-Mc. range, and after passing through a stage of tunable amplification (V_{3A}), the signal is heterodyned to the operating frequency in a 6AH6 mixer, V_7. The beat frequency is furnished by a crystal-controlled oscillator, V_8. The proper crystal for each band is switched into the circuit by the panel BAND SELECTOR control. V_7 is grid-block keyed when on c.w.

Following V_7, a 12BY7 drives two 12DQ6B final amplifiers in Class AB_1 for a rated p.e.p. input of 150 watts on s.s.b. and 125 watts on c.w. The amplifier has a pi-network output circuit designed for working into a 50-ohm nonreactive load; the loading is not adjustable, although the network can be resonated by the FINAL TUNING control.

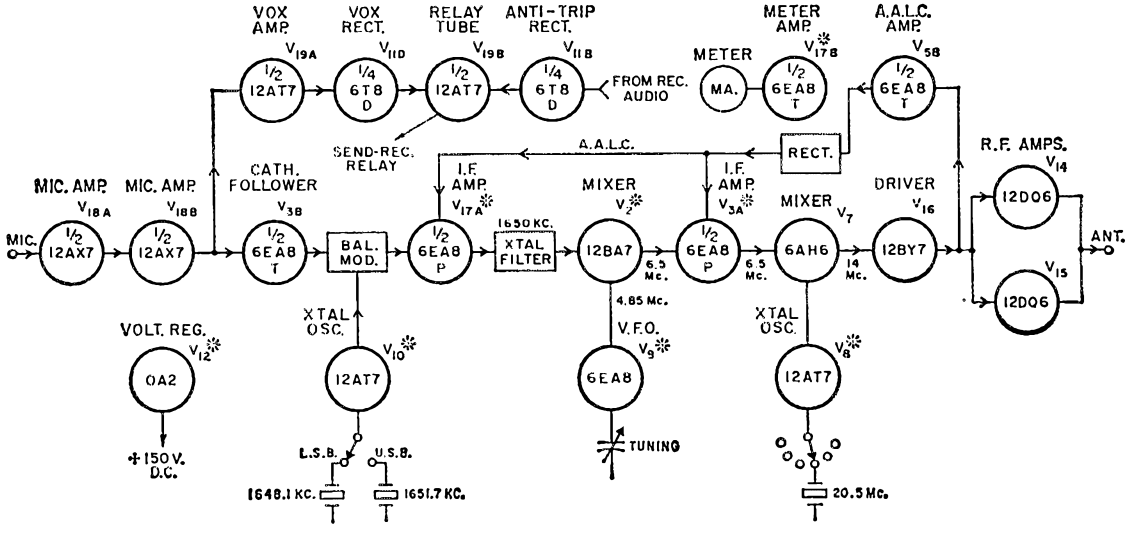


Fig. 1—Block diagram of the transmitter section of the Hallicrafters SR-150 transceiver. Tubes marked with a star operate both in transmitting and receiving. Frequencies for 14-Mc. output are shown.

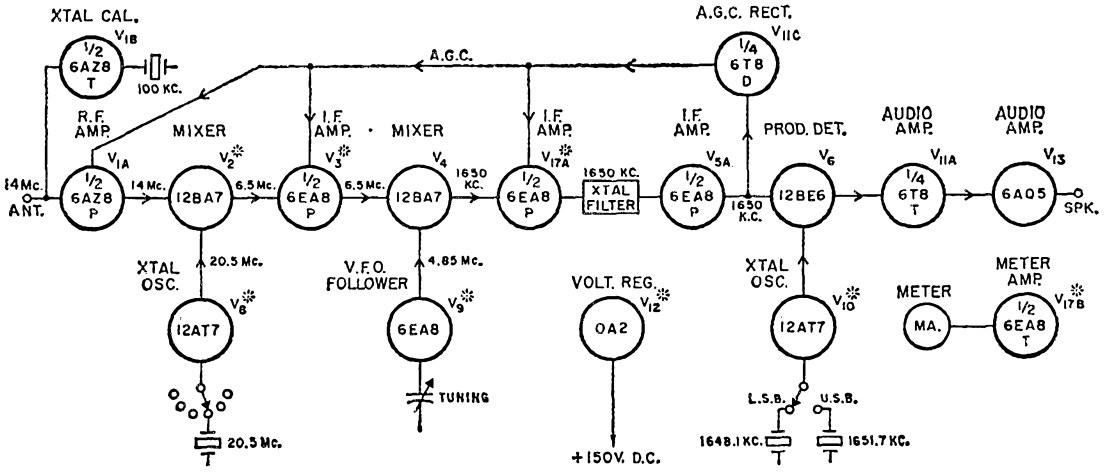


Fig. 2—Block diagram of the receiver section of the Hallicrafters SR-150 transceiver.

The amplifier has built-in protection against overdriving, through an automatic audio level control (a.a.l.c.) circuit. When the 12DQ6Bs are driven into grid current in voice operation, the rectified signal has an audio-frequency component which is applied to the a.a.l.c. amplifier, V_{5B}, and subsequently rectified by a semiconductor diode. The resulting d.c. voltage, negative with respect to ground, is used to bias the grids of amplifiers V_{17A} and V_{3A} to reduce their gain.

Either push-to-talk or VOX (voice-controlled break-in) operation can be used with the SR-150. For VOX operation, audio from the high-impedance microphone, which has been amplified in two speech amplifiers, V_{18A} and V_{18B}, is fed to the VOX amplifier and rectifier. The d.c. output from the VOX rectifier controls the plate current of V_{19B}, which has a relay in its plate circuit for switching the transceiver circuits from send to receive. The VOX rectifier output also is balanced against rectified d.c. output from the receiver audio, obtained from the anti-trip rectifier, V_{11B}, to prevent sound from the speaker from tripping the VOX circuit.

A meter on the front panel of the transceiver operates as an r.f. voltmeter during transmission, and is useful as a relative-output meter and for tuning up.

Receiver Operation

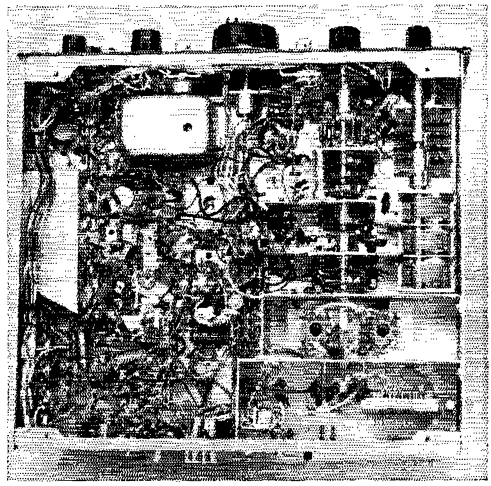
The block diagram in Fig. 2 shows the receiver section of the SR-150. The v.f.o. (tuning), heterodyne crystal-oscillator circuits, and the crystal filter and i.f. amplifiers are all common to both the transmitter and receiver.

Incoming signals are amplified in the pentode section of r.f. amplifier V_{1A} and are then converted in V_2 to the first i.f., which is tunable between 6 and 6.5 Mc. The crystal-controlled oscillator, V_8, provides the injection voltage. The r.f. amplifier and mixer tuned circuits are selected by the panel BAND SELECTOR switch and are tuned by the panel PRESELECTOR control. As an example, Fig. 2 shows the frequency relationships when operating on 14 Mc.

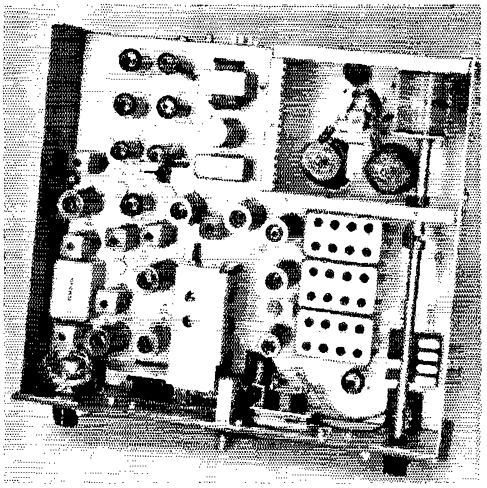
After amplification in V_3, the first-i.f. signal is converted to the second i.f., 1650 kc., in V_4, a 12BA7. The beat frequency here is provided by the v.f.o. and cathode follower, using both sections of V_9. After a stage of amplification, the 1650-kc. signal goes through the crystal-lattice filter, another stage of 1650-kc. amplification, and finally to the product detector, V_6, where it is mixed with the output of the crystal-controlled b.f.o., V_{10}. The b.f.o. frequency is selected from the front panel for either u.s.b. or l.s.b. reception.

Two stages of audio amplification give enough drive for speaker operation. (The speaker is not built in.) There is a jack on the front panel for headphones.

A diode section of V_{11C} is used as an a.g.c.



Bottom view of the SR-150 with the cover plate removed. The final-amplifier stage inductance and tube sockets are in the compartment at the lower right of the photograph. The shielded box just below the front panel at the top of the picture is the v.f.o. compartment.



The neat layout of components in the SR-150 is evident in this view. The final r.f. amplifier cage at the upper right of the photograph has its cover removed in this shot.

rectifier. A.g.c. is applied to the i.f. amplifiers, V_3 and V_{17A}, and to the r.f. amplifier, V_{1A}.

The front-panel meter works as an S meter when receiving, the meter amplifier, V_{17B}, being controlled by the a.g.c. voltage. The receiver apparently is expected to handle terrific signals, since the meter reads to S0 db. over S9!

Receiver Incremental Tuning

The big feature of the SR-150 is the r.i.t. tuning. Fig. 3 shows a partial diagram of the circuit. The v.f.o., which is used for both transmitter and receiver frequency control, has a capacitor diode, CR_3, in its tuned circuit. When a positive bias is applied to the cathode the capacitance across the v.f.o.'s tuned circuit changes, detuning the v.f.o. frequency slightly. R_2 is a

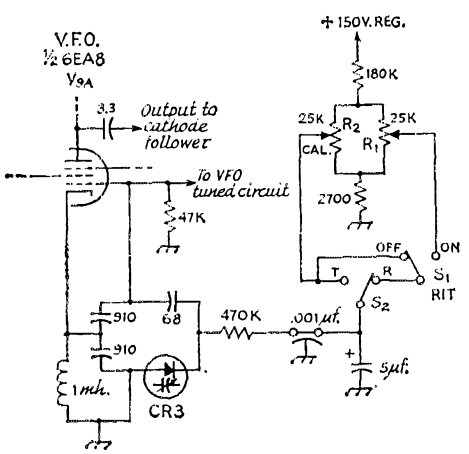


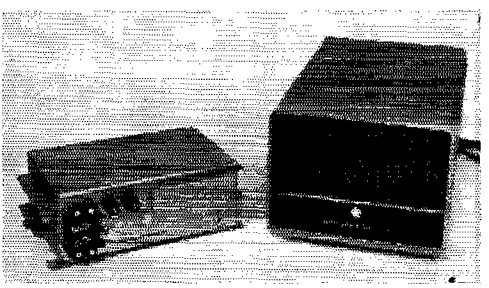
Fig. 3—Bias on a semiconductor capacitor diode, CR_3, is used to tune the receiver over a ±2-kc. range about the transmitter's frequency. Receiver incremental tuning (r.i.t.) control R_1 is a potentiometer that controls the bias.

panel CALibration ADJust controlfor varying the frequency of the v.f.o. over a small range so that its frequency can be set precisely when compared to a standard. This control is always operative during transmitting, whether or not the r.i.t. is in use. With the r.i.t. switch, S_1, in the OFF position the transmitting calibration remains during reception, so the transmitting and receiving frequencies are identical.

For independent receiver tuning, S_1 is put in the ON position. This applies positive bias, adjustable by means of the r.i.t. control, R_1, to the capacitor diode when the send-receive relay contacts, S_2, are in the receive position. The receiver can be tuned 2 kc. either side of the transmitting frequency with the r.i.t. on, but the transmitting frequency is not affected. The RIT ON-OFF and RIT tuning controls are concentric and are located at the upper left corner of the panel.

Controls and Accessories

Other panel controls are RF and AF GAIN (concentric), a four-position FUNCTION switch



The P-150 DC transistor d.c. power supply (left) and P-150 AC power supply (right) offer alternative power sources for the SR-150.

(CW-USB-LSB), on-off switch for the 100-kc. calibrator, V_{1B}, eight-position BAND SELECTOR (four 10-meter positions), PRESELECTOR tuning, and jacks for the microphone and headset. The PRESELECTOR control tunes the receiver r.f. and first-mixer stages in receiving, and the transmitter mixer and driver stages in transmitting.

The tuning system has a very good "feel" to it, and is quite similar to that used in the SX-117 receiver. The dial has two scales, one reading 0 to 500 kc. and the other 500 to 1000 kc., and is calibrated in 5-kc. steps. The scales and BAND SELECTOR markings are color-coded so the operator knows which scale to use. The tuning rate is such that the knob makes about 30 revolutions to cover the 500-kc. spread. The knob has an extension post for fast cranking.

Rear-apron connections on the SR-150 include a power and control socket, key jack, two antenna connectors (either a common or separate transmitter and receiver antenna may be used), an antenna switch (common or separate), and a 500-ohm audio output jack.

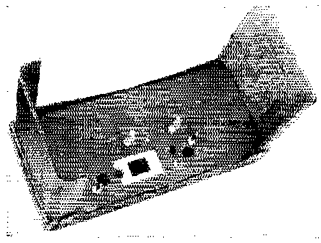
As mentioned earlier, power supplies are available as accessories. The P-150 AC power supply

SR-150 Transceiver

Height: 6½ inches.
Depth: 13 inches.
Width: 15 inches.
Weight: 17½ pounds.
Power requirements: 12.6 volts at 5 amp., 250 volts d.c. at 220 ma., —75 volts d.c. at 10 ma. and, on transmit only, 500 volts d.c. at 250 ma. A 115-volt a.c. 240-watt power supply (Model P-150 AC) and a 12-volt d.c. power supply (P-150 DC) are available from the manufacturer for supplying the necessary power for the SR-150.
Price class: SR-150, $650; P-150 AC, $100; P-150 DC, $110; MR-150, $40.
Manufacturer: Hallicrafters, 5th and Kostner Aves., Chicago 24, Illinois.

is styled to match the SR-150 and will furnish all the necessary operating voltages. It has a built-in 6-inch speaker, in addition. A 12-volt d.c. (either positive or negative ground) supply, the P-150 DC, is completely transistorized and is made for "stow-away" installation in mobile applications.

A mobile mounting rack, MR-150, also is available. It is adaptable to dashboard, firewall, transmission hump or floor mounting. This can be wired up on installation so that when the



The MR-150 mobile mounting rack is a convenient accessory for mounting the SR-150 in an automobile or boat.

transceiver is plugged in, all rear-apron connections (including antenna) are made automatically. The transceiver is supported by two side panels which, when not in use, fold over on the back plate of the mounting.

The manual supplied with the transceiver is entitled "Operating and Service Instructions," and that just about covers it. There is almost nothing in the book about the circuit features as such. A single page on "Theory of Operation" gives a very sketchy description, but touches on nothing but broad generalities. The technically inclined reader will find many questions raised by the complete circuit, the answers to which he can only guess at. Could it be that manufacturers take it for granted that the day is past when the buyer was interested in what makes the box click?

—*E. L. C.*

NEW BOOKS

RCA Transistor Manual, SC-10, published by Semiconductor and Materials Division, Radio Corporation of America, Somerville, N. J. 8⅜ × 5⅜ inches, 304 pages, paper cover. Price, $1.50.

This new publication will be of value to anyone interested in semiconductor devices and circuits. Containing data for almost 400 semiconductor devices, the manual starts off with semiconductor theory, construction and applications. It then gives detailed run-down on the technical data for the various semiconductors. The technical data usually includes a brief description of the unit, its typical application and mechanical specifications. Maximum ratings, electrical characteristics and operating information are given. Usually, collector characteristics curves are given for transistors.

Following the technical data section are outline drawings and a collection of circuits — some involving circuits of interest to amateurs. A ½-watt 70-Mc. power oscillator and a 250-Mc. 150-milliwatt oscillator are shown. There are several voltage regulator circuits involving transistors and rectifiers, a code practice oscillator and a transistor grid-dip meter.

RCA Transmitting-Tube Manual, published by RCA Electron Tube Division, Harrison, N. J. 320 pages, 5⅜ × 8⅜ inches, paper cover. Price, $1.00.

This latest edition of the *Transmitting Tube Manual* contains information on power tubes up to 4 kw. plate input. As in previous editions, the following subjects have been brought up-to-date: Power-tube fundamentals, construction and materials, applications, circuit-design consideration, operating conditions and adjustments, installation, and rectifier considerations. This information is followed by the tube data. The rear of the manual is filled with outline drawings and typical circuits, some of which deal with amateur radio equipment. Circuits of v.f.o.'s, crystal oscillators, amplifiers, modulators, and complete transmitters, both for a.m., s.s.b., h.f. and v.h.f., are included. The manual concludes with a reading list and index.

Wideband F.M. for the Radio Amateur, by James S. Aagaard, K9OJV, and John L. DuBois, K9YHQ, Department of Electrical Engineering, Northwestern University, Evanston, Illinois. 28 pages of text, plus 14 schematic diagrams, 8½ by 11 inches, loose-leaf, paper cover. Diagrams 11 by 17 inches, folded. Price, $1.75 from authors.

The July, 1960, issue of *QST* carried an article by the authors of the above book, entitled "Two-Meter F.M. for Noise-Free Local Communication." This described in a general way the conversion to amateur use of the large amounts of commercial f.m. gear now becoming available for amateur use at moderate cost, because of the imminent conversion to narrower channels in the 40- and 150-Mc. commercial f.m. bands. Since the appearance of the *QST* article, the authors have received a steady stream of requests for additional information. The volume of information was too great for incorporation in a *QST* article, so it has been compiled in book form.

Eight brief and concise chapters discuss the philosophy and applications of f.m. in amateur work, and describe suitable power supplies, test equipment, control circuits, antennas, transmitters and receivers. Reproductions of the original Motorola circuit diagrams for all applicable units are included in the 14-page appendix. The book is neatly printed in handy loose-leaf form. It should be a must for the growing number of amateurs interested in fixed-frequency wide-band f.m. communication with Motorola equipment.

I.A.R.U. News

R.S.G.B. GOLDEN JUBILEE

1963 marks the 50th anniversary of the formation of the Radio Society of Great Britain, on July 5, 1913. To celebrate the occasion, the RSGB, first known as the London Wireless Club and later as the Wireless Society of London, will hold a five-day Golden Jubilee celebration, starting on Monday, July 1. A number of events have been scheduled, including visits to the BBC Television Centre; the Radio Research Station at Ditton Park; the London Planetarium; and Mullard, Ltd. Tours of London will be available for the ladies while their escorts are visiting the Television Centre. There will also be an all-day cruise on the Thames, and the London UHF Group will hold a social evening for those interested in meeting the members.

Admission to most of the events is by ticket only; tickets for several activities are available in limited quantities and requests will be handled in the order received. For more information on the five-day program, interested persons should contact Mr. Frank Fletcher, G2FUX, Hon. Business Manager, Golden Jubilee Celebrations, 11a Ickenham Road, Ruislip, Middlesex, England.

For the benefit of visitors, the Society has reserved a number of rooms at the Royal Hotel, Woburn Place, Russell Square, London, W.C.1. Visitors requiring accommodations should write directly to the Royal Hotel, stating their requirements and mentioning that they are coming to the RSGB Golden Jubilee Celebrations.

QSL BUREAUS OF THE WORLD

For delivery of your QSLs to foreign amateurs, simply mail cards to the bureau of the proper country as listed below. Cards for territories and possessions not listed separately may be mailed to the bureau in the parent country; e.g., cards for VP8s go to RSGB in Great Britain. W, K, VE and VO stations only may send foreign cards for which no bureau is listed to ARRL. See "How's DX?" for QSL information on specific stations.

For service on incoming foreign cards, see list of domestic bureaus in most *QST*s, under "ARRL QSL Bureau." **Bold face listings indicate corrections or additions.**

Aden: **J. M. Hern, VS9AAA, 114 M. U., B. F. P.O. 69, London, England**
Algeria: G. Deville, FA9RW, **21 Blvd. Victor Hugo,** Alger
Angola: L. A. R. A., P.O. Box 484, Luanda
Antarctica: **KC4AA cards go to the Office of Antarctic Programs, National Science Foundation, Washington 25, D. C. KC4US cards go to KINAP, COMCBLANT, USN, CBC, Davisville, R. I.**
Argentina: R.C.A., Carlos Calvo 1424, Buenos Aires
Australia: P.O. Box 41, Box Hill, E. 11, Victoria
Austria: Oe. V.S.V., Box 999, Vienna 1/9
Azores: via Portugal
Bahama Islands: D. R. Thompson, VP7NS, Box 48, Nassau
Bahrein: (All MP4) Ian Cable, MP4BBW, P.O. Box 425 Awali
Belgium: U.B.A., Postbox 634, Brussels 1
Bermuda: R.S.B., P.O. Box 275, Hamilton
Bolivia: R.C.B., Casilla 2111, La Paz
Brazil: L.A.B.R.E., Caixa Postal 2353, Rio de Janeiro
British Guiana: D. E. Yong, VP3YG, Box 325, Georgetown
British Honduras: **P.O. Box 487, Belize**
Bulgaria: Box 830, Sofia
Burma: B.A.R.T.S., P.O. Box 800, Rangoon
Burundi: **Bolte Postale 14, Usumbura**
Canton Island: Phil Preece, **KB6CB,** Postmaster, Canton Island, USPO 06-5000, Phoenix Group, via Honolulu, Hawaii.
Cape Verde Island: **Radio Club de Cabo Verde, CR4AA, Praia**
Caroline Islands: **Father Jack Walsh, Xavier High School, Truk**
Cayman Island: **via Jamaica.**
Ceylon: P.O. Box 907, Colombo
Chagos: **via Mauritius.**
Chile: Radio Club de Chile, P.O. Box 13630, Santiago
China: M. T. Young, P.O. Box 16, Taichung, Formosa
Columbia: L.C.R.A., P.O. Box 584, Bogota
Congo: (TN8) Albert Noger, TN8BA, Box 2012, Brazzaville
Congo: (9Q5) U.C.A.R. QSL Bureau, P.O. Box 3748, Elisabethville, Katanga
Cook Island: Bill Scarborough, ZK1BS, % Radio Station, Rarotonga
Costa Rica: Radio Club of Costa Rica, Box 2412, San Jose
Cyprus: **C.A.R.S. QSL Bureau, P.O. Box 216, Famagusta**
Czechoslowakia: C.A.V., Box 69, Prague 1
Denmark: E.D.R. QSL Bureau, OZ6HS, Ingstrup
Dominica: VP2DA, Box 64, Roseau, Dominica, W.I.
Dominican Republic: R.C.D., P.O. Box 157, **Santo Domingo**
Ecuador: Guayaquil Radio Club, P.O. Box 5757, Guayaquil
El Salvador: YS1O, Apartado 329, San Salvador
Ethiopia: Telecommunications Amateur Radio Club, P.O. Box 1047, Addis Ababa **or via APO 843, New York, N. Y.**
Faeroes Islands: **via Denmark.**
Fiji Islands: **P.O. Box 184, Suva**
Finland: S.R.A.L., Box 306, Helsinki
Formosa: (BV1 only) Taiwan American Radio Club, USARSCAT, Box 8, APO 63, San Francisco, Calif.
France: R.E.F., Boite Postale 26, Versailles (S & O)
France: (F7 only) F7 QSL Bureau, MARS, Headquarters U. S. European Command, APO 128, New York, N. Y.
Germany: (DL2 only): **G. D. Griffiths, DL2OX, 212 Hohewzollew Str., Moenchen-Gladbach**
Germany: (DL4 & DL5 only): QSL Bureau, % DL1VJ, Base MARS Station, APO 130, New York, N. Y.
Germany: (Other than above): D.A.R.C., Box 99, 8 Munich 27
Ghana: 9G1CW, Hans Suess, P.O. Box 1945, Kumas
Gibraltar: E. D. Wills, ZB2I, 9 Naval Hospital Road
Great Britain (and British Empire): R.S.G.B. QSL Bureau, G2MI, Bromley, Kent
Greece: George Zaralis, P.O. Box 564, Athens
Greece (SV0s only): Signal Officer, Hqtrs. JUSMAGG, APO 223, New York, N. Y.
Greenland (OX calls only): via Denmark
Greenland (KG1 calls only): All KG1F's to MARS Director, 2004 Comm. Sqdn., APO 121, N. Y., N. Y. All other KG1's to MARS Director, 1983 Comm. Sqdn., APO 23, N. Y., N. Y.

(*Continued on page 164*)

COMING A.R.R.L. CONVENTIONS

June 1–2 — Oregon State, Eugene
June 7–9 — West Gulf Division, McAllen, Texas
June 15–16 — Rocky Mountain Division, Pueblo, Colorado
June 30 and July 1 — Saskatchewan Province, Moose Jaw
July 6–7 — West Virginia State, Jackson's Mill
Aug. 31 and Sept. 1 — Atlantic Division, Washington, D. C.
September 14 — Kentucky State, Lexington
September 14–15 — Dakota Division, Sioux Falls, South Dakota
September 28 — Ontario Province, Hamilton
October 4–6 — ARRL National, Cleveland, Ohio
October 11–13 — Southwestern Division, San Diego, Calif.
October 26–27 — Midwest Division, Wichita, Kansas
November 29–30 — Delta Division, Lafayette, Louisiana

ROCKY MOUNTAIN DIVISION CONVENTION

Pueblo, Colo. — June 15–16

The Rocky Mountain Division Convention will be held on Saturday and Sunday, June 15 and 16, at Southern Colorado State College in Pueblo, Colorado. Convention activities will include FCC examinations; a talk by ARRL Technical Director George Grammer, W1DF; YL activities; and an initiation ceremony of the Royal Order of the Wouff Hong at midnight on Saturday. There will be displays of the latest in amateur equipment, together with demonstrations of closed circuit TV, 441 Mc/s amateur TV, a light-sensitive robot and an RTTY terminal unit.

Overnight lodging at the college dormitory will be available at $2.60 per person. The Sunday banquet will be $2.50. Early-bird registrations at $3.50 will end June 10; registration after that date will be $4.50. Checks should be made payable to Ray Sisson, WØHHL, % Southern Colorado State College, Electrical Engineering Dept., Pueblo, Colorado.

In conjunction with the convention, there will be a QSO party from 0800 June 8 to 2400 MST June 9. One point will be given for each QSO when convention information is given; contacts may be repeated on other bands. A copy of the log must reach Don Middleton, WØNIT, at the college, by June 12.

SASKATCHEWAN PROVINCE CONVENTION

Moose Jaw — June 30 and July 1

The Saskatchewan Province Convention will be held on Sunday and Monday, June 30 and July 1, at the Legion Hall in Moose Jaw. The program for Sunday will include a breakfast, swap shop, mobile judging, code contest, ARRL meeting and the convention banquet. Monday's activities will begin with a breakfast, followed by a transmitter hunt, outdoor barbecue and various other outdoor events.

Registration is $3.00 per person or $5.00 per couple, either in advance or at the door. For tickets and hotel reservations, write to box 1281, Moose Jaw.

WEST VIRGINIA STATE CONVENTION

Jackson's Mill — July 6-7

The West Virginia State Convention will be held on Saturday and Sunday, July 6 and 7, at the State 4-H Camp, Jackson's Mill (near Weston) on U. S. Route 19. The program will include transmitter hunts, mobile judging, technical discussions and demonstrations of electronic gear. Facilities are available for swimming, tennis and various other outdoor activities.

Highlights of the schedule for Saturday will be the ARRL forum, SWOOP for XYLs, round and square dancing and the Royal Order of the Wouff Hong initiation ceremony. There will be meetings of the West Virginia phone and c.w. nets, WVN (PON) and the WACWV club, together with YLRL activities. Church services will be held at the Mill on Sunday morning and the presentation of West Virginia's "Outstanding Amateur" award will be made at Sunday dinner. A separate program has been arranged for the ladies. Children's activities will be supervised.

Registration is $7.00 per person, children eight years old or under $5.00. These fees include dinner on Saturday, lodging Saturday night, breakfast and dinner on Sunday and admission to all convention activities. Lodging is dormitory style, with separate cottages for the men and women. Those desiring more privacy may stay at motels or hotels in nearby Weston or Clarksburg, registration tickets which do not include meals or lodging may be purchased for $2.00 per person. Cottage and dining hall capacity is 400; therefore, full registrations are limited. When ordering $7.00 tickets, state number of men and women in the party.

Requests for full registrations should be sent to Dorothy Morris, 1111 Alexander Place, Fairmont; $2.00 tickets are available from Paul Kesling, K8NYE, 106 Brookhaven Drive, Nitro, or from Keith Chambers, W8SSA, Box 62, Bluefield. For additional information, contact Kay Anderson, W8DUV, Convention Secretary, 209 Childers Court, Huntington.

Strays

A cumulative index to *QST* is now available for 25¢ postpaid. This 64-page booklet covers the years 1950–1962, with provision for your updating it easily for the next five years. Send your order and 25¢ (no stamps, please) to ARRL, West Hartford, 7, Conn.

Happenings of the Month

FLASH — Just at press time FCC issued a report and order establishing license fees for all radio services effective January 1, 1964. For amateurs the fee will be $4 for initial applications or renewals; $2 for modifications (e.g., change of address); no fee for Novices or for RACES; $20 for special call sign requests. Details next month.

160 METER CHANGES

As we reported in these pages last month, the FCC, in a Report and Order (RM-298) released April 11 removed the restriction on s.s.b. which had been previously scheduled to go into effect on April 15. Thus, amateurs may use a.m., s.s.b., or c.w. on the band segments and with the powers shown on page 64B of *QST* for March. (Those desiring a copy of this page may have one by sending a stamped, self-addressed envelope with their request to ARRL headquarters.)

At the same time, the Commission advised amateurs of a pending revision in the allocation for areas adjacent to the Gulf Coast:

"4. The Director of Telecommunications Management has also informed the Commission that the Loran-A system of radionavigation operations on 1900 kc/s will be extended to the area of the Gulf of Mexico beginning June 1, 1963, and suggests that the Amateur Radio Service be advised at this time of the impending restrictions in the bands 1875–1900 and 1900–1925 kc/s in the Gulf area. The Loran-A stations are located at Cape San Blas and Venice, Florida and Biloxi, Mississippi. Prior to June 1, 1963, the Commission will amend its Rules to further restrict amateur operation in the above bands in these areas."

At press time, no further word had been received. Amateurs using the band, therefore, should check W1AW bulletin schedules for later information on 160 meter changes as June 1 arrives.

AMATEUR RADIO WEEKS

Minnesota this year joins several other states in proclaiming Field Day week as Amateur Radio Week in the state. The background work in Minnesota was done by W9GER, a political associate of Republican Governor Elmer L. Anderson, and the proclamation for June 17–23, 1963 was issued on March 13. When the famous recount of votes was finished a little later, W9GER went to work again and secured a duplicate proclamation, this one signed by the new Democratic Governor, Karl F. Rolvaag, on April 26!

The proclamations cite ". . . the contributions made by amateur radio operators in a wide variety of fields, such as providing communication between relatives of people stationed overseas; assisting in the prevention and control of forest fires; seeing that communications are kept open in the event of floods, tornados, and other disasters. . . "

Governor James H. Rhodes has proclaimed the tenth annual Amateur Radio Week in Ohio for June 16–22, referring to "a valuable potential 'second line' communication system," and to amateurs' research, experimental work and public devotion to the welfare of Ohio's citizens.

The week of June 24–30 has been declared Amateur Radio Week in Florida by Governor Farris Bryant. Governor Bryant cited emergency service, contributions toward international good will, rehabilitation of handicapped persons, traffic handling for Arctic and Antarctic personnel and civil defense preparedness as his reasons for proclaiming the Week.

FCC DENIES ANTHEM REQUEST

By Memorandum Opinion and Order, released April 17, the Federal Communications Commission denied a petition for rulemaking (RM-338) by Fred E. Huntley, W6RNC, Secretary of the Anti-Communist Amateur Radio Network (ACARN) which would have permitted radio amateurs to transmit the National Anthem twice each day, once at the beginning and once at the end of each day's transmission. The Commission commends the patriotic purpose of the petition, but points out that it would violate Article 41 of the International Radio Regulations, Geneva, 1959 and several sections of the Commission's own rules. FCC also points out that the petition would be a fundamental departure from the principle that the Amateur Radio Service is intended for two-way radio communications. It mentions, further, that music transmitted by only a small percentage of the 250,000 FCC-licensed amateurs would add to the difficulties to be experienced in establishing and maintaining normal amateur communications, especially in the heavily congested bands open to international communications.

AMATEUR LICENSES REVOKED

In this column of the January 1963 *QST*, we warned of a new tougher FCC procedure for handling violators of the regulations who fail to answer notices from the Commission: the "Order to Show Cause" why the amateur station license should not be revoked. FCC has now carried two such cases through to completion. An Order of Revocation was issued on February 27, 1963 against John K. Boyd, W1YVK, of Manchester, N. H. A written notice of violation had been sent to Mr. Boyd on February 14, 1962, alleging a violation of Section 12.113, in that the sideband frequencies of his transmission were not confined within the amateur band in use. Not having

(Continued on page 168)

Board Meeting Highlights

The Board of Directors of the American Radio Relay League, Inc., at its annual meeting in Hartford, Connecticut, on May 3, 1963, heartily endorsed the "clean signals" campaign, technical/educational projects in *QST* and other publications such as *Understanding Amateur Radio*, and the statement of band usuage principles, all as previously initiated by the Executive Committee — and incorporated them into the League's over-all program for progress in the amateur radio service.

The Board took another major step by adopting a four-point program to be presented to the Federal Communications Commission calling for extension of the existing incentive-licensing structure by re-establishment of an advanced grade of license; eventual assignment of portions of the high frequency amateur bands as appropriate to the higher grades of license; a complete review and revision of present written examinations for amateur licenses in the light of present amateur techniques; and modification of the Conditional Class license rules to limit the term and permit renewal only for handicapped persons, those in military services or upon a finding by FCC of genuine hardship. The policy statement specifically excludes holders of General, present Advanced and Amateur Extra Class licensees from further code examinations. The effective date of the final regulations, including frequency privileges, which eventually develop from the Board's proposal, will be such as to afford all existing amateurs ample opportunity to qualify for the new class of license. (See the editorial this issue for further discussion.)

The Board urged affiliated clubs to participate in this program by giving particular attention to technical and operating aspects in their planning of programs, and directed the Hq. to furnish additional assistance in the form of taped discussions illustrated with slides. The directors requested strengthening of the AREC and National Traffic System activities for more effective performance in the public interest. A project was initiated to better acquaint League membership with ARRL history, accomplishments and goals and thus a better understanding of League actions.

The Board directed its officers to file a petition asking FCC to make the entire 2-meter band, 144-148 Mc., available to Technician Class licensees, in place of the present 2-Mc. center segment of the band.

Dakota Division Director Charles G. Compton, WØBUO, was newly elected to the Executive Committee; Directors Kahn of the Hudson Division, Denniston of the Midwest Division, Eaton of the Canadian Division, Vice President Handy and Treasurer Houghton, were all re-elected — the latter two as special members.

The Board expressed its gratitude to Senator Barry Goldwater for his continued efforts to secure reciprocal operating agreements, and urged the directors and membership to work for passage of S.920 through their state Congressional delegations. The Board commended the President, General Counsel and General Manager for their liaison work in Washington, particularly in securing additional operating privileges in the 160-meter band. The Board also expressed its thanks to the Executive Committee, the FCC, the Department of Transport in Canada and ARRL field officials for their respective efforts on behalf of amateur radio. The Board ordered a special "Cover Plaque" award to John Troster, W6ISQ, for his excellent series of articles in *QST*.

Approval was granted for the holding of an ARRL National Convention, August 21–23 1964, in New York City, and plans for participation in the New York World's Fair were announced. The Radio Society of Great Britain was congratulated on its 50th Anniversary being observed this year. The Board authorized the President and General Manager to attend any meeting or conference where the status of amateur radio might be under consideration.

The Board reviewed virtually every phase of League activity, studied and discussed the work of headquarters, the officers and its committees, and made numerous policy decisions for the coming year. Two days of informal meetings preceded the official sessions, and included an inspection of the new Hq administration building nearing completion in Newington, Conn.

Minutes of the meeting will appear in July *QST*. QST

Strays

David C. Pinkerton, W2NQG, has been named manager of engineering for the General Electric Company's Communication Products Department.

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Hams in the Pontiac, Michigan, area can get QSLs free of charge from the Pontiac Motor Division. If you hold a Technician Class or higher, contact the Amateur Post Card Dept., Pontiac Motor Division, 197 Oakland Ave., Pontiac, Mich.

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W8YX is trying to organize an intercollegiate phone net on 7270 kc., Thursday mornings at 1200Z. K8RHZ hopes other college stations will check in.

Hints and Kinks For the Experimenter

COLOR CODING LEADS

THE eight wire leads in my beam antenna installation terminate at a small metal box mounted at the top of my antenna mast. All the wire leads are of one color, and a system of color code identification was made by employing an inexpensive package of assorted colored pipe cleaners. Short lengths of about one inch were simply bent around each strip lug, twisted tight, and then snipped off flush. The operation is fast, neat and practical. The colored pipe cleaners are usually stocked by five and dime stores.

— *William Staiger, W7IN*

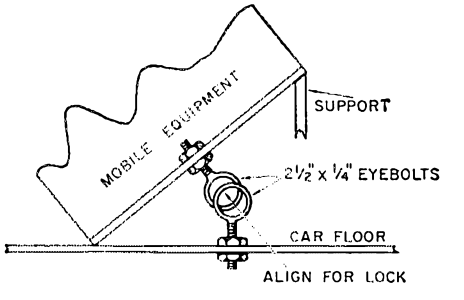
MOBILE LOG DEVICE

I HAVE found one solution to the problem of keeping a log when operating mobile. The unit is a pilot's flight-plan log holder and has a curved bottom that fits snugly on the operator's leg. A leg strap is provided to make sure the log stays put! A clip at the top and bottom of the device holds the log sheets in place. The gadget holds 2 pencils and even has a built-in pencil sharpener. A night light powered by two small batteries is also included. My unit was manufactured by Jeppesen & Co., and probably can be purchased at aircraft supply houses or the local airport.

— *Alan R. Haywood, K6AUE*

THEFT-PROOFING MOBILE EQUIPMENT

THE sketch in Fig. 1 shows how I theft-proofed my Cheyenne and Comanche mobile equipment. Two 2½ × ¼-inch eyebolts are used —

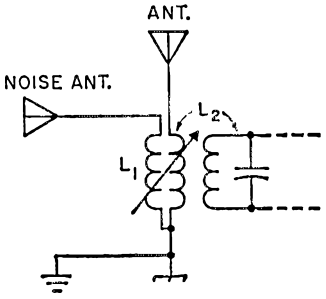


one attached to the floor of the car, the other to the bottom of the equipment. Any kind of equipment support may be used. The eyebolts are aligned so that when the equipment is installed, a padlock or combination lock can be inserted through the eyebolts and locked.

— *Francis L. Neubauer, K3OKF*

NOISE CANCELLING SYSTEM

A SYSTEM for noise reduction, which has been around since the "spark days" and which can be used successfully under certain conditions, is shown in the diagram of Fig. 2. I am using the system on 80 meters where L_1 consists of about 20 turns of wire on a 1½-inch diameter form.



The coil, L_1, is mounted so that the coupling to L_2, the receiver's antenna input coil, can be varied until the phase relationship between the two coils is 180 degrees out of phase and the noise will be canceled out.

— *Gordon Crayford, VE6EI*

PROTECTING MOBILE RELAYS

OLD voltage regulator boxes make excellent relay enclosures for mobile applications. The boxes are weather-tight, are easy to mount, and usually have a hole or two in the bottom for bringing leads in or out of the box. Discarded voltage regulators can probably be obtained at local garages.

— *Rathbun B. Griffin, W1VON*

CLEANING SMALL GAS TANKS

SOME emergency (and Field Day) generator owners experience poor carburetion because of rust and dirt in the fuel tank. To remedy this problem, remove the gas tank, place a small handful of lead shot or BB's in it, add a few ounces of kerosene and a dash of Gunk concentrate. Gunk is the trade name for a degreaser compound used to clean aircraft, auto and motorcycle engines. It is available from most auto-supply dealers. Close all of the entry holes in the gas tank and shake the tank vigorously, holding the tank in various attitudes. Now empty the tank, rinse it out a couple of times with gasoline, and replace the tank. Try to keep the tank full of gasoline in the future, as a partially empty tank is largely responsible for rusting.

— *James R. Oliver, W9RDW*

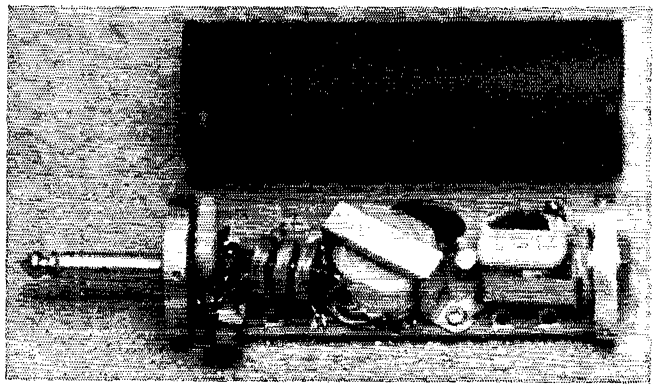


Fig. 3—W6UWX's Paratone.

MODERNIZED PARATONE

THE photograph in Fig. 3 and the schematic in Fig. 4 show my up-dated Paratone, originally described in *QST*, August 1954, page 25. My version plugs (P_1) directly into the receiver phone plug; the phones plug into the Paratone (J_1). A small pin jack on the side of the plug-in unit is for the r.f. pick-up connection.

Electrically, I followed the original design except for the addition of the miniature imported transformer, T_1, which, of course, was not available at the time of the original design.

The chassis board is a 1-inch-wide resistor board (Miller type 440 bakelite terminal plate) cut down to about 3½ inches in length. The lugs are cut off close to the eyelets. The end disks were cut with an ordinary circle cutter from a sheet of ¼-inch aluminum. The disk holes were then drilled and tapped for the plug and jack, respectively. The cover for the unit is a 3¾-inch section of 1¼-inch diameter TV antenna mast and is slotted on one side to make room for the r.f. input pin jack.

— *Joseph Kotzum, W6UWX*

IMPROVED KEYING FOR THE BC-459

PART of the conversion of the ARC-5/T18 transmitter mentioned in *QST*, February, 1963, page 35, involved the addition of a 12A6 buffer stage. This system also makes a satisfactory conversion for the BC-459 transmitter and will improve its keying characteristics considerably. Referring to Fig. 1 in the *QST* article, I substituted a slug-tuned coil along with a 50-pf. fixed silver mica across it, in place of the tuning capacitor C_1 and the r.f. chokes in the plate circuit of the 12A6 tube. The combination is resonated at 7100 kc. and will give adequate grid drive for the c.w. portion of the 40-meter band. The hot side of the heaters was wired with shielded wire and bypassed at the socket connections according to another article that appeared in *QST*, October, 1949, page 112. I use two power supplies with the transmitter; one gives about 240 volts for the oscillator, buffer, and the final-amplifier screens, and the other delivers about 400 volts for the 1625 plates. After the modification, no one recognized my signal as one from a "Command set!"

— *Bob Richardson, W6WHM*

HOMEMADE TERMINAL BOARD

A CUSTOM terminal board can be fabricated in the home shop simply by driving brass nails into a piece of phenolic or wood. After inserting the nails, you can solder to either the head or the spike end of the nails. Drilling a hole, smaller in diameter than the nail diameter, will facilitate the process.

— *Fred W. Asmussen, KØZAQ*

DOUBLE COAX FOR THE VO-CAN

AS W4AMN points out in his VO-Can article, April 1963, *QST*, a suitable double coax cable is hard to find. A neat yet flexible cable can be made by using two lengths of Amphenol Subminax, type 21-598, pushed side-by-side through a piece of ¼-inch clear plastic tubing.

— *Harry E. Adams, W9JX*

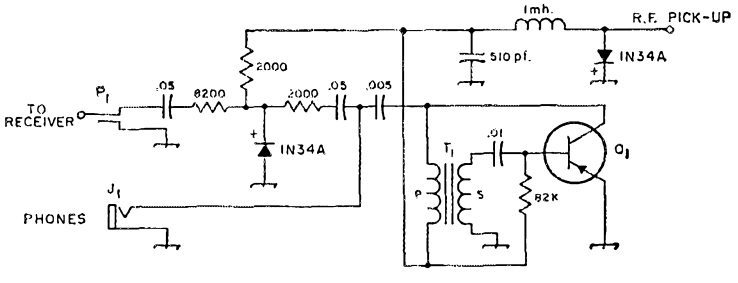
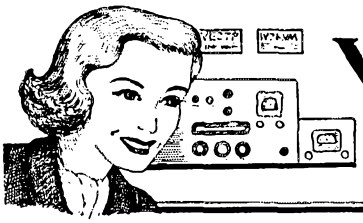


Fig. 4—Circuit diagram of the Paratone. Unless otherwise indicated, capacitances are in μf., resistances are in ohms, resistors are ½ watt.

T_1—Transistor transformer (Argonne AR-103).

Q_1—2N34 (a more modern p-n-p transistor, such as the 2N107, can probably be substituted).



YL NEWS AND VIEWS

CONDUCTED BY ELEANOR WILSON,* W1QON

YL Certificates And How To Obtain Them

LAST month we catalogued here information on 28 YL clubs of the United States and one DX YL club. (Please note elsewhere in this column additional YL club information just received.) Many of the YL clubs, and nets, issue certificates. Below we list these various YL certificates and general rules for obtaining them.

Unless it is specifically stated that the awards are for YLs only, or for OMs only, they are usually available to both YLs and OMs. In most cases contacts made during club net meetings do not apply toward awards, and certificate seekers are requested to make contacts other than during net time. Award custodians appreciate, and sometimes require, a stamped, self-addressed envelope with sufficient postage to cover cost of returning QSLs, lists, and logs (if they are to be returned).

ISSUED BY THE YLRL

Worked All States YL — issued for a contact with a duly licensed YL in each of the 50 states. District of Columbia may be substituted for Maryland. ARRL "single community" rule applies. No time or band limitations. Send QSLs and alphabetically-by-state list, showing call, *date*, band and whether A1 or A3. Include postage for return of cards by 1st-class mail. Custodian Grace Ryden, W9GME, 2054 N. Lincoln Ave., Chicago 14, Ill.

Worked All Continents YL — issued for a contact with a duly licensed YL on each of the six continents. All contacts must be made from within a 25-mile radius of original location. Send QSLs and list to Miriam Blackburn, W3UUG, Box 2, Ingomar, Pa.

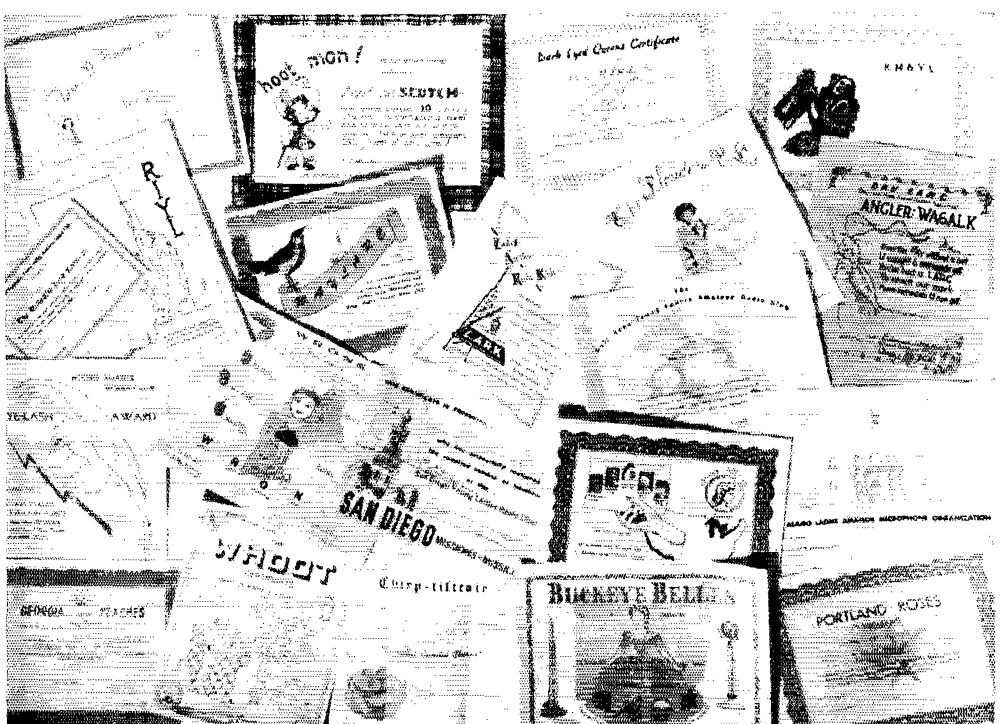
YL Century Certificate — issued for contact with 100 different YLs. All contacts must be made within 25-mile radius of original location. Send list in alphabetical order by operator's last name, showing operator's full name, call letters and date of contact. Enclose postage for return of cards by 1st-class mail. Endorsement given for each additional 50 YLs. Applications for stickers to be in same form as application for original certificate. This award is for working different YLs — same YL worked under different calls counts only once. Send applications and QSLs to Katherine Johnson, W4SGD, Box 666, Fuquay Springs, North Carolina.

DX YL — available to YLs only. Work 25 duly licensed YLs outside your own country as defined in the ARRL DXCC countries list. All contacts must date after April 1, 1958. Send log extracts showing date, time, station, band, mode RST report and own QTH, name, and call. QSLs not required. No charge, but return postage appreciated. (Note: work 25 different DX YLs, not necessarily 25 different countries.) Custodian is Maxine Willis, W6UHA, 6502 Wynkoop St., Los Angeles 45, Calif.

Continuous Membership Certificate — issued to any YL who has been a member of the YLRL for 5, 10, 15, or 20 years. Send request giving year in which you joined YLRL to custodian Ruth Siegelman, W2OWL, 2336 Holland Ave., Bronx 67, N. Y.

YLRL Affiliation Certificate — issued to YL clubs only. Those YL clubs with at least 50 per cent of their members belonging to YLRL are eligible. Send request with membership list to current YLRL Secretary (for 1963, Blanche Randles, K1IZT, 62 Linda Ave., Framingham, Mass.)

* This is the last column to be written by W1QON — see the note on page 69. Send all future YL news notes to Jean Peacor, K1IJV, 139 Cooley St., Springfield, Mass.







Meet the 1963 officers of the Camellia Capital Chirps of California! Top row, left to right—Jan O'Brien, K6HHD, President; Trish McGlynn, WB6AOG, Vice-President; Velma Lohner, WA6DGH, Secretary-Treasurer. Bottom left Wanda Gluck, K6ENK, Publicity Chairman; right—Marcia Rast, K6DLL, Historian.

ISSUED BY OTHER CLUBS AND NETS

EAST

WRONE Certificate — issued by the Women Radio Operators of New England. Work 6 WRONE members after May 1, 1959. Three of the N. E. states must be represented at least. To qualify for a sticker you must work a WRONE member in all three of the states not worked for original certificate. When you have received both the certificate and sticker, you will have worked 9 WRONE members and all six N. E. states. Send QSL cards, 20¢, and stamped, self-addressed envelope to custodian Blanche Randles, K1IZT, 62 Linda Ave., Framingham, Mass.

Rhode Island YL Club Certificate — Contact 10 YLs residing in R. I. Send QSLs and list to custodian Norma Walker, W1ZOK, 58 Locust St., Riverside 15, R. I.

Penn-Jersey Club Certificate — U. S. stations contact 10 club members; foreign stations contact 5 after June 1, 1956. Send list (no QSLs) to custodian Carolyn Currens, W3GTC, P.O. Box 523, Norristown, Pennsylvania.

Petticoat Operators of Six YL Certificate — issued by YLs in the Pittsburgh, Pa. area who get together Tues. at 0200 GMT on 50.4 Mc. Contact 7 net members. Send log data to custodian Jane Smurphat, W3FTV, Powers Run Rd., Pittsburgh 38, Pa.

WAYLARC Certificate — issued by the Washington Area YL ARC. Contact 5 members after Jan. 1, 1960. DX stations need only 3 contacts. Send QSLs to custodian Camille Hedges, W3TSC, 2202 Culver St., Washington 21, D. C.

Georgia Peach Award — issued by the Georgia Peach YL Club for contacts with 10 members after Oct. 1, 1957. Gold sticker for each additional 5 members worked. Send QSL cards to current vice president (for 1963, Lin Starling, K4IFF, 1346 Lavon Ave., Savannah, Ga.).

Floridora Certificate — issued by the Floridora YL Club for 10 contacts with members (who must be in Florida at time of contact). Send QSLs, return postage and 10¢ to custodian Marge Campbell, K4RNS, 1700 Nova Rd., Holly Hill, Fla.

FINS (Florida YLs International Sidebanders) — W/K stations work 10 DX plus 5 W/K members; DX stations work 10 W/K members plus 5 DX. Seal endorsement for each additional 10 worked. Send s.a.s.e. to custodian V. Mayree Tallman, 428 S.W. 28th Rd., Miami 36, Fla.

MID-WEST

Buckeye Belles Certificate — issued by the Buckeye Belles. Ohio stations contact 20 members; other continental U. S. stations contact 10; all else contact 5 members. Send log data, including number of Buckeye Belles, and 25¢ to custodian Marie Helmin, 3943 Concord Rd., Toledo, Ohio.

Chix on Six Certificate — Ohio stations contact and QSL 10 members of the Chix net, which meets Wed. 1900 GMT on 50.7 Mc. Other stations contact and QSL 4 members. Sticker issued for 4 more members worked. Send log data to Margie Blose, K8ZEV, 6159 Thistlewood, Mentor, Ohio.

Hiawatha Land Certificate — issued by the Upper Peninsula YL ARC for contacts with 50 licensed operators in the Upper Peninsula of Michigan. Also required are confirmed QSOs with 5 members of the Upper Peninsula YL Net. Send list to custodian Zelma Neault, W8HAV, Box 483, Marquette, Michigan, along with 50 cents. Endorsements issued for each duplication of the requirements.

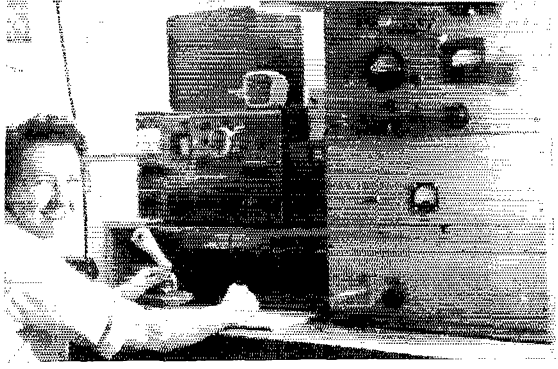
HAWK Certificate — issued by the Hoosier Amateur Women's Klub. Contact 10 HAWKs after Jan. 1, 1958. Send QSLs and list to custodian Adah Elliott, W9RTH, 721 Centennial St., Seymour, Indiana.

LARK Certificate — issued by the Ladies Amateur Radio Club of the Chicago area. Contact 10 members and send log data to custodian Connie Kalinowski, W9UON, 1045 Milwaukee Ave., Chicago 22, Ill.

Dark Eyed Queens Certificate — issued by the Chicago YLRL, Inc. for contact with 5 members after Jan. 1, 1960. Send QSLs and 10¢ to custodian Esther Talbott, K9UHD, 15144 Hiawatha Trail, Orland Park, Ill.

IMPS Certificate — Indiana Michigan Petticoat Sisters

C.w. operator Bette Peterson, K7TTV, of Forks, Washington, on the Olympic Peninsula, has the distinction of being the farthest west YL station in the continental U. S.



We're always glad to be able to point out a YL who can claim that she enjoys building some of her ham gear herself. New Mexico YL Rose Stewart, WA5ALX, is such a YL. Rose's homebrew all-band transmitter runs a single 813 in the final.

Net, which meets Mon. thru Fri. at 1800 GMT on 50.4 Mc., offers this certificate for contact with 5 net members (not during net time). Send list to NCS Amy Baldwin, K9YIC, 3812 Elkhart Rd., Goshen, Ind.

Texas

TYLRUN Certificate — issued by the Texas YL Round Up Net. Confirm contact with 25 YLs who are full paid-up members of TYLRUN. Send QSLs and list to custodian Bernell Johnson, K5GBX, 1822 S.W. 3rd St., Grand Prairie, Texas, along with 25¢ and sufficient return postage.

YL-OM 10CC Certificate — issued by the Texas YL Round Up Net to YLs only. Confirmed contact is required with 1600 different licensed OMs. A YL may use only one call. Send list (no QSLs) and 20¢ to custodian Lyn Ohlson, W5RYX, 8928 Hackney Lane, Dallas 18, Texas.

GAYLARK Certificate — issued by the Gulf Area YL AR Klub for contact with 6 GAYLARKs after Jan. 28, 1958. DX contact 5 members. Send log extract and 10¢ to Betty Sutton, W5ERH, P.O. Box 45-588, Houston 45, Texas.

WHOOT Certificate — issued by the Women Ham Operators of Texas for contact with 7 members after July 1, 1958 Send log copy to Bea Winnett, K5BNH, 508 Thompson, Irving, Texas.

WHO Certificate — issued by the Women Ham Operators of Tarrant County for contact with 3 members, or 2 members and club station K5LZW after May 1, 1958. Send log extract to custodian Margie Klar, K5PIO, 3525 Bellaire Drive, North Fort Worth, Texas. Endorsment for three contacts on one band, all c.w. or all mobile.

ALAMO YLs Certificate — issued by the Alamo Ladies Amateur Microphone Organization. U. S. and DX stations contact 3 members; Texas stations contact 4, after Nov. 1, 1959. Send list and 25¢ to custodian Inez Cole, W5WXT, 320 Meadowbrook Drive, San Antonio, Texas.

Texas Bluebonnets Certificate — issued for contact with six members of the Texas Bluebonnets net on any band. Send log extract to Doris Steele, K5RAE, Orangefield, Texas.

Currently serving as president of the 200 member TYLRUN is Mickle Inks, K5IOJ, of Odessa, Texas. A member of MARS, Mickie is active in local RACES and AREC programs.

Colorado

SYLver Dollar Award — issued by the Colorado YL club for contact with 5 members after July 1, 1961. Send list and 50¢ to custodian Tillie Curington, KØRGU, 2067 Brentwood, Denver 15, Colorado. Second certificate may be issued — same requirements. For the Colorado Counties award issued by the Colorado YLs Club write Marte Wessel, KØEPE, 1635 Tamarac, Denver, Colorado.

WEST

Loaded Clothes Line Net Certificate — issued by the LCNet for contact with 10 members after Jan. 1, 1959. (Net contacts do not apply.) Send list to Lucille Miller, K5GYZ, 215 E. Frazier St., Roswell, New Mexico.

Puget Sound YL Coffee Net Certificate — for OMs only, issued by the net for contact with 7 members. OM DX stations work 3 members. Send list to Laurie Hansen, W7HTD, 16413 N.E. 180th Place, Woodinville, Wash.

Portland Roses Certificate — issued by the Portland Roses YL club for contact with 8 members. Send log extract to Helen Wise, W7RVM, 4311 S.E. Salmon St., Portland 15, Oregon.

Oregon Elizabeth Certificate — is offered to YLs who bear the name "Elizabeth" or a derivative of that name (Betty, Bessie, Beth, etc.) and who furnish proof of contact with five so-named YLs in Oregon. Send QSLs to custodian Beth Taylor, W7NJS, 14637 S.E. Fair Oaks Ave., Milwaukie 22, Oregon. Endorsements for each five additional contacts.

Three Sisters Certificate — issued for contact with W7CSQ, K7DCI, K6HAT. Write Ethel Moore, W7CSQ, Junction City, Oregon.

BAYLARC Certificate — issued by the Bay Area Young Ladies' Amateur RC for contact with 6 members after Sept. 1960. Send copy of log to custodian Elaine Carter, K6SZT, 1011 85th Ave., Oakland 21, Calif.

Chirp-tificate — issued by the Camellia Capital Chirps for contact with 6 members after July 26, 1957. Send list and 10¢ to Velma Lohner, WA6DGH, 5400 Rockwell Rd., North Highlands, Calif.

Lad 'N' Lassie Certificate — issued by the Los Angeles YLRC for contact with 10 members after Jan. 1, 1952. Send log extract and return postage to custodian Irma Weber, K6KCI, 762 Juanita Ave., Santa Barbara, Calif. Endorsement for each additional 10 members.

Missions to Missiles Certificate — issued by the San Diego YLRC for contact with 5 members after June 1, 1959; DX stations contact 3 members. Send log data to custodian Pat Mulheim, W6GGX, 4275 Del Mar Ave., San Diego 7, Calif.

Alaska and Hawaii

PARKA Lucky Seven Award — issued by the Polar ARC of Alaska for contact with 7 members. Alaskan members contact 11 members. Endorsements issued for each two additional members worked. Contacts valid from Feb. 1, 1955. Send sufficient return postage to custodian Geraldine L. Nichols, KL7ALZ, Star Route "A", Box 4017, Spenard, Alaska.

KH6YL certificate — issued by the KH6 YL club for contact with 4 members. DX stations contact 3 members. Send QSLs and s.a.s.e. return postage to custodian Louise Bostwick, KH6AFL, 4825 Kahala Ave., Honolulu, Hawaii.

Union of South Africa

Worked All YL Award — issued by the South African Women's Radio Club for contact with 10 YLs located in any of following areas: ZS1-9, ZE, VQ2, OQ5, or CR7. Send QSLs and 7 IRC to Margaret Snyman, ZS1RM, P.O. Box 80, Strand, Cape Province, South Africa.

K.K.K. Award — issued by the So. African WRC in three parts as follows: 1) for 100 2-way c.w. contacts, 2) for 500 2-way c.w. contacts, 3) for 1000 2-way c.w. contacts — all contacts made after Dec. 31, 1956, with minimum report

R4/T8. Application requires that logs must be verified by another person, who in turn is witnessed in this act of verification by another person. Apply with list signed by applicant, "scrutinizer," and witness (total of 3 persons) with $1.00 or 5/s to Margaret Snyman, ZS1RM, P.O. Box 80, Strand, Cape Province, South Africa. (No charge for SAWRC members).

Miscellaneous Certificates

Grandmother's Certificate — issued by the Grandmother's Club. Contact 10 members after May 17, 1958. Send log extract to Anita Ruckman, K9HCY, 809 So. Monroe St., Streator, Illinois.

Great Grandmother's Award — issued to YLs who are great grandmothers upon contact with another YL who is a great grandmother. Send letter, QSL and 10¢ to Grace McCormack, W7GWG, 1428 East 20th Ave., Eugene, Oregon.

Seldom Heard OM Certificate — issued by *Western Amateur Radio Magazine*. Contact 25 licensed OMs who have XYLs who are licensed hams at time of the contact. Contact must be with the OM using his own call, not with the XYL using her OM's call. Contacts must date on or after Jan. 1, 1960. Send list showing OMs' calls and call letters of the XYLs to Jean M. Kincheloe, K6OQD, 6625 N. Brightview Drive, Glendora, California.

SWOOP (Suffering Wives of Operators' Protectorate) — Esther Given, W6BDE, and Kay Mac Gillivray, K6HIW, are founders of the SWOOP organization designed to make XYLs feel welcome at hamfests and conventions. Certificates for distribution to XYLs may be obtained from Esther Given, W6BDE, P.O. Box 84, Montara, California.

Worked Kansas YL Certificate — issued by the Kansas Radio Club. Contact YL stations in Kansas after Jan. 1, 1947, as follows: Novice applicants contact 2; Kansas stations 10; rest of U. S. contact 6; DX stations contact 2. Send QSLs, 50¢ or 4 IRC to Kansas Radio Club, 5019 Gramar, Wichita, Kansas.

Ohio YL Award — issued by the Ohio Council of Amateur Radio Clubs. To qualify one must have received QSLs confirming contacts with 25 Ohio YLs since the end of World War II. Send list of QSLs to custodian Marie Helminski, W8MBI, 3943 Concord St., Toledo 12, Ohio.

COMING EVENTS

13th Midwest YL Convention — June 22 and 23 at Fall Hotel, Newberry, Michigan. W8IIAV and W8JXJ are co-chairmen. Many interesting events planned.

ARRL Field Day — June 22 and 23. YLs and YL clubs who participate are invited to submit summaries and photos of their FD doings to this column.

AWTAR — The 17th annual All Woman Transcontinental Air Race ("Powder Puff Derby") will start at Bakersfield, California July 13 and will terminate July 17 at Atlantic City, N.J. This year's stop-over cities are Las Vegas, Nev.; Farmington, N.M.; La Junta, Colo.; Great Bend, Kansas; Kansas City, Kansas; Springfield, Ill.; Dayton, Ohio; Cumberland, Md. Carolyn Currens, W3GTC, will supervise the AWTAR amateur radio net for the sixth year. Assistance from amateurs who live in cities along the flight route is welcomed. Contact W3GTC, P.O. Box 523, Norristown, Pennsylvania.

ARRL Atlantic Division Convention — Aug. 31–Sept. 1 at the Sheraton-Park Hotel, Washington, D.C. Ethel Smith, K4LMB, is general chairman for women's activities. Claire Bardon, W4TVT, is in charge of licensed YL activities, assisted by Irene Akers, W3RXJ. WAYLARC is hostess YL club. A special forum will be conducted by Lillian Beebe, K3NLU.

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CONGRATULATIONS to *YLRL Harmonics* Editor Edie McCracken, K1EKO upon the birth of a second child and first daughter on April 15, 1963.

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Silent Key

With deep regret we report the untimely death on Dec. 18, 1962, of Brenda Gail Allen, WN4DLG. The fifteen year-old YL from Charlotte, North Carolina was the victim of an auto accident while on the way home from a radio club meeting. A member of the Mecklenberg County Amateur Radio Club and Secretary of the Myers Park High School radio club, Brenda Gail was a fine c.w. operator, and in the year she was licensed had made many friends on 40 and 80 meters.

Thirty-two W8 YLs enjoyed getting together at the ARRL Michigan State Convention at Saginaw March 15 and 16.

To my dear friends everywhere,

In turning over these YL pages to a new conductor, I wish to thank everyone who in the past eleven years has helped to make this *QST* YL column grow and prosper.

For the marvelous cooperation so cheerfully extended, for your invaluable aid untiringly given, for your enthusiastic spirit, and for countless expressions of kindness — my deepest appreciation to everyone.

I know that you will support your lovely new YL Editor, Jean Peacor, K1IJV, in every way possible, making it for her the joy to serve you as it has so completely been for me.

33, 73, 88,

— *W1QON*

For their outstanding leadership as chairmen of the ARRL Southeastern Division Convention/Hamboree in Miami last January, Evelyn, W4WYR, and Carl Gauzens, W4DTJ, were presented with a Drake 2-B receiver by the Dade Radio Club during a recent meeting of the club. Fellow club member W4OBA reported that "it was worth the price of admission just to hear Evelyn squealing for joy." And as Jack added, "Come to think of it, who wouldn't squeal?" (Photo courtesy W4IYT of Florida Skip)

Simulated Emergency Test—1962

The Amateur Radio Public Service Corps in Action

BY GEORGE HART,* W1NJM

THE Amateur Radio Public Service Corps is a new name for the combined facilities of the Amateur Radio Emergency Corps and the National Traffic System. This represents a gradual blending of the two into a single strong facility, rather than a sweeping reorganization program. The AREC, with its emphasis on emergency communications preparedness and implementation of the Radio Amateur Civil Emergency Service (RACES), continues to exist, as does NTS with its emphasis on daily traffic handling. The ARPSC starts out as the name covering both of them and will end up, we hope, as a byword for amateur radio communication in the public interest. To that end, you will one day see it beginning to appear on certificates and forms.

The annual Simulated Emergency Test is and has been, for quite a few years, a combined test of these two principal public service entities. The local AREC group conducts its community- or county-wide exercise and reports the results by amateur radio to headquarters via the National Traffic System through liaison established at the local level. Anyway, this is the general idea. How well it works out is attested by the results, which we shall now proceed to examine.

The Results

If you will refer to last year's write-up of the SET (April, 1962, *QST*, p. 21) you will note the graph showing how we have improved from year to year following the 1955–57 "doldrums." If we were to plot the 1962 results on this same graph, the line would extend still farther upward, over the 30 thousand mark, showing that we are still on the way up. In addition to a higher total score, we received many more reports than last year, both by mail and radio. The number of "hearsay" reports declined, and this is good. The total known participation of "almost 4000" in the 1961 test increased to just three short of that number in this test. Other data show that there was an insignificant drop in the number of mobiles and portables and in the number of fixed stations using emergency power, a significant drop in the number of AREC member messages sent to their Section Emergency Coordinators, a good increase in the number of EC radio reports claimed to have been sent, but an even lower percentage of receipts of these messages by radio.

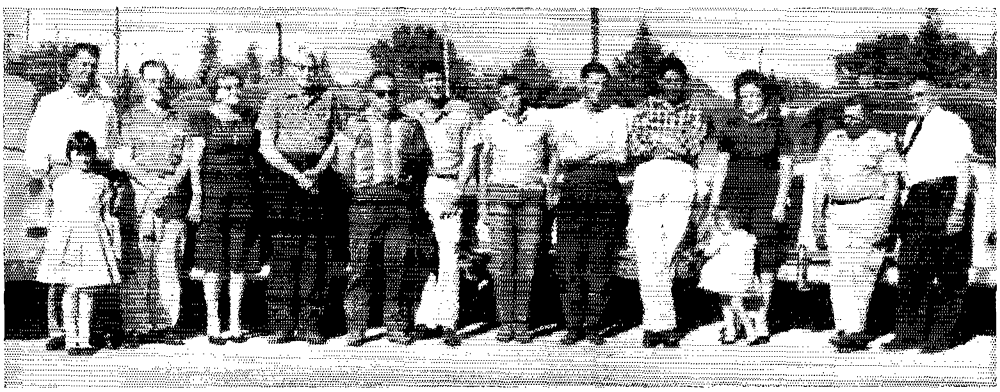
As usual, the over-all picture showed any kind of results you are looking for. We can point with pride to the much-improved performance of AREC groups in some places, be disappointed at the apparently diminished interest in others. Civil defense interest was high, but can no longer be said to be the "keynote" of these tests. The Red Cross participation was even greater than usual, particularly in Florida and the southeast where a special network was set up in connection with the statewide Florida SET on Sept. 8-9. Following the discontinuance of the AMCROSS teletype network, we look for increased use of our facilities from that quarter.

As usual, the statistics don't tell everything. Each SET report is accompanied by comments of various kinds, by detailed communication plans, by membership rosters. We could write books if we tried to go into detail concerning each local test, and we wish we could. Some of the pertinent comments appear later on, the rest is shown in the statistics which are tabulated.

Long Haul Traffic

After the local test, each emergency coordinator is supposed to dispatch a brief radio report to

* National Emergency Coordinator, ARRL.



Here is the AREC group who put on the SET in Terry County, Texas. Left to right are K5LSN & daughter, K5CWL, K5MBS, W5NFO, W5JMS, W5HFT, an s.w.l., K5LFI, K5LFJ, W5FBM & grand-daughter, W5AMA & K5JST. (*Photo by K5GEC.*)

At Miami Red Cross amateur station K4IWT, W4IIS watches K4DHU copy a string of 15 on Net D (7115 kc.) while W4HFD holds down the 6-meter position.

headquarters, preferably by the National Traffic System. The local tests are not all held on the designated October week end (Oct. 6–7 in this case), and so such traffic may trickle in for weeks. According to mail reports received, 167 messages were originated by ECs to ARRL headquarters. Checking against the messages received by radio, only 57.8% of them *reached* us. This is even more horrifying than last year's percentage, and, as last year, we refuse to believe it. We wonder how many of those ECs intended to originate a message but never did, how many of them misunderstood and sent the message to their SEC or SCM? Even allowing for a high percentage of these, however, the efficiency is lamentable. We should be able to improve it.

How? Well, to begin with, by making closer and stronger liaison with your NTS net. Contrary to popular belief, all NTS nets do not operate on c.w. Once a message is in the system's channels, its chances of reaching its destination are very good. If no NTS liaison is available, get the message into some other established traffic net; there are a lot of good ones around. We suspect that many ECs tried in vain to handle the message direct to headquarters by random methods, then either heaved it into the wastebasket or mailed it.

The stack of messages received at headquarters seems a little smaller than usual, but the statistics do not bear this out. We received 132 radio reports from ECs, as compared to 96 last year. The total SET messages received was 207, including v.i.p. messages from C.D. Director Condon of New York City; Mayor Dickflint of Bethany, Mo.; Deputy Director Slattery of Chicago C.D.; the disaster chairman of Dade County, Fla., Red Cross; the sheriff of Livingston County, Mo.; the c.d. director and sheriff of Grundy County, Mo.; and the chairman of the Marshall County Chapter, ARC. The difference between the total EC radio reports received plus the v.i.p. messages and the total of 207 represents miscellaneous messages received from individual amateurs, net control stations and net managers, SECs and others. We wish to acknowledge one or more messages from the following: *K1s* LQV NKT RTS RZN WIQ YGS, *W1s* DND JUV TXL YNE, *K2s* OVN UBG, *W2s* HDV WFL, *WA2s* GPT IKI, *K3s* BHU QFG RBN, *W3s* BUR CVE NVO, *K4s* BNL BY CLL EHY GUE YDL, *W4s* BWR BFB DDY FQQ HFH IYT KGP MLE PAY SDR, *WA4s* CIR CJC GYE JYV, W5AIR, K6UMV, WA6PDE, K7ET, *W8s* EUC HNP LOX, *W9s* BBF BGW, *KØs* BMY WKT, *WØs* AIM AQY SCT YZB.

Traffic for ARRL headquarters showed a peak just after the SET week end, but because many AREC groups used other week ends or week days for their SET, nobody was overworked. The following stations made delivery (number of messages delivered in parentheses): W1AW (72), W1YBH (25); W1NJM (19), K1LFW (18); K1DQC (16); W1BDI (10); K1QPN (10); W1KGF (6); W1DAV (6); K1QKZ (5); W1EFW (5); W1EKJ (5); K1KYC (3); K2PKH (1).

The SET in Florida

Don't ever make the mistake of asking a Florida EC or SEC how they made out in the SET — not unless you have plenty of time, that is. Last year we gave them a separate *QST* article, out of a drawerfull of information. This year all we got was a 3-page prospectus followed by a 17-page report, so we're reducing them to a paragraph or so herewith. We do this at the risk of incurring the wrath of other sections of the country who may think that *their* SET deserves as much space. In justification, we can only say that the Florida AREC is so exemplary of what for many years we have been trying to implement that we think it ought to be held up as something for all to emulate. The following paragraph taken from the introduction to the 17-page report written jointly by SECs W4MLE and W4IYT is significant.

"One of AREC's strongest points is that it is an emergency communication service for *everyone* who needs it. Our circuits are AREC circuits. We

K8DNS, EC for Lorain County, Ohio, operates mobile on 160 meters during the SET.

have no Red Cross circuits. We have no civil defense circuits. We have no utility department circuits. AREC circuits move traffic impartially for civil defense, Red Cross, utility department and private individuals alike, using AREC procedures, AREC volunteer personnel and for the most part AREC-owned equipment. We need no one else's 'hat' to make us 'official.'"

The Florida statewide SET had two main objectives: first, to test arrangements with the American National Red Cross for handling their traffic, and second, to test statewide ability to use 2, 6 and 10 meters to avoid the "horrors" of the h.f. bands. The final report says that more traffic was handled than in "Hurricane SET" of last year, in half the time, with much less confusion. The Red Cross, state civil defense and AREC members dumped heavy loads of traffic into all nets at the beginning of the exercise, and then the state's AREC traffic-handling system went into operation to cope with it. RTTY was utilized to its utmost, the state emergency net (QFEN) operated under heavy load and with limited station participation, v.h.f. circuits were called upon for statewide distribution of traffic outside the "key cities," and a traffic "storage" technique was used for the first time whereby key cities absorbed all traffic addressed to other cities in their areas whether or not they could be reached direct immediately.

All messages were answered or service messages sent back to the originating point. This was not a "file it and forget it" type of operation.

The test showed that the use of v.h.f. was practical for a state the size of Florida provided that adequate provision is made for relaying, both in equipment and schedules — this despite the fact that the airline distance from Miami to Pensacola is over 500 miles.

Well, we wish we had room to go into some of the details discussed in the final report, but we keep getting stopped by the bottom of the page.

Statistical Summary

In the organizational rivalry which exists during the SET, this year a "dark horse" rose to the top of the pile and relegated the perennial leaders to second place. The Iowa section, through a sustained effort on the part of SEC KØEXN, came through with 33 reports and first place in the statistical standings. Eastern Florida and Indiana tied for second. Next came Tennessee, another section which is fast becoming an organizational giant.

Kansas Zone 3 EC KØLHF (center) talks over the situation with KØBJO (left) and KØZSG.

No caption information came with this photo of mobiles from Jefferson County, So. Texas, but from the license plates we can identify W5ZAT, W5MSX and K5INE, who took the photo.

The standings are based on the average of four factors: (1) total number of EC reports received; (2) number of mail reports; (3) number of radio reports; (4) total points compiled. Under this system, as in nearly any system that can be kept relatively simple, the sections with the largest amateur population will *tend* to place high, and it therefore follows that those with a low amateur population will gravitate toward the bottom of the list. Your section's standing, therefore, is relative. Iowa is not by a long shot the section with the greatest amateur population, however, so there is some "justice" to these arrangements. EC areas of jurisdiction are listed under each section alphabetically. In the summary, figures in parentheses are 1961 scores for comparison.

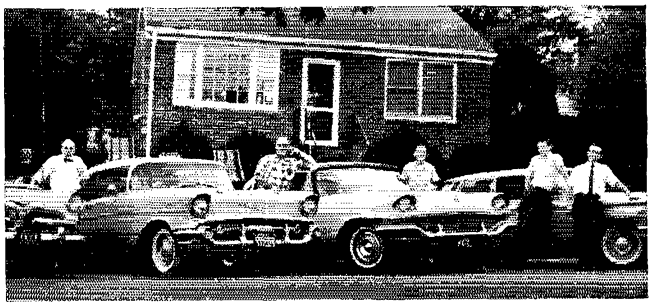
W4PAY, the station of the Northern Virginia Radio Club, served as the principal collecting station for Red Cross traffic. Here, at W4PAY, are (l. to r.) K4IAG, Red Cross Communications Chief; W4ZLN, club station custodian; W4UKD, club president; General W. Collier of Fairfax County Red Cross Chapter, which sponsors W4PAY.

Total Reports Received: 294 (236)
By Mail: 247 (194)
By Radio: 132 (96)
By Hearsay: 15 (20)
AREC Member: Represented: 7849 (7142)
Total Known Participation: 3997 (3890)
Mobiles & Portables: 1109 (1113)
Fixed Stations on Emerg. Power: 215 (221)
AREC Messages to SEC: 1771 (2210)
EC Radio Reports Sent to ARRL: 167 (124)
Per Cent Received by Radio: 57.8 (58.9)
Total Points Compiled: 30,200 (28,862)
AREC Groups also heard from in 1961: 003 (96)
AREC Groups bettering 1961 Score: 42 (42)

Area of Jurisdiction	*Reported By*	*Points*
1. IOWA (33 Reports)		2310
Adair[1,20]	KØZBW	150
Buena Vista County[1,3]	KØEVC	29
Cherokee County[5]	KØTBO	26
Clay & Palo Alto Cos.[1]	KØHGH	37
David-Wapello[4]	KØYPP	28
Clinton County[1,22]	KØSCW	162
Davison, Aurora, Sanborn & Hanson Counties[3]	WØDWW	...
Decatur County[1,28]	KØDYS	16
Des Moines County[4]	KØUVE	53
Fayette County[1]	WØFEK	17
Fremont County[1,3,23]	WØONG	9
Grinnell (Dist. #4)[1,3]	KØVKT	57
Guthrie & Madison Cos.[1,3]	KØTOO	94
Humboldt County[1,3,25]	WØFDM	48
Ida County[1]	KØLXL	69
Jasper County[1]	WØNWX	138
Jefferson & Van Buren Cos.[1,2]	KØIQV	47
Kossuth County[1]	WAØDQD	17
Marshall County[3]	KØEAA	24
Linn County[1,3]	WØGQ	206
Lyon County[4]	WØNLF	6
O'Brien County[4]	KØOZI	3
Osceola County[3]	KØWKT	6
Pocahoutas County[3]	KØZKU	6
Polk County[1,3,16]	WØMJH	373
Pottawattamie County[1,3,24]	KØUAB	128
Shelby County[3]	KØVHR	10
Sioux City, N.W. Iowa[1]	KØQDC	14
Story County[1]	WØLSF	164
Union & Ringgold Cos.[1,26]	WØOXY	149
Webster County[1,2,26]	KØOFI	69
Wright County[4]	KØJMA	...
Woodbury-Plymouth-Monono Cos.[1,26]	KØMMS	161
2. EASTERN FLORIDA (21 Reports)		2417
Alachua County[1,7]	WA4BMM	204
Brevard County[1,7]	W4TFT	104
Broward County[1,7]	K4SJH	174
Daytona Beach[4]	.....	...
Duval County[1,3,7]	W4TKE	62
Highlands County[1,7]	K4JJZ	63
Hillsborough County[1,7]	W4BNE	344
Indian River County[1,2,7]	W4BBE	63
Lake County[1,7]	W4SXJ	185
Lee County[3]	W4KOB	...
Manatee County[1,3]	K4ILB	105
Martin County[3]	K4KGB	...
North Dade County[1,7]	W4ELR	506
Orange County[1,2,7]	W4NKD	248
Osceola County[1,7]	W4DDW	50
Palm Beach County[4]	K4BZS	...
Pasco County[1,7]	K4MTP	25
Pinellas County[3,5,7]	K4QOK	...
Polk County[1,3,7]	W4CCC	151
Seminole County[1,7]	W4NGR	24
St. Lucie County[1,2,7]	K4JZU	109
3. INDIANA (21 Reports)		1475
Allen County[1,3]	K9OET	140
Blackford County[5]	K9AEK	...
Carroll County[1]	K9EFY	16
Clark County[1]	K9QVT	43
Dearborn County[1,3]	K9RLM	61
Decatur County[1]	K9TJJ	66
Delaware County[1]	W9FYC	120
Floyd County[1,2,18]	K9HEL	73
Henry County[1,3]	W9SVL	171
Jay County[1,2,19]	K9ULW	82
	W9SNQ	...
Fulton County[1,3]	K9VEC	61
Lake County[1]	W9GUX	61
Madison County[1,3]	W9FHW	105
Marion County[1]	K9OFG	204
Marshall County[1,3]	K9ZLB	82
Mills County[4]	KØPOI	4
Morgan County[1,2,3,20]	W9ZSK	114
Orange County[3]	W9QYQ	...
Ripley County[1]	K9PYM	23
Tipton County[5]	K9WKK	...
Vanderburgh County[1,21]	W9DGA	19
4. TENNESSEE (16 Reports)		1668
Bedford County[1,3,27]	K4YUJ	57
Campbell County[1]	W4TZG	86
Carroll County[1]	W4BQG	67
Gibson County[1]	W4IGW	29
Hamilton County[1,3,45]	W4JVM	199
Haywood County[1]	K4VIR	5
Henry County[1,3]	W4NGO	19
Knoxville & Knox County[1,3]	W4TZJ	174
	W4ZBQ	...
Memphis & Shelby County[1,2]	K4PYH	460
Montgomery County[1,3]	W4NGK	90
Oak Ridge & Anderson Co.[1,3]	K4VOP	177
Roane County[1,2,3]	W4VNU	65
Rutherford County[1]	W4SZE	29
Sullivan County[1]	W4TYV	123
Weakley County[1,3]	W4FLW	88
Wilson County[3]	W4PFP	...
5. MICHIGAN (11 Reports)		1883
Calhoun County[1,3]	K8AEM	187
Hillsdale County[1,2,3]	W8IUG	74
Kalamazoo County[1,3,11]	W8EMD	221
Kent County[1,3]	K8KCD	150
Midland County[1,3,37]	K8AQI	109
Montmorency County[1,3]	W8ZHB	23
Muskegon County[1,33]	W8UCG	182
Oakland County[1,3,32]	K8GIK	314
Shiawasse County[1,3]	K8BDR	191
St. Clair County[1,2]	W8QFQ	148
Wayne County[1,2]	K8SGL	284
6. OHIO (12 Reports)		1299
Clermont County[1,3]	W8WYS	95
Erie County[5]	.....	...
Jefferson County[1]	K8VBH	141
Licking County[1,3]	K8RXD	34
Lorain County[1,2,3]	K8DNS	231
Lucas County[1]	K8LMI	130
Montgomery, Green & Preble Cos.[1,3]	W8GQ	112
Richland County[1,2,3]	W8TAJ	120
Scioto County[1]	K8BNL	95
Seneca County[1,20]	K8SVM	123
Stark County[1,2]	W8AL	218
Tuscarawas County[3]		
7. CONNECTICUT (11 Reports)		663
Bethlehem[3]	W1FHP	...
Bloomfield[1,2,3]	W1PRT	97
Canaan, Falls Village, Sharon, Norfolk, Goshen, Lakeville & Salisbury[1]	K1BEN	43
East Hampton[1,3,51]	W1HGE	...
East Hartford[3]	W1EKJ	...
Fairfield[1]	W1WX	76
Hamden[1,3]	W1NFG	124
Marlborough & E. Hampton[1,3]	W1LVT	56
Norwich[1,3]	W1GEA	173
Southington[1,3]	K1CSY	94
Thomaston[3]	K1PUG	...
8. ILLINOIS (10 Reports)		1150
Chicago & Northern Ill.[1]	W9SPB	361
Cook County[3]	W9HPG	...
Fulton County[1]	W9MUL	110
Greene, Jersey & Calhoun Cos.[1,17]	W9IFA	161
Madison County[1]	W9DJG	198
Moline-Rock Island[1]	K9YGC	148
Monroe County[1,2]	W9ICF	49
Montgomery County[1]	W9VWJ	123
Rock Island County	W9BBF	...
Winnebago & Boone Cos.[3]	K9QQY	...
9. NEW YORK CITY — LONG ISLAND (8 Reports)		2225
Bronx & Yonkers[1,3]	WA2QAO	103
Kings County[1,34]	K2OVN	587
Nassau County[1,3,35]	W2FI	1321
Area 6, Nassau Co.[1,35]	W2ELK	...
Area 7, Nassau Co.[1,35]	W2UAL	...
West Central Nassau Co.[1,35]	W2ZAI	...
Queens County[1]	WA2WAO	89
Queens Co., 10 Meters[1]	W2IAG	125
10. SOUTH DAKOTA (10 Reports)		485
Butte & Harding Cos.[1,3]	KØZMA	20
Codington County[1,3]	KØZBJ	62
Davison, Aurora, Sanborn & Hanson Cos.[1,2,3]	WØGWW	71
Deuel County[1,2,3,31]	KØTAM	52
Douglas County[1,3,49]	KØDUR	30
Fall River & Shannon Cos.[1]	WØHOJ	94
Grant & Roberts Cos.[1,47]	WØRSP	19
Lake County[1,2,3,42]	KØBSW	27
Lawrence County[1,3]	WØDVB	70
Tripp County[1,30]	KØBMQ	10
11. SOUTHERN TEXAS (7 Reports)		1060
Galveston County[1,3,43]	K5YYD	77
Harris County[1,3]	K5RDP	385
Nueces County[1,44]	W5AQK	285
San Patricio County[1,44]	W5BRZ	27
South Jefferson County[1,3]	K5RVF	121
Tyler County[1,11]	W5ZTB	155
Wharton County[1]	W5FBI	10
12. LOS ANGELES (8 Reports)		668
Alhambra[1]	K6SUJ	54

A good turnout, as always for the Blair County (Pa.) SET, under EC W3ISZ. This group simulated a train wreck on PRR's famous Horseshoe Curve in Altoona.

Centinela Valley Area[1,30]	W6OI	125
Pasadena[1,2]	W6ORG	107
Redlands & vic.[1,2,3]	K6GGS	151
San Fernando Valley[1,3]	WA6HUO	136
San Gabriel[5]	W6MLZ	...
South Central Los Angeles[1]	K6HOV	...
Whittier[1,31]	W6LVQ	95
13. EASTERN MASSACHUSETTS (7 Reports)		860
Dedham-Hyde Park[1,3]	W1AAU	92
Groveland[1,2]	W1MRQ	106
Sharon[1]	K1ICJ	88
Southbridge & vic.[1]	W1EFC	72
Tewksbury[1,3]	K1OLN	169
Waltham[1,3]	W1JSM	87
Winthrop[1,2,3]	W1BB	246
14. EASTERN PENNSYLVANIA (8 Reports)		933
Berks County[1,11]	K3KHV	114
Lehigh County[3]	K3LKQ	...
Luzerne County[4]	.....	...
Lycoming County[3]	W3CHC	...
Montgomery County[1,2,12]	W3AHZ	698
Northumberland County[1,2,3]	K3JSX	77
Schuylkill County[1,13]	K3KNP	44
Tioga County[3,11]	K3CKB	...
15. OKLAHOMA (7 Reports)		699
Comanche County[1,2,3]	K5BYF	333
Delaware County[1,11]	W5KEH	58
Craig County[1,2,11]	K5BPV	97
Creek County[1]	K5CCO	47
Le Flore County[1]	W5BBA	3
Stevenson County[3]	.....	...
Washington & Nowata Cos.[1,3]	K5UZL	161
16. VIRGINIA (7 Reports)		596
Alexandria[1,3]	W4JXD	65
Appalachia & Big Stone Gap[1]	W4KRX	67
Falls Church & Fairfax Co.[1,2]	W4OP	143
Lynchburg[3]	K4MKO	...
Norfolk[1]	W4QDY	186
Orange & Louisa Cos.[1,2,3]	W4JYL	96
Richmond & Henrico Co.[1,3,42]	K4WKH	39
17. KANSAS (6 Reports)		952
Zone 3[1,2,27]	KØLHF	212
Zone 11[1,28]	KØVQC	163
Zone 13[1,3,16]	KØLPE	133
Zone 14[1,29]	KØYBR	101
Zone 16, Sedgwick County[1,3]	WØYZB	312
Zone 18[1]	KØEWW	31
18. WASHINGTON (5 Reports)		901
Benton County[1,3]	W7YFO	124
Clallam County[1,3,32]	W7PSD	67
King County[1,3]	W7RPZ	349
Kitsap County[1,3]	W7UWT	70
Pierce County[1]	W7HMQ	291
19. SOUTH CAROLINA (7 Reports)		323
Barnwell County[3]	K4JOQ	...
Beaufort County[1,3]	WA4ECJ	70
Laurens County[1,3]	K4WJU	49
Lexington County[1,3]	W4UJB	20
Marlboro County[1,3]	K4ZLW	44
Rock Hill[1,3,27]	W4UMW	140
Spartanburg County[3]	K4GVE	...
20. ONTARIO (6 Reports)		470
St. Thomas[1,3,11]	VE3OT	48
Midland-Penetang Area[1,20]	VE3AG	44
North Bay[1,3]	VE3DXG	152
Peel County[1,3]	VE3FES	21
Toronto UHF, 2 Meters[1,3,38]	VE3DRF	139
Whitby[1,3]	VE3ATI	66
21. NORTHERN NEW JERSEY (6 Reports)		597
Bayonne[1,21]	WA2BGW	78
Englewood, Bergen County[1,2,3,29]	WA2CCF	86
Essex County[1,3]	WA2BNF	162
Morris & Sussex Cos.[1]	W2LEP	127
Passaic County[1]	W2KXO	55
Wood-Ridge & S. Bergen Co.[1,21]	W2DMJ	89
22. WESTERN NEW YORK (4 Reports)		527



Mobiles are lined up and ready to go in the Orange and Louisa Counties (Va.) SET. Left to right are K4DCN, K4LTO, K4CVL, W4SXH and EC K4JYL.

Chemung County[1,3]	K2DNN	141
Orleans County[1,30]	K2QKM	81
Steuben County[1,2,3]	W2YIY	200
Tioga County[1,3,47]	K2MEF	105
23. ALABAMA (6 Reports)		416
Lawrence County[3]	K4JLE	...
Madison County[1]	K4RSB	120
Marshall County[1]	K4WSS	65
Morgan County[1,3]	K4WHW	150
St. Clair County[1]	K4NUW	70
Sumter County[1]	W4DS	11
24. EASTERN NEW YORK (3 Reports)		511
Eastern Putnam County[3]	W2DQW	...
Schenectady[1,2,3]	K2HNW	342
Dutchess County[1,3,10]	K2GCH	169
	W2HZZ	...
24. WISCONSIN (4 Reports)		478
Eau Claire County[1]	W9BEW	...
Marathon County[1,3]	W9VHA	131
Milwaukee County[1,2,48]	K9KJT	216
Ozaukee County[1,3]	W9RYA	131
26. MARYLAND-DELAWARE-D.C. (3 Reports)		504
Baltimore Area[1,3]	K3RGD	291
Calvert County[1,3]	W3ZNW	52
Prince George's County[1]	W3CVE	161
27. LOUISIANA (3 Reports)		391
North East Louisiana[1]	K5BLO	159
Southwest Louisiana[1,3]	W5SKW W5IIF	165 ... 67
Webster Parish[1]	K5WOD	314
28. MONTANA (3 Reports)		95
Harlowton, Wheatland County[1,2,6]	W7RZY	70
Kalispell Area[1,16]	K7PKN	149
Missoula Area[1,3]	W7COH	564
28. SANTA CLARA VALLEY (3 Reports)		102
Palo Alto[1,2]	K6BBF	335
Redwood City, Atherton & Menlo Park[1]	W6DEF	127
Santa Clara County[1]	WA6EIC	170
30. ARIZONA (3 Reports)		93
Sierra Vista, Cochise Co.[1,3]	W7AMM	77
Phoenix[1]	K7RUR	...
Pima County[3]	W7SQX	249
31. IDAHO (3 Reports)		114
Bannock County[1]	W7GCO	6
Blaine County[1,14]	W7EVZ	129
Twin Falls County[1,15]	K7LLA	415
32. WESTERN PENNSYLVANIA (2 Reports)		258
Blair County[1]	W3ISZ	157
Centre County[1,2,3]	W3SAY	220
32. WYOMING (3 Reports)		...
Natrona County[1,50]	W7LKQ	...
Sublette County[1,50]	W7AEC	220
Wyoming Section[49]	W7HH	124
34. MISSOURI (4 Reports)		124
Jasper County[1,3]	KØIHY	...
Gilman City[4]	KØOLW	...
Grundy County[4]	.....	...
Livingston County[4]	.....	266
35. ALBERTA (1 Report)		266
Calgary[1,3]	VE6FK	
35. WESTERN MASSACHUSETTS (2 Reports)		189
Gardner & vic.[1]	K1LNC	125
Springfield[1,46]	W1NLE	64
37. QUEBEC (1 Report)		105
Chambly, Vercheres, Napierville, Laprairie & Rouville Cos.[1,3,5,11]	VE2AEW	105
38. COLORADO (1 Report)		104
Montrose County[1,3]	KØEDK	104
38. EAST BAY (1 Report)		253
Southern Alameda County[1,2,6]	K6HTJ	253
40. RHODE ISLAND (1 Report)		216
Composite[1,39]	W1YNE	216
41. NORTHERN TEXAS (2 Reports)		48
Cooke County[1,31]	K5ULC	48
Terry County[6]	W5NFO	...
42. SAN FRANCISCO (1 Report)		46
Eureka Area[1,3]	W6SLX	46
43. OREGON (1 Report)		114
Benton County[1,2,29]	K7CNZ	114
44. MINNESOTA (1 Report)		91
Cottonwood, Jackson & Watonwan Counties[1,30]	KØIKU	91
45. WEST VIRGINIA (1 Report)		70
Fayette County[1]	K8CFT	70
46. NEVADA (1 Report)		54
Reno, Sparks & Washoe County[1,29]	W7PC	54
47. UTAH (1 Report)		52
Utah County[1,18]	W7MSY	52
47. NORTH CAROLINA (2 Reports)		21
Mecklenburg County[4]	.....	...
Orange County[1]	W4MFK	21
49. VERMONT (1 Report)		33
Lamoille County[1]	W1KJG	33
50. MISSISSIPPI (1 Report)		31
Adams County[1]	K5MDX	31
51. GEORGIA (2 Reports)		0
Gordon County[3]	K4WWY	...
Savannah[4]	.....	...
52. SAN DIEGO (1 Report)		0
San Diego Section[4]	.....	...
53. ALL OTHER SECTIONS		zilch

[1]Mail report received. [2]Bettered last year's score. [3]Radio report received. [4]Hearsay report, EC not heard from directly. [5]Mail report without point summary. [6]Oct. 19. [7]Sept. 8–9. [8]Oct. 8. [9]Report no SET. [10]Oct. 19–20. [11]Oct. 14. [12]Oct. 18. [13]Sept. 2. [14]Oct. 4. [15]Nov. 11. [16]Oct. 9. [17]Oct. 7–8. [18]Oct. 15. [19]Oct. 22. [20]Oct. 28. [21]Oct. 3. [22]Sept. 28. [23]Oct. 1. [24]Sept. 25. [25]Sept. 23. [26]Sept. 30. [27]Oct. 5. [28]Harvey County on Oct. 21. [29]Oct. 31. [30]Oct. 23. [31]Oct. 21. [32]Oct. 20. [33]Oct. 11. [34]Composite of ECs WA2FRW, K2LOE & W2OKU. [35]Composite of reports of 10 Nassau County ECs and asst. ECs. [36]Data included in report of W2FI. [37]Oct. 22–31. [38]Oct. 27. [39]Composite of local reports received. [40]Oct. 25. [41]Nov. 4. [42]Oct. 12. [43]Oct. 5–6. [44]Sept. 11. [45]Oct. 29. [46]Oct. 13. [47]Oct. 29, 30 & 31. [48]Oct. 6 & 21. [49]Composite score of section by SEC. [50]Data included in W7HH report. [51]Data included in W1LVT report.

(*Continued on page 170*)

The Amateur: A Study in Information Theory

BY H. RICHARD HINER, JR.*, W4HMK/1

When any large group of individuals bands together with a common interest, various channels of communication emerge among the individuals and their leadership areas. In order for every element of any specialized society to survive, it is necessary that these channels of communication be dynamic and capable of delivering a free flow of information to every minute part of this society. With respect to the amateur, information pertinent to his hobby is received and transmitted by him through various channels. One is his two-way radio conversations with other amateurs in every part of the world. Another is the publications issued by ARRL as well as other amateur and electronic publishers. Person-to-person communication in the form of conversations with friends at home or at radio club meetings is still another channel.

A study to investigate these channels of communication and their relative effectiveness was begun in the fall of 1961. We wanted to find out what the major source of amateur information was; had he ever been misled by manufacturer's advertising, and if so, how often; and so on. The methods used by the amateur for gathering news of certain specific events was of great importance to us, as well as the measurement of some basic attitudes of amateurs on salient issues.

The Amateur Poll, a limited survey done in 1953 by Paul Segal and Quayle Smith, indicated that League members were often ignorant of many basic facts concerning the organization. We were interested in finding out if this was indicative of a void of knowledge on the part of all amateurs of events which affect the existence of the entire amateur population. If so, then how do the various communication channels of the amateur contribute to this ignorance?

In an attempt to answer these and other questions, a six-page questionnaire was developed and mailed in May, 1962, from Boston University School of Public Relations and Communications, to 2000 calls chosen from twelve call areas, including KH6 and KL7. A quota system of sample selection was used to insure that the percentage of the sample from any one call area would be the same as the actual percentage that the call area contained of the whole amateur population. Each amateur was sent a questionnaire, a letter of introduction and explanation, and a self-addressed, postage-paid envelope. As each questionnaire was returned, the answers were coded and recorded on IBM cards. Upon completion of the survey, these cards were tabulated and cross referenced according to the data we wished to obtain.

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Of course, it would be impossible to indicate here all of the results and conclusions which were reached. It is our purpose in this article to present some of the highlights of the study. The complete results and conclusions are now being embodied in a thesis for a Master of Science degree at Boston University.

While this study was not primarily intended to examine demographic characteristics of the average amateur, it is interesting to note some characteristics of those who responded to the survey. If it is assumed that our sample was representative (and we have no reason to believe this not to be the case) our data can be interpreted as representing the amateur universally.

It was found that the average age of the amateur fell between 41 and 55 years, the median being around 43. 1% were under 15 while only three individuals admitted being over 70. The study revealed that XYLs or YLs constitute 3% of the amateur population, and that 69% of all amateurs are married. The annual income of most amateurs falls within a range of from $5,000 to $10,000. 50% of all amateurs are at least high school graduates, 16% are at least college graduates, and 15% have completed more than four years of college. This is to say that 31% of all amateurs are college graduates or better, and, of course, some are still in school.

A surprising result was found when we asked the number of hours the respondent had operated during the past thirty days: 27% had no operating time at all: 27% reported some operating time but less than 10 hours: and 20% had logged more than 10 hours but less than 24 for the month. It may be inferred that most of those who responded to the survey were more interested in their hobby than those who did not respond Thus, if we equate interest with operating time, those who did not respond would have less operating hours than those who did. The inactivity in the amateur ranks is probably greater than that indicated in our results. It is interesting to speculate about band conditions if every amateur were active. We complain about crowded bands now?

Pursuing the question of operating time further we programmed our survey to reveal how being a League member affected the amount of time spent on the air. It was found that for ARRL members, 17% reported no operating time for the thirty-day period; 28% had some operating time, but less than ten hours. This means that 45% of the League members operated less than ten hours for the period. However, it was then found that 40% of non-members had no operating time

for the same period, and 26% had logged some time, but less than ten hours operating time, compared with 45% for members.

Paul Segal's study, *The Amateur Poll*, revealed in 1953 that the average operating time per month for a League member was 37 hours, while the non-member logged 20 hours average for the same time period. It seems that the operating hours of the amateur have decreased in the last ten years, perhaps because of increased congestion in the amateur spectrum.

As our study was primarily designed to expose the media and channels of communication utilized by the amateur, the respondents were asked from what source they received most of their information concerning amateur radio: 57% claimed that ARRL publications were their first choice of communication; 15% indicated on-the-air conversations; 9% listed other publications; 9% other sources (such as conversations with friends); 5% indicated radio club meetings; and 2% W1AW bulletins as their initial choice as a source of information. The channels that the amateurs listed as second choice can be ranked as follows: other publications (29%); on-the-air conversations (23%); ARRL publications (17%); radio club meetings (13%); other sources (8%); and W1AW (4%).

After the general question concerning sources of information was asked, we then became more specific with regard to various amateur publications. We listed four amateur or electronic magazines, *CQ*, *QST*, *73*, and *Popular Electronics*, and asked the respondent to indicate the regularity, if any, with which he read these publications. The results are shown in Table I.

We asked to what degree the respondent saved the back issues of these publications for future reference: 88% of those who read *QST* keep the issues; 76% of *CQ* readers, 59% of *73* readers and 79% *Popular Electronics* readers save the back issues.

We were interested in finding out how amateurs first heard of some specific aspects of their hobby. We found that 50% of the respondents first hear of changes in FCC rules and regulations in *QST* magazine; 15% hear of them from on-the-air conversations. Other sources mentioned less frequently were radio club meetings, *CQ* magazine and other publications. With regard to Project Oscar, 40% first heard of it in *QST*, 11% from *CQ* and 9% from on-the-air conversations. 14% had never heard of the project! We found 24% of the amateurs had never heard of FCC's proposed amateur licensing fee. Of the 76% who had, 33% of these heard of it first in *QST*, 13% heard of it from on-the-air conversations. The remaining ones are spread out fairly equally among the sources already mentioned.

We asked the respondents if they had ever constructed a piece of gear from a publication description: 70% stated that they had. Of this 70% who had constructed gear, 61% were ARRL members.

Since advertising plays a major role in informing the amateur of advances in equipment technology and availability, we considered it a major channel of communication and brought it under close scrutiny in our study. *QST* is the only amateur publication that screens its advertisers for integrity before allowing them to buy space in the publication. *QST* publishes this fact regularly. We were interested in finding out if this screening had any effect upon the confidence the amateur placed in various amateur publications. It was found that 60% of the respondents did not know of any publication that screened its advertisers. Of the remaining amateurs who did, 79% of these mentioned *QST* as one who has such a service. However, over half of the 40% who knew of such a service listed other publications who they thought screened their advertisers. We then asked questions concerning the confidence the respondents placed in various magazine advertising: 49% claimed that they placed more confidence in *QST* advertising than in most similar publications; 2% in *CQ* advertising; 1% each in *73* and *PE*. However, 43% said that there was no basic difference in publications when it related to the confidence placed in advertising content. We asked the amateur if he had ever been misled by false or fraudulent advertising in any amateur or electronic publication; 11% mentioned that they felt they had been misled, and mentioned those organizations who had been at fault.

Several questions were asked in an attempt to measure the amateur's attitude toward the citizen's band operator. Of the respondents, 11% had been CB at one time, and 8% were still CB. The amateurs attitude toward CB was measured on three five-point scales, ranging from good to bad, useful to useless, and inoffensive to offensive. It was found that the amateur held a neutral position on the good-bad and inoffensive-offensive scale, while indicating a useful position on the useful-useless scale. While most respondents admitted that CB was justifiable as it was originally conceived, they were quick to claim that various difficulties have emerged in this service. Many felt that the service was not regulated properly and was abused by many of its operators.

Various statements were made in the questionnaire which revealed the amateur's opinion on timely topics. The respondent was asked to mark either "agree," "don't know" or "disagree" by each statement. It was found that 78% of the amateurs felt that amateur radio was in no danger of becoming extinct, in spite of heavy de-

REGULARITY OF READERSHIP

(May, 1962)

Publication	*Every Month*	*Alt. Months*	*Occasionally*	*Seldom or Never*
CQ	38%	6%	36%	16%
QST	69	4	20	6
73	12	2	17	56
Pop'tronics	19	5	33	36

mands being placed on the spectrum by other services. However, 48% did believe that the amateur would have to meet stricter licensing requirements in the future (26% didn't know and 25% said no). 56% claimed that CB service should not be discontinued (20% didn't know and 22% said that it should be). 57% said that they felt the amateur was adequately represented by official agencies before the FCC (22% didn't know and 21% said that they were not). 48% said that they were adequately represented before international conferences dealing with radio communication (34% did not know and 17% said that they were not). 42% indicated that there was adequate exchange of information among amateurs, manufacturers, official amateur representatives, and the FCC (37% did not know and 21% claimed that there was not). Of the 21% who thought that improvement could be made, only 25% of this group indicated specifically how they thought this improvement could be made. Those suggestions which appeared with the greatest frequency were that the FCC should communicate via bulletins and memos directly with each amateur regarding changes in regulations, that there is a need a for another amateur organization other than the ARRL, and that more publicity stressing the value of amateur radio to the public would be a great step toward total acceptance of the amateur by the community.

In conclusion, we were interested in finding out what the respondent thought the largest problem was facing the amateur. The answers ranged on a continuum from "ingrown toenails" to "mother-in-law problems." We managed to catagorize most of the responses into ten areas which indicated the amateur's major concerns. Over one-third of the respondents claimed that crowded bands was the major problem. 14% said that the loss of frequencies to other services was of initial concern. 10% of the respondent's reactions fell into the category of public relations, *i.e.*, associations with neighbors regarding TVI and antennas, and the negative attitude which is occasionally found regarding the amateur. Other areas which appeared with less frequency were the need for greater technical ability among hams (7%), lack of operating courtesy (5%), lack of adequate licensing requirements (4%), and CB operation (3%). 15% of the responses fell into the "other" category which was highly varied. Among these were high cost of gear, lack of quality in commercial gear, no leadership in amateur ranks, and foreign broadcasting in the amateur bands. Few indicated that the amateur had no problems.

It can be tentatively concluded from an examination of the results of this survey that the active amateur is pretty well informed about the happenings and details of his hobby. It is assumed that being well informed varies directly as the amateur's interest and operating time. It can also be tentatively concluded that the major channel for information to the amateur is printed publications: 67% of all amateurs go to printed matter first for information (about 84% of this number go to ARRL publications first).

Of the respondents, 42% felt that there was adequate exchange of information among amateurs, manufacturers, official amateur representatives, and FCC. While 37% had no opinion one way or the other and 21%said that improvement was needed, it can still be concluded that the amateur can get all of the information he wants most of the time (especially since less than 25% of those who thought improvement was needed could think of a way it could be improved).

The preceding tentative conclusions and the results of the survey indicated in this article are just a few of those which we obtained in our study. The completed product of this study will be embodied in a final report which we hope to make available to those organizations and individuals who might wish to investigate some specific aspect of the radio amateur. The procedure for obtaining this report will be published as soon as the report is available.

We are deeply indebted to the American Radio Relay League for financing a great portion of the survey. They provided their support without pressure upon us as to what questions to ask or how to conduct the survey. Our greatest debt of gratitude, however, goes to those amateurs who were willing to take the interest and time to return their completed questionnaires. QST

Strays

Have you written your senator about the reciprocal operating bill — S. 920? See page 92 of the May issue of *QST*.

—•••—

WA8DOM (Frederick E. Wirth, Jr., 545 East Whipp Road, Dayton 40, Ohio) would like to hear from other hams who are also Franciscan Tertiaries.

—•••—

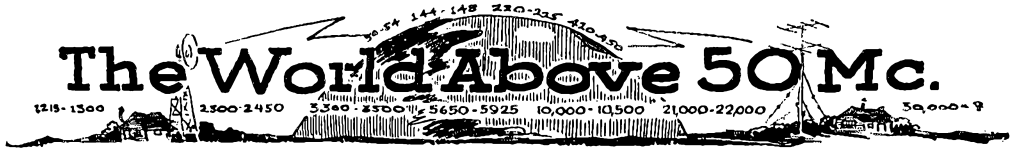
Camp Kenico, Kent, Conn., is looking for a ham to serve as counsellor this summer. Preferably a college student or college grad who is interested in working with youngsters. Contact Fred Egre, 1 Sunnyside Ave., Hempstead, N. Y.

—•••—

Interested in lightning protection? Send to the Wire and Cable Division, Copperweld Steel Co., Glassport, Pa., for a free booklet entitled *Practical Grounding*. Good dope in it, W3KOU tells us.

—•••—

WA2WIR claims that he and WA2VFW hold the record for a marathon QSO — 99 hours on 6 meters last November.



CONDUCTED BY SAM HARRIS,* W1FZJ

Springtime and the V.H.F.

IF any season of the year can be properly called v.h.f. time, then the first warm days of spring surely qualify. When the winter winds have blown their last and the snow and ice are gone, the v.h.f.er checks his gear and girds his loins for the coming June Contest. If the combined efforts of all the mountain-toppers who are preparing for the contest were laid end to end, it seems certain that the v.h.f. fraternity could have an antenna which stretched from coast to coast. Some of the tremendous efforts made last June, for instance, included such unlikely installations as sixteen-element phased arrays on six meters, rotatable, and sixty-four element rotatable phased arrays on 144 Mc. Kilowatts on top of mountains are the rule. As a result of all these efforts the multi-operator score in the June Contest has slowly risen from the 10,000 or so points to the over 100,000 points turned in last year by the Waltham Amateur Radio Association, W1MHL. The Waltham Association, perennial high scorer in the June Contest, is offering a handsome plaque to the highest scoring single operator *home* station in the New England area. Details on the eligibility for this plaque are available from W1DDN. Rumor has it that there is at least one group in California whose avowed purpose is to capture top honors nationally for the multi-operator section. Another club in the southern Connecticut area operating under the club call of W1GB is shooting for the magic 100,000 points. An analysis of the number of contact points turned in by various stations across the country indicates the obvious fact that the highest score should come from a southern Jersey or Philadelphia area. Heretofore no concerted multi-operator effort has been made in that area and as a result the New Englanders have had it all their own way. But one of these days . . . !

Wind and Antenna Size

The annual March wind-testing of the antennas at the Rhododendron Swamp VHF Society has indicated that the 144-Mc. 64-element beam is obviously not large enough, as it has survived three years of testing and has as yet shown no signs of blowing down. Likewise the 18-foot 1296-Mc. parabolic antenna, having survived for three years, is obviously too small to be considered useful. Fortunately, the 220- and 420-Mc. antennas were of sufficient size to be blown over in the last high-level pressure test conducted during March, and new antennas for these bands are being contemplated. One of the considerations for the 420-Mc. band was an array of yagis and as a preliminary measure to determine the number of yagis required a box of four 11-element beams was assembled. Using a commercially manufactured antenna and their recommended spacing and feeding bars, the field strength and pattern of this antenna were compared with a similar sized array consisting of a 32-element collinear device with 16 driven elements and 16 reflectors. In order to make the test as fair as possible the collinear array was purchased from the same manufacturer and his instructions on assembling it were also followed to the letter. Pattern measurements indicated that both antennas were performing to their specifications, however the 44-element yagi array was approximately 3 db. down in field strength on the front of the main lobe from the 32-element collinear array. This was a carefully conducted measurement on a homemade antenna range with the target antenna placed approximately 800 wavelengths away from the testing site. As a 3-db. loss per bay in the proposed new array was more than we were willing to accept, the final decision was to put up 128 elements using the so called phased array configuration.. i.e., 64 driven elements backed up by 64 parasitic reflectors. In order to achieve a reasonable beam width, an array is being constructed using a 4 wide and 18 high configuration. The result of this array is a beam width of approximately 20 degrees on the main lobe with two satellite sides down approximately 10 db. Front to back ratio is 15 db. on this array. The 220 array will consist of 64 elements in the same type of configuration. In view of the many comments we have received on the good performance of yagi arrays, we are at somewhat of a loss to understand why the array of yagis on 420 should perform so poorly in comparison with a slightly smaller phased array. If anyone has any constructive suggestions on this situation, we would be grateful to receive same. In any event, having set up the range where we can make more or less quantitative measurements on antennas we would welcome any and all comers to test their arrays in comparison to the setup which we have here. I recall that a group in northern California had an arrangement whereby all comers were entered in an antenna derby to see who could get the most from a given array. The results of this continuing test were not always disseminated to the general public but what few we heard were very interesting and it is too bad that all the effort that went into such a project was not given more general distribution. In any event I would think that any active v.h.f. group might be well advised to undertake the antenna derby type of contest as a summer time club activity if for no better reason than to acquaint the members with the merits of various antennas as demonstrated in actual use.

Average Performance

One of my pet peeves has always been that the usual reporting of activity in the v.h.f. bands consists of chronicling the activities of various stations during periods when the band is in better than average condition. I always felt that much more valuable information could be found in an outlining of the normal activity range from a given location. For instance a map of your area indicating your average nightly contacts, showing your maximum usable range, would be of much more interest than what you happened to work one night last August when the band was open. If you are interested in this type of information I would suggest that you send in a map of your normal operating area with your next OES report. I will undertake to redistribute the information on an OES-wide basis to anyone who is interested.

Moonbounce Activity

The photograph of the new dish which is slowly going up at the Rhododendron Swamp Society is on the next page. The dish is presently mounted on the side of the new support tower and is in what we refer to as the "Tune and Prune Position." The feed for this dish is going to be a combination 1296/432 feed which will allow us to use the polar-mounted dish on both 1296 and 420 Mc. moonbounce work. Unfortunately, the dish is not going to be located at a

* P. O. Box 334, Medfield, Mass.

high-enough elevation to provide much use for groundwave type communications. The paramp and converter for both 1296 and 420 will be mounted at the focal point of the dish. The transmitter will be located in the base of the tower and the feedline for the transmitter will run up through the center of the dish to the feed horns. The new dish which will with extenders be approximately 50 feet in diameter will have some reasonable gain at both 220 Mc. and 144 Mc. and can in fact be used for moonbounce work on these bands although it is not at present contemplated. We have a letter from G2HCJ concerning 144-Mc. moonbounce efforts in England. A group composed of the London UHF Society and the N.W. VHF Society and G2HCG have started the ball rolling. Antenna site and antenna installation will be provided by Bill Sykes, G2HCG. Among other things Ralph (G2HCJ) is making an investigation of the sync detection type of receiver which has been used in radio astronomy, frequency comparison, etc. Anyone who has any reference or information on the subject of synchronous detection please forward same to G2HCJ and I am sure he will appreciate it. A letter received from WZ6JZN indicates that he has a synchronous type receiving system in operation which is giving him effective bandwidths of 5 cycles or less. It is hoped that a complete run-down on his system will be available soon. Interested parties should contact W6JZN for further details."

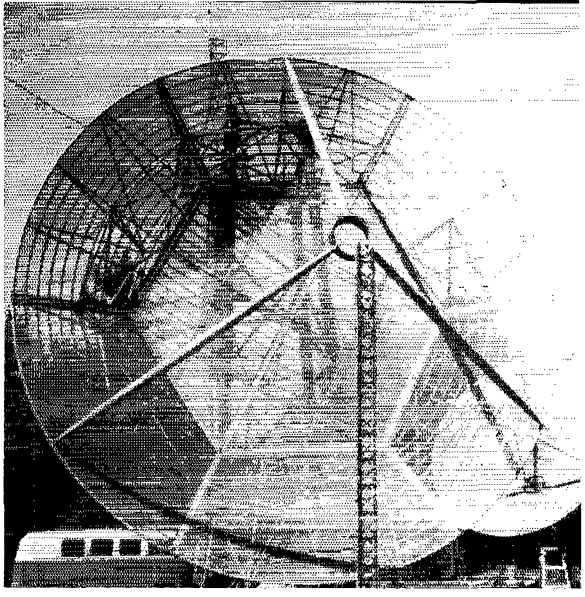
While on the subject of bouncing signals, a note from John Zimmer W2BVU, co-author of the articles on pulse operation on 2300 Mc., indicates that his efforts to correlate band openings on 2300 Mc. with weather conditions have finally paid off. On March 18 the first day of our recent warm spell he received targets at 60, 70, and 88 miles coming through well above the noise. The 88-mile target was the maximum range displayable on the scope. In view of the low power and hilly terrain involved these results should be very encouraging to those amateurs interested in operating 2300 Mc. using the pulse technique outlined in the article. The results which John has obtained after several months of testing indicate a close correspondence between 432-Mc. conditions and good 2300-Mc. conditions.

V.H.F. in Alaska

The following is a rundown on part of the v.h.f. activity in the Fairbanks area as reported by KL7ECO. "On February 8, 1963 at 0700 GMT, KL7ECO at Fairbanks and KL7CLH at Tanana, Alaska made a two-way contact on 144 Mc. This is a 330-mile path and conditions were a little above average. The contact was made by bouncing signals off of Mt. McKinley. Chuck, KL7ECO was using a Heath Tower and a home-brew three-element beam 20 feet high. KL7CLH used about 280 watts to a collinear array and a homebrew 417A converter for receiving.

"Regular daily QSOs between KL7IS at Lake Minchumina (using a Seneca) and KL7ECO/KL7ECO (XYL) are being made with Q5 reports both ways. Both aim beams at Mt. McKinley which makes it a 240-mile path. KL7IS and KL7ECO have also made a two-way Twoer QSO.

"KL7ECO, KL7ENO now have their BC-348 and homebrew nuvistor converter, a new 8-element wide-spaced beam and a Heath Seneca on the air. KL7DMB is running a Clegg Zeus and Interceptor. Pete is the first station in the Fairbanks area to work KL7AUV on 50 Mc. c.w. in Anchorage. He is also on RTTY on two meters and is net control of the local Air Force MARS Net. (Busy, isn't he! And having fun too!) KL7BET runs RTTY on 144 Mc. and has had a 2-way QSO with KL7IS via this method, and has copied KL7CLH, KL7AEQ/KL7AZJ (XYL) has a new Seneca and is going to use it to drive an amplifier. KL7BKB at Shaw Creek works into Fairbanks regularly on 6 and 2 with his Seneca. KL7IS works into Anchorage via Mt. McKinley regularly and has even worked KL7ALA/mobile in Anchorage, 210 miles. He has also worked about twenty-six of the forty-five stations in Anchorage. The Fairbanks area has about 50 two-meter stations. There still remains to be accomplished a Fairbanks-to-Anchorage two-meter QSO via the 310-mile path of Mt. McKinley. The mountain gives endless possibilities for v.h.f. contacts between any stations that can see the mountain. It is clearly visible in both Fairbanks and Anchorage as well as many other points on the Alaska mainland. Other active two-meter stations around Fairbanks are: KL7TEK, KL7ELJ, KL7CUH, KL6CFN, KL7DEJ, KL7DCF, KL7DHD, KL7DVO, KL7DIY, KL7EEH, WL7ENZ, WL7EOE, WL7ENY, WL7EPG, WL7EOB, WL7EPP, WL7ENR, WL7ENA, WL7EJJ and many others who get on occasionally.



The new and the old. The new 432 and 1296 moonbounce dish on the way up, in the "Tune and Prune" position at the R.S.V.H.F. Society. The 18-ft. dish in the background will be replaced by this new dish when it is mounted. For those interested, this dish was purchased at a local junk yard where it was being cut up for use as backstops for Little League ball games.

"Active on 50 Mc. in the area are: KL7ELR/KL7ELQ (XYL), KL7ECO/KL7ENO (XYL), KL7DMB, KL7CWH, KL7BKB. Soon to be operating 50 Mc. are KL7AEQ/KL7AZJ (XYL), and KL7BET and his XYL who is awaiting her call." Many thanks, Chuck, for the fine report from Fairbanks. The v.h.f. gang will indeed be grateful for the information concerning v.h.f. in our grand and glorious "49th."

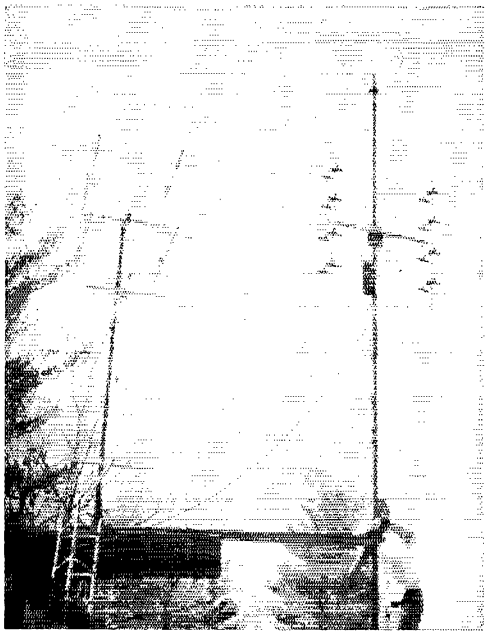
144 Mc. and Up

A number of people have mentioned that the "old Timers" are regaining their interest in the v.h.f. bands. One of these is Larry, W5UGO, in Tulsa, Oklahoma who writes: "After having been inactive on v.h.f. for ten years or more I began again last May. Since that time I have succeeded in a score of thirteen states worked in four call areas, and best distance is 635 miles. At the present time my station consists of a 522 transmitter, an Ameco Nuvistor preamp into an International FCV-2 into my homebrew 18-tube tunable i.f., and the antenna is a 16-element collinear built from the *Handbook*. Heard but not worked here are: Iowa, Ohio and Michigan. Other close needed states are New Mexico, Colorado, South Dakota, Minnesota and Alabama." Good! Another station in Oklahoma with whom to make schedules. Let's get with it, boys.

K3OBU in Delaware sez that conditions on 144 Mc. were poor during March until March 29 and 30 came along. On the 29th Joe heard K4EUS and worked WA2IAN, and on the 30th he worked WA2TNT, WA2FBA, WN2CUD, W2DWY, WA2DRK, WA2OZN and K3EGD, all with good signals. No activity heard from New England. At State College, Pennsylvania K3STG also noted the March 31 opening when he copied Pennsylvania, Ohio, West Virginia and Maryland.

Down Memphis way W4ZNV had a good day on 144 Mc. on March 12th when he worked W5BEP from Longview, Texas, for his first Texas contact. Both stations received 20 over nine reports. Jack using a.m. and Jim using s.s.b. W5FYZ then called Jack, giving him his first Louisiana contact on two, Ernie using s.s.b. also. On March 31 W4ZNV worked W5TIE in North Little Rock, Arkansas, and they set up a morning sked for the summer. Anyone interested in these skeds get in touch with Jack, W4ZNV.

Three reports of good conditions or openings for March 17, these from K4YYJ in North Carolina and from W4FJ and K4EUS in Virginia. K4YYJ worked W4RMU in Jack-



432-Mc. antennas on testing range at the Rhododendron Swamp V.H.F. Society.

sonville and W4MNT in Orlando. Jim sez that local net activity on 144 Mc. is good but over-all activity is off. Also, he is looking for information on diode tripler to drive 4X150 to about 400 or 500 watts on 432 Mc. Anyone help him? W4FJ also heard and worked the Florida stations. Ted is now keeping nightly skeds with K4IXC in Melbourne, Florida, via meteor scatter. Sez he always hears him and signals are frequently S9. W4FJ can be found on 144.087 and K4IXC on 144.089.

In Chester, Virginia K4EUS tried to nab K4IXC during sked between K4IXC and W4FJ. One drawback only, Sam couldn't hear K4IXC. However, he did work W4RMU with signals peaking 569 both ways. On March 29 Sam, K4EUS, W2LWI, K2IEJ, and W1ZAD on c.w. W1RJA was 5–9 on phone and Sam Worked W2JAO, W2WAX and W3SMK all on phone. Another North Carolina station, K4MHS worked W4RMU and W4MNT on March 18. All stations getting through with good signals. John now has 17 states worked on 144 Mc. John also comments on good conditions on 432 Mc. on March 31: "At 0345Z I heard W4MKT in Winston-Salem running 30 watts on 432.073 Mc. He was 536 in Salisbury. Paul was using a helix antenna and it was inside his shack. My antenna is 16 elements up 32 feet. As yet Paul has been unable to receive my 432 signals but we're still trying and hope to report a two-way QSO soon." Keep with it, fellas, we're rootin' for you.

On April 9 W4TLV in Alabama noted both 144- and 420-Mc. bands open from Demopolis to Texas. On 144 Mc. he worked K5SDM, K5INU, W5ONS, W5FSC and W5RPH. On 420 Mc., K5SDM (first Alabama/Texas on 432 Mc.), K5PTG and K5TUP. After this good night's work Barry's total for 420 Mc. is 4 states, 2 call areas, 500 miles Good work!

According to Les, K4RNG, April 10, 11 and 12 produced unusual two-meter openings during which all Florida amateurs were given a chance to work each other. W4KCV, an old-timer on v.h.f., sez it was his first experience of such an "all-Florida" opening. On the 10th two meters opened into Texas and on Thursday night (April 11) the band opened dipping into Mobile, Alabama, and Biloxi, Mississippi, and also covering the entire state of Florida making it possible for the boys throughout the state, who had never heard each other before, to make contact. Last stations heard in the early hours on the 12th. Reports of good ground wave received from WA2VKK, W8ZGW and W9JOT. Ed (WA2VKK) sez that conditions were fairly good on March 22 when he heard K1WVE and worked K1TGI in Connecticut, but conditions were excellent for him on March 29 when 1's and 3's were coming through. W1QAK was getting through with a 20 over 9 signal. Another Ed, this time W8ZGW, reports that local activity is very low but that stations are being heard quite well from Detroit, Ypsilanti, Ann Arbor, and Ohio stations were in with good signals during a good part of the month. W8VOZ in Van Buren, Ohio had a particularly good signal. Ed also tells us that K8HEG lost his antennas during the March storms but expects to have four 10-element yagis up about 60 feet before long. (They just couldn't have been big enough!) Phil, W9JOT reports that Indiana stations are coming through into Wisconsin more frequently.

Out in Las Vegas, Nevada K7ICW reports on his 144 Mc. and up activity. "My two-meter signals were RST 579 at W6NLZ on March 31, although my converter was not working. Future plans call for extending the tropo range and returning to the m. s. work for the major showers in July and August. (Better start making your skeds now, fellas.) Made contact with K6IBY on 220 Mc. on March 19, his signals were RST 339 with deep QSB. On March 20 local electric fence QRN wiped out the circuit. All tests abandoned until the QRN problem gets fixed. (We have the same problem, George.) In Columbus, Ohio, K8HRR now has his rig back on 220 Mc. and can operate all bands from 50 Mc. to 3500 Mc. He recently worked W8BAX over a two-block path using inside antennas on 3600 Mc.

A number of reports have been received this month concerning ham TV and indicate that activity is growing in this fairly new area of our hobby. WA8DZP from Detroit, Michigan, contributes the following: "Telecolor over 432 by W8RLT. Invented by W8IYI, John Mayer and is also seen on WJBK-TV." At Flushing, New York WA2GFP has acquired a surplus TV camera and T-61/AXT-2 transmitter. The camera is working and the transmitter modification is to begin soon. Plans call for construction of varactor diode-tripler and 4X150 final for audio on 432. Till then the audio is on 50.310. K3ADS sez "For TV I have a flying spot scanner working into a local loop. Picture quality not airworthy but improvements are being made and expect to be on with low power shortly with both audio and video. Video at 440.100, audio at 445.600. In Florida WA4AME is still working on his ham TV. He is building a flying spot scanning camera, and the transmitter might be changed to run higher power. We've also heard that WA9EQE is working with TV at 420 Mc. Something was mentioned about a T-26 surplus transmitter.

A few pithy comments from W8JLQ in Toledo, Ohio. "Only contacts to date on 432 Mc. (this year) were with W8EDS in Salem, Ohio and W3RUE in Belle Vernon, Pennsylvania. We need more activity and more antennas. *More antennas* before high power and or parametrics! Most antennas are too small! Sound advice, Howard, hope the remarks get some results. W4TLC is now ready and rarin' to go on 432.345 Mc. Charlie is running about 30 watts to a 13-element yagi and receiver is a homebrew converter using 2 6CW4 g.g. r.f. amps into a crystal mixer. W4VHH and W4MKT are also arriving on 420 Mc. soon. Charlie, W4TLC will be operating during the June VHF Contest on 50 Mc., 144.115 Mc., 220.200 Mc., and 432.345 Mc.

Out in La Mesa, California W6IEY had his first two-way contact to Los Angeles on 432 Mc. on March 2. We don't know who held the other end of that contact but the distance is approximately 125 miles. W6AUB has completed his transmitter for 432 Mc. and we should be hearing something from him soon. W9CTM (formerly W9DOH) has completed or is completing a new high-power transmitter for 432 Mc. and hopes to be on the air shortly with TV and phone. Gary is beginning to build a set of receiver pre-amps for 432 and 1296 Mc. using the 416B. A recent arrival on the 220-Mc. band is Jim, WA4GHK. He is using a 5894 transmitter running 48 watts and a nuvistor converter. Antenna is a six-element yagi up about 15 feet. He hopes to get a tower soon and raise the antenna to 45 feet. Nightly skeds are held with W4UWH (80 miles) with average signal reports 5–8. Contacts have also been made with K4RCV (120 miles) and W4RMU (180 miles). Jim also has centimeg gear on 432 Mc and is hopefully looking for contacts.

Looking for a good year on 432 Mc. is K2UUR, who worked W3GGR and W3ZFW on that band on April 2. Reports good all the way around. Bob also nabbed a new state on 220 Mc. when he worked W3UJG in Maryland on April 7. This makes Bob's total for 220 Mc. 5 states, 3 call areas and 172 miles. W7IST reports that interest is booming

on 220 Mc. and above in his area. Al has numerous contacts with K7ISI, K7IRR, W7AGJ, and W7ZQX on 220 Mc.

We might start a "box" headed "In the Works," as a number of the fraternity are preparing to make appearances on 432 and 220 Mc. in the near future. Among this number are W4EQR who reportedly is gathering parts for 432 Mc. A5, and WA4HMB who is nearly ready with A5 on 432 Mc. WA6NDZ is modifying a Vocaline JRC 400 to 420 Mc. and hopes to be heard on that band in the not too distant future. K7GPJ is planning a 432-Mc. transmitter capable of between 50 and 100 watts a.m. and will use helical beams on the band. And — K7QLC may make his appearance using an APS 13. To finish the 432-Mc. information, remember that W1BU is looking for skeds any week night or anytime during the week ends. Frequency is 432.000 Mc. Address correspondence to W1BU, Frank Vernon, P.O. Box 334, Medfield, Massachusetts.

2-METER STANDINGS

W1REZ	32	8	1300	W5YYO	7	4	1330
W1AKZ	28	8	1205	W5UNH	6	3	1200
W1KCS	24	7	1150	W6QSQ	15	5	1390
W1RFU	24	7	1120	W6NLZ	12	5	2540
W1AJR	23	7	1130	W6DNG	9	5	1040
W1MMN	22	8	1200	W6AJF	6	3	800
W1HDQ	22	6	1020	W6ZL	5	3	1400
W1IZY	20	7	1080	K6HMS	4	3	850
K1CRQ	19	6	800	K6GTG	4	2	800
W1AFO	18	6	920	W6MMU	3	2	950
W1MEH	17	6	700				
K1AFR	17	5	450	W7JRG	17	6	1280
				K7HKD	15	5	1150
W2NLY	37	8	1300	W7LHL	7	3	1050
W2CXY	37	8	1360	W7CJM	5	2	670
W2ORI	37	8	1320	W7JIP	4	2	900
W2BLY	36	8	1020	W7JU	4	2	235
K2GQI	35	8	1365				
K2LMG	30	8	1290	W8PT	39	9	1260
W2AZL	29	8	1050	W8KAY	38	8	1245
K2IEJ	27	8	1060	W8SSDJ	37	8	1220
K2CEH	25	8	1200	W8IFX	35	8	980
W2AMJ	25	6	960	W8SFG	34	8	1040
W2ALR	24	8	1100	W8LOF	33	8	1060
W2RXG	28	8	1200	W8GGH	32	8	1180
W2SMX	23	7	1090	W8BAX	3	8	960
K2HOD	23	7	950	W8RMH	32	6	910
W2DWJ	23	6	860	W8NOH	31	8	1090
W2PAU	23	6	753	W8SYI	30	8	1080
W2LVI	22	6	1050	K8AXU	30	8	1050
K2KIB	21	5	700	W8EHW	30	8	850
W2ESX	21	6	750	W8LPD	29	8	850
W2UTH	20		880	W8WRN	28	8	680
W2WZR	19	7	1040	W8DX	26	8	720
W2RGV	19	8	720	W8ILC	25	8	800
WA2EMA	19	6	1010	W8JWV	25	8	940
W2RUG	17	6	980	W8WNM	25	8	900
K2JWT	16	6	550	K1CRQ/8	25	8	690
				W8GFN	23	8	540
W3RUE	33	8	1100	W8LCY	22	7	680
W3EPH	33	8	1000	W8BLN	21	7	610
W3SGA	31	8	1070	W8GTR	17	7	550
W3TDF	30	8	1125	W8NRM	17	7	550
W3GKP	30	7	1180				
W3KCA	28	8	1110	W9KLR	41	9	1160
W3BYF	28	8	1070	W9WOK	40	9	1170
W3LNA	21	7	720	W9GAB	34	9	1075
W3LST	21	6	800	W9AAG	34	9	1050
W3NKM	20	7	730	K9AAJ	33	8	1070
W3LZD	20	7	650	W9REM	31	8	850
K3HDW	12	6	1015	K9UIF	30	9	970
				W9ZIH	30	8	830
W4HJQ	39	8	1150	W9PBP	28	8	820
W4HHK	37	9	1280	W9LVC	27	8	950
W4LTU	34	8	1160	W9OJI	27	9	910
W4ZXI	34	8	954	K9SGD	26	8	1100
W4WNH	33	9	1050	W9ZHL	25	8	700
W4MJL	33	8	1149	W9BPV	25	7	1030
W4AO	30	8	1120	W9CUX	24	7	
W4LVA	26	8	1000	K9AQF	24	7	900
K4EUS	26	7	1130	W9LF	22	7	825
W4EQM	25	8	1040	W9KPS	22	7	690
W4AIB	25	8	900	W9ALU	18	7	800
W4TLV	23	7	1000	W9WDD	16	5	600
W4JC	23	6	725				
W4VYE	22	6	724	WØBFB	37	9	1350
W4RMU	21	7	1080	WØLHD	31	8	1030
W4IKZ	20	6	720	WØLFE	30	7	970
W4OLK	20	6	720	WØSMJ	29	9	1075
W4LNG	19	7	1080	WØQDG	27	9	1300
W4RFR	18	9	820	WØRUF	23	7	900
K4YUX	08	8	830	WØMOX	23	6	1150
W4CPZ	18	6	650	WØIC	22	7	1360
K4VWH	18	6	590	WØENC	22	6	1100
W4MDA	17	6	757	KØITF	21	6	940
				WØINI	21	6	830
W5RCI	38	9	1280	WØTGC	21	7	870
W5FYZ	33	9	1275	WØRYG	20	8	925
W5AJG	32	9	1360	WØDQY	20	7	700
W5JWL	29	7	1150	WØJAS	19	7	1130
W5DFU	29	9	1300	WØAZT	18	7	1100
W5PZ	27	8	1300	KØAQJ	16	6	1120
W5LPG	25	7	1000	WØIPS	16	6	1100
W5KTD	23	8	1200				
W5SWV	20		960	VE1CL	8	4	800
W5ML	16	6	700	VE3DIR	36	9	1330
W5KFU	13	4	1300	VE3AIB	29	8	1340
W5UGO	13	4	635	VE3BPR	24	7	950
W5FSC	12	5	1390	VE3BQN	20	7	790
W5HEZ	12	5	1250	VE3AQG	18	8	1300
W5CVW	11	5	1180	VE3DER	17	8	1340
W5NDE	11	5	620	VE3HW	17	7	1350
W5WAX	10	5	735	VE6HO	1	1	915
W5VY	10	5	1200	VE7FJ	2	1	365
W5BEP	9	3	1000				
W5EDZ	8	5		KH6UK	2	2	2540

The figures after each call refer to states, call areas and mileage of best DX.

50 Mc.

Once again word has been received from VE8BY reporting his activities on 50 Mc. Pete tells us that on January 31 he worked 5 VE4 stations, 3 VE6 stations and heard WØEUQ working VE4MA. He also heard a weak K7 station but was unable to identify the call. On February 13 Pete worked VE8EW at Whitehorse, Yukon on 50.250 so it looks like another VE8 on six meters. Hope the activity grows and grows in VE8 land, and even if it doesn't much credit must be given to VE8BY for his persistance in flaying the band for so long with so few contacts.

From the Bahamas VP7CX writes that he has had no six-meter openings since February 10 but Hal feels that from all indications "it won't be long now." He is even going to take down his 15-meter beam and put the six-meter one back up at the 45-foot level. (More power to you, Hal, and I bet you'll leave it up there this time.) Present plans in San Salvador are for operating the ARRL VHF contest from the top of a 90-foot tower. Hal will probably be there for about four hours late Saturday afternoon, weather permitting. He will be operating his regular six-meter frequency of 50.046* and two-meter frequency will be 144.025. K4IXC and VP7CX have been keeping two-meter skeds but have had no success to date. The boys feel that part of the problem is that the two-meter beam at VP7CX is only 25 feet high at the present time and they expect to experience little difficulty making the contact when Hal is at the top of a ninety-foot tower.

Looks like activity on 50 Mc. is picking up in South Dakota. According to Bill, KØCER, KØFKJ at Dell Rapids and KØESC at Sioux Falls and KØCER at Sioux Falls are all active on the band. KØESC should soon be operating SSB. KØCER will operate on 50.020 for the c.w. minded and 50.160 and 50.108 for the phone minded. Bill will be glad to keep skeds with anyone within a working range of Southeastern South Dakota.

Out Washington way K7QFW reports that several VE7s work ground wave into the Seattle-Tacoma area every Saturday and Sunday morning until TV Channel 2 appears on the band. K7TCA, K7SVI and K7QFW have all worked VE7OE and VE7KD from Vancouver, B.C. quite regularly. Chuck runs a TBS-50 into an 8-element beam 40 feet up and receives with an R-100 with a Parks converter ahead of it.

The sideband bug has bitten a number v.h.f.ers down in Louisiana. According to Charlie, WA5CWD, some of the first to be affected are members of the Southern Louisiana VHF Club. K5JZF is on six with a Heathkit HX-30; Sam, WZ5DRS is scooping out 50-Mc. r.f. with a Supreme store-built rig; from Houma, Louisiana, K5DKR is running a homebrew d.s.b. rig with about 30 watts out. S.s.b. rig at WZ5CWD is an "SR-150 tooling into a P and H 6-150, with a Johnson Thunderbolt." The a.m. rig at the same QTH is a Clegg Zeus and antenna is an 8-element yagi 235 feet above the streets of downtown New Orleans. (Come on now, Charlie! How high above your own ground?) Seems that RTTY is growing fast in New Orleans and surrounding area. Charlie, WZ5CWD admits to being one of its staunchest supporters and sez that when the band opens he can be found on RTTY around 51.02–51.20 Mc.

Other "addicts" on the air at the present time with RTTY are: K5EDV who is printing on a Model 19 and with homebrew transmitter; WA5DXP, running a Poly-Comm and Thunderbolt with a Model 15 page printer; W5JGV is using a Model 15 and a homebrew gallon; WA5CWD is making errors on a Model 19 and feeding it into the a.m. rig. Furiously working to get on v.h.f. RTTY are: W5CME, K5YAB, K5JZF, K5GVD and WA5CDY. All have their machines and expect to be on the air within the next few

(Continued on page 164)

* Note that the frequency used by VP7CX is outside the U. S. phone assignment. U. S. stations using voice must call him above 50.1 Mc. — *Editor.*

How's DX?

CONDUCTED BY ROD NEWKIRK,* W9BRD

How:

We've been much more frivolous than constructive in these lines lately, so this month we'll give VR2BC (ex-VP1GG) the floor for a commentary on files and filing. Station bookkeeping, aside from basic logging requirements, is a personal preference proposition. Some DXers have all they can do to keep track of DXCC countries (1) worked, and (2) needed. But Greg's effective approach to statistics may give you a few ideas to incorporate into your own *modus operandi*.

Just for the Record

It is a matter of personal satisfaction to the writer to be able to reply to a calling station with the name of the operator. After all, don't we all have our vanities? And isn't it gratifying to pick out a calling station whose operator ends his call on a personal note with one's own name?

In view of the many bouquets thrown this way for (a) a good memory, (b) a thorough filing system, and (c) fast guesswork, some idea of the simple records kept at VR2BC may be of interest. The *log* itself needs only passing mention; we all have to keep one. But here the log has an extra column for recording the number of each contact, starting from No. 1 on January 5, 1956, when the present VR2BC first fired up. The latest number is well over 18,000.

The *station record* is kept in a looseleaf binder so that pages can be added as the record grows. It is arranged in alphabetical order of prefixes. Each country prefix (there may be more than one per page) is marked at the top right hand corner. It is a mere matter of seconds to riffle through the record for the required page. Each page is ruled into four columns in which the following information on stations worked is noted: (1) "W4XXX", his call; (2) "Wilbur", his name; (3) "2/3/56(20)", "15/12/58(15)", the dates and bands of initial QSOs per band; and (4) "Macon, Ga.", his location and any other notes you wish to record. An appropriate entry also is made on receipt of QSL and the despatch of same.

The preceding deals satisfactorily with those stations you work once or very seldom. But for stations that are contacted fairly regularly the practice here is to transfer the record to a standard 5X3-inch card file, indicating that this has been done by marking a "C" in the fourth column of the record page.

Roughly half the VR2BC record is occupied by W/K stations, each call-area and prefix letter being recorded separately. It can, of course, be more than a mere matter of seconds to trace, say, a W6 call, for these alone occupy some twenty-odd pages (K6s are not far behind, and there is an ominous total of WA6s building up). Identification in this case is made easier by allocating a page in front of each call-area section, noting alphabetically the first suffix letter. E.g., "A" for ARE ABX AXY, "M" for MOB MOY and MBX.

Here's how it works: K9XXX calls VR2BC. I log the call and time (in GMT!) and then turn smartly to the K9 section of the station record. The alphabetical list tells me that we have worked before. I then scan quickly down the call sign column until I find "XXX" in Column 1, usually in time to greet him by name (from Column 2) when I reply. Admittedly, a few seconds of stalling may be necessary until I find the call sign. If our previous contact was one of those hail-and-farewell contest deals, his name may not be on record, but I still have something to talk about by way of breaking the conversational ice. And the *present* contact will allow *me* to fill in the blank spaces in *my* record.

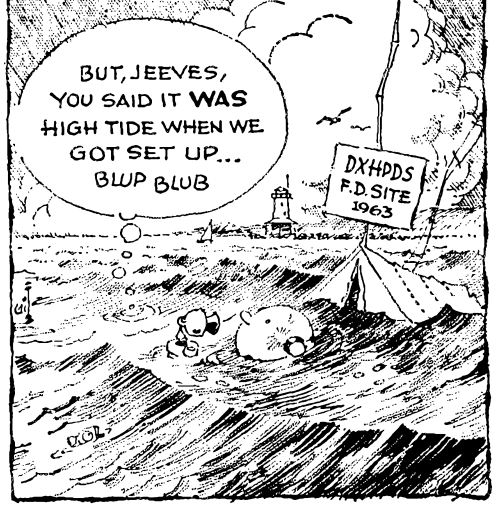
This recording system does not really encroach on valuable time. New items can be entered during the listening periods of the QSO; you've already got the book open at the proper page. Abstracting to the filing cards takes longer, but yesterday's entries are easily made today in the time normally spent doodling on scratch pads or waiting for the rig and the hand to warm up. Don't be perturbed at the thought of requiring an extensive filing system; judging from experience here, you will not need a large number of cards because the great majority of stations worked do not return for subsequent QSOs. Moreover, you get to know the real regulars so well that there is no need to look them up.

What all this amounts to is this: Within seconds of being called by another station I can ascertain whether or not we have contacted before. If we have, I can immediately establish his name, location, date and band of previous contacts, see at a glance what the QSL situation is — and perhaps even inquire about his lumbago!

Can anyone systemize such records still further?

— *G. B. Gregory, VR2BC*

* 7862-B West Lawrence Ave., Chicago 31, Ill.



What:

"Hurray for Spring!" shouts K6TZX. "Twenty meters is beginning to stay open evenings again with good signals from Oceania and eastern Asia, also occasional good openings to central Europe and central Asia. Even 15 has picked up a little steam." Doug's comment covers the propagational situation well, and so do the following amalgamated band-by-band reports from "How's" correspondents far and wide. . . .

20 c.w., playground for **Ws** 1GDQ 5KFT 6KHS 7DJU 7POU 8KML 8YGR, **Ks** 1KSH/4 1PCE 1PJT 1RHZ (317/16 countries worked/confirmed), 1SMT (58/38), 2UYG 2YFE 3MNJ 4MYO 4TEA 6TZX (108/94), 8AJK (125/84), 9CZV 0AXU 0GVA 0JPL 0VSH. **WAs** 2HLH (96/76), 2IZV 2K8D (165/135), 2PZD 2HJZ 2RUB 2UEV 2UQM 2ZVJ 5AER 5EEM 6HRS 6TMY 6TZN 6VAT, **VEs** 3AWE 7BBB 8DX, **DL9JI, HER** and **ZS2U**, comes up with **BV1USG, CE9AY, CO6AH, CP1CD, CRs** 6CA 7IZ, **CT2BO** 1900 *GMT*, **DM3s** TUM 22, YCG YED YPE, **DU7SV** 12–17, **Fs** 2CC/**FC** (14,069 *kc.*) 19, 8SW/**5T5** (25) 18, **FG7XJ** 13, **FK8AS, FO8AA, GC2FMV** 12, **GD6UW**

(85) 21, **HAs** 1KSA 3KGC 5KDF 8UD, **HH2FA**, **HK0AI** of San Andre, **HL9s** KH (19) 22–0, KO KS TF (2) 0, TG, **HP1IE**, many **JAs** including 4AI 7AD 7VX 8FY, **JT1AG** 23, **KAs** 2CM 2KS 7RT, **KB6s** BJ CA (26) 2, **KC6BK**, **KGs** 1FU 6AIG 6AAY/p (45) 23, 6SZ, KH6COY/**KW6** (18) 3, **KM6CI**, **KR6s** AR BQ ED MO, **KV4s** AA (82) 22, CF, **KZ5s** EM MQ LC, **KX6DB** (30) 5, **OE5KE**, **OH8QW**, **OX3s** DL KM, **PJ2ME**, **SLs** 5ZL 6BH, TF2WHY (45) 1, TI2s ES WB WD 13, **UAs** 2AK 2AW 9FW (31) 4, **9XB** 23, **0BF 0BI 0EV** (40) 2, **0EW** (40) 3, **0FF** (50) 2, **0KCO** (40) 0, **0KEW 0KFG** (60) 2, **0KFR** (21) 4, **0KIF** (31) 2, **0KJA** (70) 1, **0KQB** 1, **0KZB** (10) 4, **0TD** 1, **UB5s** AU DB GS JX KBA KFV KJE NP OE WF, **UC2s** AR AW BU (40) 16, BW (49) 21, WA, **UF6KPE**, **UM8KAA**, UN1BC, **UO5BM**, **UP2s** CP 19, CT KBC (55) 17, KCF 14, NK, **UQ2s** DR KAR, **UR2s** BU KAC KAN 13, **UT5s** BN 19, CC, **UWs** 3BJ 3NE **0FM** (29) 4, **0IJ 0IK 0IN**, **VK0VK**, **VPs** 5GT 6LJ 12, 7CC (63) 18, 8FU 8HD (32) 3, 9BO 9L, **VRs** 2DK (39) 20, 2EH 3E 4CE 22–23, **VS4RS**, W6ZDF/-**KM6**, **XE2JS**, **YOs** 2BU 3JL 5KAU 6EY 6KAF 7DL all 13–16, **ZB1BX** (100) 22, **ZEs** 1BK 6JM 18, 7JV, **ZK1AR** (29) 4, **ZPs** 5OG 9AY (5) 22, **4S7**WP 17, **4U1s** SU ITU (16) 15–19, **5As** 2TS 20, 3CR 19, **5N2s** ACB JWB 22, **5R8s** CJ CM 21, **5X5IG**, **6O1ND**, **9M2s** GJ UF and **9Q5AB** (25) 22–23.

20 phone is favored by **Ws** 3LE 8KML, **Ks** 1KSH/4 1PCE 1PJT 2TDI 2UYG 4TEA 6TZX 8AJK **0AXU 0VSH**, **WAs** 2RJZ 2UEV 5EEM 6TZN and **VE7BBB** because of signals like those of **CE0ZI**, **CN8IU**, CO8RA, EI4AK, **FG7XJ**, **FY7YI**, **HI8MMN**, **JA1DN** 1, **KC4s** AAC USB USG USN USV USX, **KGs** 4BII 6AKR 6SZ, KH6PD/**KG6** (295) 20, **KR6MB**, **KV4AA** (290) 18, LU1XII, **OA1A***, **OE1RZ**, **OX3KM**, **PJ5CG** (280) 12, **PZ1AX**, **SV0WY**, **UAs** 2AW (322) 12, 9KCA **0EH 0EK**, **UB5WF** (260) 12, **UP2KND** (340) 14, **UR2KAT** (348) 14, **VK0VK**, **VPs** 1BA* 5BP 5TK 7NX 8HB*, **VQ1GDW** 22, **VS9s** ADV/p (303) 18, MB 15, **XE1IQ***, **YS1BV*** and **ZD8DW** (349) 22, the few asterisks denoting non-s.s.b. types.

15 c.w. comes especially alive on week ends if the r.f. bounces right, gladdening **W8YGR**, **Ks** 1PCE 1PJT 2UYG 2YFE 4MYO 5MHG 6TZX 8AJK **0AXU 0JPL 0VSH**, **WAs** 2KSD 5AER 6VAT 9ATA, **WNs** 2DDA 8FFO and HER. They recommend the 21-Mc. code of **CEs** 1AD 3AG 3XA (40) 2, 4BS (41) 10, **CR7IZ** (67) 18, **FO8AA**, **FR7ZD** (44) 14, **HAIs** KSA (33) 14–15, KSD, **HC1DC**, **HKs** 3AH (11) 1, 3HU 3HY 3TH 7BE 7UL 7ZT, **HL9s** KH (19) 22, TF, **HP1IE**, **JA0SU**, KA2GF, **KC6BK**, **KG4AM**, **KR6ED** (30) 1, **KV4CF** (15) 20, **OE1SQ**, **OX3DL** (60) 18, **PJ2AE** (70) 21, **PZ1AQ** (59) 10, **UB5WF**, **VPs** 2KR 2SZ/mm 9JI (32) 16–17, 9L, **VS4RS** (49) 0, W6ZDF/-**KM6**, **WAs** 5ECN/mm (35) 17 off VP4-land, 6NPW/am (55) 16 in Europe, **XEs** IFN (124) 9, ISS (47) 10, 1VT (31) 11, 2OK (26) 21, **ZB1BX** (85) 17–18, **ZD6OL** (74) 18, ZE1BA 18, **ZK1AR** (49) 1, **ZL1HY** (32) 11, **ZP9AY** (2) 22, **5As** 1TW (50) 17, 2TS, **5H3IP** (70) 18–19, **5N2RSB**, **5R8AB** 17, **6W8s** BE BL DE DF all (22–55) and **9U5JH**.

15 phone is far from barren when a few DX-type CQs stir things up. **Ks** 1PJT 1QEQ 2YFE 5FSU 5MHG 8AJK **0AXU 0VSH**, **WAs** 2KSD 5AER and **VE7BBB** do right well with **CO8HT** (242) 21, **CR6AL** (230) 20–21, CX4EK, **EL5C** (270) 19, **FY7YI***, **HH2s** CE M, **HRs** 3DW* 8SM, **Ks** 6IXS/mm 7HQX/**VP4***, **KG4AM***, **KP4BIQ***, **KV4BI** (280) 21, **KZ5s** AF* MF* SS, **OA8B** (210) 21, **OX3KM** (270) 21, **PJ3AO**, **TG9s** MP SC, TI2SS, **UW3BV** (280) 14, **VE8CB** (200) 17, **VPs** 2SZ/mm 3FM (280) 22, 5AA **5BB 7NC 7NX 9AK**, **VR3O***, **XEs** IQK 2SO (255) 21, YV11K, ZL3GN* and **ZS6BBP**, this time the little stars representing sidebanders.

10 phone, thanks to the annual ARRL DX Test fillip, is spurred on by **Ks** 1PJT 2YFE 5FSU **0AXU 0JPL 0VSH** and **WA5AER** who managed to come up with **CO8s** CO (480) 16, RA, **HC1DC**, **HI8MMN**, **HK0AI**, LUs 1BC (425) 23–0, 9LA (520) 0, 9VD, **PJ2AF***, **TG9s** MP SC, **VPs** 5AH (508) 0, 6GN (620) 19 and YV5AGD, the stars going for sideband, a rarity on 28 Mc. . . . . K0JPL isn't ready to throw in the sponge for **10 c.w.** — not just yet, anyway — because of **HC1DC** (20) 18–19, **HK7s** BE (15) 20, ZT (8) 18–19, **KV4CF**, KZ5LC (21) 20–21, **VP9JI** (42) 20, YV5AGD (24) 18–19 and **ZP9AY** (3) 22, mostly weekend fare. With openings growing more infrequent, perhaps dedicated 28-Mc. men should steal a trick from their v.h.f. colleagues and rig up "beacon" CQ and TEST automatic gear. This attack is bound to decrease the number of good openings that pass unnoticed.

40 c.w. certainly needs no automated signals to pep things up. **W7DJU**, **Ks** 1DFC 1RIIZ 1WPG 2JIR 5MHG 6TZX **0AXU 0VSH**, **WAs** 2HLH 2KSD 2PZD 6PMK 6VAT 9ATA, **WN8FFO** and HER have their hands full with **CE4AD**, **CM2BB**, F2CB/**FC** (10) 3, **FA8PG** (3) 2, **FO8AA** (95) 9, **FR7s** ZC (3) 2–4, ZI (3) 2–4 (guess who), **GC2FMV** (8) 2, **GDs** 3FTQ/a (10) 1, 6UW (3) 3, **HA1KSA** (7) 22, **HCs** 1DC 2AC (20) 3, 2AF (82) 2, **HI8XAG**, **HKs** 1QQ 3VV 7AME (25), 3 7BE 7UL, **HL9s** KH (3) 8, TF (1) 10, TG (9) 9, **HP1IE**, **HR2FG** (20) 3, **JAs** 1ARY 1BX 1BZS 1CWM 1DFN 1DMX 1DRQ 1DVE 1DY 1EEM 1EQM 1FKN 1FNA 1GGO 1GKP 1HE 1ISA 1IVS 1JEJ 1JRZ 1JXC 1JXU 1KJK 1LYK 1PF 1UT 1VX 1YA 1YDJ 1YL 2ARY 2BNE 2BY 2CBK 2COZ 2FHX 3AYU 3BDO 3BQH 3CZA 3DAZ 3DDG 3TT 5BN 5PL 6ACG 6AK 6AKL 6AKW 7AKZ 7AUV 7XF 8AZK 0OP (where are the 4s and 9s?) at breakfasttime out west, **KG4BT** (46) 3, **KV4CF** (6) 10, **KX6s** AJ (5), BK (28) 8, **KZ5MF**, **OD5AX** (38) 4, **OH2PM/1**, **OX3DL** (18) 9, **PI1DDR**, **PJ2s** AE AL AW (20) 5, plenty of LUs and PYs, **SPs** 5ADZ (25) 23, 6ALD (13) 23, 6FZ, **SV0s** WG (10) 4, WZ (40) 3, **UAs** 1FI **0KCO** (12) 10, **0KFA** (1) 9, quite a few VK-ZLs, **VPs** 2KR (42) 3, **6LJ 6LW** 22, **7NQ** (11) 4, 9FK (25) 18–2, **9L 9VRE** (5) 23, **VQ4IV** (5) 3, **VS1FG**, W1DTS/**KV4**, **XEs** 1OI 1VT (40) 6, 2DX 2MK (34) 5, 2OK, YN1JMM (71) 3, YV2CJ and a host of YV5s, **ZK1AR**, **ZP9AY**, **5B4s** AK (2) 4 and TX (3) 3–4.

40 phone, jolly well gypped by jammers, nevertheless permits **Ks** 6TZX **0AXU 0VSH**, **WA2PZD** and **DL-4BS** to squeeze through to **CO8RA**, **DL4BS***, **FG7XL**, **HH2CE**, **JA2BAY*** (100) 8, K4PGL/**VP9**, **PJ2CE**, **VPs** 3HAG **7CX** and **VR3O***, the asterisks meaning single-sideband specimens. Possibly conditions will get bad enough so that those SWBC juggernauts will move down to the standard broadcast band. Ambivalent optimism, that.

80 c.w. still has a long way to go to reach the DX peak attained during the previous sunspot minimum. Must be a general reluctance among DXers to abandon the rotary beam approach, or something. Anyway, **Ws** 1SWX 1 7DJU, **K0s AXU VSH**, **WAs** 2HLH 2KSD 5EEM 6PMK and **WN8FFO** are game for **CT2BO**, **DJs** 4TX 6WD 7AU (4) 0, **DLs** 3LL 4SD, EI9J (2) 2, **Gs** 2BPY 3MRP (11) 0, 3PSA (8) 0, **GIs** 5UR 6TK, **HAs** 1KSA (10) 1, 3KGC, **HB9EO** (5) 0, **HC1DC**, **HI3PC**, **HKs** 1QQ 7ZT, **HL9KH**, **HP1IE**, JA2WB, **KP4CH**, **KV4s** AA (10), CF CI (2) 23, LA7RF/mm, **LU3EX**, **OKs** 1AHV 1AEZ 1AFO 2KU, ON4UN, **OZ1W**, **SPs** 3VH 9UH, **UAs** 2AC **0KFG**, VK3-CAL/**FP8**, **VKs** 2QL 3AXK 5JA 5JE, **VP9VRE** (9) 0–3, XE1AX, **YOs** 2BU 3FD, YU2BOB, YV5s ACP (6) 1, AGD BOA, **ZLs** 1MO 3OX and **3A2CL** . . . . . K0VSH finds the s.s.b. of **VP7CX**, **VR3O** and **YV5ANS** workable on **75 phone.**

160 c.w. (and **phone** as well!) is still a well worn conversation piece among DX men although OM QRN now rules the 1.8-Mc. realm. A few hours after Puerto Rico had been reauthorized use of 160, **KP4AXU** tallied up his log to find he had worked, among U.S. call areas, 7 Ones, 15 Twos, 4 Threes, 8 Fours, 1 Five, 5 Sixes, 2 Sevens, 16 Eights, 7 Nines and 10 Zeroes, plus four VEs, Gs 3OQT 3PQA 6BQ, **KP4s** AQY ASK, **VP2s** VJ and VL . . . . . W1BB's *160-meter Bulletin* No. 5 recounts a few outstanding individual performances on top band: **DL1FF** now has 35 countries on 160, including **VP8GQ**, **5B4s** GF and PB. . . . **KL7JDO** made Alaska available late in the season, worked a logful of Statesmen and was heard by KP4AXU. . . . **ZS2FM** heard signals from DL1FF and W6YY. . . . **ZL3OX** worked Ws 1BU 1EFN 1HIV 1TX 3GQF and 6KIP, heard five G3s, KP4AXU and XE2OK. . . . **ZL3RB** worked G3OQT four times, also G3s ERN and FGT . . . . . DXwise, things have quieted down on 1.8 Mc. but we expect to be hearing about summertime transequatorial QSOs from North Americans undaunted by the static barrage. Keep us posted!

DJØIR recently tried his DXpeditionary luck in San Marino as 9A1IR and 9AØIRA. Don especially likes 75- and 20-meter phone DXing, managing to do quite well with attic dipoles in Kassel.

Where:

Asia — W1TYQ tells W1ECII of ARRL that QSLs for any HZ station can be sent via HZ1AB whose address appears in the listings to follow . . . . . Gary also indicates that ex-HS5OSQ-XW8AS-KG6SX now is available as KH6FBJ, QTH as listed . . . . . The real HL9KZ, though licensed for a year already, hasn't been radio-active until this month. 'Twas somebody else on 20 c.w. in March . . . . . HL9TG (W7UXZ) guarantees 100-per-cent QSL

response during his continuing Korea career . . . . . W3LE has it that the UQ2FX, UA9KOG and UA9OAP addresses in the roster to follow are useful for radiotelephone confirmations only. Correspondence other than QSLs can reach UQ2FX via P.O. Box 183, Riga, Latvian S.S.R., U.S.S.R. . . . . 4X4OZ tells W3PVZ he will gladly QSL direct in response to requests bearing International Reply Coupons.

Africa — "I have arranged with 5U7AH to handle his QSLs," states K9EAB. "Please ask the [W/K] boys to furnish self-addressed stamped envelopes." Non-W/Ks can probably help Cliff by including self-addressed envelopes with IRCs or appropriate U.S. postage . . . . . 5A5TW affirms through W1ECH that he runs the Libyan QSL bureau at Box 372, Tripoli, Libya . . . . . "All those deserving QSLs for ET2US/ET2 (opr. Dick), ET3RC and EP2RC, my present call, are invited to apply via my home address or Iran QTH," writes K1KOM . . . . . "I have QSLs on hand for my terminated EL8D operations," informs 6O1WF. "If any chaps have not received EL8D cards by this time they should write me at [the address to follow]." . . . . . G3PEU-ZB1BW, preparing to sign ZD7BW in August, says, "All QSLs will be answered when I return to the U.K. at the end of the year, so a little patience will be needed." Well, those St. Helena QSO-provers will make nifty Christmas presents . . . . . "I'm handling QSL chores for EL8C of Ganta," notifies W4GJY. "I have logs from December, 1962, and get additional data each month. The usual s.a.s.e. are requested; otherwise cards go out via bureaus." . . . . . W9EQN apprises, "I will be handling QSLs for 9G1ZD, Accra, as soon as I receive his logs. Art also is sending 200 QSLs for me to dispense from here — s.a.s.e., please." . . . . . Contrary to previous misfortunate misinformation, 6O1ND (W1WIQ) specifies the address Box 397, Mogadiscio, Somali Republic. This via WA2RXI . . . . . "Through the efforts of W7BTH I now have the long lost logs of ZD3P," reports G2BVN, DX editor of RSGB's *Bulletin*. "Outstanding cards are being sent out. Will be pleased to deal with any missing QSLs on receipt of the usual paperwork."

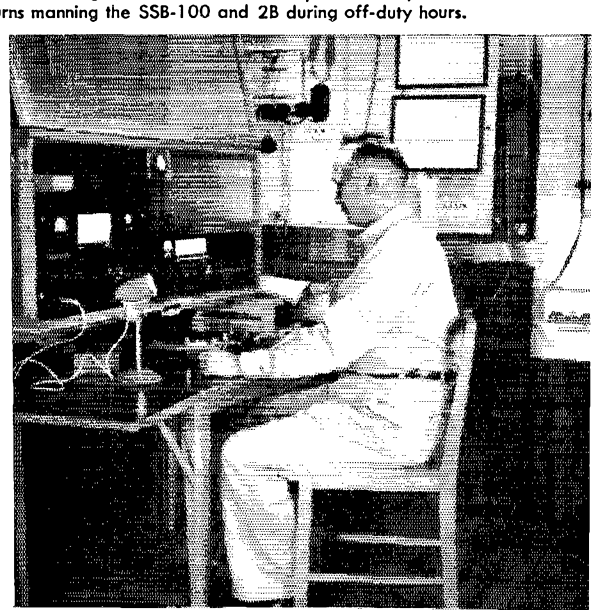
Oceania — QSLs for the May-June *DX*peditionary endeavors of VK9BH, Nauru; VR1N, Ocean Island; and VR4CB, Solomons, can be addressed to Hammarlund DXpedition, General Post Office, P.O. Box 7388, New York 1, N.Y. According to a company press release, s.a.s.e. and/or IRCs are not required. S.w.l. reports also will be confirmed . . . . . Northern California DX Club's *DXer* mentions recent receipt of ZL3VH/3 confirmations for late-1960 Chatham island contacts. *Never give up* . . . . . DARC's *DX-MB* scoop-sheet suggests the VK6 bureau route as an alternate VK9LA Cocos-Keeling possibility.

Europe — SM5AIO, QSL chief for Sweden's SSA, issues a communique to the following effect: "Only 67 per cent of Swedish amateurs are members of our society. They get their cards via the bureau; QSLs for others are returned. We are receiving many incorrect QSLs from foreign stations because they have heard wrong or have written wrong. In Sweden there are callsigns SM1-7 with two or three letters after the numeral (AA-ZZ, AAA-AZZ, BAA-BZZ, CAA-CZZ, and DAA-DZH at present). Newly licensed amateurs are getting the calls DAI, DBI, etc. We receive many cards for such calls as SM5KXX but this is most likely SM5CXX. If anyone has a QSO with a Swedish station and is not sure of the callsign I will try to find the correct station if given the name of the operator and his QTH. One last request to all QSLers and correspondents: *Please* write legibly." And, we might add, stick to Greenwich Mean Time . . . . . Speaking of statistics, IT1AGA's log shows some 31,000 QSOs, 13,500 QSLs sent out, and 13,000 cards received. Not a bad return percentage, and fine performance with 25-60 watts to a single-wire antenna . . . . . "I reply to QSLs without return postage but I appreciate the inclusion," remarks OH4QG . . . . . DL5AO (W5BYI) declares, "I QSL W/K stations only on receipt of their QSLs because returns on my TF5WDW cards were so poor. Anyone who does not receive my DL5AO QSL in response to his own in a reasonable time should reapply direct and I will airmail a reply." . . . . . The SL6BH gang tells W1YYM, "We answer all QSLs received, and two IRCs merit airmail return." . . . . . F7CP (W2ZRX) gives four possible routes for incoming QSLs: the F7 bureau, his home QTH, or P.O. Box 3012, 1992nd Comm. Sq., APO 10, New York, N.Y., or direct to Box 3012, Base de la Martinerie, Chateauroux (Indre), France. Bob likes to QSL 100 per cent.

South America — West Gulf DX Club's *DX Bulletin* discloses that PY1CK has logs for the recent PY1BCR Trinidade DXpedition and began issuing QSLs in April . . . . . "No mail will be leaving Deep Freeze until the fall, sometime in October," reminds W3LE. "Those expecting cards from the antarctic should be so aware." Gladly do we let the southern hemisphere entertain OM Winter for a while!

Hereabouts — "QSLers of the Month" this month include DL1KB, EL4YL, FG7XJ, GC2FMV, HKs 1QQ 0QQ, ON5AX, PJ2ME, TF2WHP, TG9SC, VP6LJ, VR6TC, W9WNV/KG6R, XEs 1CV 2JS and 6W8DD, plus QSL managers Ws 2CTN 4TAJ and 9VZP, all nominated for this recognition by "How's" correspondents W0GER, Ks 2JJR 5FSU 6TZX 0AXU 0VSH, WAs 5EEM 6TZN and 9BRC for prompt attention to QSL requests. Any candidates for such kudos in *your* mailbox lately? . . . . . WA4FAT volunteers his time and effort as QSL manager for a deserving overseas DX station . . . . . Halp! K2JJR is anxious for a tip on VU2AJ QSL attainment, and WA6VAT needs a boost toward confirming a QSO with PZ1AH . . . . . ARRL Assistant Secretary W1ECH is assured by KG4BR-W5JDX/-VP9 that QSLs will be forthcoming 100 per cent . . . . . FG7XT's entire layout went up in flames in mid-March but QSL manager K5AWR learns that John managed to save his logs. Furthermore, Don has photoduplicates on file . . . . . VP5AH records, "Since taking over my present job as QSL manager for the VP5 bureau I've discovered that there are several hundred QSLs awaiting delivery dating as far back as 1959. It is almost impossible to return these to senders. . . . Regarding Turks & Caicos, I have managed to get some off, but quite a few have been returned to me marked 'unknown'. Many of these must be for U.S. hams with VP5 licenses who operated from there for only a short while and then returned Stateside without forwarding advice." Alec wants to hear immediately from such ex-VP5s who are interested in securing their due QSLs. Otherwise he may have to destroy the undeliverable backlog to make room for current operations . . . . . KP4YT, QSL manager at the P.R. bureau, reports receipt of QSLs for such prefixes as KP1, KP2, KP3, etc. KPs gotta be Fours or Sixes, fellows . . . . . Now let's check the mailbag for individual specifications, keeping in mind that these recommendations are necessarily neither "official," complete or accurate:

Not long ago QSOs with Ethiopia were rarer than left-handed microphones, but things have changed. ET3FW (ex-W8EMJ) and ET3JK (W3MCB) send us these pictures of recent goings-on near Addis Ababa. At lower left the boys are setting up shop at the site of the Lutheran World Federation Broadcasting Service antenna farm; ET3JK blasts a c.w. CQ at middle left; ET3FW relaxes on phone at middle right; and far right, the ET3FW-ET3JK 15/20-meter quad and 20-meter vertical soar into the blue. Jack and Frank take turns manning the SSB-100 and 2B during off-duty hours.

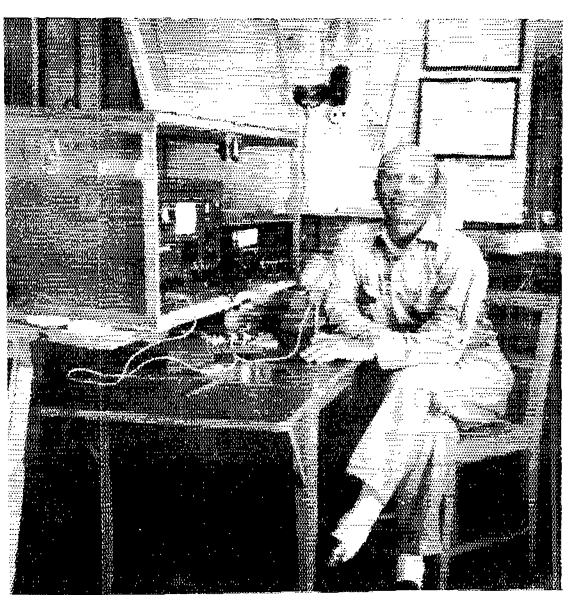


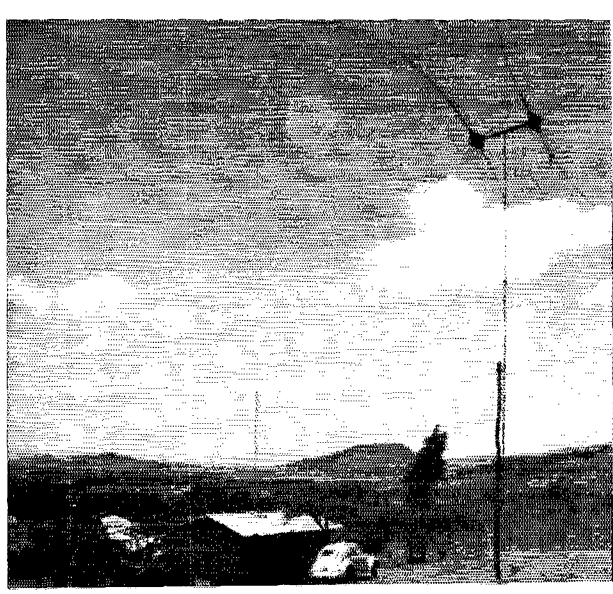
CE2DI, P.O. Box 301, Valparaiso, Chile
DL4BS, R. Lawson (K1MOU), Box 614, 6910th RGM, APO 175, New York, N.Y.
ex-DL4FT, R. Johnson, 216th Sig. Det., Army Chemical Center, Edgewood, Md.
ex-DL4RB (to K1UDC)
DL4TU, J. Guaderrama (K6QQB), Hq. & Hq. Co., 24th Inf. Div. (LRRP), APO 112, New York, N.Y.
DL5AO, R. McCaffrey, jr. (W5BVD), Johnstr. 36, 867 Hof/-Saale, Germany
DU0DM (via PARA)
EI0HE (via EI9V)
EL8C (via W4GJY)
ex-EL8D (to 6O1WF)
EL0J/mm, c/o A. Fennell, North Lodge, The Moat, Berkswell nr. Coventry, England
EP2AL, Dr. H. Glanville, P.O. Box 1527, Tehran, Iran
EP2AS (via EP2BN)
EP2BR, B. Joannon, P.O. Box 1423, Tehran, Iran
EP2DV, D. Walker, Marine House, APO 205, New York, N.Y.
EP2MA (via EP2BN)
EP2RC, R. Cormier (K1KOM), USA TRS, APO 205, New York, N.Y.
EP2RH, R. Hargreaves, U.K. Embassy, Tehran, Iran
EP3HS, H. Schmidt, P.O. Box 709, Tehran, Iran
ex-ET2US/ET2-ET3RC (to K1KOM or EP2RC)
ET3JK, J. Kear (W3MCB), Box 65, Addis Ababa, Ethiopia (or via K3HQJ)
ET3PP, P. Perkins, Opns. Co., Box 327, Kagnew Stn., APO 843, New York, N.Y. (or to K4QDC)
F2CC/FC, R. Grabot, 9 rue de Dr. Delpeligrini, Ajaccio, Corsica
F7CP (see preceding text)
FA8PG, J. Speer, SP88175, via BCM, Paris, France
FG7XS, A. Haikel, Postbox 110, Pointe-a-Pitre, Guadeloupe
FR7ZC/t/g (via W4ECI)
HC8CA-HC9CA/mm (via W2MES)
HI3MSP, M. Smester, Aptdo. 95, Santiago, D.R.
HK0ZU (to HK1ZU)
HL9KZ, T. Reger, 6146th AFAG, APO 76, San Francisco, Calif.
HL9TG, L. Walters, 8th Army Hq., Sig. Sect., APO 301, San Francisco, Calif. (or to W7UXZ or via KARL)
HZ1AB, Det. 5, Hq. USMTM, APO 616, New York, N.Y.
K0DMW/KB6 (to K0DMW)
ex-KA2RR (to K1WZZ)
ex-KA7RT, R. Tassone (KITXA), 184th USASA Co. (A), APO 171, New York, N.Y.
KG4BR, VP-49, FPO, New York, N.Y.
KH6EGL/KM6 (to KH6EGL)
KH6FBJ, H. Sherrod, jr., 1132 McMorris Dr., Honolulu 18, Hawaii
M1VU (DL1VU, via DARC)
OX3AI, A. Jorgensen, Station Nord, Greenland
PJ5ME (via W1JYH)
SL6BH, FSS F14, Halmstad, Sweden
SV0WY, c/o MARS, 2140th Comm. Sqdn., Det. 13, APO 223, New York, N.Y.
TF2WHW, Det. 300, H.2, Box 6, Navy 568, New York, N.Y.
ex-TF5WDW (to DL5AO)
TI0RC (via RCCR)
TT8AJ (via K2UYG)
TT8AK, P. Curazi, N.P. 438, Ft. Lamy, Tchad
TY2AB, A. Desmet, Porto Nuevo, Dahomey
UA6KOD, Box 22, Taganrog, U.S.S.R.
UA9KOG, P.O. Box 13, Novosibirsk, Siberia, U.S.S.R.
UA9OAP, V. Chavkin, P.O. Box 13, Novosibirsk, Siberia, U.S.S.R.
UQ2FX (via UA9OAP)
VE8DX, D. MacLean, c/o 84 Gill St., Sudbury, Ontario, Canada
VK9BH (see preceding text)
VRs IN 4CB (see preceding text)
VR4CE (via NZART)
VR6TC (via W4TAJ)
VS9ALD/4W1 (to W9JJF)
W5JDX/VP9, R. Carthen, VP-49, FPO, New York, N.Y.
XE2JS, J. Ortega, Aptdo. Postal 395, Guaymas, Son., Mexico
YV5AQD (via RCV)
ZA1BC, Box 53, Tirana, Albania
ZD3A, Box 285, Bathurst, Gambia
ZD3P (see preceding text)
ZD7BW (to G3PEU or via RSGB)
ZL4JF (via ZL2GX)
ZS6BIJ, Box 854, Pretoria, Trvl., So. Afr.
4X4OZ, U. Nitsan, 1 Neve Amal, Herzlia, Israel
5A2TJ, J. Teaster, Box 372, Tripoli, Libya
5A3CR, RAF Radio Club, El Adem, BFPO 56, London, England
5A5TH, H. Dahmani, 49 Sciara Sidi Dargut, Tripoli, Libya
5A5TW, W. Williams, Box 1281, APO 231, New York, N.Y., or via Box 372, Tripoli, Libya
5N2ACB, P&T Hq., Lagos, Nigeria
5U7AH (via K9EAB)
6O1WF, W. Franklin, U.S. Embassy, Mogadiscio, Somali Republic
ex-6W8CW (via DL9KRA)
9A1IR, D. Simonsen (DJ0IR), Parkstr. 47, bei Bressler 35, Kassel, Germany (or via K7RVZ)
9A0IRA, D. Simonsen (DJ0IRA), Felsberg (Bez. Kassel), Burgstr. 266, bei Plail, Germany
9G1ZD (via W0EQN)

The preceding QTH catalog comes your way with the compliments of **Ws** 1ECH 1ETF 1SWX 1WPO 1YYM 3LE 3PVZ 7UVR 8YGR 9QFC, **Ks** 1PCE 2JJR 2UYG 2YFE 4MYO 5AWR 6TZX 0AXU 0VSH, **WAs** 2HLH 4BJL 4FAT 6SLU 6TMY 6TZN 6VAT, **DL4TU**, **EP2AB**, **VEs** 3AU 3AWE 7BBB, American SWL Club *SWL* (6204 E. 109th Ter., Kansas City, Mo.), DARC *DX-MB* (DLs 3RK 9PF), DX Club of Puerto Rico *DXer* (KP4RK), Far East Auxiliary Radio League *News* (KA2EB), International Short Wave League *Monitor* (12 Gladwell Rd., London N.8, England), Long Island DX Association *DX Bulletin* (W2MES), Newark News Radio Club *Bulletin* (L. Waite, 39 Hannum St., Ballston Spa, N.Y.), North Eastern DX Association, Northern California DX Club *DXer* (WA6TGY), VERON *DXpress* (PA0s FX LOU VDV WWP), and West Gulf DX Club *DX Bulletin* (W5IGJ). Any similar fresh QTH clews in *your* recent loggings?

Whence:

Asia — Need an EP or two? "The Amateur Radio Society of Iran will hold a field day on June 28th," notifies YI, EP2AB. "We will be on the air using c.w., s.s.b. and straight a.m., 6 through 160 meters, from 0330 to 1430 GMT." . . . . . W4KKA advises ARRL's W1ECH of his departure in mid-April with the international Indian Ocean Expedition for Monsoon Research. [Hope they don't bring back samples, Boss. — *Jeeves*] "The latest country to give me permission to operate aeronautical mobile and portable is Iran. I have yet to hear from Pakistan, India and the Seychelles." Harry expects to be in those regions for several months with headquarters at the Sun-N-Sand Hotel, Bombay, India . . . . . "I'm active on 40 and 20 c.w. with a T-368 100-watter, R-390A receiver and 15-ft. whip antenna," reports HL9TG (W7UXZ). Neighbor HL9KZ anticipates 14-Mc. sideband ing with his new SR-150





It's hamfesting time again and these group photos reflect get-togetherness from overseas. At upper left, left to right, are DU1GS, DU1NL, DU1CE, W6JVG, DU1OR, DU1RS, W4YKO, K4HHW, W5PCL and ex-KA1GZ, a joint Filipino-American field day team (DUØDM) that helped commemorate the 1945 return of U.S. troops to Corregidor. Upper right, front, are ET3AP (W4FPO), ET3JK (W3MCB), ET3MEN (W8MEN), VQ2AF (ex-ET3AH), ET3GZ (W1VWP), ET3LM (W7KMF); rear, ET3FW (ex-W8EMJ), ET3HG (W7FJT) and an s.w.l. At lower left are SP6s AAT ARU BZ SD ADO DQ and YS; the YL also signs UA3RU. Lower right, JA1s BWA YL CO GV and BK of Japan's DX contest gang assemble to swap notes. (Photos via K3CUI and WA6HRS)

. . . . . EP2AM (W4EXM) may return to Uncle Sugar at the end of this month, according to EP2AB . . . . . "4X4OZ is a young fellow just out of the Israeli army," notes W3PVZ. "Uzi worked some 300 *W/K/VEs in this* year's ARRL DX Contest." . . . . . K2UYG observes, "AP5JA is active daily on 14,055 kc. at 0130 GMT." . . . . . From the DX clubs press, more Eastern items: The Aden *RAF* lads had a March romp as VS9ADV/4WI with their KWM-1. They hope to return to Yemen occasionally as opportunities arise. . . . European DXers report another Afghanistan sideband candidate in YA1AK. . . . TA5SW and TC3ZA (W3ZA) are recent Turkey entries lurking among the 14-Mc. sideband underbrush. . . . 9M2UF soon will terminate his 14,030-kc. c.w. availability at 0030 and 1430 GMT, but 9M2CR expects to keep a KWM-2, 30L-1 and yagi rolling on 14,300-plus sideband. . . . Cape Schmidt's UW0IN is sometimes passed up as a W0 near 14,010 kc. at 1300-1400 GMT. . . . KAs 2BM (K8SSO), 2YP (WAØBDX) and 8AR (KØZQR) are new FEARL members. Far East Auxiliary Radio League brass now lines up as KA2s RC pres., CM secy.-treas., DC awards mgr., LL *News* ed., EB DX ed. and gen. mgr., RJ v.h.f. and tech. ed., and CF observer-coordinator. . . . Ex-KA7RT (KITXA) awaits a *DL* call at APO 171, and ex-KA2RR is about to try a Connecticut comeback as K1WZZ at Niantic. . . . A quote from VS9MB, Gan Radio Club, Maldives, goes, "At present we boast four operating members, three on s.s.b. and the other on c.w. We are on the air almost daily, 1700 to 2300 GMT. A new selection of aerials has been erected consisting of an eight-wire cage dipole, a ground-plane and a vertical folded terminated dipole, all cut to 14 Mc. where 98 per cent of our contacts are made with our DX-100 and SB-10 adapter."

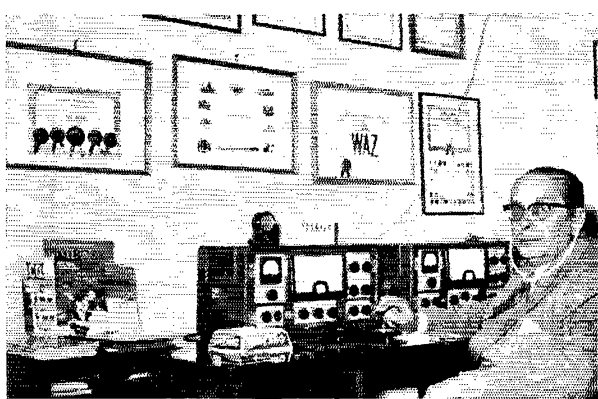
Africa — Dust off your ZD7 rhombics, fellows. G3PEU-ZB1BW warns, "I shall be taking a KWM-2, 30L-1 and 312B-5 to St. Helena on July 25th and should be on the air as ZD7BW by August 7th. I also hope to have along a Viceroy KW-77 combination so that both ZD7SE and myself can be on s.s.b. simultaneously." . . . . . WA4BJL, through W1ECH, relays TT8AK's inquiry for 6- and 12-volt apparatus for mobile Tchad operations . . . . . Among other stipulations, five contacts with 6W8 stations since the first of this year can qualify you for the *Diploma du Senegal* issued by the Senegal branch of REF (France). The full story is available from 6W8BF, P.O. Box 971, Dakar . . . . . Notes from K2UYG's African scratch pad: Lack of a ball bearing for his fishing boat may limit VQ9HB's DX-peditionary aspirations until after the monsoon season. . . . 9U5JH apparently is acquiring a taste for c.w. with regular appearances on 21,060 kc. around 1800 GMT . . . . . "I was on the air with phone as much as possible during the 1963 ARRL DX Test," remarks 6O1WF (ex-EL8D). "The 20-meter band was the only one open here and it was usable just a few hours each day. We did the best we could." . . . . . 5U7AH tells QSL manager K9EAB that his 150-watt Cheyenne, SB-10, homebrew 6146s outfit, 2B receiver and cubical quad will be regularly catchable on 14,125 and 14,265 kc. around 2000 GMT . . . . . W4GJY has it that EL8C expects three more years of Liberian DX-*ing with his* Viking II, *HRO-50 and* trusty rhombic . . . . . K2JJR understands that FA8PG, active on 40's low edge with 15 watts, is a French legionnaire in the Sahara . . . . . More Liberia comments via EL6E: "To avoid confusion and new QSLs I've been reassigned my former call, EL6E, and I operate almost nightly at 2100 GMT between 14,260 and 14,270 kc. with a KWS-1 and tree-supported dipole. We also have 15-meter schedules on Fridays and Saturdays using a homemade three-element beam. In putting up the tower with a Caterpillar we buckled the bottom section, so I don't recommend this method. EL6NB will leave Liberia shortly for return to Alabama and further college work. EL6NE will sport a new call when he moves up from novice status; normally we would just drop the 'N' from his present call but this would result in two EL6Es. Ken manages a coffee mill at Voinjama. EL2F, one of the oldest and most consistently active Liberian stations, has retired a BC-610 in favor of sideband gear. This is a club station at SWBC transmitter ELWA near Monrovia and they frequently schedule the U.S.A." . . . . . W4BPD did it again with glorious output from the Glorieuses as FR7ZC/g. With 20 meters becoming more and more temperamental, Gus recommends more monitoring of his 7002- and 3502-kc. spots . . . . . ZD3A gets a big play high in the 20 c.w. segment nowadays . . . . . The new s.s.b. outfit at VE3FFW/SU is a 14,106-kc. highlight at 1630-1730 GMT.

Oceania — W2GHK of Hammarlund, aided by G3AWZ, VK3AHO, W9IOP and others, is lining up a "DXpedition of the Month" series commencing with VR1N, VK9BH and VR4CB. An HX-50, HQ-170A and Hy-Gain arrays will be included in gear available for the undertakings. The announcement states, "Ultimately a committee of world-wide DX clubs will be formed to determine and plan future DXpeditions. All inquiries at this time should be addressed to [the address given in 'Where']." . . . . . W6AL, coming back home after a spell of VR2EK s.s.b. propagation, tells WA6TZN that 40- and 20-meter paths between the U.S. and Fiji are getting no better fast . . . . . DU1OR clears up the mystery of DUØDM: "A joint Filipino-American group of radio amateurs set up equipment on Corregidor February 15th-17th to commemorate the initial landing of U.S. liberation forces on February 16, 1945. The party was transported to the island on a Philippine Navy gunboat and returned on a U.S. Navy LCM. The expedition, sponsored by the Philippine Amateur Radio Association, contacted over 200 amateur stations on all continents including Antarctica. . . . The station operated as DUØDM, the last two letters being the initials of Douglas MacArthur and Diasdado Macapagal, President of the Philippines." The boys planned another DUØDM swing for last month . . . . . ZS6LM crystallizes plans to produce Willis Isle and VK9-Christmas QSOs . . . . . FO8-HC8-KZ5 is the tentative return route of VP2VB/mm and *Yasme III* after a brief VR2EO go.

Europe — W4KXV and K5IKL are top U.S.A. scorers in the PZK (Poland) 1962 Millenium SP Contest for c.w. and phone, respectively. SPs 6FZ and 5XM are the winners on the home front for code and voice. SPs 7LA and 5KEH take similar multioperator honors . . . . . DJØIR-9A1IR enlightens us through W1WPO: "In reference to permission to operate in the Republic of San Marino, one must first write to the Ministry of Communications for Italy in Rome. They will send you a letter permitting you to carry your transmitting equipment across Italy to San Marino. When you receive this letter you send a photostat copy to the Chief of Police, San Marino, and he will issue you a license. The correspondence must be in Italian to get results. It is also possible to go in person to Rome and receive the letter from the Ministry in a matter of hours, then proceed to San Marino where the police chief will issue your license at once." Don further states, "In August or September when I again have some free time from college studies I will go back to San Marino as 9A8 1IR and ØIRA. I hope to have s.s.b. gear along this time and would like to operate from Corsica as well." . . . . . K2UYG hears that 1IRIF's kilowatt feeds a 3-element beam 350 feet aloft. Darned near line-of-sight to Long Island . . . . . Four GC-type QSLs will qualify W/K/VE/VOs for the QUA Club (Channel Islands) WAGC certification provided they confirm QSOs with at least two of the islands. Check with GC2CNC for complete details. Monty comments, "I'm grateful for the publicity *QST* afforded me when I agreed to make skeds with U.S. and Canadian DXers. So far 37 schedules have been made on c.w., 34 completed satisfactorily. Regarding WAGC, seven have already been issued, two to W's." . . . . . Listener J. Gentry of England, a soon-to-be G3, confirms the sunspot trend, observing, "I find it easier to hear fine DX on 80 and 75 meters these days than on 20. And don't think that band is for winter only. A good motto for North American 75-meter men is 'Look below 3800 kc. for fine phone DX!'" . . . . . Forty-meter phone QSOs between our west coast and Europe come under the heading of superdifficult DX. DL4BS emphasizes this: "It's possible only in the wee hours here in Europe. I have a 1000-ft. long-wire antenna about 50 feet high, all in the clear, running a kilowatt. Receiving the Stateside end is the hitch. When I recently worked K6AHV I had to select a spot for him where the weakest (or least strong) jammer carrier was running. We would like to hear from anyone who heard our s.s.b. QSO on March 28, 1963. I was on 7010 kc., K6AHV on 7214 and 7265 kc." . . . . . The official announcement of this year's April–May PACC DX Contest by VERON (Holland) arrived much too late for relay to the "How's" readership. We urge overseas societies and other groups planning operating activities to give us details *at least* two months in advance . . . . . K2YFE worked WA6NPW/am on 21,055-kc. c.w. while the latter cruised over Spain . . . . . 1IER says that the '63 ARRL DX test was favored by a fine 15-meter opening on March 23rd-24th, one of the few good 21-Mc. sessions in recent months . . . . . IT1AGA's QRP DX efforts have resulted in almost 200 certification awards . . . . . OH4QG sends word from a rare call area: "It is true that OH4s are difficult to work. There are some 75 licensed but only about a dozen are active at this time, including OH4s NG NS OF OK OO OQ OW OZ PJ PN PS PT QB and QL. Half of these work only 80-meter locals. I am on 20 meters almost daily, 1300–1700 GMT; also week ends, 1000–1300. You can find my 40 watts on 14,040 kc. most of the time and I'm very interested in obtaining WAS." . . . . . "I've just received the call DL5AO and have had over 800 contacts on 20 meters since late April," declares W5BVI, ex-TF5WDW. "I'll be after as many certifications and QSLs as possible during the next three years." . . . . . DL4TU (K6QQB) advises that DL4RB (K1UDC) closes down his Adventurer and BC-342 on 20, 40 and 80 c.w. for return to Rhode Island . . . . . Timely tip from W9QFC: "OH2PM/1 tells me that OH1-AD/Ø will be active from the Alands on all h.f. bands with c.w. and s.s.b. on June 2nd and 3rd." . . . . . European news via the club route: EI0IE was a display station at the recent Dublin Hobbies Exhibition. . . . IT1TAI's new four-element twirler should be highly audible on 14,280–14,320-kc. sideband at 1300–1500 and 1930 GMT. . . . Another DXing YL is Olga of UA6KFC, 14,310-kc. sideband around 1100–1200 GMT. . . . GI3OLJ works his DX from Blackhead lighthouse where he suffers monumental local QRM from the installation's explosive fog signals during murky weather.

South America — W4RUF participated in the pursuit of that stolen Venezuelan freighter earlier this year, and found time during the chase to visit pleasantly with PZ1s AX and BR. Bill is radar controller aboard hurricane-hunter aircraft . . . . . PY7EC directs a school for 51 needy youngsters and would like to hear from others interested in education for the financially retarded, according to WA2RUD . . . . . PY4AS indicates that prospects for another Trinidad trip are good for late this month, call as yet unspecified.

Hereabouts — YS1BV is a rare one for your YL-type DXCC. YL VE7BBB schedules Berta on 20-meter a.m. and has now QSOd ladies in some fifty countries . . . . . VE3-AWE returns to the DX wars well equipped with a *QST*-styled HBR-16 receiver, W1TS's 500-watt package and a 14-Mc. three-element spinner. Terry is not alone in yearning for the good old DX days of the late '40s and early '50s when every band was hot and Europeans boiled through on 160 through 10 meters day after day after day . . . . . Ws 6OBH and 7DJU express desires to see the old-style "What" listings revived wherein appeared each individual report of who-worked-what. If DX conditions decline much further, perhaps this can be managed. Meanwhile we're lucky to find space to specify the times and frequencies used by quite a few DX stations. This information sometimes can be useful beyond its basic documentary intent . . . . . "Bands were excellent for a change during this year's ARRL Test," asserts W7DJU. "My new 7-Mc. doublet really does the trick out here." U.S. west coast contestants are almost unanimous in declaring 40 meters a bountiful blessing in this year's ARRL DX joust. But where were all the VK/ZL chaps? . . . . . Temporary DXpeditionary complications in the Caribbean are recounted by ARRL Director VE3CJ-VP5BP: "Since responsibility for the Caymans is no longer Jamaica's, Cayman must now issue its own licenses. Nobody there knows how to do this as yet. My own license just expired and nobody will renew it! I've offered to help them set up the necessary regulations." Immediately if not sooner we'll be collecting new prefixes from that region, possibly in the 6Y series . . . . . J. Howard of ASWLC gives WRUL's shortwave BC DX program times as 1830 GMT on Saturday, 1940 on Sunday, and says the presentation may be expanded to an hour's duration . . . . . Sorry to hear that W2QHH, Mr. QRP DX, has a siege of illness curtailing his DX doings. The population and construction explosion now swallowing up so many ham antenna farms is likewise engulfing the famous 135-foot end-feed wire of W2QHH. "Looks like its DX days are done for," declares Howy. "Four commercial plants are building right under it and off the ends." . . . . . K3DCP reports HP1ME going strong again in the 14-Mc. s.s.b. Pan-American Net. Manuel was injured in a fall from his tower about a year ago . . . . . K4MYO confirms that TIØRC's March appearance was Costa Rica-based, not DXpeditionary. By the way, Bill seeks correspondence from individuals proficient in Slavic and or African languages . . . . . WA6-VAT finds the gang neglecting some delicious c.w. DX in the 20-meter range above 14,100 kc. "Recently worked BV1 FO8 HL9 VR6 VS4 9M2, etc., in that range with hardly any competition or QRM." Hmm — maybe everybody else is watching for Gus on 14,034 kc. . . . . WA4FAT proposes a 10-meter DX contest to bolster activity on that band. Might help things temporarily, but contest activity thrives on band openings, too, Bill . . . . . K5AWR reports that FG7XT has a new SR-150 on order to help replace equipment he recently lost by fire . . . . . VP5AH offers, "If anyone wants a Jamaica contact and a sure QSL he can find me on 15 meters any Sunday." . . . . . W5IGJ succeeds K5ADQ as editor of the West Gulf DX Club *DX Bulletin*, one of the oldest and peppiest periodicals on the DX scene . . . . . More local dispatches courtesy club journalists: W6ITH expects to be able to generate much more rare Caribbean QRM upon passage of Bill S.920 in the 88th Congress, especially among French and Dutch territories. . . . Those who do their DX fishin' with inputs of 100 watts or less may be interested in the QRP Club, an outfit reachable through K4WVX. . . . The DX Club of Puerto Rico is weighing the possibility of sponsoring an annual DX contest. . . . Early returns among Northern California DX Clubbers have W6s HOC LDD FYM WB SC WX BYB and WA6HRS placing in that order in 1963 ARRL DX Test claimed scores. Looks like about 2.8 megapoints for the aggregate NCDXC total. . . . K6CQM/5, former NCDXC *DXer* editor, hobnobs with the DX gang around Houston while setting up DX shop. . . . Radioteletypist **KP4GN** lists active RTTY DX like **DJs** 4KW ØEK, **DLs** 1WX 4IA 6EQ, **EP2AD**, **Gs** 2FUD 2HIO 3BXI 3CQE 3FHL 3KZI 6CW, **GMs** 3GNR 3ENJ 3IQL 8FM, **HH2P**, **1IRIF**, **KR6BE**, **KW6COY**, **LAs** 5LG 6J, **PA0s** FB LQ, **TG9AD**, **VKs** 2EG 4RQ, **YV1EM**, **ZLs** 1WB 3HJ, **ZSs** 1FD 6UR and **5A2TC**. Got *your* RTTY WAC yet? QST



IT1AGA of Palermo has a 221/214 DXCC countries worked/confirmed record and more additional diplomas than you can shake a bug at. Gius runs 60 watts to a Windom wire on c.w. bands and is active almost daily during non-summer months at 1300–1500 and 2200–0300 GMT.

Correspondence From Members-

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

160-METER NOISE BLANKER

¶ The article on Loran Interference by W6ZH (January *QST*, page 24) is the best technical write-up I've seen in a long time. It's clear, concise and very practical. — *Frank V. Capellupo, W2JZQ, Brooklyn, New York.*

BASICS FOR BEGINNERS

¶ Just a short note of praise for your latest production in a long line of fine books. *Understanding Amateur Radio* is terrific! I only wish I had had this when I first became interested in ham radio; It would have solved a lot of problems!

It is, also, a refreshing change to be able to purchase a paper-back book for the price of a paper-back, rather than for some exorbitant fee. I only wish that *USAR* could be made required reading for every new ham — and some old ones, too! — *Martin J. Feeney, Jr., K1OYB, Chatham, N.J.*

¶ If the whole publication of *Understanding Amateur Radio* is as great as the first article in March *QST*, "A.C. in Radio Circuits," this should be just what the doctor ordered. . . . I think *all* amateurs could benefit from these articles, even those who own kilowatt s.s.b. rigs. — *John Nelson, WB2AEJ, Westfield, New Jersey.*

¶ I have no choice, but to buy *Understanding Amateur Radio;* some years back I wrote urging preparation of a book of this type! Let us hope that it will bring a few gleams of added light. — *William A. Simkins, K5BBA Bartlesville, Okla.*

¶ Please send me your new book *Understanding Amateur Radio.*

As a new ham I feel this — not restriction of privileges — is the right track. — *Paul Edward Doering, K3WIG, Lansdowne, Pa.*

¶ I would like to congratulate you on "Basics for Beginners" in *QST*. I sometimes have problems with a few of the basics. Many other hams and would-be hams will profit from it. — *E. S. Robinson, W12ZLL, Waverly, New York.*

¶ . . . I am glad to see "Basics for Beginners." *QST* has something for the entire ham population. — *John J. Herro, K9VRA, Rolling Meadows, Illinois.*

MODE WITH A FUTURE

¶ I have just finished modifying my QS-59 to receive micro-band frequency modulation. This mode really has a future! — *William E. Schwartz, WA4JCP, De Bary, Florida.*

¶ The article on micro-band f.m. in April *QST* was very interesting.

However, I have been informed by a Mr. Rapp of "Larsen E. Enterprises, Inc.," that his firm has been manufacturing micro-band f.m. transmitters for several years now. This probably accounts for the many seemingly unmodulated carriers found on the 75-meter band. — *Robert W. Myers, WA2JZX, Copiague, L.I., N.Y.*

¶ I enjoy both hamming and reading *QST*. However, I feel it a shame that so much space and effort is going to waste on restricted voice bands and "April Fool" articles, when it could have been channeled towards reciprocal licensing and an effort made toward ham TV on six meters, where it should be.

I did enjoy "Practical Techniques for Amateur Microwaves," but please keep the fairyland stories like Micro-Band F.M. out. There is enough of that on TV. — *John V. Smith, K2MWR, Port Washington, New York.*

PLEASE, NO CONFUSION

¶ . . . Certainly you think of the California group, the ACARN and its parasites the same way as we do over here. Nothing else can cause more "badwill" towards the U.S.A. than such an organization among amateur radio. Think of the results if a similar organization would be founded by the communist countries. We small countries between all that would meet the worst troubles! But, probably the ACARN will disappear with time. However, their subdivision called "NRRL" (National Radio Relay League) is something which the Norwegian ham friends of ours don't look at with friendly feelings at all: the Norwegian Radio Relay League has just the same abbreviation and certainly that will cause some confusion. Perhaps it might be useful to warn members about the possibility of mixing the two similar abbreviations. The California NRRL will receive absolutely no support from the IARU Member Societies; such would be against the IARU Constitution. — *John Velamo, OH2VV, Lauttasaari, Finland.*

SNOWSHOES IN AUGUST

¶ Every so often I get so dog-gone exasperated at some U. S. hams, I'm afraid I'll bite my fingernails off so far I'll have no keying fingers left.

We don't use snowshoes in August (mostly), U. S. stamps are not usable here, we have our own currency, and most of us are smart enough to know that Ohio and Conn. are in the U.S.A. and that the "W" or "K" prefix tells us that anyhow. — *Bill McCullagh, VE3DAN, Toronto, Ontario.*

TROSTER STILL TOPS

¶ Let me say hooray for John Troster and his wonderful stories in *QST*. Both my wife (one of the pre-Novices) and I enjoy them thoroughly — and he is consistently good. We might not be interested in amateur TV or thyratrons, but we always can count on a good fifteen minutes worth of laughs from W6IVK — oops — W6ISQ. — *W. D. Gehres, WA4BSK, Nashville, Tennessee.*

FINE CRAFTSMANSHIP

¶ It's high time we W/K/VE hams give applause to the seemingly never-tiring DX operators of the world. Such consistant efforts of stations such as ST2AR, SV0WZ, etc., have made many an American operator appreciative of their fine craftmanship, and courteous QSL habits.

To these hams the world over, we all should give heartfelt thanks for their time, money and skill involved in working us. — *Cliff Watson, K4ADU, Columbus, Georgia.*

OR BETTER EARS?

¶ I would like to take up a collection for all amateurs who transmit, but do not own receivers, especially those who operate on W1AW's frequency while it's running code practice. Then those receiverless amateurs could QSY and let others become full members. — *Lawrence C. White, Prescott, Ontario.*

PICOFARAD

¶ Re "Correspondence from Members," *QST* for February in answer to W2HFZ's querry about picofarads (pf). Here in Europe, in order to purchase a capacitor, a person must use pf or nf, not $\mu\mu$f or μf, because the supply houses do not know the units of capacitance used in the U.S.A. — *B. R. Chambers, W4NIC, DL4DU, Bad Tolz, Germany.*

ARRL RECOMMENDS . . .

¶ I must say that I agree wholeheartedly with the Executive Committee's suggestions on page 65 of the March issue. I feel that if our fellow hams will stand behind and back up

(Continued on page 162)

Operating News

F. E. HANDY, W1BDI, Communications Mgr. ROBERT L. WHITE, W1WPO, DXCC Awards
GEORGE HART, W1NJM, Natl. Emerg. Coordinator LILLIAN M. SALTER, W1ZJE, Administrative Aide
ELLEN WHITE, W1YYM, Ass't. Comm. Mgr.

All Amateurs Invited; Test Your VHF and Emergency Station. There's a VHF QSO Party June 8-9 and ARRL Field Day June 22-23. These popular June activities have been listed for some months in the Activities Calendar, so we assume everyone has requested his log-report forms and is all set for participation.

Any contesting in the *VHF Contest* is between you and v.h.f. operators in *your immediate* League Section (see page 6) for the ARRL Section Award. We reserve a winner's certificate *for each Section area.* This June party is the first good chance in a League VHF activity for '63 to operate from hill tops . . . now our good weather has arrived. It's one of the best times of the year for VHF DX! New QSO records and ARRL Sections worked are a customary result for those who take part. We'll be looking for your log. The full announcement appears elsewhere in this issue.

Field Day Planning was the subject of some detailed suggestions in last month's *QST* column. See the results of the last year's FD in December *QST*, too. The rules in full for this FD likewise are detailed elsewhere in this issue. Go out in this field test either by yourself or as part of a radio club or group to be assured of a top fraternal and operating experience. There are many equipment-pooled club stations supported by as many operators!

However, it is our personal belief that just as many amateurs as possible should possess and habitually try out their *small transmitters.* Make them "portable"; devise them for the Field Day power level if you will. See that you can *emergency power* them! Use these fully, we suggest as regular station adjuncts to keep schedules, report into nets, render more than "casual" communications service to the fraternity and the public, and for personal pleasure and utility on vacations in this and coming seasons!

The Field Day has come to be noted as an operating contest between those groups that have the same size or numbers of transmitters and challenge each other. It's a chance for all concerned to *improve* equipment availabilities and test both station and operating know-how. One class of entry encourages a workout of your car-installed and other mobile rigs also. Don't let this week end opportunity go by without testing your emergency equipment! Here's to a successful ARRL Field Day, and again be sure to report whatever you do in either of the above activities. The fellow who works hard to complete some piece of equipment or objective, if he tries it out and has only a single contact is *way ahead* of the fellow who passes up the opportunity to take part.

On-the-air Tune Ups a Pet Peeve of Many. "Xmitter tuning *must* be done, but why on the air? A signal on one's frequency while a QSO is taking place is downright annoying in such cases, also absolutely *unnecessary.* In one seven minute period starting at the low end of the phone band and tuning to the high frequency end I counted 23 hams tuning their rigs with Ah-h-h-h . . . 1-2-3-4, whistles, test, test, test, woo-o-o-o, and *you* name them! Not once did I hear a call sign given in this exhibition of the *lowest of operating practices.* Two DX stations worked lately, one in Uganda, the other in Northern Greece, also on 20, had to request a standby and ask other amateurs to stop tuning their rigs on frequency. Northern California was just as rare to them as the DX was rare to me. Why should anyone be permitted to tune-up a rig on his antenna on a rare DX frequency? Our foreign hams must think we W's are without manners and a selfish group of people . . ."

— *William Nesbit, WA6YVW.*

Bill is right, that resentment runs high against the operator guilty of such inconsiderate practices who does not set himself up with dummy antenna provisions for tune up. The April Communications Department Bulletin listed several "must" points for good operating. Point 3 stressed the following: *Dummy Antennas should be switchable for tune-ups. Keep unnecessary testing and transmitter-adjusting for resonance, or output, off the air.*

—*F. E. H.*

In spite of all that has been said on the subject, we continue to be plagued with reports of misunderstanding and even conflict between AREC and RACES groups; also, MARS and citizen's band and non-amateur RACES operators frequently come into the picture. We think all this misunderstanding results from the increasing complexity of our daily lives, both amateur and otherwise. There are so many classes of amateur license and the regulations are getting so complex (often we think the FCC doesn't understand them themselves) that everyone is confused. Let's see if we can't get a few things straightened out, at least in the public service field.

Quite some time ago we proposed a lead for this column in which it was announced that henceforth we would spell the word "amateur" with a capital A when we were referring to amateur radio as a service, to avoid confusion with the word used in its general connotation. We received an editorial thumbs-down on this. Nevertheless, we think it is one of the underlying causes of confusion. In fact, as far as the public is concerned, a radio amateur is not a duly-licensed individual, but anyone who fools around with radio in any form, just for fun. This includes SWLs, citizens-banders, even BCLs. The press calls them amateurs, even "hams," and we can do nothing about it; they fall back on the definition of the word "amateur," and refuse to reform.

In this column, and elsewhere in *QST*, nearly every use of the word refers to a licensed, transmitting radio amateur operating under FCC's Rules Governing the Amateur Service. When we say "amateur," this is what we mean. He's a critter who operates on the bands specified by the amateur regulations, using a license, privileges and equipment controlled by those regs.

Under this definition, RACES is also amateur radio, so there might be some justification for calling a RACES operator an amateur. *But*, what about non-amateur RACES permittees? They operate in the amateur bands under amateur (i.e., RACES) regulations, but they do not have amateur licenses. No, we'd say they are not amateurs, in our sense.

MEET THE SCMs

Kansas SCM Lee Cheney, WØALA, is no stranger to either amateur radio or the League's field organization. Lee was first licensed in '31 and is a transplanted New Englander, having held the calls W1EPT and W1EUV. A versatile amateur is he, with appointment activity (EC OO OPS OBS), participation in contests, local emergency work etc. This fine shack located in the basement houses the WØALA station: HT-32B-HT-33B linear, SX-101A. Antennas in use are a tribander and vertical for 40 and 75. Lee can be found most every evening from 0200–0500 GMT on or near 14315 or 3920.

What about MARS? This is a quasi-military service with a wholly-military mission which operates entirely outside the amateur bands, using non-amateur procedures and military (quasi-amateur) calls. It often purports to be an amateur service, but it is not. Its only connection with amateur radio is its exploitation of amateur operators. You say some MARS stations operate in the amateur bands? This is not so. However, it is true that amateur stations are licensed at military bases under special licensing provisions of FCC, and that such stations, used also in MARS, frequently operate in the amateur bands. When they do so, they are *amateur* stations, not MARS.

How about citizen's band? This is not amateur radio in any sense of the word, and the band on which they operate is not an amateur band *and never was*. There may be some CB'ers who are *also* amateurs, and there are *undoubtedly* a great number of frustrated or "flunked out" amateurs, as well as a considerable number of potential amateurs, but the Citizens Radio Service is an entirely separate service under entirely separate regulations having nothing whatever to do with our amateur radio. This doesn't mean you can just forget it, because in many places they are cutting into our traditional public service activities, and we need to look to our laurels. But let's keep it in its proper place. CB'ers are not eligible, as such, either for the AREC or RACES.

The AREC is the amateurs' own emergency communications organization. It is sponsored by the League and implemented by appointed (by the SCM) leaders as an amateur service for whatever public service is available. Yes, AREC can (and in many places does) serve civil defense, either through RACES or in its own name.

RACES is an amateur service sponsored by local civil defense under a c.d.-appointed radio officer, in accordance with special FCC regulations governing it. These regulations are part of the amateur regulations. RACES operations are limited to civil defense communications.

The distinctions between RACES and AREC is the question most often posed, and yet the answer is absurdly simple. RACES is civil defense's amateur communications arm. AREC is amateur radio's emergency communications arm. Thus, amateur radio and civil defense are connected via the AREC and RACES. Amateur Radio's AREC implements RACES, which supplies the c.d. connection. RACES is the connecting link between amateur radio and civil defense.

If it doesn't work out this way in your neck of the woods, then you aren't doing it the most effective, efficient and beneficial way. If the way you are doing it happens to be the *only* way you *can* do it, then that's all *right*. We understand that circumstances alter cases. We recommend that RACES be implemented through the AREC. At the same time, we fully understand that sometimes compromises are necessary in order to render public service in the name of amateur radio. So don't worry so much about it. — *W1NJM*.

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Members of the Clermont County (Ohio) Radio Club were able to be of assistance during the flood emergency which struck the area on Mar. 4. The three base stations (K8BON, K8ADM and K8SOE) were activated and three mobiles were sent out: W8SAX on the Hamilton County side of the Little Miami River and W8ZRL and WA8EMA on the Clermont County side. Base stations passed information on road closing to the mobiles, which then moved into position to stop traffic. The operation lasted about four hours. — *W8EMA*.

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Tornadoes swept through Alabama, Mississippi and Tennessee in March, precipitating a series of emergency incidents which have been reported to us by Alabama SEC W4NML.

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On March 5 a tornado wiped out many telephones in Bessemer, Ala., and the AREC took charge. Eight mobile units and 24 fixed stations maintained communications between the Red Cross and civil defense from 1545 CST to 2032, operating in Alabama Emergency Net "O." At the request of c.d. and Red Cross authorities, mobiles and portables were dispatched to Bessemer from Birmingham and Jefferson County units, setting up local nets on 6 and 2 meters with K4HAG supplying liaison. Communications were supplied for city officials and were used by the Red Cross to dispatch disaster units. Amateurs taking part: *K4s* EDS BFM CTB DJR HPX ILL JIA JSY LFO UMD WSK

ZCV HAG UTH, *W4s* FSW LEM OGT OXU, *WA4s* BQK DDV FSK GKR HMK CCV INS KTK.

Alabama Emergency Net "P" operated for eight hours on an emergency basis on Mar. 11 during tornadic activity in Ala., Miss. and Tenn. K4ZTT assumed net control and 23 stations checked in. The net handled welfare traffic and relayed weather, damage and flood reports. Participants: *K4s* DSO AOZ FZQ GHX TDJ PFM WSS WHT ZNK, WHW, *W4s* DFE ALG GKO PBK SNP, *WA4s* FOH FYO FHU, *K5s* MFY GGV, W5BEV.

At 2040 CST on March 11, Alabama Emergency Net "O" was also called into emergency session by Net Manager W4OGT because of tornadoes in Cullman and Madison Counties. Twenty members reported in and assisted in handling welfare traffic for the stricken areas. Damage reports were handled for the state c.d. office. Net was secured at 2200. The following day severe weather again hit Alabama and AENO was called into session by WA4CCV with 28 stations reporting in. Participants: *K4s* DJR RWW TIY BFM CTB OCV UTH WHZ HAG MQU, *W4s* OGT FSW KWQ, *WA4s* CCV INS GGN GSW LPG FHU GXR.

Also on Mar. 11 the town of Hartselle in Morgan County was hit by a tornado and Alabama Emergency Net "H" was called into action at the request of EC K4WHW. A 6-meter base station was established at county c.d. headquarters from which liaison was available with state c.d., the Highway Patrol, county Red Cross disaster units and surrounding communities via the Alabama Six Meter Net (AENR). Mobile units were dispatched to Hartselle and Decatur to survey damage and relay information for county disaster units. Commercial circuits were out and rumors were prevalent. The net was secured after eight hours operation. Participants: *K4s* WEC JSL ROP JSM ILN, *W4s* BFM YXQ USF HVK PEX PKA, *WA4s* GNG KWN.

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A chain of thunderstorms containing tornadoes lashed through North Alabama during Mar. 11–12. The result was both flooding and tornado damage. The Madison County AREC was activated at 1700 CST Mar. 11, nets being activated on six and ten meters. Ten-meter mobiles were assigned to assist in evacuation procedures. Six-meter mobiles were assigned coverage points throughout the county and acted as weather observers, informing both the Weather Bureau and c.d. officials of conditions throughout the county and providing a warning service whenever a tornado funnel was sighted. The nets were secured at midnight when the storms lessened somewhat. The next morning the nets were activated again to provide damage survey information. Mobiles toured the county reporting all damage observed and conditions of the roads. This latter service especially made it possible for thousands of employees of Redstone Arsenal to report for work who might otherwise have been delayed by blocked roads. Participants: *K4s* VJL PTA RSB QXU KJD OCV YKQ WSS UTH NSO VLL EAO IQU UEC WMA, *W4s* WGI TFN ERX UVM YXQ DQJ YIZ RVO WWL WEY EKL, *WA4s* EXA DCS BRA IJF KUP DPX AZA LVK. — *W4NML, SEC Alabama.*

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On March 12 a devastating flood hit Eastern Kentucky, the second time in five years. Amateurs served c.d. units, the Red Cross, Public Health departments and the Weather Bureau as well as the general public in handling health and welfare messages. Many amateurs were flooded out of their homes, but they moved to high ground and set up operations. Five of Kentucky's ECs were active, along with the SEC and SCM. This is all the information we have, but here is the list of known participants: *K4s* AVY CC ECJ HSB ITF KXH ZQQ CGW AXO OPW OVW QHZ TFG ZHO USA VDK OZI QPB VCJ QIO YZU ZJS, *W4s* BYG GLP ZHL BEW BAZ EON JPV KWO BEJ TFK JKY KXH JTB JDU MWR RHZ SZB MVU ZXV, *WA4s* FYN JVE FHP ELP, W8AFX.

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While driving in Queens, K2MVT/mobile spotted a pedestrian lying on the street. He asked WB2DOF, with whom he was in contact, to stand by while he investigated. He then asked WB2DOF to summon an ambulance and police, both of which arrived within 20 minutes and the stricken pedestrian was taken to the hospital.

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Amateurs in the Hamilton County (Tenn.) AREC assisted the county police on March 12 when high water in the Tennessee River made some of the roads impassable. The AREC furnished mobiles to supplement police cars in covering the area and reported via the NCS to the police department when inundated roads were encountered. During the day K4MDA/mobile encountered a car which had driven into the water before realizing how deep it was; he was able to attach a rope and pull the stranded car out before the water rose any higher. A number of inundated areas were reported to the police, mobile to NCS on 50 Mc., then from NCS to the police station via telephone. Involved in this operation were *K4s* MDA YET KTC, *W4s* JVM RMT, *WA4s* MAA INB. — *W4JVM, SEC Hamilton Co., Tenn.*

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On Mar. 17 the regular session of the Minn. Phone Net was interrupted by KØKYH with emergency traffic. Communication was out between Minneapolis and Stewart as a result of a freight train derailment at the latter place and the Milwaukee Railroad station master needed information. WØGBF KØKGY and WAØDCJ were able to provide some of it, and later WØVOA mobile provided communications from the scene of the derailment. The whole operation took about an hour. — *WØOPX, SCM Minnesota.*

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On March 19 northern Alabama was again beset by thunderstorms and a tornado ripped a large path through Madison, Morgan and Limestone Counties, disrupting communications. Alabama Emergency Net "H" was called into emergency session on six meters by Net Manager WA4GNG at the request of EC K4WHW. A base station was located at the Morgan County c.d. office to link c.d., Red Cross and the highway patrol; this station was manned by WA4GNG, W4PKA, W4PEX and WN4GGE. W4YXQ served as liaison to the Ala. Six Meter Net (AENR) and the Weather Bureau in Huntsville. W4CKL and W4HVK served as liaison to the Ala. SSB Net (AENM) on 75 meters, by means of which they were able to relay reports between the disaster area and state c.d. in Montgomery. W4BFM was stationed at the hospital to receive requests for medical assistance. At the request of the county c.d. director, mobiles K4WHW, K4SMF and WA4GNK were dispatched to the stricken area for a damage survey. The net was secured after about three hours operation. — *W4NML, SEC Alabama.*

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On Apr. 2, WA6HGO put out an emergency call on a monitored 6-meter frequency and was answered by one of the regular monitoring stations, WA6BZA. It seems a high voltage line was down across E. 14th St. in San Leandro and a bad traffic tie-up had resulted. WA6BZA summoned the highway patrol and a Pacific Gas & Electric Co. truck. The tie-up was broken within fifteen minutes.

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We received February reports from 43 SECs, one lower than January but still an easy record for the month. A total of 18,061 AREC members were represented. This is an average section AREC membership of 420 which, if extended to 73 sections, falls just short of 30,000 total AREC members.

Sections reporting: E. Mass., S.N.J., Alberta, Mich., E. Bay, Ala., Ind., N. C., Kans., Minn., Ohio, W. Fla., S. Tex., Nevada, Ariz., Maine, Wyo., S.C., Wash., Colo., Mont., N. Tex., S.J.V., NYC-LI, Tenn., W. Pa., S. Dak., Los A., Ore., New Mex., W. Mass., N.N.J., E. Pa., Okla., Utah, S.C.V., R.I., Iowa, B.C., Ga., Ont., E. Fla., Md.-D.C.

A.R.R.L. ACTIVITIES CALENDAR

(Dates shown are per GMT)

June 6: CP Qualifying Run — W6OWP
June 8–9: V.H.F. QSO Party
June 19: CP Qualifying Run — W1AW
June 22–23: Field Day
July 5: CP Qualifying Run — W6OWP
July 13–15: CD Party (c.w.)
July 18: CP Qualifying Run — W1AW
July 20–22: CD Party (phone)
Aug. 1: CP Qualifying Run — W6OWP
Aug. 16: CP Qualifying Run — W1AW
Sept. 6: CP Qualifying Run — W6OWP
Sept. 12: Frequency Measuring Test
Sept. 14–15: V.H.F. QSO Party
Sept. 21: CP Qualifying Run — W1AW
Nov. 9–11, 16–18: Sweepstakes Contest

RACES News

W9VQP sends along a newspaper story of the new RACES communications center (mobile) in Hammond, Ind. The unit is a truck-drawn trailer converted from a house trailer by volunteers in the communications division of Hammond c.d. RO of this wide-awake outfit is K9PCZ, and W9MNO is head of the communications division. The trailer is a thing of beauty, containing all the necessities for maintenance of both communications and other c.d. functions. The newspaper story ingeniously avoids any mention whatsoever of amateur radio and refers to RACES as "the military radio network." W9VQP says the equipment was all procured *without* matching funds.

South Carolina's RACES is under the direction of our old friend Bannie Stewart, W4CE, of Columbia, and the state now has radio officers in most counties. W4CE and his boys work very closely with ARRL SEC W4BCZ and the county ECs in a model of cooperation between the two groups. Most amateurs in the program are members of both groups.

DXCC NOTES

Announcement is hereby made of the addition to the ARRL Countries List of *Glorioso Islands*. Glorioso Islands are French territory under the administration of the Overseas Department of Reunion and located off the northern tip of the Malagasy Republic, which separates them from Reunion. DXCC credit claims for contacts with the Glorioso Islands may be made starting August 1, 1963. Such confirmations must be for contacts made June 25, 1960 or later. Confirmations for Glorioso Islands credit received before August 1, 1963 will be returned without credit.

DX CENTURY CLUB AWARDS

Honor Roll

The DXCC Honor Roll consists of the top ten numerical totals in the DXCC. Position in the Honor Roll is determined by the first number shown. The first number represents the participant's total countries less any credits given for deleted countries. The second number shown represents the total DXCC credits given, including deleted countries. Positions in cases of ties are determined by date of receipt. All totals shown represent submissions received from March 1, thru March 31, 1963.

W1FH....311/327	G3AAM....308/322	W6EBG....306/321	W1CLX....305/318	K2GFQ....303/317
W6CUQ....310/325	W8JIN....308/323	W8BF....306/319	W7PHO....305/317	W9HUZ....303/316
W2AGW....310/324	W3KT....307/321	W8UAS....306/319	W2HMJ....304/317	CX2CO....303/317
W1GKK....310/325	W8BKP....307/320	W9YFV....306/320	W5MMK....304/317	W0AIW....303/316
PY2CK....310/324	W6AM....307/322	W8DMD....306/319	W6GPB....304/317	W9LNM....303/318
W4DQH....309/323	LU6DJX....307/321	CE3AG....306/320	VE7ZM....304/318	W3LMA....302/315
W3GHD....309/323	W5ASG....307/321	W0QVZ....306/318	W0DU....304/317	W2LPE....302/316
W8KIA....309/323	4X4DK....307/319	HB9J....305/320	W6YY....304/318	W4TM....302/316
W9RBI....308/323	G4CP....307/321	W7GUV....305/319	W1ME....303/317	W8DAW....302/316
KV4AA....308/323	G2PI....307/320	W2BXA....305/319	W8KML....303/316	W1JYH....302/316
W8BRA....308/322	W2HUQ....306/320	W3JNN....305/319	W1BIH....303/317	W4GD....302/316
W9NDA....308/322	W5ADZ....306/319			W0ELA....302/315

Radiotelephone

W3RIS....311/326	W8GZ....307/320	4X4DK....305/317	W7PHO....303/315	W4DQH....302/314
PY2CK....310/324	W1FH....306/319	VQ4ERR....305/319	CX2CO....303/317	W8KML....301/314
W9RBI....308/321	W8BF....305/318	W8PQQ....304/315	W6YY....303/317	W6AM....300/314

New Members

DL9VZ....148	KØECK....115	K7MKW....110	HA8CF....103	ZS6AMS....102	W4YE....100
SP9PT....122	K4EOP....114	DU1OR....110	HS2M....103	K1YRO....101	K5IJU....100
DJ1XP....121	G2FLY....114	W8KIT....109	DL3YQ....103	W5TEP....101	K6JIC....100
PY4AYO....120	HI8DGC....112	K8INA....105	DJ4MP....103	DJ6HE....101	W8LKM....100
K8QYA....118	PA0KF....112	K2SZK....104	W2GUZ....102	WA2KMV..100	KØVSH....100
SP2HL....118	DL9AU....111	K6ASL....104	K9DGK....102	W3LIV....100	VE4XJ....100
SM3BYJ....116	W1SEO....110	DJ5BV....104	OZ5MJ....102	K4PXY....100	

Radiotelephone

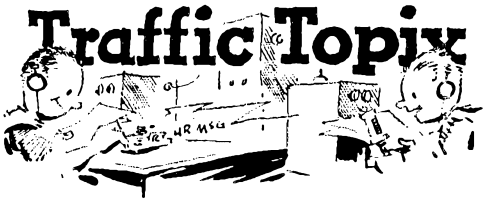
YV5AQC....175	I1DH....121	VS1GC....110	DJ5LA....105	YV5BFT....104	K6CYG....101
DJ5CU....169	K3MNW....110	K1IMD....109	W2AGO....104	DJ2KS....103	K6RFU....101
GD3ENK...143	W9GMY....110	PY7AEG....108	PAØKF....104	WØRJF....102	

Endorsements

W5ABY....310	W7C8W....231	VE3TR....201	W5EJV....162	W4HOS....141	IT1ZDA....122
W6HX....282	W2ZVS....230	W4BHG....200	K9OKD....162	K8RBB....141	K1LWI....121
K9AGB....273	K8OHG....230	W6OUN....200	SM5BEU....162	GI3NKQ....140	WA6AYU....121
W6SQP....270	DJ2KS....229	W8QNW....200	K9PNV....161	W5AJY....132	K8ZBY....121
W8SZS....270	W7UMJ....228	WA2CBB....199	DJ3HW....161	W2HWA....131	W2TKG....120
W9JUV....270	W6OF....222	W3ZQ....197	W5VA....160	W4UF....131	W3KID....120
KZ5WZ....265	W4FNQ....220	K4HYL....191	KØIFL....154	W5QIN....131	W8AI....120
W3MWC....262	WØAUB....220	SVØWI....191	SP9ADU....152	W2GRA....130	W5KWY....120
VE4XO....261	OE3WB....220	VP7NS....190	W1YQF....151	K4HPR....130	W9ARV....120
W7CMO....260	KP4AQQ....220	W9MAF....188	W7VIU....151	WA6KNE....130	WØOVQ....120
K8ONV....252	W7HDL....216	W6ISQ....180	W8OQV....151	KL7AL....130	VE2BCT....120
W4JJL....250	KP4AOO....216	W3HTF 179	W8ZDF....151	KØBHM....130	W9ARV....116
W8UMR....250	W8KSR....211	ZB1CR....178	W1BPW....150	WA4CXR....129	VS1GC....113
W2AYU....247	W8QQH....211	SP9KAD....177	W1PNR....150	WA6GLD....125	W1PYM....110
W4IKL....242	W7NRB....210	W8AJH....172	ZL2BG....150	W3JO....124	W1LQA....110
W5EJT....242	W9WHY....210	VE3AGC....171	K8ANX....149	K4YFQ....124	K1PZB....110
K4RJN....240	K8QJH....207	Z82U....171	K6EXO....143	W3AAZ....123	WA5CBL....110
W9TKD....240	SM5AJU....205	W7STC....170	DL1TA....143	DJ4VU....123	W5GZR....110
K4TEA....237	W9WJH....203	KØMAS....170	OZ5Z....143	G3JBR....123	W6FB....110
W3VRJ....236	K8IQQ....202	G2KI....164	K5GOT....142	K6CYG....122	KØQJG....110

Radiotelephone

W0QVZ....281	W9Z8Z....210	KØMAS....170	ON4AR....151	W6USG....143	W5NTL....126
W8ZET....261	ZP5EC....205	WØMAF....169	W1PNR....150	K5GOT....142	W4IKL....125
ON4BZ....257	K8ONV....195	W8AJH....163	W2JLH....150	FY7EC....141	W5EJT....125
W2TP....244	W9JYJ....195	W7CMO....154	W9RKJ....150	W1AW....130	W8ZDF....125
K9ECE....240	K4HYL....190	K8OHG....154	W6KLC....150	W2ZVS....130	W1YQF....121
Z88UR....226	W8UMR....173	W9UMJ....153	W1RO....148	W6KUT....130	K2POA....120
W4MS....221	WA2EOQ....171	KØKKN....151	DJ3OJ....144	W5AJY....129	VE2BCT....120
W8SZS....212	W8GLK....171				F2KC....119



A couple of months ago we talked about a "hotshot" c.w. traffic man in this column. Quite a few comments were received, most of them favorable. One unfavorable comment raised that old bugaboo, that the headquarters staff are a bunch of c.w. men and they all hate phone.

The first part of this allegation is true. The second part we deny. That the great majority of the licensed headquarters staffers are proficient c.w. men we are proud to admit; that we are prejudiced against other modes we indignantly deny. And to prove it, we are now going to talk about the qualities that make for a "hotshot" *phone* traffic operator.

Just as a basic quality for traffic proficiency on c.w. is a thorough grounding in the code, a basic quality on phone is knowing how to talk. Being able to send code characters is not "knowing the code," and being able to utter words is not knowing how to talk. The sad fact is that a very high percentage of our phone operators do *not* know how to talk, and some of the phone traffic-passing you hear on the air is eloquent testimony of this fact. A hotshot phone traffic operator first of all is able to *enunciate distinctly* (and this is a good practice phrase in itself).

The hotshot phone traffic handler realizes that the business at hand is to get the traffic to the receiving station intact — a much trickier business using voice than you might think! He doesn't try to impress anyone with his deep voice, with his magnetic personality or the importance of the traffic he holds. He reads at writing speed, one word at a time, repeating unusual words and spelling phonetically extraordinary words, initials, symbols and uncommon names. He avoids all extraneous remarks (the receiving operator might write these down as part of the message) unless absolutely necessary to the copying of the message — and you'd be surprised how few words out of context are really required. Above all, he eschews such expressions as "John, common spelling," "Missus, a married lady," "Black, as in the color." Any doubtful words he *spells*, and words unusual enough to require really careful spelling he *phoneticizes*.

The hotshot voice traffic man *avoids* over-phoneticizing. He uses a standard alphabet, but not any particular one.

A common practice in phone traffic handling is to read the text of the message by clauses, then to repeat it. This has one advantage — it helps the receiving operator make sense of the text. It also has several disadvantages, the principal one being that it tends to make the transmitting operator read the message faster than the receiving operator can write. It is far better to read each word once, repeating (with the phrase "I repeat") as necessary (but only *if* necessary), spelling when required, pronouncing each word carefully, putting emphasis on each word instead of parts of the sentence as would be done in ordinary conversation. It is not necessary for the text to make sense to the receiving operator — only to the addressee — and emphasis has a corollary known as de-emphasis, in which words can be missed. The hotshot emphasizes *every* word and doesn't waste time repeating common ones.

The hotshot phone traffic operator *never* makes any allusions to any part of a message he is transmitting, especially the text. This is a common phone lidism and it's a bad one. He simply reads it, makes no comments.

You say you don't agree that this is the best way to send a message by voice? Okay, we're listening. Voice is an inefficient way to transmit a written message in the first place, and it has a lot of ramifications not mentioned above because of lack of space. — *WINJM*.

— • • • —

Net Reports. (March).

Net	*Sessions*	*Check-ins*	*Traffic*
All Service	5	37	33
75 Meter Interstate SSB	31	1265	620
7290	42	1698	1034
Eastern Region Traffic	20	63	34
Barnyard	—	920	18
Early Bird Transcon	31	—	72
20 Meter N. American SSB	20	450	382
20 Meter SSB	21	547	1990

— • • • —

National Traffic System. The annual statistical analysis of NTS region nets shows that the 1962 statistical champ was the *Third Region Net*, for the first time in NTS history. We extend hearty congratulations to 3RN Manager W3UE and his fine crew of operators who pulled 3RN up from seventh place in 1959 and 1960 to second place in 1961 and now to the top in 1962. Staying there is going to be a different matter, however. Some of the other region nets are going to be gunning for that top rung on the ladder in 1963.

Relative standings of region nets are based on performance in the five categories of the monthly NTS summary: number of sessions, traffic total, rate, average per session and representation. The five factors tend to balance each other out, but it is true that some regions have a statistical advantage over others by reason of geography, population, interest and number of sections. In general, we would say that Regions 1 thru 6, plus Regions 8 thru 10 should each be capable of making top place. For RN7, ECN and TWN it is a bit more difficult, but RN7 has been as high as 3rd, ECN as high as 6th and TWN reached 8th in 1962, its highest so far. Here are the relative standings in the five categories and the final standings of the region nets:

Net	*Sessions*	*Tfc*	*Rate*	*Average*	*Rep.*	*Final Standing*
3RN	4	3	5	3	1	1
2RN	1	7	2	9	2	2
9RN	8	1	1	1	10	2
TEN	5	2	2	4	12	4
4RN	6	4	8	6	3	5
RN6	10	8	6	2	4	6
RN5	2	5	9	8	7	7
TWN	10	11	4	5	5	8
1RN	9	6	7	7	9	9
8RN	3	10	11	11	6	10
RN7	7	9	10	10	11	11
ECN	12	12	12	12	8	12

Note the first places in the above table, just to show how the factors can balance each other out. We see, for example, that although 9RN made first place in traffic, rate and average, it fell down in number of sessions and representation, whereas 3RN and 2RN, the other high-placers, made first in only one category but did pretty well in others too.

Well, so much for that. We get a little criticism, once in a while, for all these statistics, but we suspect much of this comes from the losers. The winners seem to like them. Odd, isn't it? — *WINJM*.

March reports:

Net	*Sessions*	*Traffic*	*Rate*	*Average*	*Representation* (%)
1RN	59	954	.409	16.2	82.3
2RN	62	870	.700	14.0	100.0
1RN	62	772	.435	12.6	91.2
RN5	62	856	.413	13.8	88.7
RN6	58	487	.292	8.4	72.6
RN7	62	449	.255	7.3	73.5
8RN	62	612	.290	9.9	94.0
9RN	31	704	.645	22.7	98.4[1]
TEN	79	683	.355	8.6	65.9
ECN	29	115	.184	4.0	78.2[1]
TWN	30	149	.192	5.0	65.3[1]
EAN	31	1941	1.075	62.6	100.0
CAN	31	1474	.910	47.5	98.9
PAN	31	1057	.692	34.1	96.7
Sections[2]	1137	6975		6.1	
TCC Eastern	90[3]	846			
TCC Central	92[3]	262			
TCC Pacific	118[3]	832			
Summary	1826	20038	EAN	9.9	2RN/EAN
Record	2007	26611	1.025	13.9	100.0
Late Report:					
RN6 (Feb.)	34	344	.246	10.0	61.4

[1] Region net representation based on one session per day. Others are based on two or more sessions per day.

[2] Section nets reporting (41): AENP Morn, AENP, AENR, AENS, AENT, AENB, AEND, AENH, AENO, AENM (Ala.); W. Fla. Phone; VSN (Va.); QKS (Kans.); MDD & MDDS (Md.-Del.-D.C.); ETPN, Tenn. S.S.B. &

TN (Tenn.); Mich. Wolverine; CAEN & ILN (Ill.); EPA & KSSN (Pa.); BEN, WIN & WSB (Wis.); GBN (Ont.); BN (Ohio); SCVSN & SCN (Calif.) MSN & MSPN Noon (Minn.); TEX & NTTN (Texas) RISPN (R.I.); BUN (Utah); NCSN & NCN (N.C.); Gator & FAST (Fla.); SCN (S.C.); CN (Conn.)

[1] TCC functions reported, not counted as net sessions.

We're doing a little better than last year in most categories, and the EAN rate this month is an all-time record for March. But we still have a long time to go to get out of the sunspot doldrums.

WA2GQZ reports that 2RN finally breaks the 100% representation barrier; 2RN certificate has been awarded to K2SBS. RN5 continues to improve under the tutelage of K4AKP, who is soon to move on to other (not necessarily greener) pastures. New RN6 Manager K6LKD is a college student; he reports RN6 now operating on 3606 kc. to avoid RTTY QRM, and sessions are back to CD-24-recommended times. RN7 Manager K7JHA is pleased with the 1962 showing of the net, and reports they may move to 40 meters for the summer; British Columbia is now one of the best sections of RN7. W8CKX has sparked West Virginia to a good month in 8RN, and this region net continues to look up with W8CHT at its helm; mighty nice bulletin, too. WØBYV reports that TEN is having troubles moving traffic in Kansas. VE3BZB says that ECN continues operating at its usual pace even though he has been out of town much of the time. EAN certificates have been issued to K1WJD, W4DVT, W8HCR, K9INF and W9JOZ. W9DYG says that CAN has a NCS "waiting list" of eager beavers just iteling for a crack at NCSing — a happy situation. Former TEN Manager WØRDN now shows up as K7QYG, representing TWN in PAN.

Transcontinental Corps. W3EML is trying to fill some of the vacancies in the Eastern Area roster. W9JOZ is taking over TCC-Central only temporarily, until a new appointee can be found. W7DZX reports that progress is being made in lining up stations for the direct J-D Pacific-to-Eastern hop.

March reports:

Area	*Functions*	*% Successful*	*Traffic*	*Out-of-Net Traffic*
Eastern	90	63.7	1659	846
Central	92	88.2	1184	262
Pacific	118	91.1	1658	832
Summary	300	80.4	4501	1940

RESULTS, FEBRUARY FREQUENCY MEASURING TEST

The February 14, 1963, FMT, open to all amateurs, brought entries from 295 participants who made a total of 955 measurements. Of these, 127 ARRL Official Observers submitted 403, and 168 Non-OOs made 549 readings. All taking part have received individual reports of their readings. The standings accredited to the more precise in each group appear below; all listed show ability of the highest order in Frequency Measurement. September *QST* will announce details on the next ARRL FMT.

Observers	*Parts/ Million*	*Non-Observers*	*Parts/ Million*
W4JUI	0	K8VLI	0
W4IU	0	W8GQ	.1
W8YCP	.1	W9TZN	.1
W8CUJ	.1	R. Ireland	.3
W3BFF	.2	W2FMU	.3
W5FMO	.4	K4HOB 4	.5
W8GBF	.4	W6KT	.7
W2AIQ	.7	WØYMG	.8
W6GQA	.8	WØANA	1.0
K8JIC	.9	W8LZY	1.0
W1TFS	2.3	W6CDF	1.0
W3UGV	2.9	W6AXV	1.0
W5MVL	3.2	WA2VLK	1.0
VE3EIG	3.5	W5DDJ	1.0
KZ5KR	4.2	KØBRA	4.1

The TCC roster: Eastern Area (W3EML, *Dir.*) — K1TSD, W1s EMH NJM, W2MTA, W*A2s* VAT WLN, K3MVO, W*3s* EML IVC, K4EHY, W4DLA, W*8s* BZX CIT, Central Area (W9JOZ, Acting Dir.) — W4ZJY, K9DHN, W*9s* ZYK JOZ CXY VAY, KØZPN, WØSCA, Pacific Area (W7DZK, Dir.) — *K6s* KCB LKD GID, W*6s* EOT HC, WA6ROF, WB6BBO, K7NWP, W*7s* DZX ZB, KØEDK, W*0s* WME KQD.

BRASS POUNDERS LEAGUE

Winners of BPL Certificate for March Traffic:

Call	*Orig.*	*Recd.*	*Rel.*	*Del.*	*Total*
W3CUL	144	1939	1756	179	4018
W9JOZ	14	1677	1635	1	3327
K6BPI	53	1542	1393	149	3137
W9IIA	13	1093	1049	2	2157
W8YDK	1378	290	204	86	1958
W9MM	24	851	852	1	1688
W3EML	21	852	774	27	1674
K1BCS	312	608	578	26	1524
K0ONK	149	667	586	25	1427
WØSCA	27	602	582	1	1212
WA2GPT	28	591	551	38	1208
W1PEX	40	540	510	19	1109
WØLGG	108	496	448	34	1086
WA4BMC	104	496	451	34	1085
K6EPT	25	514	313	201	1053
W1TXL	93	430	405	21	949
W6RSY	44	409	326	116	895
K5QXV	9	463	393	10	875
W7BA	8	407	365	37	817
W2RUE	20	431	281	83	815
W4DLA	23	359	378	6	766
WA9AJF	17	370	294	59	740
K9IMR	40	352	260	88	740
K4BFY	351	190	175	5	721
W7DZX	6	354	325	3	688
K8YUZ	8	339	326	13	686
K3MVO	24	331	302	25	682
W3IVC	13	335	324	6	678
K3ONW	7	327	339	5	678
W4ZJY	34	312	306	6	658
W6GYH	102	280	269	7	658
K4WJI	23	311	305	2	641
K9KZB	17	306	295	11	629
K5ANS	45	298	269	6	618
W9DYG	57	294	222	25	608
WA2RUE	40	287	223	54	604
W6EOT	8	309	274	13	604
W8UPH	5	296	246	47	594
K4AKP	17	278	194	84	573
K3OOU	30	287	176	75	568
WA6ZOW	77	206	191	92	566
K1LOM	20	278	237	27	562
W8DAE	63	257	154	84	558
WA2EKF	14	277	246	20	557
W2EZB	5	315	280	52	552
W9RUQ	12	259	213	45	529
KØZPN	10	257	251	9	527
K4POA	18	263	233	12	526
W9NZZ	140	195	0	191	526
K8LGA	17	250	247	5	519
K1SSH	20	241	208	45	514
W9CXY	11	250	244	3	508
K4PXY	39	160	160	144	503
WA6NFI	127	196	120	58	501
Late Report:					
K5QXV (Feb.)	9	397	343	7	756

More-Than-One-Operator Stations

W6IAB	224	1579	1495	78	3376
W4PFC	29	683	645	38	1395
KR6GF	678	161	88	73	1000
KR6MB	430	63	43	20	556
Late Report:					
K7WBC (Feb.)	28	282	142	142	594

BPL for 100 or more *originators-plus-deliveries*

W4SHJ	265	W7APS	150	WA2CCF	103
K6GZ	237	WA6YLZ	147	WA2GAB	103
K1TMD	229	K4VFY	137	K1WKK	102
K8AAG	217	K3QOO	134	W3RV	102
W4NTR	191	K8JJC	118	WØBDR	101
K9GMZ	187	WA4ELB	115	Late Reports:	
W2EW	162	WA2UOO	113	K8AAG (Feb.)	178
WB2FWA	160	K8KMQ	113	KØYTA (Dec.)	103
K4MTB	160	WA6BYO	110		
K8GOU	158	WØPZO	109		

More-Than-One-Operator Stations

KR6MD	258	W5AC	102	Late Report:	
W4DFU	103			K6FCT (Feb.)	172

BPL medallions (see Aug. 1954 *QST*, p. 64) have been awarded to the following amateurs since last month's listing: K1NEF, WA2GAB, WA2RUE, K4HSB, K4PXY, W9RE.

The BPL is open to all amateurs in the United States, Canada, and U. S. Possessions who report to their SCM a message total of 500 or more or 100 or more originations plus deliveries for any calendar month. All messages *must be handled on amateur frequencies within* 48 hours of receipt in standard ARRL form.

CLUB COUNCILS AND FEDERATIONS

Affiliated Council of A.R. Clubs, Inc., Bettie Jane Mayer, K7BED, Secy., 6115 S.E. 13th Ave., Portland 2, Ore.

British Columbia A.R. Assn., Dave Gilmour, VE7YG, Secy., 1150 Comox St., Vancouver 8, B.C., Canada

Chicago Area Radio Club Council, Inc., Diane Price, K9TRP, Secy., 6123 N. Rockwell St., Chicago 45, Ill.

Cleveland Area Council A.R. Clubs, Gertrude E. Maxim, W8OIS, Secy., 23644 Woodhill Dr., Brook Park 42, Ohio.

Federation of E. Mass. A.R. Assn., Eugene H. Hastings, W1VRK, Secy.-Treas., 28 Forest Ave., Swampscott, Mass.

Federation of Long Island Radio Clubs, Inc., Louis H. Roth, W2DKH, Secy., 114-67 233 St., Cambria Hts. 11, N.Y.

Indiana Radio Club Council, Inc., Adah Elliott, W9RTH, Secy., 721 Centennial St., Seymour, Ind.

Michigan Council of Clubs, Howard Rieman, K8HM, Secy.-Treas., 16124 Locherbie, Birmingham, Mich.

Ohio Council of Amateur Radio Clubs, Ernest D'Angelo, K8DJM, Secy., 3134 Ontario, Columbus 24, Ohio.

South Carolina State A.R. Council, Charles M. Rogers, K4LNO, Secy., 432½ Virginia Ave., Spartanburg, S.C.

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 Section. 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 received at ARRL on or before 4:30 P.M. 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 reasons of expiring memberships, individual signers uncertain or ignorant of their membership status, etc.

The following nominating form is suggested. (Signers will please add city and street addresses to facilitate checking membership.)

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

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

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

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

— *F. E. Handy, Communications Manager*

Section	*Closing Date*	*SCM*	*Present Term Ends*
Vermont	June 10, 1963	Miss Harriet Proctor	Aug. 10, 1962
Oklahoma	June 10, 1963	Adrian V. Rea	Aug. 9, 1963
West Indies	June 10, 1963	William Werner	Aug. 10, 1963
Western Massachusetts	June 10, 1963	Percy C. Noble	Aug. 11, 1963
San Francisco	June 10, 1963	Wilbur E. Bachman	Aug. 14, 1963
Northern New Jersey	June 10, 1963	Daniel H. Earley	Resigned
West Virginia	July 10, 1963	Donald B. Morris	Sept. 18, 1963
Wisconsin	Aug. 9, 1963	Kenneth Ebneter	Oct. 10, 1963
Rhode Island	Aug. 9, 1963	John E. Johnson	Oct. 12, 1963
Arkansas	Aug. 9, 1963	Odia L. Musgrove	Oct. 13, 1963
Indiana	Aug. 9, 1963	Donald L. Holt	Oct. 14, 1963
San Diego	Aug. 9, 1963	Don Stansifer	Oct. 15, 1963
Utah	Aug. 9, 1963	Thomas H. Miller	Oct. 28, 1963

A.R.R.L. AFFILIATED CLUB HONOR ROLL

Our Honor Roll presented in two parts each year is based mainly on data provided in your Club Annual Reports. The club affiliation requirements established by the Board of Directors require 51% or more of a club's membership to be League members, full or associate, for initial and continuing affiliation. Our HONOR ROLL is for those affiliates that come up with *every member a League member* or 100% ARRL Membership. Special recognition for the club that can do this is well deserved! In addition to the listing here in *QST*, we shall shortly send the 100%ers certificate to the club officers of the following so this can be documented to the club.

As questionnaire forms are received from additional affiliates and these show 100% ARRL membership, such clubs also will be in line for a listing or Honor Roll that appears later in the year. Certain clubs having membership drives may then be included in the second part of our Honor Roll following such qualification.

Aeronautical Center A.R.C., Inc., Oklahoma City, Okla.
Amateur Radio Technical Society of St. Louis, Mo.
Athens Amateur Radio Club, Athens, Ga.
Auburn A.R. Assn., Auburn, N.Y.
Band Hoppers Radio Club, Ferguson, Mo.
The Birmingham A.R.C., Inc., Birmingham, Ala.
Central Kansas Radio Club, Inc., Salina, Kans.
Dividing Ridge Amateur Radio Club, Ebensburg, Pa.
Experimental Amateur Radio Society, Rockford, Ill.
Fountain City Radio Club, Knoxville, Tenn.
Georgia Single Sideband Assn., Inc., Atlanta, Ga.
Harlo Radio Club, Harlowton, Mont.
Hoffman Amateur Radio Club, Los Angeles, Calif.
IRC Amateur Radio Club, Philadelphia, Pa.
Keystone Amateur Radio Club, Springtown, Pa.
Lamar Amateur Radio Club, Wiley, Colo.
Levittown Amateur Radio Club, Inc., Levittown, N.Y.
Martin Van Buren H. S. A.R.C., Queens Village, N.Y.
Mason County Radio Club, Inc., Ludington, Mich.
Maui A.R.C., Kahului, Maui, Hawaii
National City Amateur Radio Club, National City, Calif.
Northeast Nebraska Radio Club, Pender, Nebr.
Northern Nassau Amateur Radio Club, Great Neck, N.Y.
Nortown Old Timers' R. Assn., Toronto, Ont., Canada
Oak Ridge Radio Operators' Club, Oak Ridge, Tenn.
O.B.P. #1, St. Louis, Mo.
Order of Boiled Owls, West Hempstead, N.Y.
Orlando Amateur Radio Club, Inc., Orlando, Fla.
Ottawa Radio Club, Inc., Ottawa, Ill.
Pickens County Amateur Radio Club, Easley, S.C.
Potomac Valley Radio Club, Washington, D.C.
Providence Radio Association, Providence, R.I.
Radio Amateur Transmitting Society, Nashville, Tenn.
Roblin Amateur Radio Club, Toronto, Ont., Canada
Rock Hill Amateur Radio Club, Inc., Rock Hill, S.C.
St. Louis Amateur Radio Club, Inc., Valley Park, Mo.
Shelby Radio Club, Shelby, N.C.
South St. Louis A.R.C., St. Louis, Mo.
Sun City Amateur Radio Club, Sun City, Ariz.
Sunrise Radio Club, Inc., Elmont, L.I., N.Y.
The Thirteen A.R.C., Vancouver, B.C., Canada
Twin Sault Radio Club, Sault Ste. Marie, Mich.
Two Meter and Down Club, Inc., Los Angeles, Calif.
Valley Radio Club, Ironton, Ohio
Vanderburgh A.R. Emergency Service, Princeton, Ind.
Wichita Amateur Radio Club, Inc., Wichita, Kans.
Windblowers V.H.F. Society, Inc., Wyckoff, N.J.
Zephyr V. H. F. Society, Inc., Oakland, N. J.

ELECTION RESULTS

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

North Dakota	Harold A. Wengel, WØHVA	Feb. 11, 1963
British Columbia	H. E. Savage, VE7FB	Apr. 10, 1963
Michigan	Ralph P. Thetreau, W8FX	Apr. 10, 1963
Alberta	Harry Harrold, VE6TG	Apr. 10, 1963
North Carolina	Barnett S. Dodd, K4QFV/W4YZH	Apr. 10, 1963
Los Angeles	John A. McKowen, W6FNE	Apr. 18, 1963
Oregon	Everett H. France, W7AJN	June 10, 1963
Nebraska	Frank Allen, WØGGP	June 10, 1963
Eastern Pennsylvania	Allen R. Breiner, W3ZRQ	June 15, 1963

NATIONAL CALLING AND EMERGENCY FREQUENCIES (KC.)

3550	3875	7100	7250
14,050	14,225	21,050	21,400
28,100	29,640	50,500	145,350

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

The following are the National Calling and Emergency Frequencies for Canada: *c.w.* — 3535, 7050, 14,060; *phone* — 3765, 14,160, 28,250 kc.

SUGGESTED RTTY OPERATING FREQUENCIES

3620, 7040, 14,090, 21,090 kc.

GMT CONVERSION

To convert to local times subtract the following hours: ADST −3, AST −4, EDST −4, EST −5, CDST −5, CST −6, MDST −6, MST −7, PDST −7, PST −8, Hawaii −10, Central Alaska −10.

CODE PROFICIENCY PROGRAM

Twice each month special transmissions are made to enable you to qualify for the ARRL Code Proficiency Certificate. The next qualifying run from W1AW will be made June 19 at 0130 GMT. Identical tests will be sent simultaneously by automatic transmitters on 3555, 7080, 14,100, 21,075, 28,080, 50,700, and 145,800 kc. The next qualifying run from W6OWP only will be transmitted June 6 at 0400 Greenwich Mean Time on 3590 and 7129 kc. *CAUTION*: Note that since the dates are given per Greenwich Mean Time, Code Proficiency Qualifying Runs in the United States and Canada actually fall on the evening previous to the date given. *Example:* In converting, 0130 GMT June 19 becomes 2130 EDST June 18.

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

W1AW conducts code practice daily at 0130 GMT on all frequencies listed above with speeds of 15, 20, 25, 30, and 35 w.p.m. on Tuesday, Thursday, and Saturday, and at 5, 7½, 10, and 13 w.p.m. on other days. Approximately 10 minutes' practice is given at each speed. To check your copy, the texts used on several transmissions are listed below. The order of words in each line of *QST* text is sometimes reversed. To improve your fist, try to send in step with W1AW.

Date Subject of Practice Text from April *QST*

June 3: *How Does TE Work?*, p. 13
June 7: *The VO-Can*, p. 19
June 11: *Pulse: A Practical Technique . . .*, p. 31
June 15: *The HBR-8 Becomes the HBR-11*, p. 37
June 17: *Micro-Band F.M.*, p. 50
June 20: *Oscar II: A Summation*, p. 53
June 26: *Just One More Guidebook, Please!*, p. 58

W1AW SCHEDULE

(June 1963)

Operating-Visiting Hours

Monday through Friday: 1 P.M.–1 A.M. EDST.
Saturday: 7 P.M.–2:30 A.M. EDST.
Sunday: 3 P.M.–10:30 P.M. EDST.

The ARRL Maxim Memorial Station welcomes visitors. The station address is 225 Main St., Newington, Conn., about 4 miles south of West Hartford. A map showing local street detail will be sent on request.

Operating Frequencies

C.w.: 1820, 3555, 7080, 14,100, 21,075, 28,080, 50,700, 145,800 kc.
Voice: 1820, 3945, 7255, 14,280 (s.s.b.), 21,330, 29,000, 50,700, 145,800 kc.

Frequencies may vary slightly from round figures given; they are to assist in finding the W1AW signal, not for exact calibrating purposes. Amateurs are respectfully requested to refrain from transmitting on the above frequencies during W1AW bulletins and code practice.

Official Bulletins

Bulletins containing latest information on matters of general amateur interest are transmitted on the above frequencies according to the following schedule in Greenwich Mean Time.

C.w.: Monday through Saturday, 0000; Tuesday through Sunday, 0100.
Voice: Monday through Saturday, 0100; Tuesday through Sunday, 0330.

Caution. Note that in the U. S. and Canada, because times are GMT, bulletin hours actually fall on the evening of the previous day.

W1AW CONTACT SCHEDULE

Would you like to work for W1AW? W1AW welcomes calls from *any* amateur station in accordance with the following schedule:

Time (GMT)	*Sunday*	*Monday*	*Tuesday*	*Wednesday*	*Thursday*	*Friday*	*Saturday*
0000-0030[1]	.....	14,280	3555[3]	14,100	14,100	7080[3]	14,100
0030-0100	.....	14,280	3555	14,100	14,100	7080	.....
0100-0130[1]	.....	145.8 Mc.	21,330	145.8 Mc.	50.7 Mc.	21,330	.....
0230-0300	.....	.....	.....	1820	.....	1820	.....
0300-0330	.....	.....	.....	3555	.....	3945	.....
0330-0400[1]	.....	.....	3945	7255*	3945	7255*	3945
0400-0500[1]	.....	.....	3555[3]	.....	3945	7080[3]	.....
1700-1800[2]	.....	21/28 Mc.	21/28 Mc.	21/28 Mc.	21/28 Mc.	21/28 Mc.	.....
1900-2000	.....	7080	14,100	7255*	14,100	7080	.....
2000-2100	.....	14,280	7080	14,100	14,280	14,100	.....
2200-2300	.....	14,280	14,280	14,280	14,100	7255*	.....
2300-2330	.....	7255*	.....	21,075[3]	.....	14,280	.....
2330-2400	.....	14,100	.....	3555	.....	14,280	.....

[1] Starting time is approximate. General-contact period on stated frequency begins immediately following transmission of Official Bulletin, on c.w. at 0000 and 0100, on phone at 0100 and 0330.
[2] Operation will be on 21,075, 21,330, 28,080 or 29,000, depending on band and other conditions.
[3] W1AW will listen for Novice Class licensees on the Novice portion of this band before looking for other contacts.
* Operation may be on *s.s.b.* as announced at the beginning of the period.

Station Activities

• 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, Allen R. Breiner, W3ZRQ—SEC: W3DUI. RM: W3EML. PAM: K3BHU. V.H.F. PAM: W3SAO. V.H.F. PAM W3SGI has been added to our list of League Officials and is active in the midwestern part of our section. K3HNP is now an OO and K3TYE and W3JYL are V.H.F. OBSs. The EPA-C.W. Net had 477 QNI with QTC of 558 for March. W3NNC is QSL Manager for EI3A. K3MVO made his first BPL. The 300-watter of K3KTH decided not to blow any more fuses. W3NNL was quite QRL; 3 harmonics and 2 adults were ill with the flu, the car broke down and the washer fell apart. Wow, what else? Our regrets to K3UOW on the loss of his XYL. K4MOC/3 is active on 6 meters in the Collindale area. W3BUR and his "lil" 75-watter worked the first "G" on 160. The OOTC gave W3BNU his 50-year sticker; he's been a ham since 1910. Ice and wind damage was repaired at K3NDW's antenna farm. There is no TVI for K3TYE now since he put a pair of 1626s in his hi-fi. Now they complain of the noise. K3TYL made tie in the NYC-LI QSO Party. A transmitter hunt at the Juniata County ARC showed K3PLX as bloodhound number one; other snoopers were K3AKN, K3GNQ, K3GOO, K3GRY, K3GSB, K3GZS, K3QGS. W3EU and W3BKF gave Luzerne and Bradford County QSOs in the Pa.-QSO Party. The rig at W3ZRQ decided to quit that week end in need of a new bias pack. K3VWT graduated from Novice to General in 3 months. She's an active YL on 80 and 40. New Gear Dept: K3UTD, a Thor 6-meter rig; K3MPN, a 6-meter converter; K3RCM, a tri-bander beam; W3JKX, a 6360 final 10-meter rig; K3MUT got a Valiant which formerly belonged to W3CUL; K3HTZ got WAC; K3MNT made WAS. A new Novice in the Harrisburg area is KN3UIS. KN3VRP and his XYL KN3WKG are in the Levittown area. New club officers: Germantown RC—K3KBX, pres.; K3MBS, vice-pres.; K3LWY, secy.; K3KLQ, treas. Your SCM and SEC will be active on Field Day and will be glad to take your FD messages on 80, 40 and 6 meters. Weather forecast for June 22-23, "Rain" as always. Traffic: W3CUL 4018, W3EML 1674, W3VR 957, K3MVO 682, K3ONW 678, K3MQE 359, W3SGI 314, K3JSX 275, W3RV 179, K3KTH 96, W3ZRQ 83, K3BHU 74, K3CAH 66, K3TLX 55, W3ELI 54, K3HNP 52, W3JKX 39, W3NNL 28, W3BKF 24, K3RJX 23, K3ADS 21, K3OWE 17, W3ITI 16, K3NLW 14, W3FEY 13, W3BNR 12, W3TNK 12, W3ADE 8, W3CHU 8, K3LTI 8, W3BUR 7, W3BNU 6, K3ARR 5, W3BFF 5, K3HTZ 5, K3NZD 5, K3MDG 4, W3OY 4, K3NDW 3, K3SEH 3, K3TYE 3, K3AKN 2, K3ANU 2, W3DUI 2, W3ID 2, K3RZM 2, K3TYL 2, W3EEN 1, K3MNT 1.

MARYLAND—DISTRICT OF COLUMBIA—SCM, Andrew H. Abraham, W3JZY—SEC: W3CVE RMs: K3JYZ, W3TN for the MDD Traffic Net, which meets on 3649 kc. daily at 0000Z, and W3ZNW for the MDDS (slow) Net on 28.1 Mc. and on 3649 kc. at 0130Z. PAM: W3EQK. MEPN meets on 3820 kc. M-W-F at 2300Z and Sat. and Sun. at 1800Z. W3CQH had an accident while at work. W3ATQ was tops in QNI on the MDD; only missed one check-in. W3BKE had the best traffic-handling month yet. K3APM is more active on the traffic nets. W3CDQ is active on the bands. W3ECP was guest on "Opinion Please," a program on WTOP radio, and discussed various phases of amateur radio. W3EOV has the car tag 73-88. W4EXM/3, now EP2AM, worked several of the MDDC gang during the DX contest. K3GZK will not be too active on the air as he will be working outside. K3DNO, an OES, sends in a very fine report. W3HQE has been very busy. W3IVC has been admitted to the ranks of the A-1 Operator Club. Red will use his station wagon with two operating positions during Field Day. K3JYZ has been traveling and is now back on the MDD. W3KCY, Felex Touches from Taneytown, is a Silent Key. Phil was active on the MEPN and on 10 meters. K3NCM is on the 10-Meter AREC Net also. K3OXL reports the MEPN now has an average of 20 members and 8 non-members check into the net each meeting. K3OWX is using s.s.b. on all bands. K3PRN sent in a very fine OES report. W3MAU reports that the Rebel Net will be on 145.92 Mc. Tue. at 8 P.M. EST. K3QDD is looking for traffic schedules. K3QFG has finished his science fair project and is awaiting the results. W3PQ is using a Valiant II with dipoles on 80 and 40 meters. W3SVA has a new linear and will be on MDD soon from the eastern shore of Md. W3TMZ worked in the DX Contest from W3MSK, having 845 QSOs and 235 multiplier. Jack will be in California for awhile. W3TN reports that the bands are unproving. The MDD wants to thank all who check into the net from Delaware for their splendid work and QNIs. K3TQM is on the Howard County AREC Net. W3VKQ is busy getting the Howard County Net going. W3YZI reports the following: W3CAY, W3GLX, K3DNU, W3HWZ and W3YZI went to N.Y. City for the SSBARA affair. W3ZAQ is having transmitter trouble. W3ZNW is recovering from an operation. W3IVC and K3QOO made the BPL. Traffic: W3IVC 678, K3QFG 238, K3QOO 209, K3OSX 181, W3TN 177, W3BKE 120, K3QDD 115, W3HQE 72, K3APM 67, W3PQ 53, K3OXL 40, K3WBJ 38, W3ATQ 36, K3NCM 26, W3ECP 24, W3EOV 24, K3GZK 15, K3JYZ 7, W3OYX 4.

DELAWARE—SCM, M. F. Nelson, K3GKF—PAM: K3LEC. RM: W3EEB. DEPN meets on 3905 kc. Sat. at 1830 local time; DSMN on 50.4 Mc. Tue. at 2100 local time. New appointees: K3KEO and K3EBB as OESs, W3UDR as OO. Renewal: K3OBU as OES. Add to the Hamfest committee: K3EBB. The Kent County ARC Fourth Annual Auction on Mar. 12 was a big success with 119 attending and items from transmitters to typewriters being auctioned. Active in the organizing were W3JFR, W3UDR, K3LGC, K3NPA, K3NVU, K3NVV, K3OCE, K3OPF and K3RUD, with K3KEO as spieler. W3BYJ has a new rig on the air but business limits activities. W3CFA now is on 50 Mc. using his 10-meter beam. W3EJU is recovering from recent hospitalization. W3EKO now is working extensively with transistors. W3HC has been active on 160 meters. Traffic: W3EKO 20, K3PZL 9, K3EWK 7, K3GKF 5, K3KAJ 5, W3HC 4, W3HKS 1.

SOUTHERN NEW JERSEY—SCM, Herbert C. Brooks, K2BG—SEC: K2ARY. PAM: W2ZI. RM: WA2VAT. New appointment: WA2NXV, Gloucester City, as OPS. W2ZVW has been building new equipment. W2ZI, Trenton, is now enjoying his 53rd year in amateur radio. W2IU, Absecon, added a KL7 to his 160-meter DX. W2BAY, Haddonfield, has many busy Sun. with four net skeds. N.J. Phone & Traffic Net March totals: 31 sessions, QNI 572, traffic 191. NJN totals: 31 sessions, QNI 506, traffic 356. W2SDZ, Collingswood, received A-1 and the 25-w.p.m. Code Proficiency certificates. WA2OZQ, W2TUR and WB2-EBW, members of the Southern Counties ARC, gave a demonstration of amateur radio at the Betty Bacharach Home in Longport. Congrats to WA2OZQ on receiving the Amateur Extra class license. W2VX and K2BG received Life Membership in the SJRA. W2JAV, Hammonton, is recovering from a recent operation. K2ECY, Riverton, also is on the mend after a heart attack. SJRA members W2BLV, WA2GSO, K3JXC, K2BZK and K2KCI visited the IRE Show. Membership and interest increased greatly this year in the Burlington Co. Radio Club. W2WUP is president and meetings are held the 2nd. Mon. at Moorestown. W2ESX has been off the air because of antenna trouble. WA2EMB, Haddon Heights, is building a new 2-meter final. The Levittown (N.J.) Club is completing its League affiliation plans. We expect to announce the appointment of an EC for Gloucester County next month. The Gloucester Co. Radio Club has been assisting in the selection. Cumberland Co. and Cape May Co. are without active ECs. Appointees are reminded that they must make monthly reports to the SCM to keep their appointment in effect. Traffic: WA2WLN 366, WA2VAT 242, W2RG 171, W2ZVW 65, W2ZI 34, WA2NXV 22, K2JJC 6, W2MMD 6, W2BEI 4, WA2KAP 2.

WESTERN NEW YORK—SCM, Charles T. Hansen, K2HUK—SEC: W2ICZ. RMs: W2RUF, W2EZB and W2FEB. PAM: W2PVI. NYS C.W. meets on 3670 kc.

at 1900; ESS on 3590 kc. at 1800; NYSPTEN on 3925 kc. at 1800; NYS C.D. on 3610.5 and 3993 kc. at 0900 Sun. and on 7102.5 at 1930 Wed.; TCPN 2nd call area on 3970 kc. at 1900; 1PN on 3980 kc. at 1600; 2RN on 3690 kc. at 0045 and 2345 GMT. BPL in March was made by W2RUF and W2EZB. Congratulations. W2FXA has been appointed OO. K2SSX and W2AITA/2 are endorsed as ORSs and W2IDM as EC for St. Lawrence County. The Fulton ARC now is affiliated with the ARRL. The SWNYVHF elected WA2CYM, pres.; WA2VCG, vice-pres.; WA2-KKF, secy.; K2VOB, treas. The club is affiliated with ARRL and has the call WB2GXE and will hold its annual Field Day and picnic at Great Valley fire tower July 13 and 14. All are welcome. There will be a transmitter hunt on 6 meters Sun. at 1400, an auction Sun. afternoon and mobiles talked in on 6 and 2 meters Contact WA2VCG for further information. WA2TGC is the proud father of a new jr. operator. K2WOQ and WA2TPS are running a course for Novices sponsored by the Corning Moose. The Chemung County AREC monitors 50.4 Mc. in St. Lawrence County and has AREC roll call the 1st Sun. of each month at 1300 GMT on 3875 kc., reports W2IDM. K2KTK got married in November. The RAGS conducts a Phone Net Mon. on 28.625 Mc. at 0100 GMT with WA2EOJ as NCS. The RAWNY elected W2CUU, pres.; W2GIH, vice-pres.; K2GUG, secy.; W2TAX, treas. Has your club completed plans for this year's Field Day? It's not too late; you can warm up with the V.H.F. contest, then get down to business on Field Day. These two June events can do more for club morale and fellowship than any other activity, don't hibernate in the summer, participate! Comments received here run overwhelmingly in favor of incentive licensing. Many clubs have gone on record in favor and the general consensus is that, "anything worth having, is worth working for." Traffic: (Mar.) W2RUF 815, W2EZB 552, WA2KQJ 376, WA2IYB 162, WA2LKW 158, W2FEB 147, W2RKU 136, W2QHH 119, W2FCG 99, WA2HSB 87, K2KPM 56, W2GBH 49, K2OFU 45, WB2FZC 43, WA2KZQ 41, WA2WEE 40, K2JBX 34, WA2HEC 33, K1BVI/WB2CCO 26, K2IMI 25, K2BBJ 24, W2RQF 21, K2ULY 21, WA2ANE 19, K2PBU 10, K2RYH 10, K2HOH 8, WA2ENV 5, WA2FRR 3, WA2GLA 2, W2QHQ 2, K2TDG 2. (Feb.) W2ANE 32, WA2DAC 18, K2RHY 11, W2QHQ 2.

WESTERN PENNSYLVANIA—SCM, Anthony J. Mroczka, W3UHN—SEC: W3LIV. RMs: W3KUN and W3NUG. The WPA Traffic Net meets Mon. through Fri. at 2400 GMT on 3585 kc. The Keystone Slow Speed Net (KSSN) meets 2330 GMT on 3585 kc. Mon. through Fri. Pittsburgh Red Cross station W3AEB is now on 75-meter phone, thanks to the antenna effort by W3OMA, W3QJJ and W3LMM. K3OWN lost his antennas in a recent storm. Butler County ARC has obtained its old call, W3UDX. The Coke Center RC reports: K3LQK, K3BTF and K3JJP are playing chess on 10 meters; K3JDZ has a new final; KN3VXS vacationed in Florida. The Bedford County ARC reports via *Shorts*: The club's 6-meter frequency is 50.2 Mc.; K3KYT has his 40-meter beam back up; K3QIX and K3VTQ are on 6 with a T-150; K3MKX has his Globe King back on. The Keystone Slow Speed Net has done very well this past year—congratulations to K3OOU and the KSSN members. The Uniontown ARC reports through *The Magpie*: K3SCH is operating on 15-meter phone; K3RLB has a new final; K3PLW and W3BWU have received the PIE award. K3JCZ had plenty of antenna trouble from recent wind storms. The Steel City ARC reports via *Kilowatt Harmonics*: W3NKM has received confirmation of his 301st country worked; W3GQJ is going to Naval Officers Training school; W3SVJ and K3SKA are taking Pilot's Training. W3ISZ, Blair County EC, reports 53 AREC members. At the recent Bucktail ARC meeting, W3COE discussed Sylvania's TV Satellite station KG2XEL, culminated by inspection of the station. The WPA Traffic Net has done a bang-up job this past season. Thanks to W3KUN and the net members for giving their time and effort for a job well done. New officers of the Conemaugh Valley ARC are W3QUIZ, pres.; K3EDV vice-pres.; K3IHT, rec. secy.; K3SJN, corr. secy.; K3SDT, treas. The ATA had K3ICA as guest speaker on *The Seismograph*. New officers of the South Hills Brass Pounders & Modulators are W3LYC, pres.; W3WFR, vice-pres.; W3HND, secy.; K3AJQ, treas.; K3MDY, W3LDB and W3QNI, dir., W3LFQ, W3BL and W3QWW trustees. The Horseshoe RC reports via *Hamateur News*: W3LIV is busy working DX; K3ELL has a new quad; K3SIQ and W3ZVA are busy on phone; a father-son combination is KN3WVD and 3KN3WVE; K3DKM was home from the Coast Guard. The Etna RC reports through the *Oscillator*: W3NVS has a 2-meter transistor outfit on the air; K3IZQ is running a Heath linear; W3MLU has won admission to four years of study at the Philippine Military Academy. The Cumberland Valley ARC reports via *Valley QRM*: W3ZUX operated his station at the recent Scout-O-Rama; K3LUE designed and built a transistorized digital computer; the club sponsored code and theory classes Wed. evening. Up Erie way: W3LSS is moving to a new QTH; K3UOC and K3USC are organizing an amateur radio club at Wesleyville High School; K3SBU has a TBS-50 on 6. Traffic: (Mar.) K3OOU 568, W3MFB 169, W3KUN 117, K3DKE 81, W3IYI 59, W3LMM 55, W3NEM 49, K3PYS 43, W3OEO 41, K3EDO 39, W3UHN 20, K3GAO 17, W3SMV 15, K3OWN 11, W3LOD 10, K3COT 5, W3KWO 1. (Feb.) W3NEM 66, K3SMB 8.

CENTRAL DIVISION

ILLINOIS—SCM, Edmond A. Metzger, W9PRN—Asst. SCM: Grace V. Ryden, W9GME. SEC: W9RYU. RM: W9USR. PAM: W9VWJ. EC of Cook County: W9HPG. Section net: ILN, 3515 kc. Mon. through Sat. at 1900 CDT. All ECs are urged to check into the state-wide EC net every Sun. at 1600 GMT on 3840 kc. W9DCV is on RTTY f.s.k. 52.25 Mc. W9RKB is back on 6 meters with a new quad. WN9HIM and WN9HHV are two new calls at Quigley Seminary South (Chicago). New officers of the St. Clair Amateur Radio Club are WA9CEO, pres.; K9VFA, vice-pres.; W9RQR, secy.; W9FPM, sgt. at arms; W9GEX, act. mgr. K9GSD received his WAC certificate. A new call heard in the Springfield Area is WN9GSG. The Moultrie Amateur Radio Klub (MARK) at Sullivan had an FB turnout for the hamfest and sale on April 21. WA9EJA is looking for the hard ones with his new Heath 2-meter transceiver. W9IDA reports that the North Central Phone Net, which operates at 7 A.M. Mon. through Sat., will now also have a noon net on the same frequency and days of the week as the morning net. W9EU and W9JID are sporting new KWM-2s. W9PBY has a new 1000 linear and is working DX like the old pros. W9LNQ, W9YYG, W9KLD/9, W9HPG, K9UCG, W9KMN, W9MAK, W9EET, W9VSO and W9PNE were high scorers in the January CD Party. WN9GTF has been appointed OES. The Chicago Microwave Club meets the first Thurs. of each month at Kosciuszko Park, according to K9CNN. K9DRS has a new homebrew 2-meter converter and transmitter. WA9BIT has a new HT-32B and a TA33. W9EQK has a new Invader, K9GRC has a new HT 37 and K9AAE a new SX-101A and a TA-33. The Montgomery Shop Amateur Radio Club and the North Shore Amateur Radio Club were approved by the League's Executive Committee for ARRL affiliation. WA9AIH and his XYL, WA9AII, built the speech compressor from February *QST*. K9FJM is president of the newly-formed Worth Township Amateur Radio Club. WA9AWP has built a TV transmitter. W9EET is finishing 1-kw. 2- and 6-meter gear. WA9BKL, WA9CLY, WA9BIX, WA9BKA and WA9BKB are new Technicians in the Bloomington area. K9PAL and K9CFV have a new Hammarlund S.S.B. transmitter. Net traffic reported for the month: Interstate Sideband Net, 620; North Central Phone Band, 452; ILN, 374, W9IDA, WA9AJF, K9KZB and K9GMZ were recipients of the BPL award for the period. Traffic: W9IDA 2157, WA9AJF 740, K9KZB 629, K9GMZ 356, W9AKV 213, W9USR 195, W9EET 181, K9ZQT 121, K9GSD 60, K9BTE 56, WA9DEW 31, K9LRN 31, K9IOG 29, K9RAS 22, W9OKI 20, K9AXS 12, W9PRN 12, K9CRT 11, W9VEY 8, K9DRS 6, W9GSC 6, K9UCG 5, W9BQC 4, WA9ATA 2, K9TVA 2, WA9ERE 1, W9ERH 1, W9LNQ 1.

INDIANA—SCM, Donald L. Holt, W9FWH—Asst. SCM: Clifford M. Singer, W9SWD. SEC: W9SNQ. PAMs: K9KTL, K9CRS, K9GLL. RMs: W9TT, K9DHN. Net skeds (all times in GMT): IFN, 1300 daily except Sun. at 1330 and 2300 M-F on 3910 kc. ISN (s.s.b.), 0030 daily on 3920 kc. IN (training), 0000 M-W-F on 3745 kc. QIN, daily at 0030. RFN, at 1300 Sun. on 3656 kc. New appointments: W9JVF as OO Class II/III/IV; K9SGZ as OO Class IV; WA9EED as OPS; K9UZF as EC of Laporte County. W9JOZ has been appointed Director of Central Area Transcontinental Corps, ARRL National Traffic System. New officers of the Central Indiana Mobile Radio Club are W9MPH, pres.; K9OFG, vice-pres.; W9NPV, secy-treas. and W9FZW, act. mgr. New officers of the Crawford County ARC are W9BGW, pres.; K9UYS, vice-pres.; K9INF, secy.-treas. K9OXA and K9WJR provided emergency communication during a flood threat in Marion County Mar. 4. W9DGA again is editing *Sparks* for the Tri State Amateur Radio Society. QIN Honor Roll: K9DHN, WA9AVT, W9QLW, WA9ELY, WA9BFR, K9KTL, K9SGZ, W9TT, K9INF. Those making BPL: W9JOZ, W9MM, W9RUQ, W9NZZ. *Amateur radio exists as a hobby because of the service it* renders. March net reports: IFN 246, ISB 3883,

(Continued on page 112)

GOLDEN JUBILEE

HALF A CENTURY AGO, during the summer of 1913, a young Londoner, Rene Klein by name, wrote a letter to the technical press of the time deploring the fact that there was no association in London whereby wireless enthusiasts could meet and discuss their hobby. To fill this obvious need he invited anyone interested to meet him in his home on July 5th. The outcome of the meeting was that the London Wireless Club came into being, but its existence under that name was short lived because at a general meeting of members held on September 23, 1913, it was decided to adopt the more apt title, Wireless Society of London.

THE FIRST IMPORTANT MEETING of the new Society took place at the Institution of Electrical Engineers, London, on January 21, 1914, under the chairmanship of the newly elected President A. Alan Campbell Swinton, F.R.S., who had been closely associated with Guglielmo Marconi from the time Marconi first arrived in England 18 years earlier. Campbell Swinton remained President of the Society until 1921 when he was succeeded by another equally famous name in wireless — Erskine Murray. In that year Marconi and Oliver Lodge became the first two Honorary Members of the Society.

IN DECEMBER 1921 the Society petitioned the British Postmaster General to authorize the transmission of commercial test telephony transmissions. In February 1922 the famous 2 Emma Toc station operated by the late Peter Eckersley came into being at Writtle, near Chelmsford, thus paving the way for the birth, later that year, of British broadcasting.

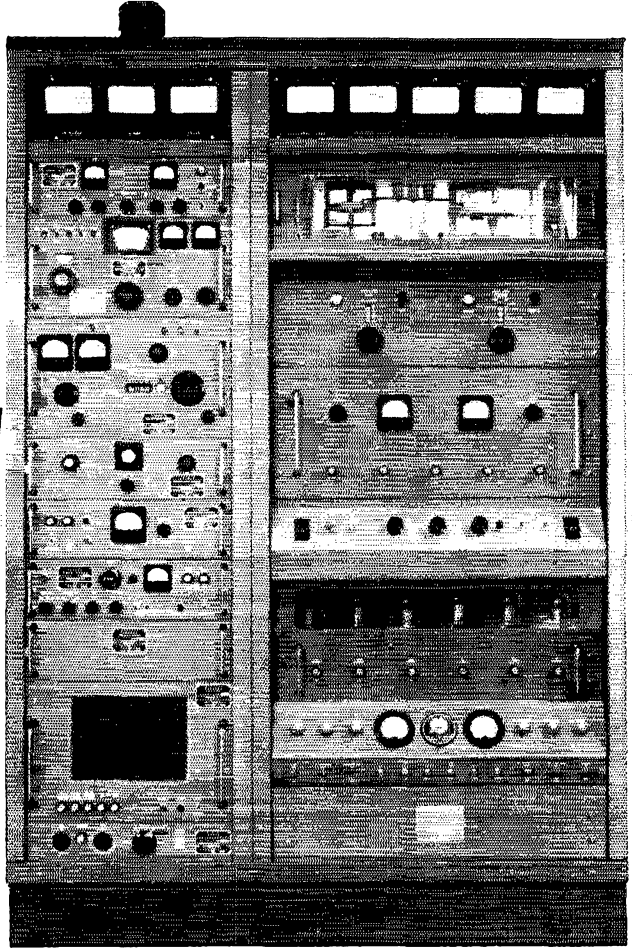
IN 1922 under the Presidency of World War I Naval Wireless Expert Admiral Sir Henry Jackson the Society changed its name to Radio Society of Great Britain, and for the first time came under Royal patronage.

IT WAS AT THIS TIME that the Society and the A. R. R. L. cooperated in a series of trans-Atlantic tests. On December 8, 1921, Paul Godley who had been sent across by A. R. R. L. heard amateur signals from the U. S. and Canada; and during these listening tests Godley and a group of British experimenters logged some 30 U. S. amateurs. The dawn of International DX had broken at last, yet two more years were to pass before the first two-way trans-Atlantic contacts took place between U1MO (Schnell and Warner at West Hartford), U1XAM (Reinartz at Manchester, Conn.), and F8AB (Deloy at Nice, France) and between U1MO (Warner) and G2KF (Partridge, at Merton near London, England.)

THIS YEAR — during the period July 1–5, the Radio Society of Great Britain will celebrate its 50th birthday with a series of special events culminating with a Golden Jubilee Day Banquet at the famous Connaught Rooms in London on July 5th.

AMATEURS from all over the world will be attending the Golden Jubilee Celebrations. Shall we see you in London?

10 KW PEP



AM • CW • SSB • ISB
FSK • MCW • FAX

This is a revolutionary new transmitter that provides the above modes of communication from 5 kcs to 500 kcs. Broadbanded output and synthesized tuning of 1 part in 10^8 per day opens many new possibilities for communications. Below approximately 30 kcs the only limitation of wideband operation, such as speech, is that imposed by the antenna system.

The application of the capabilities of this transmitter are not limited to communication techniques; in fact, this transmitter may be used as a sonic or supersonic driver for a laboratory "shaker table" and as a pulsed keyer for high power sonar heads. Under pulsed operation, this transmitter will provide 25 kw peak power with 10% duty cycle.

• WORLD WIDE SUPPLIERS • OF ELECTRONIC COMMUNICATIONS EQUIPMENT

MODEL **GPT-10KLF**

BROADBANDED

5KC TO 500KC

SYNTHESIZED IN 100 CYCLE INCREMENTS

- 85% of the parts, circuits and modules interchangeable with the AN/FRT-39D.
- 5 kc coverage & broadband tuning opens new communication media.
- Proven suspension system available for shipboard applications.
- Broadband tuning eliminates necessity for helix when fed to proper antenna.
- Matches antenna resistance of 25 ohms to 100 ohms.
- Can be used as Sonar transmitter...provides 25 kw on pulsed transmission.
- Excellent driver for reliability "shaker table" in laboratory environmental testing.

AFCEA SHOW
BOOTHS 52, 53, 54

For additional information, request TB1015 from:

THE TECHNICAL MATERIEL CORPORATION
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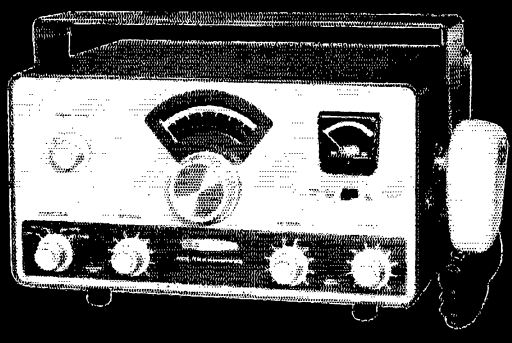
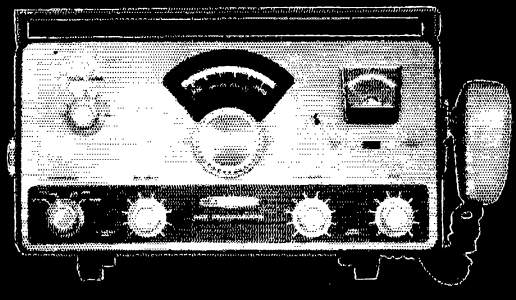
PICK A BAND . . .

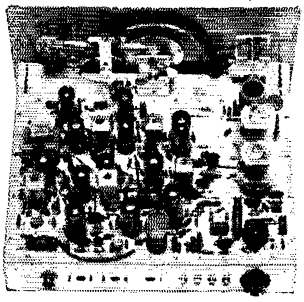


SINGLE BAND SSB . . .



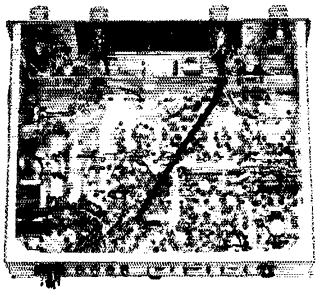
TAKE YOUR CHOICE . . .

...PICK A NEW HEATHKIT



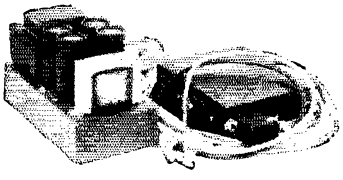
80, 40 & 20 METER SSB TRANSCEIVERS—Brand new! More features . . . better performance . . . at one-third the cost of three-band units. Save by buying only the bands you need • True Transceiver for one band, one sideband operation • Crystal filter type SSB generator • Automatic level control • PTT and VOX circuits built-in • Low frequency VFO (1.5—1.7 mc) for greater stability than comparable units • 2KC dial calibration; 6" of bandspread; vernier tuning • Provision for operation with linear amplifier • Easy assembly with heavy-duty circuit board, rugged steel chassis and wiring harness • Welded and braced one-piece steel chassis & cabinet, gimbal mounting bracket • Accepts Heathkit HRA-10-1 100 KC Crystal Calibrator as plug-in accessory • Uses GH-12 push-to-talk microphone • Operates with new Heathkit HP-13 (DC) or HP-23 (AC) power supplies; also Heathkit HP-10 (DC) or HP-20 (AC) supplies **HW-12, 80 meters,** available June, no money dn., $11 mo. **$119.95. HW-22, 40 meters,** available July. **HW-32, 20 meters,** available August.

...TRANSCEIVERS JUST $119.95 EACH



SPECIFICATIONS—RF Input: 200 watts PEP. **Tube Complement:** Fourteen tube heterodyne circuit; (3) 6EA8 mic. amp., VOX relay amp., IF amp., RF amp., Rcvr. mixer; (5) 6AU6's, VFO, VOX amp., IF amps., Xmtr. mixer; (1) 6BE6, VFO isolator (HW-12), Het. osc and mixer (HW-22 & HW-32); (1) 12BY7, Driver; (1) 12AU7, Xtal osc., product det.; (1) 6EB8, Audio amp. and output; (2) 6GE5 R.F. output. **Sideband Generation:** Crystal lattice bandpass filter method. **Stability:** 100 cps overall after warm-up. **Carrier & Unwanted Sideband Suppression:** 45 db. **Frequency Coverage:** HW-12, 3.8—4.0 mc; HW-22, 7.2—7.3 mc; HW-32, 14.2—14.35 mc. **Receiver Sensitivity:** 1 uv for 15 db S+N/N ratio. **Receiver Selectivity:** 2.7 kc @ 6 db, 6.0 kc @ 50 db. **Output:** 50 ohm fixed (unbalanced). **Operation:** HW-12 & HW-22, LSB; HW-32 USB. **Audio output:** 1 watt @ 8 ohms. **Mike Input:** Hi-Z. **Panel Controls:** Frequency, final tune, function (OFF-PTT-VOX-TUNE), RF gain, AF gain, (pull for crystal calibrator), VOX gain, meter. Front panel screwdriver adjust for S-meter and VOX delay. **Rear Panel Controls:** Mike gain, tune level, final bias. **Power requirements:** 800 VDC @ 250 MA peak, 250 VDC @ 100 MA, —125 VDC @ 5 MA, 12 VAC or VDC @ 3.75 amperes. **Cabinet Dimensions:** 6" H x 12" W x 10" D.

...80, 40 or 20 METERS



POWER SUPPLIES FOR ABOVE: Specially designed for SSB operation with emphasis on maximum dynamic regulation . . . may be used with most other popular SSB transceivers. Dependable solid-state circuitry is used throughout with long-life silicon rectifiers in both units and rugged power transistors in the HP-13 "mobile" supply. Both units provide output at: (HV) 800 VDC @ up to 300 ma, SSB duty cycle; (LV) 325 or 240 VDC @ 150 ma (selected by transformer tap), continuous duty to 175 ma; (Bias) —130 VDC and adjustable —40 to —80 VDC. The HP-23 AC supply also furnishes filament voltages of 12.6 VAC @ 5 amps or 6.3 VAC @ 10 amps. Extensive filtering assures low AC ripple content for smooth DC output. Input voltage requirements are 12-14 VDC for HP-13 DC "mobile" supply and 120 VAC, 50-60 cycle for HP-23 AC supply.

Kit HP-13. DC "Mobile Supply", available August, Price To Be Announced
Kit HP-23, AC Power Supply, available June, $5 mo.....**$39.95**

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THE FATE OF A NATION

OR A COMMUNITY, OR A PERSON, MAY SOMEDAY REST IN THE HANDS OF A SINGLE HAM. THE HAM WHO IS BEST PREPARED TO OPERATE ON ALL BANDS IS THE BEST PREPARED FOR ANY EMERGENCY. YOUR STATION SHOULD INCLUDE AN ALL-BAND ANTENNA, IN PLACE AND READY FOR OPERATION ON ALL THE FREQUENCIES YOU CAN COVER. GOTHAM VERTICAL ANTENNAS MEET ALL FREQUENCY REQUIREMENTS OF CD, MARS, CAP, AND THE 6 THROUGH 160 METER BANDS OF HAM RADIO.

GOTHAM VERTICALS DELIVER THE CONTACTS

THE ULTIMATE PROOF OF THE FINE PERFORMANCE OF THE GOTHAM VERTICAL ANTENNAS IS IN THE ACTUAL FIELD RESULTS, BY HAMS ALL OVER THE WORLD.

PROVEN! PROVEN! BY THESE EXCERPTS FROM UNSOLICITED TESTIMONIALS:

CASE HISTORY #71

"I am very delighted with the first V80 and want another for a different location." A. C., California.

CASE HISTORY #159

"I ordered a Gotham V40 Vertical Antenna and found it so successful that several others are wanting them, too. Will you please send me four more." W. A., Alaska.

CASE HISTORY #248

"I just wanted to let you know how pleased I am with my Gotham V80 antenna. I have worked a W.A.S. of 46/43, a WAC of 3/3, and DXCC of 14/12 in about 12 months." G. W., Maryland.

CASE HISTORY #111

"The V160 did a beautiful job on a VE1 for me. Also, I forgot to take it down during the hurricane of last week. It is just as straight as it was when bought it." D. S., New Jersey.

CASE HISTORY #613

"I have never been happier with any antenna than I have been with the V80. I have worked all bands with it and have had tremendous success — i.e., DL4s, ZS3, etc., all solid copy." R. D. S., Penna.

CASE HISTORY #483

"My V80 is working wonders. I am able to maintain a 1:1 SWR all across the 40 meter band. After many years on 10, 15, and 20, the XYL and I are getting great kicks out of some of the lower bands." J. A., New Mexico.

CASE HISTORY #146

"I have had very good luck with mine (my V80) feeding it with a Johnson Adventurer; works fine on all bands." B. I., Nebraska.

CASE HISTORY #555

"Being an owner of your V80 vertical I would like to let you know of the excellent results I am getting with it, both working the DX and the local stations on the lower bands. It certainly is an excellent antenna system." F. H. Jr., New York.

CASE HISTORY #84

"A few months ago I purchased your V40 vertical and have achieved outstanding results on the air." K. G. B., North Carolina.

CASE HISTORY #407

"I recently purchased a Gotham V80 vertical antenna and I am very pleased with the results. Up until now my home brew antenna has had a very high SWR, but with the V80 the SWR is 1:1." J. D. R., Virginia.

FREE

Catalog of all Gotham antennas, including 47 different beams covering 2 meters through 20 meters, free on postcard request.

WHY

THE GOTHAM VERTICAL ANTENNA IS THE BEST ALL-BAND ANTENNA

- Absolutely no guying needed.
- Radials not required.
- Only a few square inches of space needed.
- Four metal mounting straps furnished.
- Special B & W loading coil furnished.
- Every vertical is complete, ready for use.
- Mount it at any convenient height.
- No relays, traps, or gadgets used.
- Accepted design—in use for many years.
- Many thousands in use the world over.
- Simple assembly, quick installation.
- Non-corrosive aluminum used exclusively.
- Multi-band, V80 works 80, 40, 20, 15, 10, 6.
- Ideal for novices, but will handle a Kw.
- Will work with any receiver and xmitter.
- Overall height 23 feet.
- Uses one 52 ohm coax line.
- An effective modern antenna, with amazing performance. Your best bet for a lifetime antenna at an economical price.

73,
GOTHAM

DO YOU KNOW

1. YOU WILL HAVE NO DIFFICULTY INSTALLING YOUR GOTHAM VERTICAL ANTENNA N JUST A FEW MOMENTS, REGARDLESS OF YOUR PARTICULAR PROBLEM, SO ORDER WITH CONFIDENCE EVEN IF YOU HAVE RESTRICTED SPACE OR A DIFFICULT SITUATION.
2. LOADING COIL NOT REQUIRED ON 6, 10, 15 AND 20 METERS. FOR 40, 80, AND 160 METERS, LOADING COIL TAPS ARE CHANGED MANUALLY EXCEPT IF A WIDE-RANGE PI-NETWORK OUTPUT OR AN ANTENNA TUNER IS USED; IN THIS CASE BAND CHANGING CAN BE DONE FROM THE SHACK.
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Enclosed find check or money-order for:

☐ V40 VERTICAL ANTENNA FOR 40, 20, 15, 10 AND 6 METER BANDS.....$14.95

THE V40 IS ALSO MADE FOR CITIZENS BAND OPERATION, WITH SPECIAL INSTRUCTIONS. DESIGNATE CB-11 ANTENNA. PRICE SAME AS THE V40

☐ V80 VERTICAL ANTENNA FOR 80, 40, 20, 15, 10 AND 6 METER BANDS. MOST POPULAR OF THE VERTICALS. USED BY THOUSANDS OF NOVICES, TECHNICIANS, AND GENERAL LICENSE HAMS... $16.95

☐ V160 VERTICAL ANTENNA FOR 160, 80, 40, 20, 15, 10 AND 6 METER BANDS. SAME AS THE OTHER VERTICAL ANTENNAS, EXCEPT THAT A LARGER LOADING COIL PERMITS OPERATION ON THE 160 METER BAND ALSO..... $18.95

HOW TO ORDER. Send check or money order directly to Gotham. Immediate shipment by Railway Express, charges collect. Foreign orders accepted.

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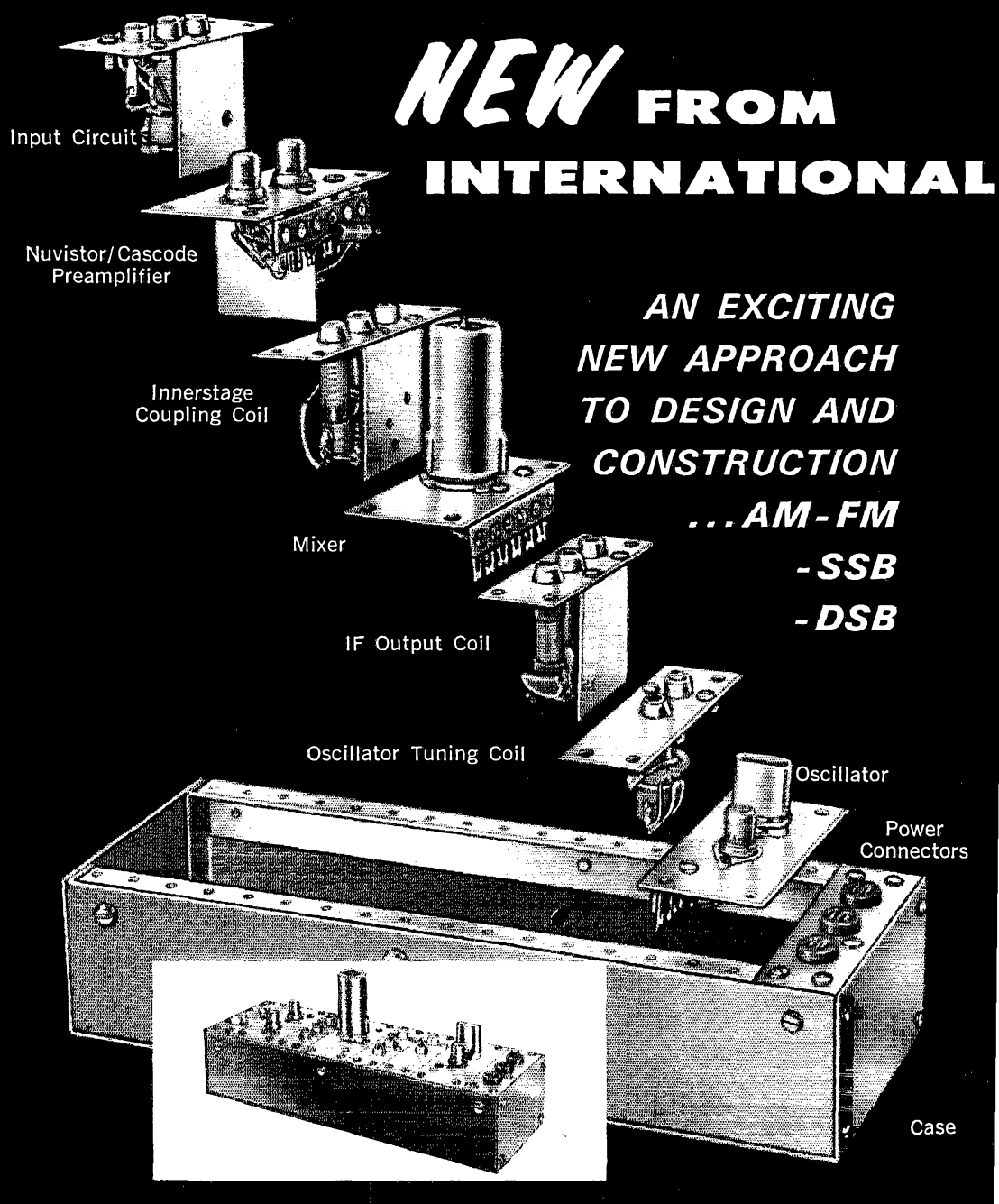
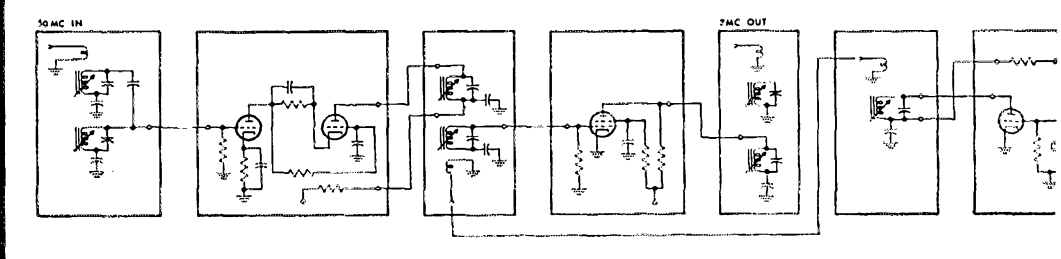
Address.....

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

NEW FROM INTERNATIONAL



AN EXCITING NEW APPROACH TO DESIGN AND CONSTRUCTION ...AM-FM -SSB -DSB



AOC*

*Add - On - Circuits

Amateurs and experimenters will discover a new and easier way to build a wide variety of communication and electronic gear with International **AOC** units . . . individually wired oscillators, preamplifiers, detectors, etc., each tested and mounted on miniature metal chassis.

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AOC units permit custom building for a wide range of frequencies, modes, and power. RF coils are available from 200 kc to 450 mc. IF transformers are available from 262 kc to 10.7 mc. Transmitter power to 100 watts. Matching cases, complete with hardware, available in a variety of lengths.

If you are planning to build a receiver, transmitter, converter, or other electronic equipment use International **AOC** units.

PREAMPLIFIERS • MIXERS • OSCILLATORS • INTERMEDIATE FREQUENCY AMPLIFIERS • DETECTORS • DISCRIMINATORS • BUFFERS • POWER AMPLIFIERS • MODULATORS • FREQUENCY MULTIPLIERS • SPEECH AMPLIFIERS • RECTIFIERS • FILTERS • REGULATORS • POWER TRANSFORMERS • OSCILLATOR BRIDGES •

AOC units are moderately priced from.....**$2.00** up.

INTERNATIONAL ANTENNAS FOR 6 METERS

BASE STATION VERTICAL

This antenna offers exceptional improvement of signal to noise ratio. Shunt fed, grounded radiator. Rigid aluminum and cadmium plated steel construction. Vertical length adjustable. Cat. No. 160-129 . . . . . **$27.95**

MOBILE

Base loaded whip antenna for installation on roof of auto. May be mounted on trunk lid or door facing with International blind mounting bracket (Cat. No. 160-126) Sealed loading coil-adjustable whip. Cat No. 160-130 **$19.95**

For complete details, mail coupon today.

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International Crystal Mfg. Co., Inc.
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Please rush details on AOC units.

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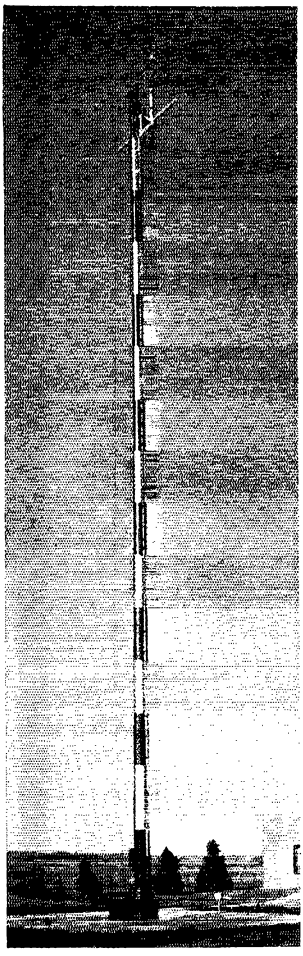
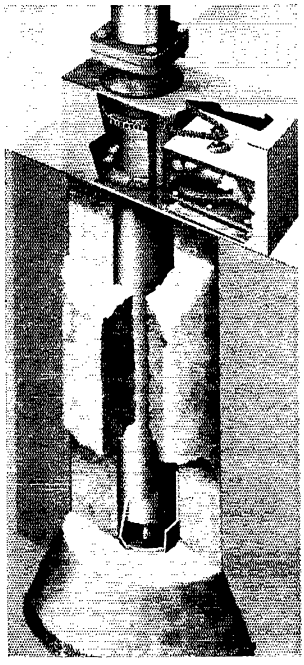




For large antenna arrays commercial users choose

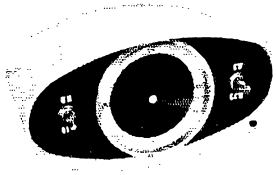
hy-gain's MODEL RP-75 ROTATING POLE SYSTEM

Where maximum dependability is a "must," in the support and rotation of large antenna arrays, Hy-Gain's RP-75 is your best choice.

The RP-75 includes a 75 ft. steel stepped mast, a 10 ft. heavy gauge steel base stabilizing unit, a ruggedly constructed azimuth rotator and a precision designed indicator system.

The three section steel stepped mast tapers from a base diameter of 13" to a top diameter of 3" and features a minimum yield strength of 48,000 lbs. per square inch. This high induced strength permits assembly of the entire mast and antenna systems on the ground so that erection can be made as a single unit.

The base stabilizing unit is designed for burial in concrete. The 16" outer casing is of ¼" steel. The 14" inner cylinder with a wall thickness of ⅜", rotates on a 6" triple sealed ball bearing. Horizontal thrust between the outer casing and the inner cylinder is accommodated by 3" Nylatron strips backed by Oilite bronze bearings.



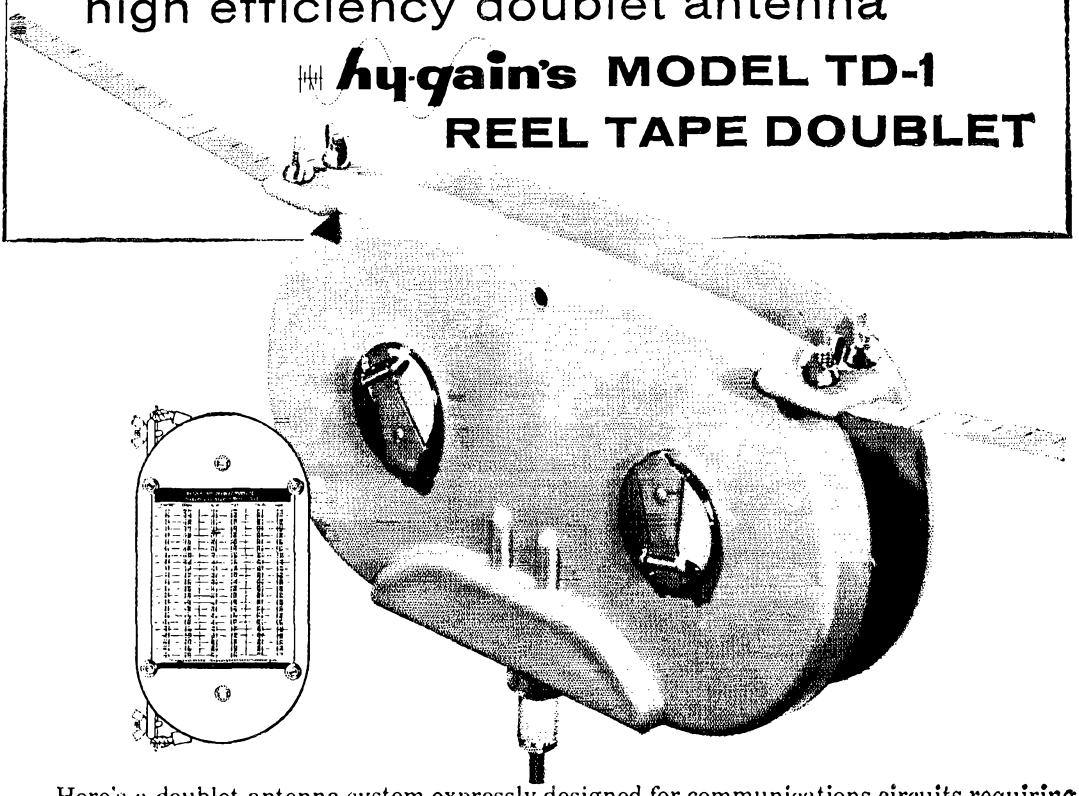
The azimuth rotator and precision designed indicator system is Hy-Gain's Model RBX-5 unit. Through a gear and dual chain reduction system, the rotator rotates the entire mast at ¼ RPM developing a minimum rotating torque of 36,000 inch pounds and a minimum braking torque of over 100,000 inch pounds. The standard indicator is Selsyn read out and is mounted in a Cycolac case measuring 5 x 8¼ x 4⅛ inches. The front panel of the indicator includes a power off/on switch, a CW/CCW rotational control switch, and a Compass Rose calibrated in 15 degree increments for directional indication. Special Digital or DC read out indicators are available. Rotator is driven by a ¼ HP electric motor. Total motor reduction is 7200 to 1. Time required to stop rotator and initiate reverse movement is 1.8 seconds.

For Technical Data Report on the RP-75, the RBX-5 Rotator/Indicator System and custom antenna configurations designed for your r.f. requirements, contact Mr. T. A. Andros, Vice President, Hy-Gain Antenna Products Corporation.

HY-GAIN Antenna Products Corporation
8406 N.E. Highway 6, Lincoln, Nebraska
Phone: 434-6331 – Area Code: 402 – TWX: 402-591-1543

The world's most portable high efficiency doublet antenna

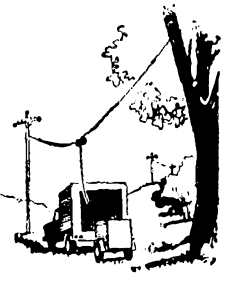
hy-gain's MODEL TD-1 REEL TAPE DOUBLET



Here's a doublet antenna system expressly designed for communications circuits requiring a high degree of portability and a maximum of radiation efficiency. It has proven very effective in establishing reliable communications in military maneuvers, in rugged terrains where permanent installations are impractical. It also has been used commercially for maintaining communications with field personnel assigned to construction and exploration projects.

The TD-1 is designed to operate for both receiving and transmitting within the frequency range of 3.5 to 30 megacycles. It consists of two stainless steel tapes which reel out of and into a durable Cycolac housing to form full-sized half wave length antenna elements. A "frequency-to-length" conversion chart, correlated with the meter calibrations on the stainless steel tapes, is an integral part of the antenna housing.

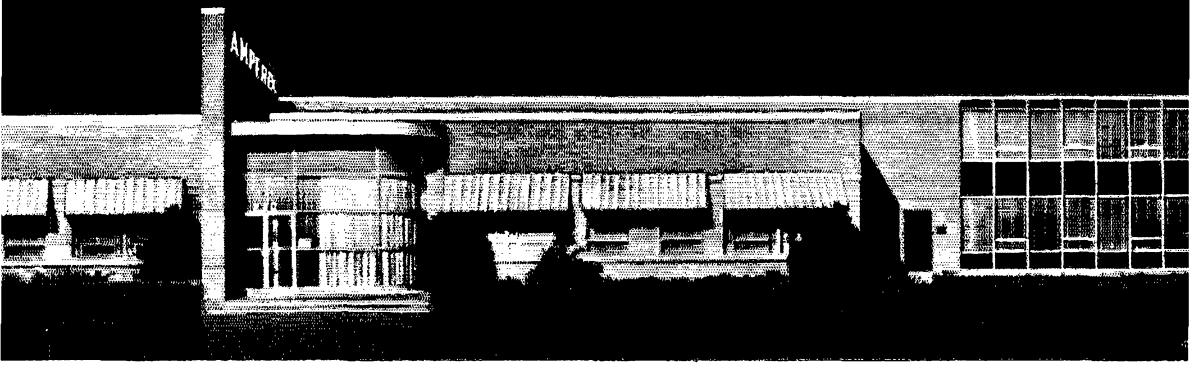
To install, you simply refer to the "frequency-to-length" conversion chart to determine the length in meters for any discrete frequency from 3.5 to 30 megacycles on which you want to operate. Then, extend the stainless steel tapes accordingly, and tie the ends to posts, trees or buildings with the polypropylene rope which is supplied for that purpose. Attach your 52 ohm coax feedline and your antenna is installed. When extended for operation, the overall doublet length varies from approximately 16 ft. at 30 megacycles to 132 ft. at 3.5 megacycles.



The efficient performance of the TD-1 coupled with its weatherproof construction also makes it suitable for permanent and semi-permanent installations as well as for portable applications.

HY-GAIN Antenna Products Corporation
8406 N.E. Highway 6, Lincoln, Nebraska
Phone: 434-6331 – Area Code: 402 – TWX: 402-591-1543

SSB problems solved here



Amperex status as the source of more tube types for Single Sideband Suppressed Carrier Service than any other producer didn't just happen. Leadership has been achieved as the result of a deliberate and continuing program of engineering research and intensive laboratory testing from which has emerged a distinctive and clearly superior comprehension of SSB technology and SSB applications for any power level from 5 watts to 5 kilowatts PEP.

From internal tube geometry to overall envelope design, AMPEREX SSB Tubes are *Performance Tested, Performance Rated* and *Performance Guaranteed* for optimum linearity and minimum intermodulation distortion at *full Single Sideband power ratings.*

Ask Amperex

like this...

SSB TYPE NO.	8179	6156	8117	7527	6079	6155
Peak Envelope Plate Power Output (watts)	1410	421	158	723	1032	206
3rd Order Intermodulation Distortion (db) (without feedback)	34	35	30	35	35	30
5th Order Intermodulation Distortion (db) (without feedback)	40	40	40	40	40	38

Illustrated are six radiation air-cooled tetrodes of a line of more than 20 AMPEREX "Performance-Rated" SSB tubes with power ratings from 5 W. to 5 Kw. PEP. Watch for releases of new SSB tubes now in prototype stage. Write for technical data sheets. Applications engineering assistance available. AMPEREX Electronic Corporation, Tube Division, Hicksville, L.I., N.Y.

IN CANADA: PHILIPS ELECTRON DEVICES, LTD., TORONTO 17, ONTARIO

Station Activities

(Continued from page 98)

QIN 214. QIN (training) 16. RFN 63. Hoosier V.H.F. 97. Traffic: (Mar.) W9JOZ 3327. W9NIM 1688. W9BUQ 529. W9NZZ 526. K9DHN 392. W9QLW 304. K9IVG 269. K9INF 260. K9KTL 213. W9VAY 166. W9TT 162. K9ZLB 98. W9ZYK 88. W9BDG 83. K9CRS 68. W9FWH 66. K9RWQ 62. WA9BFB 59. WA9AVT 55. W9SNQ 42. WA9ELY 39. W9BTZ 36. W9CC 31. W9DGA 31. W9OG 30. K9HYV 29. W9EJW 28. K9ILK 27. K9OXA 26. W9QYQ 26. K9AMWC 24. W9RTH 23. W9DOK 22. K9QJR 21. K9HYV 19. W9CHO 17. K9WJR 17. K9BSL 16. W9JBQ 13. K9ZLA 13. W9AB 12. K9YAP 12. WA9EED 11. K9WET 9. W9ETJ 8. W9BDP 7. K9MAN 7. W9YYX 7. K9DFG 6. K9CIF 4. W9JSV 3. K9WWJ 3. W9AQW 1. K9ARW 1. (Feb.) W9ZYK 60. WA9BBJ 9. WA9EED 8. K9LVK 4. W9GUX 1.

WISCONSIN—SCM, Kenneth A. Ebneter, K9GSC—SEC: W9BCC. RM: W9VHP. PAMs: W9SAA, W9NRP and W9NGT. Nets: WSBN, on 3985 kc. at 2245 GMT daily; BEN, on 3950 kc. at 2300 daily; WIN on 3535 kc. at 0045 GMT daily. Net reports: WSBN, 914 messages offered and 675 cleared; BEN, 444 and 299. WIN, 133 and 122. New appointees: WA9CDY as OES. Renewed appointments: W9BEW and K9QKG as ECs; K9WVM as OBS; W9MWQ. K9UUT and W9GIL as ORSs. WN9ESX is on with a Knight T-50. W9OTL is getting 100 miles per watt from his 2-watt mobile rig. W9DFS has completed his new 70-watt mobile rig for 6 meters. K9TRB has received a new bug. W9YT has over 200 countries confirmed. W9KQB has received his 110 DXCC sticker. W9FXA is back on the air from Green Bay. W9ONI has installed a new antenna system. The WNA picnic will be held in Hartford again this year on July 14. K9WIE has worked his 100th country. W9FBC has a new 829B final on 2 meters and reports K9TQX and K9UVX are active on 2 meters. K9WRQ also is active on 2 meters. BPL for March was made by W9DYG, K9FMR and W9CXY. All Wisconsin stations are invited to send monthly activity reports to the SCM. Traffic: (M. r.) K9IMR 740. W9DYG 608. W9CXY 508. WA9CDY 153. K9GSC 109. W9CBE 81. W9SAA 68. K9BLN 55. W9VHP 54. W9NRP 35. K9GDF 24. W9AOW 23. K9UUT 23. W9HPC 19. W9UEB 13. W9KQB 8. W9OTL 8. W9ONI 4. WA9BEK 2. W9DFS 2. K9LGU 2. K9WIE 2. (Feb.) W9VHP 37. K9HFR 11. W9VIK 3.

DAKOTA DIVISION

NORTH DAKOTA—SCM, Harold A. Wengel, WØHVA—SEC: WØCAQ. PAM: KØTYY. New officers of the N.D.S.U. Amateur Radio Societyare KØRRW, pres.; KØJRE, vice-pres.; KØMPH, secy.-treas.; KØPVH, public relations officers; Philip Schloss, QSL mgr.; KØMHC, research director; WØRRW, faculty advisor. The Bismarck Amateur Radio Klub held an auction, the proceeds to go to the ARRL Building Fund. New calls in the Bismarck area are WNØEWW, WNØFDA and WAØEYW. KØDWW *has* a new Meteor transmitter. WAØAYL is now mobile on 160 and 75 meters and has converted an ARC-5 to both bands. The North Dakota 75-Meter Net reports for March: 26 sessions with 778 check-ins, 60 pieces of formal traffic and 96 pieces of informal traffic handled with 18 relays. The MARA will start a code class to run 6 weeks, meeting at the Minot YMCA Mon. and Fri. nights at 7:30. Traffic: KØITP 149. WØQWY 16. WØYCL 15. WAØAAD 11. WAØAYL 8. WØDNJ 8. WAØBFN 7. WØTYY 5.

SOUTH DAKOTA—SCM, J. W. Sikorski, WØRRN—SEC: WØSCT. The South Dakota S.S.B. Net completed its new roster showing 85 members. They operate on 3987.5 kc. daily at 0100Z. WAØBNT, operating mobile from Brookings, is the son of WØCMJ. WAØCWW is operating a new s.s.b. transmitter and a new home-brew rig on 144 Mc. WAØBMW reports his home-brew three-band beam is working. Sympathy is extended to KØWEM and WB6ECP, the wife and son of KØWEM, who passed away Mar. 16. KØGSY qualified for a C.W. Net certificate. WØLXD, Centerville, has returned to the ham bands after several years inactivity. KØAPZ is now located in Chamberlain. WØCUC has a new HX-10. KØCER is a newsman for KELO. He operates on 7 Mc. and 50 Mc. Fort Meade ARC has received the club call of WAØCIJ, with WØFAM as trustee. The club conducts code and theory classes three times weekly. The latest count shows slightly more than 200 ARRL members in South Dakota. Traffic: WØSCT 331. WØDVB 139. KØBMQ 132. WØØFP 30. KØVYY 30. KØYGZ 19. WØYQR 18. WØDIY 12. KØZBJ 12. KØGSY 10. KØDHA 8. KØTXW 8. KØBSW 7. KØCXL 5. KØHQD 4. KØKOY 4. KØSZJ 4. KØYJF 4. WAØBMG 2. WAØCKH 2. WØQDU 2. WØRRN 2.

(Continued on page 114)

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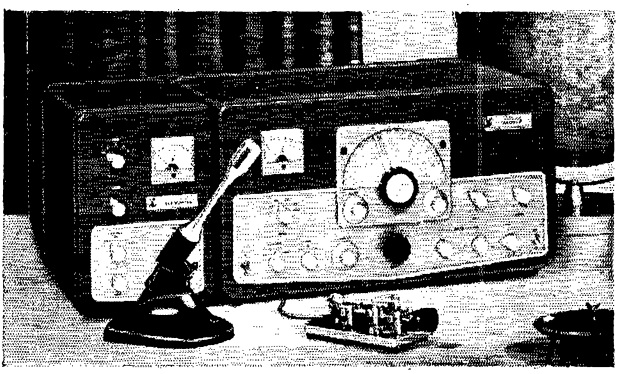

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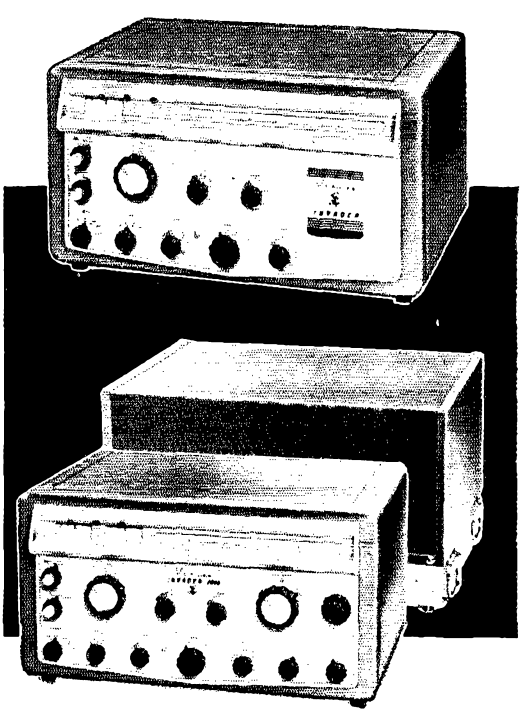

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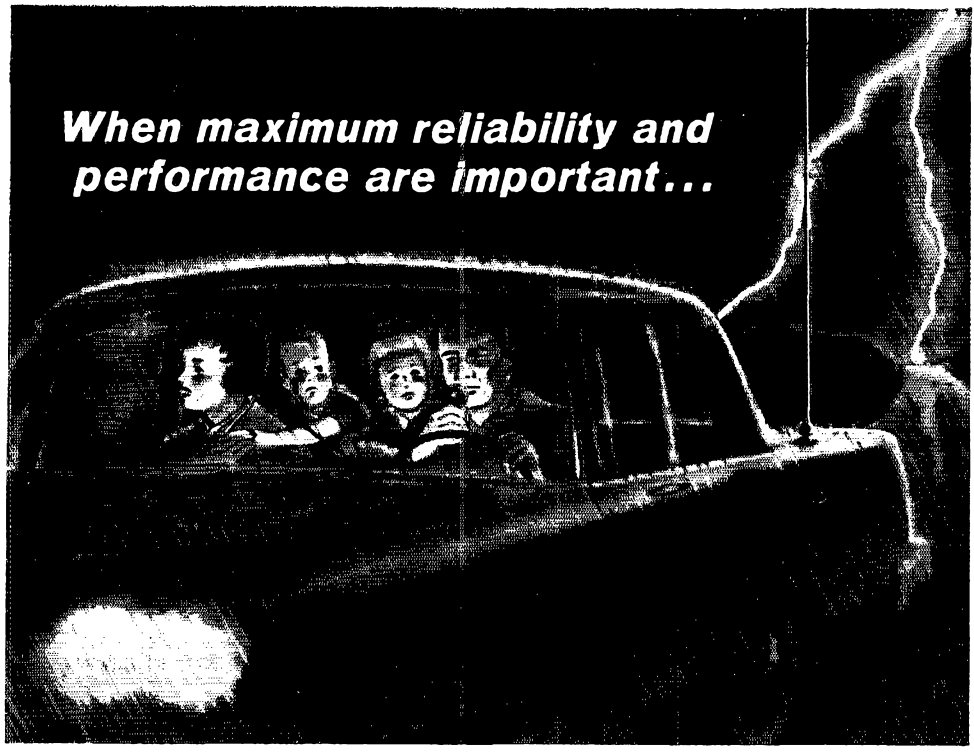
MINNESOTA—SCM, Mrs. Helen Mejdrich, WØOPX—Asst. SCM: Emerson Mejdrich, WØRIQ. SEC: KØKKQ. RM: KØUXQ. PAMs: WØGCR, WØYHR. MSSB PAM: WØHEN. The Dakota Division Convention will be held Sept. 14 and 15 at Sioux Falls, So. Dak. The Mankato Area Radio Club picnic is planned for July 28. Newly-elected officers are KØYOF, pres.; Kenneth Scheim, vice-pres.; WØTCK, secy.-treas. The Minneapolis Radio Club picnic is scheduled for Aug. 11. The RATS (RTTY group) meets on 3625 kc. Thurs. at 9 P.M. KØZRE received an Eagle Scout award and was the only sophomore to be chosen for the Senior Class Play. KØGKI, who is using a Ranger, skeds KØPAU, who is slant O at Mankota State, with PAU on a light-bulb! (Maybe the dummy antennas aren't so dumb). KØGPI is coaching his Dad for a Novice license. EC KØBFS operates on 6 meters. She is attending U. of Minn. evening classes. KØMGT and his XYL are the proud parents of a new son. New hams: WNØFLB, Harry of Olivia, and WNØFAM, John of Elysian. WØHUU has designed and built a very neat and efficient transistorized receiver. OO WØKLG cited 18 violations and WØTIV cited 36 violations. WØTJA has been named Dakota Division Asst. Director. Appointments issued are WØZOB as ORS, WØCTM as OES, WAØBYO as OPS, KØGCJ as ORS. Endorsed WØTCK, KØBFS, KØGKI as ECs: KØVPJ, KØLWK, KØZKK as OPS. Traffic: (Mar.) WAØBYO 267, KØIJU 110, WØKJZ 71, KØUXQ 64, WØOPX 62, WAØARA 61, KØADI 54, WØRIQ 51, KØJHD 49, WØGCR 42, KØWWY 40, KØZRD 33, KØICG 30, WØTHY 28, KØGCJ 27, KØJYJ 27, KØGOY 26, KØJFJ 26, WØKLG 26, WØWMA 23, WØMXC 19, WØBUO 18, KØVPJ 18, KØLWK 14, WAØBZG 13, KØMGT 13, WAØAAK 9, WØKYG 9, KØZKK 9, WØHVM 8, WAØABU 7, WØOEZ 7, KØFLT 6, KØWYV 5, KØZNE 3. (Feb.) KØQBI 58.

DELTA DIVISION

LOUISIANA—SCM, Thomas J. Morgavi, W5FMO—The Delta Division ARRL convention will be held Nov. 29 and 30, 1963. K5VDF, convention chairman, has the convention plans going pretty well with much assistance from WA5BCK, Lafayette ARC president K5UYL, ORS-OPS, is this years' Field Day Chairman for the Lafayette ARC. The Ouachita Valley ARC members provided communications for the KO-Polio drives' first phase, which was very successful. Not only did they supply a public service but it gave them a chance to check their AREC emergency system. Another project was a network of stations to relay pledges from surrounding towns in the Cerebral Palsy Telethon held in early May. K5QXV made BPL in February and March and is now Asst. Net Manager for the ISSB Net. Loyola University ARC has been showing signs of activity mainly because of the efforts of K5PGS. The club operates 75-10 meters on c.w. and s.s.b. with RTTY coming up. K5PGT is club president. W5TAV is making a fine net control on the ole Delta 75 Net on 3905 Kc. at 7:30 A.M. Sun. K5FYI has been driving a Warrior Linear with T-150 controlled carrier to 600 watts on a.m. with good reported results. W5JET was endorsed as ORS while W5HHA was endorsed as ORS and OPS. Please answer cards sent you by your SCM on appointment expiration. W5JFB is running 90 watts to a 5894 in a new 2-Meter rig. W5KAT was appointed Warning & Communications Coordinator of Caddo-Bossier Civil Defense (RACES) effective Apr. 1. W5CEZ is working hard on the Lake Charles Fish-Fry. Traffic: (Mar.) K5QXV 875, W5CEZ 306, W5EA 14, K5FQN 12, K5TJG 12, K5FYI 7, K5UYL 6, K5OKR 2, K5MOJ 1. (Feb.) K5QXV 756.

MISSISSIPPI—SCM, S. H. Hairston, W5EMM—Hamfests: Biloxi, July 6 and 7; Jackson July 28 with dinner the 27th. Magnolia Net time change: 1900 CST week days. There is increased traffic on the Mississippi C.W. Net largely because of W5JDR's efforts and fine bulletin, with lots of help from K5KSK, W4CJD/5, W5WZ and others. Fine participation on RN5 puts Mississippi in third place. Help us get an EC for each county. W4CJD/5 is leaving for Nevada. K5DPG/5 has a new daughter and a pair of 811As in his new linear. Six-meter activity is going strong in Jackson, Meridian and on the Coast. K5SQS lost his mother. We are sorry to lose W5FSS. We appreciate receiving the Jackson ARC bulletin. W5MZV is on sideband in Jackson. Meridian ARC's new officers: K5PYS, pres.; W5UTL, vice-pres.; K5INV, secy.-treas. K5DZE has a new SW-III and a pair of 813s. W5JIIS continues to do a fine job with the Gulf Coast S.S.B. Net. New appointment WA5BQJ as EC. Traffic: W5JDF 83, W4CJD/5 70, K5GVV 26, K5IHQ 24, K5AFM 16, K5YTA 15, K5AFO 10, K5KSK 5, K5PPI 5, K5DZE 4, WA5CJM 1.

(Continued on page 116)



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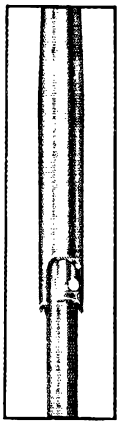

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TENNESSEE—SCM, David C. Goggio, W4OGG—SEC: W4WBK, RMs: W4OQG, K4AKP. PAM: K4WWQ. March net reports:

Net	*Freq.*	*Time*	*Days*	*Sessions*	*QTC*	*QNI*	*Average*
ETPN	3980	0640E	M.-Fri.	20	43	420	21
TN	3635	1900C	M-Sat.	23	186	246	11
TSSN	3980	1830C	M-Sat.	26	76	797	31

New appointments: W4TDW and K4FZJ as OOs; W4SZE and WA4AIS as OPSs; W4KAT as ORS. The RAC of Knoxville holds a radio school and meets the 3rd Mon. of the month at Wright's Cafe. It was another active month for C.W. OO K4RIN. Two additional OOs for c.w. are needed. Four years amateur experience is required. The R.A.T.S. Field Day plans have been made and the club is planning to award a Metropolitan Nashville certificate signed by the mayor. The MARA had 134 present for the Bell Lab MASER. A hamfest will be held June 2 at the Fairgrounds, Memphis. WA4DPJ, W4NCH and K4CHM are on the hamfest committee from the Mid-South VHF club. The Loudon ARC has resumed its fine bulletin, *QRM*. The Kingsport ARC received a fine write-up in the recent ARRL annual club bulletin. Field Day will be held June 22-23. W4OGG will be on 3980 kc. from 5-6 A.M. and on 3635 kc. from 6-7 A.M. CST June 23 to receive FD messages (25 points credit). OES WA4EPY worked 372 stations in 10 states on 50-Mc. ground wave the past year. All Ecs with local nets: Please arrange liaison with section nets, invite your members to originate messages and place incoming traffic on the local net for training members. The Delta ARC announces its annual hamfest will be held Aug. 3-4 at Harbin's Pavilion, Whitehaven. The dinner at Oak Ridge for Delta Division Director W5MUG was attended by 75. Traffic: W4ZJY 658, K4AKP 573, W4PQP 149, W4OGG 106, W4MXF 62, K4WWQ 61, W4KAT 54, WA4BNF 45, K4JNG 44, W4RMJ 43, WA4AVX 41, W4CVG 36, W4OQG 33, W4ZAC 33, W4ODR 31, W4LIJ 30, W4HPN 29, W4VTS 19, K4OUK 18, W4UIO 18, W4WBK 18, K4RQP 16, W4PHW 15, WA4KGX 14, WA4DPJ 10, K4WUH 10, K4EWI 8, WA4IRX 8, K4FZJ 6, W4JVM 6, K4VIJ 6, K4NRO 4, W4WXN 4, WA4AIS 3, K4EJQ 3, W4CZE 2, W4NMR 2, W4SLC 2, W4SGI 1, K4TTA 1.

GREAT LAKES DIVISION

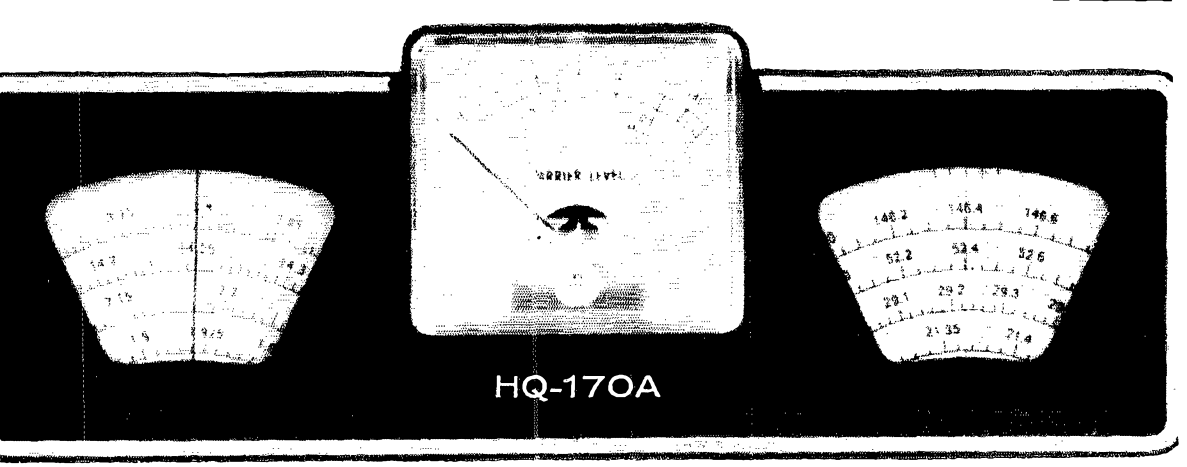
KENTUCKY—SCM, Elmer G. Leachman, W4BEW—SEC: W4TFK, PAMs: W4SZB, K4ECJ. V.H.F. PAM: K4LOA. RM: W4CDA. Asst. RM: K4NYO. RM (KNN): WA4APU. Amateurs responded in true fashion again in March as serious floods struck Eastern Kentucky for the second time in 5 years. Net reports for Mar.:

Net	*Freq.*	*EST Time*	*Days*	*Sessions*	*QTC*
KYN	3600	1900	Daily	51	169
MKPN	3960	0830	Mon.-Fri.	28	52
EKPN	3960	0630	Mon.-Fri.	21	20
KPN (S.S.B.)	3960	1900	Mon.-Fri.	25	61
KNN	3737	1830	Mon.-Fri.	10	0

Please note that KNN (Kentucky Slow C.W. Net) is trying out on 3737 kc. All stations, and especially Novices, are invited to QNI. K4HSB was named editor of his school paper and also is busy with civil defense and EC work so his traffic total is down. WA4ELB made BPL the third consecutive time, qualifying him for a medallion. WA4GCL now is helping as NCS on KYN. W4CDA has completed a new transmatch coupler. Correction of December Station Activities report: "The c.d. bus holds call W4ABK". Smokey says "the intentions are that the call W4ABK will be used primarily on the c.d. bus as a function of the Kentuckiana Radio Club, Inc." K4ZRA says over 80 awards have been sent out in the Owensboro ARC's award program. He is OO and a student, too. Traffic: K4WJI 641, WA4ELB 129, K4QIO 98, W4CDA 85, K4KWQ 81, W4BYG 54, W4EON 39, K4HSB 36, W4ZSB 30, K4NYO 26, W4BEW 21, K4VDO 21, WA4ELK 19, W4USE 18, WA4GCL 15, K4HOE 13, K4LOA 13, K4QHZ 11, K4HHG 10, W4KJP 10, WA4JQR 7, W4YYI 4, W4JUI 2.

MICHIGAN—SCM, Ralph P. Thetreau, W8FX—SEC: W8LOX. RMs: W8EGI, W8INJ, W8FWQ, K8KMQ. PAMs: W8CQU, K8LQA. V.H.F. PAM: W8PT. Appointments and endorsements: K8BZL, K8JID, W8PDF as ECs; K2PVB/8 as OBS; WA8EIQ, WN8GCN, WN8GME, W8HFA, W8TIN, W8ZGW as OESs; W8VPC as OO; K8BZL, K8CKD, K8EFY, W8HK, W8JYJ, W8TIC as OPSs; VE3CYG/W8, W8BEZ, W8TBP, W8WQH, W8ZJE, W8ZLK as ORSs. New officers: HVARA—W8TEZ, pres.; W8WLD, vice-pres.; WA8FGK, secy.; K8PSJ, treas. The Saginaw Convention was fine, even with a "bomb hoax" and a small fire, although I did not appreciate having picture of my homely "mugg" taken alongside some teenage "beauty queens"—at my age yet!

(*Continued on page 118*)



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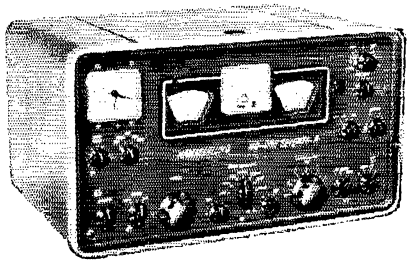

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VARIABLE AIR CAPACITORS ... AND ... THE OUTERCOM 2-WAY RADIO

DARA's Swap & Shop at Lovett Hall was a success with over 550 registered, some from Akron (Ohio) and Milwaukee. K8PBA comes up with an excellent transistorized keyer. Your SCM asks each Michigan radio club to advise the *month* officer elections are held each year. The information will help in getting out this column. CMARC's *Scope* reports that W8FEV made 1st-class commercial. W8BQD made 2nd class and W8RXY and W8QQL 3rd class. The CMARC also has an MCW Net going each Sat. at 2000 on 50.4 Mc. Maybe I should dust off the 40-year old "chopper." WN8GCW is spending 18 months on Guam, working portable KG6. Hope he has a General by now. The "foot resting" room that the MCRC had at Saginaw was excellent. K8CFU is operating as 4U1ITU in Geneva, and K8NZD is operating as FY7YI. Both are on s.s.b. near 14.340 kc. W8RTN was in charge of communications for the Buick Open Golf Tournament. K8LNE lost his appendix and now is doing fine. K8YZP wants to hear from teen-age hams in the Kazoo-Paw Paw area. WMU is organizing a ham club. K8UOP/8 is building the QST 2300-Mc. system. W8YY now is closed because of lack of interest. K8PSV got a scholarship to Kazoo College. W8QIX was in the hospital for a hernia operation but is OK now. BPLers: K8GOU, K8KMQ and K8JJC on originations and deliveries. Traffic: (Mar.) K8GOU 401, K8NJW 320, K8KMQ 297, K8JJC 249, K8VCB 146, W8QFO 144, K8QLL 137, W8DSW 89, VE3CYG/W8 88, W8BEZ 74, W8AUD 66, W8FWQ 52, WA8ASV 51, W8HKT 49, K8PYW 47, W8IXJ 44, W8FX 43, K8VDA 43, W8RTN 38, K8LNE 34, K8TFE 33, W8USZ 32, W8EGI 30, W8YNY 30, K8WQV 29, K8CIP 27, W8CQU 26, W8TBP 20, W8SWF 17, W8ZHB 16, W8WVL 13, W8AHV 11, K8JED 11, K8TJH 10, K8HLR 9, K8WWM 6, W8DSE 5, W8IUJ 5, K8KVV 4, K8LZF 4, K8YZP 4, WA8DZP 3, K8GJD 2, WA8IEQ 2. (Feb.) W8EU 33, W8AUD 10, K8IUZ 2.

OHIO—SCM, Wilson E. Weckel, W8AL—Asst. SCM: J. C. Erickson, W8DAE. SEC: W8HNP. RMs: W8BZX, W8DAE, W8IEP and K8ONQ. PAMs: W8VZ, K8BAP and K8UBK. Ohio Valley ARA's 1963 officers are W8WC and W8SMQ, pres.; W8BOJ, vice-pres.; W8JIN, corr. secy.; W4JBQ, rec. secy.; W8TJM, treas.; W8FGX, FD mgr. K8MMJ has a new baby girl. New appointees are K8MAZ and W8VCD as ECs, W8IEP as RM, K8NYM as OES, W8FFK and K8OBW as OOs, WA8AWV and W8CZM as OBSs. Warren ARA's *Q-Match* informs us the club saw the films *Progress Report on Transistor Research* and *Solar Batteries and Tools of Telephony* along with a photo tour of the Western Electric plant and took a tour of the Niles Ohio Edison plant; K8AMR became a Silent Key. W8QFG was in the hospital. K8QDQ has a new Swan 240 and the Warren Hamfest will be held Aug. 25 at the Newton Falls Community Center. Stark County's new CD officers are K8CMI, communications officer, and K8UBK, radio officer. Dayton ARA's *R-F Carrier* says that W8ACE spoke on Electric Shock Hazards and K8YDO told them about the Drake TR-3-SB; K8CEL became a Silent Key and K8HNV is now W8UU. Findlay RC's *W8FT News* informs us that W8-IYC has a new baby boy and that W8MBI, editor of *Ham Shack Gossip*, underwent major surgery. We here in Ohio are all pulling for a quick recovery, Marie. Columbus ARA's *Carascope* states that the clubs' new ham directory is out, K8YCH spoke on transistors, W8DMR spoke on amateur TV and W8WRR returned from Florida. K8EKG graduated from Kent State, WA8EFH received his General Class license and WA8CUO received his Technician. South East ARC's *Ham Fax* names K8-AYT as its Member of the Month. Parma RC's *P.R.C. Bulletin* says the club was shown the Bell Telephone film, Skywatch on 55 Degrees. Seneca RC held an auction. Toledo's *Ham Shack Gossip* names W8BIQ as its Ham of the Month and W8ITT tells us the Toledo RC's 1963 officers are W8NXN, pres.; K8YOO, vice-pres.; W8QUR, rec. secy.; W8ITT, corr. secy.; W8LZU, treas. Cincinnati ARA's *The Mike and Key* has four pictures taken in W8JDV's antique radio museum and informs us that W8PLA became a Silent Key and WA8FLX was in the hospital. Queen City Emergency Net's *The Listening Post* states that W8DBC spoke on Single Sideband and Radio Highlights. The Amateur RC of Ohio State University's *The W8LT Log* informs us the club moved into Room 402, Stadium, and now has W8LT on the air again. Six-Meter Nomads' *The Amateur Extra* reports that W8CWL was confined with pneumonia. W8TFW became a Silent Key and the club saw a film on transistors and one on crystals. K8BXT sends in this news: WN8CAJ has a new Drake 2-B, W8KAK went to XE-Land on business and W8VTD, K8BXT, K8ORF, K8QDQ and K8ZNB received Worked Trumbull County (WTC) awards. Clermont County RC had K8ADM, K8BON, K8SOE set up as base stations with W8SAX, W8ZRL and WA8EMA as mobiles during the Ohio River flood. Springfield ARC's *The Q-5* says two of its members, W8KJP/F7CL and WA8CFU are in the Navy. Be sure to mark down the dates of the Lancaster Hamfest, June 15 and 16. The FCC General Class license examination

(*Continued on page 120*)

C-P COMMUNICATION ANTENNA SYSTEMS

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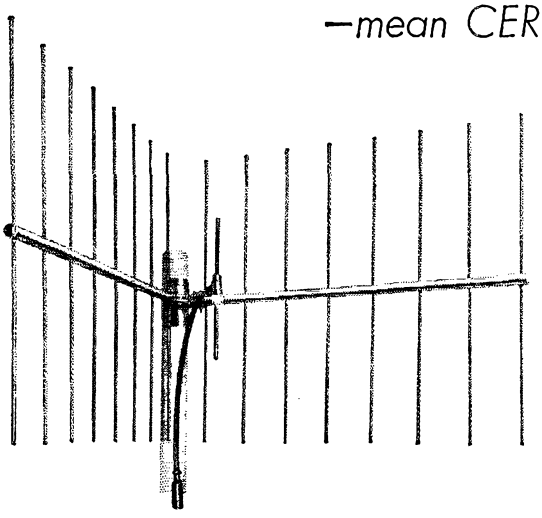


Base Station Corner Reflector Advanced Design Antenna

(10X-Unidirectional Gain)

Cat. No. 161-509, Frequency Range 450-470 MC

Cat. No. 161-509 Corner Reflector Antenna is designed for use in the 450-470 Mc band. All reflector screen components are manufactured of high strength aluminum alloys, all mounting components are fabricated of hot-galvanized steel and all radiating components are fabricated of aluminum. The above combine maximum strength, optimum electrical performance and minimum weight for the first time in an antenna of this type.

This lightweight aluminum antenna is ideal for use in multiple corner arrays.

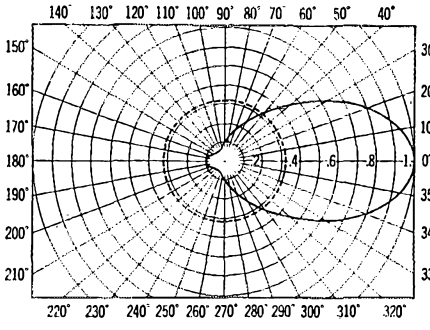
Electrical Specifications:

Nominal input impedance	50 ohms
Forward gain	10 db
Front-to-back ratio	20 db
Maximum power input	250 watts
Internal feedline	RG-8A/U
Flexible terminal extension	18" of RG-8A/U
Termination	Type N male with Neoprene housing
VSWR	1.5:1
Bandwidth	±3%
Lightning protection	Direct ground

Mechanical Specifications:

Reflector (size per side)	2' x 2'
Reflector material	High strength aluminum alloy
Radiating element material	High strength aluminum alloy
Radiating element diameter	⅜"
Rated wind velocity	100 MPH
Lateral thrust at rated wind	16 lbs.
Torsional moment on mounting pipe	16 ft. lbs.
Weight	8 lbs.

Stainless steel hardware supplied to mount antenna on 2" IPS pipe.



Horizontal field strength pattern of Corner Reflector 10X-Gain Antenna Cat. No. 161-509. A dipole pattern is shown for reference.

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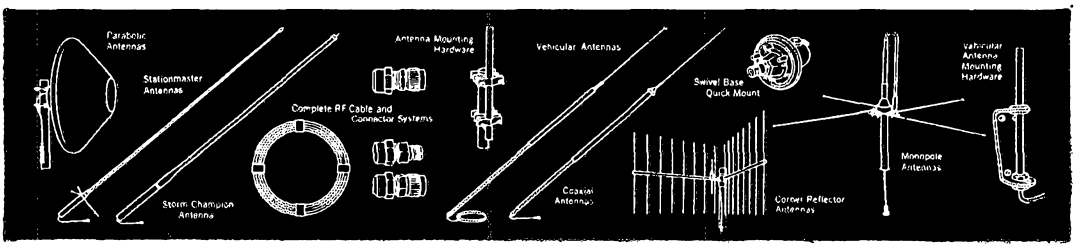


will be given Sat., June 15 at 0930. W4CAC (ex-W8KMB) is a Silent Key. W8DAE, W8UPH, K8AAG, K8LGA and K8YUZ made the BPL in March. K8AAG made the BPL in February. W8ANQ reports the East Shore V.H.F. Radio Club is relocating at the Willowick Nike site. Traffic: (Mar.) K8YUZ 686, W8UPH 594, W8DAE 558, K8LGA 519, W8BZX 311, W8CHT 308, K8AAG 220, K8SQK 189, W8MGA 157, WA8AJZ 147, K8UBK 130, K8DIU 109, W8IEP 62, K8RND 60, W8PZS 48, W8AL 33, K8ONQ 33, W8DQD 31, W8QCU 31, K8BAP 20, K8KLA 18, K8LGB 17, W8LZE 15, K8WWN 13, K8DDB 12, K8AGN 11, WA8BZR 11, W8DIH 10, W8UID 10, WA8ADB 9, WA8BOV 7 K8PJH 7, W8ILC 6, K8RFU 6, WA8AWV 5, K8KXS 5, K8BXT 4, K8ATA 2, W8EEQ 2, K8DDG 1. (Feb.) K8AAG 162, K8KXS 6.

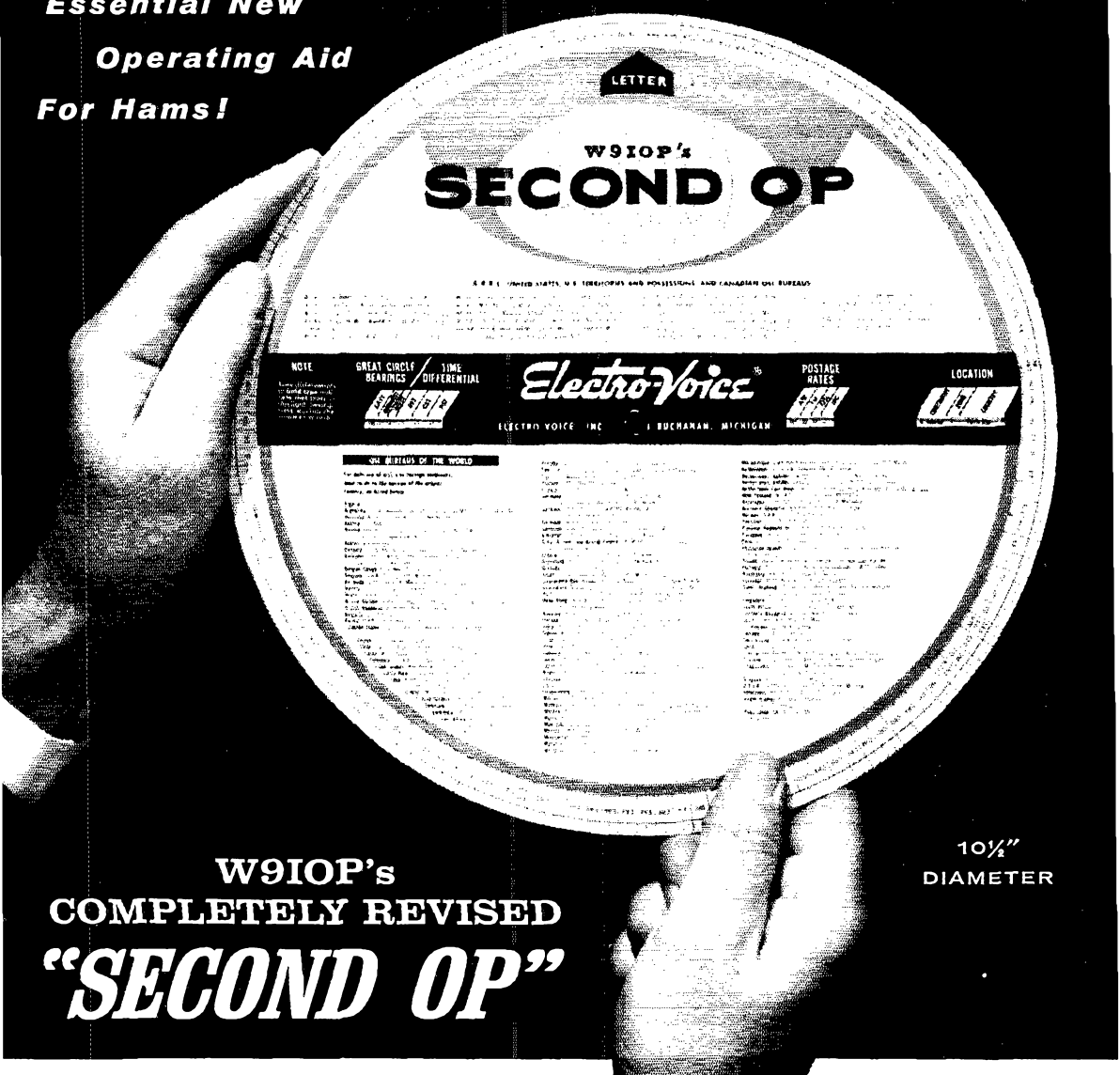
HUDSON DIVISION

EASTERN NEW YORK—SCM, George W. Tracy, W2EFU—SEC: W2KGC. RMs: W2PHX and K2QJL. PAM: W2IJG. Section nets: NYS on 3670 kc. nightly at 0000 GMT; NYSPTEN on 3925 kc. nightly at 2300 GMT; ESS on 3590 kc. nightly at 2300 GMT; MHT (Novice) on 3716 kc. Sat. at 1800 GMT; Inter-club on 28.690 kc. Mon. at 0130 GMT; Emergency Coordinators on 146.550 kc. Fri. at 0015 GMT. Endorsement: K2UTC as OO. Westchester County AREC members are urged to report into their new net on 146.556 kc. Fri. at 2015 EST. Schenectady County AREC drills three nets each Sun. on 75, 6 and 2 meters. Let's hear from other ECs regarding your local AREC net activity! W2THE and WA2HGB reported into NYS over 200 times during 1962. Congrats. W2LCB, W2TVR and K2HNW were speakers on propagation at the Schenectady Club meeting. K2SDU is the club's Field Day chairman. W2GTB received a 50-year award from the OOTC. W2URP has qualified for the 50-Mc. Century award. Both AREC and civil defense were discussed by W2AWF at the Albany Club. WA2DTF and WA2DTE are Field Day chairmen. Welcome to the Albany Academy Club, WB2HBA, a new group. WA2RYO is teaching a class of 20 for licenses at the Academy. OO K2DEM was active during the YL-OM Contest. WA2LJM is a new MARS station. W2WGE reports a new turnstile on 2 meters. Among those using twin-stacked big wheels on 2 meters in Schenectady are W2ODC, WA2CGD and W2EFU with another installation at the Red Cross Chapter. The Harmonic Hill Radio League in Westchester Co. has reorganized with 25 members. Traffic: K2TXP 312, WA2UZK 262, W2THE 249, WA2VYS 171, W2PKY 113, K2SJN 57, WB2FZC 43, K2LJM 37, W2URP 32, W2GTC 23, K2HNW 18, K2MPK 13, W2EFU 12, WA2DRP 10, WB2CPU 3.

NEW YORK CITY AND LONG ISLAND—SCM, George V. Cooke, jr., W2OBU—SEC: K2OVN. RM: W2WFL. V.H.F. PAM: W2EW. Section nets: NLI, 3630 kc. at 0015Z nightly; NYCLIPN, 3908 kc. at 2230Z nightly; V.H.F. Net, Tue.-Wed.-Thurs. on 145.8 Mc. at 0100Z and Fri. through Mon. on 146.25 Mc. at 0000Z; Mike Farad on 7238 kc. at 1700Z; All Service Net at 1900Z Sun. on 3925 kc.; Q5 Net on 3935 kc. at 2100Z daily. BPL certificates for traffic handled during the month of March have been granted to WA2GPT, WA2RUE, WA2ENP, W2EW, WB2FWA and WA2GAB. WB2DSL and WB2FWA have received RCC certificates, with FWA sporting a new Seneca and a six-element Telrex. WA2LJS finally made WAS. WA2IUQ received a certificate for CP-25. W6OLO has stirred up considerable interest in this area in the Oscar I and II projects and in prospects for much active participation in the future-planned Oscar III program. WA2SOD is extremely interested in contacting others in this section having an interest in setting up an organized effort for contact and reporting in this proposed Oscar III setup. W2GKZ is highly pleased with his new Hy-Tower and his nephew, WB2FCU is very active in the Huntington area. A new club in Manhattan is called the Ionosphere Busters, with WA2VKK handling publicity and seeking new members. WA2IZV has been appointed ORS. WA2TYF announces the formation of the 6-Meter Technical and Traffic Net meeting Fri. at 0130Z on 50.35 Mc. with WA2IHY as NCS. W2SEU constructed an s.s.b. exciter to be used in the June V.H.F. Contest, together with an eleven-element beam at 45 feet up for 432 Mc. K2AHS now is operating 20-meter RTTY. WA2KDZ put up a twenty-element cross-polarized 6-meter beam, ten-element horizontal, ten-element vertical. Ask him how it is phased. WA2URH announces the formation of the Oceanside RC with WB2FGF, pres.; WA2UVQ, vice-pres.; WB2CAV, secy.; WB2AXI, treas. W2WFL, RM for NLI, announces the start of the NLI-SS Net for slow-speed operators operating on Fri., Sat. and Sun. on 3630 kc. at 2330Z with WA2QJU assisting. The Eastern District HS RC, WA2TWC, has been formed and operates 6 daily for other school or student contacts. WA2TYU has compiled an N.Y.C. operator directory and profits from the sale of same will go to the ARRL Building Fund. WA2ROT has been appointed Asst. EC for the Manhattan 2-Meter AREC Net. WA2UXK is interested in contacting other amateurs who also are

(*Continued on page 122*)

Essential New Operating Aid For Hams!



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scuba divers in the N.Y.C. area. Results of the NYCLI QSO Party held recently are in and WA2RUE was found to be the highest scorer of all entries; W9OKN was *tops from the 21 sections outside our section.* Radio amateurs in the Nassau County Police Department have organized the Orange and Blue ARC with W2FE1, pres.; WA2EQK, vice-pres.; WA2YHM, secy.; K2TXD, treas. WA2GPT has added a kw. linear (HT-42) to her HT-37. W2OBU has a new SX-101A. K2DNY has been appointed *secretary to the Radio Officer, 2 meters, Kings County* AREC and C.D. Net. Most clubs in the section are deep in plans for the annual Field Day and for those extra points your Field Day messages can reach the SCM at the Lake Success RC location under the station call W2YKQ/2. Good luck and have a wonderful Field Day week end. Traffic: (Mar.) WA2GPT 1208, WA2RUE 604, WA2EXP 557, W2EW 486, WB2FWA 353, WA2VLK 259, WA2QJU 195, W2MTA 176, WA2GAB 166, WA2LJS 152, K2UAT 152, WA2IUQ 150, WB2CAV 138, K2KYS 137, W2GKZ 108, WA2RZJ 100, W2JGY 81, K2UFT 80, WA2ZDT 75, WA2ZXR 59, WA2WAO 37, WA2SIV 36, WA2RMP 31, W2EC 24, K2THY 21, WA2VKK 19, WA2IZV 12, W2PF 10, K2AAS 9, WA2YNH 6, WA2EFN 5, WA2RAQ 5, WA2VZVN 5, W2EHA 4, WA2GFP 4, K2KHK 3, WA2PMW 2, WA2RKK 2, WA2TYF 2. (Feb.) WA2VLK 173, WN2EQP 2.

NORTHERN NEW JERSEY—SCM, Daniel H. Farley, WA2APY—SEC: K2ZFI. RM: W2QNL. PAM: K2SLG. V.H.F. PAM: K2VNL. Names, times and frequencies of the NNJ NTS nets: The NJN, 0000Z, daily, the NJPN, 2330Z, daily except Sun. at 1400Z on 3900 kc.; the NJ 6 & 2, Mon., Thurs. and Sun. 0300Z on 51.15 Mc., Tue. and Sat. 2200Z on 146.70 Mc. Sessions, attendance and traffic of the above: NJPN, 31-572-191, NJ 6&2, 22-123-47. New appointments: WA2OQP and WA2ZZR as OPSs, W2CG as OO, WA2IGQ as ORS, WA2WAJ as OPS. Renewed appointments: W2BVE as ORS and K2VNL as V.H.F. PAM. WA2ZQH got his MARS call and reports 15 meters really is hoppin'. We still get the same reports here about bad operating aimed at the A-1 Operators. A-1 can be revoked and with the air crowded these days we can stand the courtesy correctness of A-1 operating. WB2CWG got his Tech. class ticket. Sorry to hear that NJPN Manager W2ZI has been in the hospit. WA2VUQ is off 6 and on 2. WA2UDX is building a rig. WN2DDA worked six new states. Guess we all better get on 15. WB2CRS has hooked up a tape recorder for the better QSOs. WA2WSB is building a front end for his receiver. We are glad to welcome the Central Jersey VHF Society as an affiliated club. Secretary is Kenneth Porsolt, WA2PNN, 26 Chestnut St., Edison, N.J. WA2VUM got such good results with his antenna lying on the ground he thinks he will leave it there. W2FNX put a new rig on the air, beams antennas and all. WA2BHC got his General. We also are glad to have the Tri-State V.H.F. Association, Mr. Seul Yee, WA2CMG, secy. P.O. Box 118, Whippany, N.J., as an affiliate. WA2PWI thinks the month of March was rather dull except for 20 meters. W2EWZ applied for the USA-CA. Nice to hear WB2DEP on the NNJ Net. W2CVW made a killing in the YL/OM Contest; you can tell he's single. WA2EDG reports that W2BSC (Steven's) has got a kw. but needs 220V. WA2ZZR has a kw. linear too. WA2SRK needs a gun to kill the birds in the v.f.o. WA2LPJ reports the passing of K2MHM, an ardent 50-Mc. operator. Wonder if anyone besides W2CVW noticed WB2APY on the NJN frequency. Gee, guess I'm on OT now. WA2CCF and WA2UOO made the BPL. Requests for OBS and OO appointments still are coming in and only a limited number are available. Please don't feel slighted if the appointments aren't always granted. Traffic: K2UCY 315, K2VNL 243, WA2GQZ 188, WA2SRK 169, WA2CCF 117, WA2TJZ 117, WA2UOO 113, WA2ZZR 109, W2CVW 102, K2SBS 82, WA2WSB 75, WA2ZKO 50, K2JTU 47, WA2LUD 32, WA2BNF 31, WA2OQP 29, WA2WAJ 29, W2FNX 28, WB2CRS 25, W2NKD 24, W2TFM 24, W2SJB 23, WA2APY 19, K2SLG 16, W2EWZ 14, W2ABL 13, K2EQP 13, WA2ZOH 11, WA2IGQ 6, W2OXL 5, WA2ZKT 4, WA2VUM 3, W2NIY 2, W2BSC 1.

MIDWEST DIVISION

IOWA—SCM, Dennis Burke, WØNTB—SEC: KØENX. RM: WØLGG. PAMs: WØLSF, WØPZO. KØJVO is a new OO Class III. WØNWX worked 2 new VP4s on 160. Let us not be like the old Dutch proverb "Too soon old und too late schmart." Make up your mind if you want amateur radio to continue, and if you do get with it and support our parent organization; namely ARRL. I am sure the boys at West Hartford will welcome your advice on what should be done. Net activities: 160 Meters, QNI 1164, QTC 21, Sessions 31.75 meters, QNI 1228, QTC 224 sessions 26. Tallcorn, QNI 169, QTC 114, sessions 19, average 6; for Feb. QNI 160, QTC 118, sessions 19, average 6.2. Hamilton Co., QNI 133, QTC 5, Webster Co. RACES, QNI 107. New club officers: Davenport ARC—KØMST, pres.; KØSVZ, vice-pres.; WØCCT, secy.; KØFQT, treas. Iowa U. ARC—

(Continued on page 124)

PROPER ADJUSTMENT of the notch filter and notch depth controls in receivers such as the NC-303 and NC-270 can make the difference between no QSO and solid copy. The operation of the depth control, in particular, seems to be most often misunderstood — perhaps because its name is a misnomer. The so-called "depth" control is usually a balancing potentiometer in both regenerative Q-multiplier and Bi-filar T-notch nulling circuits, and is provided in order to allow the operator to balance the notch filter for maximum rejection, and to compensate when necessary for component aging or drift.

THE EASIEST WAY to adjust the notch and depth controls in any receiver is to simulate an interfering heterodyne by tuning the receiver to a fairly strong steady CW signal, such as that from a crystal calibrator, turn on the BFO, and adjust the main tuning for a beat note of approximately 800 cycles. Set the depth control (which may be either front panel or internally adjusted) to a trial position and rotate the notch frequency control until a null in the signal is detected. Unless you are lucky and happen on the precise depth control setting immediately, the notch frequency tuning will be quite broad through the null, and the null itself will not be pronounced. Leave the notch setting alone, and *carefully* re-rotate the depth control for a greater null. Go back to the notch control again and alternately rock both the notch and depth controls back and forth until the point of maximum null is obtained. You'll find that as the proper settings for both controls are approached, it will be necessary to be quite careful to "catch" maximum null.

AT THIS POINT you should be able to reduce the heterodyne by a minimum of 40–50 db, and *the depth control should now be left alone.* It has served its main purpose — to balance the notch filter for maximum rejection. All future work on heterodynes should be done only with the notch frequency adjustment which should be tuned out of the receiver passband when not actually in use. On some receivers there may be enough AGC action available on strong signals to override the notch — that is, the AGC brings the rejected heterodyne back up in amplitude and an adequate null cannot be obtained. During CW reception the solution is easy — simply turn the AGC off. For SSB and AM, back the RF gain off until AGC action is reduced sufficiently to get the proper null. This point may usually be found anywhere below the AGC "knee" — the point where reduction of RF gain on a strong steady signal causes the S-meter reading to suddenly drop rapidly.

ASIDE FROM ROUTINE rejection of heterodynes, the notch filter can serve a most useful purpose by being used to increase the effective CW and SSB selectivity of the receiver. Set the receiver up for single signal CW or SSB reception, and tune a steady CW signal *through* zero beat until it peaks up on the *suppressed* side of the receiver filter and simulates the unwanted "audio image." The signal will be quite weak but will probably still be readable. Now tune the notch frequency control and notch out the signal completely. Go back and run through zero beat again — if "pop-up" of the unwanted signal is apparent, unbalance the notch depth control slightly to widen the rejection notch. You have effectively added the rejection capability of the notch filter to the selectivity of your receiver and the improvement should be well worthwhile — particularly when digging out the weak ones during Sunday morning QRM.

MIKE FERBER, W1GKX

KØUJJ, pres.; WØFHS, vice-pres.; KØBFI, secy.-treas. SWIOWA ARC—KØGIE, pres.; KØPFA, vice-pres.; KØHCX, secy.-treas.; WØYIQ, dir.; KØTHG and KØAJA, programs; WØGUD, TVI. Central Iowa ARC—KØHTK, pres.; WAØDGY, vice-pres.; WØEFL, secy.-treas. Traffic: (Mar.) WØSCA 1212, WØLGG 1086, *WØPZO 227, WØBDR 141,* WØNTB *114, KØQKD 93,* KØTDO 57, WØUSL 44, WØBLH 32, WØLJW 21, WØQVA 16, KØAFG 15, KØGXP 15, WØYDV 12, KØEVC 9, KØMHX 8, WØDIB 7, WØNWX 7, WØIO 5, WØEEG 4, WØFMZ 4, WØGQ 4, KØJYZ 4, WØUIZ 4, KØUAA 3, KØQVZ 2. (Feb.) KØAUU 37, KØUAA 3.

KANSAS—SCM, C. Leland Cheney, WØALA—Asst. SCM: Richard G. Caspari, WØYZB. SEC: KØBXF. PAMs: KØEFL, WØBOR. RMs: WØQGG, WØPFG. V.H.F. PAMs: WØHAJ, KØVHP. Net reports:

Net	*Freq.*	*Time*	*Days*	*Sessions*	*QTC*	*QNI*	*Average*
KPN	3920	1245Z	M-W-F	31	118	500	16.1
QKS	3610	0030Z	Daily	No March Report			
HBN	7280	1800Z	Daily M-F	20	146	475	23.7
SCAN	7070	1900Z	Mon.	No March Report			
SCAR	7205	1900Z	Tues.	No March Report			

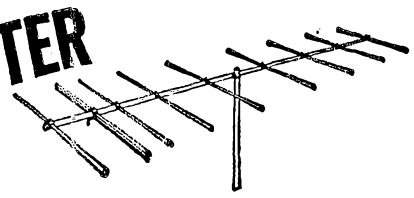
The following hold ORS appointment: WØPFG, WØQGG, WØSAF, WØKSY, WØBLI, WØFDJ, KØBXF, WØOAQ, WØIFR, *KØHVD, WØRJF,* WØBYV, WØVBQ, WØHS. Appointments are available for active stations. Apply to your SCM. Endorsement is necessary each year to keep your appointment. Also stations *Must* make monthly reports. WØVBQ now is comfortably relocated in his new radio studio in the basement of a spanking new home. WØHAJ bemoans an all-time low *ebb in 2-meter activity in his area. 6 meters is slow but* should perk up with the anticipated spring skip. With the advent of spring comes the usual tornado activity with lots of business for the Kansas Weather Net. These operators are to be commended on their splendid work in assisting the weather bureau and residents of the state. Traffic: (Mar.) KØZPN 527, WØBVV 180, WØBLI 57, *KØYTA 52, WØTWJ 31, KØGII 29. KØEFL* 25, WØEXG 21, WØIFR 15, KØQKS 15, WØTSR 9, WØALA 8, KØLHF 8, WØFPI 7, WØRJF 7, WØVBQ 7, WØERQ 6, KØVQC 6, WØFHU 4, WØYZB 4, KØEMB 3, KØJID 3, KØTGR 2. (Dec.) KØYTA 293.

MISSOURI—SCM, Alfred E. Schwaneke, WØTPK—SEC: KØWNZ. RMs: WØOUD, KØONK. PAMs: WØBVL, WØBUL, KØONK, WØLFE (v.h.f.) Renewals: WØEPI, KØJPL, KØWNZ, WØEOJ, KØVPH as OBSs; WØGCL, KØLGZ, KØBLJ, WØTPK as ORSs; WØKY as OBS; KØJPJ, Class I; KØJPL and KØONK, Class III and IV, as OOs. New appointments: OBS (6 & 2 meters) KØJWN as OBS, (6 and 2 meter); WØBUL, MEN manager (by vote of the net members) as PAM; KØONK, as PAM for liaison with intersectional phone nets; KØONK, as Saline County EC. I am trying to bring the files on appointments up to date for all appointees. The Wave Riders of Branson and the Chillicothe ARC are two new ARRL affiliated clubs. Congratulations! WØQDF demonstrated new transceivers to the N.W. St. Louis ARC. KØGOB is the new president of the Missouri University ARC and reports completion of a new SB-10 and a DX-100 to put WØZLN on s.s.b. KØFPC received his A-1 Operator certificate. So did WØTPK. KØVSH received his DXCC certificate. WAØFBQ has a new DX-60. WØAIM now is Acting EC for Jasper county. Have a big Field Day and send news. Net reports for March: Phone: MEN QNI 335, QTC 119, NCS KØVPH 5, KØONK 4, WØTPK 4. MO S.S.B. QNI 189, QTC 38, NCS WØECA 4, WØOMM 4; PON (MO) QNI 316, QTC 83, NCS KØBWE 8, WØHVJ 8, KØONK 3, KØVIQ 2. C.W. nets: MON QNI 203, QTC 138, NCS KØFPC 10, WØOUD 7, WØKIK 4, KØVBT 2, KØVPH 2, KØGFA 1; SMN QNI 25, QTC 64, NCS KØFPC 5; MSN QNI 68, QTC 53, NCS WNØCWV 5, KØONK 6, KØFPC 5, WØZLN 4. Traffic: KØONK 1427, KØGFA 416, KØFPC 353, KØVPH 149, WØTPK 147, WØOUD 80, WØKIK 67, WØMKJ 62, KØVNB 49, KØBLJ 40, WØZLN 38, KØYIP 37, WAØCXG 28, WØBVL 25, KØVBT 24, WNØCWV 21, WØEOJ 19, KØVIQ 15, KØVSH 10, KØBWE 9, WØPXE 9, KØWNZ 8, WØEEE 5, WØKCG 2.

NEBRASKA—SCM, Charles E. McNeel, WØEXP—SEC: KØTSU. The Nebraska Emergency Phone Net, WAØBES, reports 31 sessions, QNI 915, QTC 97, 100 per cent check-in WØFIG, Western Nebraska Net, WØNIK, reports QNI 638, QTC 524, of which 491 were WX, 100 per cent check-in WØAHB, KØAIE, KØBMQ, WØDVB, KØITP, WØNIK, WØZHV. The 75-Meter Morning Phone Net, KØDGW, reports QNI 572, QTC 106. The Storm Net on 3983 kc. at 1930 CST, KØJXN, reports 31 sessions, QNI 590, QTC 11. WØOKO is moving to Illinois and we are losing a very fine RM. Good luck, Bill, at your new QTH. A simulated RACES Emergency Civil Defense drill was held very successfully at Kearney Apr.

(Continued on page 126)

NEW SCOTCH! MASTER



2 & 6 Meter Antennas

MOSLEY Model A-92-S

An introduction to the New MOSLEY SCOTCH-MASTER two meter beam. This nine element antenna may be mounted vertically or horizontally, providing excellent front-to-back ratio, handling maximum legal power, amplitude modulated or 2,000 watts P.E.P. SSB. Mounting bracket fits masts up to 1½ inch OD. Antenna is matched for 300 ohm balanced line. Boom is made of sturdy medium weight wall 1¼ inch OD aluminum tubing to achieve maximum strength with minimum weight and wind loading characteristics. Stacked arrays feature 300 or 75 ohm balanced feed.

SPECIFICATIONS AND PERFORMANCE DATA: Forward gain, 14 DB. Front-to-back, 20 DB. SWR, 1.5 to 1 or less at resonant frequencies. Maximum element length, 41 inches. Boom length, 12 feet. Turning radius, 6.5 feet. Assembled weight, 4 pounds. Maximum wind surface area, 1.25 square feet. Wind load, 25 pounds. Antenna is shipped in kit form. Amateur Net $16.40

MOSLEY Model A-76-S

Also introducing for the first time, the MOSLEY SCOTCH-MASTER six meter beam. This seven element array provides maximum forward gain with excellent directivity. SCOTCH-MASTER will handle the full legal power, amplitude modulated. Mounting bracket fits up to 1½ inch OD mast. Antenna is "Gamma" matched for 52 ohm unbalanced line. Boom is of heavy guage 1¼ inch OD aluminum. Easily rotated with TV rotor and can be mounted vertically or horizontally.

SPECIFICATIONS AND PERFORMANCE DATA: Forward gain, 12 DB. Front-to-back, 20 DB. Boom length, 24 feet. Turning radius, 13 feet. Assembled weight, 12.5 pounds. Maximum wind surface area, 2.5 square feet. Wind load, 51 pounds. Antenna is shipped in kit form, complete with detailed instructions. Amateur Net $35.10

MOSLEY Model A-56-S

The New MOSLEY SCOTCH-MASTER six meter beam features five elements, maximum forward gain and excellent directivity. This gamma matched beam will handle the full legal power amplitude modulated. Can be mounted vertically or horizontally. Feed with 52 or 75 ohm line.

SPECIFICATIONS AND PERFORMANCE DATA: Forward gain, 10 DB. Front-to-back, 20 DB or better. SWR, 1.5 to 1 or less at resonant frequencies. Maximum element length, 118 inches. Boom length, 12 feet. Turning radius, 7 feet 8¾ inches. Assembled weight, 6.5 pounds. Wind load, 32 pounds horizontally, 56 pounds vertically. Antenna is shipped in kit form, complete with detailed instructions. Amateur Net $ 28.16

•• Mosley SCOTCH-MASTER Stacking Kits ••

MOSLEY Model A-92-S-SK1

A kit for stacking two horizontally polarized A-92 SCOTCH-MASTER beams, one above the other. Comes complete with matching transformer, insulator, complete instructions and phasing line. Feed point impedance - 300 ohm balanced line. This stacked array will attain 3 Db additional gain over a single horizontally mounted beam. Amateur Net $3.15

MOSLEY Model A-92-S-SK2H

A kit for stacking four horizontally polarized A-92 SCOTCH-MASTER beams, two over two. Complete with support members, mounting plates, phasing line, insulators, hardware and instructions. Feed point impedance - 75 ohm balanced line. This stacked array will attain 6 Db additional gain over a single horizontally mounted beam. Amateur Net $44.35

MOSLEY Model A-92-S-SK2V

A kit for stacking four A-92 SCOTCH-MASTER beams, two over two, in the vertical plane. Comes complete with support members, mounting plates, insulators, phasing line, hardware and instructions. Feed point impedance - 75 ohm balanced line. This stacked array will attain 6 Db additional gain over a single vertically mounted beam. Amateur Net $44.35

Mosley Electronics, Inc. 4610 North Lindbergh Blvd. Bridgeton, Mo.

2. This was conducted from the county bomb shelter in city hall, both hospitals and mobile units and was 100 per cent successful between Kearney and c.d. headquarters in Lincoln and other points out of the state. The Blue Valley Amateur Radio Club of Seward is expanding its public relations program through presentations on amateur radio at various organizations in Seward. Traffic: (Mar.) WØGGP 407, WØLOD 116, WØJCF/0 88, KØKJP 66, WAØBID 57, WØNIK 52, WØOKO 51, WØFIG 49, WAØBYK 48, KØRRL 44, WAØBES 42, WØYER 35, KØFAL 32, KØDGW 30, WAØAES 29, WØAHB 26, WØZHV 26, WØRIH 24, WICJP/0 22, WØEGQ 22, WØZJF 17, WØCCD 14, KØKEK 14, KØCYN 13, WAØCDQ 12, WØBOQ 11, WØIAY 11, WØNOW/0 11, KØZEO 11, WØNYU 10, KØFJN 9, WØVEA 9, KØMSS 6, KØYZP 6, WØVZJ 5, KØEYZ 4, WØWKP 4, KØZTA 4, KØBRG 3, KØDVI 3, WØJFN 2, WØPQP 2, WØHOP 1, KØJPP 1. (Feb.) WØJCF/0 44, WØNYU 7.

NEW ENGLAND DIVISION

CONNECTICUT—SCM, Robert J. O'Neil, W1FHP. SEC: W1EKJ. RM: W1KYQ. H.F. PAM: W1YBH. V.H.F. PAM: W1FHP. Traffic nets: CPN, Mon.-Sat. at 1800 on 3880 kc. CN daily at 1845 on 3640 kc. CVN, Mon., Wed. and Fri. at 2030 on 145.980 Mc. Certificates and awards: SNC and CPN to K1PUG and K1PPF. W1YBH reports only 60 have been issued since 1956. A new EC is W1OPZ of New London. ORS endorsements: W1RZG and W1BNB. AREC membership cards went to K1UUP, K1HNG and KN1ZXO. BPL certificates were issued to K1LOM and K1WKK for March traffic. W1EQV and W1CKA sent OO reports. OES activities reports were received from K1PLR, K1VMI, K1ONX, K1RTS and W1NGR. Spiritan Fathers ARC (K1JAD) operators K1JXG, K1LAH and K1LQD will be operating from summer locations and will be looking for Norwalk area hams for QSOs. K1JXG hopes to be in Africa on an assignment. K1KEA is home from the service and is on with a Marauder and a tri-bander beam. *Key Klix* and *Hara-Scope*, Meriden and Hamden Club bulletins, keep the members well informed with news of interests. Congrats on well-written bulletins, editors. W1GNS was honored with a tour and a meeting of the crew aboard the SS *Hope* for his traffic-handling recently. Bristol papers carried the story and pictures of the event. The Connecticut traffic nets held a dinner in Forestville with a large turnout. W1EFW, New England Division Director, spoke on the ARRL. W1FHP, your SCM, spoke on station reports and the importance of reporting your station activities. CPN manager W1YBH lists attendance leaders in March as follows: W1FHP, K1AQE, W1LUH, K1ONZ, W1DAV, K1DGK, K1SRF, W1VQH, K1NTR and K1PUG. He reports 30 sessions held, with 181 messages handled and an attendance of 19 stations. CVN reports 54 stations in 11 sessions. CN reports 31 sessions, 329 messages, attendance 9.2 stations per session, high QNI W1CTI, K1CGG, W1RFJ. Traffic: (Mar.) K1LOM 562, K1WKK 233, K1QPN 177, W1AW 161, W1EFW 134, W1CTI 110, K1PQS 104, K1GGG 86, K1PUG 69, K1JAD 56, W1RZG 55, W1EKJ 52, W1LUH 44, K1DGK 42, W1MPW 42, W1YBH 39, K1SRF 34, W1BDI 33, W1RFJ 30, K1NTR 27, K1AQE 26, W1CUH 18, K1UQQ 17, K1OIZ 16, W1BNB 10, W1CHR 10, K1QVX 5, K1MHM 4. (Feb.) W1CUH 9.

MAINE—Acting SCM, Robert R. Beaulieu, W1YYW—SEC: K1DYG. RM (Acting): K1MZB. PAM: K1ADY. Traffic nets: Phone—Sea Gull 3940 kc. 1700-1800 EST. C.W.—PTN 3596 kc. 1900. W1WRZ celebrated his 62nd birthday by saying "Hello" to the Barnyard Net from the Veterans Hospital at Togus, via K1MDM. W1ZE, acting as M.C., led the net in the now well-known "Royal Salute" for Hap. Hap says a big "Thanks" to the many hams who called and sent messages, letters and cards, and also to those who came to visit. Gladys, Hap's XYL has made many trips to visit her OM at Togus, from atop their snowbound antenna farm. K1IQZ, Angie; K1LMJ, Gil; and K1AXO, Cy, have done an excellent job of bringing patients at the Veterans Hospital at Togus a little closer to their families an loved ones. A hearty thanks, from K1BZD, chief opr. at K1MDM. Walt advises that they have started an amateur radio club at Togus hospital for patients and volunteers. In the group are 3 boys, ages 11 to 13 years. Hams visiting Togus in March were K1SFX, W1YYW, K1YJE, W1QIH, K1UXZ and dad W1JTH, W1NDG, W2STH, W1BOC, W1VXU likes to needle W1YYW about night-clubbing activities. K1QIG has finally got an antenna that really works. W1FKC is doing fine as net control on the Sea Gull Net. K1MZB/M witnessed an auto crash in Gorham Mar. 31. K1LTO on frequency then alerted Gorham Police. K1SCY/M, also on frequency stopped at State Police Hq. in Scarborough. Police were at the scene in 15 minutes. The s.s.b. gang here is working Mainers who have transplanted to Florida on 75 meters. W1GRG has started his studies at Mass. Radio School. Thanks, Bob, for the excellent job you did

(Continued on page 138)

BRAND NEW FROM CLEGG LABS . . . THE

POWER PACKED THOR 6

TRANSCEIVER FOR 6 METERS.

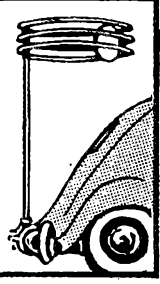
Come on up out of the noise . . . let 'em know you're around! For contests, marginal openings or just overriding the Qrm . . . your new sixty watt, VFO controlled, 100% high level modulated THOR 6 transceiver makes you the "Voice of authority" on six . . . and what's more you'll hear them too! The receiver section with its crystal lattice filter, is selective to the nth degree and so sensitive that even S1 signals are Q5. Sound good? Here's the rest of the story.

TRANSMITTER FEATURES:

- **FULL 60 watts input on phone or CW to 6883 final.**
- **BUILT-IN VFO that automatically tracks the receiver or switches to crystal control for fixed frequency operation.**
- **ALL stages broadbanded for easy QSY.**
- **SPEECH-CLIPPING FOR MAXIMUM talk power.**
- **BUILT-IN PUSH-TO-TALK.**
- **BUILT-IN Keying relay for clean chirpless keying.**

MOBILE OPERATION

Now you can run a mobile "power house" using the new Clegg Model 418 transistorized 12V DC power supply / modulator unit to power your THOR 6 transceiver.



RECEIVER FEATURES:

- **NUVISTORIZED front end for extreme sensitivity at lowest noise level.**
- **CRYSTAL lattice filter for maximum selectivity.**
- **BFO with variable carrier injection for SSB reception.**
- **ULTRA-STABLE tuneable local oscillator that also functions as VFO for transmitter.**
- **EXCELLENT audio characteristics. 2 watts into 3.2 ohm speaker.**
- **Sharp reduction in spurious responses and cross modulation.**
- **Effective noise limiter.**

The THOR 6 is of two unit construction with attractively styled receiver and transmitter rf section mounted in one cabinet for convenient desk top operation. The power supply/modulator section is mounted in a second cabinet for remote location. A ten foot interconnecting cable is provided.

Amateur net price for AC operation $349.95. 12V DC Mod./Pwr. Sup. $100.

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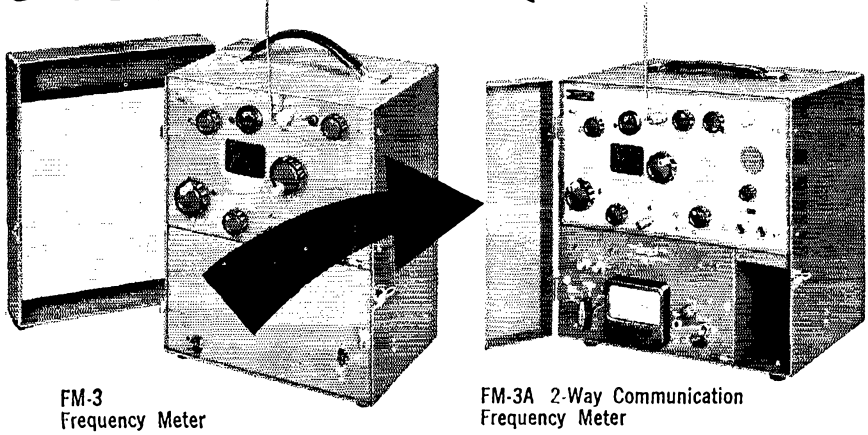
here as SEC. Traffic: K1GUP 211, K4BSS/1 50, K1MZB 49, K1MDM 40, K1SZC 37, K1UXZ 19, K1ADY 12, W1-YYW 10, K1VEQ 5.

EASTERN MASSACHUSETTS—SCM, Frank L. Baker, jr., W1ALP—SEC: W1AOG. Appointments endorsed: W1HKG Malden, W1DBY Chelmsford, W1EHT Wayland, K1HBM Stoneham, W1IPZ Shirley, W1HRY Wellesley, W1RM Newton, W1AAU Dedham as ECs; W1MX, W1DOM, W1DIY and W1HIL as OPSs; W1MX, W1SMO, W1DIY and W1FJJ as ORSs; K1KMV as OES; W1s NF, JNV, WK, RHN and ACB as OOs; W1ALP as OBS. We wish W1QON the very best of luck after serving as YL Editor for 10 years. The Needham HS ARC is now affiliated with ARRL. Ed Craig is secy.-treas. On 2 meters: K1s RWS, PQG, RXS, GHH, RAB, MNO, WNJ, TBD, KN1s UKE, YEU, W1YGC. W1ALP is back on 2 again. On 75 meters: W1s QAF and VKL. W1ALP spoke at the Framingham Club. K1VHZ is busy at B.C. High. K1DYA is in the USAF and at Otis Field. W1AOG received reports from K1s MBU, IMP, OLN, ICJ, PNB, W1s FON and HNW. W1BGW took part in the RTTY SS Contest. K1UHN and W1HBB spoke at the QRA meeting. K1TWV is Middlesex ARC treasurer. K1OGA has a new 51J4 and is looking for DXCC. The T-9 Club met at Doc Savage's. KN1ESG, Woburn, is 12 years old. W1KSZ and W1FTK made a QSO on 1215 Mc. A first in Boston? The Cape Cod & Island ARA is making Field Day plans. Our sympathy to W1SGL on the death of his sister. W1AKN is active mobile. W1GRC and K1CQD are in the hospital. W1CMT is in a nursing home in Framingham after an illness. W1PX is considering s.s.b. W1BMW is studying hard since his promotion in the USNR. W1NUP is active in traffic nets. K1HBM, Stoneham EC, has the following working with him: W1s WYC, AUO, K1s NOE, LIH, VKW and NTY. K1-NOE and his XYL are in Florida. K1ONW is on 40 meters with a dipole. W1OSS is building a transistorized 6-meter rig for the car. K1SGZ is mobile on 6 meters. W1FON, Boston EC, says they are getting mobiles organized for the AREC. W1AUQ got 4 new countries in the DX Contest. K1GKA has a new baby son and new skeds. W1FJJ made ZX s.s.b. DXCC. K1UAB has the mobile rig on 10. W1HGT now is a member of the First Class Ops Club. K1QVU is a member of the 6-meter mobileers. W1ZFQ is working hard for his Extra Class license. W1NSP has a new QTH in Lakeville. Our sympathy to W1MHN on the death of his XYL. K1WJD is NCS once per week for EAN. K1VWL passed the General Class exam; he got WAS as a Novice. W1NF has been a ham for 60 years. W1JXZ, formerly of Milton and now in N.H., writes that he is on 75 quite a bit. W1OHA now has a Dim Light. W1FQA is in Florida. W1BA is working on DXCC. W1MCE is the new Vice-pres. of the Yankee Radio Club. The club heard a talk on Safe Boating by Mr. Joseph Pergola. W1AWO is on 160. The Milton Club and North Shore RA had Wellesley ARS auctions. North Shore had a talk on First Aid and Disaster by Mr. Gauthier of the Lynn Red Cross. W1-RHN is building an s.s.b. rig. W1IPZ is on 21-Mc. phone trying to work stations in New Mexico, where his boy is going to school. K1REW is running a party boat in Florida. K1LIE is pushing the classes at Barnstable Radio Club; over 100 attended a banquet. W1DY is at Woods Hole for a month. K1KKS has been endorsed as OES. WOPAN/1 is in the Navy living in Brockton and is on the air 80 through 10. W1CJK is on 50-Mc. s.s.b. W1ZBL has a new son. K4BVD, K4RNH and K4RID, at W1MX, spent a lot of time in the DX Test. KN1s ZOE and ZFU are on 2. KN1UKE and K1PQG are in our EM2MN. The EM2MN had 22 sessions, 236 QNIs, 223 traffic. The Massasoit ARA had a Homebrew Equipment Night. K1HKG is director for Field Day. K1JIL is home on leave. W1BB has a Valiant for 160-meter DX. Traffic: (Mar.) W1PEX 1109, W1EMG 460, K1ONW 333, W1OFK 252, K1PNB 225, W1ZSS 194, W1LES 180, K1MYN 78, W1DOM 56, W1AOG 45, W1-FON 34, K1OFV 32, W1AUQ 30, W1SIV 19, K1GKA 16, W1FJJ 13, K1UAB 11, K1CMS 10, K1SMT 8, K1TNL 8, K1VXB 8, W1MX 7, W1HGT 5, K1OWK 4, WOPAN/1 4, K1QVU 4, W1ZFQ 2. (Feb.) W1DIY 57, K1WJD 46, K1-CMS 17, W1DLY 10, K1LCQ 6.

WESTERN MASSACHUSETTS—SCM, Percy C. Noble, W1BVR—SEC: W1BYH/K1APR. C.W. RM: K1-IJV. PAM: K1RYT. RM K1IJV reports the following stations are quite active on WMN (3560 kc. 7 p.m. daily except Sun.): W1DVW, K1IJV, K1SSH, W1BVR, W1-ZPB, K1LBB, W1BKG, K1VPN, W1MND and W1AMI (in that order). WMN is open to any Western Mass. station—the more the merrier! PAM K1RYT is trying very hard to get a West. Mass. phone net going on 3870 kc. Drop him a line for details—Dr. David Angel, P.O. Box 493, North Adams. We have had good West. Mass. phone nets in years gone by; let's build one up again! K1TLY has a new three-element beam on 6 meters. W1-JYA sends Official Bulletins on 50,499 Mc. at 0900 Sun., 1900 Tue. and 1845 Wed. K1JQT/8 is on 40- and 80-meter c.w. from Hiram, Ohio. W1DPY has completed his

(*Continued on page 130*)

YOUR GERTSCH FM-3 FREQUENCY METER CONVERTED TO MEET FCC REQUIREMENTS



FM-3
Frequency Meter

FM-3A 2-Way Communication
Frequency Meter

— factory conversion provides direct reading of all allocated channels in the 150-170 mc band

All Gertsch Model FM-3 frequency meters can now be factory-converted to measure and generate *all* assigned channels in both 150-170 mc, and 450-510 mc bands.... with ±.00025%(2.5ppm) accuracy. Instrument features a single 1-mc crystal which is easily standardized against WWV.

Converted units can also be operated as standard FM-3 instruments through 20 to 1,000 mc, at .001% accuracy.

Conversion includes: an all transistorized converter module, a new front panel and carrying case, and a built-in amplifier (with speaker). Also, a front-panel jack allows input of external audio signals, such as those from a Gertsch Model DM-3 deviation meter. Space for a DM-3 is provided in the case.

Compact size — only 13½" W x 11½" D x 13¾" high.

New Gertsch frequency meters are also available in both battery operated and AC power supply units. New meters incorporate same features as converted instruments.

Send for literature on FM-3A series.

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Heath Marauder. W1BVR cannot say the same for his HX-20! K1PDM is now in Turkey. K1ZNL has completed an 813 job and will be on 7 and 21 Mc. Six meters is very active in the Pittsfield area. K1PYX has a new Clegg 6-meter transmitter. The new officers of the Nipmuc Emergency Radio Corps of Upton are K1KQK, pres.; K1ODW, secy.; K1ZNU, treas.; K1SLG, corr. secy.; W1DGM, W1FY, K1PQY and K1MBW, trustees. Traffic: (Mar.) K1SSH 514, K1LIV 161, W1ZPB 146, W1BVR 84, W1DVW 39, K1LBB 38, K1ZBN 23, K1TLY 9, K1TTT 6, K1VPN 2. (Feb.) K1TTT 4.

NEW HAMPSHIRE—SCM, Albert F. Haworth, W1YIH—SEC: W1TNO/W1ALE. PAM: K1NXV. RM: K1BCS. *Attention*: The NHN (c.w.) now meets at 2345Z on 3685 kc.; CSPN and CNEN same as reported last month. Endorsements: K1MOZ as OBS; K1PDA as OES. Appointments: K1DWK as Asst. EC Merrimack. K1ECU as OBS; W1ALE as OBS; K1TMD as ORS. NHN (c.w.) certificate were issued to W1SWX/1, W1EVN, K1TMD, K1UHE, K1AEG, K1SDL, W1MKA. Congratulations to K1DWK, net manager of Merrimack County. The AREC Net, which meets Mon. at 2100 EST on 50.82 Mc. and to K1BCS on his appointment as Navy MARS Director. Anyone interested in same, contact Press. New officers at W1OC: W1CNX, pres.; W1CUE, vice-pres.; W1AIJ, secy.-treas. A fine AREC meeting was held by K1CXP at the Nashua Mike & Key Club. K1PWF placed second at the Science Fair with his HB s.s.b. rig. The Nashua Mike & Key Club is sponsoring the granite State Award certificate. W1SWX/1 completed WAC on 80 meters during the DX Contest. Traffic: K1BCS 1524, K1TMD 368, W1CUE 23, W1EVN 17, K1UHE 12, W1ET 9, K1BGI 6, W1SWX/1 4, W1TFS 4, K1ECU 1.

RHODE ISLAND—SCM, John E. Johnson, K1AAV—SEC: W1YNE. PAM: W1TXL. RM: W1SMU. New appointments: K1OZI as OBS and OPS; K1QKJ as OES; K1JOD as EC of Tiverton; K1RHG as EC of Bristol; W1QLT as EC of the University of R.I. Endorsement: *K1NKR as OES. RISPN report*: 31 *stations*, 728 QNI, 187 traffic. The AREC under the K1RFM, Coventry EC, provided transportation for the Polio Clinic held recently in the area. AREC members participating were WIs ZRO, VDI, IMY, KIs VOU, VVO, DVY, VFM, VYC, WPH, YJO, UOW, VZU, ADK, CPL, WPA, UAM and OZI. The NCRC of Newport reports that K1TAQ and W1UGH were elected to membership. K1ZHA was awarded the NCRC certificate for working five members of the club. K1CFQ is back on the air with a new Ranger and an RME-6900 receiver. W1CCN is now on s.s.b., 75 and 20 meters, looking for contacts. W1MZB is building a new home in Bristol on three acres of land for his antenna farm. Construction is in progress for a *20-meter rhombic and a 100-ft. tower for his tri-bander* beam. K1TPK worked W3JZY on ground wave. Traffic: W1TXL 949, K1TPK 51, W1BTV 42, K1NJT 42, K1DZX 32, K1SXY 20, W1YNE 7.

NORTHWESTERN DIVISION

IDAHO—SCM, Mrs. Helen M. Maillet, W7GGV—The FARM Net meets at 1900 MST on 3935 kc. M-F. The Gem State Net meets daily at 2000 MST on 3580 kc. TEN meets Sun. at 0900 MST on 3910 kc. The Boise Valley Net meets Sun. at 1930 MST on 145.44 Mc. The Early-bird Contact Net meets at 0700 MST on 3995 kc. with W7DWE as NC. The FARM Net elected K7KBX of Sagle, mgr. and K7OAB, of Rupert, net control. The WIMU Hamfest Committee is busy making plans for the annual meet at Macks Inn, Aug. 2, 3 and 4. The Pocatello Club assisted with communications in search for two crashed aeroplanes. Rexberg AREC operated portable in Clark County to aid Centennial Certificate seekers in getting a rare county. W7GGV is the first Idahoan to get the Centennial certificate. K7MRX, K7-GTK and K7CPC have USA-CA. K7HYJ won a prize for the TEN check-in contest. Thank you all for your cooperation *during my term of office. Please give your* new SCM your wholehearted support. FARM Net traffic: 46. Traffic: (Mar.) K7HLR 34, K7QIE 13, K7OZB 11, W7GGV 10, W7SLY 6, W7MJZ 5, W7IY 4. (Feb.) W7JFA 24.

MONTANA—SCM, Walter R. Marten, W7KUH—PAM: W7YHS. RM: K7AEZ. The Montana Phone Net meets Mon., Wed., Fri. on 3910 kc. at 1800M. Code practice is given Mon., Wed., Fri. on 3825 kc. at 1900M by K7OGF. The Electric City Radio Amateurs Club has been renamed the "Big Sky Radio Club" (Great Falls). K7BYB has printed the first issue of the Big Sky Radio Club paper, *Hi-Q*. The Glacier-Waterton Hamfest will be held July 20-21, 1963, at Waterton Lakes, Alberta. *Station activity reports were received from* K7EWZ, K7VMJ, W7FIS, W7TYN, K7OGF, K7KJH and W7-UPR. I am sorry to report that W7ZUK became a Silent Key Mar. 10. K7EWZ is affiliated with RN7 and TWN. W7VLZ and his XYL are the proud parents of a new son. K7OGF has a new HX-20 on s.s.b. mobile, also an AF-67, CB rig, Link 2-meter rig and f.m. rig in

(*Continued on page 132*)

his car. Club officers of the Anaconda Club are K7OCK, pres.; W7TYN, secy.-treas.; W7CPS, vice-pres.; W7-TQC, pub. chairman. W7TYN is building a 2-meter beam. K7VMJ worked 56 YLs in the YL-OM Contest. (c.w.). W7UPR is moving to Oregon. W7KTC was re-elected Mayor of Darby. A new call in Bozeman is KN7WOC. W7ZPT moved to Great Falls. A new call in Billings is KN7WNV. W7BGX returned to M.S.C. K7-DES returned to M.S.U. after the spring break. K7BMI also is back at M.S.C. K7IMZ is remodeling his ham shack. The new editor of *Hellgate Static* (Missoula) is W7GBH. W7FTD served as Montana Governor during the absence of the Governor. W7FIS OO averaged one cooperative report per day. W7EGN has suggested a state frequency of 50.110 kc. for the state get-together v.h.f. frequency. It has been suggested that the 1964 hamfest be held at Helena in connection with the 1964 Montana Centennial. Traffic: K7GWZ 94, W7TYN 16, K7OGF 12, K7GHK 7, K7MEG 4.

OREGON—SCM, Everett H. France, W7AJN—SEC: W7WKP, RM: W7ZFH. Appointments: K7QCM EC for Curry County. Endorsements: K7KZP as EC, K7CNZ as EC/OPS, W7LT and W7MAO as ORSs, W7WKP as OPS. Nets: OSN C.W. NTS Traffic, 3585 kc. 0230 GMT Tue.-Sat.; OAREC C.W. Emergency 3585 kc. 0330 GMT Wed.-Thurs.; AREC Phone Emergency, 3875 kc. 0300 GMT Tue.-Sat.; OEN Phone, 3840 kc. 0200 and 0300 GMT daily; AREC V.H.F. Emergency, 50.550 Mc. 0400 Fri. W7ZFH, OSN mgr.; reports sessions 22, total attendance 181, traffic 59, BRAT awards to W7AJN, W7-BVH, W7ZFH, K7IWD, K7SQC. OAREC: sessions 8: attendance by counties, Multnomah 21, Lane 5, Clackamas 7, Columbia 6, Washington State 7, total attendance 46. All interested amateurs and AREC members are invited to participate in the OAREC. See schedules above. W7DEM reports that W7EFR, of Grants Pass, became a Silent Key Mar. 11. KN7WNN is a new ham in Grants Pass. K7TIK is on the air with a new Valiant and will operate from Black Bar Lodge on the Rogue River during the fishing season. W7RVN, Multnomah County EC, reports an increase of 3 new AREC members, making a total of 59. W7BNS, Columbia County EC, reports 2 new members, making a total of 14. YLs, XYLs, young squirts, OMs, OTs, if you never see your call in this report it is because we don't know about your activities. Traffic: (Mar.) K7IWD 345, W7-ZFH 77, K7CBA 65, W7AJN 15, W7MAO 13, W7BVH 11, W7DEM 10, W7LT 4, (Feb.) W7GUH 54.

WASHINGTON—SCM, Robert B. Thurston, W7PGY—Asst. SCM/SEC: Everett E. Young, W7HMQ. RM: W7AIB. PAM: W7FLA. The second annual banquet of the Puget Sound Council of Amateur Radio Clubs was held at the Reef Cafe in Kent with approximately 260 in attendance. The Northwest Slow Speed Net had 31 sessions, 439 QNIs and 76 QTCs for March. Net time is 2000 PST on 3700 kc. daily. The Clarke County AREC Net was activated during the big wind storm of Mar. 30 and had check-ins from all sections of the country. W7SAP is looking for TD for his RTTY. W7IST has had numerous QSOs on 220 Mc. in the Puget Sound area. The Tacoma Radio Club (W7DK) held an auction of ham gear and raised $165 for the ARRL Building Fund. The club also has a construction program going both in amateur radio and in the remodeling of the club house. W7GUJ is 100 per cent AREC in Pend Oreille County. K1RFX/7 is awaiting a new Drake TR-3. New Novices in the Spokane area are KN7WOK and KN7WOL. They obtained their licenses through the Fairchild MARS code classes. W7AIB modified his TCM-2 transmitter and took out the "yoop". KN7RRV took the Technician Class exam. W7EMP is QRL 10-meter gear for the Walla Walla Club. W7ZEI received a three-year National Science Foundation grant and will attend Cambridge University in "Merry Ole England." W7NXV is a Silent Key. K7AXV is leaving for Kentucky to teach in IBM school. Congrats to K7RAM on being nominated as Seventh District chairman of the YLRL. W7NCY is recuperating after a recent operation. The 6-meter boys in the Seattle area furnished communications for the Water Ski Race on the Sammish Slough Apr. 7. The Richland Amateur Radio Club was requested to assist in the May Army Maneuvers covering the area from Richland and Wenatchee. W7VFR is awaiting delivery of a tri-band Swan. K7-RSM had a ball during the recent ARRL DX Contest. K7UDG moved from Moses Lake to Richland. W7OEB is heard on the 14-Mc. band; Ev also has his NSA-CA certificate. W7IYC now is settled in a new QTH and is QRL with antennas. K7DFS is newly married and also in a new QTH. New officers of the Puget Sound Amateur Radio Council are W7HMQ, pres.; W7ISC, vice-pres.; W7YKA, treas.; K7LED, secy. W7UOJ reports that the Spokane Radio Amateurs emergency truck now is 90 per cent complete. W7RGL will transmit Official Bulletins on 3700 kc. at 1900 PST, Tue., Wed. and Thurs. K7GRE received his CP-25. W7BTB is handling traffic for local service men in the Bremerton

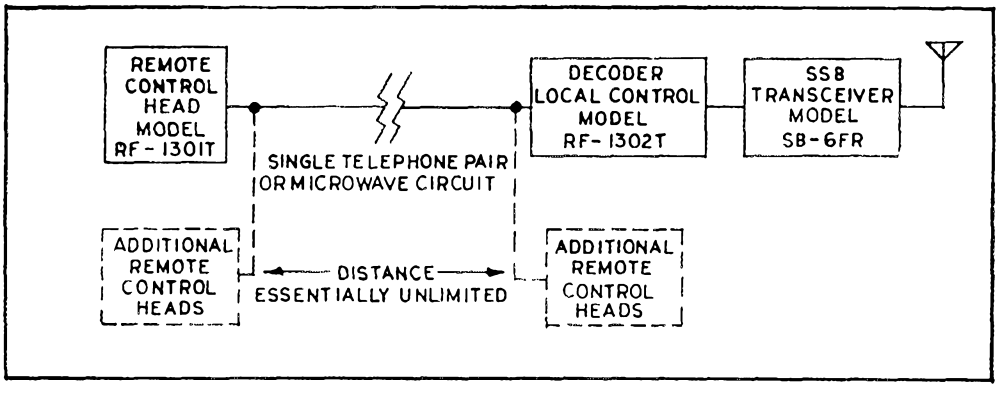
(Continued on page 134)

SSB COMMUNICATIONS
with TWO-WIRE REMOTE CONTROL

THE PROBLEM: In many commercial and government point-to-point SSB communications systems, it is necessary to locate HF radio stations in congested downtown areas. Local noise generated by fluorescent lights, elevator controls, etc., frequently results in such a high noise level as to make efficient reception impossible.

PREVIOUS SOLUTIONS: In the past, several approaches have been used to overcome this problem. One is to increase power levels in an attempt to swamp out the noise. This is obviously inefficient. Another, is to eliminate the noise. This is usually impractical, since it may originate from sources beyond control of the communications group. A third, is to use multi-conductor remote control SSB equipment which is very expensive due to the cost of running long lengths of special cable.

A NEW APPROACH: R F Communications now has available an SSB point-to-point transceiver system which can be controlled remotely over any **two-wire** communications link. This includes telephone pairs, microwave links, VHF links, etc. See block diagram below:



The Model RF-1301T Remote Control Head can be placed in any location regardless of noise level. The output can send over any two wire circuit (such as a leased telephone line) to the transceiver/antenna site. At this low-noise antenna site the control signal is decoded by the Model RF-1302T Decoder and used to control a Model SB-6FR SSB transceiver. This is a specially modeled version of the widely used R F Communications SB-6F transceiver.

Functions that can be controlled are Channel Selection, Power, Mode (SSB or AM), Transmitter Keying and Receiver AF Gain. And, the distance over which control can be exercised—**essentially unlimited.**

The SB-6FR Transceiver provides six fixed channels in the frequency range of 1.6 to 16 Mc—both SSB and AM modes. Power output is 125 watts p.e.p. Local control is also provided at the transceiver location.

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area. W7LFA is building a new rig for 75 and 20 meters. K7IEY is a new OPS in the Burlington area. Traffic: W7HA 817, W7DZX 688, K7JHA 240, W7APS 191, W7GIP 117, W7OEB 89, K7CTP 81, W7BTB 78, K7QMF 69, W7AMC 39, W7IEU 30, W7AIB 11, K7IEY 8, K7PIG 8, K7JRE 6, K7CWO 4, W7JC 4.

PACIFIC DIVISION

NEVADA—SCM, Leonard M. Norman, W7PBV—K7QPK is the new OBS for the Las Vegas Area using a 32V-1 with a 400-ft longwire antenna. W7TGK is the new EC for Boulder City. K7ICW is conducting tests on 6, 2 and 1¼ meters. W7VYC is setting up and checking out the Las Vegas Amateur Radio Club's new station; when installed in the new club room it will be available to visiting amateurs. The Silver Dollar Net meets on 3980 kc. each Sun. at 1900Z and 29.6 Mc. each Thurs. at 0300Z. The Over The Hill Net now meets each Tue. at 0400Z. Members of the Las Vegas High School Radio Club are working on 2-meter f.m. gear. Your SCM attended the Pacific Director's meeting at Oakland. Traffic: K7GQD 26, K7QPK 10, W7PBV 5.

SANTA CLARA VALLEY—SCM, Jean A. Guelin, W6ZRJ—Asst. SCM: Edward T. Turner, W6NVO. SEC: WA6EIC. RM: K6KCB. PAM: WA6HVN. Your SCM gave a talk at the North Peninsula Electronics Club and Hayward Radio Club during March and showed the Santa Clara Valley section slide collection and CD slides. This talk and the slide collection are available to any club in the section and features information on all Communications Department appointments. W6RSY and K6GZ made BPL during March. WA6RRH has taken hold of the Santa Clara Valley Section Net on 2 meters and reports 145 check-ins and 18 traffic for March. The SCVSN meets on 146.7 mc. at 0300Z. W6YBV reports that conditions on RN6 have much improved and skeds are now being kept. W6DEF is active on NCN which meets at 0300Z on 3635 kc. Hal had an "eyeball" QSO with W6ISQ and reports that Jack is recovering nicely after a recent heart attack. W6JNK is active on NCN from Daly City. RC station W6LW, of SCCARA, stood by during a recent explosion at a San Jose Department Store which killed 3 and injured 47. W6RFF is now back on NCN on a regular basis. K6MTX has his new shack in action and is on 80- and 20-meter RTTY. K6VQK is now on 2 meters. W6MMG put up a 2-meter beam and is QRL swing-shift. PAM WA6HVN was in the hospital for 8 days recently. The SCARS enjoyed a talk on tape recorders in satellites. WA6RXM is busy with OO activity and is rebuilding. OES K6HEP sports a new SX-62. Traffic: (Mar.) W6RSY 895, K6GZ 295, W6YBV 132, W6AIT 66, W6PLG 55, W6DEF 52, W6ZRJ 50, W6JNK 48, W6AUC 46, W6YHM 25, K6YKG 17, W6RFF 16, K6MTX 13, K6VQK 11, K6EQE 6, W6UVP 4, WA6HVM 3, K6TEH 2. (Feb.) W6YBV 44, WA6HVM 3.

EAST BAY—SCM, B. W. Southwell, W6OJW—W7QOH/6 has a new 3.5-Mc. end-fed long wire. WA6ECF is QRL U. of Santa Clara, but manages to get on for CD and DX Tests. WB6EIA is the new call of ex-KH6ERG. WA6MIE is busy with NCN and AREC. WA6RGD is liaison to RN6 and PAN, and worked in the DX Test. WA6BZA is a new OBS on SACEN on 50,250 Mc. W6JI is hoping to get the rig on soon. WA6MJP has a DX score of 125/94, got 10 new ones in the DX Test and is now CHC. K6ZYZ got his Extra Class ticket. Congrats. WB6DAM is new in the Napa area. K6BYQ will be trustee for the Silverado Amateur Radio Society Club station, and the memorial call of W6RBQ has been requested of FCC. AG6AA, Hamilton Air Force Base, operates relay on 148.125 Mc. WA6NOV is a new OBS in Vallejo and is working on the 10-kmc. band and 420-Mc. TV. K6GZO spoke on AFCS to the Silverado ARS. The Silverado Six Shooter Net is on 50.4 Mc. at 2100 PST each Tue. WA6KLK is on 145.8 Mc. with a new rig. WB6CKU is a new call in Pittsburg. WB6AEG reports W6BB, U. of Calif., has an emergency and traffic net on 145.2 Mc. SACEN held a net breakfast and took a tour of the tower and radar control at Oakland Airport. K6LFH gave a talk on the coming Oscar III to the LARK at its March meeting. The LARK is planning for FD. K6URG used his PE-75 during a recent power outage to supply power for his XYL's household duties as well as communications. We extend our deepest sympathy to W6HC, PDD, on the recent loss of his mother. WA6OXD is Richmond ARC pres. with WA6FFF, vice-pres.; and WA6QVS, secy.-treas. MDARC reports a new net on 28.69 Mc. at 2000 PST Mon. WA6YXP, WN6CWA, WN6CVZ and WN6CIR are new members of the HARC. K6TWB has a new c.w. perking. The HARC is readying its DX-100 for Field Day. WA6VPG and WA6VPH are QRL new QTH. WA6NPC is portable in Oregon. WV6CVA is grooming his Dad for his Novice ticket. WV6CUA is on 7 Mc. with a DX-60 and worked his first VE4. WA6MXK has a new keyer. W6VKR is mobile with a

(Continued on page 136)

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new Heath S.S.B. receiver. W6HF and K6JNW are overhauling the HARC portable generator for FD. WA6LTV has a Knight T50 and an NC-240 on 7, 14 and 21 Mc. WA6BBJ is building a crystal converter for 7 Mc. WA6BUE won first place in his school district Science Fair finals. K6DEL, W6LKE and WA6YET are new mobile converts in the Walnut Creek area. K6POR *is in the hospital.* W6LGW is TVI *chairman* for the MDARC. The ORC issued its first overseas award for WAC'C to OK1CG. W6WBD is conducting code and theory classes for ORC. W6OU is on 75-meter s.s.b. New NCARTS officers are K6TCD, pres.; W6ZVV, vice-pres.; K6ZBL, secy.-treas. K6SEX is on a trip to Minnesota. The NCARTS held a testimonial dinner Mar. 30 for W6VPC and his XYL. K6ESZ has information on some RTTY gear for sale in the Bay area. Traffic: WA6RGD 197, WA6MIE 33, W7QOH/6 11, WA6BZA 9.

SAN FRANCISCO—SCM, Wilbur E. Bachman, W6BIP—SEC: W6KZF. Our special thanks to our SEC, W6KZF, this month. Bill, in addition to putting in many hours on his assignment, also edits the Marin Club paper and the Central California Radio Council *Circle*, which lists data from each club in the council every month. W6KZF, W6BIP and W6GGC attended the Apr. 3 meeting of the Santa Rosa Club and received a royal welcome from all the members. Sonoma County amateurs came through for a third time on the KO-Polio Program. There were 26 clinics covering the county which had need for communications so each station received amateur radio coverage and proved once again what great help the boys could give. K6LCF reports on the installation of the repeater on top of Mt. Tamalpais. Operating on a.m. and just outside the 2-meter band, it covers most of northern California. Control is by time sequence Multitone from K6AIR. Through it an operator in Mt. Shasta can contact Bakersfield or down the coast to Monterey. The next link is the repeater on the Tehachepi Range to connect South and North of California. The final link in the border-to-border v.h.f. repeater system will be the *unit in the Siskiyous.* Starting Apr. 1 base station K6FCT has been conducting a code and theory class covering the Novice license. On Mar. 29, K6AIR took a communications van to Napa, Calif., in response to a plea for communications. Radio links were then established with search parties trying to find a little four-year-old girl missing from home. At this writing there have been no real clues as to what happened to the little one. The AREC Net meets Sun. at 10:30 A.M. on 3900 kc. Have your EC check in. The Red Cross station now has a net on 50.4-Mc. phone at 8 P.M. Sun. 6-meter fans are invited to check in. San Francisco Radio Club's yearly auction was a huge success. New officers of the Marin Club are WA6AUD, pres.; K6OJO, vice-pres.; K6RKG secy.; W6JEU, treas. WN6COE is new in the club. The MARC is starting new code and theory classes. W6VPC and his XYL, Maribel, were the guests of honor at a dinner Mar. 30. Over sixty of the old-timers in RTTY showed up to honor Buck for all the faithful hours he put in to make RTTY the success it is all along this coast. W6HC's director's meeting Mar. 30 had more representatives present than any former meeting. The BAYLARC girls like the present *arrangement of meeting in different members' homes* instead of one permanent meeting place. WA6YNL, Affiliated Radio Communications Service is a new club in Petaluma. W6RMM, of TV Station KPIX, showed the HAMS members through the station after a recent meeting. Traffic: (Mar.) K6AIR 432, K6FCT 305, K6TWJ 44, WA6OTE 15, W6GGC 10. W6PZE 4, W6FDU 3, WA6UHN 2. (Feb.) K6FCT 172.

SAN JOAQUIN VALLEY—SCM, Ralph Saroyan, W6JPU—K6HTM/1 is operating from WIAF, Harvard Wireless Club. W6WEU is building a 20-meter final. W6EPB is on 75-meter s.s.b. K6LKJ has a new Swan Tri-Band. W6ARE reports that the 6-meter band around Visalia has been inactive. W6YGZ has moved from Lodi to Stockton. W6ADB has an HX-20 and is driving a 4-837 and working out very well. W6MVU has a TA-33 *and a 60-ft.* tower. The San Joaquin Valley Net for the month of March reports 855 check-ins, 20 traffic, 80 contacts, 5 QST, 10 Bulletins, and emergency traffic of 2. W6JUK has a brand-new 60-ft. pole in his front yard and is on 75-meter s.s.b. W6TRP is located back in Fresno. K6SEV is having problems with his 837 GG amplifier. K6UBJ is heard on 75-meter s.s.b. with a 20-A and a 600L. WB6CQL is on 2 meter f.m. W6DUD is thinking of 6-meter s.s.b. The Fresno Amateur Radio Club still meets the 2nd Fri. of each month on the 10th floor of the PG&E Building. Traffic: W6ADB 136, WA6YZA 113, WA6ESH 45, W6ARE 14, WA6VPN 13, W6EFB 10.

ROANOKE DIVISION

NORTH CAROLINA—SCM, N. J. Bonuch, W4CH—SEC: W4MFK. RM: K4CPX. V.H.F. PAM: W4ACY. A

(Continued on page 138)

AMECO *Leader in Compact, Quality Ham Gear*

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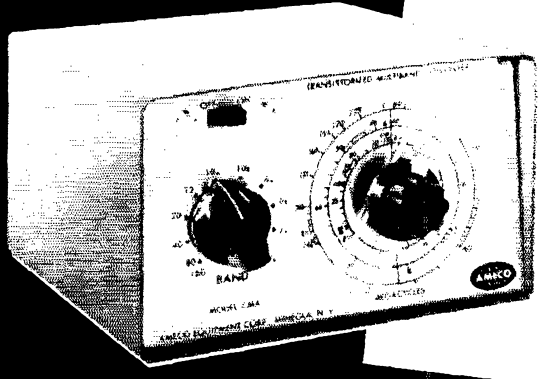
The NEW AMECO Model CMA



Model CMA covers all frequencies from 1.7 to 54 Mc. and 108 to 174 Mc. The output can be fed to a standard broadcast set or any communications receiver. The CMA has better than 1 microvolt sensitivity. It can be operated from an internal battery or from the 12 volt car battery. Model CMA has an RF stage, tuned by a panel dial for best image and spurious rejection. Up to 10 crystals can be selected by the band-switch. Size — 3¾" x 6" x 6¾". For more detailed information, write for special "Converter Information Sheet".

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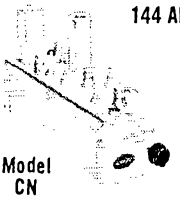
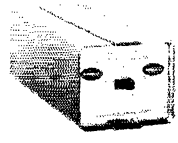


Model CN

Has 3 Nuvistors (2 RF stages & mixer) and 6J6 osc. Available in any IF output and do NOT become obsolete as their IF is easily changed to match any receiver. Average gain — 45 db. Noise figure — 2.5 db. at 50 Mc., 3.0 db. at 144 Mc., 4.0 db. at 220 Mc. Power required 100-150V. at 30 ma., 6.3V. at .84A. See PS-1 Power Supply.

TRANSISTORIZED MOBILE CONVERTERS, CRYSTAL CONTROLLED



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Model CHT will convert any single frequency or band between 108 and 174 Mc. down to the broadcast band or any other IF output. Has a ½ microvolt sensitivity.
Complete with one crystal ... **$35.95**
Model CLT same as above except that it receives any frequency or band between 2 and 54 Mc.
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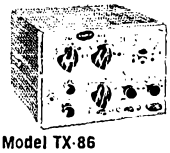

Model TX-86

Handles 90 watts phone and CW on 6 thru 80 meters. Final 6146 operates straight thru on all bands. Size — only 5" x 7" 7 7" — ideal mobile or fixed. Can take crystal or VFO. **Model TX-86 Kit $89.95 — Wired Model $119.95, Model PS-3 Wired $44.95, Model W612A Mobile Supply wired $54.95.**

CB-6

CB-6K — 6 meter kit, 6ES8-rf Amp., 6U8-mix./osc. $19.95
CB 6W — wired & tested $27.50
CB-2K — 2 meter kit, 6ES8 1st rf amp., 6U8 — 2nd rf amp/mix, 6J6 osc. $23.95
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Model PS-1 — Matching Power Supply — plugs directly into CB-6, CE-2 and CN units. **PS-1K — Kit ... $10 50**
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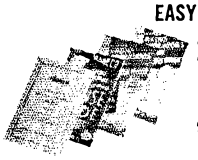

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Amateur License Guide	.50		
Radio Operators' Lic. Guide, EL 1-2	.75		
EL 3 ..... 1.75	EL 4	1.25	
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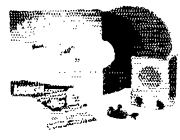
CODE PRACTICE MATERIAL



Ameco has the most complete line of code records, code practice oscillators and keys. Code courses range from start to 18 W.P.M. and are on 33, 45, or 78 r.p.m. records. Model CPS oscillator has a 4" speaker and can be converted to a CW monitor.

Write for details on code courses and other ham gear. **Dept. Q6** **Ameco equipment at all leading ham distributors.**

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letter from our SEC reveals a fine showing of EC activity for the past two months. K4YYJ writes that the V.H.F. Society had a very nice meeting Mar. 31 with the Forsyth Radio Club as host. There were about 90 present and an excellent program was given by W4BUZ on TVI, on Ham TV prepared by W4LRG and given by K4DVE and W4ZG. Membership in the society is now about 150 with over 80 per cent ARRL members! W4FDO submitted his initial OES report and is building a 50-watt 6-meter transmitter. K4MHS worked 2 Florida stations, giving him 16 states confirmed on 144 Mc. W4COJ lists an all-ham family: Father is WA4FLU, Jr. is WA4AJI and Danny is WN4MST, all in High Point. The Carolina Radio Monitors League, WA4EYA, secy., is an ARRL affiliate now. Since this is my final report of station activity to ARRL as SCM, I wish to express my sincere thanks to all who have been so helpful with their consistent reports. I especially appreciate the fine support given me by the NCN and v.h.f. groups. They have been most cooperative and I trust they will continue their excellent work with the new SCM. Traffic: (Mar.) WA2WBA/4 229, K4CPX 125, WA4FJM 112, W4LWZ 106, K4QFV 83, K4YCL 57, WA4ANH 37, W4ATC 33, K4MPE 28, K4TPK 26, W4BAW 22, WA4GEU 15, K4CDZ 13, W4COJ 13, W4EVN 11, W4EJP/4 8, K4IEX/4 8, K4MSG 3. (Feb.) W4ATC 34.

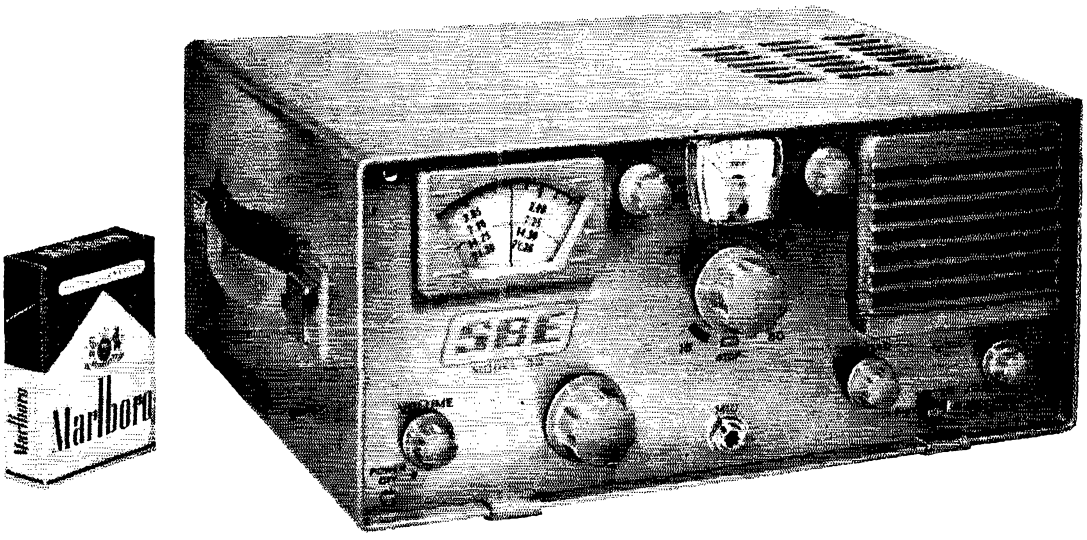
SOUTH CAROLINA—SCM, Lee F. Worthington, K4HDX—SEC: W4BCZ, S.S.B. PAM: K4JOQ. RM: W4PED, A.M. PAM: K4KCO. Nets: C.W., 1900 and 2200 EST 3795 kc.; S.S.B. 1900 EST 3914 kc.; A.M., 1900 EST 3930 kc.; AREC, 1830 EST 3914 kc. Wed. New appointments: K4WJR as ORS; K4NUG as EC. March marked the first issue of the new state-wide paper, *SCARAB*, published by K4BMI as the official organ of the State Radio Council. Our congratulations to Bill on an excellent edition. Subscriptions for *SCARAB* is one dollar, sent to Bill King, Box 488, Bishopville, S.C. W4TLC is very active on v.h.f. and sending in excellent monthly reports as an OES. Don't forget the new S.C. Field Day Award sponsored by the State Radio Council. Details will be published in *SCARAB*. The Aiken ARC elected the following new officers: WA4EIU, pres.; Bob Ashley, vice-pres., secy.-treas.; K4HBM, station custodian; W4CF, act. mgr.; WA4ABY corr. secy. Net Traffic: C.W. 134, AREC 5. Traffic: K4LND 91, K4WOI 50, W4BCZ 43, W4PED 31, K4PJW 30, K4VWL 26, W4BWZ 22, W4UJB 9, K4OCU 8, WA4CSO 5.

VIRGINIA—SCM, Robert L. Follmar, W4QDY—Asst. SCM: H. J. Hopkins, W4SHJ. RMs: W4LK, K4ITV, W4SHJ, W4QDY. PAM: W4UFX. Virginia Traffic Nets: Virginia Slow Net (VSN) c.w. 1830 EST 3680 kc.; Virginia Net (VN) c.w. 1900 EST 3680 kc.; Virginia Phone Net (VFN) 1900 EST 3835 kc.; Virginia Sideband Net (VSBN) 2100 EST 3935 kc. All nets operate daily except VSN, which operates Mon. through Fri. K4POA made BPL for the first time. Up Richmond way K4AL reports transmitter and antenna troubles. W4BZE is beginning to thaw out. K4SDS is the new president of the Richmond ARC and K4RNH was able to be active during the spring vacation. K4IIP is back on the phone net. W4BGP is presenting pertinent FCC regs to members of the Tidewater Amateur Radio Club (TARC) as an OO activity and WA4BVE, the XYL of W4BGP is active in traffic, earning a Section certificate and OPS appointment. W4NTR made his 13th consecutive BPL. W4RHA complains about a traffic count of only 156 because of being away! WA4GWD was transferred to Langely AFB. W4KFC worked AP5-JA and AP5SS for a new country; attended the S.S.B. dinner in N.Y.C. and joined the QWCA and reports that K4CG, USCG club station, now is on the air and the club has 12 members. OO W4PXY is back from a Florida trip. W4ZAU is changing rigs. W4ZMU has antenna as well as time problems. W4PTR's activities conflict with hamming. W4JUJ took part in both the YL-OM C.W. and Phone Parties, the No. Dak. QSO Party and Pa. QSO Party, won for Virginia in the NYC-LI QSO Party and tied for first place nationally. W4NVX says there are lots of hot traffic men in the Post Office Net. WA4DUW is getting over his spring fever. K4IKF is working Navy MARS and had a 55-minute soaring flight, getting to 3900 ft. from a 1400-ft. launch. K4GRZ is having a ball with traffic work. K4QIX moved to Dayton, Ohio. W4DLA earned his BPL Medallion. W4FOR, ex-ORS/OO/EC, arrived at a new QTH in California. Traffic: (Mar.) W4PEC 1395, W4DLA 766, K4POA 526, K4PXY 503, W4NTR 410, W4SHJ 327, WA4GWD 187, W4RHA 156, W4DVT 146, W4LK 112, WA4FCS 99, K4ITV 66, W4FOR 64, K4FSS 58, W4ZM 58, K4WVT 46, W4PTR 45, WA4BVE 31, K4RNH 31, W4NVX 26, K4GRZ 23, K4IIP 23, W4LRN 23, W4QDY 19, W4TE 19, W4BGP 18, K4MXF 13, K4YZT 12, K4JYL 11, K8KFK/4 11, K4IKF 10, W4JUJ 10, K4SDS 10, K4BAV 7, K4AL 6, K8GQ 6, W4ZAU 5, W4MXU 4, W4KFC 2, W4OWV 2. (Feb.) W4BZE 4, K4TZG 2.

(Continued on page 140)

SB-33

without question...
one of the biggest...and best ssb transceiver values!



Compare SB33 price wise. The 115 volt AC power supply and the loudspeaker are built-in—**are included in the low 389.50 price!** And in addition, SB-33 gives you **four bands**—selectable sidebands—a **Collins mechanical filter** that is used both on transmit and receive.

Compare SB-33 circuit-wise. 20 transistors—13 diodes—1 zener diode—virtually all solid-state with exception of the two husky linear amplifier tubes and that in the RF driver. The transistors are all in low-level applications—consume very low power—have very long life expectancy. And of course, **no heaters** so that cabinet temperature is lower, equipment size can be smaller, stability higher. Much of the advanced transistorized circuitry is **bilateral**—two directional—operates both transmit and receive. This means fewer components, less assembly and wiring. These savings are passed on to you in the form of a low selling price.

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POWER INPUT: 135 watts P.E.P. maximum. (Speech waveform)

RECEIVER SENSITIVITY: Better than 1 μv for 10 db signal/noise ratio

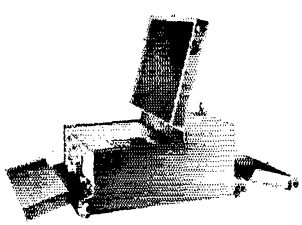
SIDEBAND SELECTION: Upper or lower sideband selectable by panel switch without change in frequency

TUBE AND SEMICONDUCTOR COMPLEMENT:
2—PL-500 beam power tetrodes
1—12DQ7 driver
20—Transistors
13—diodes, 1—zener diode.

POWER SUPPLY: Built-in 115V AC supply.

LOUDSPEAKER: Built-in

SIZE: 5½"H, 11¾"W, 10¼"D. 15 lbs.



Take your SB-33 along on vacation. Functional, luggage-type carrying case has thick foam rubber nesting for SB-33 also felt-lined accessory compartment. **SB-33 carrying case.....29.50**

SB-33 Special Inverter
12V DC/115V AC.....59.50

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WEST VIRGINIA—SCM, Donald B. Morris, W8JM—SEC: W8SSA. RM: K8HID. PAM: K8CFT. WVN (c.w.) meets on 3570 kc. at 0000, (phone) 3890 kc. at 2330; (s.s.b.) 3903 at 0100. PON (phone) meets on 3905 kc. at 2015; (c.w.) 3570 at 0100. The following were active during the recent Logan floods:—WA8FAJ, WA8FAT, WA8DEU, WA8CYD, WA8RAZ, WA8CGM, WA8DXP, WA8HQS, WA8BPD, K8YPZ, K8WFR, W8BXR, WN8FQD. WA8FCM and WA8EWM. K8UOA was elected president of the Black Diamond Radio Club. K8ZDV has a new mobile rig on 6 meters. Congrats to W8WSL, a new member of the WACWV Club. The West Va. Centennial QSO Party sponsored by the Kanawha Radio Club, K8YBU, chairman, was a huge success. W8CKX is quite active on WVN. CW and 8RN. W8DRU worked 41 stations in 5 states on 50 Mc. in twelve hours. K8CSG finds moving traffic on RTTY a pleasure. WA8CKN is a new OBS. WA8CPY is a new ORS. K8CFT reports 21 sessions of WVN Phone, with 503 stations and 63 messages. K8TPF reports for WV PON Phone 376 stations, 68 messages and PON CW 63 stations and 36 messages. K8HID's operation is nil because of work with the Centennial Commission. The West Va. State ARRL Convention will be held at Jackson's Mill, July 6 and 7. See you there. Traffic: W8NYH 144, W8CKX 131, K8CSG 105, K8CFT 63, WA8CKN 39, K8TPF 38, K8ELH 36, W8WSL 17, W8JM 14.

ROCKY MOUNTAIN DIVISION

COLORADO—SCM, Donald R. Crumpton, KØTTB—SEC: WØSIN. PAMs: WØCXW, WØIJR, WØGNK. RMs: W4UGI.Ø, KØFDH. *The Rocky Mountain Division Convention will be held in Pueblo June 15 and 16.* This will be one of the highlights of the year for Pueblo. WØNIT is in charge and from all reports it looks like there will be about everything, including one of the best electronic labs in the state. The convention will be held at Southern Colorado State College. WØIA reports that the WX net has been doing a very good job and Gene handled 1882 WX messages in March. The WX Bureau is giving Certificates on Merit to all the steady WX stations for the fine job they are doing. WØSIN reports that our AREC Columbine Net also is on the ball with a total QNI of 724 and QTC of 191. KØFDH will replace WØYFL as net manager for the Colorado Emergency Phone Net. Traffic reports still are a little slow coming in but an improvement is shown over last month with the following reports: W2VQS/Ø 17, W4UGI.Ø 195, WØKQD 24, KØQGO 10, KØLCZ 14. Don't forget to make plans to attend the Rocky Mountain Division Convention in Pueblo, Colo. June 15 and 16, 1963.

UTAH—SCM, Thomas H. Miller, W7QWH—Asst. SCM: John H. Sampson, W7OCX. SEC: K7BLR. New officers of the Utah Council of Amateur Radio clubs are W7WDR, chairman; W7OWK, K7GRO and W7ZJI, vice-chairmen. Newly-formed clubs are invited to join and participate. The annual Field Day competition among the different clubs is sponsored by the Council. BRAT awards for March on BUN went to W7OCX, W7QWH, K7MPQ, K7QIE, W7VTD, K7QEQ, K7QGW and W7VTJ. BUN statistics were up even with extremely bad conditions. K7RPA did *quite a bit of traveling* and had eyeball QSOs with W7YPC, W7QWH, K7PDM, K7BGU and K7SNZ. K7SDF had an interference problem with the Utah State Highway Patrol but seems to have it cleaned up. W7BAJ made a small try at the DX Contest and is on the air quite a bit. Traffic: K7NWP 251, W7OCX 118, W7QWH 4, K7RPA 2, K7SDF 1.

NEW MEXICO—SCM, Carl W. Franz, W5ZHN—SEC: K5QUN. V.H.F. PAM: W5FPB. 10-Meter PAM: W5WZK. We regret the passing of the following amateurs during March: W5CDY, Jim Giddings; W5UCX, Ralph Roane; Tommy Thompson, W5VDY. We welcome two new hams in Albuquerque, WN5GBG and WN5BGH. The N.M. Army MARS Annual State Convention will be held in Albuquerque June 1 and 2. For more information contact Virginia, K5GLJ. K5HTT now is operating RTTY. The Alamogordo Club will hold its hamfest at Cloudcroft Aug. 18. Activity on 2 and 6 *meters* is picking *up in the Albuquerque area.* K5UYF is building a new 6-meter rig. Seventeen New Mexico counties were on during the 4th N.M. QSO Party. Albuquerque hams got a fine write-up in the *Denver Post* for their work with the Chamber of Commerce. The Yale ARC for the Visually Handicapped is getting ready for Field Day operations. K5UYF won the NY/LI QSO Party for N.M.; also the CQ WW C.W. DX Contest for his state. Traffic: W5UBW 61.

WYOMING—SCM, Lial D. Branson, W7AMU—SEC: W7IHH. The Pony Express Net meets Sun. at 0830 MST on 3920 kc.; the YO Net is a c.w. net on Mon., Wed. and Fri. at 1830 MST on 3610 kc.; the Wyoming C.D. Net meets Wed. at 1900 MST on 3537.5 kc.; the TWN Net

(*Continued on page 142*)

Since its introduction in 1956, the PL-172 beam pentode (now identified as the PL-8295/172) has become widely accepted by both amateurs and manufacturers of military and commercial communications equipment as the tube to use as a 1000 to 1500 watt-output linear amplifier of single-sideband signals. Now, in keeping with Penta Laboratories' policy of continuing product improvement, we announce the *ceramic* PL-8295A, which promises to become the new standard of excellence.

Like the PL-8295/172, with which it is directly interchangeable, the 1000-watt plate dissipation PL-8295A beam pentode uses the exclusive Penta vane-type suppressor grid, which provides high efficiency and output, excellent linearity and low distortion. The new ceramic design adds to these features improved reliability, decreased cooling air requirements, and tolerance of high temperatures and severe shock and vibration.

Design your new linear amplifier around the Penta ceramic PL-8295A, or use it as a replacement for the PL-8295/172, and enjoy all the advantages of this rugged, high-performance, low-distortion beam pentode. Write today for your free copy of the complete, factual PL-8295A data sheet.

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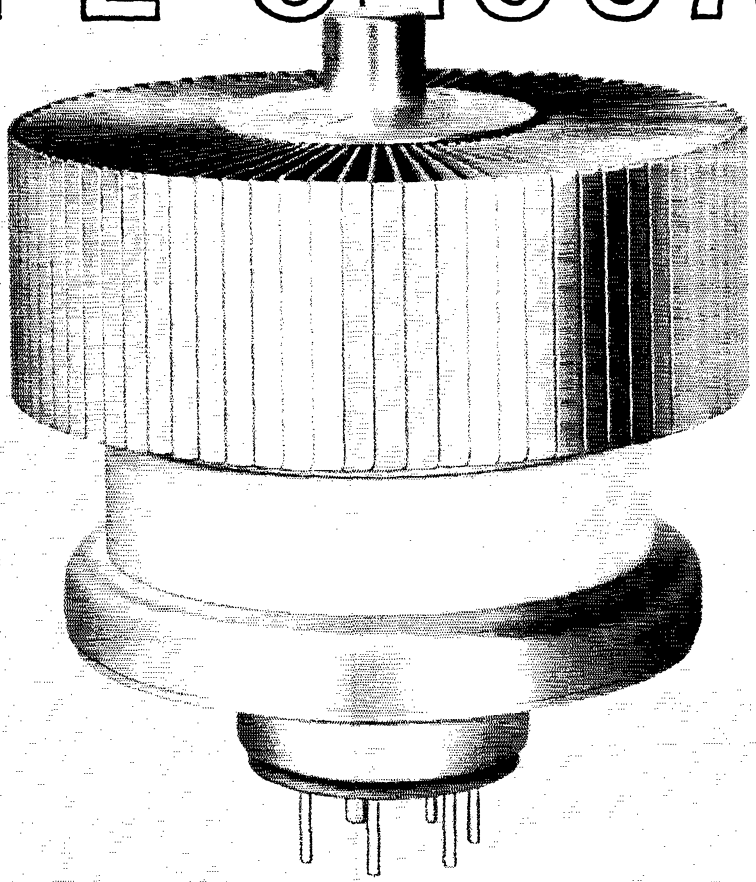
NEW CERAMIC PL-8295A



is a daily net at 2000 MST on 3570 kc. W7IVK has received All State YL Certificate No 75. W7LVU and W7MZW are holding skeds on 144.004 Mc. and have more prospects. K7QYG is active on all nets and QRS. The Pony Express Net has a nice large check-in list. The Casper Amateur Radio Club held a very nice surprise party for SCM Lial D. Branson and presented him with Life Membership and a plaque which he cherishes very much. Traffic: (Mar.) W7DXV 69, K7QYG 39, W7BHH 37, W7AMU 21, W7HLA 15, K7IVK 10, W7AEC 8, W7LKQ 6, W7CQL 3. (Feb.) W7BHH 18.

SOUTHEASTERN DIVISION

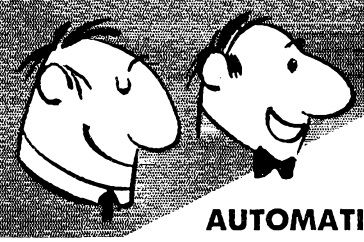
ALABAMA—SCM, William S. Crafts, K4KJD—SEC: W4NMI. RM: W4USM. PAMs: K4BTO, K4TNS, K4WHW. V.H.F. PAM: K4DJR. All nets did an excellent job during the recent tornados in the state. Officers of the new Redstone Society of Amateurs are WA4DJQ, pres.; K4FYR, vice-pres.; W4SNP, secy.-treas. The club has 100 per cent ARRL membership. K4BSK, K4WOP and K4WOQ have a new 6-meter beam. AENT has training sessions at 1615 CST on 3970 kc. Tue. and Thurs. K4DSO was appointed Asst. Director by W4ZD. WA4CWI is the new Elmore Co. EC. WA4HGN now is on s.s.b. with an Apache SB-10-SX-101A. K4YUD is back on s.s.b. with a 20A; also WA4ENJ with an Apache SB-10. W4USM is a new Amateur Extra class licensee. W4PVG and K4UEC were winners in the recent 3rd Army MARS Frequency Measuring Test. K4DJM is holding code classes in Arab. K4UMD does an FB job editing the Birmingham Club's *Aric Static*. WA4IQP has DX-40-VFI-S-85. Traffic: (Mar.) K4WOP 188, WA4BDW 163, K4NUW 143, K4AOZ 110, K4BSK 91, K4WHW 74, K4KJD 63, K4TNS 51, K4FZQ 49, WA4IQP 42, W4NML 28, K4TDJ 28, W4USM 28, K4ANB 27, W4SNP 27, K4DSO 22, K4BRZ 20, K4NSU 20, K4UMD 20, K4WSK 20, WA4CWI 19, K4GXS 18, K4HJM 18, W4DFE 17, K4GRA 17, WA4HFE 17, K4PHH 15, K4BTO 12, W4YER 12, K4AVM 11, WA4EXA 10, WA4IHI 10, K4KDE 9, K4WSH 8, W4WGI 7, K4YUD 7, K4JDA 6, K4WPZ 6, W4CIU 5, WA4EDF 5, WA4EEC 5, K4NKT 5, WA4ENJ 4, WA4HGN 4, K4CFD 3, K4RIL 3, K4WWP 3, K4PBY 2, WA4FWP 1. (Feb.) K4DJR 7, K4CTB 5, K4ZTT 4, WA4IHI 1, K4WSS 1.

EASTERN FLORIDA—SCM, George E. Cushing, W4QVJ—SEC: W4IYT. Many thanks for the numerous letters and offers of cooperation. Will be calling on many of you for help in the next two years. Traffic totals are running high as a result of county fair activity. The U. of Fla. station W4DFU had a setup at the Engineering Fair and originated many messages. A great deal of interest is shown in ham radio at these fairs and other displays. K4VEJ took home a blue ribbon for his display at the Bell System Hobby Show. A great deal of interest is being shown in Ham TV with many parts of the state being represented. Welcome to new ECs WA4DGS, Hillsboro, and W4CWD, Brevard County. All amateurs should contact their EC to find out the activities planned for the Emergency Test. The hurricane season is around the corner and it is better to be prepared than to run in circles, scream and shout and not know what it's all about. The reissuing of 160-meter privileges found K4FMA sitting up until 0301 local time to give out with a blast on a full-size 160-meter dipole. W4DQS used 160 meters for a few more multiplier points in the DX Tests and reports excellent results. All clubs are requested to send information on meeting dates, times and places to your SCM. I am looking forward to seeing many at the club meetings. The Orlando Club is to be congratulated on another very successful Hamboree. Traffic: WA4BMC 1085, K4EHY 721, K4KDN 381, W4KTS 358, W4MIN 249, K4SJH 225, W4TUB 219, W8LDU/4 215, W4TRS 208, W4EHW 206, K4BY 187, K4MTR 167, K4COO 163, WA4GBM 141, W4DFU 113, WA4KB 91, K4LCF 90, W4BKC 87, W4KCG 82, K4NVD 81, WA4COR 79, K4HD 76, WA4BGW 73, WA4CJC 72, WA4DMV 63, W4ZBL 60, WA4FGE 59, K4KFP 56, W4CWD 54, K4DAX 54, K4DRT 50, W4GUJ 37, W4NGR 29, W4IYT 24, WA4JYR 24, W1AGM/4 19, W4LMT 19, W4OGN 19, W4SMK 18, W4BIL 16, W4BBZ 12, W4DFZ 9, WA4ILQ 9, K4ZIF 8, K4MGX 4, W4AYD 3, W4LVV 3, W4SVB 3, W4NOK 2.

WESTERN FLORIDA—SCM, Frank M. Butler, jr., W4RKH—SEC: W4MLE. PAM: W4WEB. RM: W4BVE. Tallahassee: The Leon H.S. Club is growing fast. Among the members are WA4DCN, WA4AMH and K4VNJ. They have a DX-60 and an HQ-129X. K4YPI has a new Drake 2A which helps his RTTY work. K4OHR, W4GAA and K4YPE, QNI the FAST Net. W4MLE designed and built the simple 160-meter rig described in this month's *QRV*. Best DX is Canada. Monticello: K4BDA is active again with a DX-40. Madison: WA4GHE was heard in Tallahassee on 10 meters. Panama City: WA4FIJ/FJF put out another

(Continued on page 144)

YOU WILL AGREE—
THEY MUST BE USING
MASTER MOBILE
DEPENDABLE POWER UNITS



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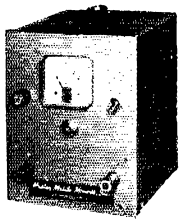

COMPACT. 8" High x 6¼" Wide x 7" Deep.

AUTOMATIC CHARGING — the charging current is automatically reduced as the battery approaches full charge, and drops to a trickle charge when the battery reaches full charge. Overcharging is completely eliminated.

HIGH CURRENT RATINGS. Model TC-15 for 15 amps, Model TC-30 for 30 amps — both types designed for continuous-duty operation.

IDEAL FOR mobile radio systems, or on boats requiring a 12-V ignition source. Unit is not only an excellent heavy-duty charger, but may also be used as a bench supply for repair of car radios...for marine application, electroplating, powering model trains, and wherever else a high current, stable 12-volt source is needed.

MODEL TC-15 $59.50
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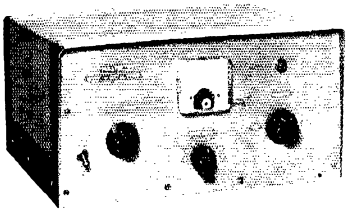
Your 12-V battery fully charged every morning!

K-73 "GO" POWER LINEAR AMPLIFIER



SMALL: 13½" wide x 6½" high and 12½" deep
COMPACT: 15½ pounds.

FEATURES:

2-811A zero bias triodes in grounded grid.
750 Watts PEP.

500 Watt self contained TRANSISTORIZED DC Power Supply employing a bridge of solid state rectifiers for excellent regulation.

Panel meter measures plate current or RF output.

Ideal linear amplifier for any 50-100 Watt SSB exciter, such as KWM-2, SWAN, HALLICRAFTERS, SONAR, etc.

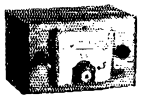
Covers 10, 15, 20, 40 or 80 meter operation with a heavy duty band switch.

Internal antenna relay allows barefoot operation when amplifier is not in use.

Wide range PI-NET output.

Does *not* require additional batteries in most automobiles.

MODEL K-73 $289.50 NET



MODEL RC-73 $17.95

REMOTE CONTROL: INCLUDES

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FB edition of *QRV* for WFPN members. The AREA RACES Hq. station, a KWM-2 and a 30S-1, is operating on 75 and 40 meters. K4VFY is a new OES, and also is an NCS for RN 5. WN4IMC worked an nero/mobile over Georgia on 2 meters. Ft. Walton: W4NOE/M and WA4IPP/M were directed through town by W4ZGS as a result of seeing "145.2 Monitored" signs on Highway 98. Pensacola: Work is continuing on the PARC clubroom. Activity on 29.560 kc. is booming, both fixed and mobile. The V.H.F. Club voted to sponsor the 6-Meter Net. W4RWY is NCS. K4KIF is working on linear for 6 meters. W4EQR is building a ham-TV rig for 432 Mc. K4RUG is mobile with a Sixer. K4FTI is the mainstay of 2-meter activity. W4PAA and K4HYL have joined forces to see how much DX they can work. W4AXP is having rig trouble. Traffic: (Mar.) K4VFY 356, W4ZWD 109, W4MLE 108, WA4-FLJ 42, W4GAA 29, K4BDF 25, WN4IMC 20, WA4DED 9. (Feb.) K4BDF 19.

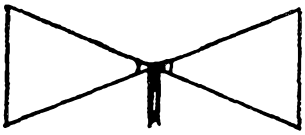
GEORGIA—SCM, James A. Giglio, W4LG—SEC: W4YE. PAMs: W4KR, K4PKK and W4RZL. RM: W4-DDY. New officers of the Warner Robins Amateur Radio Club are K5MRQ, pres.; Chuck Guy, vice-pres.; K4UTE, secy.-treas. This club meets each 2nd and 4th Tue. at the City Hall. The Sowega Amateur Radio Club is continuing its tours for interesting programs. The Turner Air Force Base MARS Club celebrated its ARRL affiliation with a picnic. WA4GPA has been busy with serious experiments on antennas. The Georgia Single Side Band Net meets nightly at 8 P.M. EST on 3975 kc. WA4CZM completed requirements for WAS by working KL7ZF recently. WA4JCH is the only ham ever to live in Braxton. K4BVD, at M.I.T., misses the Georgia gang. Watch for him on W1MX. On his AREC application K4BAI lists his code speed as 55 w.p.m. Why underrate yourself, Johnny? W4HYW continues to enlarge his shack to house his gear. K1SJM/4 has returned from VK-Land. K1KSH/4 has completed a homebrew linear using a single 100TH. Old reliable W4PIM continues with the FB job on 4RDN. W4ZD has gone s.s.b. W4GTS has a new wooden mast but is bothered with woodpeckers. New appointments: W4-RZL as S.S.B. PAM; K4PKK as V.H.F. PAM. Traffic: K4MCL 275, W4DDY 239, K1KSH/4 131, W4RZL 55, W4LME 47, W4HYW 33, K4YRL 23, K4DKY 9, K4-NQQ 9, WA4GPA 6, WA4JCH 6, W4OHA 6, W4BZ 4, W4YE 4.

CANAL ZONE—SCM, Thomas B. DeMeis, KZ5TD —The month of March featured a lot of activity promoted by the boat ride on the Las Cruces up through the Gaillard Cut in the Canal Zone. The Canal Zone Amateur Radio Assn., the Crossroads Amateur Radio Club and the LIGA of Panama got together for the tour of the Locks and the boat trip through the cut. KZ5HF and KZ5TF are back in the U.S. and plan to be on the air from W5-Land. KZ5WZ, the DX leader of the Canal Zone, will be leaving here sometime in July on retirement. Others who will be leaving shortly are KZ5HB, KZ5SB and KZ5SH, who will be shifted to assignments in the U.S. LC now is operating with S/Line equipment. KZ5CU has activated his station. KZ5FM has installed a new tri-bander and again is active. KZ5RJ is now inactive, pending his retirement and return to the U.S. KZ5MQ is operating once again from Gatun. A new net is being activated by MARS with a frequency near the 80-meter band. KZ5JT is using a DX-100 now. HP1IE tried 160 meters in the DX Contest but could not work into the U.S. although he reports good conditions towards Ecuador.

SOUTHWESTERN DIVISION

LOS ANGELES—SCM: Albert F. Hill, jr., W6JQB—Asst. SCM: W6KGC. SEC: K6YCX. RM: W6BHG. PAMs: W6ORS, WA6TWS, K6PZM. The following stations earned BPL in March: K6EPT, W6GYH and WA6YLZ. Congrats, fellows! WA6ORS attended the District Student Congress in San Diego. K6SIX is now V.H.F. OBS. Listen for Official Bulletins on 6 meters. W6SRE is operating on the Weather Net. WA6USU put time-sequence keying in the rig. W6GYH is using a B&W 6100 rig and likes its operation. New officers of the Citrus Belt Amateur Radio Club are: K6EF, pres.; WA6NBK, vice-pres.; WA6YIM, secy.; WV6YIN, treas. W6QAE is the new Asst. net manager of SCN. WA6TYV has a new antenna system up for 80 meters. The Desert R.A.T.S. of Palm Springs did a fine job in supplying communications for the Desert Circus. WA6DJB reports the So. Calif. V.H.F. Club is sponsoring a dance to raise money for the Rose Parade Float. W6OZ is running code practice on 3747 and 7198 kc. Mon. through Fri. at 1800 PDST. WA6YIT worked W5-Land during the 6-meter opening on Mar. 2. New officers of the Douglas, Santa Monica Amateur Radio Club are: WA6-UYF, pres.; WA6PJU, vice-pres.; WA6UEJ, secy.; WV6UQF, treas. This being the last report from your SCM, I wish to thank all of you for your wonderful

(*Continued on page 146*)



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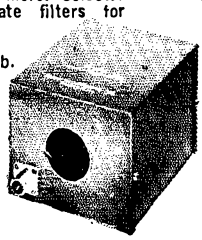

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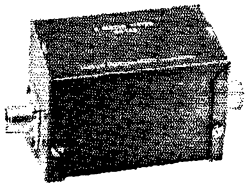

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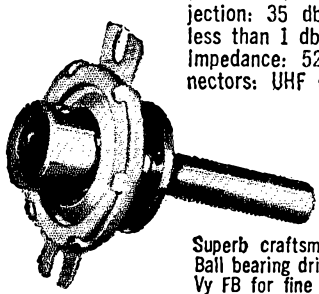

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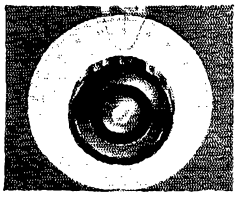

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support in the past six years. I want to request your support and help for the new SCM, who is Pete McKowen, W6FNE. Have a ball, Pete! Support your section nets. On c.w., the Southern California Net (SCN) meeting at 0200 GMT daily on 3600 kc.; on phone, the Southern California Six Net (SoCal 6) meeting at 0130 GMT daily on 50.4 Mc. Traffic: (Mar.) K6EPT 1053, W6GYH 658, K6MDD 470, W6WPF 330, WA6YLZ 292, WA6UHM 214, W6QAE 205, WA6TWK 178, WB6-BBO 177, K6HIT 84, W6BHG 73, K6ZDL 73, WA6DJB 56, WB6AJT 48, WA6USU 27, K3LKQ/6 22, K6SIX 13, K6OZJ 12, WA6TYV 11, W6FNE 9, W6USY 9, WA6CKR 8, W6SRE 6, W6CK 4, W6VOZ 2, W6VUZ 1. (Feb.) WA6YTV 13.

ARIZONA—SCM, Kenneth P. Cole, W7QZH—Asst. SCM/SEC: K7NIY. PAM: W7OIF. RM: W7LND. Copper State Net meets at 1930 MST Mon. through Fri. on 3880 kc.; the Grand Canyon Net Sun. at 0800 MST on 3880.; the *Tucson* AREC Net Wed. at 1900 MST on 3880; the Cochise County AREC Net each Sun. at 1400 MST on 7260; the Tucson 2-Meter Net at 1000 MST on 145.35 Mc.; the Arizona Interstate Net, C.W., Mon. through Fri. at 1900 MST on 3555; the Maricopa County AREC Net each Thurs. at 0200 GMT (7 P.M. MST) on 28.620 kc. The v.h.f. communications attempted last month between amateurs of the Phoenix area and Southern California were only partially successful. *Only low powered*, hand-carried rigs could be used. The large transmitters could not be transported up the steep mountainous grades in California because of heavy snowfall! The annual picnic at Casa Grande had the largest attendance in its history. Cactus Keys is a newly-organized Tucson Radio Club for YLs and XYLs. A certificate has been designed and will be issued to any out-of-state amateur contacting eight CK members. Correspondence should be addressed to Viola Luthy, 5509 East Lester, Tucson, Ariz. The Ft. Huachuca Amateur Radio Club meets the 2nd Mon. of each month at Ft. Huachuca. Those active on 2 meters in the Ft. Huachuca area are W7AMM, K7AOJ and W7MES. Look for K7QBI/7, now at the U. of Arizona, during the late evening on 80- and 40-meter c.w. W7KOY recovered her stolen receiver. W7LHM has a 2-meter f.m. repeater going on Mt. Ord, Ariz. Teletype operators take this opportunity to thank Mt. States Tel. and Tel. for the Model 15 printers they have been selling. The two teletype nets now consist of 30 stations, approximately 25 on the lower bands and 5 on v.h.f. The new American Red Cross Building in Phoenix, which is now in the planning stage, will contain a separate radiation free room with three positions for amateur radio. Congratulations to K7RQI, who worked an FE8 and a VP7 the same afternoon—on c.w. New calls: K7RZN, SEC, RQL, RQE, KN7WLG, VWJ and VWK. Traffic: (Mar.) K7WBC 458, W7FKK 321, W7AMM 58, K7VQI 19, K7CET 16, W7AOJ 6, K7RUR 5. (Feb.) K7WBC 594.

SAN DIEGO—SCM, Don Stansifer, W6LRU—The Orange County Club *enjoyed a talk* on r.f. coax line and fittings at its March meeting, and also worked on Field Day plans. VR3E was home in Vista for two weeks in May. WN6DPV worked 27 states, KH6, KL7 and JA during his first month on the air. The Palomar Club Field Day chairman is W6NWI. The Newport Club March meeting featured a talk on Telemetry Space Communications. KH6AJF recently visited at W6IAB, and helped install a new 40-meter beam. The W/K6 QSL Bureau was deluged with over five feet of JA QSL cards in one mail during late March. OEW W6IEY reports more 432-Mc. activity including W6s AUB, BLK and IEY. A USAF MARS V.H.F. net has been established in the area at 2000 PST Sun. on 143.95 Mc. If interested, check with WA6OMQ or WA6-SJM. Congratulations to K6BPI, traffic handler, who in April *QST* lead the nation as a single station operator in traffic totals. WA6NFI, in Anaheim, reports a *traffic count of 501 for March, his first, and it earned* him a BPL certificate. ORS WA6ROS is experimenting with 6-meter beams. WA6CDD was one of the main traffic handlers with the raft *Lehi V* after it left San Diego. As this column appears in June *QST*, all amateurs again are reminded to keep news coming through the summer. My address from June 18 until Sept. 6 will be Route 3, Box 47, Bishop, Calif., where I'll be signing WA6YUT from Mono County. Traffic: W6IAB 3376, K6BPI 3137, W6YDK 1958, W6EOT 604, WA6ZOW 566, WA6NFI 501, WA6ROF 295, WA6CDD 115, K6IME 109, K6GJM 72, W6SK 5.

SANTA BARBARA—SCM, William C. Shelton, K6AAK—SEC: WA6OKN. WA6KCM applied for ORS and OBS appointments. W6AGO reports for the Paso Robles Club which held its Charter Night Apr. 10. W6-MSG, K6TIH, WA6RTI and W6BRY are all active with high power on 2 meters. WA6RTM works the Bay area at night on 2 meters from the high mountains east of San Miguel. W6FYW is secy. of the Paso Robles Club. W6AGO, ex-W2AGO, now has DXCC after 10

(*Continued on page 148*)

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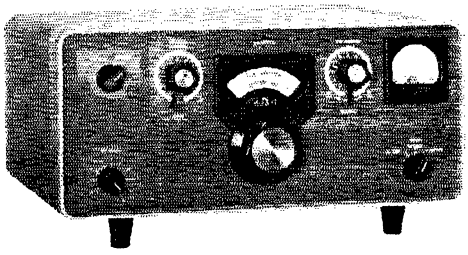

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years. W6YCF sends in his usual fine report and still is active on the Tri County Net at noon on 3820 kc. Morro Bay is active with W6PPZ and W6JTA on the net. The Estero Club is active with antenna measurements with the club's new reflectometer. The Arroyo Club has a new code class with WA6IIU as instructor. W6OUL reports from Lompoc and renews his ORS, OES and OPS appointments. The Santa Barbara Club held an Old Timers Night which was a huge success. Thanks to K6GHU and K6KCI, Lou and Irma, for the club paper. Traffic: W6OUL 14, K6AAK 6, W6YCF 2.

WEST GULF DIVISION

NORTHERN TEXAS—SCM, L. L. Harbin, W5BNG—Asst. SCM: E. C. Pool, W5NFO. SEC: K5AEX. RM: W5LR. The Midland ARC held its Annual St. Patrick's Day Swaptest Mar. 17 with an attendance of more than 425. Next year the club will present some amateur with an award for outstanding service in the field of amateur radio. This will not be a popularity contest but will be based on some outstanding service performed by an amateur. The Permian Basin ARC has scheduled its swaptest for June 2. The Northeast Texas EN has set the same date for its annual picnic to be held in the City Park in Commerce, Tex. New officers of the KC Club, Ft. Worth are K5KNX, pres.; K5IOO, vice-pres.; W5FJP, treas.; W5YUO, secy. K5ANS has been appointed ORS. The Red River ARC gave the Novice test to 12 of its class of 40 students and thinks all of them passed. The rest of the class will take the test at a later date. The club used its mobiles in connection with the Heart Fund drive and made an excellent showing. The Dallas ARC is planning a super hamfest to be held sometime in August. Watch for announcement of the date. Thanks to Mr. Jess Whatley, City Manager of Burkburnett, the Boomtown ARC has a new club house. Material was furnished by the city and the club members furnished the labor. This is a 100 per cent affiliated club and I think we will be hearing more from them in the near future. Traffic: (Mar.) W5BKH 156, W5ACK 50, W5LR 23, W5KNA 7.

OKLAHOMA—SCM, Adrian V. Rea, W5DRZ—SEC: W5PPE. We were glad to see the interest in the EC QSO Party. New ECs are W5GMJ, K5EZE and WA5AQA. New amateurs at Enid are WN5GCD and WN5FTW. WN5FVJ is a new amateur at Drummond and WA5DGE is new at Ponca City. Our sympathy to W5QAC on the loss of his wife, Helen. W5PPE informs us he can work 6, 2 and 75 meters simultaneously. W5WAX is now working 6 and 2 meters sideband as well as in the h.f. bands. We are told that K5LDI has developed an improved RTTY converter. K5MIB and W5EHC are on 6 meters again. K5GQW is working 2-meter s.s.b. W5TKE, K5FLL, WA5EXY and KØJOC/5 are now working the evening phone net. We are glad to have stations from their section of the state. We still need better coverage for all nets. Congratulations are due all Oklahoma ARRL appointees on the fine job they are doing. Oklahoma Operator of the Month is W5FFW, for the very outstanding job he is doing as an OO. K5MYS is back on the air after a short lay-off while moving his store. K5LZF is doing a good job as liaison between the 75-meter net and the 2-meter net in his area. Traffic: K5TEY 359, K5VNJ 252, K5IBZ 197, W5PPE 173, W5QMJ 110, K5AUX 76, W5DRZ 70, W5JMQ 46, W5PML 37, K5DLP 34, W5GJM/5 30, K5OCX 28, K5FSU 26, K5ZEP 25, W5WDD 16, W5CCK 15, WA5CHD 14, W5BBA 6, W5PNG 6, K5CBG 3, K5HQE 3, W5EHC 2, W5FKL 2, W5WAX 2.

SOUTHERN TEXAS—SCM, Roy K. Eggleston, W5QEM—SEC: W5AIR. PAM: W5ZPD. RM: K5BSZ. The Student Union Amateur Radio Committee of the Texas A&I College, Kingsville, has received its club station call, WA5FXR. Listen for the fellows on the air. Officers are K5YYD trustee; K5SBU, chairman; K5TFX, vice-chairman; W5IMJ, secy.-treas.; K5QWT, sta. mgr. The Southern Texas section was honored in having W6ZH, ARRL President, as a business visitor in Houston. Our Director, W5QKF, and some of the Houston hams report a nice visit with him. Start making plans now for the West Gulf Division Convention at McAllen June 7-8-9, with a side trip to Monterey, Mexico, Mon. the 10th. Another convention that is always a pleasure to attend will be the South Texas Emergency Net Convention at Kerrville, Aug. 16-17-18. Let's take a vacation up in the hill country. The Texas A&M Radio Club has 40 members; most of them are licensed and the ones that are not are attending code and theory classes. The club station is W5AC. New officers of the Houston Amateur Radio Club are W5DSF, pres.; WA5CLF, vice-pres. The club project is building 2-meter gear. Other officers are K5QQG, treas., K5LLL, secy.; W5YCK, program; K5BCU, membership. New Officers of the Beaumont Radio Club are K5GCE, pres., K5VUX, vice-pres.; K5RCO, secy.-treas. Traffic: K5ANS 618, W5AC 176, W5ZPD 14.

(Continued on page 150)

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CANADIAN DIVISION

MARITIME—SCM, D. E. Weeks, VE1WB—Asst. SCMs: A. E. W. Street, VE1EK, and H. C. Hillyard, VO1CZ. Deepest sympathy is extended to the relatives and friends of VO1AK, who has joined the ranks of Silent Keys. VE1ZI, VE1NZ and VE1OK are new calls on 50 Mc. VE1AHO has a new mobile rig on 75 meters. VO1AA is back on the air after a long absence. VO1DZ and VO1FG have attained their WAG (Worked All Goose) certificates. Newly-elected officers of the SONRA (Society of Newfoundland Radio Amateurs) include VO1BL, pres.; VO1EC, vice-pres.; VO1BT, secy.; VO1CA, treas. SONRA also reports that the "Bob Lewis Award" for the outstanding amateur in the past year was recently presented to VO1EC. VE1AHY/VO1 has his WAVO (Worked All VO) certificate while VO1-BD received two—one for phone and one for c.w. VE1-AHZ has a 2-transistor beacon in operation on 50 Mc. Field Day activities are with us once again. It is hoped your club or group will take advantage of the extra points to be gained by originating a *Field Day Message*. Care should be taken to make certain that your message is in correct form as points can be deducted for inaccuracy. Traffic: VE1YE 22, VE1OM 14, VE1AEB 10.

ONTARIO—SCM, Richard W. Roberts, VE3NG—Good luck to all of you in the Field Day test. Once again the Ont./Que. Net meets on 3535 kc. daily at 0000 GMT, VE3CYR mgr. Newcomers are welcome. Ottawa and Kingston have 2-Meter nets in operation. The Westside ARC of Toronto will celebrate its 25th anniversary Oct. 1. VE3DK1 has the details. VE3BBW is in the hospital as is VE3EZC. VE3BEO now is with the Green Keys. VE3ERB now is in the Belleville area. The Ottawa Valley Mobile Club held a fine skating party and a social evening. VE3ADK now is G3RGB. London held its annual dinner and from all reports it was a "LARC." VE3BTD has returned from the hospital. Richmond Hill hams may form a new club. The Windsor Club has new headquarters. The Radio Society of Ontario elected VE3RX, pres. pro tem; VE3BXA, vice-pres.; VE3CNV, 2nd vice-pres.; VE3CO, rec. secy.; VE3AML, asst corr. secy.; VE3GB, hon. counsel. VE3EXI is now AA licensed. Welcome to VE3BOB, who is on 2 meters in Toronto. EC VE3LI and EC VE3DRF of Metro Toronto AREC, will hold an SET soon on 2 and 75. All ECs holding SETs are to advise SEC VE3AML immediately on completion of same. A full report is required via mail. My thanks to the Metro ARC of Toronto for the splendid effort at the Sportsman Show in that city. Over 400 contacts were made. VE3AJA was in the hospital in North Bay and is on the road to recovery. VE3BQT has a new rig. The Ontario Division ARRL Convention will be held Sept. 28, 1963, at the Royal Connaught Hotel in Hamilton. VE3CEC is chairman. VE3DSX is on RTTY. Your SCM was speaker at the Niagara ARC meeting. Traffic: (Mar.) VE3CYR 155, VE3DPO 114, VE3EHL 106, VE3NG 90, VE3CFR 81, VE3GP 74, VE3ELQ 55, VE3RN 55, VE3AML 51, VE3BZT 43, VE3SG 29. VE3ETM 27, VE3DRF 24, VE3BUR 23, VE3CFI 16, VE3EYC 16, VE3BLZ 14, VE3BAQ 12, VE3CQN 12, VE3VD 3. (Feb.) VE3CFR 66, VE3CWA 3.

QUEBEC—SCM, C. W. Skarstedt, VE2DR—Asst. SCM: Jean P. Achim, VE2ATL, reports: Veuillez prendre note que vos rapports pour la section francaise devront parvenir à la nouvelle adresse suivante: VE2ATL, 10310 Cartier, Mtl. 12. Salutations à tous les amateurs de région des Laurentides, nous aimerions recevoir vos rapports d'activités pour cette colonne. VE2AGR/2, de Manitougan, a rendu visite à quelques amateurs de la métropole. VE2BOY a été nommé aumonier de VE2DN. VE2BKY annonce l'arrivée d'un harmonique, félicitations. VE2KC a fait le premier pas vers la route de l'art de devenir grand-père. Voici les résultats des dernières élections à JC: pres., VE2BKE; vice-pres., VE2BEZ et BJV; secy., VE2BJY; treas., VE2AWR; cons. tech., VE2BHK; dir., VE2PY et ATL. VE2UQ received well deserved recognition in *QST* for assistance in the Oscar II project. The South Shore group, under the direction of VE2SC, held a simulated emergency test. HQ station VE2APX handled traffic. When VE2BE and VE2BR were at Daytona Beach daily skeds were kept by VE2DD, TA, BG, DR and others. Over 15,000 visitors saw the amateur booth at a recent Scoutarama where every type of hobby was on display. VE2AQV and VE2BMK were responsible for the amateur part of the exhibit and VE2UN assisted in operating for over 50 hours. VE2EC reports that VE2AUH was reelected president of the St. Maurice Valley Assn. This group is very active and VE2AMA plans a club house. VE2AGI and VE2AJD again will conduct courses for future hams. VE2CI relinquished his OBS appointment and we are looking for volunteers for this appointment. VE2AN moved to Pointe Gatineau. VE2EK is back after a long silence. Traffic: VE2DR 154,

(*Continued on page 152*)

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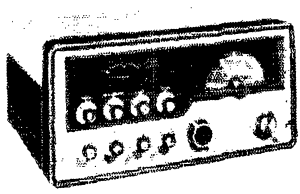
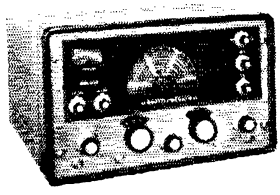
SPECIALS OF THE MONTH

IDEAL SSB STATION





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HT32B	469.50
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R100 W/S METER	69.75
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NC109	99.50
NC190	139.50
NC270	189.50
HQ100	119.50
HQ110C	149.50
HQ145C	199.50
HQ170 C	257.50
HQ180C	339.50
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PMR7	105.50
PMR6 & 12 volt supply	59.50
M1070 3-way supply	39.50

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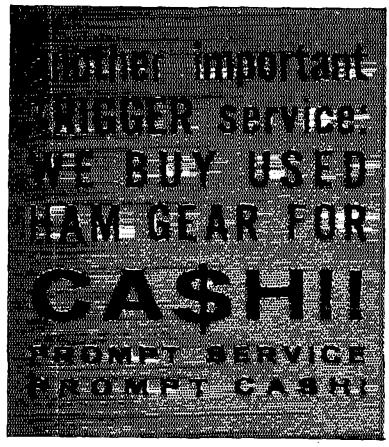

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Amount Enclosed _____

RUSH THE FOLLOWING: _____
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CITY _____ ZONE ____ STATE _____

*ORDER BLANK TO: (1) trade ur present gear, (2) order above units, (3) sell ur gear for cash.

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VE2EC 40, VE2AQV 37, VE2BB 37, VE2CP 37, VE2TA 36, VE2UN 17, VE2ALE 16, VE2AJD 3.

ALBERTA—SCM, Harry Harrold, VE6TG—SEC: VE6FS, PAM: VE6PV, RM: VE6AEN, ECs: VE6FK, VE6SS, VE6ABS: OPSs: VE6CA, VE6PV, VE6HM, VE6SS, VE6BA, OOs: VE6HM, VE6NX, VE6PL, OBS: VE6HM, ORS: VE6BR, OESs: VE6DB, VE6HO. Our PAM reports band conditions better at the earlier hour with better check-ins. New officers of the Red Deer Club are VE6PZ, pres.; VE6AJT, secy.-treas. This club is supplying a shut-in with a receiver: also two or three of the Edmonton Club boys are instructing four hospital shut-ins in amateur radio. One will key "stick and mouth." Keep up the good work, fellows. Let your hamfest committee know your intentions on the International Hamfest to be held July 20 and 21. As your SCM for the past two years I would like to thank one and all for the support given and advise you that you will have to put up with me for another term. How about some news from VE8-Land? VE8CW is the reporter. Send your news and traffic to him. We would like some club news from Lethbridge, Vulcan, Calgary, Edmonton and Medicine Hat. Are you trying for your Golden Jubilee certificate from Red Deer? Contact VE6PZ for the rules. Traffic: VE6HM 162, VE6PL 9, VE6ADS 8, VE6FS 8, VE6SU 7, VE6CA 6, VE6SS 6, VE6FK 5, VE6UH 4, VE6AFJ 3, VE6VE 3, VE6PV 2, VE6TT 1, VE6US 1, VE6WN 1

BRITISH COLUMBIA—SCM, H. E. Savage, VE7FB —Many thanks for your support the past two years and hope I can serve you as well during the next two years. Thanks for your letters and please keep them coming. If anyone is interested in finding or selling equipment "Swap and Shop" is featured on the AREC Net 3755 kc, Wed. at about 0200 GMT, VE7AOI net manager. VE7BHW is sporting a new HT-37 and threatens to capture all DX. There were 22 guests at the Chilliwack ARC supper party and they are planning for an annual dinner. VE7DH reports from Nanaimo that 6-meter mobiles are VE7ACE, VE7BBQ, VE7BHD and VE7DH. VE7AC reports 104 countries toward DXCC. Our Canadian Division Director reports 1280 QSOs from nine weeks operating with the call VP5BP. VE7NW just couldn't look any longer at the s.s.b. rig so wrote her Class A and made it. VE7BBB, Little Eva, received yet another certificate, Stars and Loaded Clothes Line. VE7AKD is an "ornery" member of the Yawn Patrol. The British Columbia Emergency Net's new manager is VE7KZ. G3MNJ, sparks aboard the *Pacific Stronghold*, paid the VARC a visit and explained why there are no Gs M/M. The O.K. Valley International Hamfest will be held at Okanagan Falls, B.C., July 27-28. There are reports that the British Columbia Government is preparing picture post cards of B.C. for B.C. amateurs' QSL cards. Traffic: VE7BJV 156, VE7KZ 56, VE7BHH 42, VE7AKE 29, VE7ARK 26, VE7AAF 13, VE7BHW 7, VE7AC 6, VE7DH 2.

MANITOBA—SCM, M. S. Watson, VE4JY—VE4FO, our energetic EC for Manitoba, addressed a recent meeting of the ARLM on the organization and merits of the AREC and also visited the Brandon ARC Apr. 6. VE4HW reports progress in the bid for call letter license plates. A disaster drill at Miseracordia Hospital was carried out with success by the members of the AREC group organized by VE4FO, VE4HW, VE4BU and VE4TC. The ARLM contributed $25 to the ARRL Building Fund. The Brandon ARC held a successful banquet and dance Apr. 6th with about 50 attending. The Winnipeg clubs are working on a hamfest for 1964. During the recent ice storm when Kenora, Ontario, was completely cut off and isolated VE3EDK handled 30 messages, several being passed to Winnipeg amateurs who cooperated in the emergency. VE4JW, an OO, reports very few VE4 phone station violations. Your SCM is off the air and traveling overseas until July 20. Traffic: VE4ED 25, VE4JY 22, VE4QD 22, VE4KL 8, VE4JA 5, VE4HF 2, VE4HW 2, VE4TE 2, VE4PE 1.

SASKATCHEWAN—SCM, Jack Robinson, VE5BL—New executives of the Regina Club are VE5JU, hon. pres.; VE5QA, pres; VE5SC, vice-pres.; VE5JI, secy.; VE5NZ, keeper of the treasury. Details of the Wheat Belt award, sponsored by the Saskatoon Amateur Radio Club, are: Eligible contacts, full members of SARC, all modes, all bands, cards to be sent to Wheat Belt Award, P.O. Box 751 Saskatoon, Sask. Qualifying contacts are Alberta, Saskatchewan, Manitoba, 15 contacts; the rest of Canada and the U.S.A., 10 contacts; all others except Africa and Asia 5 contacts; Africa and Asia 3 contacts. Eligible Saskatoon contacts will have a special sticker on their QSL cards. VE5JK and his XYL have returned from a visit to VE7-Land. New calls heard are VE5VD, in Regina, and VE5SB, in Melville. VE5QA is now on phone in Regina. VE5SC is experimenting with RTTY. BCNU at the Hamfest at Moose Jaw the July 1st week end. Traffic: VE5HP 152, VE5LM 72, VE5FO 14, VE5CM 12, VE5JU 6, VE5NX 4, VE5RE 4, VE5AT 2, VE5KZ 2.

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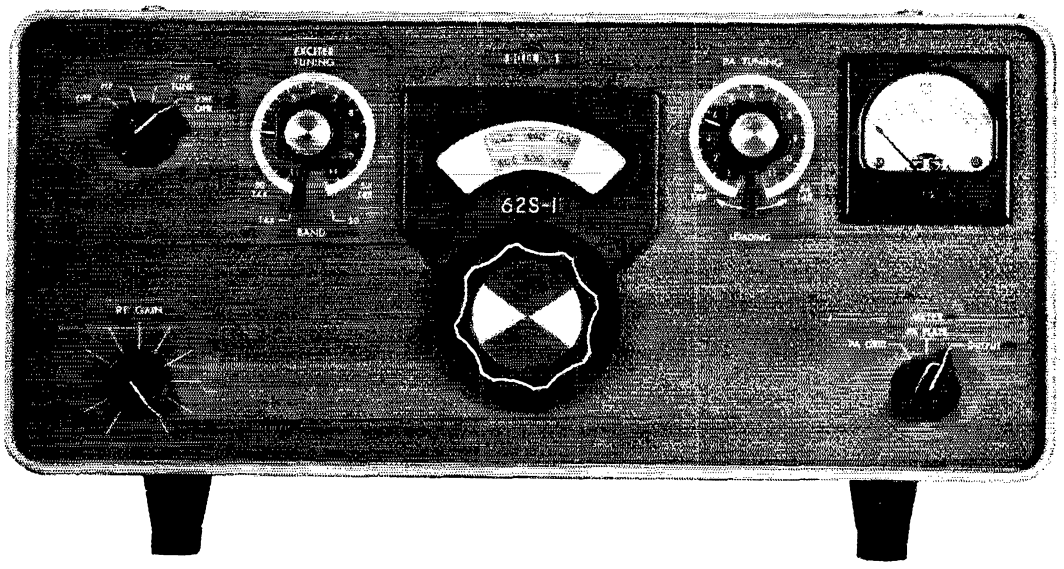

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V.H.F. SS Summary

(Continued from page 38)

WB2DNZ 2560- 80- 6-B
WA2EUS 2516- 74- 7-B
WA2YBC 2431- 72- 7-B
WB2BQJ 2278- 67- 7-AB
W2QAN 2080- 65- 6-AB
WA2JUG 2064- 65- 6-B
WA2UJC 2040- 51-10-B
WN2BPC 1920- 69- 5-B
K2OTZ 1904- 56- 7-B
W2HNX 1800- 60- 5-B
WA2VPQ/2 1760- 55- 6-B
WN2CLV 1540- 57- 4-B
W2NBI 1472- 46- 6-B
W2MGV 1440- 45- 6-B
WA2DRK 1386- 33-11-B
W2ZSD 1280- 40- 6-AB
WN2EMX 1260- 43- 5-B
WA2LIT 1184- 37- 6-A
W2DUN 1140- 38- 5-B
W2TNI 1064- 38- 4-B
WA2KWY 1020- 34- 5-B
W2OQL 1020- 30- 7-B
WN2AXG 924- 33- 4-B
WA2NRR 910- 35- 3-AB
K2PWG 736- 23- 6-AB
K2CVD 616- 22- 4-A
W2AGT 560- 20- 4-B
W2AUF 480- 16- 5-B
WN2BAY 408- 18- 2-B
WA2UKI 308- 14- 1-A
W2ZKD/2 234- 9- 3-A
WA2OOL 216- 9- 2-B
WA2IKN 192- 8- 2-B
WA2EXP 132- 6- 1-A
W2YSI 88- 4- 1-B
WB2DQR 22- 1- 1-B
WA2UNC 22- 1- 1-A
W2EIC/2 (K2s BGJ EIC, W2EIC) 23,874-523-13-AB
W2BMW/2 (8 oprs.) 8352-261- 6-AB
WB2BON (WA2VKY, WB2BON) 5840-146-10-AB
WB2BZZ (WA2WIH, WB2 BZZ) 3808-136- 4-AB
WB2DDI (WB2s DDI DZX) 3200-100- 6-B
WA2RRK (WA2RRK, WN2BQD) 1040- 42- 3-AB
WA2YDN/2 (WA2YDN, WN2 BMI) 507- 20- 3-A

Northern New Jersey

W2HUX 27400-548-15-AB
WA2JVO 9568-208-13-AB
W2GKR 8736-208-11-AB
W2SXO 7896-188-11-AB
WA2QCQ 7000-175-10-A
K2RMD 6732-187- 8-ABC
WA2WIL 6300-150-11-B
WA2BDP 6120-153-10-AB
W2NNL 6080-152-10-B
K2HHS 5940-165- 8-B
WA2WAJ 4828-142- 7-AB
WA2IJI 4464-125- 8-AB
WA2TGY 4332-114- 9-A
W2COT 4320-109-10-AB
W2NIF 4250-125- 7-AB
WA2JTM 3572- 95- 9-B
WA2PBN 3458- 91- 9-A
WA2RJE 3128- 94- 7-A
WA2VPI 3043- 90- 7-AB
WA2CMG 2772- 77- 8-AB
WA2JAM 2640- 55-14-AB
WB2CRS 2576- 98- 6-A
WA2NYN 2400- 75- 6-AB
WA2UDT 2244- 66- 7-B
WN2CWG 2208- 69- 6-B
WA2KZP 2144- 67- 6-AB
WA2CNV 2108- 62- 7-A
WA2QHI 2040- 60- 7-AB
WA2IDH 1740- 58- 5-B
WA2PWI 1734- 51- 7-A
W2SMF 1728- 54- 6-A
K2MPD 1710- 57- 5-A
WN2DQS 1696- 53- 6-B
WA2CGO 1600- 50- 6-B
K2TTI 1548- 43- 8-B
WN2BBY 1485- 50- 5-B
WB2BCX 1472- 46- 6-A
WN2CGG 1440- 45- 6-B
WN2CNH 1360- 44- 6-B
WB2BUR 1280- 40- 6-A
WB2EEP 1176- 42- 4-B
WN2CRX 1105- 46- 3-B
WB2CSE 1064- 28- 9-A
WA2RGZ 1056- 33- 6-B
W2SMJ 962- 37- 3-ABC
WA2IDM 850- 25- 7-B
WN2ALF 780- 26- 5-B
W2DZA 720- 24- 5-ABC
K3BGT/2 690- 23- 5-A
W2LWO 560- 20- 4-B
WA2OOD 432- 18- 2-B
W2SWI 416- 13- 6-ABC
K2DMI 264- 11- 2-B
WA2VLR (6 oprs.) 26,750-535-15-AB
WA2GVT/2 (K2s LSX OWR, WA2WBH) 15,024-313-14-AB
K2RGF (K2s QGF RGF SCD) 8778-200-12-AB
K2BJP (5 oprs.) 6342-151-11-B
W2VSG/2 (K2MWA, W2s IMU VSG) 5300-134-10-B
WA2SZY (WA2SZY, WB2DCA) 5282-139- 9-AB
WN2EJO (4 oprs.) 4248-118- 8-B
K2KDQ (K2KDQ, WA2s PTA UES) 3888-108- 8-B
WA2VEB (WA2s UUY VEB) 2635- 79- 7-AB
WA2REM (WA2REM, WB2 BSO) 754- 29- 3-B
WA2CCF (WA2s CCF SRK TAB) 672-24-4-B
WA2VYN (WA2VYN, WB2 BCS) 364- 13- 4-B

MIDWEST DIVISION

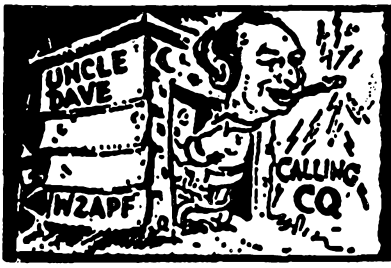
Iowa

WØPFP 660- 22- 5-A
WØDRE 396- 18- 1-A
WØDZH 300- 10- 5-B

Kansas

KØREE 3555-119- 5-AB
WØGPR 1752- 73- 2-B
KØVHP 1742- 67- 3-B
KØJQV 1508- 58- 3-B
KØRNZ 1482- 57- 3-B
KØSMQ 1464- 61- 2-B
KØGIC 1260- 54- 2-AB
WØOLC 1200- 50- 2-B
KØJWT 1040- 40- 3-B
KØGIA 984- 41- 2-AB
KØLGW 960- 41- 2-B
WAØASA 888- 37- 2-AB
KØDHT 792- 36- 1-AB
KØYNW 792- 33- 2-A
WØSPF 720- 31- 2-AB
KØEBR 660- 30- 1-AB
WØQGN 504- 21- 2-B
WØAPG 440- 20- 1-B
KØRWC 22- 1- 1-A
WØROY/Ø (14 oprs.) 4128-130- 6-B
KØWLB (KØs BXF WLB) 4043-156- 3-A
WØBZN/Ø (KØs JID SFU TGR) 1716- 66- 3-B

(Continued on page 156)



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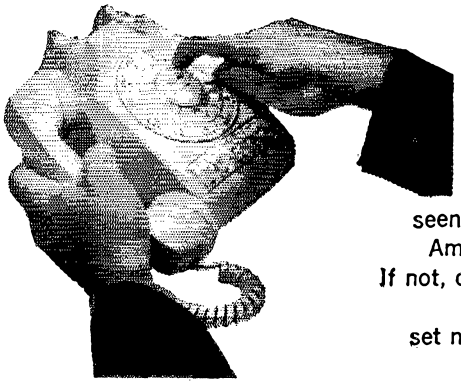
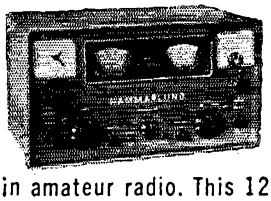


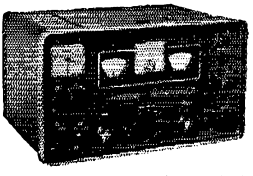
HOLD IT!

. . . before you make a final decision, have you seen the complete story on the NEW Hammarlund Amateur receivers and Fabulous '50 SSB transmitter? If not, delay a day and send for the latest technical bulletins. These NEW Hammarlund units actually set new performance standards—and the price is right!



NEW HQ-110A

The receiver that offers a NEW DIMENSION in amateur radio. This 12 tube dual-conversion superheterodyne receiver covers all amateur bands from 160 to 6 meters plus a 144 to 148 MCS calibrated scale for 2 meter converter use. A separate linear detector assures top-quality reception of CW and SSB signals. **only $249.00***



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Noted as the SSB SPECIALIST, the radically improved HQ-170A blazes a new frontier for Amateur radio receivers. NEW features include significantly improved electrical and mechanical stability, silicon rectifiers for cooler, high-efficiency operation, 2 meter calibration, an accessory outlet and system socket, and a new top-lid cabinet for effortless inspection and/or tube replacement. ALL PLUS FEATURES at no extra cost! **Still only $369.00***

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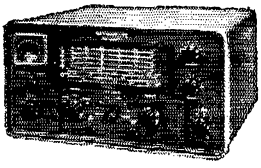
NEW the fabulous HX-50



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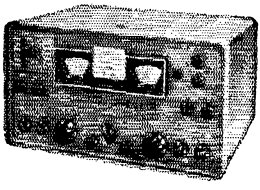

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Missouri

W0KMV 5440-170- 6-A
K0ZKC 4536-162- 4-A
K0VUW 2472-103- 2-A
W0CMI 1488- 62- 2-A
K0BYR (K0s BYR CWP) 2784-117- 2-A
W0GWS (2 oprs.) 1344- 57- 2-A

Nebraska

W0CCD 1540- 55- 4-A
WN0DJK 88- 4- 1-B

NEW ENGLAND DIVISION

Connecticut

W1RJA 22,650-453-15-AB
K1MRI 8688-181-14-A
W1HDQ* 8625-188-13- ABCD
W1MEH 7488-156-14-AB
W1HKL 6864-156-12-B
K1RGO 6132-146-11-AB
KN1UOL* 6048-144-11-B
K1RCK/1 5092-134- 9-B
W1YDS* 4708-107-12- ABCD
K1CMF 4114- 99-12-B
K1HZJ 3744-104- 8-AB
W1DZA 3720- 93-10-B
K1PCC 3360- 80-11-AB
W1WHL 3276- 78-11-A
K1ONX 3024- 84- 8-AB
K1ROK 2890- 85- 7-AB
K1WHS 2717- 72- 9-B
KN1WVE 1802- 53- 7-B
K1OAV 1786- 47- 9-AB
K1PKQ/1 1463- 39- 9-B
K1SNB 1120- 35- 6-B
K1PKQ 901- 27- 7-B
K1YON 855- 29- 5-B
K1OSY 780- 30- 3-B
K1BNO 728- 26- 4-B
KN1YHM 676- 26- 3-B
W1HAX 520- 20- 3-B
W1YNC 264- 11- 2-B
W1GB/1 (6 oprs.) 36,250-725-15-AB
W1DDJ/1 (10 oprs.) 9280-232-10-AB
K1PLR (5 oprs.) 4662-130- 8-AB
W1AW (W1s Q18 WPR YNC) 1700- 50- 7-AB

Maine

W1ECM 990- 33- 5-B
KN1YJB 480- 20- 2-B
K1KKK 264- 11- 2-AB
K1NTC (K1s JDY NTC) 4408-122- 9-A

Eastern Massachusetts

K1SRZ 11,508-274-11-AB
K1QNQ 9114-217-11-AB
K1YDG 8930-235- 9-AB
K1JCC 8924-194-13-AB
W1J8M 7340-184-10- ABC
W1OOP 7172-163-12- ABC
K1OOG 6880-172-10-AB
K1WTK 6588-183- 8-A
K1HSI 6160-140-12-AB
K1CHY 5472-151- 8- ABC
W1AQE 4830-115-11-AB
K1UAN 4752-132- 8-AB
K1MKV 4750-125- 9-A
W1JZD 4664-106-12-B
K1ZNU 4428-123- 8-A
K1ODW/1 4356- 99-12-A
W1FNM 4032-112- 8-A
W1LJO 3852-107- 8-AB
K1WTZ 3420- 90- 9-AB
K1QVU 3200-100- 6-AB
W1QIB 3192- 84- 9-A
K1ZNR 3096- 86- 8-A
K1WGA 3060- 90- 7-A
K1OOM* 2828-101- 4-AB
K1YFM 2788- 82- 7-A
K1YVB 2196- 61- 8-B
W1NJL/1 2176-68- 6-AB
W1MOJ 2142- 63- 7-A
W1BXI 2016- 56- 8- ABD
W1IAU 1972- 58- 7-B
K1KYB 1888- 59- 6-A
W1PLX 1802- 53- 7-B
K1TKW 1536- 48- 6-B
W1BL 1530- 51- 5-AB
K1ZTP 1530- 51- 5-A
KN1YFI 1484- 53- 4-B
W1RSR 1456- 56- 3-B
K1ONL 1440- 48- 5-A
W1DDN 1400- 50- 4-AB
K1DVX 1394- 41- 7-A
K1CQX 1386- 50- 4-BC
W1FY 1380- 46- 5-AB
KN1VWN 1326- 51- 3-B
W1LMZ 1176- 42- 4- ABD
W1JVL 1092- 39- 4-BC
K1SOP 1080- 45- 2-A
K1PMN 980- 35- 4-A
K1YQC 858- 33- 3-A
K1RPI 800- 25- 6-A
K1WEI 768- 24- 6-A
K1DVJ 756- 27- 4-A
K1RMO 702- 27- 3-A
K1WJQ 648- 27- 2-A
K1VHD 532- 19- 4-A
W1JDP 416- 16- 3-A
KN1ZKX 364- 14- 3-B
W1LUW 336- 14- 2-B
W1DGM 308- 11- 4-A
K1CHC 288- 12- 2-B
K1WJP 168- 7- 2-A
W1FNM/1 120- 5- 2-A
K1IAG 66- 3- 1-A
K1NTU 66- 3- 1-A
KN1WNJ 66- 3- 1-B
K1NUN 55- 3- 1-A
KN1UMI 44- 2- 1-B
K1UMP 44- 2- 1-B
K1ELA 22- 1- 1-A
W1KBN (5 oprs.) 12,880-322-10-AB
K1RAB (K1s CMU RAB) 9000-225-10-AB
K1UGO/1 (5 oprs.) 5130-149- 8-AB

Western Massachusetts

W1RFU 13,752-287-14-AB
K1HDM 11,776-256-13-A
K1PLA 5120-128-10-A
K1LWL 4620-110-11-AB
K1SLG 3924-109- 8-A
W1GYM 3200- 80-10- ABD
K1VTX 2752- 86- 6-AB
K1ISW 2268- 63- 8-A
K1JNS 1938- 51- 9-A
K1BRX 1860- 62- 6-A
K1VXJ 1590- 53- 5-A
K1VPD 1428- 42- 7-B
KN1USC/1 1386- 33-11-B
K1SUE 1312- 41- 6-A
K1RKF/1[10] 1296- 36- 8-A
K1ZBC 1200- 40- 5-A
K1JIR 1056- 33- 6-A
K1PRG 1020- 34- 5-A
K1PQY 960- 30- 6-A
K1BOU 896- 32- 4-A
W1STR 870- 29- 5-AB
W1OY 840- 30- 4-AB
K1RNH 750- 25- 5-A
W1JWV 660- 22- 5-B
K1CZZ 644- 23- 4-B
K1YLU 520- 20- 3-AB
W1FBF 420- 15- 4-A
K1LVO 336- 14- 2-A
K1VRO 286- 11- 3-AB
K1LNB/1 216- 9- 2-A
KN1YHN/1 104- 4- 3-B
K1WZS (K1s RYT WZS) 3014- 70-12-A

New Hampshire

W1FZ/1 9324-222-11-AB
K1PSR 5280-133-10-AB
W1PYM 3230- 95- 7-AB
W1KB1/1 2904- 66-12-B
W1UXS 540- 18- 5—
KN1YCD 216- 9- 2-B
W1TEB 192- 8- 2-A
K1KQJ (K1KQJ, KN1s YCD YCH) 10,836-260-11-AB
W1ALE (W1s ALE YQH) 4694-207-11-AB

Rhode Island

W1VXL[11] 10,902-237-13-AB
W1OP (K1s LPI, HZN) 7200-200- 8-AB

Vermont

K1GYT 2548- 91- 4-AB
K1KQK/1 1296- 36- 8-A
K1WEI/1 640- 20- 6-A
W1EXZ 260- 10- 3-AB
W1KSI/1 (K1OF, W1-KSI) 13,146-313-11-AB

NORTHWESTERN DIVISION

Alaska

WL7ELJ 396- 18- 1-B
KL7ENO 352- 16- 1-B

(Continued on page 168)

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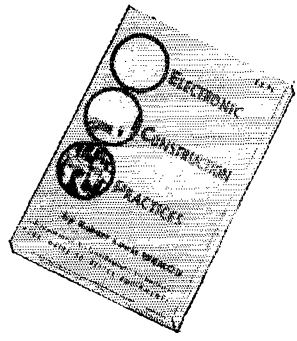

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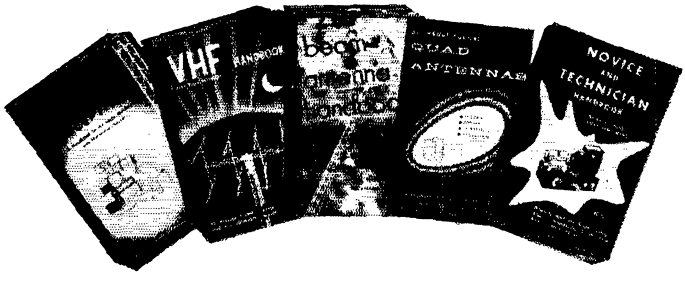

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W7ZSL 2424-101- 2-AB
K7QLC 1416- 59- 2-A
KN7TTQ 528- 22- 2-B
K7QFN 154- 7- 1-A
K7BBO/7 (K7s BBO HSD) 5642-217- 3-AB
K7OSM (K7s OSM OSN) 4452-159- 4-A

PACIFIC DIVISION

Santa Clara Valley

WA6BYA 4830-161- 5-AB
W6ASH 3120-104- 5-B
K6JMK 2250- 75- 5-B
K6HXY 1764- 63- 4-A
W6YKS 868- 31- 4-A
WA6QQI (WA6s QQH QQI) 2580- 86- 5—

East Bay

WA6NXC 4110-138- 5-AB
WA6LGE 1485- 50- 5-A
WN6APK 728- 28- 3-B
K6LRN 570- 19- 5-B
W6ZRH 448- 16- 4—
WA6AGA/6 (WA6s AGA IKE) 8910-297- 5-AB

San Francisco

WA6WIJ/6 2646- 94- 4-A
K0GEY/6 1950- 65- 5-B
WA6YYM 1287- 49- 3-B
WA6NDZ 260- 10- 3-A
W6MLK (Multi opr.) 1710- 57- 5-AB

Sacramento Valley

WA6GER 2520- 84- 5-ABC
K6CFF 1740- 58- 5-B
WV6ZHG 1650- 55- 5-B
K6PWH 1196- 46- 3-ABC
WB6AVE 312- 14- 2-A
W6GGW 110- 5- 1-C
W6TEE 88- 4- 1-C
K6EWO/6 (7 oprs.) 4110-137- 5-AB

San Joaquin Valley

W6OVR/6 1860- 62- 5-B
W6FZA 896- 28- 6-AB
W6YGZ 420- 15- 4-A

ROANOKE DIVISION

North Carolina

W4ACY 3472-124- 4-AB
K4HJE 3024-108- 4-AB
K4MHS 2604- 93- 4-ABD
K4YYJ 2470- 95- 3-ABD
W4BUZ 2304- 96- 2-B
W4WDH 2256- 94- 2-B
W4AJT 2156- 77- 4-AB
K4OJT 1968- 82- 2-B
K4GPL 1944- 81- 2-B
W4IVY 1804- 82- 1-AB
W4MWD 1740- 58- 5-AB
WA4CCK 1606- 73- 1-B
K4QIF 1562- 71- 1-B
W4VHH 1372- 49- 4-B
WA4CUD 1248- 52- 2-B
W4OAB 1080- 45- 2-AB
W4CAH 1056- 44- 2-AB
K4DCU 1032- 43- 2-B
K4ICK 1012- 46- 1-B
W4MHC 946- 43- 1-B
W4RRK 814- 37- 1-B
WA4BKR 770- 35- 1-B
K4JQU 660- 30- 1-B
K4OJP 616- 28- 1-B
K4HQM 594- 27- 1-B
WN4JDW 594- 27- 1-B
W4HJZ 432- 18- 2-AB
W4FDO/4 (W4s FDO YBN WA4BBY) 1243- 58- 1-AB

South Carolina

K4JQY 1568- 56- 4-AB
K1TBC/4 924- 33- 4-A
W4VRV 742- 27- 4-AB
W4DEN 532- 19- 4-AB
WA4HEV 448- 16- 4-A
K4ITLQ 364- 14- 3-A
W4TLC/4 312- 12- 3-B
W4VIW 120- 5- 2-B

Virginia

K4VWH 12,098-263-13-A
W4VCC 8040-201-10-ABC
W4LTU 6288-131-14-B
W4GOC 2205- 74- 5-AB
W4GVQ 1350- 45- 5-A
K4EM 1204- 43- 4-B
W4TNS 812- 29- 4-A
W4SRB/4 672- 28- 2-A
K4EUS 656- 20- 6-AB
WA4GFW 480- 20- 2-A
WN4KIK 384- 16- 2-B

West Virginia

K8WVP 2550- 75- 7-AB
WA8DIS 784- 28- 4-A

ROCKY MOUNTAIN DIVISION

Colorado

K0QAN 1032- 43- 2-B
K0PGM 672- 28- 2-B
K0MNQ 264- 11- 2-AB
W0SIN 88- 4- 1-B
W0DK/0 (multiopr.) 4110-137- 5-AB
W0FPP (4 oprs.) 1344- 56- 2-AB

New Mexico

K5KJW 528- 24- 1-AB
W5CYZ 440- 20- 1-AB
W5IXR 88- 4- 1-A
W5IXS 88- 4- 1-A
W5KWR 88- 4- 1-A
W5FMK 44- 2- 1-A
W5IXS/5 22- 1- 1-A

Wyoming

K9DNW/7 22- 1- 1-A

SOUTHEASTERN DIVISION

Alabama

WA4AFF 403- 16- 3-A
K4ZAJ 144- 6- 2-B

Eastern Florida

K4YSN 2508-114- 1-AB
WA4KGH 2002- 91- 1-A
WA4KJF (K4ZDS, W4HFD, WA4BAW) 1210- 55- 1-AB

Western Florida

WA4FIJ 696- 29- 2-AB
W4ZGS 624- 26- 2-AB
K4VFY 396- 18- 1-B
WA4DYN 374- 17- 1-AB
WA4GJO 374- 17- 1-B
WA4FJF 286- 13- 1-AB
W5JJZ/4 198- 9- 1-B
WA4FIJ/4 132- 6- 1-AB
WA4GJO/4 132- 6- 1-B
WN4IMC 132- 6- 1-B
WA4FJF/4 110- 5- 1-AB
WA4JSC 110- 5- 1-AB
WN4IMC/4 44- 2- 1-B
W4SRX/4 (7 Oprs.) 816- 34- 2-AB

Georgia

K4YZE 2160- 72- 5-AB
W4GIS 520- 20- 3-B
K4QMS 442- 17- 3-B
WN4LFP/4 22- 1- 1-B
W4TOE/4 (K4s YFU YGK, W4MDS) 5516-197- 4-AB

SOUTHWESTERN DIVISION

Los Angeles

K6JQB[12] 2448-102- 2-A
WA6BYJ[12] 2448-102- 2-A
WA6SLF 2400-100- 2-B
WA6VAA 2016- 84- 2-B
WA6GAG 1612- 62- 3-A
K6GYF 1560- 65- 2-BC
WA6TYV 336- 14- 2-A
W6FNE/6 (4 oprs.) 20,352-638- 6-AB
WA6IBM/6 (2 oprs.) 4592-164- 4-AB

(Continued on page 160)

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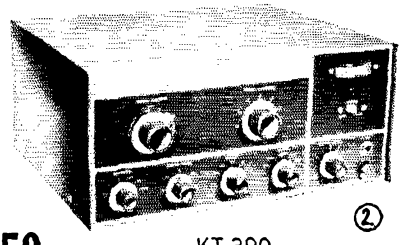

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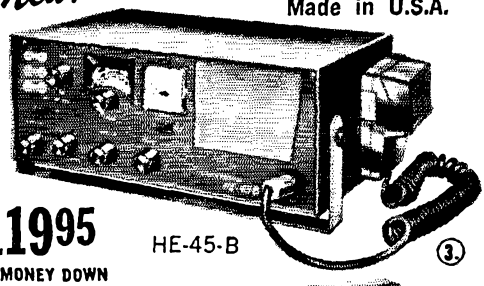

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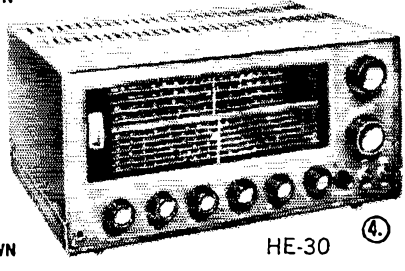

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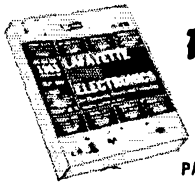

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K6BPC (5 oprs.) 4256-152- 4-AB

Arizona

W7LXY[13] 1408- 64- 1-AB
K6JJC/7 (K6JJC, WA6S RQE TKF) 312- 13- 2-AB

San Diego

K6RCK 2832-118- 2-AB
K6QWZ 1300- 50- 3-B
K6RTR (11 oprs.) 5892-246- 2-AB
W6POG/6 (K6BNT, W6POG, WB6BTE) 1548- 66- 2-A
W6NLO/6 (K6AIDG, W6NLO, WB6BAL) 2352- 98- 2-AB

WEST GULF DIVISION

Northern Texas

W5EFH 3672-153- 2-A
W5EME 3432-143- 2-A
K5RWR 3432-143- 2-A
K5MLD 3024-126- 2-A
K5ARU 2860-133- 1-A
K5GHS 2530-115- 1-AB
K5IVB 2376-100- 2-A
WA5DDI 1628- 74- 1-A
K5CMC 1584- 73- 1-A
WA5CUG 1540- 70- 1-A
WA5DXV 1430- 65- 1-AB
K5KWB 1100- 50- 1-A
K5KPC 946- 43- 1-A
K5MUH 792- 36- 1-A
K5WIN 572- 26- 1-A
K5KVE 550- 25- 1-A
K5VUF 396- 18- 1-A
WA5CLX 286- 13- 1-A
WA5CMA 284- 12- 1-A
K5OBO 198- 9- 1-A
K5VUM 176- 8- 1-A
K5TKR (K5TKR ZBM) 4560-190- 2-ABC

Oklahoma

W5ORH 1742- 67- 3-AB
K5WQE 1612- 62- 3-AB
W5LOW 1326- 51- 3-AB
W5VCJ 1100- 50- 1-AB
W5WAX 784- 28- 4-AB
W5FMX 660- 30- 1-AB
W5GIQ 312- 13- 2-B
W5MFX 264- 11- 2-B
WN5DWK 264- 12- 1-B

CANADIAN DIVISION

Maritime

VE1MX 360- 15- 2-B
VE1OD 264- 12- 1-A

Quebec

VE2AXO 784- 28- 4-AB
VE2BNP 442- 17- 3-B
VE2BBP 216- 9- 2-B

Ontario

VE3EZC 5740-205- 4-B
VE3CUY 4452-159- 4-B
VE3ESE 4424-158- 4-B
VE3AIB 4260-142- 5-AB
VE3TT 3380-130- 3-B
VE3CVC 3052-109- 4-B
VE3C1L 2800-100- 4-B
VE3CKP 2800-100- 4-B
VE3DUU 2678-103- 3-AB
VE3CWN 2604- 93- 4-B
VE3CRU 2520- 90- 4-AB
VE3EZZ 2380- 85- 4-B
VE3FAX 2366- 91- 3-B
VE3TW 2268- 81- 4-B
VE3NW 2080- 80- 3-B
VE3FCE 1898- 73- 3-B
VE3DWQ 1794- 69- 3-B
VE3AAH 1464- 61- 2-B
VE3DFA 1326- 51- 3-B
VE3CWR 1224- 51- 2-B
VE3NG 960- 40- 2-B
VE3AST 936- 39- 2-B
VE3FAP 936- 39- 2-B
VE3IU 840- 35- 2-B
VE3EOD 672- 28- 2-B
VE3CLT 648- 27- 2-B
VE3FEE 456- 19- 2-B
VE3FAQ 396- 18- 1-B
VE3EOC 374- 17- 1-B
VE3FAZ 374- 17- 1-B
VE3DIR 336- 12- 4-B
VE3DRF 288- 12- 2-B
VE3ASZ 242- 11- 1-B
VE3AEZ 216- 9- 2-B
VE3EWU 176- 8- 1-B
VE3DAY 110- 5- 1-B
VE3TCD[14] 104- 4- 3-B

British Columbia

VE3BZS/7 276- 12- 2-A

FOREIGN

VP7CX 22- 1- 1-A

[1] W3HFY, opr. [2] K3ESJ, opr. [3] Novice Award Winner. [4] WA2VSH, opr. [5] K9HUY, opr. [6] K9JPH, opr. [7] K9EEC, opr. [8] Hq. Staff, not eligible for award. [9] K1ADB, opr. [10] K1ODW, opr. [11] K1ABR, opr. [12] Tied for Section Award. [13] K7KZF, opr. [14] VE3OF, opr.

ARRL thanks the following amateurs for submitting their logs for checking purposes: K1WUT K8OTS W0FJZ.

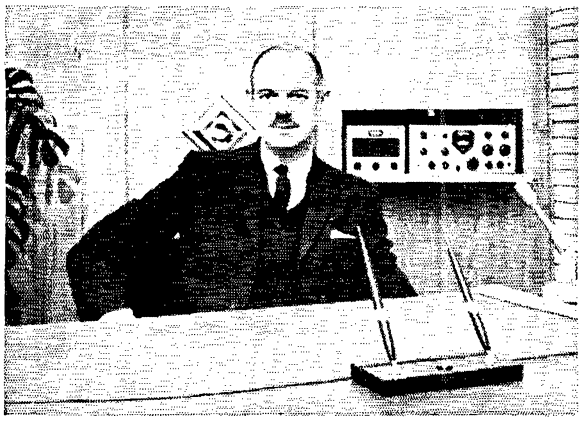
Mobile Antennas

(Continued from page 13)

Specialists Type M-25) is mounted on top of the coil. This does a good job of absorbing shock when passing under low tree branches and similar obstructions. A Master Mobile easy-off connector is used for quick disassembly of the whip when entering garages. To prevent possible damage to the coil section when the car is passingt hrough an automatic car-washing machine, this section can be quickly removed by running the drive motor to its lowest position, unscrewing the coil from the insulated coupling, and in its place screwing on a metal or plastic cap to prevent water from getting inside the coupling. This operation takes about two minutes and I usually do it while the inside of the car is being vacuumed before it enters the washing machine.

Since completing this antenna I have changed the whip to an Antenna Specialists Type 19A328-1 and the small spring to an Antenna

(Continued on page 162)



"Hi! I'm Lowell McNeil, W9PTN, president of the West Racine Bank in Racine, Wisconsin. As a banker, I can assure you that Collins radio equipment is an excellent investment. It has quality, performance and top trade-in value. These are the things we bankers look for. Many banks offer special finance rates on Collins equipment, just as Terry is offering here. I have a KWM-1 at the office and a complete Collins station at home. I've been 'All Collins' for many years."

It takes a banker to know a good buy

. . . Collins

S S B EQUIPMENT

and it takes Terry, W9DIA,

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	Amateur Net	1 Year (10% down)	2 Years (20% down)	3 Years (30% down)
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30S-1 Linear Amplifier	1556.00	122.53	57.05	34.79
32S-3 Transmitter	750.00	59.06	27.50	15.81
62S-1 VHF Converter	895.00	70.48	32.81	20.01
75S-3 Receiver	680.00	53.55	24.93	15.20
75S-3A Receiver	750.00	59.06	27.50	15.81
KWM-2 Transceiver	1150.00	90.56	42.16	25.71
KWM-2A Transceiver	1250.00	98.43	45.83	27.95
51J-4 Receiver	1464.00	115.29	53.68	32.73
51S-1 Receiver	1828.00	143.95	67.02	40.87
351D-2 Mobile Mount	120.00	9.45	4.40	2.68
MP-1 14V DC Power Supply	198.00	15.59	7.26	4.42
PM-2 Portable Power Supply	150.00	11.81	5.50	3.33
CC-2 Carrying Case	85.00	6.69	2.99	1.90
CC-3 Carrying Case	107.00	8.42	3.92	2.28
516F-2 AC Power Supply	115.00	9.05	4.21	2.57
312B-4 Speaker Console	195.00	15.35	7.15	4.36
312B-5 PTO Console	350.00	27.56	12.83	7.82
399C-1 PTO Speaker	164.00	12.91	6.01	3.66

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

☐ Send latest reconditioned equipment bulletin

Specialists Type 19A434-1. This makes the top section much lighter, thereby further relieving any strain at the base section. I have also painted the whole assembly the same color as the car, which makes it less conspicuous and more attractive.

To date no difficulties have been encountered with this antenna's operation, even in zero degree temperature and with ice, sleet and snow all over it. So with warm weather or spring just around the corner and with mobile activity once again on the increase, I hope that this article will serve to help fellow mobile enthusiasts to enjoy more convenient all-band operation and a greater number of mobile QSO's. QST

50-Mc. Transceiver

(*Continued from page 46*)

contact, the signal was heard in Fayetteville, Tenn., 30 miles away, and off the main line of the beam. Reports indicate good signal readability. Frequency response of the phone unit is restricted to the speech range, which probably helps.

Bear in mind that the receiver radiates a signal that could cause real trouble to a near neighbor on the 50-Mc. band, so do not make a practice of using it to monitor the contacts of local stations. It should be fun to see if DX can be worked with this low power when the band is open, and the writer would be interested to learn if anyone has success in this.

In the second unit, the stability of the detector was improved by mounting a small brass screw so that it could be used as a core in the detector coil. Apparently the *Q* of the coil was a bit too high at first, or perhaps it was merely that the transistor used was not quite as good as in the first unit. The screw was run into the coil until sputtering ceased, and then cemented in place. There is likely to be quite a bit of difference between transistors, so you may want to experiment with any surplus you have available, trying for smoothest reception or best transmitter output.

Presumably this same general circuit would work well on 28 Mc., by adding more capacitance and inductance in the tuned circuits. A word of warning: don't grid-dip the coils with the transistors in place. The output of a vacuum-tube dipper may be enough to damage the transistors. QST

Correspondence from Members

(*Continued from page 88*)

the ARRL recommendations ham radio will be a much more pleasant and wonderful hobby. — *Joseph E. Sheinman, WSAZE, Utica, New York.*

¶ I heartily agree with the ARRL Board that all stations should use only the amount of power required to communicate with the station being contacted. In fact, it is the law and the FCC should enforce it. — *Ralph E. Alexander, W6WRJ, Tustin, California.*

WHEN IS NIGHT?

¶ Just finished reading *QST*, about new freqs for 160 meters. Never worked 160 so I got interested. Then a ques-

(*Continued on page 164*)

tion arose right now. I get home from work in the evening. Card says my district has 100W daytime 25 night. The Dr. Miles Calendar says on 2/27/63 sun sets 5:49 P.M. But was not dark outside; not until 6:52 P.M. Could see one mile down road yet.

I got a fat Barred Rock rooster, takes his harem to bed at around 5 P.M. (night for him) and cuts loose at 4 A.M. (day for him). Now I want to know what does identify day and night (beginning and end). Looked in *License Manual*, could not find any dope. Kick this around. — *Frank E. Lewis, Sr., K8GKR, Harrod, Ohio.*

EDITOR'S NOTE: Night is that period between sunset and sunrise local time, as far as the amateur rules for 160 meters are concerned. These exact times are published in most local newspapers on a regular basis, often in the same section which contains the summary of weather information.

The World Above 50 Mc.

(*Continued from page 81*)

weeks. Looks like the Louisiana gang is really making its mark.

WA2DAC in New York sez that he sends CQ, tape, every Sunday morning at 0900 local time on 50.25 to the south and east and would like some skeds or contacts. K7CAZ in Longview, Washington has taped transmissions between W6FZA and W6NLZ during their Sunday morning tropo scatter skeds. Mike has copied the boys every Sunday morning during these skeds for the past four months.

Reports of sporadic *E* have fallen off (of course) but there has been some skip throughout the country. WØDRE sez that the band opened up March 10 for a very short period of time and only two stations were heard. One of these was WA5CQD in Kingsville, Texas who was running a Heath Sixer and had a good signal during the thirteen-minute contacts with John. WA6NOV reports that activity on 50 Mc. was local rag-chewing during March but that during February "6 meters was hopping with DX." Heard from his QTH at Vallejo were: WA4AEZ in Florida, K5UNK in New Mexico, W5SFW in Texas, K7CIN in Arizona, WA6LGV in Southern California and North Carolina. Sounds almost like the "good old days." "Only one opening noted during March" sez Charlie, W4FDO at Chapel Hill, North Carolina. That opening was on the 17th when he worked K1MIDD/4 in Charlotte and K4VPA in Williamsburg, Virginia. V.h.f. is growing in that area with about thirteen stations now active as compared to five stations six months ago. The group meets on six meters each Wednesday night at 9:00 P.M. on 50.55 Mc. and is looking for breakers. QST

I. A. R. U. News

(*Continued from page 60*)

Guam: M.A.R.C., Box 445, Agana, Guam, Marianas Islands
Guantanamo Bay: Guantanamo Amateur Radio Club, Box 55, Navy 115, FPO, New York, N. Y.
Guatemala: C.R.A.G., P.O. Box 115, Guatemala City
Haiti: Radio Club d'Haiti, Box 943, Port-au-Prince
Honduras: **Jacobo Zelaya Jr., HR1JZ, Bo. Buenos Aires, 13 Calle 505,** Tegucigalpa, D. C.
Hong Kong: Hong Kong Amateur Radio Transmitting Society, P.O. Box 541
Hungary: H.S.R.L., Postbox 185, Budapest 4
Iceland: Islenzkir Radio Amatorar, Box 1058, Reykjavik
India: P.O. Box 534, Delhi 1
Iran: Joseph L. Mattingly, EP2BN, American Embassy, APO 205, New York, N. Y.
Ireland: I.R.T.S. QSL Bureau, 24 Wicklow St., Dublin 2
Israel: I.A.R.C., P.O. Box 4099, Tel-Aviv
Italy: A.R.I., Viale Vittorio Veneto 12, Milano
Jamaica: Ruel P. Samuels, **2 Lismore Ave.,** Kingston 5
Japan (JA only): J.A.R.L., Box 377, Tokyo
Japan (KA only): F.E.A.R.L. -M-, APO 925, San Francisco, Calif.
Kenya: **Box 30077, Nairobi**
Korea: Korea Amateur Radio League, Central Box 162, Seoul
Kuwait: William N. Burgess, 9K2AZ, % Kuwait Oil Co., 14 5th St. North, **Ahmadi 4,** Kuwait, Persian Gulf
Lebanon: R.A.L., Ahmadi, B.P. 3245, Beirut
Liberia: Ken Bale, EL4A, Le-Tourneau of Liberia, Roberts Field

(*Continued on page 166*)

Libya: 5A QSL Service, Box 372, Tripoli, **or via Box 1281, APO 231, New York, N. Y.**
Liechtenstein: via Switzerland
Luxembourg: R. Schott, 35 rue Batty Weber, Esch/Alz.
Macao: via Hong Kong
Madeira Island: **via Portugal**
Malagasy Republic (**Madagascar**): P.O. Box 587, Tananarive
Malaya: QSL Manager, **M.A.R.T.S.**, Box 777, Kuala Lumpur
Malta: R. F. Galea, ZB1E, "Casa Galea," Railway Road, Birkirkara
Marianas Islands: **see Guam**
Marshall Islands: **KX6 QSL Bureau, via KX6BU, Box 444, Navy 824, FPO, San Francisco, Calif.**
Mauritius: Paul Caboche, VQ8AD, Box 467, Port Louis
Mexico: L.M.R.E., P.O. Box 907, Mexico 1, D.F.
Midway Island: Midway Navy 3080, **Box 23,** KM6CE, Naval Security Group Activity, FPO, San Francisco, Calif.
Monaco: Pierre Anderhalt, 3A2CN, 49 rue Grimaldi
Morocco: A.A.E.M., P.O. Box 2060, Casablanca
Morocco: **(CN8FA-JZ only): American QSL Service of Morocco, Box 2104, APO 30, New York, N. Y.**
Mozambique: Liga dos Radio-Emissores de Mocambique, P.O. Box 812, Lourenco Marques
Netherlands: V.E.R.O.N., Postbox 400, Rotterdam
Netherlands Antilles (Aruba): **Aruba Amateur Radio Club, P.O. Box 43, Seroe Colorado,** Aruba, Netherlands Antilles
Netherlands Antilles (Curacao): P.O. Box 383, Willemstad, Curacao, Netherlands Antilles
New Zealand: N.Z.A.R.T., P.O. Box 489, Wellington
Nicaragua: Club de Radio Experimentadores de Nicaragua, Apartado Postal 925, Managua
Nigeria: Dr. M. Dransfield, 5N2JKO, Agricultural Research Station, Samaru, Zaria, **Federation of Nigeria**
Northern Ireland: **via Great Britain**
Northern Rhodesia: N.R.A.R.S., P.O. Box 332, Kitwe
Norway: N.R.R.L., P.O. Box 898, Oslo
Nyasaland: ZD6RM, P.O. Box 472, Blantyre
Okinawa: O.A.R.C., APO 331, % Postmaster, San Francisco, Calif.
East Pakistan: **Mohd, AP5CP, Tiger Amateur Radio Club, Dacca Signals, Dacca 6**
West Pakistan: Ahmed Ebrahim, AP2AD, P.O. Box 65, Lahore
Panama, Republic of: L.P.R.A., P.O. Box 1622, Panama
Paraguay: R.C.P., Casilla de Correo 512, Asuncion
Papua: VK9 QSL Officer, P.O. Box 204, Port Moresby **(or via Australia)**
Peru: R.C.P., Box 538, Lima
Philippine Islands: P.A.R.A. QSL Bureau, **1546 Requesens, Santa Cruz, Manila**
Poland: PZK QSL Bureau, P.O. Box 320, Warsaw 10
Portugal: Rua de D. Pedro V., 7-4°, Lisbon
Rodriguez Island: **via Mauritius**
Roumania: Central Radio Club, P.O. Box 95, Bucharest
Rwanda: **via Burundi**
Saudi Arabia: **HZ1AB, Det. #5, Hq. USMTM, APO 616, New York, N. Y.**
Scotland: **via Great Britain**
Senegal: Ch. Tenot, **6W8BF,** P.O. Box 971, Dakar, **or via REF (France)**
Singapore: QSL Manager, P.O. Box 777
Somali Republic: **Box 397, Mogadiscio**
South Africa: S.A.R.L., P.O. Box 3037, Cape Town
Southern Rhodesia: R.S.S.R., Box 2377, Salisbury
Spain: U.R.E., P.O. Box 220, Madrid
St. Vincent: QSL Bureau, P.O. Box 142, St. Vincent, West Indies
Sweden: Sveriges Sandare Amatorer, Enskede 7
Switzerland: U.S.K.A., Buron/LU
Syria: P.O. Box 35, Damascus
Tanganyika: **P.O. Box 2387, Dar es Salaam**
Trinidad and Tobago: **J. La Motte Kerr, VP4TE, 10 Kelly Kenny St., Woodbrook,** Port of Spain, Trinidad
Tunisia: S. S. Wagoner, Jr., 3V8CA, % U. S. Embassy, Tunis
Uganda: **R.S.E.A. QSL Bureau, P.O. Box 3433, Kampala**
Uruguay: R.C.U., P.O. Box 37, Montevideo
U.S.S.R.: Central Radio Club, Box 88, Moscow
Venezuela: R.C.V., P.O. Box 2285, Caracas

(Continued on page 168)

Virgin Islands: Richard C. Spenceley, KV4AA, 16 Commandant Gade, Charlotte Amalie, St. Thomas
Wake Island: T. D. Musson, **KW6CJ**, P.O. Box 445
Wales: via Great Britain
Yugoslavia: S.R.J., P.O. Box 48, Belgrade
Zanzibar: **via Tanganyika**

Happenings of the Month

(*Continued from page 62*)

received a reply, the Commission sent a follow-up notice by certified mail on October 4, 1962. This too having gone unanswered, the Commission on October 24, 1962 ordered Mr. Boyd to show cause why his station license should not be revoked, his failure to answer official communications being a violation of Section 1.76 of the Commission's rules. Again the FCC communication went unanswered, and accordingly, the station license W1YVK was revoked, effective April 8, 1963.

In a similar case, Boris G. Petroff, K8SYR, of Painesville, Ohio, failed to answer an official notice of violation citing voice operation on 7197.7 kc., mailed August 10, 1961, follow-up letters dated October 26, 1961 and October 9, 1962, and the Order to Show Cause released November 8, 1962. Accordingly, his license was revoked by an order released March 1, effective April 9, 1963.

Several other cases are now pending, and the time factors have speeded up considerably: in one case a notice of violation was mailed January 30, the follow-up letter February 28, and the Order to Show Cause on April 18.

Sections 1.56 and 1.57 of the FCC regulations require every licensee to keep the Commission informed as to his current address. Failure to receive a notice of violation or other correspondence from the FCC due to a change of address, therefore, is not a valid excuse for failure to answer. All amateurs should be careful to keep the Commission informed of their current address, and should promptly and honestly reply to every communication from FCC.

Those whose licenses have been revoked may not apply for a new license for at least a year. Even then, they may be required to show cause why a license should be issued, in view of their previous record. QST

Strays

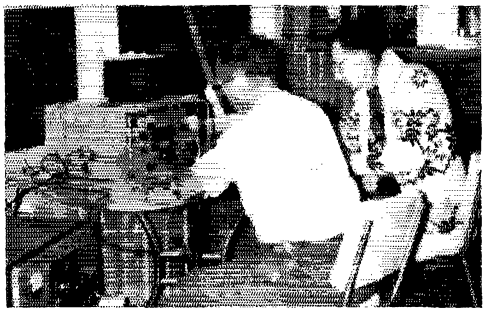
More about the HBR8/11 receiver. Not all the Miller 1731 coils supplied by local dealers have been the new improved ceramic type. In order to keep everyone happy, the J. W. Miller Co. (5917 South Main St., Los Angeles 3, Calif.) will replace each phenolic or resenite type 1731 with a ceramic type 1731 upon receipt of the coil and $1.00. (The newer form *is* more expensive.) However, W6TC made a test on his receiver, using the two different coils, and found *very little* difference in performance. So all is not lost if you decide to stick with what you already have.

SET — 1962

(*Continued from page 74*)

Comments

Local Red Cross officials were very interested in the test. They hope to make a national story of the event. — *VE6FK, EC Calgary, Alberta.* Amateurs did a swell job and publicity gained with townspeople was most beneficial to ham radio. — *W1WX, EC Fairfield, Conn.* The Florida AREC plan of "key cities" with v.h.f. links proved excellent. — *W4TFT, EC Brevard Co., Fla.* We had news shots on TV five times. — *W4TKE, EC Duval County, Fla.*



VE6AB and EC VE6FK operate 75-meter control from Chestermere Lake near Calgary, Alberta, during a simulated snowstorm emergency on Oct. 8.

It is my conclusion that this was not a successful drill and had it been an emergency the confusion would have been two or three times as great. — *W4BNE, EC Hillsborough County, Fla.* Every amateur was in back of me and we're in there pitching. — *K4QOK, EC Pinellas Co., Fla.* The test almost turned out not to be simulated; one of the worst storms this area has experienced. — *W1AAU, EC Dedham-Hyde Park, Mass.* Not enough stations were assigned to cover the NCEFs. — *K1ICJ, EC Sharon, Mass.* This test drill was called without previous notice; all mobiles performed as necessary and without a hitch. — *W9DJG, EC Madison Co., Ill.* I can count on one half to one third of my CB stations and none of the hams. — *W9ICF, EC Monroe Co., Ill.* The Test was very successful; everybody had a good time and lots of fun. — *K9AEK, EC Blackford Co., Ind.* RACES is at a standstill until more money is provided by the government for matching funds. — *KØVKT, EC District #4, Iowa.* No EC active, so a group of us got together and had SET ourselves. — *W9DGA, Vanderburgh Co., Ind.* You deserve better help here in Zone 18. — *KØEWW, EC Zone 18, Kans.* We noticed that our operators need some training on handling this kind of traffic, but considering the short time we have been operating, I am very pleased with the outcome. — *K5BLO, EC North East La.* The time and day selected were about the roughest I could have picked — Saturday at 5:30 P.M. — *K8GIK, EC Oakland Co., Mich.* Our equipment is furnished by the individual amateur, as money is not available from city or county agencies. — *W7RZY, EC Harlowton, Mont.* This EC had only two weeks since appointment to organize and execute SET this area; hope to do better next time. — *K7PKN, EC Kalispell Area, Mont.* A smaller number of people were active this year as compared to last year, but we have more mobile and emergency power available. — *K2OVN, EC Kings County, N. Y.* RACES RO does not feel they need AREC, so we are on our own. — *WA2BNF, EC Essex Co., N. J.* I was particularly pleased with the number of amateurs taking part, since I had not even mentioned the SET at our last club meeting. — *VE3DXG, EC North Bay, Ont.* SET Bulletin very useful but not too timely. — *VE3FES, EC Peel Co., Ont.* The test gave those operating an opportunity to use standard ARRL forms and procedure; another test of this kind will smooth the procedure a bit. — *VE3ATI, EC Whitby, Ont.* Apparently no watch kept from San Francisco on 7100 kc. We have had this same trouble in past years. — *W6SLX, EC Eureka, Calif.* Just one week after our SET we had the real thing! — *W6DEF, EC Redwood City, etc., Calif.* Our group was only five days old at the time of this SET. We plan to do much

(*Continued on page 172*)

better next year. — *K5VYD, EC Galveston Co., Texas.* A successful SET, but pointed out the need for message handling experience and training. — *K5RDP, EC Harris Co., Texas,* SET was held one year after Hurricane Carla hit the Texas Coast. — *W5BRZ, EC San Patricio Co., Texas.* Thoughts on improving AREC here: a new EC; a monthly quota of originated messages per station; a national AREC party; lots of equipment and antennae. — *W4JXD, EC Alexandria, Va.* We used the personal help of our Red Cross disaster chairman; is he considered a "facility"? — *W7PSD, EC Clallam Co., Wash.* One h - - - of a good time. The village supplied the gasoline. — *K2MEF, EC Tioga Co., N. Y.* SET in two phases, second of which was to welcome a losing Penn State team back home. — *W3SAY, EC Centre Co., Pa.* QST

Silent Keys

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

K1MHA, Bernice L. Lincoln, Winchester, Mass.
W2FLO, Cecil W. Cranmer, Manahawkin, N. J.
W2IIY, George Petersen, Brooklyn, N. Y.
K2MHM, Donald A. Solovikos, Neptune, N. J.
W2VEO, Howard C. Fairbanks, Williamson, N. Y.
WA2VFM, Stuart Nadelson, Bayside, N. Y.
W3ECM, George A. Jenkins, Philadelphia, Pa.
K3JDO, Ernest J. Hilton, Waymart, Pa.
W3KVU, J. Clyde Amon, New Wilmington, Pa.
W3MTE, Henry H. Washburn, Lutherville, Md.
W3UQ, Merril C. Kent, Monessen, Pa.
W3WVS, James J. Wilson, Jr., Philadelphia, Pa.
W4DOZ, Thompson W. Jackson, Kings Mountain, N. C.
W4EBZ, Francis F. Thompson, Birmingham, Ala.
W4EEB, Harry A. Cole, Atlanta, Ga.
W4ITK, Neal F. Johnston, Richmond, Va.
W4TUX, Stephen Demeter, St. Petersburg, Fla.
K5KOV, Richard B. Lollar, Abilene, Tex.
W5ODU, Robert L. Culley, Oklahoma City, Okla.
K5PUS, Thomas C. Ray, Brownwood, Tex.
W5VDY, J. B. Thompson, Los Alamos, N. Mex.
K5YSI, John H. Hamilton, Jr., Galveston, Tex.
ex-W6COJ, James V. Date, Hughson, Calif.
W6CQ, Marcus G. Carlton, Solana Beach, Calif.
WA6IGT, Ray E. Enger, Atascadero, Calif.
W7LOX, Carleton W. Morris, Warren, Ariz.
W7NXV, Frank E. Burdick, Milton-Freewater, Oreg.
W7RTE, Raymond E. Olsen, Prescott, Ariz.
ex-KN8ZOG, Oakie G. Samuelson, Port Huron, Mich.
W8ZPF, Ralph D. Woodburn, Columbus, Ohio
W9AAJ, Thomas J. Reid, Berwyn, Ill.
K9GID, Eldo S. Ary, Rockton, Ill.
W9ZDC, Joseph S. Dzengel, Chicago, Ill.
WN0BEM, Clauss H. Carter, Marshalltown, Iowa
WØEXO, Wesley J. Jefferson, Hope, N. Dak.
KØFPV, James T. Breth, Wichita, Kans.
WØUXD, Earl P. Stultz, Omaha, Nebr.
KØWEM, Clayton L. Wardell, Sr., Sioux Falls, S. Dak.
VE1DR, J. L. Mullins, Bear River, N. S., Canada
VE2AJR, Carillas Charbonneau, Hull, Que., Canada
VE4XP, J. C. McMurray, Dauphin, Man., Canada
VE6OL, Terence Ingoldsby, Lethbridge, Alta., Canada
VE7NL, S. W. Lawrie, Vancouver, B. C., Canada
VK3TX, W. S. Tregear, Ashburton, Victoria, Australia
VO1AK, Jeremiah J. O'Grady, St. John's, Newfoundland

Two amateurs were aboard the Navy's nuclear submarine USS *Thresher* when she was lost on April 10 off the New England coast. Tilmon J. Arsenault, W1SNO, and Don R. Dundas, WØWBD, were stationed at the Portsmouth Naval Shipyard, and were members of the Port City ARC.

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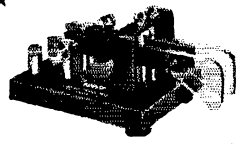

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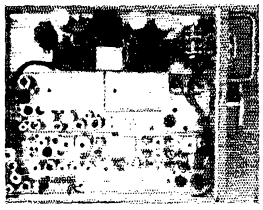
9 Market Street Stamford, Conn.

432 MC FM GEAR

MOTOROLA CRYSTAL CONTROLLED

0.6μV RECEIVER 18 W. TRANSMITTER



450-470 Mc. mobile transmitter has 2C39 tripler 2C39 final

Final will operate with cool 80 w. input-40 w. output. No mechanical changes required in cavities to tune to 432 mc. Final can be AM plate modulated. FM receiver converts to 432 mc. with simple changes. All units complete with 2C39 tubes and diagrams and allignment instructions. No control heads or cables, or cases.

T44A—6vdc, missing few tubes and crystals $40.00
Receiver strip complete 25.00
Transmitter strip complete 25.00

6 & 2 METER FM GEAR

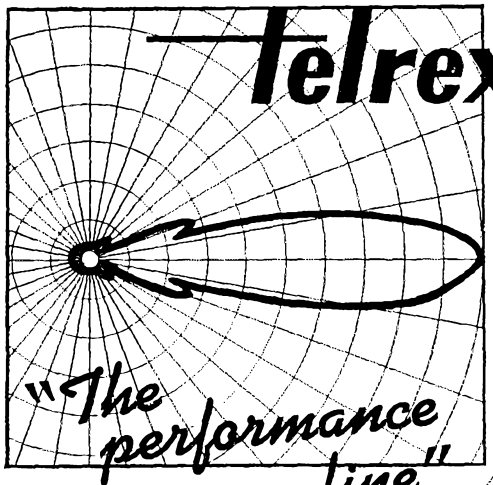
Complete Trans., Rec., & Power Supply Chassis
FMTRU-80D 150 mc. 30 watt (2-2E26) 6 volt...$44.50
12 volt... 52.50
FMTR-80D 30-50 mc. 30 watt (2-2E26) 6 volt... 44.50
12 volt... 52.50
FMTRU-140D 150 mc. 60 watt (829B) 6 volt... 54.50
FMTR-140D 30-50 mc. 60 watt (829B) 6 volt... 54.50

Following 2 Items Shipped Postpaid in U.S.A.
Motorola 55 amp. Alternator (new) 12 volt 59.50
Motorola Transistorized Ignition 12 volt 40.95

Sales of FM equipment to amateurs only
Limit: Two to a customer

Write for list of 30-50 Mc. gear and 150 Mc gear.

F M SALES CO. 1100 Tremont St. Roxbury 20, Mass. ♦ GA 7-3513



"—with a MATERIAL DIFFERENCE!"

"BEAMED-POWER" ANTENNAS and ANTENNA SYSTEMS

The Choice of the Discriminating Communication Engineer... the Man who Never Settles for Anything Less than THE-VERY-BEST!

You too — can enjoy World renowned TELREX performance and value!
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ANTENNAS SINCE 1921 **Telrex LABORATORIES** Communication and TV Antennas
ASBURY PARK 40, NEW JERSEY, U.S.A.

A.R.R.L QSL BUREAU

The function of the ARRL QSL Bureau system is to facilitate delivery to amateurs in the United States, its possessions, and Canada of those QSL cards which arrive from amateur stations in other parts of the world. All *you* have to do is send your QSL manager (see list below) a stamped self-addressed envelope about 4¼ by 9½ inches in size with your name and address in the usual place on the front of the envelope and your call printed in capital letters in the upper left-hand corner.

W1, K1 — G. L. DeGrenier, W1GKK, 109 Gallup St., North Adams, Mass.

W2, K2 — North Jersey DX Ass'n, P.O. Box 303, Bradley Beach, N. J.

W3, K3 — Jesse Bieberman, W3KT, P.O. Box 400, Bala-Cynwyd, Pa.

W4, K4 — Thomas M. Moss, W4HYW, Box 20644, Municipal Airport Branch, Atlanta 20, Ga.

W5, K5 — Brad A. Beard, W5ADZ, P.O. Box 25172, Houston 5, Texas.

W6, K6 — San Diego DX Club, Box 6029, San Diego 6, Calif.

W7, K7 — Salem Amateur Radio Club, P.O. Box 61, Salem, Oregon.

W8, K8 — Walter E. Musgrave, W8NGW, 1215 E. 187th St., Cleveland 10, Ohio.

W9, K9 — Ray P. Birren, W9MSG, Box 510, Elmhurst, Illinois.

WØ, KØ — Alva A. Smith, WØDMA, 238 East Main St., Caledonia, Minn.

VE1 — L. J. Fader, VE1FQ, P.O. Box 663, Halifax, N. S.

VE2 — George C. Goode, VE2YA, 188 Lakeview Avenue, Point Claire, Montreal 33, Quebec.

VE3 — R. H. Buckley, VE3UW, 20 Almont Road, Downsview, Ont.

VE4 — D. E. McVittie, VE4OX, 647 Academy Road, Winnipeg 9, Manitoba.

VE5 — Fred Ward, VE5OP, 899 Connaught Ave. Moose Jaw, Sask.

VE6 — W. R. Savage, VE6EO, 833 10th St., N., Lethbridge, Alta.

VE7 — H. R. Hough, VE7HR, 1291 Simon Road, Victoria, B. C.

VE8 — George T. Kondo, VE8RX, % Dept. of Transport, P.O. Box 339, Fort Smith, N. W. T.

VO1 — Ernest Ash, VO1AA, P.O. Box 6, St. John's, Newf.

VO2 — Douglas B. Ritcey, Dept. of Transport, Goose Bay, Labrador.

KP4 — Joseph Gonzalez, KP4YT, Box 1061, San Juan, P.R.

KH6 — John H. Oka, KH6DQ, P.O. Box 101, Aiea, Oahu, Hawaii.

KL7 — Alaska QSL Bureau, Box 6226, Airport Annex, Anchorage, Alaska.

KZ5 — Ralph E. Harvey, KZ5RV, Box 407, Balboa, C. Z.

(Cards for SWLs may be handled via Leroy Waite, 39 Hanum St., Ballston Spa, N. Y.)

HAM-ADS

(1) Advertising shall pertain to products and services which are related to amateur radio.

(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. No Box Reply Service can be maintained in these columns nor may commercial type copy be signed solely with amateur call letters. Ham-ads signed only with a box number without identifying signature cannot be accepted.

(3) The Ham-Ad rate is 35¢ per word, except as noted in paragraph (6) below.

(4) **Remittance in full must accompany copy, since Ham-Ads are not carried on our books. No cash or contract discount or agency commission will be allowed.**

(5) Closing date for Ham Ads is the 20th of the second month preceding publication date.

(6) **A special rate of 10¢ per word will apply to advertising which, in our judgment, is obviously non-commercial in nature.** 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, takes the 10¢ rate. Address and signatures are charged for. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and all advertising so classified takes the 35¢ 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 copy, signature and address be printed plainly on one side of paper only. Typewritten copy preferred but handwritten signature must accompany all authorized insertions.**

(8) No advertiser may use more than 100 words in any one issue nor more than one ad in one issue.

Having made no investigation of the advertisers in the classified columns except those obviously commercial in character, the publishers of QST are unable to vouch for their integrity or for the grade or character of the products or services advertised.

CLUBS. The 13th ARRL National Convention, October 4, 5, 6, 1963 has display space available for a number of unusual amateur radio club displays. For details contact the ARRL National Convention, P.O. Box 5167, Cleveland, Ohio.

BREAKFAST Club Hamfest July 20 and 21. Terry Park, Palmyra, Ill. For tickets write K9YRP, Chatham, Ill. P.O Box 323.

HAMFEST: The date is June 2nd for the Starved Rock Radio Club Hamfest. Same place as last year. See our announcement in the May Hamfest Calendar. Free gift to each registrant. $1.50 registration before May 25. $2.00 at the gate. Write G. E. Keith, W9QLZ/W9MKS, RFD #1, Box 171, Oglesby, Ill.

14 WEATHER Instrument Plans, $2.00. Saco Industries, Box 2513, South Bend, Ind.

WANTED: Early wireless gear, books, magazines, catalogs before 1922. Send description and prices. W6GH, 1010 Monte Dr., Santa Barbara, Calif.

MOTOROLA used FM communications equipment bought and sold. W5BCQ, Ralph Hicks, Box 6097, Tulsa, Okla.

WE buy all types of tubes for cash, especially Eimac, subject to our test. Maritime International Co., 199 Front St., Hempstead, N.Y.

TOROIDS: Uncased 88 Mhy, like new. Dollar each. Five/$4.00 P. P. DaPaul, 309 So. Ashton, Millbrae, Calif.

SOUTHERN California: Transmitters and receivers repaired, aligned. Bandwidth, frequency, harmonics measured. Used ham gear bought, sold, traded. Robinson Electronics, 922 W. Chapman, Orange, Calif. Tel. KEllogg 8-0500.

CASH For your gear! We buy, trade and sell. We stock Hammarlund, Hallicrafters, National, Johnson, RME, Hy-Gain, Mosley and many other lines of ham gear. Ask for used equipment list. H & H Electronic Supply Inc., 506-510 Kishwaukee St., Rockford, Ill.

WANTED: Military or Industrial laboratory test equipment. Electronicecraft, Box 399, Mt. Kisco, N.Y.

WANT 1925 and earlier ham and broadcast gear for personal collection, W4AA, Wayne Nelson, Concord, N.C.

MICHIGAN Hams! Amateur supplies, standard brands. Store hours 0830 to 1730 Monday through Saturday. Roy J. Purchase, W8RP. Purchase Radio Supply, 327 E. Hoover St., Ann Arbor, Michigan. Tel. NOrmandy 8-8262.

CHICAGOLAND Amateurs! Factory authorized service for Hallicrafters, Hammarlund, Johnson, Gonset Service all amateur equipment to factory standards. Heights Electronics, Inc., 1145 Halstead St., Chicago Heights, Ill. Tel. SKyline 5-4056.

HAM TV Equipment bought, sold traded. Al Denson, W1BYX, Rockville, Conn.

TOROID RTTY Kit: Mark-Space discriminator and bandpass filters. Includes 4-88 Mhy and 1-44 Mhy uncased like new condx. toroids: information sheet, mounting hardware and six mylar capacitors. $5.00 ppd. Toroids: specify 88 or 44, less capactrs. $1.00 each. 5/$4.00, ppd. KCM Products, Box 88, Milwaukee 13, Wis.

WANTED: For personal collection: QSTs January through August 1916; QST supplement Index for Aug. 1922 to July 1923; ARRL Handbooks: Editions 1 and 5. W1CUT, Box 1, West Hartford 7, Conn.

TUBES Wanted. All types, highest prices paid. Write or phone. Lon-Tronics, Inc., 131 Lawrence St., Brooklyn 1, N.Y. Tel. UL 5-2615.

QSLS?? SWLS?? WPE?? Largest variety samples 25¢ (refunded). Sakkers, W8DED, Holland, Michigan.

QSL. SWL, cards that are different. Quality card stock. Samples 10¢. Home Print, 2416 Elmo, Hamilton, Ohio.

C. FRITZ QSLS. Highest quality consistently for a quarter century! Samples 25¢ deductible. Box 1684, Scottsdale, Ariz. (formerly Joliet, Ill.).

QSLS. Twenty exclusive designs in 3 colors. Rush $3.85 for 100 or $6.90 for 200 and get surprise of your life. 5 days' service. Satisfaction guaranteed. Constantine Press, Bladensburg, Md.

QSL Specialists. Distinctive Samples 15¢. DRJ Studios, 2114 N. Lavergne Ave., Chicago 39, Ill.

QSLS "Brownie," W3CJI, 3110 Lehigh, Allentown, Penna. Catalog with samples, 25¢.

QSLS-SWLS. Samples 10¢. Malgo Press, Box 375 M.O., Toledo 1, Ohio.

QSL-SWL-WPE. Finest. Since 1946. Largest assortment. Priced right. Send 10¢ for samples to: Glenn Print, 1103 Pine Heights Ave., Baltimore 29, Md.

DELUXE QSLS. Petty, W2HAZ, Box 27, Trenton, N.J. Samples, 10¢.

QSLS, Special, 100 50 Star U.S. Flags on glossy cards. $3.70. Ppd. Other samples 10¢ or 25¢ refunded. Dick, W8VXK, Rt. 4, Gladwin, Mich.

QSLS-SWLS, 100 2-color glossy, $3.00; QSO file cards, $1.00 per 100. Samples, 10¢. Rusprint, Box 757, Kansas City 16, Mo.

QSLS: samples 25¢ (refundable). Schuch, W6CMN, Wildcat Press, 6707 Beck Ave., North Hollywood, Calif.

CREATIVE QSL Cards. Free, new catalog and samples. Personal attention given. Wilkens Creative Printing, P.O. Box 1064-1, Atascadero, Calif.

QSLS, SWLS, WPE. Samples 5¢. Nicholas & Son Printery, P.O. Box 11184, Phoenix 17, Ariz.

QSLS, SWLs, XYL-OMs (sample assortment approximately 93¢) covering designing, planning, printing, arranging, mailing; eye-catching, comic, sedate, fantabulous, DX-attracting, prototypal, snazzy, unparagoned cards (Wow!). Rogers, KØAAB, 961 Arcade St., St. Paul 6, Minn.

SUPERIOR QSLS, samples 10¢. Ham Specialties, Box 73, Hobbs, New Mexico (formerly Bellaire, Texas).

DON'T Buy QSLs until you see my free samples. Bolles, W5OWC, 7701 Tisdale, Austin, Texas.

QSLS, 300 for $4.35. Samples 10¢. W9SKR, "George" Vesely, Rte. #1, 100 Wilson Road, Ingleside, Ill.

QSLS. Samples 25¢. Rubber stamps: name, call and address $1.55. Harry Sims, 3227 Missouri Ave., St. Louis 18, Mo.

QSLS. 3-color glossy, 100—$4.50. Rutgers VariTyping Service, 7 Fairfield Rd., Somerset, N.J.

QSLS, Kromekote 2 & 3 colors, attractive, distinctive, different. Free ball point pen with order. Sampls 15¢. Agents for Call-D-Cal decals. K2VOB Press, 62 Midland Blvd., Maplewood, N.J.

POCKET Rubber Stamps. Your call plus name and address, $1.00. Ralph, KØUMY, Box 238, New Ulm, Minn.

RUBBER STAMPS, $1.00. Call and Address. Clint's Radio, W2UDO, 32 Cumberland Ave., Verona, N.J.

QSLS. $2.50 per 100. Free samples and catalog. Garth, Jutland, N.J.

PICTURE QSL cards from your photograph of your shack, home, etc. 1000, $12. Raum's, 4154 Fifth St., Philadelphia 40, Penna.

QUALITY Rubber stamps, low prices, pocket size, 3 lines, $1.00. Sam Koury, K8TCI, 3867 Fernleigh, Troy, Mich.

QSLs At the sign of the "Hobby Horse". Quality at uninflated price and quick delivery. Glossy, red and green, $2.00 per 100 postpaid. Free sample. Hobby Print Shop, Umatilla, Fla.

QSLS, $1.50 up. Samples free. Filmcrafters, Box 304, Martins Ferry, Ohio.

COMPARE: Deluxe rubber stamp. King-size call; name, address: $2.00. Frey, Box 296, Schwenksville, Penna.

QSLS, 100, $2.50. Samples free. Amec's Printery, W9FXQ, Box 13A, Oak Lawn, Ill.

1¼" Call QSLs (2 sides printed) 100 $3.15. Sample free. Gariepy, 2624 Kroemer, Ft. Wayne, Ind.

QSLS: 3-color glossy, 100- $3.89. Nice designs. Samples 10¢. Gates Print Shop, 317-11th Ave., Juniata, Altoona, Penna.

QSLS. Sparking, distinctive styles. Samples dime. Refunded. Filmcrafters, Box 304, Martins Ferry, Ohio.

QSLS. All new designs. Free catalogue. Longbrook Press Box 393, Quakertown, N.J.

QSLS. Samples, dime. Printer, Corwith, Iowa.

QSLS, 100 2-color, $3.00. Samples 10¢. Brigham, 32 Colson St., North Billerica, Mass.

QSL Cards. New, kute, klever, komical designs. Some as low as $1.80 per 100. Samples 10¢. R. Hellwig, Box 425, Lakes Wales, Fla.

QSLS. Stamp and call brings samples. Eddie Scott, W3CSX, Fairplay, Md.

RUBBER Stamps for hams, sample impressions. W9UNY, Hamm, 542 North 93, Milwaukee, Wis.

ATTRACTIVE QSLS. Large variety of styles, cartoons, colors. Samples 25¢ (deductible). Paul Levin, K2MTT, 1460 Carroll St., Brooklyn 13, N.Y.

QSLs. Samples free. The Ink Well, Spencer, Mass.

QSL Cards. Write for free samples. W9WOC, Frank Rossner, Jr., Keyhole Press, 3425 Hirsch St., Chicago 51, Ill.

CANADIANS: Invader 2000, Valiant, 6N2, HRO, DB23, R390 receiver, Taoctone receiver, BC375E, ART-13, LM7, oscilloscope, G4ZU Triband antenna, antique Atwater Kent. Send list. VE3BVX, Sussex, North, Lindsay, Ont., Canada.

CANADIANS: Complete Collins S/Line station 75S-1 including noise blanker and 500 cycle filter 32S-1 transmitter 516F-2 power supply 312B-4 control console, cables, etc. $1400.00. VE2JS, J.P. Millar, 78 Dahlia, Dorval, Quebec, Can.

CANADIANS! Apache, $300: HA-10, $300, both commercially wired, not a scratch! TA33 Senior, $75. VE6BJ, 15406 75th Ave., Edmonton, Alta., Canada.

CANADIANS! 1962 Johnson Valiant, in mint condx, $450.00; Mosley TA-33,Jr., beam and rotator, $85.00. VE3EQO, 1539 Warland Rd., Oakville, Ont., Can. Tel VA 7-2394.

CANADIANS: Hallicrafters SR-150 transceiver including AC and DC pwr. supplies and mounting rack. Vy clean and in A-1 condx. Will accept $950.00. VE3FSC, 471 Water St., West, Cornwall, Ontario, Canada.

SELL, Swap or buy ancient radio sets and parts, magazines. Laverty, 118 N. Wycombe, Landsdowne, Penna.

THE Ham Trader Magazine devoted to sale of amateur radio equipment advertises free, pay when you sell. Subscription 6 issues, $1.50, 25¢ per copy. Information, The Ham Trader, Box 153, Dept. Q, Franklin Square, N.Y.

CASH promptly paid for your ham gear. Trigger, 7361 North, River Forest, Ill. FR 1-8616.

FOR Sale: Complete instructions including 28-p. booklet and 26" x 36" schematic for converting the ART-13 transmitter to AM and SSB. $2.50. Satisfacion guaranteed. Sam Appleton, K5MKI, 501 N. Maxwell St., Tulia, Texas.

ACT Now!! Barry pays cash for tubes (unused) and equipment. Barry Electronics, 512 Broadway, NYC 12. Call 212-WAlker-5-7000.

SELL: Collins MP-1 mobile 12V DC supply; 351D-2 KWM-2 mobile mount with cables, both new, never used. Slightly used Collins PM-2 portable AC supply and CC-2 carrying case. Best offer. WØOGI, 303 N. Wisconsin, Gunnison, Colorado.

NEVADA Stations. Am trying to arrange sked for EA1GZ, a vy fine operator who needs only Nevada for WAS. Please contact K4EF.

ELECTRONIC Equipment. All in excint condx: TS-323, $150; TS-174, $125; TS-175, $125; LR freq. meter, $100; new HP412A-VTVM, $295; TS-34, $40; GR1110A interpolation osc., $125. Lampkin 105B, $100. S. Wolf, 3 Lawrence Lane, Lexington, Mass.

ATTENTION: Amateur radio equipment repaired, work guaranteed. L & S Electronic Technicians, WA2OOG, Sid Levinson, 393 So. 3rd, Brooklyn 11, N.Y. Tel EV 4-7564.

WANTED: All types of aircraft or ground radios. 17L, 618F or S 388, 390, GRC, PRC, 51J, RVX. Especially any item made by Collins Radio, ham or commercial. Also large type tubes and test equipment in general. For fast cash action contact Ted Dames, W2KUW, 308 Hickory, Arlington, N.J.

NEW And used ham gear. Top trades. Norm, K9HRI at Dahn Electronic Supply, 14 Jayne St., Algonquin, Ill. Mail orders welcome!

ATTENTION Mobileers! Heavy-duty Leece-Neville 6 volt 100 amp. system, $50; 12 volt amp. system, $50; 12 volt 60 amp. system, $60; 12 volt 100 amp. system, $100. Built-in silicon rectifier alternators 12 volt 60 amps. $100; 12 volt 100 amps. $125.00. Guaranteed no ex-police car units. Herbert A. Zimmerman, Jr., K2PAT, 1907 Coney Island Ave., Brooklyn 30, N.Y. Tel. DEwey 6-7388.

HAM Discount House. Write us for lowest prices on ham equipment. Factory sealed cartons. Specify equipment wanted! H D H Sales Co., 327 Greenwich Ave., Stamford, Conn.

NATIONAL NC-98, $100; Globe Chief 90W, $25; excellent for the Novice. W1TQB, 19 Westford St., Gardner, Mass.

QSTS. Selling my duplicates from 1916 to 1960. Want old Callbooks, catalogs, etc. for personal collection. Erv Rasmussen, Box 612, Redwood City, Calif.

SELL: Valiant, $300: NC300, $250: Collins 310B, $100: TA33 Jr., $40; Ham-M (new), $90; 813 Kw. linear, $120; 3000-V Kw. power, $50: all gear excellent condx with instruction books. Richard Larson, KØVIG, 1312 14th, Glencoe, Minn.

ELMAC Complete station, fixed/mobile, 80 thru 6 meters. Latest models AF-68 transmitter, PMR-8 rcvr; M-1070 12DC/-117AC supply, cables, mike, coaxial relay, low-pass filter, in original cartons, turned on less than 10 hours total time. Like new condx! Sell 30% off. Mac, Box 4192, Lynchburg, Va.

KWM-1 matching speaker and AC supply, $495. No trades please! Ser. 1059. Alton Cuver, 530 Elizabeth Rd., San Antonio, Texas.

RANGER For sale: 90 watts trans, factory wired, like new condx, $169. K2YFO, Gil Vazquez, 522 West 136th St., N.Y. 31, N.Y. Tel. TO 2-6812.

TMC-GPR-90, rack mount, $380. Prepaid. W7WYV.

FOR Sale: KWS-1 in excint condx. Will consider all reasonable offers. Dave De Armond, 3024 Seminary Ave., Oakland, Calif.

KWS-1, 75A4, $1200 for both. Gonset Communicator IV 2 meters, $200 or best offer over. All A-1 condx. Will ship. W5VPN, 1300 Walter N.E. Albuquerque, New Mexico.

KWM-2 with late vox, 516F-2 AC supply. Like new condx with cables, manual, and factory cartons. Both for $795 firm. Closing down station so no trade deals, pse. Save $120 plus over a dealer. W7PGA/6, 1139 Doon Ct., Sunnyvale, Calif. Tel. 244-9267.

304TL tubes wanted. Also other xmttg and special purpose tubes. We will buy military or commercial transmitters and receivers with designations ARC, GRC, URR, 51 and MN. Air Ground Electronics Co., 64 Grand Pl., Kearny, N.J.

TRAVEL Abroad: Cheaper, more fun through the N.A. Ham-Hop Association. Summer travelers note: 2-month Minimum needed to arrange "hops". W8SZF, 3075 Scarborough Road, Cleveland, Ohio.

MUST Dispose: 82 copies Proceedings of the IRE, 3 volumes complete, 1926 to 1952. Real bargain for lot. Write for list. Mrs. Miriam Y. Knapp, W1ZIM, 191 Beechwood Rd., West Hartford 7, Conn. Tell: 521-2055.

VALIANT. Like new, $275. Gone SSB. Edwin O'Brien, W2LJF, MI 1-1298, 132-38-84 St., Ozone Park 17, N.Y.

INTERESTED In two-meter linear amplifiers, transmitters, receivers, etc. If the price is reasonable, for members of St. Mary's Radio Club, or as tax exempt donation to Missions. K8WLB, St. Joseph's Mercy Hospital, Centerville, Iowa.

SALE: Dumont 4 beam scope, $125; R.F. Gen. 1% acc. 90-600 mcs, $250, Sorenson Line reg. 1%, $105; Texas 2N964, 50¢, Variacs, $6 and Deutsch, Cannon quality conn., 15 contacts, $1 pr. 1N91 GE rect., 5-$1, BNC male co-ax conn. 4-$1; Recorders, rect. co-ord. Ail, $75; Polar $300; Brush $60; Open Sat. 9-6. Free list. 1040 E. 45th St., Brooklyn, N.Y. A & B Engineering.

SX-101 Mark III, $225; Globe King, 500B, $375; SB-10 Heath Adapter, $75; 5 inch Weston 'scope, Model 983, $60. All in like-new condx. Will ship. W2CHM, 41 Birchwood Dr., No. Arlington, N.J.

LINK 500 w/6M final, $40; Meridian Lab SWR Bridge, $60, new. Measur. 65 VTVM, $30; 1296 Transmitter, G-E, new, $90. 6146-6883 tubes; 3 for $5. Meinwald, K2JSO A&B Engnrg., 2043 E. 52nd St., B'klyn, N.Y.

SALE: Electronic Tubes: Bendix Types: 3D21WA @ $6; 6080WB @ $6: 6900 @ $7; 6384 @ $8; 6889 @ $8; 6385 @ $5; 2K50 @ $300: 6754 @ $7; 7757 @ $7; 7403 Tubes Bendix @ $9.00. Send cash, check or m.o. to P. Lore, 33 Somerville St., Rochelle Park, N.J.

CUSTOM Building ham gear, VHF specialists, converters, power supplies, etc. Free quotes Frontier Electronics, Orr 1, Minn. WØHPS, Everett Hoard, WØPYC, Frankie Hoard.

WILL Trade new or used ham parts and equipment for U.S. or Canada philatelic stamps. W9AU, P.O. Box 155, Barrington, Ill.

WANTED: Collins 51J-3, 5U4, R-388, R-390A, R-391, 75A-4, SP-600, teletype, Kleinschmidt, facsimile and test equipment. Cash or trade for new amateur equipment. Sell: 75A2A w/3kc filter, $275.00; Collins 32V xmttr, $175; P&H 400C linear ampf, $125; Boehme c.w. keyer $125. Write: Tom, W1AFN, Alltronics-Howard Co., Box 19, Boston 1, Mass. Tel. Richmond 2-0048.

LM7 Frequency meter with modulation and with original calibration book. Home brew power supply. Works fine. $50 or best offer. Ades, W3WQN.

RANGER, low pass, $160: DX-100, $115; HQ-140-X, Q-multiplier, $150: Globe Chief, $35; Johnson Mobile, VFO, $65; Trigand Whip, James p/s (12v/6v), $25; three element 20M beam (needs work), 110v. coax relay, $25; Tenor, $30; Terrograph recorder, $150. K2TBO, 627 Mountain Ave., Bound Brook, N.J.

REGENCY AT-1 transistor all-band converter, just returned from factory, $40.00. Bob Davy, W9TPA, Harvard, Ill.

SELL Collins 75A4, #2163, with spkr, $415.00: Hallicrafters HT-32A, #23705, $375.00, with manuals and in gud condx. Both for $765 or best offer. No trades. Rule, W4ZUK, 2817 North Atlantic Blvd., Ft. Lauderdale, Fla.

HRO-60-R in matching cabinet includes calibrator, NBFM adaptor, Select-O-Ject, spkr also and all coils including 6 meters: $300. Ranger II factory-wired, $225. Will deliver within 200 miles radius. Frank, K3GQC.

FOR Sale: Collins 75A4, in mint condx: $550. Mark Grossman, K2CON, 1665 Monroe Ave., Bronx 57, N.Y., or call 212-TR8-1174 after 7:30 PM.

WANTED: Manual on the Navy surplus RAL-7 rcvr. Will pay. Any info helpful. Can you help me. Write WN5EDL, 620 College St., Jackson, Miss. Charles D. Hudson.

TRADE Collins station, 75A4, KWS1, Rohn tower, Telrex rotator, beams. Want: late auto, prefer compact. W5YRY, 7224 Alexander, Dallas 14, Texas.

PROTECT Your ham license. Have it sealed in clear plastic. Send license and $1.00 to John Mason, WA2YHM, Box 83, W. Hempstead, N.Y.

SELL: HQ-145C, in mint condx: WA2ZVJ, 2115 East 27th St., Brooklyn, N.Y.

FIRST Check for $70 gets my NC-98, in excint condx, f.o.b. Elizabeth, N.J. WA2ERJ, 810 Vine St., Elizabeth, N.J.

SELL Gonset G-76 transceiver, in mint condx, with matching AC supply: $325. W1BIH, Box 1, Torrington, Conn.

75A4, HT-33A, and HT-32, $290.00 each if you take all three. All in like-new condx. K5IZE, 1810 Peavy, Dallas 28, Texas.

CLEGG Zeus transmitter, $495.00; factory-wired 6N2 Johnson converter, $40: SX-101A with R46 spkr, $295; new Summer of 1962. All immaculate condx. Will ship in factory cartons with manuals. Will consider trade to S/Line or KWM2. K8KBW.

IMPROVED BC-455, $20; BC-454, $15. Both converted. WA9AUE, 1480 Lawrence, Lake Forest, Ill.

SELL: Swan 175 Adcom 12V 800V 200 Ma. New-Tronics RM-75; MD-1 body mount, Turner 150C mic 3 mos. old, $350.00. Del Schlump, KØDEV. 315-5th St. NE, Little Falls, Minn.

HAM BUERGERS—Used Equipment, Money Back Guarantee B & W 51SB, $399.95; Globe Chief Deluxe, $65.00: Globe Scout Deluxe, $109.05; Glove Champ 300A, $285.00: Gonset G 76 AC PS, $125.00; G-76 Transceiver, $375.00: SR-34, $274.95; HT-33, $325.00: SX-28, $99.95; FPM-200, $1275.00; Hammarlund HQ-129X/spkr, $139.95; Heath Mohawk, $249.95; Thunderbolt, $399.95; Vik. 2, $149.95; NC 300, $244.95. Trades . . . Write for Free list. Ham Buergers, Wyncote, Pa. CA 4-1740.

HOWARD Radio: Spring sale. Special Demo prices with full warranty on KWM-2, $1035.00: 75S3, $612.00; 32S3, $675.00; SR-150, $585.00: SW-240, $288.00: SX-117, $341.00: 30 day warranty on choice used equipment: Viking KW w/desk, $595.00; Viking 500/FW, $495.00: Globe King 500B, $395.00; Invader 200, $475.00: Pacemaker, $195.00: 75A2's $225.00; HQ-160s, $230.00: AF-67's, $85.00. Let a ham take care of your needs. Write or call R. L. K5ABO or Ed. W5ILR, for prices or current list. Terms. Cash. Howard Radio, 1475 Pine St., Abilene, Texas. Phone ORchard 2-9501.

SELL: $500 for HT-37, SX-111 and speaker. Individually, HT-37 at $350 and the SX-111 w/spkr, $200. Also Gonset IIB, $150; Gonset 2-meter VFO, with audio preamplifier, $40: Johnson Matchbox, $30; Heathkit SWR Bridge, $15. Hobbs, 40 B, 221 St., Rockaway Point 95, N.Y. Tel.: No. NE-4-8889.

SELL: S-108 receiver, $115; HD-11 Q-multiplier, $10. Both only 6 mos. old. K1YMA.

SELL: F500B08 and F500B31 mech. filters for Collins 51J4 receiver, $55.00 each. Hammarlund PRO31Q rcvr, like new condx, $235.00. Hallicrafters SX-71 rcvr, gud condx, $70. Globe Scout 680-A xmttr, like new, $65.00. Merrill W. Roscoe, 1880 18th St., East Moline, Ill.

DRAKE 2-B w/spkr, $215; Heath DX-100, $100; Hy-Gain rotor-brake w/cable, $100; Gonset G77A w/3 way power, $125; Pierson KE-93 w/6-12 pwr, $125.00. All in exclnt condx. K5R8X, 3502 Briscoe, Greenville, Texas.

FOR Sale: Ranger II transmitter with PTT, $240.00. Write John Christianson, WA9EDG, 22 W 431 Elmwood Dr., Glen Ellyn, Ill. Local deal preferred. Factory-wired.

FOR Sale: BC-610-E, capable of a kw on fone or c.w., complete but lacks mod. xfrmr; brand new HQ-100C; Johnson low-pass filter, trap dipole ant. complete. Complete station in operating order. Want $375 or will trade for good camera and strobe and other acc. WA2KEC, Wayne, 135 Oak St., Patchogue, N.Y.

AMATEUR Paradise Vacation. Livingstone Lodge and log cabins. Mascoma Lake, Enfield, N.H. Couples, families, 100 acres, swim, fish, boats, sports. Dartmouth golf, tennis, 33rd year. Light Housekeeping. $20 PPPW; children half. Literature. W2QPN, Al Livingstone, 12-01 Willis, Fair Lawn, N.J.

TRADE Mobiline 6 meter transceiver for 6-12-110 volt power supply crystal or VFO, for Lampkin frequency meter. R. Goetz, 3202 Sunnyside Drive, Rockford, Ill.

COLLINS 75A2A, 1 filter, $269; 32V transmitter, $169; Johnson Thunderbolt amplifier, $289; Ranger I, $169; Hallicrafters SX-100, $165. 88 mhy. toroids, $3 for 6. Ppd. W1AFN, Tom, 46 Mt. Vernon, Boston 8, Mass. Tel. Richmond 2-0916.

HT-33, mint. Pair new 4CX300 spares, $425. SX-101 Mark 1A mint, $250.00. No shipping, sry. W8GWA. Wanted: Swan 20 meter.

20M, 15M, 10M beams: full-size, gamma-matched, 3-element. Twenty meter boom is an aluminum ladder. $50.00. Gamma-match of 10 and 15 meter beams remotely controlled, $35.00 each; 10-ft. 3-legged tower, $15.00; CDR rotator and indicator with special circuit permitting spotting position of antenna, $35.00; Mark Mobile heliwhip, $7.00; 275 watt Matchbox, $35.00. Will ship collect. W8GAS, 1821 North Park Blvd., Cleveland Heights 6, Ohio.

FOR Sale: SX-101A, $240, and HT-37, $335. Will deliver within 100 mile radius of Washington, D.C. Wanted to buy: 50 ft. foldover tower, beam and rotor with accessories. H. Fleming, 1205 White Way, Laurel, Md. Tel. 301-PA5-2791.

SELL: Lysco 600S with 30 watt plate modulation transformer built-in, also 10-pass filter. In exclnt condx: $80. W8VLB.

SELLING Out: Almost new HQ-110C, $179.00; DX-20, $29.95; modulator for DX-20, $5.00; Heath VF-1, VFO, $17.00; power supply for VFO, $7.00; QF-1 Q multiplier, $8.50. brand new BC-522, $22.50. Bill Boyd, 128 Blackburn, Elk City, Okla.

MOBILE: Transistor power supplies for most commercial and homebrew rigs. As low as $50.00. Not a kit. Reich Electronics, P.O. Box 774, Garland, Texas.

BC610 wanted. Cash or trade. Bernard Gordon, W3CJV, 251 Fairview Park, Mountaintop, Penna.

SELL: SX-99 receiver in exclnt condx, w/spkr and QF1, $95.00. K5ADU.

SELL Or trade HX-20 new $225; BC348-P, $45; G76, AC power, $80; GR212, $95. Want: 51J or S. Have many parts for hi-power tubes trans., conds. F. Baker, McComb, Ohio.

SALE: Viking Valiant, factory wired, in superb condx and physically and electrically; $270.00, with Johnson low-pass filter premounted. B. Diamond, K4KVJ, 2081 S.W. 13th St., Miami 45, Fla.

75A4, Serial 4933, 3.1 filter, like new, spkr, $500/00; Valiant, like new condx, $250.00; Tri-Ex tower H.S. 471, 71 ft. cranks up, $250.00. F.o.b. Caldwell, Idaho Ham-M rotator, like new condx, $80.00. Dr. Patrick, Box 103, Caldwell, Idaho.

Wanted: All cables for Navy surplus RBM-5 series receivers and power supplies with control unit, type CAY, 46076A and 74. Need manuals. R. Grayson, 651 Fairview, Elmhurst, Ill.

SELL: BW5100-B wid 51SBGEN, SX-101A; homebrew, pair 4-250As, with 0-6000 VDC pwr supp., all in exclnt condx. All for $850 cash or part. Write for prices. Steve Hopkins, WA6-MZQ/5, 3716 35th St., Lubbock, Texas.

SELL: NC-300 and speaker, $180; National 6 and 2 converters in matching cabinet, $50. Ronald Robinson, K9FRL, Winchester, Ill.

COLLINS 32V2, 75A1, Astatic T3 PTT microphone. Collins spkr and Dow-Key relay. All are in exclnt condx. $425.00. Mark T. Swearengen, W9LI, Monroe City, Mo.

HQ-180 with IF noise silencer, best offer over $275; Heath scope demodulator probe, wired, $3.00. No trades. P. W. Nieman, 613 W. Roosevelt, Wheaton, Ill.

SALE: HT-32, recently factory aligned; NC-300 w/xtal calibrator, and $550.00 takes both items. Will deliver within 150 mile radius Washington area. Maj. W. O. Eden, Box 13, Bolling AFB 25, D.C.

SELL: Hallicrafters SX-71 receiver with R-46 spkr, in gud condx: $100.00. Paul Makowski, K5WYF, 5716 Chaparral Cr., NW, Albuquerque, N.M.

VIKING Challenger with VFO modified, $145.00. Edward Turner, 26 Church St., Swansea, Mass.

SELL: Heathkit Apache and Sn-10 with all cables, microphone, key and antenna relay.: $225.00. Richard Cooper, WA2KCM, 1079 Astor Ave., Bronx 69, N.Y. Tel. OL 4-6298.

APACHE Transmitter, $200.00; HQ-110 receiver w/spkr $165.00. J. B. Corbly, 5 Russel Avenue, Ft. Monmouth, N. J.

SELL Unused Collins MP1 12V. portable pwr supply, $150; KWM1 mobile mount, $40; slightly used 75S3, $495. Also Ampex portable stereo system 960 recorder, $245; two 2010 amp. spkr units, $95 each. Ed O'Brien, 86-10 34 Ave., Jackson Heights Queens, 72, L.I., N.Y.

PE75D, 2500 watt electric plant, $150. Nells Roth, W8UPR, Rte. 1, Wauseon, Ohio.

WANTED: Ink recorder BC1016, RD-60/U, McElroy SR-900, RPC, RAPC, RAP/S or GNT undulator 309. All for 3/8 in. (9.5 mm) tape. Also manuals and spare parts. KØJRU, Box 246, Savannah, Ga.

TELETYPE First class condx, 14 teletype tape type. Trade for mobile rig. Paul L. Wise, WAØENI, 120 N. Moffet, Joplin, Mo.

COLLINS 75A-3 with 800 and 3100 cycle filters, 8R-1 calibrator, spkr, in mint condx. Best offer over $300. Gregory Pierce, 5514 University Ave., Chicago 37, Ill.

SELL: KWM-2 and A.C. supply, like new, $1040: HC-10 SSB converter, like new, $75; QX-535 (see Goodheart ads), $29; VFO-matic for transceive operation on 75A receivers, $80; Testomatic field strength and modulation meter, 6 coils, $15.00; UTC-S46 pwr. xfrmr, $10; S-62 fil. Trans., 10 VCT-10 amp. $6.00; S-12 audio, $3.00; Merit P. 3146 10VCT, 10 amp $6.00. All in like new condx. F.o.b. Morrisville, Penna. R. R. Lamb, M.D. 1219 Yardley Rd.

SELL: Gonset Communicator IV, 6 meters; in exclnt condx; $225.00. WA2WEO, 58-08 210 St., Bayside, L.I., N.Y. Tel. BA 9-3428.

FOR Sale: KWS-1 No. 1293 with spare final tubes, 75A4, No. 4614 with 3.1 and 1.5 filters. Make offer! W1ETF, Box 373, West Haven, Conn.

FACTORY-Wired Ranger for sale. In exclnt condx, $160.00 or your best offer. Also have hi-fi equipment, electric train sets to swap. Send for details. Mike, K9ZSL, 1418 Stevens, Rhinelander, Wisc.

FOR Sale: Immaculate Mohawk receiver, $275.00; B & W 5100B, perf. condx, $275.00; Ameco converters, factory-wired 6 and 2 meters with matching P/S, never used, $50.00; Alliance rotor (TV type), never used, $30; 8 element Hy-Gain 6 meter antenna, never used, $25.00. Ship collect, K7HXM, Wallace Payne, Philco TechRep Field Engineer, 866th Radar Sqdn, Tonopah, Nev.

32's-1, AC pwr. supply, manual. Like new condx, $550.00. Pick up deal only. W6HTK, Suite 104, 2515 N. Main, Santa Ana, Calif. Tel KI 3-1784.

WANTED: January 1945 CQ, June 1945 CQ, September 1958 CQ. All issues of QST 1931 and earlier. Good, clean copies only. Ted E. Suiter, Route 3, Box 1252, Klamath Falls, Oregon.

SELL: Gonset G76 transceiver with matched Gonset transistorized 12 Volt DC pwr. supply. Turner push-to-talk mike. Mosley mobile Tribander antenna, hardly used and in practically new condx, $400. Dr. Mortimer D. Solomon, 41 Westbrook Lane, Roosevelt, N.Y. Phone 516-BA-3-3575.

HIGHLY Effective home study review for FCC commercial phone exams. Free literature! Wallace Cook, Box 10634, Jackson 9, Miss.

75A-2, DX-100, $275.00 for rcvr, $115 for xmtr. Also trap antenna and coax relay, $20. Package deal, $390.00. Will ship anywhere F.o.b. Ken Mickam, 146 Woodside S.E., Grand Rapids, Mich.

SX-101 with R-46B spkr, $225.00. Mosley V-4-6 vertical antenna with 80 meter coil, $25.00. K2EMJ, 12 Riverside Dr. Denville, N.J. Phone 627-3824. Cash and Carry deal!

SELL: National NC-125, $68.00; Heath HW-29A "Sixer" and GP-11 mobile supply with cables, $42.00. Both in exclnt condx. K6VOS/Ø, Box 1007, USAF Academy, Colo.

HEATH Shawnee, 6 mtr. transceiver in exclnt wkg condx. No reasonable offer refused. Will ship. K9YCA, 107 N. 26th, South Bend 15, Indiana.

SELL: BC-794 Super Pro rcvr, complete, $75.00. F.o.b. Miami, A. Wm. Johnson, 8360 SW 154th Terrace, Miami 57, Fla.

SELL: HQ-145-C with calibrator, $195.00 cash. K2ZSY, 3013 Valentine, Bronx, N.Y.C. Tel. SE 3-6152.

SELL Complete or separately: Hallic. HT-37, used only 10 hrs., $375.00; Heath Mohawk, like new condx, expertly assembled, $250.00; Hy-Gain 4-el. Tribander, newest traps and matching, $7.00; e-el. 10-meter beam $20.00; CDR AR-22, $18.00; 10 ft. tower w/roof mount, $20.00; Electro-Voice 630 mike, $18.00; Heathkit SWR bridge, $15.00; 40-80 dipole and coax, $7.00; coax switch, $5.00; coax relay, $8.00; homebrew exciter, needs work, inc. VFO, pr. 6146s, $65.00; homebrew xmtr, needs rebuilding or use for parts pair 812As, coils for all bands, 1250 V 300 w. pwr. supp. Modulator with 809s, $110.00. One buyer takes all at $800.00. Dick Goldberg, W2PGF, Elm Pl., Armonk, N.Y. Tel. AR 3-8846.

COLLINS late model 75-A3 with 3, 100 and 800 cycle filters, crystal calibrator, A-4 knob, spare set tubes and Ameco Nuvistor 6 meter converter. Original cartons. First $350.00 certified check. Joseph Hiznay, RD #2, Vestal, New York.

WANTED: Commercial, military, all types. ARC, ARN, ARM, BC, GRC, PRC, TRC, URR, URM, TS, 618S, 17L, 51R, 51J, others. R1TCO, Box 156, Annandale, Va.

FOR Sale: 1-NC-270 w/matching spkr, plus antenna relay, 60 ft. of RG-58W coax cable, $230.00; 1-Lettine 242, 40 watts 6 m. transmitter, $50.00. B. R. Thompson, WA8BTL, 165 William Ave., Ripley, W. Va.

FOR Sale: Central Electronics 200V, $600.00; K9MRC, 1713 Meharry St., Lafayette, Ind.

FOR Sale: Copies of QST from 1928 to 1952, at 35¢ each. Write for complete list. David Hales, 56 Woodside Ave., Waterbury 8, Conn.

FABULOUS Transmitter for sale or trade: AN/URT-2. Unused. Original cost approx. $18,000. Compact 16 inches wide, 56 in. high. Crystal synthesizer provides any frequency between 300 Kc and 26 Mc. to within five cycles. 4-400A final, 3 vacuum variables. AM, CW, FAX, FSK for RTTY adjustable 0-2000 cycles continuous. SWR bridge built-in 110 V. AC power supplies. Select frequency and transmitter tunes itself through antenna tuner automatically in a matter of seconds. W6BJI, 1260 W. San Ramon, Fresno, Calif.

FOR Sale: Hammarlund receiver: HQ-160, used vy little and cannot be told from brand new. Its performance is far above average. In original carton, with manual. Will ship for $250. Jack Plane, Niantic, Conn.

COLLINS 30-L, $395.00; 75A2, $240.00; 75A3, 3 kc. filter, $20.00; 32V-1, $165.00: 30K1, $395.00: S-78, $85: All equipment in gud condx. Kilowatt plus AM transmitter, PP 450THs in final, 304TH modulators, two 5 ft. cabinets, 2 big power supplies, both with Variacs. Will show pitcures. Rig has worked over 200 countries on phone. W7MBW/W7MBX, 415 S.W. 2nd Ave., Portland 4, Ore. Tel CApitol 2-4221.

SSB Special! HT-37, $349.00 F.o.b. Atlanta, Ga. Drake 2-B, $199.00. F.o.b. Atlanta, Ga. J. G. Crosby, K4GBL, 117 Collingwood Terrace, College Park, Ga.

HQ-180C; WS-200 spkr and Lettine 240 w ant. tuner and extra 807: HQ-180C used as S.W.L. station only, for under 12 hrs. Lettine used for ½ year in Novice station. Failed tech lic. twice. Package deal at highest bid. Call 516-RO-6-2555 or write Joel Schuster, 6 Vanderveer Ct., Rockville Centre, N.Y.

HELP! Have no funds. Would appreciate donation of old receiver and transmitter. Will pay for shipping. Write first! Tnx. WN8GVQ, Box 73, Indian River, Michigan.

SELL: Exc. Drake 2-B, "-BQ, 2-AC and Heath SB-10: Apache. Johnson TR switch, Vibroplex Original, Bud xtal calibr. and homebrew c.w. monitor. Will sell in package or pieces to highest bidder. KØESK, 316 W. 6th St., Hays, Kans.

SELL: Command transmitters, receivers, accessories; panel meters; crystals; variable capacitors; panel mounted power supplies; etc. Stamped addressed envelope for bargain parts list. Roberts, WIKUK, 49 Daniel Rd., West Haven 16, Conn.

SALE: Stancor 203A, 10M mobile rig. Never used, $25; Elmac PMR-6A receiver with AC and 12V supplies, $80; Mosley Triband whip, $10; Gonset 10-meter converter, $10; Signal Slicer, $12.00; Heath grid dipper, $15; Gonset modulation meter, $10. W9WTY.

DX-100, in exclnt condx, $150.00; National 100X receiver with "Q" multiplier, $50.00. Carl Willihnganz, 2266 Gondar Ave., Long Beach, Tel. GE 9-6459.

DRAKE 2A, late model, in exc. condx, $170. No trades! P. Nieman, W9NHP, 613 W. Roosevelt, Wheaton, Ill.

COLLINS KWM-2 mobile mount, $85; MP-1 DC supply, $145.00. WA2BKT.

SELL: 50 ft. Hy-Gain vertical tower Model 18HT for 10, 15, 20, 40 and 80 meters. In exclnt condx. Pick it up for $60.00. C. Kretschmar, WA2JZU, 18 Elm Road, Pompton Plains, N.J. Tel: TE 5-3804.

BANDIT 2000A linear amplifier, new, in unopened carton, late serial number. Make an offer! CR-9-1895. Richard E. Mann, 7205 Center Dr., Des Moines, Iowa.

HT-37, perfect in every respect. Original shipping carton. I. J. Hemingway, W1HUM, 12 Sunset Terrace, West Hartford, Conn. Phone 232-6520.

WANTED: As I am disabled, want kit-wiring jobs to do and put in working order to occupy time. Will test and align for gud operation. For Sale: Heath HX-20 and HR-20 mobile, ac and dc power supply. Mike and all: $326.00. Presently in car working. Don't drive enough. Bought for a trip to Florida. No longer needed. KØHWK, Guy Hall, Alburnett, Iowa.

SELL Or swap: 14AVS, 14RMK, LC-80. WA2TKS, 2727 Ocean Parkway, Brooklyn 35, N.Y.

75A4 for sale. Serial No. 3805. Clean. Has vernier knob and 3.1 kc Mec filter. $450.00. Can ship. W5OCN, George L. Bacon, 5507 Exeter Drive, Austin 23, Texas. Fone GLendale 2-2474.

ISRAEL Tourist hams. Enjoy 4X4 eyeball hospitality. We were there, will arrange visits with our friends IARS. Goodwill informal project to help you and them without expense or obligation. Travel tips, benefit from our experience. See my letter QST Nov. 1962, P. 67. Licensing, operating, schedules. Write or phone and be glad you did. Help us to help some nice guys on the air. Dr. M. Soled, W2NXS, 135 Helmont Ave., Jersey City, 4 N.J. Jack Aviv, WA2KNC, EV-5-6770, 451 Rockaway Pkwy, Brooklyn 12, N.Y.

COLLEGE Forces sale: Eico 723, F.W.; NC-190 w/XCU-109 xtal cal.; Mosley TD-3 Jr. dipole, 10/15/40 m.; Dow-Key, spkr, headset, key, 5 xtals, cable, hardware. Separately or $225. Complete. R. Miller, 119 Ramblewood Ave., S.I. 8, N.Y.

SELL: Collins 75S3 4 months old, $550; 6 SWL crystals for 75S3, $20.00; Hy-Gain 402-B 40M beam, $60; AR22 rotator, $18.00. Will consider trades. Want: LPA-1 LPS-1 linear. Good general coverage receiver. KØDLG, 6524 16th Ave. S., Minneapolis 23, Minn.

SELL: In A-1 condx: Valiant, $300.00; HQ-170, $275.00; Gonset 111, 2M, $200; Elmac AF-68, PMR-8, 1070 PS, Webster Band-Spanner, $380.00; Ameco Nuv. convert 144 Mc. $40.00; 50 ft. tower, $60.00; Mosley TA-33, $65.00; Hy-Gain rotobrake, $125.00; Heath tunner-dipper, $30.00: an offer on complete station considered. Delivery within 300 mile radius. K1KSS, Jericho, Vt. Tel. 899-2222.

HX-50, new, won at SSB Dinner March 1963. Never removed from carton: $350.00. WA2UHV, 516 IV 1 9844 days; 516 MA 1-2629 or MA 1-0739 evenings, Hempstead, N.Y.

PHILMORE CR5AC short-wave rcvr with Q mult., $40; Knight Span-Master, $15.00. WA8EXC, 2111 Fleetwood, Grosse Pointe Woods, Mich.

WANTED: KWM-2. Have cash. WØDVZ, Box 475, Ottumwa, Iowa

VALIANT, Factory-wired, two years old, in vy gud condx. College commitments (forced sale at $240.00 firm.) Contact F. A. Dorsey, KØRXJ/4, Chi Phi, Box N, Emory Univ., Atlanta 22, Ga.

SELL-TRADE: 6 beautiful homebrew 12-watt mobile stations, 3 for 75; 3 for 160 meters. Stations include: converter that needs no "B" plus, Vibrapack, mike, 25 ft. of new coax; each complete station, $45.00. 125-watt modulator, $20.00; 12v. mobile Vibrapacks: 400v., -200 ma., $15.00; 280v. 100 Ma., $10.00: 15 watt 6 meter transmitter, $35.00; 5 mobile converters that need no "B" plus. 2 for 75, 3 for 160 meters, $10.00 each; everything in A-1 mint condx. Want: BC-221, BC-348, BC-779, receiver, grid-dipper, tube-tester, polaroid camera or??? Stan., W8QKU, 2748 Meade, Detroit 12, Michigan.

SALE: 60 ft. E-Z Way tower, Hercules Model, no guys, 20 ft. pole: six months old, brand new Ham-M rotator; two 6 element 6 meter beams, one 11-element 2-meter beam, 100 ft. RG-14 cable, one new Clegg 99'er and Zeus Climaster mikes, bridges, meters, all 100% perfect. Dr. Aaron Schlecter, 2 Oriole Dr., Wyomissing, Penna.

FERRIS Microvolters Model 20A, $30.00; GR-561 tube bridge, $100.00: H-P Model 325 distortion analyzer, $75; Triplett AM percent modulation meter, $15.00; special Ferris microvolters Model 18, one band, 26.8 to 27.3 Mc. $50.00. All clean tested and perf. electrical. Fritz Franke, 919 Ridge Court, Evanston, Ill.

MUST Sell: SX-101A, 1 yr. old, vy gud condx. Best offer over $200.00; Heath Cheyenne xmtr, vy gud condx, best offer. Also accessories. WA2GZD, Joel Herbsman, 1510 Unionport Road, Bronx 62, N.Y. TA 2-7215.

YL, General License, seeks position N.Y.C. or vicinity, where office skills can be applied. Write: YL, c/o G.P.O. Box 952, New York 1, N.Y.

SX-101A Hallicrafters SSB/AM/CW receiver. In mint condx, need money, $315.00 or offer WØERX/6, 14022-H Bellflower Blvd., Bellflower, Calif.

MUST Sell: Mohawk receiver, $220.00; Apache xmtr, $200.00; SB-10, $65.00, or all three for $465.00. Exclnt condx. Used less than 20 hours. Will deliver within 200 miles. W9FME, 53142 Twyckenham, South Bend 17, Indiana.

APACHE. In gud condx: $185.00. Will deliver within 100 miles NYC area. K2PDK, Clive Jacobs, 266 West 44th St., N.Y.C. 36, Tel: LO 4-0774.

WANTED to buy or rent for photo-copying: Manual and schematic for Harvey-Wells T-90 transmitter. Earl Smith K1NEV AMEMB (DSRS) Navy 539, New York, N.Y.

QST Library, August 1920 through 1962. To 1933 in binders. Make offer by years. Lettine 240 phone CW transmitter coils 10 thru 80 complete with two low-pass filters, $25.00. W2EW, 1355 Bushwick Ave., Brooklyn 7, N.Y.

COMPLETE Collins Station: 32-S-1, 75-S-1, 30-S-1, 516F-2 and 312B-4. Can ship all in original cartons. Central Electronics RF Analyzer TA-33 Mosley Ant. All like new condx. First $2500 takes all. Also have RTTY converter and local loop at $100 ea. K9SJF, 3925 Moller Rd., Indianapolis, Ind. J. H. Coffey, Tel: AX 1-9666.

KWM-2, in exclnt condx, AC and DC supplies mount 995. Prefer pick-up deal. E. MacFaul, 822 The Circle, Lewiston, N.Y.

WORLD'S Largest stock of premium quality reconditioned equipment. Terms! Trails! AF-67, $89.95; GSB-100, $329.00; HT-37, $375.00; Cheyenne, $89.95; DX-100, $169.00; DX-40, $49.95; Apache, $219.00; Challenger, $79.95; Viking II, $169.00; Valiant, $299.95; Geloso G-209, $149.00; G-66, $89.95; SX-101, $239.00; Comanche, $89.95; NC-109, $119.95; RME-6900, $249.00. Leo, WØGFQ, WRL, Box 919, Council Bluffs, Iowa.

WANTED: Two old style Navy double-decker hand-key knobs. W1BB.

SX-111, $189.00; factory-wired Eico 720, $59.00. Alex Vance, K9ODJ, 820 E. Westminster, Lake Forest, Ill.

SELL: Globe Champion, $225.00; Knight VFO, $25.00; Sry, no shipping. W5SUN/6, 1120 Cottonwood, Vandenberg AFB, Calif.

APACHE, $200; SX-101 MK III, $200.00; Matchbox with dir. coupler, $50.00. Send stamped env, for info. W7HMS.

NEED MONEY FOR COLLEGE. Heath Apache, $200.00; Mohawk/spkr, $210.00; SB-10, $75. All in exclnt condx. Complete station: $475.00. Paul Ferguson, K5ESW, 4012 Richmond, Shreveport, La.

CE-20A with QT-1 and 458 VFO, $150.00; 522 rcvr converted to six, $12. Prefer local deal. D. Vanderhoek, W2VLL, 785 The Circle, Lewiston, N.Y.

FOR Sale: HT-32, 75A3, Dow-Key relay, microphone. Best offer. Must sell. Both items in real gud condx. Dan Pierce, 1930 8th Ave., Kearney, Nebraska.

COMPLETE SSB-CW-AM station, new, never been used. SX-100 Hallicrafters. Pacemaker, latest factory modifications. Hy-Gain Tribander triaxial gamma match antenna. Xtal mic. power rotator, selsyn indicator. All coax and equip. to put it on the air. $400.00, net worth $1000.00. Kranzer, 1057 Indiana Ave., Venice, Calif.

DX-100, in exclnt condx, with spare 6146s and TR switch, $120.00: HQ-140X with spkr, like new, $125.00, QST's, 1952 through 1962, in binders. Make offer. W6EYH, 2016 Bobolink Way, Pomona, Calif.

MODEL 15 teletype printer, including metal table and WE KS566L1 power supply. In exclnt condx, $130.00; rack mounted on one chassis, tuning indicator, W2JAVTU with 1275-2125, 2125-2975 cps frequencies, and AFSK with same frequencies, used 2 hours: $80.00. Pair 4CX250B, $40.00. W1SUQ.

KWM-2 and PM-2 in mint new condx with original cartons, styrofoam packing, manuals, and tags. S/N 11946. $900.00: Hornet TB-500 beam, new, never assembled, complete: $50.00. Arthur Zolot, W1SKQ, 5 Pershing Road, Salem, Mass.

SELL: Mobile/Fixed SSB. Heath HX-20, HR-20, AC/DC. Supplies. Make offer. R. Arnold, 90 Devon Rd., Norwood, Mass.

SELL: Exclnt DX-100B professionally wired, factory modifications, $150.00; Drake 2B, 2BQ, $295.00. T-O Keyer with Nikey, $45.00. Stamped envelope brings details. W1VVA, 25 Lincoln Ave., South Norwalk, Conn.

SELL: Immaculate Elmac Twins AF-67, $80; PMR-7, $80.00; pair $150.00. Transistorized 120-watt power supply 12VDC to 600-300VDC, $10.00. Earl Fox WA2WSI, 10 Cedar Street, Basking Ridge, N.J.

HEATH Mobile/ fixed station SSB HR20, HP-10, HP-20, factory aligned and checked, mike, $297.00; Cheyenne with xtal socket, AC pwr, $100: Gonset G66 with spkr 12/110 pwr. supply, $120.00: Matched pair BC-611 $40.00; all in HB shape. ART-13 with call book, all tubes, as is, $30. Prefer pick-up deal. W8VXL, Box 218, Delton, Mich. Tel: MA-3-6631 evenings.

FREE Bargain Bulletin! Write: "Brand's Bulletin", Sycamore, Ill.

GO Maritime mobile! Homebrew inboard pontoon boat with unique landing gear for road travel. Willys Jeep motor, fiberglass covered plywood pontoons. Built by K9FVW with many one-of-a-kind extras. Size 8 ft. by 16 ft. Bring your trailer hitch and trail it home for $875.00. Or will trade for ham gear. K9FVW, Richard Laisuk, Thorp, Wisconsin.

MUST Sell my Gonset GSB-101 SSB-CW, etc. transmitter-exciter. New unblemished unmodified condition. Need money for other project. Excint xmtr or driver 80 thru 10 mtrs. Will ship in original carton in wood crate via express collect with handbook to best offer over $250.00 cash. W4HUI, R. Lloyd Mize, RFD 4, Versailles, Ky.

CENTRAL Electronics 20A, factory-wired, complete with QT-1 and deluxe case. 5-band converted BC-458 VFO $175.00; Hammarlund HQ-170-C with clock and spkr, $250.00; Globe LA-1, 400 watt P.E.P. linear, $75.00. In excint condx. All or part. Will ship express charges collect. Send certified check. Guy Reed, Jr., P.O. Box 107, Brookfield, Conn.

COLLINS KWM-2, SN11681, 516F-2 AC supply with built-in spkr, never mobile. In excint condx, $850.00, with no trades. Al Rothschadl, W9WAQ, 1223 9th St., Watertown, Wis.

COLLINS KW-1, in mint condx, HRO-60, like new and loaded. Make offer. W2QJT, 630 Highland Rd., Ithaca, N.Y.

HALLICRAFTERS SX-115 rec. with spkr. In carton. T. Jones, Kirkland Ave., Exton, Penna.

JOHNSON Viking II, factory-wired, gud condx, $175.00. F.o.b. Urbana, Ill. Warner Bandy, W9RRY, 707 W. Ohio St., Urbana, Ill.

FOR Sale: HQ-110-C and Viking Challenger (factory-wired) with push-to-talk (self-installed). Make reasonable offers. Also Ameco 6-meter preamplifier, $10.00. WA2MHY, 16 Coolidge St., Larchmont, N.Y.

MUST Sell HQ-145X with xtal calibrator. All near new condx and a real steal at $195.00. K9SRR, 1408 Dial Ct., Springfield, Ill.

SELL: Gonset II, 2-meters 5 xtals, ant., mike, new tubes and send-receive switch, $125.00. I will pay shipping on all. Viking I, in excint condx, 10 xtals, heavy-duty 5U4's, 807's, TVI suppressed, $95.00; LM-7 2-20 mc. freq. meter AC supply, $45.00. W2UGM, Dick Marsino, 66 Columbus, Closter, N.J. Tel. PO 8-1884.

COLLEGE Bound! Sell: Valiant, SX-101A, SB-10, DB-23, TH-2, AR-22. Inquire about details. K2HQZ, Bob Gelman (IN 2-5537), 305 Linden Blvd., Brooklyn 26, N.Y.

COLLINS 75A4 serial number 5530. One of the last manufactured, $490.00. Richard Rayner, 340 North Dover, La Grange Park, Ill.

LOOKING? Shopping? Trading? Trying to save money? Write Bob Graham for special deals on new and reconditioned used ham gear. Cash or budget. Graham Radio, Dept. A, Reading, Mass. Tel:944-4000.

SALE: Clegg Interceptor, $280.00. Absolutely in perfect mint condx. K3TUX, 1302 Sharpnack St., Philly 50, Penna.

AF-67, PMR-6A with twin noise squelch, new mike, 12 volt power supplies, antenna, body mount, $150; AC power, $25.00. New RCA 550 watt modulation transformer, $15. W5DHK.

FOR Sale: To settle the estate of "Dick" Lollar, K5KOV, SX-101A and 200V with less than 50 hours of operation. Immaculate condx. $875.00. Contact Walt Wilkerson, 1025 No. Mockingbird Lane, Abilene, Texas.

FOR Sale: Collins 75A4, 3 filters, $550.00; 32V-3, $250.00; KWM2 c/case, $65.00; 30IB, $150.00; Hammarlund HQ-145X demo, $245.00; HQ-110, $180.00; HQ-100, $125.00; HC-10, new, $75.00; Heath DX-100, $135.00; Cheyenne, $95.00; Apache, $200.00; Elmac AF 67, $100.00; PMR-7, $100.00; Johnson Valiant, $275.00; Viking I, $75.00; Viking II, $125.00; Navigator, $100.00; Pacemaker, $275.00. Grice Electronics, Inc., P.O. Box 1911, Pensacola, Fla.

FOR Sale: G-76 plus crystal calibrator and DC supply, in A-1 condx, $375.00; 10-meter International Crystal converter and Ameco noise limiter, both for $20.00. Jack Resnick, K2OPP, 63-07 71 St., Middle Village 79, N.Y. Tel. IW 4-8980.

WANTED: Crank-up tower, 40-meter rotatable dipole, inexpensive KW linear. H. Tatar, 3294 Chalfant, Cleveland 20, Ohio.

COLLINS Owners: Increase S/Line and KWM-2 versatility. Receive Mars, RTTY, Short-wave, citizens and space transmissions with same precision as ham signals. Just plug adaptor in. Receive twelve additional 200 Kc segments. $29.75. Less crystals. Tele-Labs, P.O. Box 6, Brooklyn 8, N.Y.

75A4, #4670, 2.1/3.1/6.0 filters, $475.00; HT-32, $435.00; 2Kw P.E.P. linear with pair of new 4CX250B's, coupled vacuum variables, adjustable regulated and metered screen and bias supplies and heavy-duty 872A power supply, $210; Model 511A Tektronics oscilloscope, $195.00; 2500 watt 117v AC gasoline motor generator, $75; 57 foot, heavy-duty E-Z Way crank-up tower, $100. Many other bargains. W2ZE, 60 Squirrel Hill Road, Roslyn Heights, L.I., N.Y.

WANTED: Gonset 2-meter Communicator. Please state price and condx. Sam Nock, P.O. Box 55, Hallwood, Va.

SELL: SX-111, in excint condx, $170.00. Joseph Liszka, WA2-JKX, 64-12 Gates Ave., Ridgewood 27, N.Y. Tel. GL 6-9027

FOR Sale: SX-110, DX-40, VFO model VF-1, mic. Best offer over $200.00. Jim Hampton, 1010 Booth, Dubuque, Iowa.

WANTED: Tower, 50 ft., crank-up, fold-over, advise make, condx, age and price. Larry Lange, W9UAN, 1240 W. 90th St., Chicago, Ill.

SELL: Collins gear: 32S-1, $375.00; 30S-1, $850.00; 312B-4, $100.00; 516F-2, $65.00, 55 hours log time. In perfect condx. K. S. Oliver, WB2AHD, 36 Aldom Circle, West Caldwell, N.J.

HAMMARLUND HQ-170-C with matching speaker, in excint condx: $275.00. K3RIY, 312 Owen Ave., Lansdowne, Penna.

COLLINS Station:32S-1, $420.00; 75S-1, $370.00; 516F-2 AC pwr. supply, $50 and Autronic Keyer, $60.00. W5YUO, 4928 Cockrell, Ft. Worth 15, Texas.

G-E, Motorola, 2-way late models only. Buy-sell. Communications Engineering, Box 8338, Minneapolis 26, Minn.

HAMMARLUND HQ-110, $155.00; TA-33 Sr. Tribander, $60; Vibroplex Original bug, $10.00; all in excint condx. WA6-GOG, 2721 Hutton, Los Angeles, Calif.

BUY SX-71 or S-76, Sell DX-40 $47.50; Heath reflected power meter, never used, $12.00. W3DGU, 478 Spruce, Pottstown, Penna.

WANTED: Tuning coils for National HR-07. Advise which type available and price. R. B. Mitchell, 1430 30th St., DesMoines 11, Iowa.

FOR Sale: Going SSB. HQ-180-C, 9 months old, $325.00; 2-meter Pawnee with Nuvistor preamp, $225.00; Cheyenne MT-1, 3 weeks old, $100.00; HP-20 power supply, $25.00. All equipment like new condx. All for $650.00. John Norton, WA2SOZ, 11 Audley Circle, Plainview, N.Y. Tel. WE 5-2487.

COLLINS 75A-4 S/N 5009, $495.00; 75S-1, 32S-1, and 516F-2, in factory-sealed cartons, $975.00; Drake 2-B, $200.00; National NC-140, $135.00; W9NHF.

LAFAYETTE HE-15 transceiver professionally modified to six meters; HE-35, $35.00; Heath HX-11 50-watt c.w. 80 to 10 meters professionally wired, $35.00. K3IBQ, 608 Maple Ave., Southampton, Penna.

DX-100, B loading, includes 160, $120.00 for fast pick-up sale; DB-23 preamp, $20.00; both in excint condx. Ray Blosser, W8DBK, 80 Samuel Lord Drive, Chagrin Falls, O. CH 7-7085.

SELL Heathkit Pawnee with mobile mounting accessories. 1 year old, $225.00 F.o.b. Champaign, Ill. Wanted: F500B-31 filter and 40-50 ft. crank-over tower. W9EYQ, 1210 Julie Drive.

SALE: Model 14 typing reperforator, $45.00; Transmitter distributor, $65.00; teletype-Boheme Wheatstone and radio parts. Se stamp for list. W7FNA, 27th S.W. Seattle 66, Wash.

LM-2 Frequency meter, original book, xtal. Power supply. Checks to original specs. $50.00 firm. George Carson, WØJV, 316 Lee, Iowa City, Ia.

ELMAC A54H transmitter with 15 and 40 meters added, $39.50; Hallicrafters S-38 receiver, $19.75. Good SWL. W5LLJ, 4607 Huisache, Bellaire, Texas.

FOR Sale: 75A3, like new condx, Collins gear reduction knob, product detector, $325.00 or your best offer. Oliver Books, W9IUK, RR #5, Chippewa Falls, Wis.

SELL: Johnson Viking 500, $550.00; HQ-160, $270.00. Both in A-1 condition. Going to medical school. Henry Oles, K8MSX, 700 Coitsville Rd., Campbell, Ohio.

SWAP: 6 months old HQ-110 for $160.00. Reasonable offers considered. WB2BUR.

SELL: QSTs: January 1929 to mid 1950's. Best offer. W2EBT.

CHICAGO Area: For sale NC-300 serial 481-0038 and matching speaker; Gonset monitor; Stancor 202A CW xmtr 100w; Deluxe Vibroplex, vertical antenna 10-15-20 and miscellaneous: $275.00 or offer. W9RFO, 163 Maple Ave., Elmhurst, Ill.

SELL: Lafayette HE-30 and Heath HD-11 Q-mult., in excint condx. $90.00. WN4JXL, 11 Davis St., Rome, Ga.

GONSET GSB-100 80-10 SSB xmttr. Original carton, $340.00; NC-300 calibrator, $175.00; all in mint condx. Need college funds. Package and extras, $475.00. Highest bid gets. K9GDN, 2355 Colfax Terrace, Evanston, Ill. Till June 1: Carl Snyder, Univ. Halls 5326, Cornell Univ., Ithaca, N.Y. After June 1: 2355 Colfax Terrace, Evanston.

KWM-2 Independent receiver frequency control. Wired plug-in kit, $15.00 postpaid! Foreign, $17.50. Wired AM kit for 32S and KWM series, $5.00. Foreign, $6.00. Kit Kraft, B-732, Harlan, Ky.

SIDEBAND Equipment for sale: GSB-100, SX-99, all accessories. In excint condx. Prefer locale sale. Preston Hadley, WA2-CCQ, 633 Fairmont Ave., Westfield, N.J.

HAM-M Rotator, control, cable, excellent condx. Best offer. K7WAY, 640 Hollins, Helena, Montana.

TRADE For electronic organ: HRO-60, calibrator, five coils, Ranger II, like new condx. John F. Porter, W7PA, 111 West Meeker, Puyallup, Wash.

SELL Receiver GPR-90, in mint condx, best offer over $250.00. Prefer sale in metropolitan area. Vic Ulrich, WA2DIG, Haledon, N.J. Tel: 201-274-2310 evenings.

NATIONAL HRO-50T1, seven coils, Universal product detector, 100/1000 kc calibrator, FM adaptor, perfect in every respect. $255.00. W5WJA, 4025 Purdue St., Dallas, Texas.

SOUTHERN California: KWM-2 with AC power supply and extra crystals, $890.00. W6BLZ, 528 Colima, La Jolla, Calif.

FIRST New development in test leads since WW II. Write Gator-Probe, Box 964, Hollister, Calif.

SK-20 Tunable Preselector, calibrated 3.5-30 megacycles, boosts reception 3+"S" units. Complete kit, cabinet, built-in power supply, $18.98 postpaid. Holmstrom Associates, P.O. Box 8640-T, Sacramento 22, Calif.

SELL: Hallicrafters SP-44 Panadaptor with manual. Works gud and like-new appearance; $42.50. W5AMK, Box 96, Temple, Texas.

ESTATE of W2IDW: Collins 75-A-3, 3.1 filter calib., $300.00; HEATH Warrior KW linear, $200.00; both in new condx. Write Mrs. Lester Rodman, 68 Greenwood Dr., Babylon, L.I., N.Y.

SELL: Heath Shawnee 6 M transceiver, professionally wired, in excint condx; $175.00; Federal type 804 UHF signal generator, 8-330 Mc., $80.00. Bob Friebertshauser, W6YMR, 2138 Montrose Dr., Thousand Oaks, Calif.

HAMMARLUND HQ-170-AC w/R-47 spkr, in mint condx for $275.00. Harry Hoffman, WA2ROX, 54-16 69th Lane, Maspeth 78, L.I., N.Y. Tel. DE 5-8493.

20-A, QT1, factory wired. In excint condx, $150.00. Wanted: Heath HX-20, SSB mobile xmtr. W5NGX, 2532 East 10th St., Odessa, Texas.

SELL: Excint condx factory-wired Valiant, $265.00; SX-100, $165.00; both one owner, ship original cartons. Gone sideband. Jim Dittrich, K2OIN, Meadow Lane, Vestal, N.Y.

RCVR: RME-6900 w/manual. In excint condx. Will sacrifice for $200.00. M. F. Kavanaugh, 520 East Bellevue, San Mateo, Calif.

VIKING Valiant; factory-wired, less than three years old and in exc. condx. $295.00. WA6IQW, Jim Pedersen, 837 Wiladonda, La Canada. Will deliver L.A. and S.F. area.

ELECTRONIC Kits wired and tested by licensed technicians. Write Langer & Baham Kit Co., Route 1, Box 39, Ponchatoula, La.

SELL: Unused SX-111 with warranty in factory-sealed carton. W1ZPB, Walton Congdon, Box 61, Mount Herman, Mass. Telephone NOrthfield 527.

NYC Area: SX-140 receiver/spkr, in exclnt condx: $105.00. Stier, 245 Essex, Bloomfield, N.J.

SELL: KWM-1, AC supp., perf. condx. $400.00. George Kralovec III, K9HFH, 290 Northwood, Riverside, Ill.

SELL: Brand new SX-115, two hours' use: $500.00 or your best offer. Neill A. Jennings, W4NWW, 112 Beverly Place, Greensboro, N.C.

FOR Sale: Collins 75S-3, only $500.00; BC610E and BC614E, both $175.00; brand new Eimac 4CX300A, $15.00 each; Collins transmitter 30K-1, complete, $400.00; also Collins receiver 75A1 at $200.00. All f.o.b. New Britain, Conn. W1DBS, John Savonis, 11 Dwight Court, New Brtain, Conn.

75A-4 w/3.1 and .8 filter, SN 3968, vernier knob and Viking Invader 200, almost new, $495.00 each or both for $950.00. Bill Green, W5BKH, 1834 University Blvd., Abilene, Texas.

HY-GAIN 20 mtr. 3-ele. Monobander, $25.00; Heath Tenner, $25.00; 12VDC power supply, $12.00. K2DAC, Larry Finch, 16 Linden Blvd., Great Neck, L.I., N.Y.

DX-40, VF-1 (needs work); JT-30 microphone, key, and antenna relay, $50.00. I'll ship. K4SGZ, Rob Bennett, 4530 Huntington Rd., Jacksonville 10, Fla.

HALLICRAFTERS HT-37, SX-101-A and accessories. All in mint condx. Need cash. Best offer. Inquire: Dan Arywitz, WA2LIJ, 77 Sullivan Place, Brooklyn, N.Y.

SALE: Complete Collins "S/Line", 32S1, 75S1, 516F2. Low operating time. Will sacrifice for cash: $825.00. W4RGV, Tel. 704-684-6364.

QSTS: Complete from 1946 to 1962 inclusive. $19.00 f.o.b. San Diego, Calif. W6SIB, 2645 55th St.

EICO 720, like new condx; 5 months old: $75.00. WB6BWN, 2315 Hillhurst Ave., Hollywood 27, Calif.

SACRIFICE: Mohawk, $199.50. WA6SNE, 921 Yale St., Santa Monica, Calif.

APECO Copy machine, two step vy gud condx; Heathkit transistor intercom, master, five slaves, 110-12v supply. Will trade for receiver or transceiver in the $200.00 range. W4JMA, Box 455, Hampton, Va.

SELL: Linear amplifiers, 1000 watt 4-811As in HT-33 cabinet, 750 watt 3-811A's in Collins 30L1 type cabinet; solid state rectifiers, bandswitched 8010, $150.00 each; almost new Hallicrafters S-108, $90.00; new Hammarlund HC-10 converter, $85.00; Globe DSB100 with vox and ant. trip, $85.00. Dr. Charles Thompson, 103 West Main, Napoleon, Ohio.

MAKE A reasonable offer on the following: 75A4, 3.1 filter, vernier knob, KWS-1, Gonset GC-105, Communicator; Eico 425 'scope, all units, A-1 condx, f.o.b. Torrington, Conn. Sry, no trades! Cash deal only. Fast action desired. R. Corbett, 46 Prospect St., Torrington, Conn.

EICO 720 Transmitter, used only 10 hours; $65.00; Globe 6 & 2 VFO, perfect condx, $35.00. Will swap Harvey-Wells TBS50D transmitter and AC pwr. supply or Heath model 0-9-5" 'scope, for Heath monitor 'scope, HO-10 or will accept best offer. WA8BOR, 149 W. 6th St., East Liverpool, Ohio.

HALLICRAFTERS HT-32 for sale: in exclnt condx; extremely stable VFO, perfect CW break-in, $365.00 KØOTH, 707 12th Ave., SW, Rochester, Minn.

SELL: Viking II with VFO: B&W 51SB, low-pass filter, as a unit, $250.00; HO-140-X with Q-multiplier, $150.00; Harvey-Wells Z-Match antenna coupler, $40. R. Litt, K2KMA, 147-24 70 Rd., Flushing, L.I., N.Y.

CLEGG 99'er, in exclnt condx, $100. Mike Honer, 351 W. 34th St., NYC WA2TRX.

CRYSTALS: Kits, SSB, Net, MARS, Marine, CAP, etc. Custom finished FT-243 .01%, and kilocylcle 3500 to 8600, $1.75 (10 or more FT-243, same freq., $1.30); 1500 to 1709, $3.95; 1710 to 20.000 kilocycles, $2.25 (overtones supplied above 10 megacycles). Fundamentals 10.000 to 13,500, $3.25. Add 50¢ each for .005%. Above 2000, add 65¢ each for HC-6/u hermetics. QST kits (FT-243): "SSB Package", five mixer, $11.95, seven matched filter (FT-241-A), $11.95; "DCS-500" "IMP", "Phasing," $11.95/set. Write regarding specific needs. Airmailing 10¢/crystal. Surface, 5¢. Crystals since 1933. C-W Crystals, Box 2065-Q, El Monte, Calif.

FOR Sale: Marauder HX-10, Drake 2B, Q-multiplier, ant. relay, Blue Racer bug, trap doublet, spkrc, mike and accessories, all in perf. condx. Stu Personick, 3230 Cruger Ave., Bronx OL-4-2381.

SELL: Good Viking II, $100; BC-455, $8.00. Many tubes, parts, cheap. K4EZY, 5109 Sylvan Rd., Richmond, Va.

WANTED: Your idle radio gear to be put to good use by Seminary Mission students. Please write Bro. Mike Gill, Maryglade Seminary, Memphis, Michigan. Will arrange transport.

VIKING Valiant; DX-40, 50 ft. tower plus TA-33, Jr. and other accessories for sale. Come and see. K3HLX, Royersford, Penna.

HALLICRAFTERS SX-100, matching spkr, in exclnt condx, $185.00; Gonset Commander mobile transmitter, 160-6 meters, with VFO and AC pwr. supply, $65.00; Gonset Super Six converter, $25.00. Myron Shapiro, K9ICS, 2933 N. Sheridan, Chicago, Ill. Tel. Phone Di 8-6334.

SELL: Viking II, $190.00; NC-183D, $195.00; both in A-1 condx, K3HPZ, Karl Klimosh, 100 South Linden Ave., Hatboro, Penna.

BOULDER Or Denver, Colorado: Sell Hallicrafters S-108 recvr. In gud condx with Q-multiplier. Call 443-2822 (Boulder) evenings.

TOROIDS, 88 mhy, 60¢ each or 5/$2.50. H & H, Box 34, Dixon, Calif.

APACHE and SB-10 for sale: $235.00. Both are in A-1 shape. K3LKB, 2332 S. 25 St., Philadelphia 45, Penna.

SELL: DX-100, aligned and re-tubed in the last twenty hours. Also a new set of 6146's. $140.00. WA2NED, Carl Hansen, 5 Drexel Ave., Stratford, N.J. Tel.: 783-2332.

"HOSS-TRADER" Ed Moory cuts prices to the bone, for cash. New items: NCX-3, $369.00; HX-500, $459.00; 32S-1, $495.00. New 20 meter Swan, $179.00; new Ham-M rotor and demo TH-4 beam, $176.00; 200-V's, $675.00; Demo SB-33, $329.00; Gonset GSB 201 linear, $259.00; Bandit, $469.00. Used: 2-B, $209.00; 75S-3, $475.00; 2-A, $179.00; SR-150, $539.00; 75A-4 serial #100, $539.00; 32S-3 used 8 hours, $525.00; KWM-2 serial 12,000, $849.00; Tri-Band Swan, $229.00; Ranger, $139.00; Invader, $409.00; HT-32-A, $419.00; HT-37, $339.00; 32V-2, $199.00; 32V-3, $339.00; Swan 75 meter, $175.00; Loudenboomer, $199.00. Terms: cash. Ed Moory Wholesale Radio, Box 506, DeWitt, Arkansas. Phone WHitney 6-2820.

WANTED: Hallicrafters SR-75, gud condx. State price, condx, etc. Bazur, 1709 Randalia Dr., Ft. Wayne, Ind.

FOR Sale or trade up 75A-4: HQ-145-X with clock and xtal calibrator, $225.00. Jim Ritter, W2ORQ, 4 Reydon Way, Commack, L.I., N.Y. Tel. FOrest 8-7493.

GONSET Communicator IV Six; G-66-B. Any offers? K2IKZ, Karl Thurber, 1510 Archer Rd., New York 62.

CANADIANS! SX-99, Heathkit VFO, DX-20, Vibroplex bug, linear, tubes (4X250B, 4X150A) transistors, mike, etc. Write for list to VE7BGC, 704 Hoover St., Nelson, B.C., Canada.

SSB, HQ-170 and GSB-100, both factory-wired and in perf condx. $450.00. K2GYY, Sam, 9 Pine Court, Westfield, N.J. Tel: AD 2-1318.

SELL: SX-101 Mk III, $230.00; HT-40 factory-wired, $80.00. Pair for $300.00. In exclnt condx. K8UFK, Edward Swartz, Lyons, Ohio.

HRO-50-T1 recvr. A, B, C, D coils, calibr. $215.00; Eimac AF-67 xmtr and PS-2V 115 VAC supply, $110.00. I invite inspection. Will ship express collect upon receipt certified check. K5EAT/6, 613 Spencer St., Monterey, Calif.

FOR Sale: Clean Hallicrafters HT-19, Husky 225-watt xmtr with blower in final. Operates CW-NBFM-AM on 80 thru 10. Same case and size as HT-32. Complete with Handbook modulator built with new components, D-104 mike with grip-to-talk stand, mounted set of balun coils, spare final tubes and numerous other spares, rectifiers, etc. The Hallicrafters HT-18 VFO is an integral part of this xmtr that was the main rig of the late W5UNW. Contact Laverne Walker, Oak St., Radio and TV Repair, 420 Oak St., Graham, Texas.

KWM-2, 516 F-1 power supply, 312B3 speaker, $875.00. All in exclnt condx. I bought one with carrying case and portable power supply. This now is excess to my needs. W3VDA, Box 1333, Harrisburg, Penna.

G-76, vy clean, latest model with matching G-76 power supply having solid state rectifiers and Turner 350 mkc, $475.00. Richard Subin, 309 North Thurlow Ave., Margate City, N.J.

SALE: HQ-110C with clock, speaker, $150.00; Heath MM-1, $20.00; Johnson 250-33 Matchbox, $30.00; CM 75-a SWR meter, $20.00; D-104 mike with stand, $12.00; all equipment perf. condx, 2 years old or less. K3JMM, 207 Mattison Ave., Ambler, Penna.

NATIONAL HRO-50T-1; KE-93; Heath Cheyenne MP/1, UTC-CVM5 transformer, Lampkin 205A; Motorolo test set P8501A, 2-door cabinet 30"/6 ft. A steal. Best offer above half-price, except cabinet. Years of magazines, trunk of other items, much free. Albright, W5MDN.

APACHE, SB-10 and HQ-160. No reasonable offers will be refused. In exclnt condx. Fred, Tel: Victor 7-8255; Norwalk, Conn.

SELL: Hy-Gain 15 meter 3 element gamma matched beam with instructions and 80 ft. of RG8/U, $23.00. W1CWU, 2 Hickory Lane, Danvers, Mass.

HOUSE Cleaning: Apache, really clean, $200.00 best offer for the following, all inquiries will be answered: Hallicrafters HT-18 VFO: mutual conductance tube-tester; RCA sweep gen. all with schematics. W3FWI, 7418 Drexel Road, Phila. 51, Penna.

F.O.B. Syracuse, N.Y. Used good: choke 10 hy 650 Ma., $8.00; BC696/TI9, $4.00. All of the following are new: PE-103 dynamotor $8.50; capacitors, 8 x 8 x 4 650 WVDC, $1.50; 100 mmfd, 2500 WVDC, 30¢; dual variable 15-150 mmfd, .035" spacing, $1.00, small micas 10/25¢. Crystals: 80/40 meters, $1.00, odd frequencies, 40¢ 115v transformer 2350-0-2350v KWDC 77 pounds, $26.50. 1% resistors 10¢. Assorted meters from $1.25. Sample of tube prices: 6AG7, 6AK5, 6SJ7, 6SK7, 6F6, 80, 117P7GT, 5U4GB at 50¢; 9002, 6AC7, 1291 at 25¢; 4-65, 813 at $5.00. Stamp appreciated for lists of much more. Money-back guarantee. Dick Wilder, W2ZCZ, 33 Wexford, DeWitt, N.Y.

VIKING 500; $495. Gonset Twins with thin pack and 110 power, $200.00; DX-40 with VF-1, both for $65.00; Vibro champ bug, $10; OM3 'scope, $18.00; Knight R-F generator, $10; Knight resistor capacitor checker $10.00; Heath G.D.O., $15.00; Heath SWR bridge, $10.00. Not junk. All with manuals. Cash and carry deal. K3KUL, 762 So. Gulph Rd., King of Prussia, Penna.

SELLING Station: Valiant II, $350.00; SX-111, Mark I, W/R48 spkr, $200.00; grip-to-talk mic, D-104, $20.00; Will deliver up to within 150 mi. radius. K8CRB, 30735 Lonnig Blvd., Garden City, Mich.

MUST Sell all gear for college: HQ-170 and spkr; WRL 90A FW; WRL 755 VFO FW; UM-1 modu, EV-951 mic; key relays; $400 or make me an offer. K4ISN, 3127 Eton Rd., Raleigh, N.C.

FOR Sale: Gonset #3012 tuner; tunes police, fire, mobile telephone, etc. $35. Motorola all transistor push-button radio from 1962 Chevrolet. Also fits 1961. $33. Richard M. Jacobs, WAØAIY, 1015 Glenside Place, University City 30, Mo.

SELL: Gonset G-76 transceiver. Used moderately in shack only. In mint condx: $295.00. F. N. Lambour, W3DCY, Nicktown, Penna.

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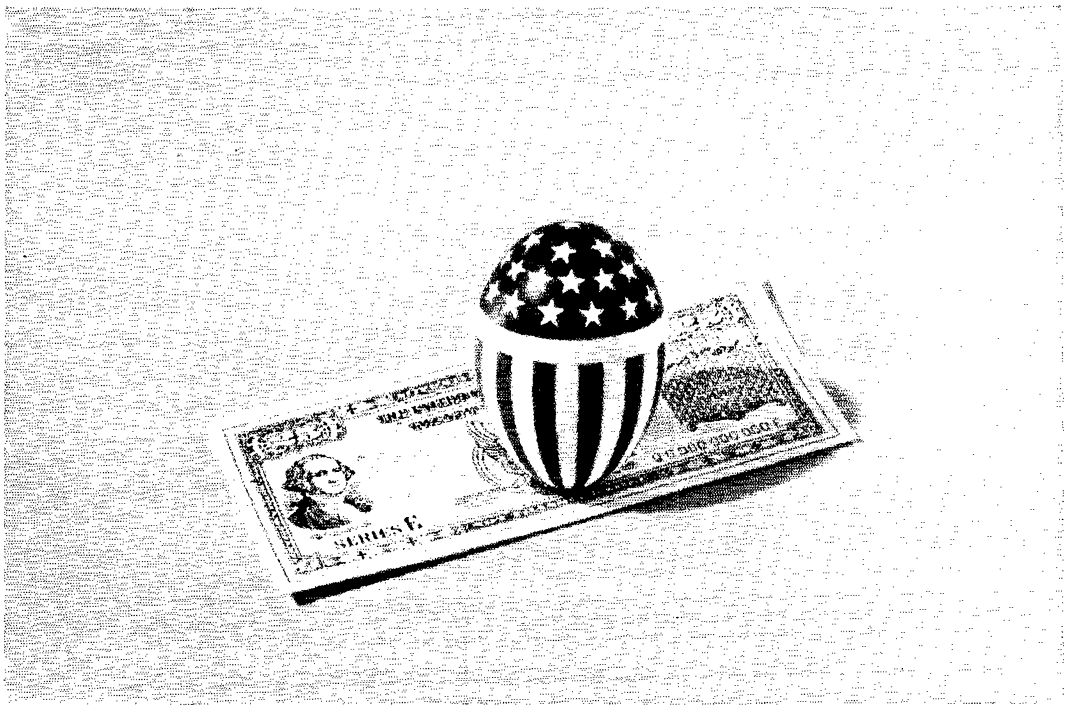

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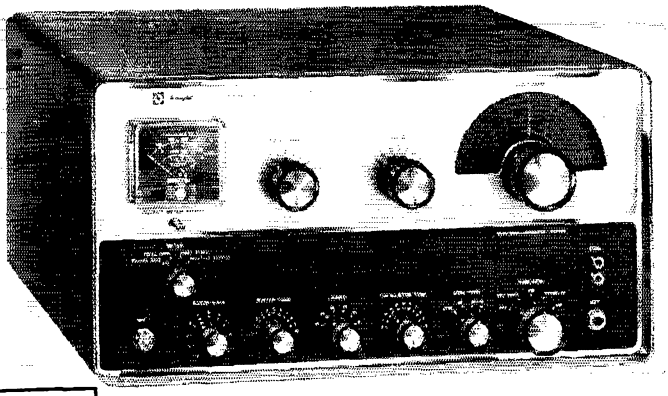

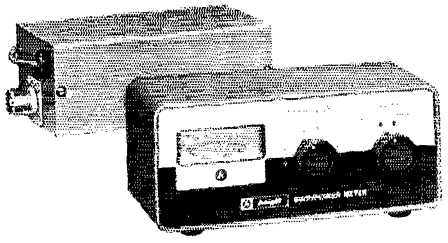

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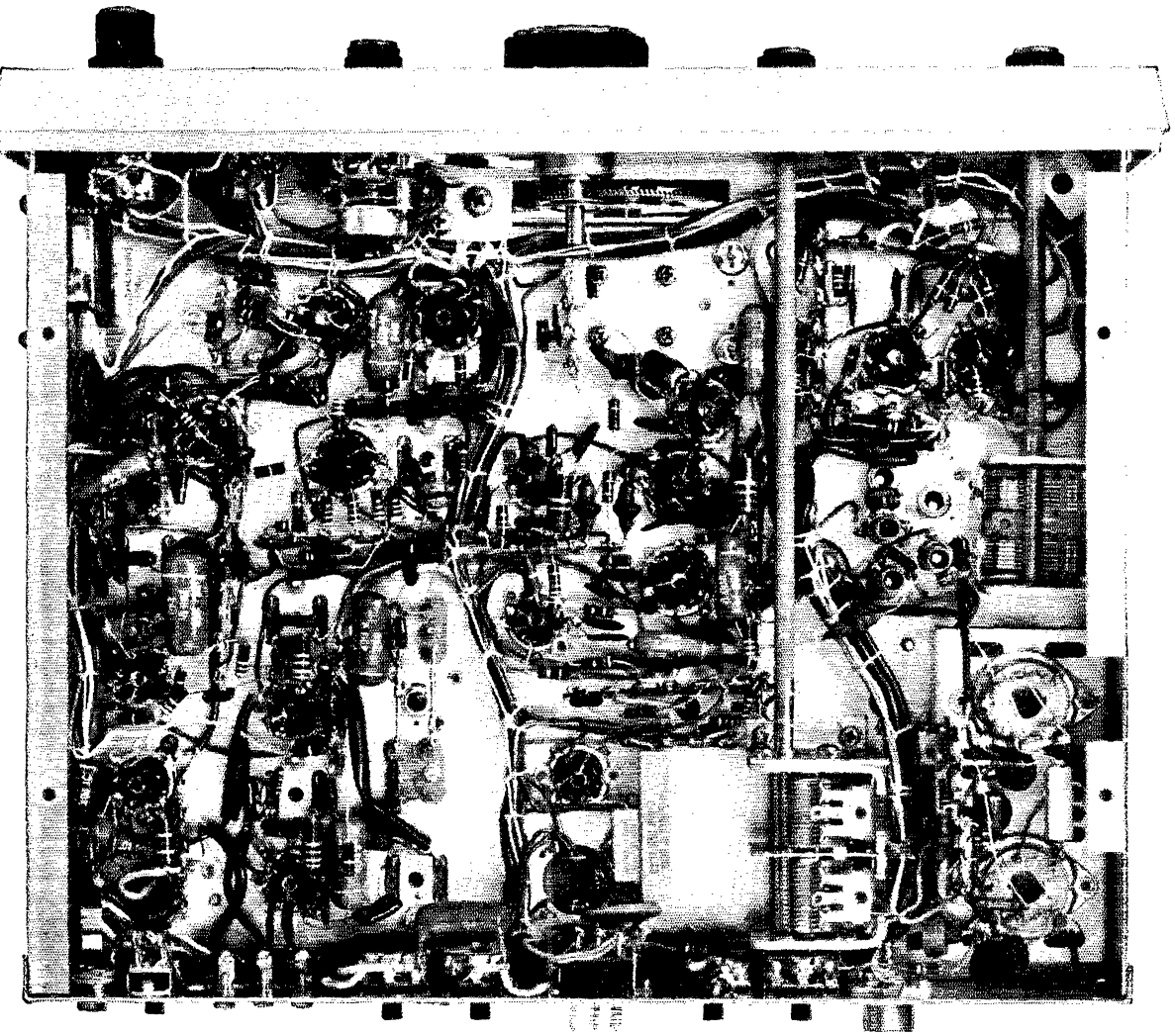

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