



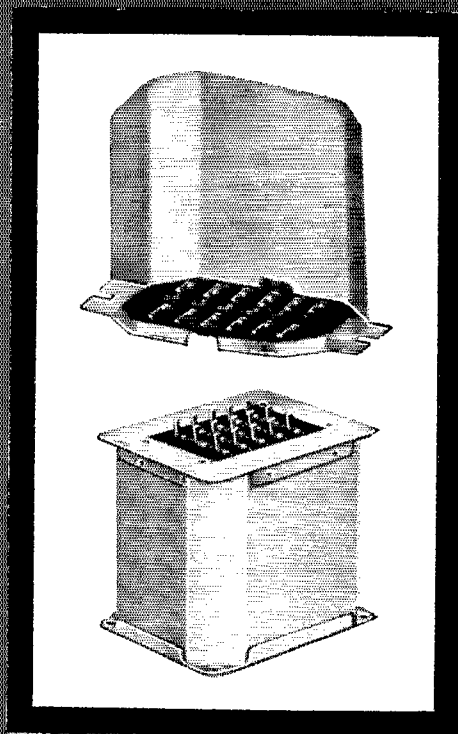
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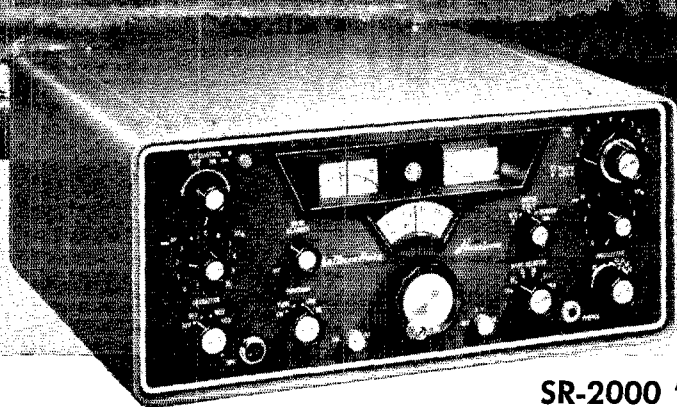
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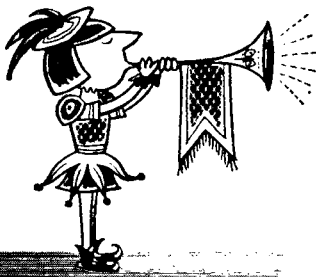
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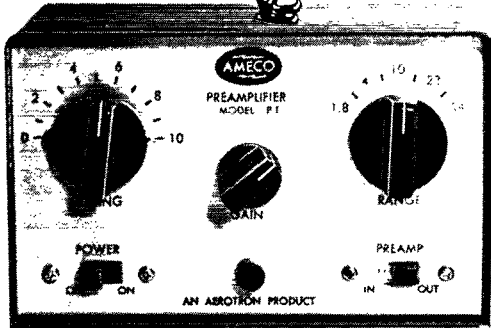
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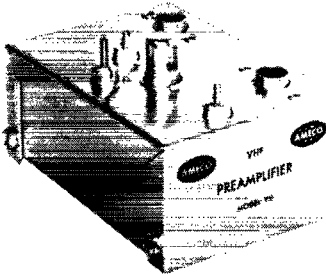
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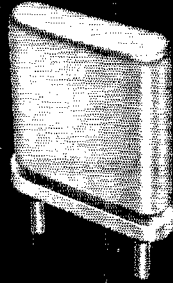
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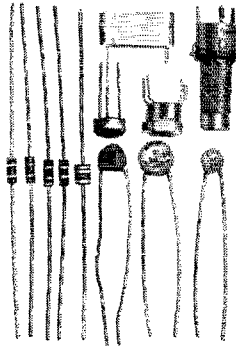
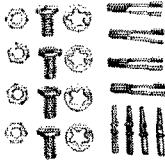
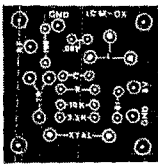
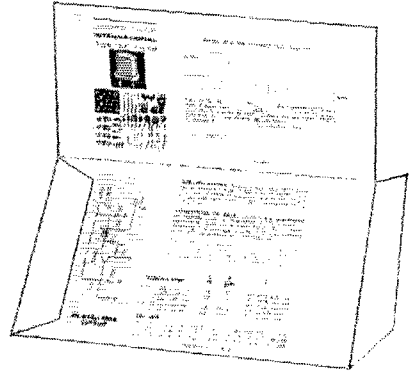
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"It Seems to Us..."



INCENTIVE LICENSING

INCENTIVE licensing, for so long a major bone of contention in amateur radio, is now once again a fact of life. (See "Happenings" this issue.)

We say "once again" because what the FCC has done in effect is to restore a basic incentive principle to the licensing structure — a principle which in one form or another has applied during most of amateur radio's history, and which brought our art to its peak of accomplishment, its "golden days" if you will.

Now that we've got it back, is incentive licensing really in our best interest or is it an infringement imposed upon us, as has been alleged? For more than four years this issue has been surrounded by misinformation, confusion and very strong feelings indeed. We have to accept and live with incentive licensing now. But can we do better than that? Can we put it into realistic and reasonable perspective at last, and see what we as amateurs really stand to gain and lose by it in the long run?

Let's review briefly a few historical highlights. Younger hams may be surprised to learn that soon after licensing was first established as an amateur radio requirement there were "stepping stone" grades with progressive levels of technical knowledge and/or code proficiency, together with commensurate operating privileges. The system which existed for the longest period — and which operated most successfully — provided for a Class A, now called Advanced Class. This license was required to operate in the 75- and 20-meter voice bands before we had 15 meters or any 40-meter phone. About 40% of all amateurs at that time achieved this license.

From 1948 to 1952 amateur radio and FCC were in a regulatory turmoil, with an intensity greatly exceeding the recent hassle. The Commission had proposed an incentive licensing system which by comparison makes the regulations just adopted seem mild indeed. In fact so harsh that the League, which had requested only a modest upgrading, fought the proposal at length. To most everyone's amazement, FCC did an about-face in 1952 and, for most practical purposes, effectively junked the whole principle of incentive licensing by opening all voice bands to General and Conditional Classes.

After a decade of repercussions, reverberations and just plain cussing among amateurs, a *QST* editorial in February 1963 brought the smoldering issue into the open with a request for specific comment from members to settle

the matter once and for all. The basic question: should the League petition for a return to an expanded system of incentive licensing? Some 15,000 replies were received by Hq. and the directors — a response which represented by far the most extensive sampling of amateur opinion on any question in our history. Not surprisingly, the breakdown of views was about 50-50. With such a split of thought, it was inevitable that the question generated as much heat as light.

After exhaustive discussion, the ARRL Board of Directors made the historic decision to seek a return to incentive licensing. The Board was aware such an action would cause some dissension, perhaps a loss of some members, and certainly many headaches for them personally as well as for the League generally. Its action was all the more significant, therefore, in showing dedication to the long-term interests of amateur radio despite the initial criticism and interim disruption which were expected to and did ensue.

A formal League proposal was transmitted to FCC late in 1963. It sought, over a period of several years, restriction of the major phone bands to holders of a re-instated Advanced Class license, which would require no additional code speed, only a moderately-difficult technical exam in line with current practice (FCC exam questions had not been substantially updated in many years).

In April, 1965, the Commission announced its own proposals (see May 1965 *QST*). They were based on eleven petitions from individual amateurs and ham organizations, some filed before and some after the League's, all seeking, in one form or another, an expanded incentive licensing system. Comments filed with the Commission in response to its announcement, although differing in specific details, indicated a majority of about two-thirds in support of the incentive licensing idea. On this basis, and its own conviction that "this incentive licensing program will result in a radio service which will be a source of pride to both amateur licensees and the Commission," FCC took its final action.

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In frank appraisal, each of us certainly can nit-pick on details on the new regulations. We even suspect that some amateurs on the Commission staff may have individual personal differences with specific points. But there had to be compromise, and the course the Commis-

(Continued on page 152)

League Lines . . .

Big news this month is the Commission's final action in Docket 15928, the incentive licensing matter. See page 80 for details, and the editorial for a brief historical background and some comment.

FCC has discarded its plan for distinctive prefixes to indicate the class of license, among other things because its computer system permits fast checks by monitoring stations. To assist amateur self-policing, the Radio Amateur Callbook Magazine will henceforth carry in its listings an indicator of the class of operator license held.

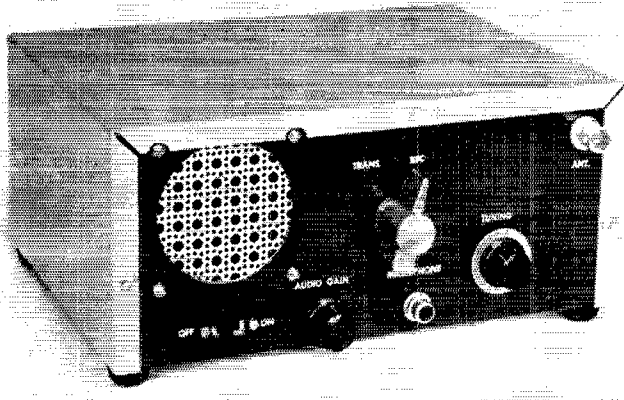
The rhombic antenna, a tradition at W1AW for the first 25 years of the Hq. club station operation but which had to be dismantled with the construction of the new office, is back up and in operation. First reports indicate an improvement of west coast signal strength on bulletins and code practice.

Phone patches, long a taboo subject for QST because they technically violate telephone company tariffs filed with FCC, may soon come into the open as a result of a Commission hearing upon complaint by a manufacturer of a device to inductively and acoustically interconnect mobile radio and telephone systems. In an Initial Decision released August 31, AT&T and other companies were ordered to rescind and cancel certain tariff schedules prohibiting use of the device. An appeal is anticipated.

In line with a Board decision, the Hq., henceforth, will require fees for the issuance of DXCC and WAS awards to U. S. and Canadian amateurs who are not League members. For DXCC, \$4; DXCC endorsement, \$1; WAS, \$2.

The ARRL Membership & Publications Committee has recommended a program of mutual assistance between radio clubs around the world, particularly to help those amateurs in new and developing countries. We expect soon to solicit volunteers among W and VE clubs to provide technical and equipment aid for a "sister" group overseas, along with exchanges of social and personal activities -- the "people-to-people" program in full measure.

Additional requirements placed on the Loran navigational service, for example to aid transatlantic aircraft, may soon result in a revision of the amateur sharing arrangement in 1800-2000 kc. In conferences between Coast Guard and ARRL officials, preliminary analysis shows the possibility of actual expansion of amateur privileges, although the net effect may be no advantage because of additional Loran frequencies and higher power. More details when available. Independently, an engineering study of the potentials of amateur interference to Loran conducted by Phil Rand, W1DBM, under ARRL auspices with Coast Guard cooperation, may pave the way for an eventual expansion of amateur usage of the band.



The 144-Mc. transmitter-receiver is small enough ($8 \times 6 \times 3\frac{1}{2}$ inches) to be hand-carried but can be used for table-top operation, too. A self-contained 9-volt transistor battery supplies all the power needed.

MANY times a small transceiver proves useful in places where mobile equipment can not go. While not made for meteor scatter work, the 2-meter transceiver shown here is just the thing for mountain topping, and with a 19-inch whip antenna it will make a good walkie-talkie for Civil Defense work. It is simple in construction, thanks to the use of a super-regenerative receiver and a ready-made audio amplifier/modulator assembly.

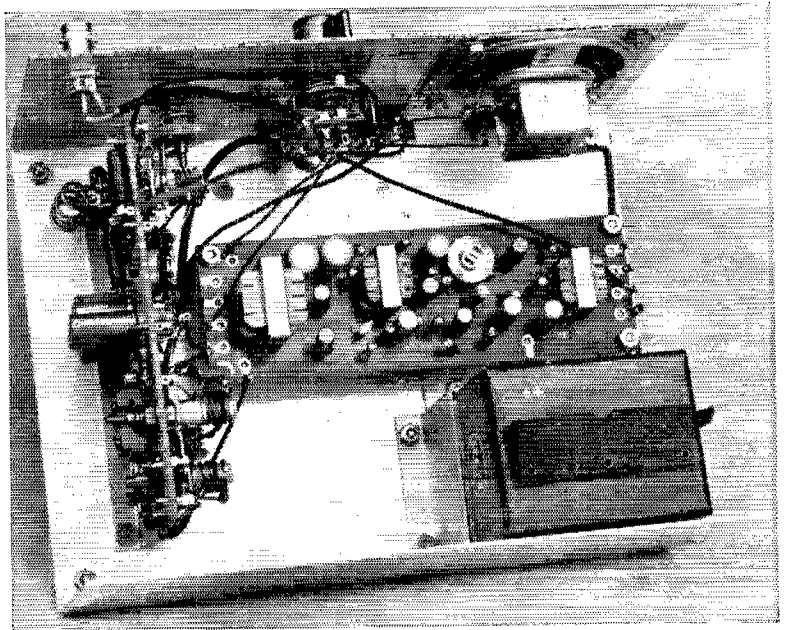
The transceiver is completely self-contained, including a 9-volt battery. Total battery drain is 30 ma. receiving and about 80 ma. transmitting.

The audio section for both transmitting and receiving is a commercially-made printed-circuit amplifier (Round Hill Associates type AA-100) having five transistors with push-pull output. Two output impedances are provided, low impedance for the speaker and high impedance for modulating the transmitter.

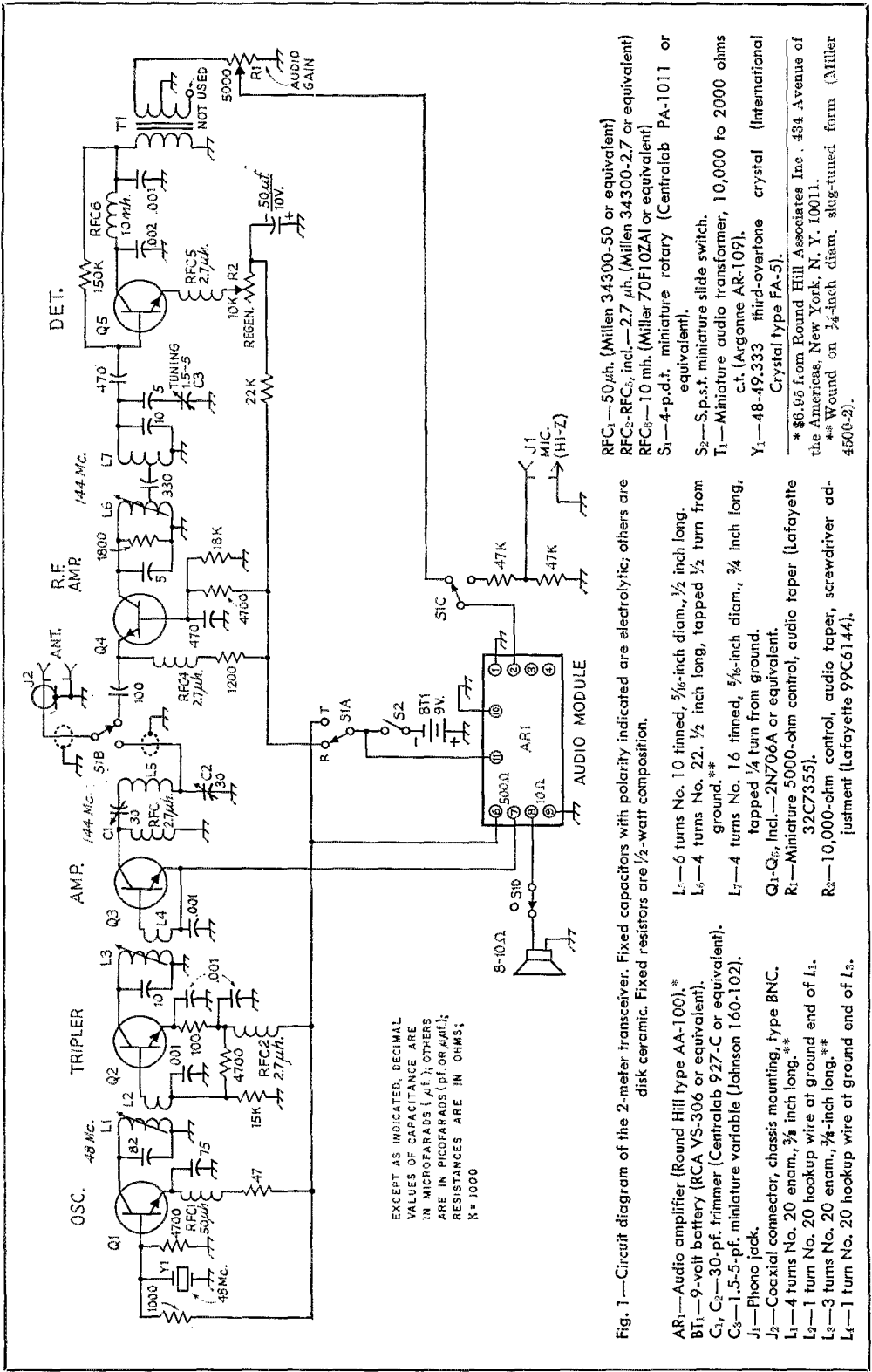
* 39C Salmon Brook Drive, Glastonbury, Conn. 06033

A Miniwatt 2-Meter Transmitter- Receiver

BY CHARLES UTZ,* W1DEJ



Inside view of the transceiver. Transmitter-receiver board is at the left.



EXCEPT AS INDICATED, DECIMAL VALUES OF CAPACITANCE ARE IN MICROFARADS (μf); OTHERS ARE IN PICOFARADS (pf. OR μμf); RESISTANCES ARE IN OHMS; K = 1000

Fig. 1—Circuit diagram of the 2-meter receiver. Fixed capacitors with polarity indicated are electrolytic; others are disk ceramic. Fixed resistors are 1/2-watt composition.

- AR1—Audio amplifier (Round Hill type AA-100).*
 - BT1—9-volt battery (KCA VS-306 or equivalent).
 - C1, C2—30-pf. trimmer (Centralab 927-C or equivalent).
 - C3—1.5-5-pf. miniature variable (Johnson 160-102).
 - J1—Phono jack.
 - J2—Coaxial connector, chassis mounting, type BNC.
 - L1—4 turns No. 20 enam., 3/8 inch long.**
 - L2—1 turn No. 20 hookup wire at ground end of L1.
 - L3—3 turns No. 20 enam., 3/8 inch long.**
 - L4—1 turn No. 20 hookup wire at ground end of L3.
 - L5—6 turns No. 10 tinned, 5/8-inch diam., 1/2 inch long.
 - L6—4 turns No. 22. 1/2 inch long, tapped 1/2 turn from ground.**
 - L7—4 turns No. 16 tinned, 5/8-inch diam., 3/4 inch long, tapped 1/4 turn from ground.
 - Q1-Q5, Inc.—2N706A or equivalent.
 - R1—Miniature 5000-ohm control, audio taper (Lafayette 32C7355).
 - R2—10,000-ohm control, audio taper, screwdriver adjustment (Lafayette 99C6144).
 - RFC1—50 μh. (Millen 34300-50 or equivalent)
 - RFC2-RFC5, incl.—2.7 μh. (Millen 34300-2.7 or equivalent)
 - RFC6—10 mh. (Miller 70F10ZAI or equivalent)
 - S1—4-p.d.t. miniature rotary (Centralab PA-1011 or equivalent).
 - S2—S.p.s.t. miniature slide switch.
 - T1—Miniature audio transformer, 10,000 to 20000 ohms c.t. (Argonne AR-109).
 - Y1—48-49.333 third-overtone crystal (International Crystal type FA-5).
- * \$6.95 from Round Hill Associates Inc., 434 Avenue of the Americas, New York, N. Y. 10011.
 ** Wound on 1/4-inch diam. slug-tuned form (Miller 4500-2).

The transmitter r.f. section, Fig. 1, uses three 2N706As. The oscillator, Q_1 , is an overtone type using 48-Mc. crystals. This stage is inductively coupled to Q_2 , which triples to 144 Mc. and is in turn inductively coupled to the 144-Mc. amplifier, Q_3 . The amplifier gives an output of about 50 milliwatts through a modified pi-network tank circuit.

The receiver circuit, also shown in Fig. 1, uses two more 2N706As. The base of the r.f. amplifier, Q_4 , is grounded and the emitter is connected to the antenna through a fixed capacitor. The collector circuit is tuned, and is capacitively coupled to the detector tuned-circuit coil, L_7 . The detector circuit, a super-regenerative type, was described in an earlier issue of *QST*.¹ The audio output is coupled through a driver transformer, T_1 , to the audio gain control, R_1 , and goes from there to S_1 . This switch section selects either the audio from T_1 in receiving, or the microphone input in transmitting. The resistors in the microphone input circuit act as a voltage divider to prevent overdriving the amplifier as a modulator. (The gain control in the audio module, V_R in the AA-100 circuit diagram, is set for maximum gain.)

Construction

The transmitter and receiver are built on a single piece of $2\frac{1}{2} \times 4\frac{3}{4}$ -inch type 85C24EP Vectorbord using type T28 push-in terminals for junctions. As shown in the inside view, the board is mounted to the case, an $8 \times 6 \times 3\frac{1}{2}$ -inch Minibox (Bud CU-3009-A), by an angle bracket which runs the length of the board.

¹ DeMaw, "A Two-Meter Pocket Receiver," *QST*, June, 1966.

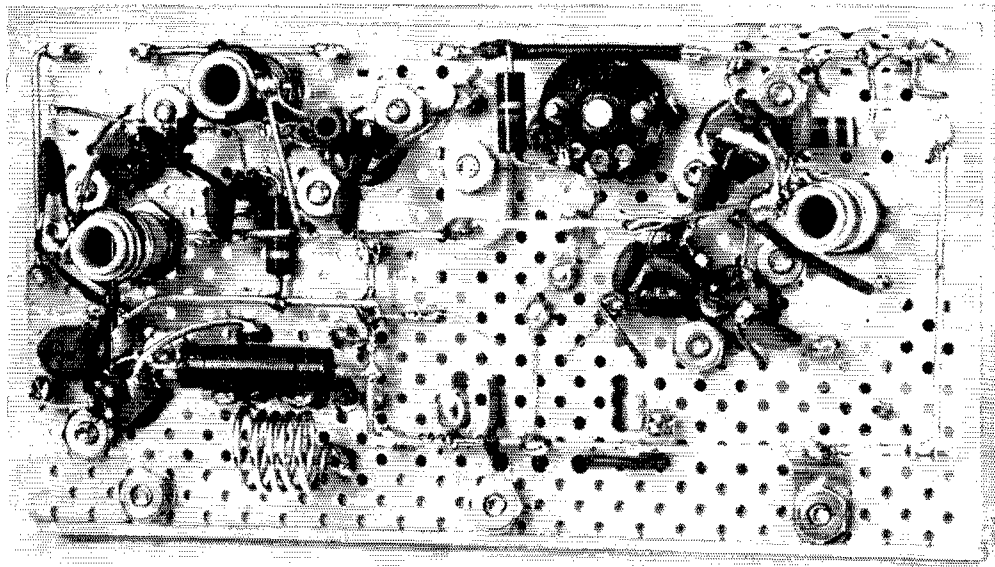
The battery is held in place with an angle bracket at the base; no top bracket is needed since the top of the case holds it firmly in place. The audio assembly is mounted at right angles to the r.f. board, and is supported by $\frac{1}{2}$ -inch metal spacers to keep the etched wiring underneath clear of the case and thus avoid short circuits. A smaller case could be used, if desired, by mounting the audio board vertically and modifying the panel layout appropriately.

The two views of the r.f. section on its Vectorbord should make the layout of this part of the transceiver reasonably clear.

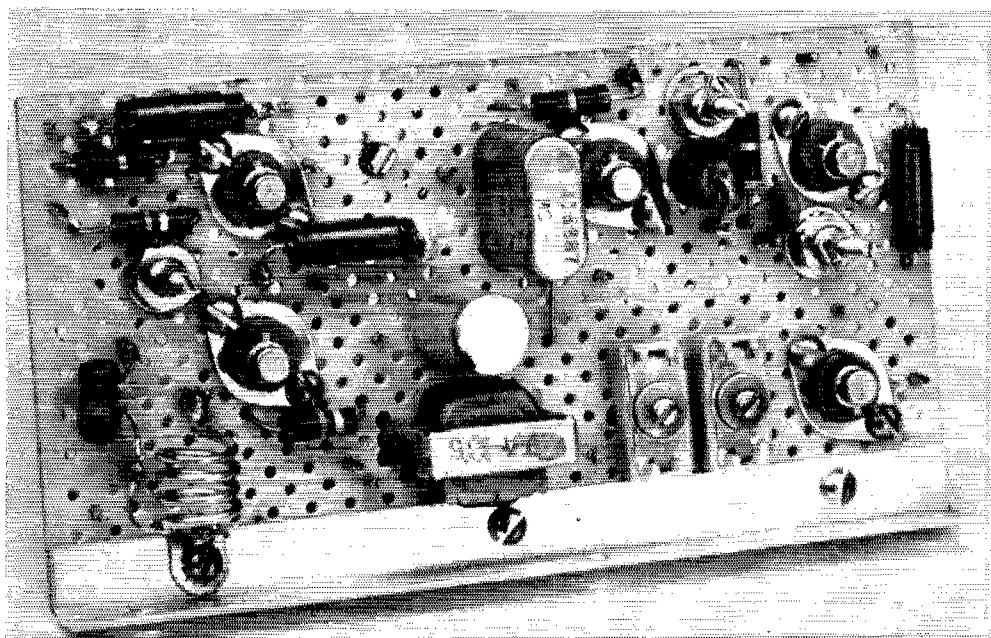
Testing and Alignment

After the wiring has been completed and the transceiver has been given a visual inspection for physical short circuits and wiring errors, the receiver portion can be checked out. With the power applied, and with S_1 in the "receive" position, the regeneration control, R_2 , should be advanced (decreasing its resistance) until a loud rushing noise is heard from the speaker. The rushing sound indicates that superregeneration is occurring. Maximum receiver sensitivity will be realized when R_2 is set just a bit beyond the point where superregeneration commences. If Q_5 does not go into superregeneration, the transistor itself may be defective, or the bias-resistor value (150,000-ohm resistor between the base of Q_5 and the primary of T_1) may need to be altered slightly. The value given in Fig. 1 proved to be satisfactory for several 2N706As tried. Normally, the resistance value should not be less than 68,000 ohms nor more than 270,000 ohms for good performance.

After getting Q_5 operating, L_7 should be adjusted to provide coverage from 144 to 148



Bottom view of the transmitter-receiver board. L_6 is at the right with L_1 at the top left and L_3 below it. At the lower left is the final tank coil, L_5 .



Top view of the transmitter-receiver board. The transmitter is at the right with Q_1 to the right of the crystal, Q_2 to the right of Q_1 , and Q_3 below Q_2 . The receiver is at the left with Q_4 at the top and Q_5 below it.

Mc. A rough check can be made by listening to the signal from a grid-dip oscillator while tuning C_3 from minimum to maximum capacitance. By spreading or compressing the turns of L_7 , the receiver can be made to tune to 144 Mc. when C_3 is set for maximum capacitance. There should be no "dead spots" (absence of hiss noise) as C_3 is tuned through its range. If such are noted, it may be necessary to advance R_2 until smooth superregeneration occurs across the entire band. Fine calibration of the receiver can best be done by using an accurate signal generator or by listening to the signal from a 2-meter transmitter whose operating frequency is known. An alternate method is to use the 5th-harmonic signal from a 10-meter transmitter for calibration (28.8 Mc. \times 5 = 144 Mc, 29 Mc. \times 5 = 145 Mc., and so on). Last, with an antenna connected and with a weak two-meter signal tuned in, adjust L_6 for best receiver sensitivity. The peak will be broad. There may be some interaction between the tuning of L_6 and that of L_7 . If so, it may be necessary to readjust L_7 slightly for proper band coverage.

When tuning up the transmitter, a dummy load (a 56-ohm one-watt resistor or a No. 49 pilot lamp are suitable) should be attached to J_2 . With the power applied and with S_1 in the "transmit" position, L_1 should be adjusted until the oscillator, Q_1 , starts. By coupling a wavemeter (or grid-dip meter in the wavemeter mode) to L_1 , output from the oscillator will be apparent when the stage is oscillating. The slug in L_1 should be screwed two or three turns beyond (toward minimum inductance of L_1) the point

at which the crystal "kicks in." This will assure rapid starting of the oscillator stage when switching from receive to transmit. Next, the wavemeter should be coupled to L_3 while tuning the slug in L_3 for maximum indication on the wavemeter. The last stage of the transmitter, Q_3 , can best be tuned by adjusting C_1 and C_2 for maximum bulb brilliance when a No. 49 lamp is connected at J_2 . If the transmitter is performing properly, the bulb will light to approximately one third its normal brightness. Alternatively, the amplifier stage can be connected to an antenna and tuned up for maximum reading on the S meter of a 2-meter receiver.

The final touches can be put to the transmitter tuning while listening to the signal on a 2-meter receiver with modulation applied. It will be necessary to adjust L_3 and C_1 (antenna connected to the transceiver) experimentally until the best audio quality is obtained. There may be a slight sacrifice in power output when this point is found. Another method is to attach a sensitive s.w.r. bridge² between J_2 and the feed line to the antenna and use it as a relative-output indicator when tuning L_3 and C_1 . While speaking into the microphone, adjust L_3 and C_1 for the least upward or downward swing of the s.w. r. meter (forward-power position). This is the point at which the audio quality is usually best. Tuning C_2 will have some effect on the audio quality during the overall procedure, but will have a more marked effect on the loading of the p.a. stage. QST

² McCoy, "The Millimatch," *QST*, August, 1967.

More Ideas for 50-Mc. Portable Arrays

Plus—Some Observations on the Use of Thin Elements in V.h.f.

BY EDWARD P. TILTON, W1HDQ*

IT is no secret that the author of these lines rates mountain-topping with v.h.f. gear near the top of his favorite outdoor activities. This penchant for hamming on the hoof has resulted in a long sequence of portable beam antenna designs aimed at giving the most decibels yield per pound of aluminum. Especially since the advent of transistors and their benefit in the form of lightweight efficient v.h.f. gear, it has seemed logical to reduce the weight and bulk of portable antennas to near the ultimate minimum. At the same time, the low power of most portable gear makes it almost mandatory that an effective antenna system be used, if we are to make other than purely local contacts.

QST, the *Handbook* and the *V.h.f. Manual* have carried examples of our portable beams for years, but we keep picking away at the weight problem, looking for ever more effective feed methods at the same time. The 50-Mc. 3-element Yagi described here came about as a result of disappearance from the market of some components of an earlier model.¹ It may be of some interest to v.h.f. enthusiasts who like to work with antennas, even though they may not be mountain-toppers at heart.

The basic system, making provision for both 50- and 144-Mc. operation, remains as described previously, with no change in the elements or feed for the 5-element 144-Mc. portion. The 50-Mc. part, Fig. 1, is a 3-element Yagi with sectional elements. The center portions of the elements are $\frac{1}{4}$ -inch aluminum tubing, counter-bored with a No. 5 drill to a depth of one inch at each end, to accept small telescoping whips. The whips originally used are no longer available, so the design was modified to take Lafayette Type 99-C-3005 whips, 0.210 inch in diameter and 10 $\frac{1}{2}$ inches long, collapsed. The whips extend to about 47 inches,² which is 11 inches longer than the earlier version. Merely making the center portions 11 inches shorter was not enough.

* V.h.f. Editor, *QST*.

¹ "Portable Beams for 50 and 144 Mc.," January, 1966, *QST*, p. 32.

² It is well to check the whips for extended length, before cutting the center sections. We found as much as four inches difference between the longest and shortest of a batch purchased.

The new elements are different enough in diameter to require different overall lengths from the original, if maximum performance is to be assured.

As pointed out in describing the earlier version, the small average diameter of these elements requires an overall element length much greater than is normally used in 50-Mc. arrays. The driven element is 120 inches long — almost 10 percent greater than is commonly used. The

much used formula, $\frac{5540}{fmc}$, will get you a dipole

that resonates somewhere in the vicinity of TV Channel 2, when these small whips are used for element ends!

The parasitic elements are spaced somewhat closer than optimum, in order to put three elements on a 6-foot boom. The reflector is less than 4 percent longer than the driven element, because of the closer spacing. The director is deliberately made shorter than the optimum-gain length, to broaden out the frequency response of the array a little.

Construction

The boom was held to 6 feet overall, to permit use of a readily-available standard tubing length. The 6-foot piece of $\frac{3}{4}$ -inch tubing is cut in half, and the two halves are joined with the aid of a $\frac{5}{8}$ -inch copper tubing insert about 6 inches long. This is permanently mounted in one of the inner ends with two self-tapping screws. The other inner end slips over the insert, and the two halves of the boom are held in alignment by the U clamp that mounts the boom to the vertical support. The latter is made of four pieces of aluminum masting, 4 feet long, that fit together to give about 15 feet of mast. The whole works — boom, mast, elements, hardware and feed system — carries in a light canvas golf bag that can be toted easily, or packed away conveniently with luggage in a car's rear deck. It should be mentioned that a copper insert was used to join the boom sections only because $\frac{5}{8}$ -inch tubing is more readily obtained in copper than aluminum. A hardwood or bakelite plug would do just as well.

In a portable array, the common matching methods such as the folded dipole and gamma match may give way to matching and feed systems that are more readily assembled and disassembled in the field. A delta-matched dipole is convenient in this respect. We use small vacuum-tube grid clips for making a sliding connection between the delta arms and the driven element, but any detachable clip should work equally well.

The center sections of the elements run through holes in the boom. Self-tapping screws in the top of the boom directly above the element holes bear against the elements to hold them in place. Drilling a slight depression at the point where the screw is to contact the element will help in maintaining mechanical rigidity, and also serve as a center mark for lining up the elements properly.

It might be thought that such small elements, especially with the seemingly fragile whips for the outer ends, would make an array that would stand very little use. There need be no worry on this score: the author has used this system for a long time, and the antennas have been put together and taken apart literally hundreds of times, in all parts of the United States and Canada. The original version was still working well, after seven years of rough service.

Feed Systems and Matching

Two versions of the delta match were tested. The simpler, Fig. 2-A, uses a random length of RG-58/U coax and a half-wave balun, with the arms of the delta made of flexible wire soldered to the balun ends. Electrical zip cord is good for the flexible arms. This balun method is simple, and it has one advantage: you cannot make it work perfectly unless the driven element is resonant. Zero reflected power in the line is thus a reliable indication of correct element length. It is not useful over a wide frequency range. Especially with small-diameter elements such as ours, the delta-and-balun combination will not "see" a 200-ohm load over an appreciable portion of the 50-Mc. band.

The other matching arrangement, Fig. 2-B, uses a delta made of 300-ohm Twin-Lead (or any balanced line) with an antenna coupler circuit replacing the balun for conversion from balanced load to unbalanced line. The tuned coupler broadens out the frequency coverage of the system appreciably, if the coupler is readjusted for wide frequency excursions. With careful adjustment of the coupler, using an s.w.r. bridge, the transmitter can be made to "see" a 50-ohm load from 50 to 52 Mc., or about twice the useful frequency range of the balun-and-delta combination. This does *not* mean that the antenna is flat in gain or impedance across this range. The coupler does make it usable, however, and readjustment of the transmitter loading is not required, as it would be with the transmitter looking into a reactive load.

The Twin-Lead delta system is made from roughly a half wavelength of line, with one end

cut apart and fanned-out to a depth of 14 inches. The other end is fitted with insulated tip plugs that are inserted into matching tip jacks in the coupler unit. The delta and line combination can be any length, but an electrical half wavelength is desirable and convenient. The antenna impedance is repeated every half wavelength along the line, so the coupler works well at this point. With Twin-Lead, a half wavelength is approximately 98 inches at 50 Mc. This brings the coupler just within reach, when the antenna is used on the 15-foot support. Random lengths of RG-58/U coax can be used for the run from the coupler to the rig.

Adjustment

The length of the delta arms and the points of connection of the driven element give some range of adjustment for different impedances, but the balun method will not provide a perfect match unless the driven element is the right length. The tunable coupler permits use of "wrong" element lengths, but better performance will result with either feed method if the element is resonant. Especially if you use element materials different from those described, it will pay you to be sure that lengths are "in the ballpark." (Checking with a grid-dip meter is a good start. Place the dipper coil close to the element, near its midpoint. It is a good idea to resonate the driven element at about 51 Mc.)

With the driven element the proper length, and with construction as in Fig. 2-A, the 3-element Yagi should show close to zero reflected power near 51 Mc. The spacing of the connecting clips can be adjusted for best indication. The antenna will then work reasonably well from 50 to about 51.5 Mc., though the s.w.r. will probably be in excess of 2 to 1 at both ends of this range.

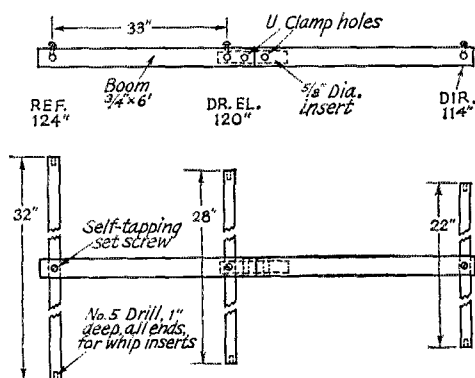


Fig. 1—Basic details of the 3-element 50-Mc. portable array. Only the center sections of the elements are shown. Small telescoping whips that extend to 47 inches fit into each of the drilled-out center portions. The two-piece boom mounts to a sectional vertical support with a U clamp. The entire array and vertical support carry in a light canvas golf bag.

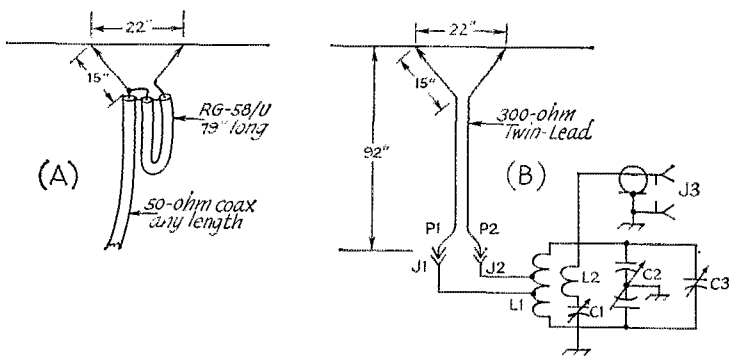


Fig. 2—Two methods of feeding the portable array. A half-wave balun and a delta match of flexible wire are shown at A. The Twin-Lead delta and line, with adjustable antenna coupler, B, permits use of the array over a wider frequency range. With readjustment, it provides a constant load for the transmitter, from 50 to 52 Mc.

C₁—75-pf. miniature variable (Hammarlund MAPC-75B).

C₂—11-pf. miniature butterfly variable (Johnson 160-211).

C₃—30-pf. miniature mica trimmer (ARCO)

J₁, J₂—Insulated tip jack.

J₃—BNC fitting.

L₁—turns No. finned, 1/2-inch dia., 16 t.p.i. Tap at and turns.

L₂—3 turns insulated hookup wire, around center of L₁. Coupler is assembled in a 1 1/2 by 2 by 3 1/4-inch Minibox, with the tip jacks at one end and the coaxial connector at the other.

That the s.w.r. rises this quickly may come as something of a surprise, if you've been in the habit of taking s.w.r. readings at the shack end of a 100-foot run of inexpensive coax. All cheap lines have enough loss to make them almost self-terminating in runs of appreciable length. With 6 to 15 feet, lengths commonly used in portable work, the losses are low enough so that reflected power readings show up quickly unless matching adjustments are "on the nose."

With the tunable coupler it is possible to tune out a fair amount of reactance and thus match a system that is not resonant. This does not mean that the antenna is working at maximum effectiveness, but it does help to extend its useful frequency range. With a driven element resonant at about 51 Mc., the coupler will enable you to tune the system to show zero reflected power from about 50 to 52 Mc., if the coupler is readjusted as the frequency is changed. The transmitter and receiver can be set up to work well with a 50-ohm load, and they will then work without readjustment over this range, provided the coupler is readjusted properly. This extra useful frequency range may be helpful, with the tendency we are currently seeing in the use of more of the band than just the first 400 kc. or so.

Performance

We do not claim to be able to measure antenna gain with a high order of accuracy, but our checks indicate that this 3-element array has at least 6 db. gain over a dipole, from 50 to 51.5 Mc. Front-to-back ratio runs about 15 db., or better. These are not startling figures, but they are honest. More important, the difference between this kind of performance, and what you can get with whip-

type antennas often used for portable work, is simply tremendous. Using the 50-Mc. transistor rig described in *QST* for February and March, 1967, running about a half watt output, we consistently work distances up to 100 miles from hilltops around New England. Fifty-Mc. enthusiasts accustomed to thinking in terms of hundreds of watts output find it hard to believe that our signal emanates from a handful of transceiver and a bagful of beam.

The acid test is what you can accomplish with a low-powered rig, by just taking it out and using it. No home rig to call on; no assistants to clear the channel — just get in there and make calls. This combination has demonstrated over and over that it can bring results, with no outside assistance, and occasionally even through the high QRM levels of contest weekends or band openings. Just a few days before these lines were typed, the revised Yagi got this kind of workout. On a Sunday afternoon, with the whole of Eastern U. S. A. boiling with sporadic-E skip, our CQ, from Bear Mountain, in western Connecticut, was answered by WA4MHS, St. Petersburg, Fla. After a solid contact, Leo left his receiver on our frequency, calling back after two hours to say that he had heard practically everything we'd said, some eight QSOs later. In this time we had worked several "locals" out to 80 or 90 miles, with consistently good reports.

All the while there were several other hilltop stations operating at line-of-sight range. The directivity of the portable beam was a considerable factor in our ability to work through what would have been intolerable QRM on an omnidirectional antenna. Yes, a beam is worth the trouble, when you head for the hills with a flea-power rig!

QST

USE SURPLUS AND SAVE

A Kilowatt Power Supply For Less Than \$35

BY LEWIS G. MCCOY*, WIICP

Lots of hams would like to run more power but the cost scares them. However, smart shopping and a little know-how can make that high-power linear very attractive.

REGARDLESS of what you may think or hear, it is possible to build your own gear and do a better and less-expensive job than you might find in some ready-made equipment. If you know—or are willing to learn—how to make use of used and surplus parts, it is possible to bring construction costs down to almost ridiculously-low levels. A good example is the power supply described in this article. This supply will power any amplifier to the full legal limit and can be built for less than \$35! If you take a look at the photograph you'll probably say we're crazy. But read on: we'll prove it's possible.

For your convenience, here is a list of some of the surplus dealers who have catalogues or flyers containing the items we used in this supply:

- Arrow Electronics, 900 Rt. 110, Farmingdale, L. I., N. Y. 11735.
- Arrow Sales, 2534 South Michigan Ave., Chicago, Ill. 60616.
- Barry Electronics, 512 Broadway, New York, N. Y. 10012.
- Fair Radio Sales, 2133 Elida Rd., Lima, Ohio. 45805.
- General Surplus Sales, 10 Alice St., Binghamton, N. Y. 13901.
- Meshna, 19 Allerton St., Lynn, Mass. 01904.
- Poly Paks, P.O. Box 942, So. Lynnfield, Mass. 01940.
- R. W. Electronics, Inc., 2244 S. Michigan Ave., Chicago, Ill. 60616

In building the supply shown here, or a similar one, there are three basic items you'll be looking for: power transformers, silicon rectifiers, and electrolytic capacitors with large amounts of capacitance at working voltages in the 300- to 450 volt region. Let's discuss power transformers first.

Power Transformers

The elementary circuit shown in Fig. 1 is a voltage doubler. This type of circuit was used in our supply for several reasons. The first point—keep this in mind in your transformer search—is that in a voltage-doubler circuit the d.c. voltage you can expect to get approaches 2.8 times the total a.c. secondary voltage. For ex-

ample, a transformer rated at 1000 volts total a.c. secondary voltage can be expected to give as much as 2800 volts d.c. out of the filter.

Another point to keep in mind is that commercial transformers are rated for *continuous* duty. In amateur service such as c.w. or s.s.b. the transformer is only operated intermittently and the ratings can be upped for our purposes. As an example, some time back we described a 700-watt amplifier using a TV power transformer rated at about 300 watts¹. However, this was a continuous-duty rating. In our application it was quite easy to get 700 watts input on either c.w. or s.s.b. with no excessive load on the transformer.

Your first step in choosing a transformer is to decide on the amplifier tube or tubes to be used and the voltage at which they will be operated. In our case a voltage of approximately 3000 was needed. In our search for a transformer one was found having two identical secondaries, each 1100 volts center-tapped, with each winding having a 180-ma. rating. As the windings were identical, it was possible to parallel them and get 1100 volts at 360 ma. The transformers cost \$4.00 each so we got two of them and paralleled all four windings for 1100 volts at 720 ma., more than enough to run the amplifier.

In addition to the surplus market, old TV sets are a source of very inexpensive transformers. Most TV sets have transformers that give about 750 volts, center-tapped, at a current rating of over 300 ma. Many TV servicemen take old sets in and just junk them. It shouldn't be too difficult to find two identical models and obtain two transformers that can operate with their windings in parallel. Also, in looking for TV transformers you'll find that many of the early sets made by one manufacturer, although of different models, used the same power transformer. Don't overlook this when examining a TV serviceman's stock of junk sets.

Getting back to surplus, we found all kinds of suitable transformers at bargain prices. In one

¹ — McCoy, "A Low-Cost 700-Watt Linear Amplifier," *QST*, February, 1966.

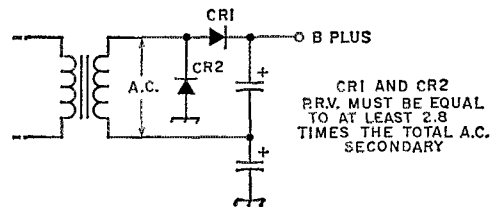
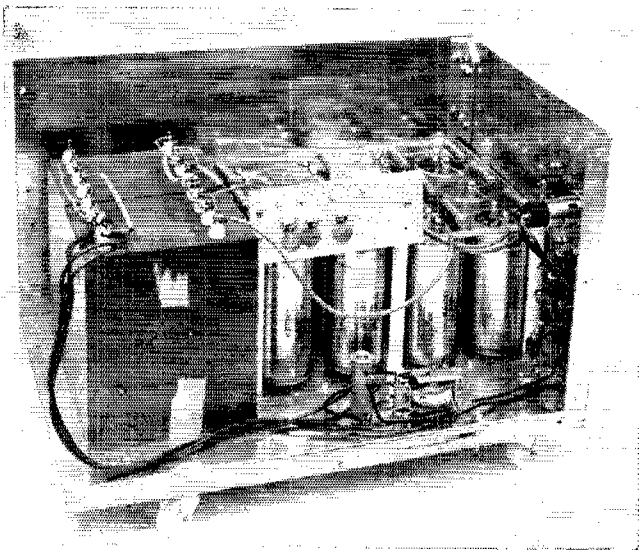


Fig. 1—see text.

* Novice Editor



This photograph shows the power supply mounting details. The two parallel-connected power transformers are at the left. Just to the right of the transformers is the rectifier board which is mounted on the bank of electrolytic capacitors. In the foreground are the relay and resistor for the rectifier surge protection.

case, paralleling *three* transformers would have given about 900 volts a.c. at 600 ma., more than adequate for a kilowatt rig — and the price was less than \$10 for the three. The moral is that it is worth your time to look around.

Connecting Transformers or Winding in Parallel

In paralleling transformer windings there is a simple procedure you can follow to make sure you have the windings connected correctly. If they are not connected correctly you'll get zero voltage and probably burn up the transformers.

First, number the various leads coming from the transformers so you'll be able to keep a record of the connections. Then connect the primaries in parallel as shown in Fig. 2. It doesn't make any difference which lead is connected to which as long as the two windings are connected in parallel. Next, connect leads 2 and 3 together and, with an a.c. voltmeter having a full-scale range at least twice the output voltage of one winding, measure the voltage between 1 and 4.² If the meter reads zero you have the correct connections, and to put the windings in parallel all you need do is connect leads 1 and 4 together.

If you read a voltage between leads 1 and 4 the connection between 2 and 3 is wrong, so connect 1 to 3 and 2 to 4. Just keep in mind that when your voltmeter shows zero voltage the connections are correct for parallel operation.

Rectifiers

These days we no longer think in terms of vacuum tubes for power rectifiers. Solid-state silicon rectifiers do the same or a better job, take up only a small fraction of the space, require no

²This measurement should be made with all due precautions for safety. The voltages associated with a power transformer are dangerous. The test can be made equally well by applying 6.3 volts from a filament supply to the transformer primaries, in which case the secondary voltage will be reduced to a correspondingly lower level. — Editor.

filament transformer, generate little heat, and have become quite cheap. The only problem in buying surplus silicon rectifiers is that it is difficult to get complete information on their characteristics. For example, you are usually given the voltage and current ratings, but nothing else. One piece of information needed for power-supply design is the surge-current rating. This is the current that flows initially through the rectifier to charge the filter capacitors when the power supply is turned on. If the surge current is exceeded, you may lose the rectifier string. However, there is an "out" as we'll show later.

In looking through *QST* ads or in surplus catalogues you'll find that there are two different terms used for the voltage rating of silicon rectifiers, "p.r.v." or "p.i.v." P.r.v. means "peak reverse voltage", and p.i.v. stands for "peak inverse voltage". They mean the same thing. However, determining what you need for handling the supply voltage is another story.

In the simple schematic of a voltage doubler, Fig. 1, let's assume that the total a.c. voltage across the secondary of the transformer is nominally 1000 volts. The required p.r.v. rating for either CR_1 or CR_2 is 2.8 times the total a.c.

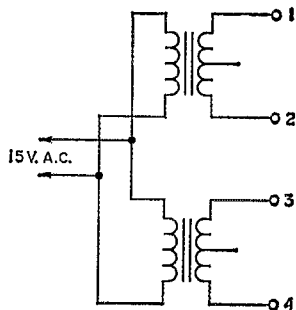


Fig. 2—see text.

voltage — in our example, 1000×2.8 or 2800 volts. Also, because we can never be completely sure that the line voltage will be just 117 volts, a safety factor should be added — let's say another 30 percent or so. It costs but a few pennies more.

A single rectifier that could handle 3000 volts p.r.v. at about 750 ma. would be fairly expensive, even in surplus. However, rectifiers can be used in series to raise the total p.r.v. rating. For example, two 1000-volt p.r.v. silicones in series will handle 2000 volts p.r.v. at the same current rating as one.

For our 3000-volt supply, we found some 1600-volt p.r.v., 1-amp. diodes for one dollar each. We used three in each leg of the supply to give a total p.r.v. rating of 4800 volts. Total cost, \$6.00.

Electrolytic Capacitors

The other expensive item in a kilowatt supply is the filter capacitor. In a linear amplifier, good dynamic regulation is required in the power supply. Dynamic regulation can be defined as "short-term" regulation, the amount the voltage varies during syllabic or voice peaks in s.s.b., or at the keying rate in c.w. The dynamic regulation is improved by increasing the amount of output capacitance in the power supply. We are not going to go into details as to the best amount for any given supply, but refer you to the *Radio Amateurs Handbook*³ for more detailed information. However, it is fairly safe to assume that for the average kilowatt supply, a capacitance of at least 15 or 20 $\mu\text{f.}$ is needed for good dynamic regulation.

Getting 20 $\mu\text{f.}$ or more at voltages on the order of 2500 to 3500 volts could run into real expense if one thinks in terms of a single-unit oil-filled capacitor. However, one way of getting around the problem is to use a string of high-capacitance electrolytics connected in series. Connecting similar capacitors in series raises the working voltage in proportion to the number of capacitors in series. However, the total capacitance is reduced in the same proportion. Assuming that all units have the same capacitance, the total capacitance will be equal to the capacitance of a single unit divided by the total number of capacitors in series. For example, six 250- $\mu\text{f.}$, 350-volt electrolytics would give us slightly more than 40 $\mu\text{f.}$ at 2100 volts.

In the supply shown here, we found a good buy in used electrolytics — 500 $\mu\text{f.}$ at 310 volts for one dollar each. With 12 of them, we had slightly more than 40 $\mu\text{f.}$ at a working voltage of 3700 volts, an ample safety factor, for a total cost of \$12.00.

When using electrolytics in a voltage-doubler circuit you should have an even number of capacitors and they should all have the same capacitance and working voltage. Also, all capacitors should be shunted by equal-value resistors to equalize the voltages across all units. In our

³ See chapter on power supply.

supply we used a 20,000-ohm 10-watt resistor across each capacitor.

This sums up the high-cost items — transformers, rectifiers, and capacitors. The remaining components consist of terminals, chassis or mounting, wiring and, for rectifier surge-current protection, a single-pole a.c. relay.

Construction Notes

A kilowatt power supply can be built in many different ways, but there are some points in the unit shown that might be worth passing on.

Because a kilowatt supply is usually a heavy beast, we mounted ours on casters so it could be moved around without straining a muscle. Take our word for it, when the XYL wants to clean up the shack, it's a lot simpler to have the supply movable.

The foundation for the supply shown is a piece of $\frac{3}{4}$ -inch plywood with enough area to hold all the components. A sheet of aluminum large enough to cover the plywood and add some panel space for terminals is mounted on the plywood.

Two sheets of $\frac{1}{4}$ -inch plexiglass are used to insulate the electrolytic capacitors from the "chassis." Although each capacitor has something less than its working-voltage rating across it, the total plus-B voltage is between the top of first capacitor and ground, so the string should be adequately insulated from the chassis.

For the primary side of the supply use wire no smaller than No. 12. The idea is to keep the voltage drop between the a.c. outlet and the transformer as low as possible. Incidentally, a good source of No. 12 is two-conductor house wire sold by your local hardware or Sears store. You can buy this in short lengths and save accordingly.

The silicon rectifiers are mounted on a small piece of Vector board, although plexiglass could be used. The lead to the high-voltage terminal is test-lead wire, 5000-volt rating. A good grade of automobile ignition cable could be used. The high-voltage terminals in the supply are Millen type 37001.

Surge Current Protection

As mentioned earlier, one of the problems in using silicon rectifiers in a voltage-doubler circuit is the surge current at the instant the supply is turned on. The surge current is limited by the voltage drops in the transformer, but without complete specifications there is no way of knowing whether it exceeds the rectifier ratings. It would be possible to put series resistance between the diodes and the secondary winding to further limit the surge current, but series resistance would make the d.c. voltage regulation poorer.

In this supply a 25-ohm resistor rated at 10 watts or more is in series with the a.c. line to the transformer primaries. This resistor, R_{13} in Fig. 3, reduces the initial voltage to the primary, which in turn reduces the surge current to a safe value.

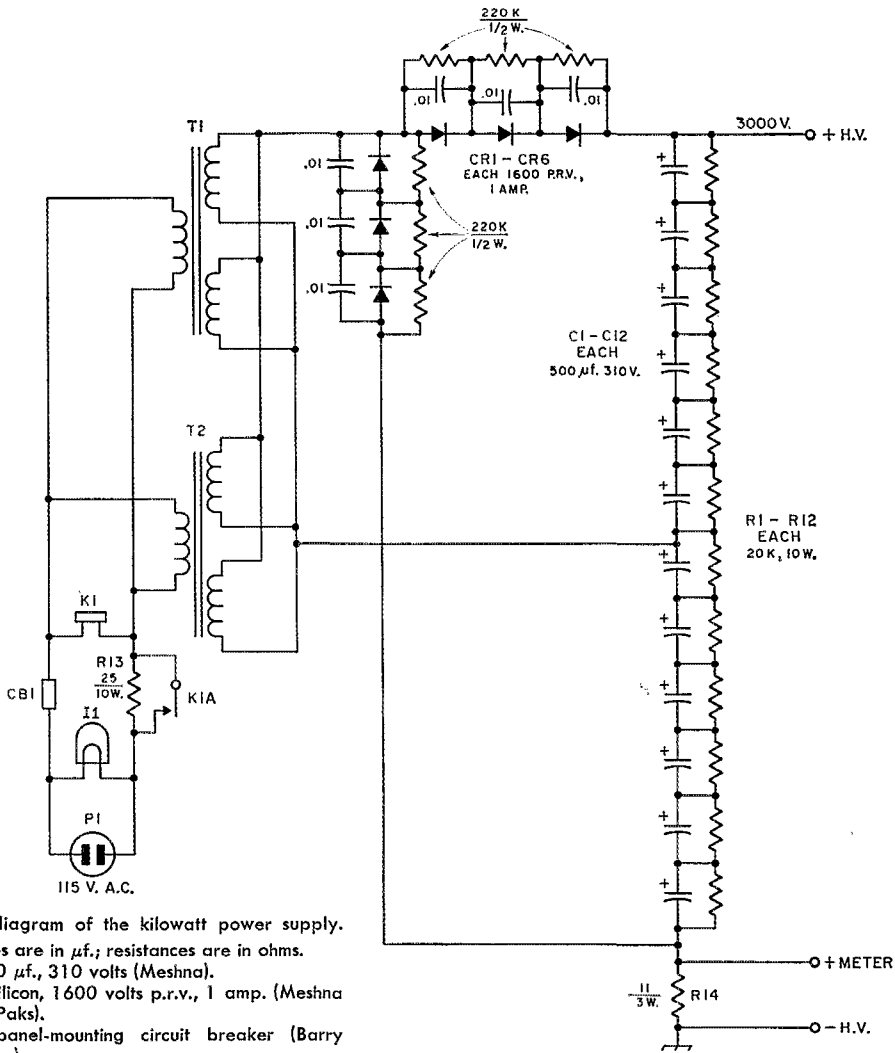


Fig. 3—Circuit diagram of the kilowatt power supply.

Capacitances are in $\mu\text{f.}$; resistances are in ohms.

C1—C12, inc.—500 $\mu\text{f.}$, 310 volts (Meshna).

CR1—CR6, inc.—Silicon, 1600 volts p.r.v., 1 amp. (Meshna or Poly Paks).

CB1—15-amp. panel-mounting circuit breaker (Barry Electronics).

I1—117-volt a.c. pilot lamp.

K1—Single-pole relay, 117 volts a.c., any contact rating over 15 amps.

P1—A.c. male chassis-mounting plug.

R1—R12, inc.—20,000 ohms, 10 watts, wire-wound.

R13—25 ohms, 10 watts, wire-wound.

R14—11 ohms, 3 watts (three 33-ohm 1-watt resistors in parallel).

T1, T2—Power transformer, two secondaries, each 1100 volts c.t., 180 ma. (center taps not used). Two transformers required; see text (R.W. Electronics type 1602).

Relay K_1 , whose contacts, K_{1A} , are connected across R_{13} , cannot close until the voltage across the primaries rises to a value high enough to pull in the armature. This delay is long enough to hold the surge current to a low value before R_1 is shorted out of the circuit. We have been using this system in another supply for well over a year, and like it very much.

A few words of caution are in order. Always have the utmost respect for *any* voltage. Be absolutely sure that the power is off before working on the supply. Also, the capacitors will take as long as a half minute to discharge *after* the primary power has been turned off, because of the high value of bleeder resistance.

In metering your proposed amplifier be sure to include a voltmeter in the design.⁴ This will give you a check on the voltage regulation as well as enabling you to measure your power input. R_{14} in Fig. 3 is included so that the plate milliammeter in the amplifier can be placed in the negative lead, for safety's sake. See the *Handbook*, transmitter chapter, for examples of this method of current measurement.

Finally, write to all the surplus dealers you can find to get their catalogs and flyers. With a little forethought and perseverance you can keep your wallet from taking a beating.

QST

⁴ FCC regulations require this if the transmitter is to be operated at over 900 watts input.

Band-Switching Transmatches

Although the T network for impedance matching has not had a great deal of use in ham gear, it lends itself to tapped-coil band switching more readily than the common inductively-coupled circuit. Here are two versions, for different power levels, intended for coupling a coaxial line to a transmitter that requires a 50-ohm load. Both are simple in construction.

Using the T Network for Circuit Simplicity

BY LANCE Q. JOHNSON,* K1MET

WHEN THE load on a transmission line causes a high standing-wave ratio to develop, the line's input impedance will no longer approach its characteristic impedance. Since most transmitters and amplifiers in use today are designed to work into 50- to 70-ohm loads, it becomes imperative that some means of impedance transformation be utilized in situations where high standing-wave ratios exist in coax line.

The way to deal with this situation is to use an impedance-matching network between transmitter and transmission line. A simple and convenient circuit is the T configuration shown in Fig. 1. Besides impedance matching, the use of this circuit provides other advantages such as harmonic suppression and increased selectivity for receiving.

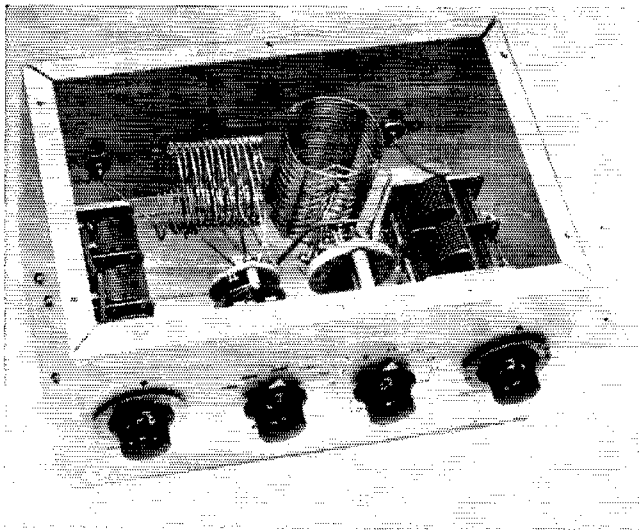
The two units shown in the photographs use this circuit and were designed to operate on 80

* ARRL Lab Assistant.

through 10 meters, with a 50-ohm unbalanced line having a maximum s.w.r. of 3:1. Both are capable of matching to higher standing-wave ratios, but in such case the power they can handle safely is drastically reduced. The smaller one is safely rated at 300 watts (d.c. input to transmitter). It is used in conjunction with an external s.w.r. indicator. The larger one is rated at 1000 watts (d.c.) and incorporates its own Varimatcher circuitry.

300-Watt Transmatch

The 300-watt version is built in a 5 × 6 × 9-inch utility cabinet. All wiring is done with No. 14 tinned wire. The input from the transmitter (and s.w.r. bridge) goes to L_1 , which is tapped to provide 12 turns for 80 meters, 11 turns for 40, 9 turns for 20, 5 turns for 15, and 3 turns for 10. The coil is positioned horizontally and is equidistant from adjacent surfaces. The appropriate



Construction of the 300-watt matching circuit is straightforward. Input side is on the left; coax receptacles for the r.f. input and output are on the rear wall of the box.

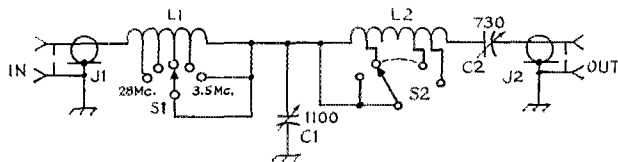


Fig. 1—Circuit of the 300-watt transmatch. Capacitances are in pf. For simplicity, only a few of the taps on L_2 are shown.

- C_1 —365-pf. variable, 3-section, receiving t.r.f. type (Miller 2113 or equivalent).
- C_2 —365-pf. variable, 2-section, receiving t.r.f. type (Miller 2112 or equivalent).
- J_1, J_2 —Coax chassis fitting, SO-239.
- L_1 —13 turns No. 14, 1 $\frac{3}{4}$ -inch diam., 8 turns per inch, tapped at 3, 5, 9, 11 and 12 turns from J_1 end

- (Polycoil 1764 or equivalent).
- L_2 —21 turns same coil stock as L_1 , tapped every other turn.
- S_1 —Ceramic rotary, 1 section, 1 pole, 2-6 positions (Centralab PA 2003 or equivalent).
- S_2 —Ceramic rotary, 1 section, 1 pole, 2-11 positions (Centralab P-270 index & YD section or equivalent).

tap is selected by the band switch, S_1 , which shorts out the unused portions of the coil. This switch is mounted on a bracket so that it can be placed close to L_1 . Its shaft goes through a panel bushing for stiffening the mounting.

The shunt capacitor, C_1 , is a three-section receiving-type variable with the trimming capacitors removed and all three sections paralleled. It is mounted flush with the side wall of the cabinet, with the shaft lined up to match the height of C_2 . C_1 ties to the common junction of L_1 and L_2 and the wiper arms of S_1 and S_2 .

The second coil, L_2 , is made from the same stock as L_1 and is cut to a total length of 21 turns. This coil is mounted vertically, perpendicular to L_1 , to reduce mutual coupling. It is supported by its tap connections and is equidistant from adjacent cabinet surfaces. The loading switch, S_2 , progressively shorts out odd turns of

the coil, and the front panel is labeled in terms of effective turns in use (1, 3, 5 . . . 21). The switch wafer is placed as far to the rear of the switch structure as possible, to shorten the length of the taps.

C_2 is a two-section variable with both sections paralleled and the trimmer capacitors removed. It is *not* connected to the chassis, since it is in series with L_2 and the output. It is mounted on three 1 $\frac{1}{2}$ -inch ceramic standoff insulators and is recessed into the cabinet so that an insulated shaft coupling can be used. A sawed-off portion of the original shaft can be used to extend from the insulated coupling through a panel bushing. L_2 ties to the stator side of C_2 and the frame is connected to the output receptacle.

The Kilowatt Model

The 1000-watt unit, Fig. 2, is similar to the 300-watt version except for component size

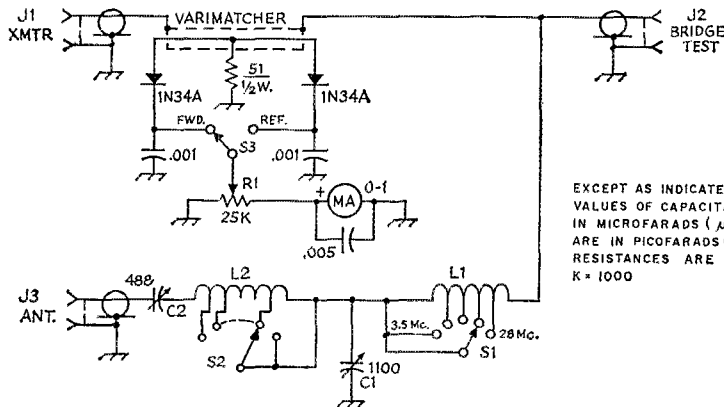


Fig. 2—The kilowatt matching circuit. Fixed capacitors are disk ceramic. Details of Varimatcher construction are given in the reference in Footnote 1.

EXCEPT AS INDICATED, DECIMAL VALUES OF CAPACITANCE ARE IN MICROFARADS (μ f.); OTHERS ARE IN PICOFARADS (pf. OR μ mf.); RESISTANCES ARE IN OHMS; K = 1000

- C_1 —365-pf. variable, 3-section t.r.f. type (Miller 2113 or equivalent).
- C_2 —488-pf. variable, 2000 volts (Johnson 154-3 or equivalent).
- J_1, J_2, J_3 —Coax chassis fitting, SO-239.
- L_1 —14 turns No. 12, 2 $\frac{1}{2}$ -inch diam., 6 turns per inch, tapped at 2, 3, 5, 8 and 11 turns (Polycoil 1774 or equivalent).

- L_2 —17 turns same coil stock as L_1 , tapped every turn.
- R_1 —25,000-ohm control, linear taper.
- S_1 —Ceramic rotary, 1 section, 1 pole, 2-6 positions (Centralab PA 2003 or equivalent).
- S_2 —Heavy-duty ceramic rotary, 1 section, 1 pole, 2-17 positions (Centralab JV-9001 or equivalent).
- S_3 —S.p.d.t. rotary (Mallory 1460 or equivalent).

and a built-in s.w.r. indicating circuit. While any type of indicator circuit can be used, provided the bridge and cables are well shielded, the device used here is a Varimatcher.¹ It is covered by an aluminum shield (not shown in the photograph) with a half-inch slot cut out so it can be lowered into place over the wire connecting the output side of the bridge to L_1 . Balancing the bridge is facilitated by connecting a 50-ohm dummy antenna to the test receptacle, J_2 , with the matching circuit disconnected. This need be done only once; afterwards the test receptacle merely serves as a tie point for L_1 and the bridge.

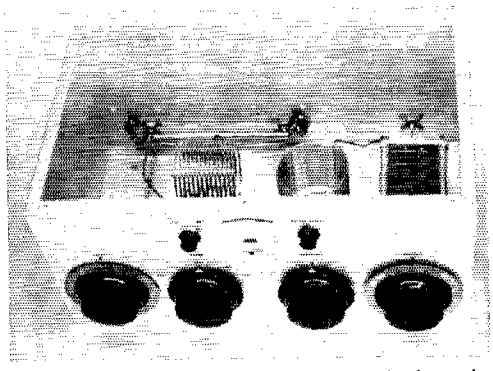
The circuit is contained in a 14 × 9 × 7-inch utility cabinet. All connections are made with No. 12 tinned wire. The coils are mounted perpendicularly to each other as in the smaller unit but because of its size, L_1 is supported by two 1-inch ceramic standoff insulators. The wire from L_1 to the bridge is formed so it can be centered in the slot cut in the bridge cover. S_1 is the same as in the 300-watt unit, but is mounted to the front panel. L_2 is made from the same coil stock as L_1 and is cut to seventeen turns, with each turn tapped to S_2 . The switch frame is mounted to the front panel for rigidity. The short solid-wire taps to L_2 hold that coil in place.

C_2 , a 488-pf. 2000-volt variable, also has to be mounted on 1-inch ceramic standoff insulators and requires an insulated shaft coupling. L_2 ties to the fixed plates and the frame goes to the output receptacle. C_1 is identical to C_1 in the low-power version, with the trimming capacitors removed and the sections paralleled. With proper tuning, this is the low-impedance portion of the circuit, and there will not be sufficient voltage to cause arc-over even with 1000 watts input.

Tuning

The operation of both units is identical. It will be convenient to make up a chart of the capacitor and L_2 settings for each band, to facilitate quick tune-up. First tune C_1 and then C_2 for minimum reflected voltage. Some loads will require going back and forth a number of

¹ De Maw, "The Varimatcher," *QST*, May, 1966.



The 1000-watt transmatch uses the same circuit as the 300-watt model, but includes a built-in Varimatcher for indicating proper adjustments. The Varimatcher is mounted between the coaxial input connector (at rear center) and the "test" connector at rear left. Connector for the r.f. transmission line is at the rear right.

times. The proper tap on L_2 will vary according to the frequency and impedance of the load. The lower the frequency the more inductance is required, with the entire coil being used on 80 meters. Do not attempt to switch either coil with power applied.

Both models were designed to match 50-ohm unbalanced lines, with up to 3:1 s.w.r., and the power rating is based on these extremes. The bandwidth for a practically exact match (on 80 meters) under these conditions is approximately plus or minus 25 kc., with only slight increases in reflected power beyond these points. The units may be utilized to compensate for even greater mismatches, but bear in mind that the voltage developed within the device will be greater, thereby lowering its power rating as well as narrowing the bandwidth. QST

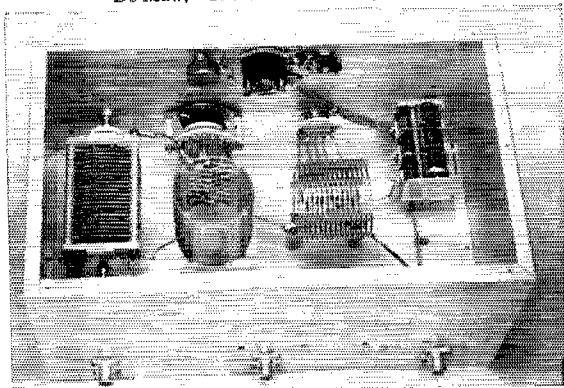
Strays

QST Clue Crypt by WIVG

A cryptogram is an enciphered message in which one letter represents another. For example, Q might stand for G; then every Q in the cryptogram would really be a G. In a Clue Crypt the first letter of each line tells the subject of the message.

FDS COKC UZZ OKM RVXHF EM
COH FHS KBKCHEI IHREPKCVDFM
COKC MCKIC CD RD VFCD HUUHZC
AEIVFR FHLC JHKL PHC'M NEKMO KPP
COH SVPA IEBDIM, IHKPVGVFR COKC
TEMCVUVZKCVDF DU VFZHFCVNH
PVZHEMVFVR
SVPP MDDF YH ZDBBDF QFDSPHARIH
(Solution on page 148)

The Post Office Department promises faster mail service with the new Zip codes. Use yours when you write League Headquarters. Use ours, too. It's 06111.



Rear view of the kilowatt transmatch, showing the s.w.r. bridge meter and controls mounted on the front panel. The output coil, left, is supported by the multiple tap leads to the switch.

sistor. The same thing happens in going back to receiving, if B+ is not removed before the antenna relay has left the transmit position.

Another important consideration is that even an excellent relay may be damaged in time if the contacts are permitted to break r.f. current. Eventually, the relay will fail because of burning and pitting of the contacts. Proper sequencing will avoid this catastrophe also.

We must, therefore, sequence our relay operations, keeping in mind that no matter how fast the power relay may operate, the power supply may drop its voltage relatively slowly, because of the retention of charge on the filter capacitors. This means that proper sequencing will assure that (1) the antenna relay goes to transmit, (2) B+ is applied, (3) B+ is removed and (4) the antenna relay returns from transmit to receive. While this sequence may be accomplished in a matter of milliseconds using somewhat exotic equipment, the practical aspects of humming will often tolerate a full second of delay, and certainly a quarter to a half second is easily tolerated.

A Time-Delay System

Fig. 1 shows a circuit which will assure proper time sequencing of the basic "one-switch" station functions. An explanation of the operation of this system is simply that on throwing the switch S_1 to transmit, C_1 is very quickly charged through CR_1 , turning on transistor Q_1 which then conducts, thus energizing relay K_1 , and switching the antenna to the transmitter. At the same time, CR_3 passes current through R_2 and thus more slowly charges C_2 . When the charge on the latter reaches the proper voltage, transistor Q_2 will turn on, energizing relay K_2 , thus turning on the transmitter.

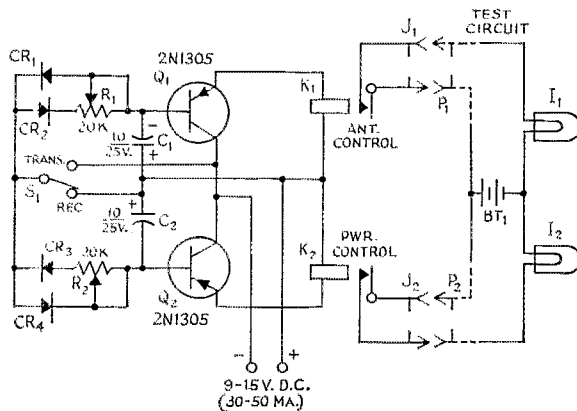


Fig. 1 — Diagram of the change-over sequencing system. Dotted lines indicate connections to a simple test circuit for adjusting to proper sequence. K_1 and K_2 should be used only to control the normal power and antenna relays.

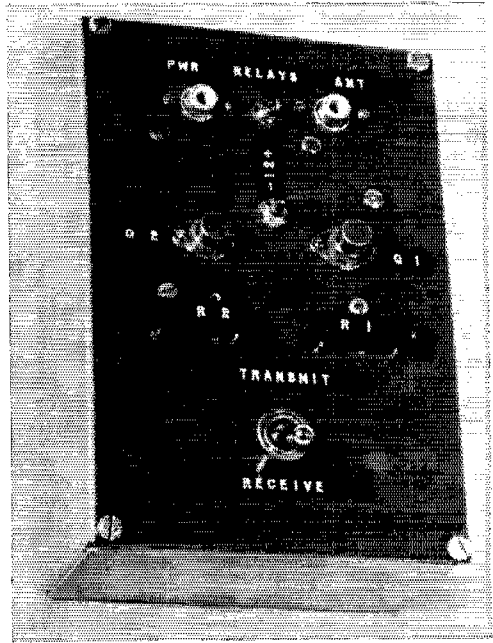
Capacitances are in $\mu\text{f.}$, and resistances are in ohms ($K = 1000$). Capacitors are electrolytic.

BT_1 —6-volt battery.

CR_1, CR_2, CR_3, CR_4 —1N198, 1N265, 1N270, 1N326, 1N458, 1N658, 1N929, 1N2069, FD135, FDM6000, or similar.

I_1, I_2 —6-udf lamp.

J_1, J_2 —Phono jack.



The completed change-over sequencer. Components are mounted on a $\frac{1}{16}$ -inch cover plate for a $4 \times 6 \times 2$ -inch chassis.

On returning S_1 to the receive position, CR_4 quickly discharges C_2 , thus turning off transistor Q_2 and de-energizing relay K_2 which turns the transmitter off. At the same time, C_1 discharges more slowly through R_1 and CR_2 , and thus relay K_1 de-energizes at a later time than did relay K_2 . The time differential for the sequence involved is determined by the values of the respec-

K_1, K_2 —1000-ohm 12-volt d.c. relay (see text).

P_1, P_2 —Phono plug.

R_1, R_2 —Linear control, trimmer or conventional type.

S_1 —S.p.d.t. toggle switch.

Other component designations are for text-reference purposes.

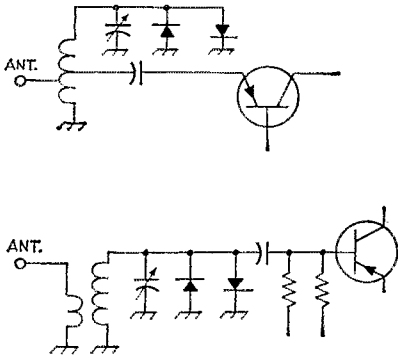


Fig. 2—Manner of installing protective diodes in typical transistor-receiver input circuits. See text.

five R and C combinations. With the values of 20K ohms shown for R_1 and R_2 , and values of 10 $\mu\text{f.}$ at C_1 and C_2 , adjustment of R_1 and R_2 will permit time delays varying from milliseconds up to about one second. The system is "fail-safe" in that loss of power to the device will shut down operations in proper sequence. As a practical matter, a number of different combinations of R , C , Q and K may be used.

Construction

Being what is known affectionately as an "average" ham with limited financial means, recourse was made to surplus parts in the construction of the unit shown in the photographs. For example, the 2N1305s specified currently sell for 52 cents each, but I found a printed-circuit board with five of these transistors and two trimmer potentiometers that I bought for 48 cents. The capacitors and diodes came from a similar source. (There are literally hundreds of such surplus boards to be found in many localities.) The diodes may be either germanium or silicon, but CR_2 and CR_4 should have low forward resistance to avoid excessive delay in the operation of the system. Any of the types listed under Fig. 1 should be suitable. By reversing the polarities of the power supply and electrolytic capacitors, n-p-n transistors may be used. With either type of transistor, either the positive or negative supply lead may be grounded, dependent only on your personal preference.

The relays may not be as easily found, but some surplus types are frequently available at a cost of 50 cents to one dollar. The relays that I used have a d.c. resistance of around 1000 ohms, pull in at 9 to 15 ma., and drop out at 2 to 4 ma. But a wide range of relay types should work. Try whatever low-resistance low-current d.c. relays you may have at hand.

The unit illustrated was assembled on a 4×6 -inch plate, used as a cover for a $4 \times 6 \times 2$ -inch chassis. This provides ample space for all of the components specified. A suitable power supply should deliver 9 to 15 volts at 30 to 50 ma.

Checking

Lacking fancy instruments, timing may most

easily be accomplished by using a pair of pilot lights turned on by the respective relays, K_1 and K_2 , as shown by the dotted-line connections of Fig. 1. A few cut-and-try adjustments of R_1 and R_2 should quickly produce a condition where lamp I_1 will light first, and then lamp I_2 , when S_1 is thrown to the transmit position, the timing being dependent on the setting of R_2 . Then, when S_1 is returned to the receive position, I_2 will go out at once, followed by I_1 , at a time delay dependent on your setting of R_1 . By watching the lamps, you may set R_1 and R_2 to any time interval that your eye can recognize. Once set, they will require no further attention whatever. A delay of approximately one-half second is used successfully at W6PBC. While this may seem like a long time to some persons, it has proved to be acceptable, and the nice thing is that no transistors have been burned out since the system was put into use. The unit pictured has been copied by a number of hams in the local area, and it has met their problems with equal success.

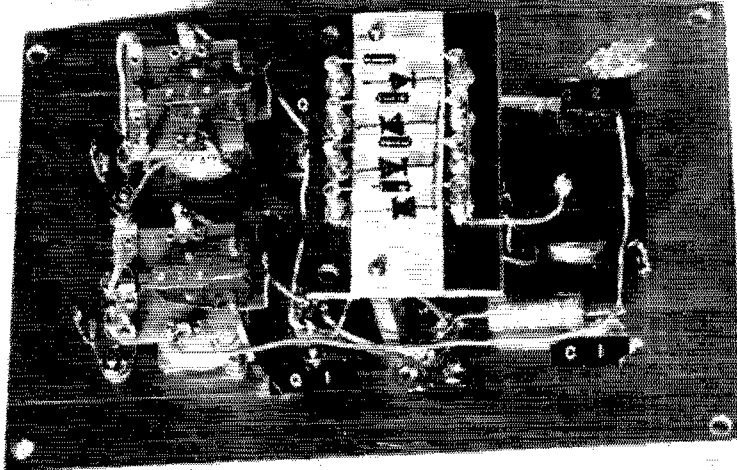
Cross Talk

Even with proper time sequencing of functions, a poor relay will permit damaging r.f. powers to enter the receiver front end through stray capacitance or dielectric leakage, and burn out transistors or damage tubes. So, in choosing a change-over relay, an important characteristic to look for (in addition to power rating, loss and v.s.w.r.) is the cross-talk rating for the frequency in which you are interested. For example, if the cross-talk rating is only 40 db., and you run 1600 watts peak output, there will be 160 milliwatts delivered into your converter or receiver front end. The normal small-signal r.f. transistor just won't take this power. And neither will it take the $\frac{1}{2}$ watt resulting from only 100 watts output and a cross-talk rating of 23 db., which so many of the relays seen in ham shacks possess. For this reason, some persons recommend the use of two or more relays in series. If poor coax relays must be used, or if high power is employed, the series method is a way out, but it is not recommended to the serious u.h.f. man. Coaxial relays with cross-talk attenuation ratings of 100 db. or more at 500 Mc. are available on the market, and are a highly-recommended investment where transistor receiving equipment is used.¹

Multi-Antenna Installations

A rather common setup for a multiband v.h.f. ham station provides separate antennas for, say, 432, 220, 144 and 50 Mc. on one tower or mast. Each is usually connected to a separate converter with a separate coax antenna relay in each transmission line. If transistor converters are used, it is possible that transmitter operation on one band may ruin the first transistor in one or more of the other converters, simply because a damag-

¹ A relay that has sometimes been found in the surplus market in the past few years is the Transco Y-type relay. W6VSV has measured the attenuation as better than 70 db. at 432 Mc.



Interior view of the change-over sequencing unit. The diodes are mounted on a small terminal board, supported by metal pillars.

ing amount of energy from the transmitter in use may be funneled into the other converters by the close proximity of their antennas to the energized antenna. Disconnecting the converter power supply may or may not provide sufficient protection, depending on the transistors being used.² Of importance perhaps equal to that of saving the transistor from burn out, however, is that of maintaining the inherent noise figure without deterioration, so a protection scheme should be used to meet this problem. The solution is perhaps the easiest of all, and one which, because of its simplicity, is often overlooked. Simply switch all antenna relays at once!

One further method of front-end protection is worthy of mention. The idea has appeared a number of times in ham publications, so no claim to originality is made. But it is often overlooked, and thus bears repeating. This scheme is illustrated in Fig. 2. It consists of two diodes in parallel and in "back-to-back" configuration. Each of the diodes will conduct as soon as its breakdown voltage is exceeded, and thus they will establish a maximum voltage that will be transferred to the r.f. stage. On the average, germanium diodes start conduction at about 0.3 volt, while silicon diodes start at about 0.6 volt. Both types have been used successfully at W6PBC. Exotic diodes are not necessary. Such a common and universally-available type as the 1N34 works very well. The important point in using this scheme appears to be to place the diodes at the highest impedance (hence high-voltage) point of the input circuit. If they are placed across the antenna input connector, most likely they will do no good at all. But, because of the usual transformer action of an

² Remember, the transistor is a "small-signal" device, and even though its power supply may be turned off, the transistor may look like a diode across the input circuit. In such a case, it will rectify input energy to the limit of its capabilities.

input circuit, if they are placed at a high-impedance point, as shown in Fig. 2, they will conduct as you intend they should.

There are, of course, some disadvantages to this protection scheme. First, the diodes add capacitance to the circuit, and the tank coil may therefore have to be reduced by a turn or two, or a linear tank line may have to be shortened to maintain resonance. Second, the *Q* of the circuit may be reduced. To the experimenter, particularly one who is prone to make many changes, these disadvantages are a cheap price to pay for such easily-obtainable front-end protection. **QST**

Strays

QST congratulates . . .

Dr. Peter B. Schroeder, W1PNY, upon publication of his scholarly, yet highly-readable history of maritime radio, "Contact at Sea," by the Gregg Press.

Luis Salido, XE2IL, on his election as Mayor of the municipality of Navojoa, Mexico.

Larry LeKashman, W9IOP, recently named president of Bogen Communications Division, Lear Siegler Corp.

Mark D. Bedrossyan, W2FIS, on publication of his play, "The First Genocide," about the dissolution of Armenia.

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I would like to get in touch with . . .

. . . amateurs interested in Pythagoreanism and Numerology. **K6RKR**.

. . . anyone interested in organizing an undenominational Christian fellowship net on 20 or 15 meters. **WASPWZ**.

. . . U. S. amateurs who are policeman. **ON5NO**.

. . . any amateurs wishing to form a low-power net. **WN4EQW**.

A Pocket-Portable Superhet for 80 or 40

Easy, Compact, Lightweight Construction

BY F. L. DWIGHT,* K6JBV

Here is a simple companion receiver for the 1-watt c.w. transmitter described in an earlier issue. A transistor broadcast receiver furnishes instant i.f., b.f.o. and audio circuitry.

DURING the last 10 years, I have used about a dozen different receivers for portable operation. These have ranged from simple 2-transistor regenerative circuits to 16-transistor receivers with lattice filters and crystal calibrators. In the simple superhet to be described, I have attempted to keep the circuit and construction as uncomplicated as possible without sacrificing any of the features that make portable operation both successful and enjoyable. This receiver is compact and light enough to be carried easily, yet when used with the 1-watt c.w. transmitter described in an earlier issue of *QST*¹, and a portable dipole thrown up into the nearest tree, it will easily make possible solid contacts with stations several hundred miles away. The complete receiver can be built for about \$20, even if all new components are used. Three similar receivers have been in operation for the past several years, and have performed well on camping trips, Field Days, and at home.

In brief, the receiver consists of a 2-transistor tunable converter feeding the 455-ke.-i.f., and audio stages of an inexpensive pocket broadcast receiver. The original converter stage of the b.c. receiver is modified to serve as a b.f.o. at 455 kc.

The H.F. Converter

The circuit of the converter is shown in Fig. 1. It is more or less conventional, consisting of a fixed-tuned mixer and a tunable oscillator. Values in Table I provide a choice of either 40- or 80-meter operation. The h.f. oscillator operates on the high-frequency side of the incoming signal for 80 meters, and on the low-frequency side for 40-meter operation.

The complete receiver is housed in a $5\frac{1}{4} \times 2\frac{1}{8} \times 3$ -inch aluminum box (LMB 780 or Bud CU-2106A). The h.f. converter is built into the flanged half of the box, while the b.c. receiver occupies the other half, as shown in the photos.

Although a miniature air trimmer might be used for the tuning capacitor C_3 , I found it

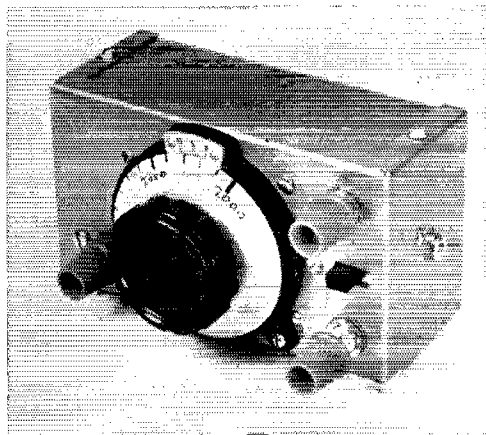
simpler to make my own. Plate dimensions are shown in Fig. 2. A small strip of insulating material was fastened against the back of the panel, using one of the dial mounting screws, and another screw set in the panel. Three small bits of the same insulating material were arranged in a semicircle and cemented to the strip. The stator plate of the capacitor was fastened, in turn, to these bits, using epoxy cement. (Be sure that the metal is clean.)

The rotor plate was soldered to one end of a short section of $\frac{1}{4}$ -inch brass rod. The other end of the rod was inserted in the dial shaft coupler, and adjusted to give a capacitor plate spacing of $\frac{1}{8}$ inch. The dial will be recognized as an import ($2\frac{7}{8}$ -inch size), handled by several mail-order houses.

The slug-tuned coils of the converter must be mounted close to one end of the box so that they will clear the end of the b.c. receiver case when the box is reassembled. The phono jack used for antenna input, and the slide switch S_1 are mounted at the same end of the box. Terminal strips are used as tie points, and to mount most of the small components.

B.C. Receiver Modification

The author chose a Philco Model 602-BK for the broadcast receiver that supplies the i.f. and a.f. stages, because this unit is compact, lends itself to easy conversion, and is one that should be widely available. Other similar transistor



A complete 7-Mc. (or 3.5-Mc.) portable superhet receiver in a $3 \times 2\frac{1}{8} \times 5\frac{1}{4}$ -inch box. The i.f. gain control is at the left. Controls at the right are the converter battery switch, and knobs for adjusting the slug-tuned mixer and oscillator coils to the desired point in the band.

* 9027 8th. Ave., Inglewood, California 90305.

¹ Dwight, "A One-Watt Rig for 40 Meters," *QST*, November, 1966.

receivers may be used, but the details of conversion will vary, of course. (I might mention that, in some of the other receivers that I have used, I have found little similarity between the schematics furnished, and the actual wiring of the receiver.)

The r.f. circuitry of the Philco receiver is shown in Fig. 3. The modification consists of revising the original converter circuit for use as a b.f.o. (as mentioned earlier), shifting the gain control from the audio section to the i.f. amplifier, and making provision for feeding the ham-band converter into the 455-kc. i.f. amplifier. Battery connections are also changed to permit the b.f.o. to be operated from the battery supply of the h.f. converter. Thus both oscillators are free from battery-loading effects of the other stages, which might result in frequency instability.

The modification procedure is as follows: Carefully remove the circuit board from the plastic case. Leave the speaker in the case, but temporarily unsolder its connecting wires. Cut a hole about the same size as the speaker vent in the rear half of the box, centering it so that it will line up with the speaker when the plastic case is placed at that extreme end of the box which will avoid interference with the slug-tuned coils of the h.f. converter. Also drill a $\frac{3}{8}$ -inch hole to provide access to the headphone jack. Then mount the plastic case in the box with four screws at accessible points.

On the receiver itself, first disconnect and remove the ferrite-rod antenna. Then use the sharp point of a knife to make the four cuts in the etched circuitry indicated in Fig. 4 (A-B, C-D, E-F, and G-D). Run a shielded wire out from A that will be connected to the collector terminal of the 2N412 in the h.f. converter (no connection to B). Soldering should be done as quickly as possible to avoid excessive heat. Run a wire from C to H. Connect F, I and J together (no connection to E). Connect a 220-pf. silver-mica capacitor from J to D. Make a ground connection to the metal box at H.

TABLE 1

Band	Capacitance (pf.)		Coil Turns				
	C ₁	C ₂	L ₁	L ₂	L ₃	L ₄	L ₅
7 Mc.	47	39	1½	35	5	1	38
3.5 Mc.	56	39	3	75	7	2	67

Capacitors are 5 percent silver mica. Coils are wound on Millen 69046 iron-slug coil forms ($\frac{1}{2} \times 1\frac{3}{4}$ inches). All are close-wound with No. 26 enameled wire, except L₂ and L₅ for 3.5 Mc. which are wound with No. 28. L₅ is tapped at 5 turns from ground end for 7 Mc., and at 8 turns for 3.5 Mc. Coupling coils are wound over ground ends of L₂ and L₅, with L₁ over L₃.

Now find R₂. This resistor will be found immediately above the point marked Y in Fig. 4. Cut the lead which runs from the top of this resistor to the circuit board. Connect a wire to the open end of the resistor, and run it around to G and solder. Connect a 0.02- μ f. disk capacitor between G and H. Solder one end of a 27K resistor to G. The other end of this resistor goes to the positive terminal of the h.f. converter battery.

Remove the wires from terminals K and L on the gain control, and tie these wires together. Locate R₆. This resistor will be found immediately above the point marked Z in Fig. 4. Cut the wire lead to the top of this resistor. Solder an extension to the wire lead (not to R₆), and connect to terminal L of the gain control (no connection to K). Run a wire from M to H.

A separable shaft coupling is required for the gain control. I cemented a short section of plastic tubing, cut from the cap of an old ballpoint pen

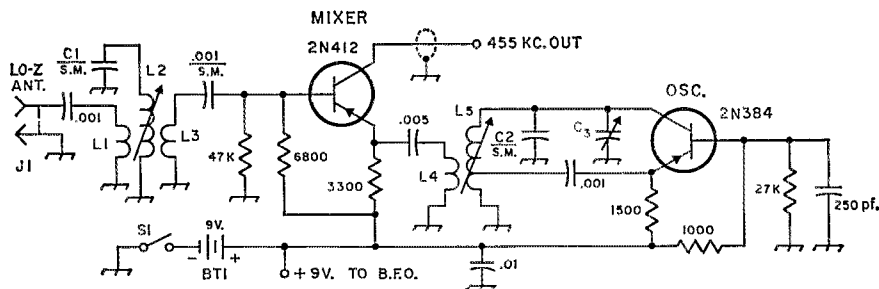


Fig. 1—Circuit of the converter. Resistances are in ohms (K=1000). Unless indicated otherwise, capacitances are in μ f. Resistors are $\frac{1}{2}$ -watt. Fixed capacitors are disk ceramic, except where S.M. indicates silver mica.

BT1—9-volt battery (Eveready 216, or similar).

C₁, C₂—See Table I.

C₃—10-pf. variable capacitor (see text).

J₁—Phono jack.

L₁—L₅, incl.—See Table I.

S₁—Miniature slide switch.

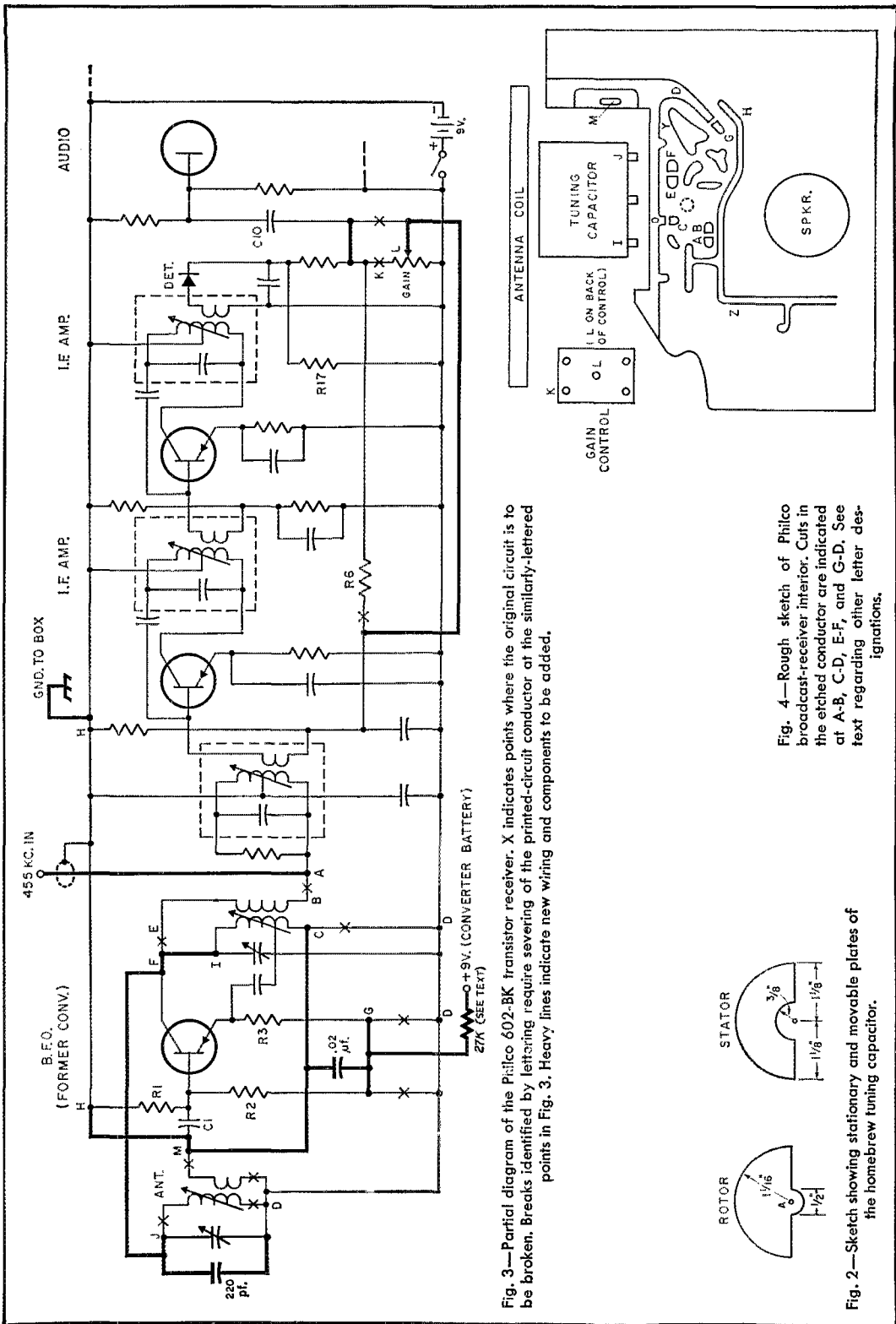


Fig. 3—Partial diagram of the Philco 602-BK transistor receiver. X indicates points where the original circuit is to be broken. Breaks identified by lettering require severing of the printed-circuit conductor at the similarly-lettered points in Fig. 3. Heavy lines indicate new wiring and components to be added.

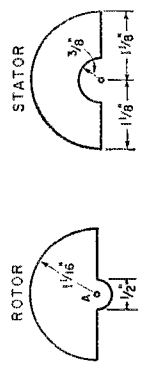


Fig. 2—Sketch showing stationary and movable plates of the homebrew tuning capacitor.

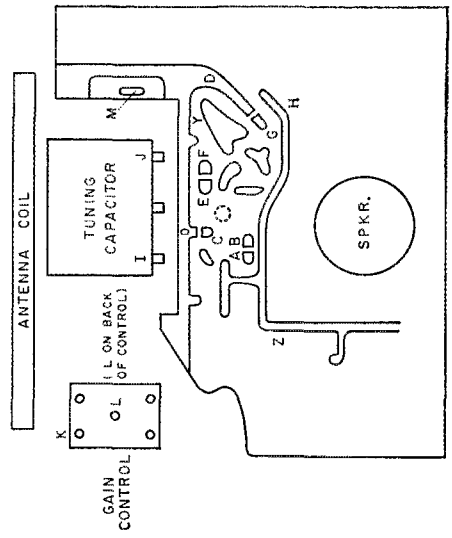
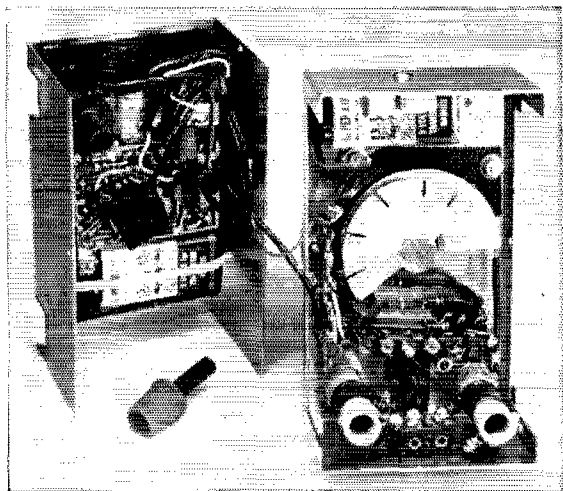


Fig. 4—Rough sketch of Philco broadcast-receiver interior. Cuts in the etched conductor are indicated at A-B, C-D, E-F, and G-D. See text regarding other letter designations.



Interior view of the portable receiver. The converted pocket broadcast receiver at the left provides i.f., b.f.o. and audio stages for the h.f. converter at the right. Construction of the simple homemade converter tuning capacitor, and gain-control shaft extension are described in the text.

(Lindy), to the shaft of the control, as shown in the interior photo. A short section of the barrel of the same pen was cemented into a cap from a tube of toothpaste, which serves as the control knob. The two sections of plastic tubing telescope with a firm grip for rotation, yet they can be separated easily when disassembling the box. (Similar toothpaste-tube caps were cemented to the adjusting screws of the two slug-tuned coils in the converter.)

This completes the modification, and the speaker may be reconnected. Make the connections to the collector of the 2N412, and the converter battery. Use plastic tape to insulate any exposed contacts.

Adjustment

A slight hiss should be heard from the speaker when the switches of both b.c. receiver and converter are turned on, and the gain control advanced to maximum. Adjust the b.c. tuning capacitor (which now controls the b.f.o. frequency) and the first i.f. transformer slug for maximum noise. Then replace the b.c. receiver in its case, and reassemble the box.

Connect a signal generator or 50/75-ohm antenna to the antenna jack, and adjust the slug of L_5 until signals in the desired frequency range are heard. With the tuning capacitor constructed as described earlier, it should cover a range of about 120 kc. on either band. This range can be shifted to any portion of the band by adjustment of L_5 . Find a signal near the center of the selected range, and peak it up by adjusting the slug of L_2 . If more b.f.o. injection is found desirable, reduce the value of the 27K resistor in the battery line to the b.f.o.

After the receiver is working properly, you may want to limit the excessive high-frequency audio response by connecting a capacitor from the base of the first audio transistor to ground. A value of about 0.1 μ f. works well for both s.s.b. and c.w., but a larger capacitance could be used if only c.w. reception is desired. This change will also result in a considerable reduction in battery drain.

QST

Strays

The 20th anniversary of QCWA will be celebrated at a dinner meeting at the Statler-Hilton Hotel, 33rd and 7th Avenue, New York City on Friday, October 27. Highlight of the meeting will be the presentation of engraved plaques to 40 Charter Members of the QCWA.

Feedback

In the caption of the schematic of the Squeeze Keyer, page 23 of the July issue, there is an error in the type number of the Potter & Brumfield polarized relay. The correct type number is JMP-5200-11.

Airman Second Class John Ferrara, HL9TK (K1NNA), who is stationed at Osan Air Base, Korea, was tuning across the band recently when he heard an emergency call from the 87-foot schooner *Dante Deo* which had run aground on a coral reef off the Paracel Islands. Ferrara organized an on-the-spot net which assisted in forming an air-sea rescue. The story had a happy ending: All seven aboard including one child, were rescued . . . thanks to HL9TK.

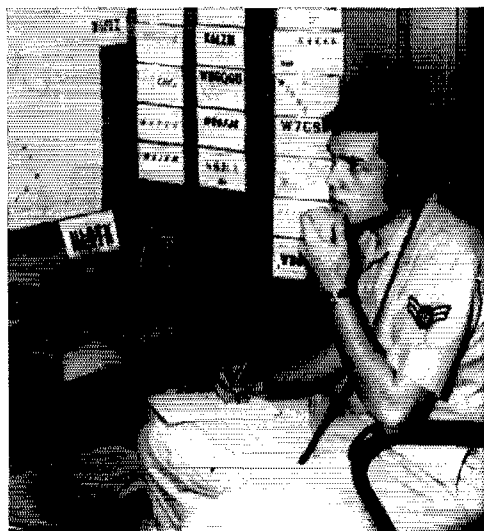
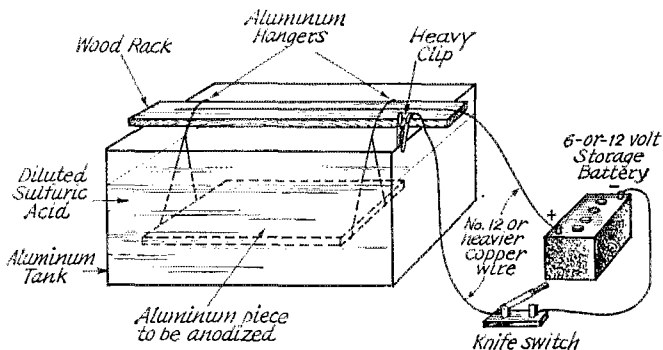


Fig. 1—Setup for anodizing aluminum panels and cabinets. Although an aluminum tank is shown, almost any acid-proof container can be used if the negative lead from the battery is connected to a large piece of scrap aluminum immersed in the acid.



Anodizing

The undisputed king of aluminum finishes is the anodized¹ finish. This finish is highly resistant to weather, corrosion, abrasion, and wear and cannot be chipped or pulled off, since it is an integral part of the metal. Furthermore, the anodized piece may be colored with a dye to produce a finish that will be the envy of those with plain "home brew."

In the anodizing process, aluminum, after suitable preparation, is subjected to an electrochemical oxidation which increases the thickness of the protective oxide film. The preparation may be graining or etching. Strangely enough, neither the required equipment nor the technical knowledge to acquire this beautiful coating need be elaborate or extensive. As a matter of fact, it surprises this writer that more amateurs do not compete in equipment appearance the way they do with circuitry.

Fig. 1 shows a typical anodizing setup, which may be varied considerably depending on what's available. The tank may be an enameled dishpan or large plastic tray. Almost any acid-proof container will do except ordinary glass, which could crack due to the heat generated in the system. A Pyrex glass container works nicely, however, as does an enameled tub. Best of all is an aluminum tank. The tank itself may then be used as the cathode in the system shown in Fig. 1.

Having no aluminum tank is no real problem. Simply use a piece of scrap aluminum such as a "throw-away" pie plate for the cathode. This may be shaped to hang over the edge of the container or even connected to the negative wire and laid on the bottom. Naturally, this is done before adding the solution. Since trapped air could cause the irregular cathode to float and short-circuit the system, it is a good idea to weigh the piece down with a few selected stones.

Any nonconducting material will do for the anode rack. Wood, of course, is the most simple and is more than adequate. If a nonconductive container is placed into service, the anode rack can then be metallic. The point here is that the current must go through the solution and not be shunted around the acid due to bad planning.

¹ Paddon, "It's a Pretty Pickle," *QST*, May, 1950.

The hangers may be made of flat strips of aluminum or hard aluminum wire. The commercial anodizing houses use lead or even titanium but we hobbyists must make use of what is at hand. There is no advantage in being exotic anyway. Make a rule that anything going into the solution must be aluminum.

Use No. 12 or heavier house wire for the power-supply leads. Heavy clips on the ends will facilitate handling. Remember to plan your setup so that the copper wires or clips do not go into the solution; sulfuric acid eats copper.

A knife switch in the line is very handy. One which will handle at least ten amperes is a good choice.

A twelve-volt lead storage battery makes a fine power supply for the system. Even a six-volt storage battery will do, but it will take longer to finish the job. In the event that a rectifier type supply is breadboarded for the setup, don't worry about filtering. The pulsations in the d.c. won't hurt the system at all. However, the supply should be able to deliver five amperes or more.

Sulfuric acid for the anodizing operation can be obtained from a good automobile supply house. The professional anodizers use a 15- to 20-percent solution. If sulfuric acid weighed the same as water, a 20-percent solution would be one unit volume of acid plus four unit volumes of water. However, sulfuric acid is 1.84 times as heavy as water. Rather than go through the arithmetic, let us just use the ratio of one to eight; that is, one unit volume of acid to eight unit volumes of water. This will serve with almost any concentration of acid which can be purchased and ordinary tap water can be used unless the water in your area is very hard.² Use extreme caution in handling sulfuric acid as it eats clothing as well as people. The use of rubber gloves and safety glasses is not a bad idea. For your own safety follow the all-important rule on diluting acids: Always pour the acid slowly into the water. Never pour the water into the acid or you may be splattered with a caustic solution.

Plan your work so that the aluminum piece can be lowered into the solution and recovered

² Hard water may be purified by using the filters sold in grocery stores to make water suitable for use with steam irons. These filters usually cost less than \$1.00. — Editor.

with ease. Normally, contact is made from the hangers to the positive lead of the power supply merely by the act of hanging. Although it is done this way commercially, a heavy clip can be used by the perfectionist.

Previous to anodizing, the work piece should receive the final finish by graining or etching. Naturally any paint or lacquer should be omitted.

Before you proceed with your endeavors, it's desirable to discuss anodizing a bit. As mentioned, anodizing increases the protective oxide film. Bare aluminum develops a very thin coat of this film as soon as it is exposed to oxygen. What we are doing here is increasing the thickness of this layer. Do not confuse this with electroplating, where a metallic coating is deposited on the work.

The aluminum oxide (Al_2O_3) formed by anodizing has several advantageous properties. First of all, aluminum oxide, aside from being hard and abrasion resistant, is an insulator. This may not seem like much of an advantage when ground connections must be scraped; however, this property does allow us to check a work piece to see if our efforts have been successful. An ohmmeter on the highest scale should show no continuity when the probes are both placed on the workpiece which has been anodized in our setup for 10 to 15 minutes.

Another advantage to anodizing is that the coating is porous. This may at first seem to be detrimental to the anodized object's weather resistance. However the pores can be sealed by simply "cooking" the work for a short time in water at 206 to 210 degrees Fahrenheit, which is for our purposes boiling. This sealing of the pores is really a slight chemical change of the cells from Al_2O_3 to $Al_2O_3 \cdot H_2O$. When the water combines with the aluminum oxide, the pores simply fill up. The importance of these pores can be seen if we can imagine filling the holes with color before sealing. This is exactly what is done with dye.

A rich-colored metallic sheen can be given to anodized aluminum by impregnating the walls of the oxide coating with dye. Since some of the

actual coating remains transparent, the result is extremely attractive.

Industry is interested in reproducing results during long production runs. This problem need not concern hams, but it is a good idea to jot down temperature, time, kind of dye and amount of dye used, just in case a later project should require the same finish. With this information, the color match should at least be in the ball park.

Commercial dyes for aluminum may be obtained from any one of a number of chemical supply houses and most will repack dyes in one pound quantities. One vendor was found who will repack in $\frac{1}{4}$ pound units.³

Fabric dyes such as Tintex and Rit may also be used for this purpose, but the dye concentration should be at least double that of the commercial dyes. Concentration of commercial dyes is between 1/10 to 10 grams per liter. Note the extreme latitude. Fabric dyes also vary in concentration, but as with any dye, the depth of color depends on the mix as well as the time given for absorption.

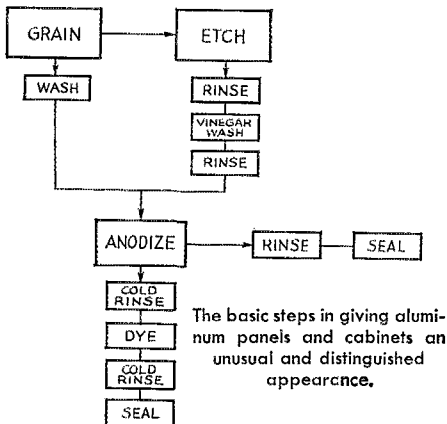
Normal dyeing time is 10 minutes at 150 degrees Fahrenheit. Try not to exceed the temperature, since some premature sealing could take place. A cold rinse after dyeing will help show the true color because some bleeding or leaching of the dye will take place. If the color is not dark enough, there is no harm done. Just make a stronger mixture and have another go. Then seal the piece, as explained previously, and the job is done.

³ A. & D. Dyestuffs, Inc., 60 N. Front Street, Philadelphia, Pa. 19106.

Stays

The Amateur Radio News Service (ARNS) announces its First Annual Publication contest. Awards will be presented to outstanding publications, editors, and clubs in several categories. The contest is open to all amateur radio publications, member or non-member of ARNS, provided the publication is strictly non-profit and is published solely in the interest of amateur radio. Entries will consist of any three issues of the publication (selected by the entrant) issued during the current year. All entries must be in the hands of the Contest Manager by Dec. 30, 1967. Entries will be segregated in two categories: Category 1 — with commercial advertising support, Category 2 — non-commercial support.

Each category will be judged on the following points and an appropriate award certificate will be issued to the one judged best in each case: Best masthead, best general format, best editorials, best club activity coverage, best local (ham) news coverage, best usage of other publication items, best variety of club member contributions, best technical articles, best illustrations (not circuit diagrams), and best sectional coverage (for sectional publications only). In addition to the above, one Grand Award will be made to the best all-around publication in all categories. For more information on the contest, write Mr. Andy Clark, W4IYT, P.O. Box 501, Miami Springs, Florida.



• *Beginner and Novice*

Antenna Switching For Beginners

BY LEWIS G. McCOY,* WIICP

A PROBLEM that many newcomers have is how to set up their stations to make it as simple and convenient as possible to switch between transmitting and receiving. The main difficulty usually involves using the same antenna for both. While Novices may listen on different frequencies from the one they transmit on because of the crystal-control requirement, the majority of hams usually transmit and receive on the same frequency. This adds the problem of "muting," or lowering the audio level of the receiver so that it doesn't overload. This article will treat some of the systems for integrating station controls to make the job easier.

One Or Two Antennas?

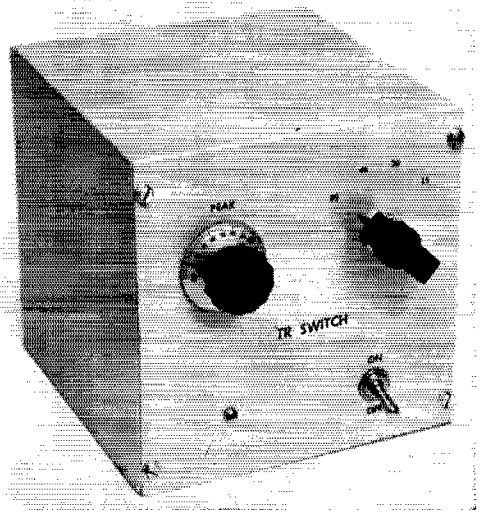
Some amateurs prefer using two antennas, one for receiving and the other for transmitting. The advantage of such a system is that no antenna switching is required. However, it is customary to install the transmitting antenna in the best possible location while the receiving antenna is relegated to a poorer one. Keep one point in mind when setting up your antenna system: The transmitting antenna will radiate signals better in some directions than others, and by the same token, the better transmitting directions will also be the best for receiving. When using a separate receiving antenna, you may hear signals better from directions where you transmit the poorest signal, and vice versa. This can lead to fruitless calls and poor contacts, so a single antenna is better.

Methods Of Switching The Antenna

There are three common methods of transferring the antenna from the receiver to the transmitter — manually (knife switch), with a relay, or electronically. Many beginners start out by using a knife switch, but they quickly find out that this is cumbersome and time-consuming. A more popular method is to use an antenna relay. In home-station operation the relay coil is usually made for 117 volts a.c. and this voltage can be switched on and off by different methods. Some commercial receivers and transmitters have built-in switches that have provision for switching the antenna relay. Or a conveniently-mounted toggle or foot switch can be used to control the relay.

Most hams use coaxial cable to interconnect the equipment and antenna system, so the antenna relay used is a coaxial type. Good coaxial antenna relays are usually expensive but you can build your own, as we'll show you, and save considerably.

* Beginner and Novice Editor



The knob at the left is used for peaking the tuned circuit. At the right is the bandswitch. Only four positions are shown and the 15-meter position also covers 10 meters, as mentioned in the text.

Still another method of switching the antenna is by electronic means, with no manual switches to throw. Such units usually are referred to as "t.r." (transmit-receive) switches (While a relay also is a t.r. switch, the electronic type is usually meant when the term "t.r. switch" is used). For break-in work, electronic switching is preferred because no ordinary relay is fast enough to follow c.w. keying.¹ Constructional details for a versatile t.r. switch are also provided in this article.

Coaxial Relays

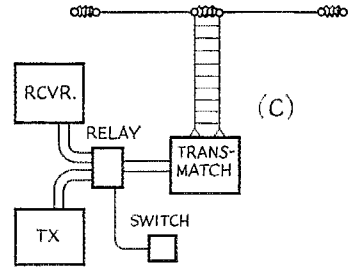
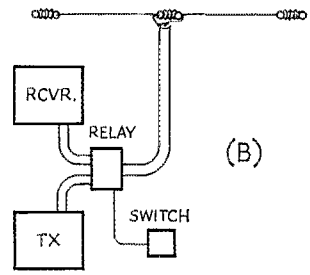
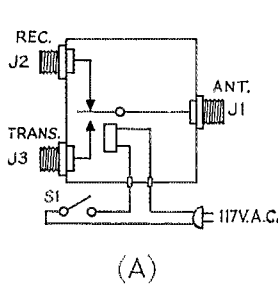
One way to beat the high cost of coaxial relays is to use the ordinary type. Almost any inexpensive relay can be used for Novice power or for

¹ High-speed relays are available and have been used (*QST*, August, 1967, p. 32; December, 1964, p. 20; July, 1964, p. 29).

It takes only a short period on the air to make the newcomer appreciate what older hams mean when they talk about "operating convenience." The price for it may be an increase in circuit complexity, but not a tremendous one.

Fig. 1—A—hookup for an antenna changeover relay. B and C show alternate methods of using a relay for antenna switching.

J₁, J₂, J₃ — See text
S₁ — See text

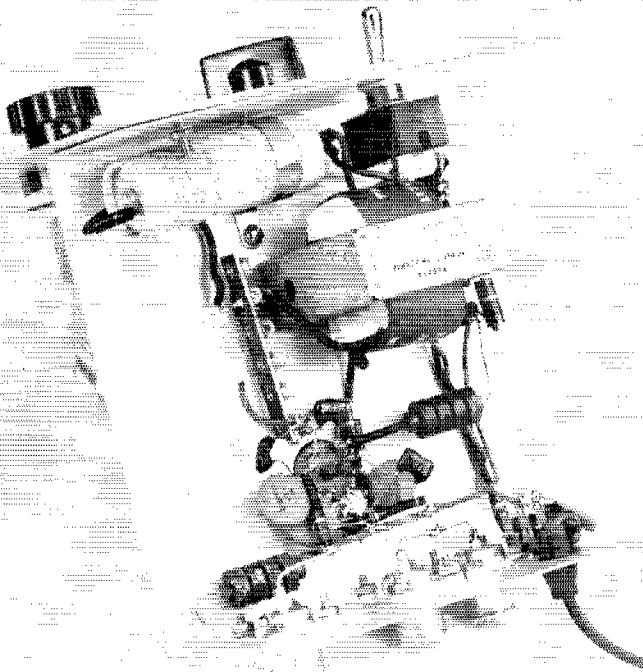


inputs up to a few hundred watts. The relay can be mounted in a small metal box and provided with coaxial fittings. Although such an assembly is not a true coaxial relay, it will not cause an appreciable impedance mismatch in the transmission line as long as the box is mounted on the back of, or close to, the transmitter. This type of relay is shown in the photograph. The relay in the circuit of Fig. 1A is a single-pole, double-throw unit with the inner conductor of the coaxial line from the antenna or transmatch connected to the movable arm of the relay. The receiver is always connected to the "at rest" contact of the relay because normally an operator does more listening than transmitting and doesn't want the antenna relay energized while listening. For transmitting S₁ is closed, feeding a.c. to the relay coil, closing the relay. The arm makes contact with the relay terminal connected to J₃, which in turn is connected to the transmitter.

A multiple-pole, multicontact relay can be used, in which case the extra contacts can be used

for muting the receiver, switching a monitor, and so forth. Most receivers have provisions for muting, and a study of the receiver instruction book will usually provide details how this can be accomplished. While S₁ is shown in Fig. 1A as a single-pole switch, it could have more than one pole so other equipment also could be switched when the antenna is transferred.

When installing the relay in the metal box, try to keep the leads from the coax fittings to the



The power transformer and filter components are mounted at the upper right. Just to the lower left of center is the socket for the 12AU7.

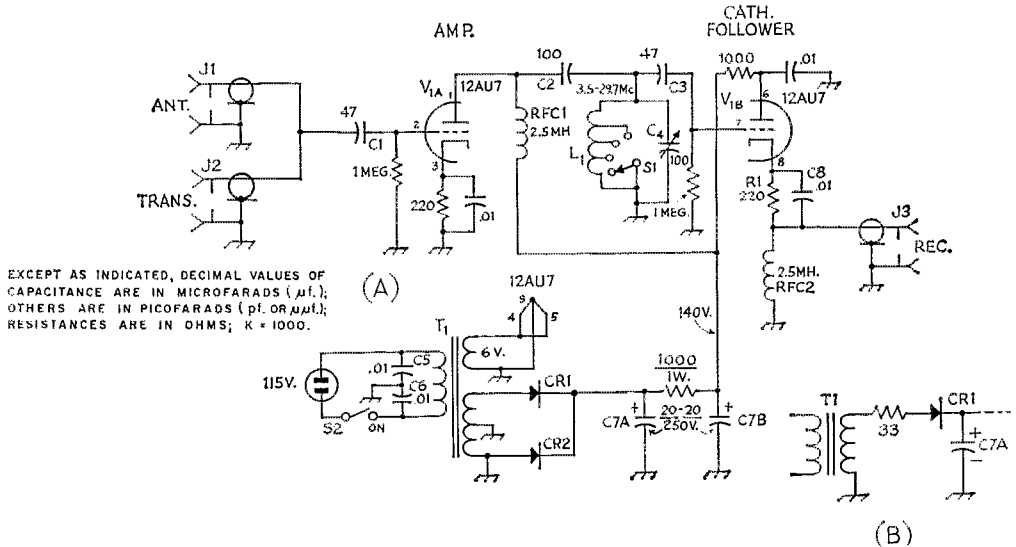


Fig. 2—Circuit diagram of the t.r. switch. Unless otherwise specified, resistors are $\frac{1}{2}$ watt; decimal value fixed capacitors are disk ceramic, others are mica with the exception of C_7 , which is electrolytic. B—method of using a half-wave transformer for T_1 . Circuit designations not listed below are for text reference.

C_4 —100-pf. variable (Millen 20100 or similar).

C_{7A} , C_{7B} —20/20- $\mu\text{f.}$, electrolytic 250 volts or more.

L_1 —See Fig. 3.

J_1 , J_2 , J_3 —Coax chassis receptacle, type SO-239.

S_1 —Single-pole, four-position wafer switch (Mallory 3115J, 3215J, or similar).

S_2 —S.p.s.t. toggle switch.

T_1 —Power transformer, full-wave, 125-0-125 25 ma., 6.3 volts, 1 amp. (Stancor PS-8416, Knight 54A2008). B—half-wave, 125 v. 1.5 ma., 6 volts, 0.6 amp. (Stancor PS-8415, Knight 54A1410).

CR_1 , CR_2 —Silicon rectifier, 400 volts or more, any current rating over 40 ma.

relay contacts as short as possible. This will help minimize any impedance “bumps” in the antenna line. If you use an s.w.r. bridge, the bridge should be connected on the antenna side of the relay. Figs. 1B and 1C show typical layouts for two common types of installations.

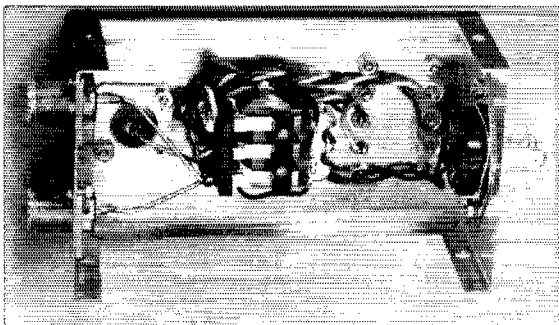
The Electronic TR Switch

The circuit diagram of the t.r. switch described here, shown in Fig. 2, is practically identical with the t.r. switch circuit that has been in the

Handbook for several editions. A 12AU7 dual triode is used, the first section as an amplifier with a tuned plate circuit, and the second section as a cathode follower. The antenna and transmitter are connected in parallel at J_1 and J_2 . When the transmitter is turned on, rectified grid current flows through the grid resistors in both sections of the tube, biasing them negatively to the point where the plate current is very small. This in turn reduces the power fed to the receiver to a safe level.

Using a tuned circuit, L_1C_4 , in the plate of the amplifier adds both gain and selectivity to the receiver. More important, some types of t.r. switches have a tendency to cut down the received signal strength; the amplifier stage and tuned circuit overcomes this. As loss in gain usually is associated with the capacitance of the coaxial cables used to connect the station units together, it is a good idea to keep the lengths of coax from the t.r. switch to the transmitter and receiver as short as feasible.

One bonus advantage in using the tuned circuit in the t.r. switch is the added selectivity that is obtained. In some areas broadcast signals can be so strong that they cause “birdies” in the receiver. This is particularly true when listening on 80 meters. The added selectivity provided by the tuned circuit will help eliminate this problem. Also, the added gain and selectivity will be beneficial in improving the 10- and 15-meter performance of some of the less expensive.



This photograph shows how to install a relay in a small metal box to make it a coaxial relay. Note that the leads from the coax fittings to the relay are kept as short as possible to reduce any impedance bump in the line. Because this is a multipole relay, connections are run from the extra contacts to terminal strips. Other equipment besides the antenna can be controlled in this manner.

T.r. switches sometimes generate TVI, so if you live in an area where TVI is likely, a low-pass filter should be installed between the t.r. switch and the antenna feed line.

The circuit of Fig. 2 will easily handle the popular 150-watt transceiver or transmitter power levels. We tested the unit at 1 kilowatt input and it didn't blow up. However, it isn't recommended that the unit be used at the 1-kw. level unless the s.w.r. on the coax line in which it is installed is less than 1.5 to 1. It might work at higher standing-wave ratios but we wouldn't want to guarantee how long the 12AU7 would last.

Constructional Details

The unit shown in the photographs is built into a 6 x 6 x 6-inch aluminum Minibox. Any box of suitable size could be used, and for the most part construction and layout of the circuit components are not critical. However, the lead from J_3 to the junction of RFC_2 and C_8R_1 should be kept as short as possible, to eliminate or minimize feedthrough around the tube. If the tube socket is mounted more than a couple of inches from J_3 , coaxial cable such as RG-58/U or RG-59/U should be used between these points. The braid of the coax should be grounded at both ends.

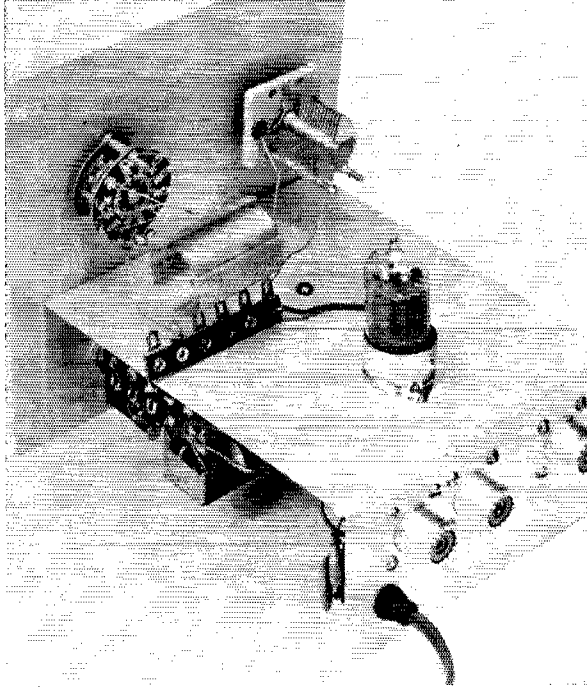
The tuned-circuit components, S_1 , L_1 , and C_4 , are mounted on and near the front panel. L_1 consists of 44 turns of coil stock tapped as shown in Fig. 3, and is supported on a terminal strip by its end leads and the tap leads. Only one tap is required for 15 and 10 meters, as the capacitor has sufficient range to cover both bands.

Power is obtained from a built-in supply that delivers about 140 volts at 15 ma. and 6.3 volts at 0.6 amp. Some commercial receivers have auxiliary voltages available for running small accessories, and if yours does you can eliminate the supply. The power-supply and filter components are all mounted below deck in the unit shown. We happened to have a center-tapped power transformer on hand so a full-wave rectifier was used. Fig. 2B shows the alternate method of using a half-wave transformer.

Using The TR Switch

The t.r. switch can be installed in the station as shown in Fig. 1 at B or C, depending on which setup you use. Turn the power on, tune your receiver to the band you want to use, and switch S_1 to that band. Tune in a signal and peak C_4 for maximum signal strength. The t.r. switch is now ready for use. Keying the transmitter will feed the transmitted signal to the antenna. When the key is open you'll hear signals normally.

In testing in different setups it was found that, under some conditions, tuning the C_4L_1 combination did not show an observable peak unless the transmitter was switched to the same band as the t.r. switch. If, in your setup, you find that the tuned circuit doesn't peak, make sure that the transmitter is switched to the same band as the t.r. switch and receiver.



The inductor for the tuned circuit is mounted on a terminal strip and supported by its own leads, plus the leads to the bandswitch, visible on the panel. At the right rear is the receiver connector and the two fittings at the left are for the transmitter and antenna.

One problem with any type of antenna switching device is that a certain amount of transmitted signal will reach the receiver, possibly strong enough to make listening very uncomfortable. One way to overcome this is to "ride" the r.f. gain control. However, this means using your hands and one of the objects in going to electronic switching is to eliminate this problem. A simple way to take care of the receiver overloading and keep your transmitted signal at a comfortable listening level—no blasted ear drums—is to use an audio limiter. An audio limiter² is very simple to build, and really will save the wear and tear on your ears. Such a unit used in conjunction with the t.r. switch will help make your operating a real pleasure. QST

² Understanding Amateur Radio, page 159.

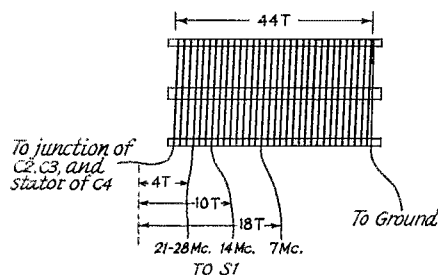
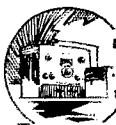


Fig. 3—Drawing of L_1 and associated taps. L_1 is 44 turns of No. 24, 32 turns per inch, 1 inch diameter (Miniductor 3016, Air Dux 832T). To solder the tap leads, indent each turn adjacent to the tap point. This will allow soldering room.



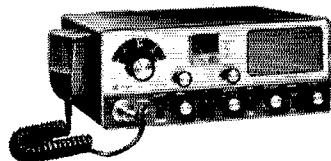
Recent Equipment



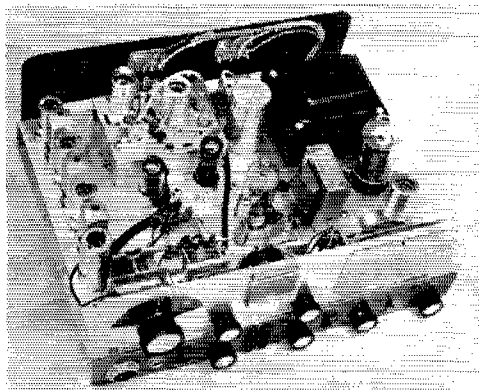
To acquaint you with the technical features of current amateur gear.

The Knight-Kit

TR-108 Transceiver



THE equipment shown in the photographs is a TR-108, a 2-meter a.m. transceiver kit covering 144 to 148 Mc. If you don't look too closely, it may seem that you are viewing the same pictures used in the October 1966 *QST* write-up of the TR-106 6-meter transceiver. Such is not the case. It just happens that most of the layout and many of the circuits employed in the two transceivers are either similar or identical. Both transmitters operate at a final-amplifier input of 15 watts and each transceiver houses a dual-conversion receiver. In addition, each unit contains a spot switch, an a.c. and a d.c. power supply, a multiple-position crystal switch and a speaker. A noise-canceling push-to-talk microphone is supplied with each transceiver. Because of these likenesses, mainly the differences will be discussed here.



Top view of the TR-108. The three tubes in the center of the photograph are in the transmitter section of the transceiver. Between these tubes and the rear of the chassis is the prewired converter.

Transmitter

Fig. 1 shows the TR-108 in block form with the receiver components at the top and the transmitter components at the bottom. In the transmitter section, a four-position switch sets up V_9 , a 6CL6, as either a Colpitts oscillator for 8-Mc. crystals or as a buffer amplifier for an 8-Mc. v.f.o. The frequency-determining element or device is connected to the grid circuit of V_9 , and its third harmonic is selected in the plate circuit and capacitively coupled to V_8 , a 6BQ5 tripler. A double-tuned, inductively-coupled circuit is used to transfer 72-Mc. energy from the plate of the tripler to the grid of the final. The coils are stagger-tuned to provide a 4-megacycle bandwidth.

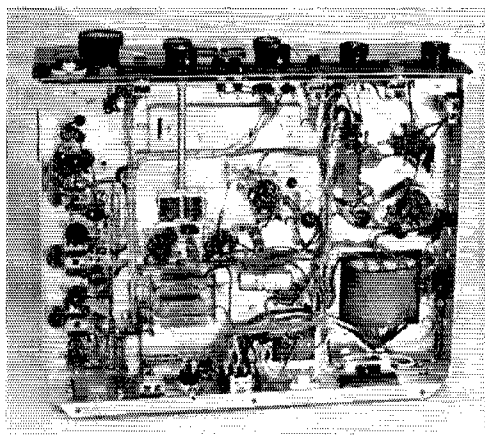
Usually the final amplifier in a transmitter operates straight through at the output frequency of the previous stage. However, in order to eliminate a neutralizing circuit that might be tricky to adjust, the 2E26 output stage in the TR-108 is run as a doubler. Unfortunately, a doubler doesn't offer as much attenuation to energy at half the output frequency nor is it as efficient as a straight amplifier. For a final input power of 15 watts, the TR-108 that was tested in the ARRL laboratory had an output of 3 watts as measured on a Bird wattmeter. As in the TR-106, the final amplifier in the TR-108 uses a combination of grid-leak and cathode bias, and the output circuit is a pi network. Transmitter tune-up in the 2-meter rig is accomplished in the same manner as in the 6-meter unit.

Receiver

The front end of the dual-conversion receiver is a three-tube prewired converter. Two-meter signals are link coupled from an image trap to a tuned circuit in the cathode lead of the grounded-grid r.f. amplifier, V_{101} . A double-

tuned, capacitively-coupled circuit is used between the plate of V_{101} and the grid of the first mixer, V_{102A} . Besides 2-meter signals, the 113.65-Mc. output from an oscillator multiplier chain is fed to the grid of V_{102A} . The 30.35- to 34.35-Mc. output of the first mixer is fed to the second mixer, V_{1A} , where it combines with the output of a 32- to 36-Mc. v.f.o. to produce a signal at 1650 kc. From this point in the circuit to the speaker, the receiver section of the TR-108 is basically the same as that of the TR-106. The modulator and power supplies in each unit are alike also.

The front end of the receiver is aligned at the factory, so there is no need to adjust it. Alignment of the rest of the receiver can be accomplished in one of two ways. Either the spotting feature can be used to obtain the eighteenth harmonic (144 Mc.) of the 8-Mc. transmitter oscillator or an accurately calibrated signal generator can be employed. Alignment with a signal generator is easy, but many hams don't have the necessary test equipment. Most amateurs who build the TR-108 will probably have to use the spotting function, which unfortunately can produce rather confusing results in this transceiver. The problem lies in the fact that although the desired eighteenth harmonic (144 Mc.) of the 8-Mc. oscillator lies in the tuning range of the converter, the unwanted fourth harmonic (32 Mc.) falls in the 30.35- to 34.35-Mc. tuning range of the second mixer. For instance, in a correctly calibrated TR-108, an 8.00-Mc. crystal results in one signal at a dial setting of 144.00 Mc. and another signal at a dial setting of 145.65 Mc. Unfortunately the unwanted fourth harmonic (145.65-Mc. dial setting) is by far the louder of the two signals. Although the instruction manual points out the presence of the two signals, the desired signal is so weak that it is very difficult to locate. This problem doesn't end with alignment; spotting itself, of course, is



Underside view of the 2-meter transceiver. The wiring is kept fairly neat through the use of a harness. Parts layout is very similar to that of the TR-106.

almost impossible, especially in a crowded band.

Miscellany

Other than the difficulties already mentioned the transceiver performed well and was easy to operate. Modulated signals of $0.2 \mu\text{v}$. or greater were audible in the speaker. S-meter readings were rather generous, but most amateurs like them this way. The attractiveness of the unit was commented on by several people; the sky-blue color of the cabinet seemed to be especially appealing to the ladies.

It was fun to put the kit together as the instructions were clear and only a few minor errors showed up in the manual. One thing that cut down construction time was the method of parts packaging. The 56 resistors used in the kit were mounted in numerical order by symbol number

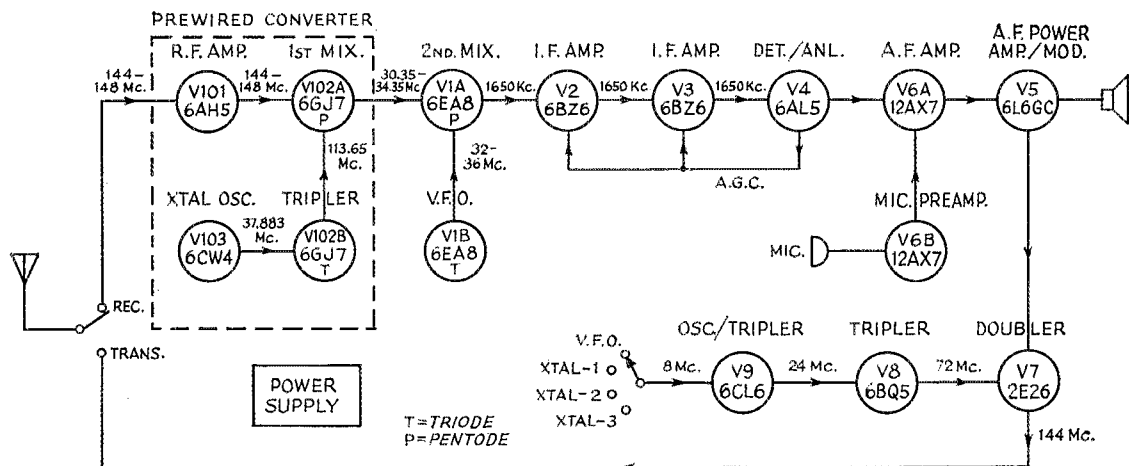


Fig. 1—Block diagram of the TR-108 transceiver.

Knigh-Kit TR-108 Transceiver

Height: 5½ inches.

Width: 13⅜ inches.

Depth: 11 inches.

Weight: 19 pounds.

Power Requirements:

110-130 volts a.c., 90 watts receive,
105 watts transmit.

12-15 volts d.c., 6.8 amp. receive, 8.1
amp. transmit.

Price Class: \$150.

Manufacturer: Allied Radio, 100 North
Western Ave., Chicago, Illinois 60680

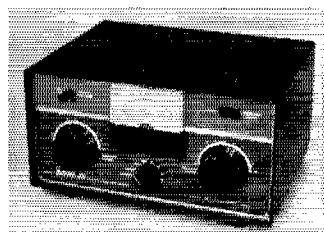
on sheets of cardboard. Another help was the wiring harness. Extra hardware included in the kit precluded the possibility of a defective nut or bolt holding up the construction of the transceiver. Although the surplus materials weren't included for this reason (it's more economical to weigh hardware and supply extra material than to count it), nevertheless they were on hand if needed.

Besides an instruction pamphlet, an operator's manual was supplied with the kit. Alignment and trouble-shooting information is given in addition to a detailed circuit description. Also included are data on antennas, mobile installations and TVI.

— WYDS

QST ————— QST ————— QST

Drake MN-4 Matching Network



THE MN-4 is intended for matching the input impedance of a coaxial transmission line to the 50-ohm load resistance demanded (within moderate limits, at least) by present-day transmitters. It can also be used for matching the input impedance of a high-power linear amplifier to the load resistance required by an exciter. Rated to carry an r.f. power of 200 watts continuously, it has a built-in power and v.s.w.r. meter calibrated to 200 watts on one scale and, on a second scale, for voltage standing-wave ratios from 1 to 1 to 10 to 1. The network constants are selected so that standing-wave ratios up to 5 to 1 can be handled on each of the amateur

bands between 3.5 and 30 Mc. This applies when the line input impedance is reactive as well as resistive; if the input impedance is purely resistive, considerably higher s.w.r.'s are manageable.

The matching network is basically a pi, with a series capacitor for tuning out the reactance in the load. The circuit is shown in simplified form in Fig. 1. The input capacitor, C_1 , consists of a set of fixed mica capacitors progressively connected in parallel as the band switch is moved from the 10-meter to the 80-meter positions. Simultaneously, taps on L_1 are selected to give the proper inductance for each band.

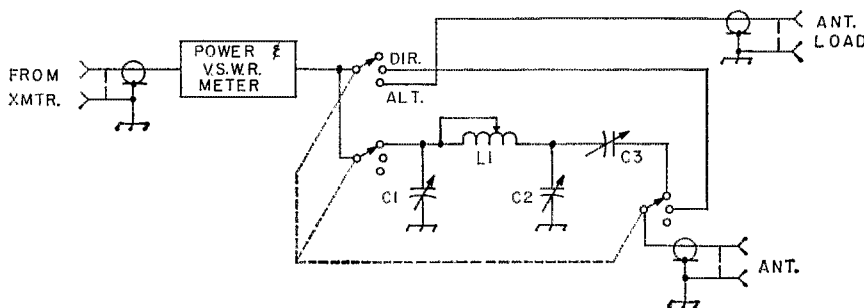
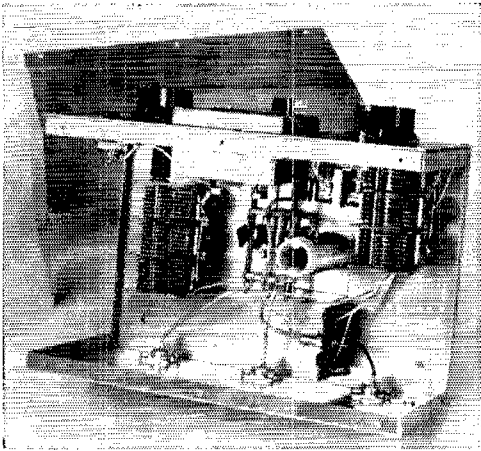


Fig. 1



Interior view of the MN-4 Matching Network. The small coil partly hidden by the meter enclosure is the 10-meter section of the pi inductance; the remainder is wound on a ceramic form and tapped for various bands in the 80-10-meter range. Input fixed capacitors are mounted between switch terminals. The small mounting board at the lower right holds the directional coupler for power and s.w.r. measurement. All operating controls are on the front panel. The U-shaped aluminum piece in the background fits around the inverted-box chassis to make a complete shield for the network, the whole then sliding into the cover shown in the title photograph.

Two 80-meter positions are provided, one being for cases where the resistive component of the line input impedance is quite low; in this case extra capacitance is switched in at C_1 . Capacitance values for C_1 range from 300 pf. at 10 meters to 1510 pf. at the low-impedance 80-meter position.

C_2 and C_3 in Fig. 1 are variables having a maximum capacitance of 225 pf. In the front-panel labelling of these capacitors, C_2 is called RESISTANCE TUNING and C_3 REACTANCE TUNING. The resistance range that can be matched to 50 ohms when appreciable reactance is present in the load is from 10 to 250 ohms. In use, the two controls are adjusted alternately until the v.s.w.r. meter indicates a 1-to-1 standing-wave ratio for the transmitter.

The reflectometer in the MN-4 is insensitive to frequency; the power calibration, which is factory set, is the same on all bands. The circuit is of the type using a toroidal transformer inductively coupled to the line and having a balanced secondary, with a capacitive divider across the line to complete the bridge.¹ It has become the custom to read forward and reflected power with circuits of this type, and then determine the standing-wave ratio by referring to a chart or to formulas. In the MN-4, however, only the forward power is read directly. In what would usually be the reflected-power position of the forward-reverse switch a variable resistance can be connected in the meter circuit (by means of a

¹ Bruene, "Directional Wattmeters," *QST*, April 1959.

push switch) to adjust the sensitivity so a full-scale forward reading can be obtained. Then on releasing the switch the meter responds to reflected voltage, and the meter scale is calibrated directly in standing-wave ratio. This is a convenient arrangement, since the s.w.r. is usually of more interest to the user than a reflected-power reading. However, the reflected power can be determined, if desired, by a simple calibration method described in the instruction manual.

Other features of the matching-network circuit are provision for connecting the transmitter output either directly to the antenna or directly to a second coax fitting to which a dummy antenna can be connected. The latter permits initial tuneup of the transmitter for a 50-ohm load (provided a good 50-ohm dummy is used, of course) after which the matching to the actual transmission line can be done without further transmitter tuning. This shortens the time the transmitter is on the air during tuneup; further, the matching adjustments can be made at reduced power since the sensitivity of the bridge circuit is such that 20 watts output is enough for a full-scale meter deflection in the v.s.w.r. position.

The instruction manual gives complete adjustment information and includes a set of curves, one for each setting of the band switch, showing approximate settings for C_2 and C_3 (our Fig. 1) for various types of loads up to 250 ohms. These are not only helpful in adjustment, but also will give an approximate idea of the line's input impedance when used "in reverse" — that is, by taking the capacitor settings found by actual adjustment, the approximate resistance and reactance can be read off the curves.

— WIDF

Drake MN-4 Matching Network

Height: 6 inches.
 Width: 10¾ inches.
 Depth: 8 inches.
 Weight: 7 pounds.
 Price Class: \$70.
 Manufacturer: R. L. Drake Company,
 Miamisburg, Ohio 45342



Members of the Old Old Timers Club will hold their first QSO Party on the air, January 26, 27 and 28, 1968. Log pages are ready, giving times and frequencies. If you don't receive yours by January 1, write Harry Manning, WA6AYF, 3026 Bagley Avenue, Los Angeles, California 90034.

DETECTOR EFFICIENCY

Technical Editor, *QST*:

In the design of a portable transistor aircraft receiver presently under construction I found it necessary to operate the audio detector at an r.f. signal level of about 1 millivolt r.m.s. After experimenting with a few diode detector circuits it became clear to me that if I wanted any kind of reasonable detector efficiency I was going to have to go to something other than a diode detector.

An ideal detector would be a device which offers a very high resistance to the flow of current in one direction and a very low resistance to the flow of current in the opposite direction. A most important property of the ideal detector for communications receivers is that the break between high and low resistance is a sharp one. In the case of a real diode, this break is far from sharp, so that for very small applied r.f. signals the change in the resistance of the diode is small. Thus a change in polarity of the r.f. signal causes very little change in the resistance of the diode, and the diode will act as a very poor rectifier or detector. Large signals, on the other hand, cause the diode to operate in both its very high- and very low-resistance ranges, and thus the diode will be an efficient detector of large signals. Fig. 1 is a plot of some measurements with several different diodes in the detector circuit shown. A general idea of the detector efficiency vs. input signal level can be gotten from Fig. 1.

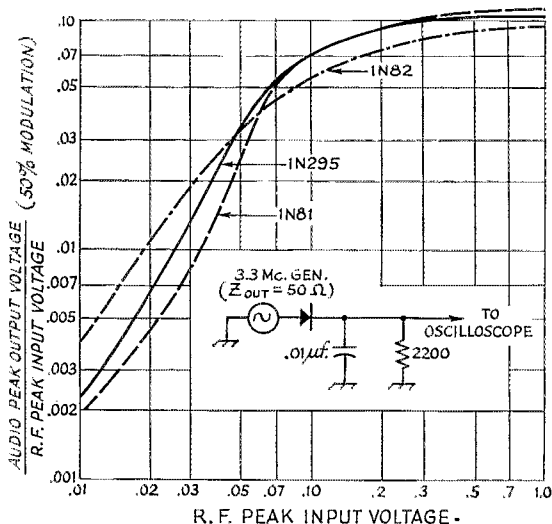


Fig. 1—Audio output vs. r.f. input for three different germanium diodes, using the test setup shown. An ideal detector curve would be a straight horizontal line at 0.5.

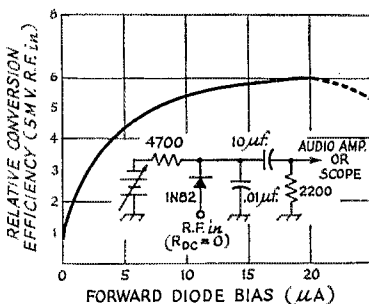


Fig. 2—Detector efficiency vs. bias current in a typical diode.

In an attempt to raise the efficiency I tried various forward-bias currents to put the diode in a more nonlinear part of its operating range. Fig. 2 shows the relative efficiency of the detector vs. bias current at 5 millivolts r.f. input. Although a substantial gain was realized, it was not enough to make the detector practical at the signal levels I was working with. In applications where the diode is a reasonably efficient detector the relative gain is probably not as great, but may still be well worth the extra bias resistor.

The detector I finally put into my receiver, shown in Fig. 3, uses the base-emitter junction as the detector diode. The entire circuit acts as the first audio amplifier, giving an overall efficiency of about 50 per cent at 1 millivolt r.f. input to the detector. Again some gain can be realized by slightly forward biasing the base-emitter junction, but my application did not call for any further gain. — *J. Richard Fisher, K3IGP, Astronomy Program, University of Maryland, College Park, Maryland 20740.*

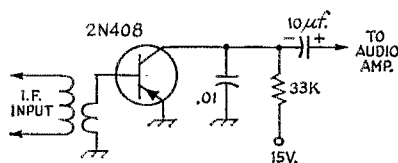


Fig. 3—Detector circuit using rectification and amplification properties of a germanium transistor.

KEYING RELAY PROTECTION

Technical Editor, *QST*:

In the article by Mr. A. F. Lutz on the "TO" Mark II keyer in June *QST*, reference was made to mercury-wetted contact relays. No mention, however, was made of the need for contact protection for these relays.

One characteristic of a mercury-wetted contact relay is that high-voltage spikes caused by inductive kicks (normally on the "breaking" of the contacts), cause the contacts to weld together. (Unless the keyer is to be used in a grid-block or other low-level keying circuit, contact protection is recommended. Cathode keying, for example, should not be done with a mercury relay whose contacts are unprotected.)

For keyer use, the mercury relay is best because of speed and bounce characteristics, and the variety of loads it can handle with protection. The best and

cheapest method of contact protection is the use of a series RC circuit across the contacts. This, incidentally, has the added advantage of acting as an effective key-click filter. — *G. Springer, VE2BMS, C. P. Clare Canada Ltd., 61 Industry St., Toronto 15, Ontario, Canada.*

[EDITOR'S NOTE: From a C. P. Clare monogram furnished by VE2BMS, representative values for the protection circuit would be: for 150 ma. keyed cathode current, 0.003 μ f. and 250 ohms; for 250 ma., 0.006 μ f. and 150 ohms].

FET OPERATING CONDITIONS

Technical Editor, *QST*:

I am writing in regard to WICER's article on FET converters in the May 1967 issue of *QST*. I appreciate the generally-high technical quality of the article, and the fact that solid-state projects of significant value are appearing in *QST*. I hope that I may be able to further the cause in this particular case by relating my experiments and modifications in the 2-meter converter model.

The i.f. amplifier mentioned in the article need not be necessary if certain design requirements are met in the converter itself. My converter resulted in a unit with superior immunity to cross-modulation, but had a dismal lack of gain. Investigation of some published literature — application notes from a semiconductor manufacturer¹ — indicated that the r.f. stage gain of an FET amplifier stage is proportional to g_m , which increases as a function of drain current (I_d). The value of the source-bias resistor in the *QST* converter, 3300 ohms, resulted in a rather low I_d . Tests indicated that the stage gain was approximately 6 db, with a noise figure of approximately 3.8 db. N.f. measurements were made with the Monode noise-generator technique described in *QST*, April 1967. Reducing the source resistor, and the drain decoupling resistor, to a value of 270 ohms raised the gain of the r.f. amplifier to approximately 20 db. The noise figure dropped to roughly 2.6 db. The I_d became 4.2 ma. — *Fred B. Cupp, K8AOE, 3810 E. 365th St., Willoughby, Ohio 44094.*

SOLID-STATE SUSCEPTIBILITY

Technical Editor, *QST*:

A neighbor across the street recently installed two color TV sets and, as suggested by the salesman, a solid-state preamplifier was installed at the antenna terminals. Although I had not bothered his TV reception before and was clean on his neighbor's color TV, my kilowatt took out all channels on both sets with this preamplifier. I understand the preamplifier had to be removed to clear up the problem.

The teen-age son of a second neighbor called recently to report that his small "combo" was trying to rehearse and I was coming in on the electric guitars. After I explained the nature of this audio interference, he said I also interfered with the family's hi-fi, intercom, and telephone. I then explained his proper course of action regarding the telephone, and suggested that he contact the company from which the hi-fi and intercom were purchased. His reaction was: "Do you mean all of this new solid-state equipment is poorly designed or poorly shielded?"

My own teen-age daughter tells me I come in loud and clear on her GE solid-state phono stereo portable *with the thing turned off!*

¹ — Texas Instruments, Application Note SC-8456-266.

The few ham friends with whom I've discussed these matters tell me these are not isolated cases. — *Sam E. Parker, W6ZWK, 3651 Liggett Drive, San Diego, California 92100.*

[EDITOR'S NOTE: When confronted with a case of this kind, the amateur has first to convince the owner of the device that the fault is in the device and not in the transmitter, then persuade him to get after the dealer from whom he purchased it to apply the necessary remedies. An unhappy customer is likely to get action.]

TAKING THE STRAIN OFF THE ROTATOR

Technical Editor, *QST*:

In connection with the April article on rotators, I would like to offer the following comments:

1) Except for pipe mast supports, which are relatively few in number, most hams use towers.

2) With a tower and a top plate, a simple thrust collar can be used to take the weight of the beam and supporting pipe.

3) With this arrangement (1½-inch pipe, TA36, total weight about 100 lbs.), a shaft collar costing \$2.50 takes all the thrust.

4) Bending moments are taken up by the top plate and the next one down, usually supplied for a rotator by the tower manufacturer.

5) This leaves only the torque requirement for the rotator.

6) An all-spur-gear rotator (AR 22) will windmill to some degree but in doing so will not damage any internal parts, requiring only recalibration after the storm is over — an armchair job.

7) My AR 22 has been turning a TA 36 plus 20 feet of pipe for 5 years, and when examined internally for wear and greasing, looked as good as new. A worm gear drive will eventually fail unless you go the Ham-M route (multibucks). — *William Nighman, W4ZSH, 8806 Overhill Road, Richmond, Virginia 23229.*

INTEGRATED CIRCUITS FOR KEYS

Technical Editor, *QST*:

Re the article, "The Micro TO Keyer," in August *QST*, it is worth pointing out that Motorola has a dual flip-flop just like the Fairchild 923s but in a dual in-line package (14 leads). The two 923s cost \$3.00 and the one Motorola dual unit costs \$2.00, a saving of 33 percent. The Motorola dual JK FF is their MC790P. They also have a unit that is equivalent to two Fairchild 914s (MC724P quad NOR, \$1.08) and several "milliwatt RTL" units that draw less power and are cheap (\$1.08 for a milliwatt quad NOR). With a little ingenuity, the extra two NOR gates in the quad NOR unit could be used in keying and possible pulse generation functions in this keyer, getting rid of several transistors and saving money. — *John K. Green, W0KPP, Box 1038, Boulder, Colorado 80303.*

W0EPV SQUEEZE KEYS

Technical Editor, *QST*:

W0EPV Squeeze Keyer presented by W5GRJ in May 1967 *QST* is nothing short of excellent. Full break-in is easily accomplished by using the "other side" of the keying relay to open and close the receiver r.f. ground connection, the receiver bias for receiver monitoring being controlled by the usual additional pot arrangement in the receiver r.f. gain-control circuit. — *John E. Walker, WA6SCE, 717 Plaza St., Bakersfield, California 93306.*



Hints and Kinks

For the Experimenter



FORD MOBILE HINTS

DURING the recent installation of a new HV-32A mobile rig in a 1967 Ford, several problems were encountered and solved. The solutions may be of interest to those planning such installations.

For routing the antenna lead from the dashboard area to the trunk, Ford has conveniently provided a nice wide channel under each door sill. The channel is used as a path for electrical wires that go between the front and rear of the car. By simply removing the aluminum sill covers, the channels were exposed.

Ford ignition noise was found to be a headache. Since the engine, muffler and tail pipes are suspended by rubber insulation to reduce vibration problems, the exhaust system acted like an antenna and sent ignition pulses to the mobile antenna at the rear of the car. To help solve this problem, I used the braid from RG-8/U to ground the muffler and tail pipe at each strap hanger. In addition I also grounded the engine to the frame of the car with a bonding strap of braid. As a result the ignition noise was reduced from an S9 level to S3.

The remaining ignition noise was completely eliminated by replacing the regular spark plugs with Autolite resistor plugs, and installing a 10,000-ohm carbon suppressor between the center distributor lead and the distributor. External suppressors could have been used instead of the resistor plugs, but they aren't completely effective because they can't be installed close enough to the spark gap. It should be mentioned that, in order to use resistor spark plugs, the original resistive ignition wiring had to be replaced with nonresistive wiring. This was necessary to prevent engine malfunction due to excessive series resistance in the plug leads. Each resistive wire has about 10,000 ohms resistance, and each resistor plug has the same. Use of resistive wire or resistor plugs resulted in satisfactory engine performance, but the combination of both presented a total of 20,000 ohms series resistance which seriously affected engine operation. Since this was also true of the wire from the ignition coil to the distributor, it too was replaced with a nonresistive wire when the suppressor was installed. Incidentally, Ford has available a nonresistive ignition wiring kit at a cost of \$7.65.

Although the above actions corrected the writer's ignition problems, they may not be completely effective on other vehicles. There are additional noise sources such as generators, alternators and voltage regulators which might

cause trouble. The ARRL *Handbook* and *Mobile Manual* are recommended as sources of help in these areas. — Stanley P. Sears, W2PQG

STABILIZING A RECEIVER R.F. AMPLIFIER

A SHORT while ago I had difficulty stabilizing a 6EH7 r.f. stage in a HQ-129X remodeling project. I finally came to the conclusion that the trouble was a v.h.f. parasitic. Taking a tip from transmitter-circuit practice, I put a parasitic suppressor in the plate lead to the 6EH7. The suppressor, consisting of 5 turns of No. 18 wire on a 50-ohm 1/2-watt resistor, was installed right at the tube socket. Once this was done, the amplifier settled down and worked like a charm! — Bill Lamb, WA8QYK

INSULATED SHAFT EXTENSIONS FOR PRINTED-CIRCUIT CONTROLS

INSULATED shaft extensions for printed-circuit potentiometers with 1/8-inch shafts can be made easily from the dielectric of large-diameter coaxial cable. Simply cut a section of the cable to the desired length, remove the braid and center conductor, and drill a 3/4-inch deep, 1/4-inch diameter hole in one end of the dielectric. Then jam-fit the piece onto the control as shown in Fig. 1. To prevent damaging the circuit board while installing the extension shaft, it is wise to support the control from below the board.

I find this kink very useful for the VOX controls in my Heath SB-400 transmitter, where occasional adjustment is desirable but somewhat difficult if a screwdriver must be used. — Father Roy Backes, KØTYY

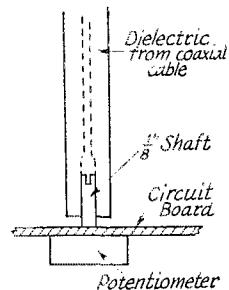


Fig. 1—An extension shaft for hard-to-reach controls.

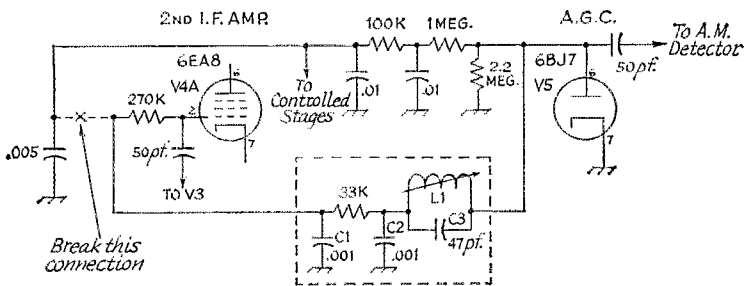


Fig. 2—Diagram of the HR-20 modification. Unless otherwise indicated, capacitances are in μf ., resistances are in ohms ($K = 1000$), resistors are $\frac{1}{2}$ watt. Added components are shown inside the dotted lines. C_1 and C_2 are disk ceramic and C_3 is silver mica. L_1 is a $60\text{-}\mu\text{h}$., $\frac{1}{4}$ -inch diameter, slug-tuned coil.

S.S.B. NOISE LIMITER FOR THE HR-20

THE noise limiter in the Heathkit HR-20 receiver is only useful for a.m. reception. When using the HR-20 to receive s.s.b. signals in my car or home, I could hear ignition noise from automobiles that were two or three blocks away. Sometimes the ignition noise from older cars and trucks completely blanketed the signals. By adding three disk-ceramic capacitors, one slug-tuned coil and a resistor, I was able to reduce most ignition interference to a very low level. A diagram of what was done is shown in Fig. 2.

The circuit is similar to one used in the Drake 2-B. Except for L_1 - C_3 , a 3-Mc. i.f. trap, the purpose of the added components is to reduce the attack time of the a.g.c. voltage going to the control grid of the second i.f. amplifier. This very fast attack helps to effectively suppress sudden noise peaks and pops.

The parts required for the modification were installed near V_5 . A small hole was drilled in the chassis to accommodate the slug-tuned coil. Once the parts were connected, the only adjustment necessary was to tune the i.f. trap to 3.0 Mc. — *Ross F. Fox, W3PZX*

MICROPHONE COVER

AN excellent microphone cover, which can be tightened around the base of a mike, can be had by saving the sacks that come with many liqueurs. These are usually velvet and are very efficient at keeping dust and dirt out of a microphone when it is not in use. — *Paul W. Kohanski, W48PJK*

COIL-WINDING TIP

IT can be difficult to remove a homemade self-supporting close-wound coil from a winding form without distorting the coil. However, by using the following method, this need not be the case. First close-wind the form with a layer of plastic fishing line. Then add a few layers of wax paper, using tape to hold the paper in place. Next wind the coil, and dope it thoroughly. After the coil has dried, pull out the fishing line from both ends. The coil should be loose enough to remove intact. — *Charles W. Kram, Jr., W5TPZ*

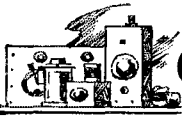
PEBBLE-GRAIN FINISH

AFTER several experiences with wrinkle-finish spray paint that failed to wrinkle uniformly over the surface to which it was applied, a pebble-grain finish was developed that is economical and foolproof. This attractive finish can be applied in the following manner.

Give the surface a coat of the paint to be used. (Surfaces that have been finished previously in the desired color need not receive this first coat.) For the usual black finish, ordinary sash-and-door paint is satisfactory. Once the first coat is dry, apply a thicker second coat. Immediately sprinkle an excess of builders' sand (a fine grade of sand used to give plaster a textured finish) on the painted surface. The sand will take up the paint by capillarity. After a minute or more, tip the painted surface and let the excess sand roll off. Once the second coat has dried in the imbedded sand, apply a very thin final coat. Completely cover the exposed surface of the sand grains, using a brush having short, stiff bristles. The result should be a dull, pebble-grain finish with an occasional sparkle from the surface of a few of the sand grains. The thicker the final coat is painted, the smoother and more glossy will be the surface. Areas that may not have had enough of the second coat of paint to cause adherence of the desired amount of sand can be touched up before or after application of the final coat. — *Charles A. Black, KØRII*

USEFUL PUBLICATIONS

ONE source of both elementary and advanced electronics literature is the U. S. Government Printing Office. They offer reports of the FCC, radio propagation data, circuit handbooks, military electronics training courses, radio law publications, and many other books and pamphlets of interest to the radio amateur. A catalog of these publications may be obtained by writing for a copy of *Price List 82, Radio and Electricity*, from the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402. There is no charge for this price list. — *Joseph F. Stephany, K2K5J*



A "Mini-Wheel" Antenna for 432-Mc. Mobile

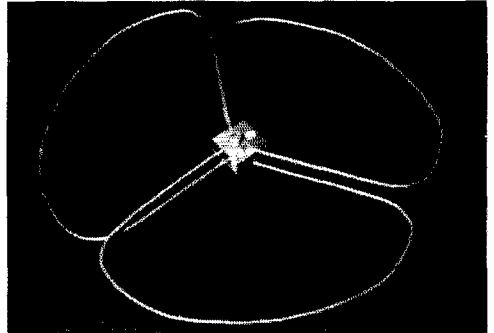
BY GEORGE J. POLAND,* WBSFWF

THE "Mini-Wheel" antenna was created for mobile operation on 432.9 Mc. in the Detroit area, where there are about 35 stations active on this band. Since almost all 432-Mc. activity is horizontally polarized, the design was based on ("stolen" from, if you like) the 2-meter Big Wheel,¹ which is both horizontally polarized and omnidirectional. The antenna is only 15 inches in diameter, and can be constructed and tuned up in your workshop. No power gain is claimed for it, and it won't compete with a good beam, but it is a practical mobile antenna and will give an excellent account of itself.

As shown in Fig. 1, the three antenna elements are each $26\frac{3}{4}$ inches long, including $\frac{1}{4}$ inch for soldering at each end. The material used here was No. 10 bare copper wire. The center mounting block is made of half-inch thick fiber — other insulating materials would do — and is sandwiched between two plates made from $\frac{1}{32}$ -inch copper. Brass could be used instead. One end of each element is soldered to the top plate, with the element overlapping the plate by $\frac{1}{4}$ inch. The other ends of the elements are soldered to the

* 32219 Rosslyn St., Garden City, Mich.

¹ Mellen and Milner, "The Big Wheel on Two," *QST*, September, 1961.



The assembled Mini-Wheel viewed from the bottom. The matching stub is on the near corner of the block-and-plate assembly. In use, the antenna is mounted horizontally with the BNC fitting projecting downward.

bottom plate, as shown in the drawing and photograph. A large soldering gun will handle the soldering job with ease.

It is strongly advised that the elements be preshaped before attempting to mount and solder them. Final shaping can be done after assembly. Each element should fill a 120-degree arc, so that when all three are assembled the rim will be approximately a complete circle. Working in a clockwise direction, the beginning radial portion of each element should be directly over the trailing radial portion of the preceding element.

A matching stub made of $\frac{1}{4}$ -inch copper strap, 1 inch long, is soldered between the top and bottom plates, overlapping the plates $\frac{1}{4}$ inch at each end. About $\frac{1}{2}$ inch of stub is all

(Continued on page 150)

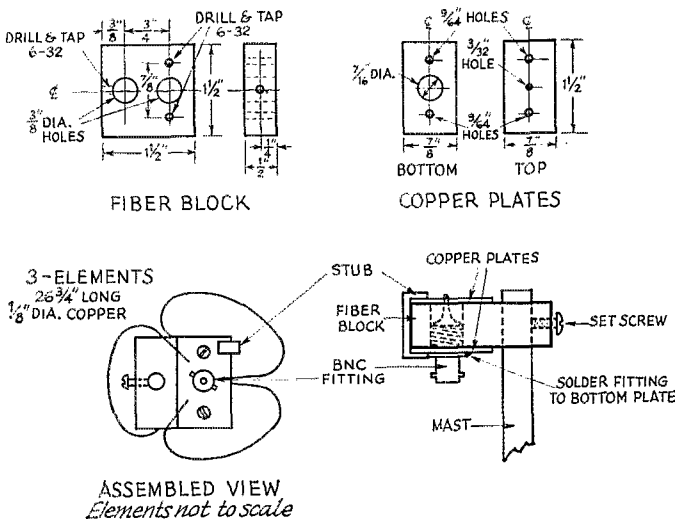


Fig. 1—Construction details of the Mini-Wheel 432-Mc. antenna.

The DXer

BY J. MICHAEL BLASI,* W4NXD

Scene

SHACK of a well known member of the DXCC fraternity whose country total hovers around 330. The large desk is piled high with efficient looking boxes that are capable of straining out the weakest signal from the hash of 20 meters and at the touch of a finger to pound out a 599 or 59 signal to any part of the globe.

High above this tiny alcove of ham happiness stand the antenna jungle. All sorts of quads, Yagis and other exhalers of energy crisscross each other.

Characters

The DXer—A steel-eyed man who is prematurely bald with stooped shoulders that have been bent by years of hunching over a warm receiver. His skin is pale and drawn, a condition caused by being indoors a great deal, especially on weekends when the rest of the world's soaking up sun. Another characteristic little noticed is the way his ears are pressed against his head in a flattened position that resembles the shape of an earphone. Black ridges are found around each eye, a sign of many nights without sleep.

Finally, we see the tight, grim set of his lips and jaw. Here is truly a man of patience.

The Kid—A good natured lad in his late teens who loves God, mother and apple pie. Since dropping the N from his Novice call letters he has become interested in the world of DX, so the DXer has been kind enough to invite our bright eyed aspirant over to his shack for a lesson in DX.

After the usual exchanges of greetings the Kid gazes in awe at the certificates on the walls: WAC, DXCC, and WAE (Worked All Everything).

DXer: "Put on that extra pair of cans and we'll see what's afoot."

Kid: "Boy, 20 meters sounds much clearer than on my old five-tube receiver."

DXer: "Hear that CQDX with the bad tone, must be a PY or an SP, no need to wait for his call."

Kid: "I hear a DX station signing, it's G3XXX."

DXer: With a sneer on his face, "I thought you said a DX station, that's just a G3. Why I've got a whole shoe box of G3 QSLs." Both listen very intently for the next half hour.

Kid: "I hear a ZDS on 14,040 calling QRZ. Aren't you going to give him a call?"

DXer: "Nah, I've worked him four times already, and I've got the cards to prove it."

Kid: "Do you ever call CQ?"



"NEVER MIND WITH THAT, YOU WANT SOME REAL DX"

DXer: With a slight smile playing across his lips, "Only if one of my good buddies is after a new one. If we hear anything good I'll let you call him, OK, Kid?"

Our young hero tenses up at these words, here is an opportunity he had dreamed of. His ears strain even harder.

Kid: "I hear an EA3, maybe I could call. . . ."

DXer: "Never mind with that, you want some real DX."

The Kid slumps down in his chair, a bit discouraged, his best DX at home had been a W7 who gave him a 559. Working an EA3 would be like working Mars.

DXer: "I'm going to be up all night, The DX Safari, Pilgrimage and Gold Mining Expedition of the Month is supposed to operate from the Hidden Island if possible."

Kid: "Don't they know for sure?"

DXer: "The island is usually under water and only rises above the surface once every 25 years. If they can put Hidden Island on, boy will there be a pileup! I'll have to take out a loan to get a QSL."

Kid: "It's past 11 o'clock I'd better be getting home so my mother doesn't worry. I've sure enjoyed myself."

DXer: "Anytime, I hope we hear some DX for you to work next time."

Our hero, a bit dismayed, moves slowly into the night. He returns to his tiny cubicle of a ham shack, fires up the 6L6s, and happily calls CQ in the Novice band hoping to raise another W7.

QST

* 711 Broad St., S.W., Gainesville, Ga. 30501.



MED-AID

An Amateur Radio Service

An electrocardiogram recording of a test transmission made between WB4BLK and Don Redmond, K6GJZ.

BY DAVID C. HOFF,* K4NUZ

Two doctors thousands of miles apart talk tersely over an amateur radio hookup.

The symptoms, the signs, the test results were described in the dispassionate language of medical science. If you understood the jargon you would know that the life of a 14-year-old boy was at stake.

The boy was critically ill with a kidney disease. His doctor, Dr. Andy Goens, Jr., YSIAG, in El Salvador, did not think he would live more than three days.

At 10 A.M. that Friday, the doctor had called station WB4BLK, located atop the Duke University Medical Center. Quickly the call was dispatched through to a Duke specialist.

The doctors agreed that the best way to save the boy was a recently developed and still rare drug. With the help of WA6ZOD, W5HUU, WIPRR and W6JZG, contact was established with the laboratory in Berkeley, California, where the drug is manufactured.

Officials said they would donate the drug. By 10 A.M. Saturday the drug arrived by air in San Salvador.

Today the boy is doing well. Complete recovery is expected.

This kind of case is far from new to amateur radio. Mindful of the need for rapid, reliable, and experienced medical assistance on the amateur bands, the Duke University Medical Center Amateur Radio Club founded Project MED-AID (Medical Assistance to Isolated Doctors).

The project is being supported by a grant from the Mary Reynolds Babcock Foundation of Winston-Salem, North Carolina.

Since August of 1966, WB4BLK, the club station, has been monitoring 14.250 Mc. daily from 1400 to 2200 GMT. It has averaged one

* DUMCARG, P.O. Box 3005, Duke Univ. Medical Center, Durham, N. C. 27706.

call per day providing three types of medical services to isolated areas.

First, the station makes available without charge the latest in diagnosis, treatment and prevention, drawing upon consultants in Duke University's 600-bed teaching hospital. Second, working with such organizations as the Direct Relief Foundation of Santa Barbara, California, assistance can be given to mission stations in maintaining their drug supplies. Third, emergency shipments of medicines are made possible through these groups and a number of cooperating drug companies.

Consultations have ranged over a wide spectrum of medical problems. Calls have come primarily from Latin America but assistance has also been given to Africa.

CP8AU in Riberalta, Bolivia, which now has regular skeds with the MED-AID station, sought, among other things, for information on tests for checking water purity. Concerned about the outbreak of an infectious disease, water supply tests were necessary. Arrangements were made through the Duke station for talking to a sanitation engineer at the School of Public Health at the University of North Carolina, in nearby Chapel Hill.

Dr. Ned Wallace, YN4WD, general practitioner and director of Gray Hospital in Puerto Cabezas, Nicaragua, has been a frequent user of the services of the MED-AID station. In fact, it was his consultations with Duke people by way of Felix Whitaker, W4OC, that furnished the impetus for the establishment of the station.

He has consulted with Duke specialists about possible cancerous growths; he has suspended surgery to inquire about a particularly delicate technique; he has obtained information on drugs to combat a possible polio outbreak.

Regular skeds are also maintained with EL2F

in Elwa, Liberia. Recently a Duke pathologist gave advice to them about the possible cause of death of a boy suspected of having a contagious disease.

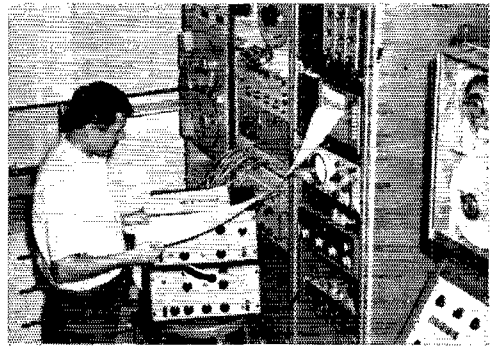
Some club members (among whom are WA5KJC, K4AGZ, K4DJZ, K1NUZ and W4OC, assisted by K4RKY, WIPRR and K6GJZ) have been developing a system for transmission of electrocardiograms, with on-the-air tests. The results have been promising. The output of the EKG machine is converted to a 1700 c.p.s. frequency-modulated tone which is transmitted, received, demodulated, recorded on a computer tape and analyzed. The printed report from the computer, along with the case history of the patient, will be studied by a Duke cardiologist, and he, in consultation with the doctor originating the call, will arrive at a diagnosis. Such techniques have been used on the land line and over the air but to our knowledge they are not being used regularly on amateur bands.

Funds have been obtained for construction of a number of modulator units which will be placed in operation in Latin America shortly. This will make available to mission doctors, instrumentation often unavailable for use even by doctors in the States.

The station has developed a close tie with the new station at the National Communicable Disease Center, WB4GFE, in Atlanta, Georgia. It is possible to refer questions to them from Duke by taped relay during regular 40-meter skeds.

The project receives regular bulletins from the United States Food and Drug Administration on drugs withdrawn because of dangerous side effects, and disseminates the information to interested parties. It also cooperates with FDA in its program of gathering reports of possible cases of ill-effects.

Friendly relations exist also with the International Mission Radio Association, the Medical Amateur Radio Council and the National Institutes of Health Radio Amateur Club, all of



Tim Heflin, K4AGZ, examines a recording of an electrocardiogram made during test transmissions between WB4BLK and EL2F. The analog-digital digital-analog converter which Tim is operating is the first stage in the computerized analysis of the EKG signals.

whom have a deep concern for the problems of international medicine through amateur radio.

The station receives referrals from many of the twenty-meter nets which it checks into often; among these are the Intercontinental Traffic Net, of which WB4BLK is a net control, the YL Communications System, the United States Morning Net, the Veterans Administration Amateur Radio Service Net, the Handicapper's Net and the North American Traffic Net.

Forest Nelson, HC8FN, for example, was referred by the YLs (WB2YUC and others). Forest, a missionary in a very isolated part of the Galapagos Islands, managed to get a call through, although he was in great pain. No medical facilities were available. His condition was diagnosed by a Duke doctor, makeshift measures were suggested for temporary treatment and immediate evacuation was advised. Other stations from the net, including HC1AF, took up the case and transportation was arranged. Happily, Forest is back at his mission doing well after a stay in a hospital in Ecuador.

The club station consists of a Collins S-line and a Henry 2K, a Collins KW-1 and 75A-4 for RTTY and an SB-100 (donated by the Heath Company) and SB-200 which is used on fifteen meters. The antennas include a beam and quad (each a tri-bander) at 140 feet; and dipoles on all bands at the same height. In addition to the twenty-meter activity, it is planned to have RTTY auto-start on 21.100 Mc. in a few months, and to establish a part-time monitoring frequency of 21.432 Mc.

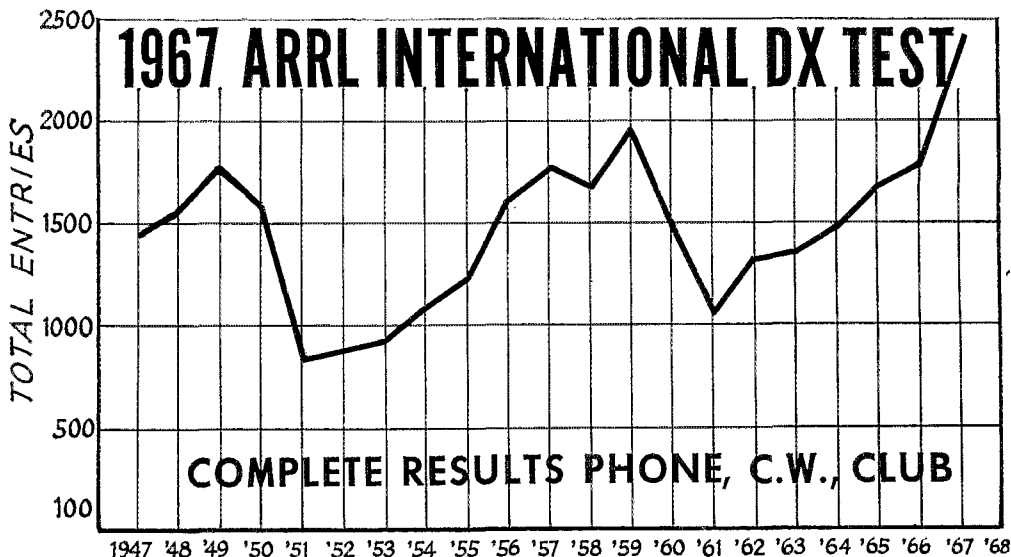
The officers of the club are Joseph Edwards, W4EL, President; Dr. Ned Wallace, YN4WD, Vice-president; Dr. E. Croft Long, Associate Dean of Medicine and Project Director; Warren Bird, Secretary-Treasurer; and Tom Ferrell, WA4MWT, Program Chairman.

Persons interested in using the service are encouraged to contact the station at Duke University Medical Center Amateur Radio Club, Duke Medical Center, P. O. Box 3005, Durham, North Carolina 27706.

QST



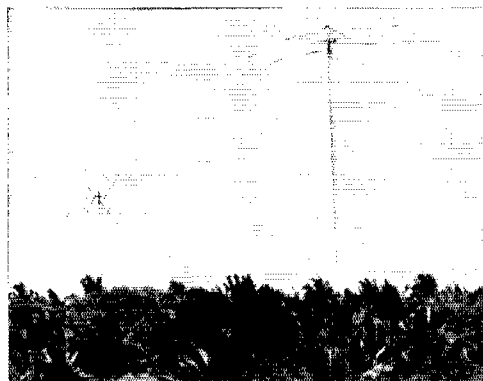
A medical consultation via amateur radio is being arranged by author.



COMPILED BY ELLEN WHITE*, W1YYM

MAKING this Fall issue of *QST*, with approximately a third more entries than in 1966, calls for some adroit footwork on the part of your reporter and a patient understanding on the part of you, the reader. The magical combination of generally superb conditions, the removal of the W/VE c.w. quota, returning KH6/KL7 to DX status and changing of the DX multiplier from W/VE call areas to the 48 conterminous United States and VO plus VE1-VE8 (sort of a Heinz-57 variety!) led to what we can now record as the biggest reported turnout in the classic ARRL International DX Competition. A total of 2427 logs from con-

*Deputy Communications Mgr, ARRL.



The top DX single-operator score on both modes by **H18-XAL** will set a mark for all future DXers. This antenna shot, taken with a telescopic lens from about 2000 feet away (at the shoreline of the Caribbean), shows Fred's 75-foot tower on the left holding a 4-element 10-15-20 meter quad. On the right, the 130-foot tower holds a 3-element 40-meter beam. Between the two towers runs the 80-meter half-wave doublet at a mean height of 70 feet. In addition, the taller tower supports various wire antennas.

testants in 135 different countries reported their activity for the first and third weekends of Feb./Mar. and in no uncertain terms voted their approval of the rules modification.

"The change to states as multipliers makes the contest more interesting." — **G2QT**. "The new rules are the best of all. Let them be the final ones." — **OZ3KE**. "Let's keep KH6 and KL7 on the DX roll." — **KH6BZF**. "The two weekends is still a sound idea and the new system of multipliers by states is more interesting." — **HPIJC**. "I like the new scoring system." — **KA7AB**. "Thanks for changing from call areas to the states/provinces. It makes it more interesting and gives better satisfaction when you come up with something new more often." — **SM0BDS**. "Removal of the quota produced a substantial rise in the QSO-rate through all four days. From the scoring point of view the scarcity of VE signals was a disappointment, I'm in favor of the rules changes." — **G2RO**. "New multipliers made it much more interesting and the rare states were present this year." — **PY2SO**. "I appreciate the new rules and think it has made a tremendous improvement on the interest to the outsiders." — **VK2EO**.

"I was surprised that the drop in the c.w. quota system stirred up a lot more activity in Europe." — **W1BPW**. "Please accept my vote in favor of the no-quota rule for c.w." — **K2GUN**. "I like the no-quota idea; keep it like that." — **W6CNA**. "Quota removal a welcomed change; never a dull moment now." — **W6CUF**. "The removal of quotas plus using states as multipliers is the best move you've made yet. Now the contest is really interesting." — **W7PGX**. "Glad to see the quotas gone, I think that they hurt the little guns rather than the big ones." — **K9DWG**. "New contest rules seem to have stimulated more phone DX activity." — **W1YRC**.

After analyzing some 2400-plus entries in a contest you become aware of areas needing improvement. The log-keeping this year seemed painful for the participants. Whatever system you use should be kept either in duplicate *at the time* or be painlessly reproduced later. There shouldn't be a need to recopy the logs. The check sheets provided, for the W/VE crew, are meant to be used during the contest to both avoid duplicate contacts and help you keep track of those multipliers you still need. They're not designed to be used to eliminate duplicate contacts

after the contest. Many of the DXers in the test commented on the large numbers of duplicate contacts which reduced their hoped-for score. If our system isn't working for you, use your own, but in fairness to all participants find and use a system that will prevent duplicate contacts. More marked this year were the comments on those calling CQ DX. They went all the way from writing a ban into the rules to other extremes! One WØ put it nicely by saying "If the so-called experts at DX contest hadn't raised such a racket calling CQ DX the rest of the gang would have heard something."

There are a few additional thoughts that occur as we wind up this report and they include a plea for more frequent signing by the DX station, a reminder that all awards are scheduled for mid-October mailing, a reminder too that the first and third weekends in Feb. and March of 1968 are on the schedule for the next one and, perhaps most of all, a personal note of congratulations to all participants who came, worked and reported.

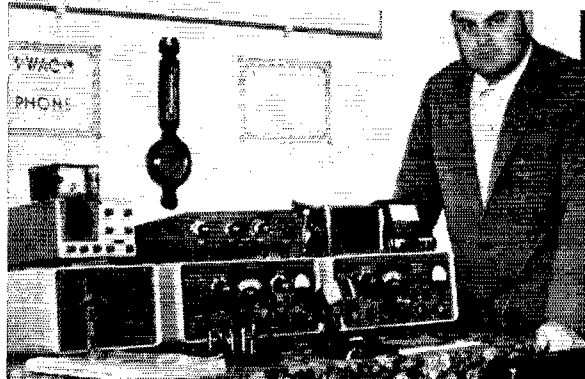
In order to have room for some 600 additional listings, the usual tabulated comparisons, etc. the full "Soapbox" will have to appear in an abbreviated fashion. Taking the editorial prerogative, let's just say that this cross-section of W/VE comment appeals to us!

Soapbox

"I'm fifteen years old and my voice hasn't changed yet. This proved helpful in the pileups." — **WB2UVD**. "The first time I've stayed up past midnight, I'm 15" — **WB2YNX**. "My first DX test, I'll be back next year to give W2FXA some competition." — **WN2YQH**. "Finished my WAS during the DX test, I'm looking forward to finishing off my DXCC during the SS." — **WA3BGE**. "Remember the DX Tests when we exchanged messages for a week?" — **W3LMZ**. "Suggest you retire the winners that repeat year after year, with proper honors recognizing them as masters. This would give the rest of us a chance." — **W4CKD**. "This would be a wonderful contest if you could get the east-coast stations to QRT." — **K5JVF**. "Yahoo, L-path is open!" — **W6QQW**. "It seems as though my beam works best 180 degrees out of phase, you might say I plunge at DX backwards." — **WA6JDT**. "It would be interesting to review a series of pictures of the contestants at about 2330Z on the last day of each session." — **W6WX**. "There should be a 5000 point bonus for each W/K who could honestly claim that he did not call CQ DX during the period." — **W7RGL**. "If all DXers had KH6IJ's operating skill, I could have doubled my score with the old junk heap I call my station." — **W8AJW**. "There must have been several thousand WB2s on. Half were calling CQ DX and the other half were holding the key down." — **W8ZCQ**. "Say, that Pussycat-2SO sure gets around, doesn't she?" — **KØYBC**. "How about an honorary membership in the American Dental Association for all contest participants. Working in those pile-ups is just like pulling teeth!" — **WA0QFC (K5PKA, opr.)**.

"Most of the operators were real gentlemen. That is, until a real rare one came along." — **WIDTY**. "Why does U5ARTTEK rate a homebrew call?" — **WB2OIV**. (Located at a pioneer youth camp in the Ukraine, Ed.). "Do the stations using the services of local v.h.f. spotting nets qualify as single operator?" — **W2OWS**. (No, Ed.)

From top to bottom, a collection of exotics to quicken the pulse of any DXer: **IS1VAZ** with better than a half-million phone points; **FG7XF** with a nice c.w. showing with 462 exchanges; **EP2BQ** giving it a go on both phone and c.w. for well over 1300 combined two-ways; **CR7CI** trying hard in both sessions to provide a Mozambique multiplier.



AFFILIATED CLUB SCORES

	Aggregate	Entries	C.W. Winner	Phone Winner
Potomac Valley Radio Club	34,376,243	53	W4KFC	W3KMY
Frankford Radio Club	33,320,718	77	W3BES	W3BES
Northern California DX Club	14,367,020	57	W6WX	K60LJ ¹
Southern California DX Club	12,538,661	49	W6FTA	W6FTA
128 Contest Club (Mass.)	9,043,877	13	K1DIR	K1DIR
Honolulu Amateur Radio Club	7,849,504	6	K8BJ	K8BJ
Niagara Frontier DX Assn. (N. Y.)	6,655,504	22	K2LWR	K2GYI
Order of Boiled Owls of New York	6,577,479	18	WB2CKS	W28UC
Connecticut Wireless Assn.	4,309,573	14	W1BIB	W1BIB
North Alabama DX Club	3,206,568	24	W4GRG	WA4WAO
Golden Triangle DX Club (Fla.)	2,819,649	3		
Miami Valley Amateur Radio Contest Society (Ohio)	1,972,663	14	W8ZIM	W8LXU
Suffolk County Radio Club (N. Y.)	1,743,373	13	W2GKM	WB2FCN
South Jersey Radio Assn.	1,445,232	22	W2GGT	W3UNJ/2
Central Michigan Amateur Radio Club	1,301,991	7	W8RXY	W8RXY
Louisville's Active Radio Operators (Ky.)	1,197,069	8	W4CVI	W4BCV
Order of Boiled Owls of Ohio	1,130,970	6	W8ZCG	K8EHJ
West Park radiops (Ohio)	820,734	15	W8AJW	K8WUQ
Indian Hills Amateur Radio Club (Ohio)	611,406	11	W8QXQ	K8AXY
Ohio Valley Amateur Radio Assn.	541,488	6		WA8AJI
Forestville Amateur Radio Assn. (Conn.)	505,290	6		W1CKA
'Tri-Town Radio Amateur Club (Ill.)	332,810	6	K9YOE	
Friendship Amateur Radio Club (Pa.)	145,215	3		W3KDD
Delta Radio Club (Tenn.)	34,737	5		W4OGG
West Alle Radio Amateur Club (Wis.)	27,384	5	WA9IAT	

¹ W6BHY, opr.

"Conditions fabulous, but little time. Gave up the first weekend so my Jr. op. WN2YQH could participate in the Novice Roundup." — W2FXA. "California stations were giving the east coast heavy competition this year." — W3INE. "Wish I could understand this blasted s.s.b." — W3GHS. "Bet Bayer made a fortune in this contest." — WA3DCG. "Losing your linear the beginning of the second day is like losing your right arm." — W3NM. "Neither frozen rotators, nor snow static, nor a midnight visit from the FCC (they came, they saw, they were satisfied), failed to diminish our fun. That is, except W3MSK." — K2GL. "It's no place to go barefoot." — W4KFC. "Heard a G-station say during the contest, to the strong carrier on frequency, if you don't mind, I'll inject the carrier in my receiver from this end." — W5OER. "The pileups were like a turkey ranch at feeding time." — WB6IMN. "Wait till next year, I have K2GL/W3MSK-West under construction." — W7ESK. "Enjoyed the world-wide chuckles my call produced." — K9BUG. "During the second half our cat ran off with my only earphone cord and plug and I had to operate the rest of the contest with a small speaker cannibalized from the children's portable phonograph. As soon as the test was over, and I was reassembling the record player, in walked the cat dragging the missing cord and plug." — W0IJM.

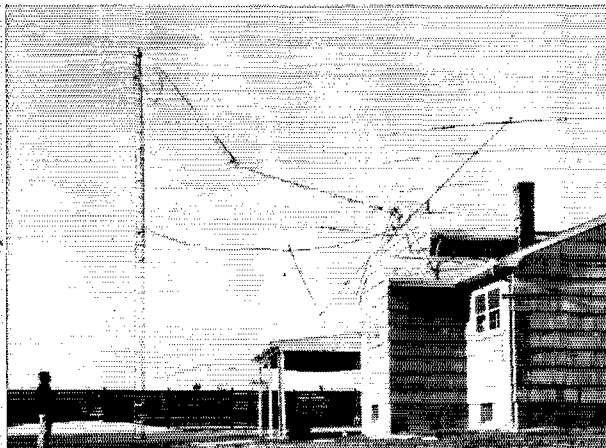
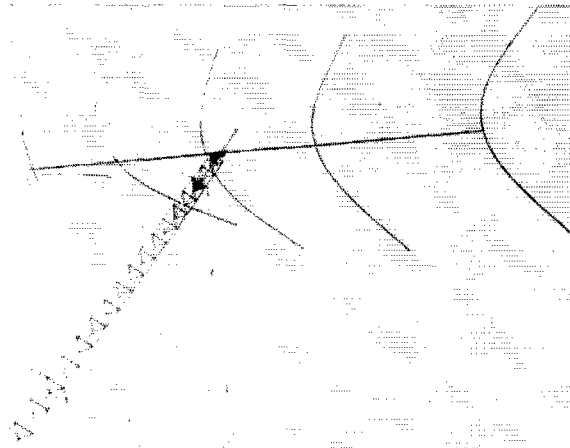
The Clubs

The brand-new contest format turned in some brand-new looking club tallies, easily doubling the 1966 sums. It was turnabout time too for the Potomac Valley Radio Club, registering 34,376,243 points and winning another engraved gavel. The Frankford Radio Club was tough competition with 33.3 million points and a lot of strength in the phone portion of the test. Position-

wise, the Northern California DX Club tacked down the third spot with 14.3 million and some real rivalry by the big signals from the Southern Southern California DX Club. A major voice in this year's test was the 128 Contest Club of Eastern Massachusetts and 9-million-plus points with just 13 entries. A brand new entry in this club group is the newly affiliated 100% ARRL club, the North Alabama DX Club. Spearheaded by WA4WAO, the group represents some of the biggest and best signals in the south. In addition, the club submitted the best-looking club letter. The highest total points per member goes to the Golden Triangle DX Club. Fine increases too were registered by the Miami Valley Amateur Radio Contest Society, the Suffolk County Radio Club and others. For the first time, we'll present a comparison of the top ten clubs by mode, a popular feature introduced in the November Sweepstakes reporting:

	C.W.	Position	PHONE
Potomac Valley RC		1	Frankford RC
Frankford RC		2	Potomac Valley RC
No. Calif. DX Club		3	Honolulu ARC
So. Calif. DX Club		4	No. Calif. DX Club
128 Contest Club		5	Niagara Frontier
Order of Boiled Owls		6	So. Calif. DX Club
Conn. Wireless Assn.		7	128 Contest Club
Honolulu ARC		8	No. Alabama DX Club
Niagara Frontier		9	Conn. Wireless Assn.
No. Alabama DX Club		10	Order of Boiled Owls

Short and very sad stories. On the left an action scene at K6YNB during an 80 m.p.h. wind storm just prior to the start of the first phone weekend. An adequate explanation of why he operated the entire test with a 15 meter four and a half element yagi W2AGM is on the right with a very clear explanation of why he operated just the first phone weekend.



HC1TH did a fantastic job amid hot phone competition in South America with a 2nd high continental total of 2.7 meg. Tom really attributes the fine results to his "chief operator" Rita since she kept the kids quiet, she fed him, she told people he wasn't home, she let him yell throughout the night without a bad word and she treated him like a human being.



Continental Comments

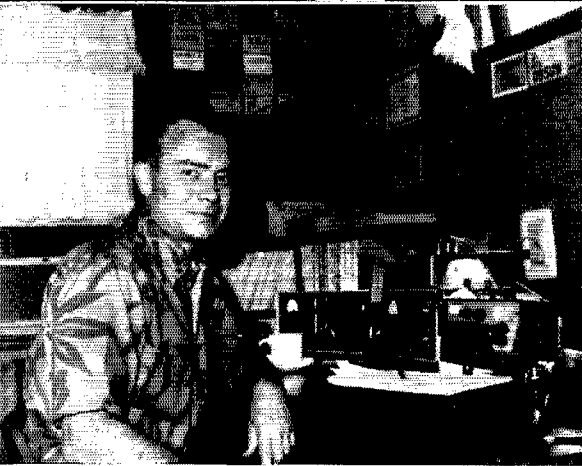
"Next year I'll be there both weekends with a qund and vee." — **5H3KJ**. "It seems strange that people one hasn't seen in years have to pick the contest weekend to visit." — **ZS5RS**. "A nice contest but I regret that so many stations gave me duplicate QSOs." — **CR6GO**. "An unscheduled business trip to the states kept me from competing in the second half of the c.w. test." — **ZD8J**. "Quite a lot different from VP5 but still a lot of fun. You need a beam for 40 out here." — **VQ9AR**.

"Only free from duty for one day and decided to give some licks on forty with all of my 25 watts." — **9V1OB**. "The Ws strong on 40. I enjoyed 4-band QSOs with **W3TMZ**

W4GRF W3MCG W4BVV W3WJD and K1DIR." — **VU2MSK/W3MSK**. "The W/VEs operated in an orderly fashion." — **MP4BFK**. "Good fun and the sun spot im-

Minimum Number of Countries					Minimum Number of Countries					Minimum Number of Countries					Minimum Number of Countries														
Band	75	30	80	60	60	Band	75	30	80	60	60	Band	75	30	80	60	60	Band	75	30	80	60	60						
W1AXA	23	33				W3HA						WA5ALB	17		81	62	77	W48RXU					65						
W1BFA					77	W3HHA*				68		K5AKQ					63	W8RXY					68	66					
W1BII		30		72	74	W3HHK				63	88	W5EHY*					82	W8SSKV						60					
W1CBW					62	W3IYE*				60	71	K5JZY			82	64	81	W8TWA/8	15					72	65				
W1CKA					71	70	W3KDD				89		W5KC					60	85	W8WT						77			
K1DIR	34	45	103	89	81	W3KMY	25			68	69	W5KGJ					80	K8YBU				141		61					
W1DIT	18					W3LOE	15	35	105	89	86	W5KTR	16	35			73	95	W9ACYV						62				
W1FJJ	21					W3MDE/2					99	W5LZZ					64	W9EWC	22					86	66				
W1DJG					60	W3MSK*	58	77	157	135	118	K5MDX					87	58	W9GIL						81	77			
W1HQV					63	K3MTK/3*				70	60	W5NMZ					65	62	W9GMV							66			
W1JYH	17	34	101	84	64	W3MVB					61	W5OGS			102	65	69	W9HJM						61					
K1OBT					61	K3NHL	28	43	107	73	86	W6CCP*					78	W9IRH						79	75				
K1OKG					66	61	W3NKM				91	K6ERV					61	W9IVL						74	62				
W1RF					60	77	K3NMY				105	W6IBD					78	W9JQD				88							
K18HN						86	K3PSW				70	W6ISQ					86	W9LKI						71	67				
W1UOP					74	72	K3TPL	18	49		82	W6ITA	17	37	106	87	83	W9MLJ/1						66					
W1YQF					70	60	W3				61	W6JTA					86	K9PPX							70				
WA2BEX					93	W3	54	51	107			W6NJ	7	3	96	61	W9RQM							65					
WB2CON					63	73	W3				75	W6OH					77	72	W9TYT							71			
W2EGG					61	W4	40	1	100			W6PC					92	K9TZH							65	64			
W2FON	19		81	80	68	W4				87		W6PZ					71	69	W9VZP							65			
W2FXA					69	W4BVV*	42	72	132	118	99	W6YMN					62	W9ZTD				82							
W2FZJ	26	39	95	52		W4BYB				52		W7ESK	32	33	64	60	K9ZJV							65					
K2GL*	66	81	151	140	110	K4EZ				97	76	68	K7PXI					71	W9BAA						64	72			
K2GXI	30	60	103	81	87	W4FVY				65			W8AJI					78	K9BHT*				87	73	61				
K2LWR	15	115	68	69		WA4GCS	16	30	85	88	80	K8AXG			81	68	70	W9CPX							77				
WB2MDH*			81	67	68	W4HKU				49			W8BF			103			W9CU	20	31	89	123						
WB2NXL					92	WA4KU					61	K8BGZ					60	W9EUC							67				
WB2OIV					60	K4KJD					67	W8RVF			111			K9ELA							61				
W2PDB					81	84	K4KZZ	22	31	88			K8DOC	52	42	80	98	88	W9EIM							68			
W2QWS					95	89	90	W4MBV				66	68	W8ECA					73	69	W9IVZ*							62	73
W2SSC					92	W4NBV	19		83	78	60	W8EEZ			41			W9IYH				117							
W2SUC					69	71	W4OGG				66	66	K8EHU					62	W9LBB							75			
K2TQC					60	W4QBK	19		115	83	W8GGE					63	W9LTE*	16	31	82	83	68							
K2USA*			32		75	75	W4QCW	31	46	122	107	99	W8GKA					72	VE1PL	23	35	101	86	63					
W2WZ					90	WA4QVQ*				60	68	W8GUF*					76	76	VP2WA							97			
W3BES	22		90	91	87	W4RQE				53		W8HBR					82	3C9FHO*							95	64			
W3BGN*	15	33	103	88	96	K4RZK					71	K8HZU					60	VE3UX							81				
W3BQN					62	60	K4VYN					99	WA8LEO					60	83	3C6SF							85		
W3BYX					66	65	WA4VZK					69	W8LXU			103	66	68											
W3DHM					69	64	WA4WAO			92	93	90	WA8LYF					102	W8MCR							70			
W3FYS					65	68	K4WSE				61	WA8MCR					61	W8RGT							77	82			
W3GRS					66	W4ZYS*	16		102	73	80	WA8RGT					77	82											

* Multi-operator Station



provement meant the bands were open to a certain extent during the nights."—EP3AM. "Next year may be back from Liechtenstein."—HB9Z.

"One operator is continuously needed to tranquilize the TV-watchers."—OH2AC. "Great to be back after 8 years."—OZ7BG. "Impressed in my first big contest by the discipline, courtesy and skill of most American operators, which contributed to my pleasure."—SM0BUO. "Still going strong with QRP. My outputs are now 1, 6 and 10 watts on 28, 21 and 14 Mc."—OH3YL. "Near the end of the contest everytime I worked a W9 in ILL I had a great urge to send HPE SN BTR, but I managed to refrain."—G3JYP. "VE7 and VE8 before and after but not a single one *during* the test."—HAIKSA. "Nicest experience was receiving a QSL from K7UCT in Utah saying he couldn't understand how I could pick his 50-watt signal out from the layers of QRM. Guess it was because I needed the multiplier!"—PA0XPO. "Please try to organize better weather for next year. It is difficult climbing a pole in a gale to straighten a quad."—G3GRS. "Lightening and thunder helped keep our operators awake during early hours and on occasion provided slack illumination."—GW3ITZ. "Outstanding this year was the marked decay of conditions on 160 and 80 and the great improvement on 10."—VK5KO. "Started the phone contest with K1DIR and ended the c.w. contest with K1DIR."—W0PAN/KH6. "A lot of fun working the gang from PY7SOL. A highlight was working Ed, VU2MSK, through the W/K pileup."—PY7SOL (W3PZW, opr.). "Thanks to all who stood in the pile up to give me their points."—CE2CR.

"If ten improves further, a vapor-cooled ballpoint pen will be needed. Water cooling just won't do it!"—OZ7DX. "U-stations can only operated s.s.b. on 80 between 3600 and 3650 kc, but only a few W/VE stations know this."—UA3KBO. "Would appreciate it if the boys back in the states would not take over the frequency from us QRP DX stations after getting their report. I had to move constantly on account of this."—DL5KS. "You certainly had your crystal ball correctly loaded this year, a pair of weekends with excellent conditions on all bands."—G3UML. "First place in our 'duplicate contest' was a certain W7 with 6 QSOs on 20 meters."—OH2AM. "Disappointed after reaching the million mark to see the figure drop below that as duplicates were deleted."—ZK1AR. "Most outstanding phone signal was K2GL on all bands except forty where W7SFA was tops."—ZL1AGO. "Rounded up my WAS."—8R1G. "Fair play was the prevalent climate in the W/VE phone boys . . . congratulations!"—CX2CN. "At one point during the contest I had a cigar lit, an 807 in one hand and a pencil in the other and during a QSO I fell asleep for five minutes."—HG1TH. "The rapidity of s.s.b. in passing exchanges is finally producing higher phone than c.w. scores. I had peak hours of 160 QSOs on sideband, an impossibility on c.w."—H18XAL. "What good are checklists if not used? I found 135 stations worked more than once and one guy worked me four times."—VP7NH. "Terrific phone QRM, all bands. Contest operation is hindered by the fact that here, in Afghanistan we have to work on Saturday and Sunday."—YA5RG. "My last effort from Japan. My next effort will be with a W1 group trying to top W3MSK."—KA7AB.

Disqualifications

The calls listed in this paragraph are all deemed ineligible for score listings or awards. In each case, disqualification was under contest rule 14 in view of non-observance

From top to bottom, DX test performers *par excellence*: **K8YBU** leading West Virginia with close to 590-K phone points and with big antenna plans for 1968; **W7NPU** active in both modes and supplying a welcome Utah multiplier, **W6PQW** specializing in a 15-meter performance while utilizing his own antenna design (5 elements, three driven, two parasitic) amid terrific competition from the East Bay area, **W9ERU/7** a familiar call from the unfamiliar section of Arizona with a half-million plus c.w. points and a brand-new call to watch for in future contests, **W7EKE**.

of FCC rules as reported by at least two accredited Official Observers, or by a single FCC citation or advisory notice. Such violations as out of band operation (sidebands or carrier), spurious emissions, etc. were the basis for these disqualifications. C.W.- K1DPB, W1EVT, WA1FHU, WB2RHW (WB2s PAR RHW, opr.), W3HHA (W3HHA, K3YQL, opr.), W4JD (WA4HHW, W4JD, opr.), W4JDR, K4CL, WA4VZK, W5WZQ, K3BXG, W5ODJ, W6ITY, W6BLV, W9FTK/8, W8AZD, K8SUZX, K9LOK,

W9QQG, K9HDP, W9VXO (WA9BWM, opr.), K9FLJ. Phone — W2JSX, W2FSK, K3JYZ (K3JYZ, W3DVA, opr.), W3AXW, W3ARU, W3OK (K3s MAZ QDU, WA3s ATK CXM FGS, W3IZL, opr.), K4MSK, W4ETO (K4s 4RD IIF RLO, W4s ETO JDR, W4s LUG PXP WIP, W6LNE, opr.), K4QVK, W4AMT, K5IIN, W6KJS, K3LY (W1DTL, W5TEH, K5LKI, K6MUX, WA6WJX, W7YAQ, W8HVN, WA6PHM, VE3DRV, opr.), W8BQH (W8s BQH HDB, opr.), WA6EMS.

Minimum Number of Countries					Minimum Number of Countries					Minimum Number of Countries					Minimum Number of Countries				
Band	30	50	80	60 60	Band	30	50	80	60 60	Band	30	50	80	60 60	Band	30	50	80	60 60
W1BLH	37	53	93	79 74	W3AFM			140		W4PTR	32		80	63	WA8CIA				85
W1BPW	45	66	95	80 64	W3AYD			88		WA4TWB				63	W8DUS				81 76
K1CDN			104	74	W3BES	32	56	99	84 72	W4WYJ	33				W8ELE				80
W1CNU				101	W3DFL		76			W4YGY			92	71	WA8FDL				72
K1DIR	53	69	103	84 73	W3DRD				62	K4YYL	32	62	98		WA8GLY*				79
W1ECH		66	87	67	W3EKN	38	61	82	67 64	K4ZA/4*	48	67	84	81 71	W8GQU				88 63
W1EOB	31	57		64	W3EOP	41	56			W4ZSH				88	W8HSK		60		
K1EUF			82	74 67	W3EYF		60		73	W4ZYQ*			92		W8MKE				64
W1FJJ	33			60	W3GHD*	32	53	67		W4ZXI*	34	63	109	76 65	WA8RGT				65
W1FTX				61	W3GRF	35	63	95	73 70	K5ABV				76 71	WA8RWU			92	61
W1GQG				61	W3GRS		81	61		W5AC*				60	W8RXY				65
W1GYE			90		WA3GTX				66	WA5BFB*			84	68	K8SBZ				62
W1JYH	37	67	101	85 69	W3HHK			68	68	W5BRR		50	90	70 63	WA8TNO				61
W1UUK			85		K3HTZ		85	69		W5CKY	31	58			WA8TPL				80 69
W1WPO			117		W3ISE			60		W5DQV				67	W8UM*	52	82	123	109 84
K1YKT	46			61	W3IWS			62		K5IIN				67	W8ZCQ				98 77
K1ZND	31			67 66	W3IYE*	40	51	82	69	WA5JMK				69	K9CSW				77
W2AYJ		53		61	K3JH		56			K5JVF		55			K9CUY				60
WA2BEX				93	K3JYZ			62		W5KC				83	K9DWK				61
WA2BLV*	63	83	70		W3KDF			80	70	W5KGI				63	W9ERU/7				85 66
K2CC*				77	W3LOE	34	66	106	86 79	W5OBS			101		W9EWC	36	68	102	78 65
K2CHQ/1	35				K3MBF*			86		K5STL			85		W9GIL				64 68
WB2CKS	42	65	90	75 67	W3MCG		5	96		W5VW				70	W9GIM*				67
WB2CON				83 66	W3MFW	47	69	92	87	W6VW				97	W9HUZ		51		66
WB2CRX				84	W3MSK*	43		16	88 70	W6WV				70	W9LHN				62
K2DCA	38	54	89	76 72	W3MSR		84	83		K6WV				98	W9IOP		71	96	86 63
W2FXA				71	W3MVB		3			W6XY				85 60	W9IRH				80 63
W2GGE	30	61	95	75 68	K3NHL	37	57	93	62	W6CCP*			101	77	W9IQD			117	
W2GGT				61	K3NMY			105		W6CUT		53	89	70	W9KDR				62
W2GKZ				68	W3NOH			61		WB6CWD				94	W9LKI				64
K2GUN	37	51	91	69	W3PZV			82		W6CYV				93	W9MQZ				67
W2HO			81		W3TMZ/3*	51	76	97	93 81	WA6EPQ				60	W9RQM				68
W2IRV			64		W3VKD*	30		86	83 78	W6ERS			84	73	W9SCZ			81	
K2KFA				69	W3WJD*	57	87	136	100 83	W6GQK*				80 64	W9VZP				63 70
K2LWR				116 66	W3YUW*	53	80	118	95 86	W6HOC				81 64	K9YOE				84
K2KTK	36				W4BRB	36			67 66	W6ISQ				100 84	W9YT*				69
W2LXK	37	66		65 63	W4BVV*	53	92	131	107 86	W6ITA		53	85	71	W9YYG*		51		
W2MEL	42	65	85	72 67	W4BYB		81			W6KEY				68	W9ZTD			86	
WA2OJD				68	W4CKD	30	53	93	84 67	W6LDD				80 62	W8CCQ				61
W2PCJ	36	64	101	81 68	W4CQI				70	WB6LED				61	WA6CVS				60
WB2PGM				62	W4DKU			85	64	W6MUB				102	WA6EMS				67
K2QIL				61	W4DVT	46			64	W6NJU				82 61	W9FDL				64
W2RDD			83		W4DXI	30			68 62	W6NKR			77	90	W9IDW			80	
W2SEI	34	68			W4FVY				75	W6PQW				101	W9OAW				64 63
W2SSC			94		W4GRG			91	76 70	W6RGG*				94 66	K9ORK				63
W2SUC			85	62	K4GSS				74	W6RW*	47	82	119	93 70	W9TDR				68
WA2UJM				78	K4GST/3		81			W6SRF				81	3C2BV				82
WA2UWA				70	WA4IKU				65 68	W6T2D				86 62	3C2NV		38		62
W2VJN	50	83	106	91 82	W4KET				63	W6TJ				61	VE2WA				94
W2WZ			82		W4KFC	41	68	103	86 70	W6UMI*				90 76	VE3ES				96
WA2ZEZ				90	W4KXV*	37	61	84	76 62	WA6URY				93	3C5US*				61 63
W2ZKQ			82	70 62	W4LCP		51	98	82 71	W6WX				104 84					
W3ADZ			86		W4NBV			98	68	W7SFA*			59	86 69					

* Multi-operator Station.

Over 300 QSOs/band — DX

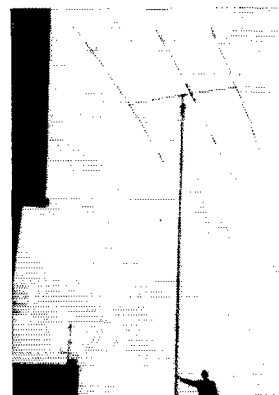
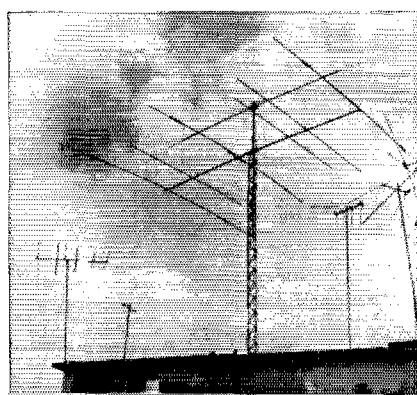
	49	40	30	15	10		80	40	20	15	10
CR6AI			679	402		OK1AIHZ				348	
CR6CK		325	408	424	555	OK1PD			479	497	
CR6GO			839	886	628	OK1ZL			729	688	
VQ9AR			898	388		ON4NM				388	
ZD8J		434	583	701	366	ON4XG			401	432	
ZS5RS			726		653	OZ1LO			362	471	
5H3KJ			330			OZ5DX			304	488	362
6O6BV			428	343		OZ7BG			439	313	
9L1TL			567	392	325	OZ7G					385
EP2BQ			377			PA0LOU			559		
EP3AM			521	311		PA0SNG			702		
JA1CWZ			438	585		PA0XPQ			490	430	362
JA1EUV				684		SM4CMG			479	522	
JA1MLN				157		SM5BNX			326		
JA1NEC				355		SM0CCE			435		
JA2HO			435	351		SP3ALJ				332	
JA2JAA				348		SP8AG				400	
JA3LGG				386		SP9AKY			330		
JA5AB				341		TF2WJN			340	460	
JA6AKW				538		U5ARTEK*			416		
JA6TQ				569		UA3KBO*			491		
OD5EJ			323			UB5KED*				330	
TA2AC			420			UB5WJ			339		
UW9OU			846			UF6LA			473		
UA9PP			523			UQ2KCR*			510		
UA0KCO*				330		YO3CR					306
UA0KFG*			481	790		YU1BCD*			469	327	319
UA0KZB			371	510		YU3LB*		454	1457	1127	
VU2KV			408			YU1TU*		313	957	1102	335
DJ7IK*			700	877	328	FG7XX				341	311
DL1JW			433	661		H18XAL	475	840	722	962	746
DL6WD			455	478	375	HK0AI		300	1095	1198	987
DL7AA			480	479	359	HP1BR			310	323	
DL8KJ			502	476		KL7AIZ* 1			450	466	
DL8KO*			642	598		KL7FRY			354	366	
DL0FR*			513	509		KL7LR			376	443	
DM4WPL			426	468		KL7MF			352		
EI9J			440	383		KP4CRT		456	688	1039	905
F5SF			373			KV4AM		372	634	473	737
F8TM				346		KZ5JF	341	572	669	615	
F8VJ			318		37	KZ2AAG		403		480	402
G2DC			305	458		KZ2OK		334	307	353	
G2MI			354			N3KM				448	
G2QT			330	503		Y5BS					351
G2RO				431	514	KH6FON			332	371	
G3GRS*			635	528		KH6FSP		383			431
G3IAR				303	367	KH6IJ		529	954	1127	890
G3JYP				369	383	KH6UL		324	581	945	709
G3LPC*			349	638		VK2EO		349	851	721	403
G3SSO		485	871	784	180	VK2GW			510		
G4CP			643	564	586	VK3AXK		342	587	375	
G5AGA					327	VK5TC			392		
G13OQR		409	829	933	482	VR2DK					305
G13SX*			661	867	491	VR4CR			478		
GM3SVK				313		ZL1AMQ			562		
GW3JI			377			ZL1HW			417		
HA1KSA			645			ZL3QH			738		525
HA4KYB*			577	392							
HA5KDQ*			303	375		HK3BAE			989	1004	863
HB9RX				354		HK3RQ		357	1043	1127	601
HB9Z*			436			LUIDAY*			492	764	804
I1HCJ					338	OA4PF			417	675	686
I1KE			612	565		PY1BYK/7				302	
I1NT			1173	872	452	PY1CQ			331		
LA1H			385			PY1NO				344	412
LA5SH					370	PY2RGL			1288	871	1050
OE3PW					347	PY2SO			1354	850	910
OE5KE			398	536		PY7AKQ		369	827		
OH1AD					364	YV1DP/5			370	521	
OH2AC*			354	443	353	YV1OB			376	422	
OH2AM*		427	1430	1129	443	YV4NS			418		
OH2BCZ			375	329							

C

W

* Multi-operator Station.

From left to right; radiators at **KP4CRT** (2.5 meg c.w.), **YV1DP/5** (1470 c.w. exchanges in just 36 hours), **PA0XPQ** (a fabulous performance both modes, 1.2 meg phone and almost 800-K.c.w.).



Thirty-Third ARRL International DX Competition

Operator of the station first listed in each section and country is winner for that area. . . . The multiplier used by each station in determining score is given with the score — in the case of continental U.S.-Canada this is the total of the countries worked on each frequency-band used; in the case of non-W/K/VE/VO entries it is the total of the continental U.S. states and Canadian districts worked on each band. . . . The total number of contacts is listed next. . . . The letters A, B, and C approximate the d.c. input to the final stage at each station; A indicates power up to and including 150 watts; B indicates over 150 watts, up to and including 500 watts; C indicates over 500 watts. . . . The total operating time to the nearest hour is given for each station and is the last figure following the score. . . . Examples of listings: K3NHL . . . 944,622-306-1032-C-71, or final score 944,622 multiplier 306, 1032 contacts; power over 500 watts; total operating time 71 hours. . . . Stations manned by more than one operator are grouped in order of score following single-operator listings in each section or country tabulation; calls or numbers of participants at multi-operator stations are listed in parentheses. . . . In sections or countries where three or more multiple-operator entries appear, the top-scoring station is being awarded a certificate. An asterisk denotes a Hq. staff member, not eligible for an award.

TOP TEN W/VE High Scorers

Under 150 Watts Only	
C.W.	Phone
K1ZND 731,557	W8ECA 320,544
W4BRB 707,183	K1THQ 306,600
3C2NV 605,472	K9DVF 271,544
WB2CON 494,988	WB6LCS 237,600
WB2PGM 121,110	WA1DJG 235,343
K5ABV 361,383	W5HVV/7 220,158
K4GSS 309,843	WB2CON 189,618
W4WYJ 288,300	WA9HJM 164,472
W3DPI 260,001	W1DYR/1 159,996
WA3GTX 256,836	K3TGM 152,205

K2OEA 19,467-63-103- A-12	W9EBY 5,292-36-49- A-26
WA2IZS 14,732-54-91- C	WA9QW 4,212-27-52- A-13
K2IEO 11,076-52-71- A-14	WA9NHM 3,276-28-39- A-5
W2NSJ 9,945-51-65- A	WA9REN 1,980-22-30- A-7
W2EBW 8,892-38-78- B-16	WA9PPY 1,020-17-20- A-14
K2SQM 8,610-41-70- B-17	WA9ART 885-14-20- A-6
W2HAZ 4,618-12-13- A-2	W9MKL 867-17-17- C-5
WB2FTE 405-0-15- C-3	WA9QXT 147-7-7- A-5
K2YU 48-4-4- A	WA9SVR 108-6-6- B-4
WA2BLV (WA2BLV, WB2MOQ) 558,730-230-745- C-	WA9RLF 48-4-4- A-1
	W9GIM (W9s PRC EVX GIM) 390,949-221-595- C-92
	W9YIG (K9ATZ, W9YYG) 370,071-231-547- C-55

Western New York

K2LWR 877,876-286-1022- C-76	W9IOP 1,512,618-339-1489- C-90
WA2UJM 603,807-271-739- B-83	W9LKI 291,276-174-558- C-35
WB2CON 494,988-247-668- A-78	K9CUY 241,362-198-425- C-71
WB2PGM 424,110-211-670- A-66	K9DWK 205,350-185-370- C-41
WA2BEX 344,100-185-620- B-66	W9JQD 87,048-117-248- C-25
W21JX 282,240-192-490- B-80	W9ZTD 61,146-86-237- C-37
K2KTK 220,272-208-353- C-30	W9A9M 42,021-87-161- A-20
W2SSC 240,051-161-497- C-33	K9HGH 38,475-95-135- C-25
W2BJH 219,618-189-388- C-58	K9VQG 20,493-69-99- A-37
WA2GHW 199,881-167-381- C-73	W9UTQ 3,600-30-40- B-20
W2UVV 168,744-178-316- C-36	WDGTA 495-11-15- A-2
K2INP 160,512-176-304- C-33	
W2FXA 141,825-155-305- C-14	
W2SEI 103,161-137-251- B-39	
WB2HZZ 93,062-158-198- C-45	
W2PGU 68,532-89-256- A-31	
W2CUI 40,890-94-155- R-17	
W2FUI 23,424-61-129- A-15	
W2QQ (W2PZL, opr.) 13,500-43-100- C-	
W2VXA 11,520-48-80- B-34	
W2ICO 10,692-44-81- A-17	
WA2OIL 6,648-32-38- A-20	
W2DGV 3,240-30-36- B-6	
K2KNV 1,425-10-25- C-3	
W2VYQH 819-13-21- A-3	
K2CC (4 oprs.) 218,943-159-450- B-62	

Wisconsin

W9EWC (W9LKJ, opr.) 1,358,016-352-1286- A-94
W9GLZ 560,712-244-766- C-
W9VZL 507,840-230-736- C-71
W9RHM 506,268-246-668- C-58
W9A9M 361,638-232-543- C-70
W9SCZ 62,694-81-258- C-11
W9QW 29,475-75-131- C-11
W9A9T 14,151-63-89- B-15
W9RH 4,322-26-44- C-8
WA9RTH 2,929-23-41- A-4
WA9GTH 2,808-24-39- A-
WA9NSR 1,994-24-27- A-4
W9AEM 1,650-22-25- A-
K9YD 1,248-16-27- A-4
W9A9PTG 798-14-19- B-7
K9DZG 351-0-13- A-4
W9YT (K9s LBQ OPF ZMS) 382,392-226-564- C-44

Western Pennsylvania

W3LOE 1,151,213-371-1035- C-78
WA3EIN 85,766-124-233- B-53
WA3BGE 18,166-62-98- A-14
WA3ARA 4,284-34-44- A-11
WA3DPT 4,224-33-43- A-
K3PZU 2,475-25-33- A-8
W3KQD 483-10-16- A-2
W3VKD (4 oprs.) 1,521,450-322-1575- C-

CENTRAL DIVISION

Illinois	
W9IRH 655,659-263-831- C-69	W9A9TH 2,808-24-39- A-
W9HUZ 450,249-268-560- C-69	WA9NSR 1,994-24-27- A-4
W9KKG 208,334-161-440- C-52	W9AEM 1,650-22-25- A-
K9YOE 206,409-160-430- A-55	K9YD 1,248-16-27- A-4
W9JGV 135,054-164-312- C-54	W9A9PTG 798-14-19- B-7
W9UX 148,680-145-328- B-1	K9DZG 351-0-13- A-4
W9WIO 119,952-136-294- C-18	W9YT (K9s LBQ OPF ZMS) 382,392-226-564- C-44
W9BUD 113,014-421-313- C-33	
K9UFO 113,004-146-258- C-37	
K9CSW 79,704-108-246- C-39	
W9EFS 67,885-115-197- A-21	
K9DWG 58,509-99-197- B-23	
K9UIY 45,540-92-165- A-48	
W9VLT 38,376-78-164- C-23	
W9MQZ 30,284-67-155- B-25	
WA9PFB 21,336-56-127- B-10	
W9KDR 20,460-62-110- A-42	
WA9EKJ 14,352-52-92- A-19	
WA9CQC 10,089-48-70- B-10	
W9YVM 8,280-40-69- A-14	
K9OWT 7,257-41-60- B-11	

DAKOTA DIVISION

Minnesota	
K9ORK 338,698-196-576- B-48	W9A9TH 2,808-24-39- A-
W9YCR 237,168-183-437- B-69	WA9NSR 1,994-24-27- A-4
W9A9M 233,110-185-402- C-18	W9AEM 1,650-22-25- A-
W9AKDI 64,020-110-194- C-40	K9YD 1,248-16-27- A-4
W9AKDS 55,242-99-186- A-38	W9A9PTG 798-14-19- B-7
K9ZXE 35,910-90-133- C-41	K9DZG 351-0-13- A-4
W9VLP 20,130-61-110- C-17	W9YT (K9s LBQ OPF ZMS) 382,392-226-564- C-44
WA9EPG 15,015-55-91- A-19	
W9KMH 12,240-51-80- B-22	
W9BHA 9,234-38-81- B-70	
WA9MKP 3,198-26-41- C-2	
WA9KIP 1,320-20-22- A-2	
W9KUI 390-10-13- B-8	

North Dakota

WA9QFG (K5PKA, opr.) 177,528-156-380- B-50
K9EIA 34,935-85-137- B-25
WA9QVW 9,936-46-72- A-34
W9CAQ 882-14-21- C-5

South Dakota

W9BLZ 139,896-134-348- C-24
W9UCU 24,780-50-140- C-
WA9CJI 9,360-40-78- B-12

C. W. SCORES

ATLANTIC DIVISION

Delaware	
K3NHL 944,622-306-1032- C-71	W3RRV (W3s ECR RRV) 291,000-200-485- C-70
W3DRD 266,910-205-434- C-	K3MBF (4 oprs.) 215,424-176-410- C-31
K3NMY 90,132-148-203- C-	K3BNS (K3s BNS JFJ) 145,200-121-402- C-45
W3SCRU 3,093-25-33- B-9	
W3LVE (W3s IVE TGF) 922,500-300-1025- B-87	

Eastern Pennsylvania

W3BES 1,472,499-343-1431- C-80	W3GRF/1 417,249-336-1406- C-70
W3MPW 1,298,552-356-1214- A-33	W3FKW 856,991-313-918- A-68
W3HHK 813,980-266-1020- C-54	W3MSR 778,397-257-1097- C-78
K3HTZ 721,188-276-873- B-54	W3MCG 597,555-271-735- A-60
W3KDF 566,820-235-804- C-66	W3PZW 490,580-220-613- C-30
K3JH 538,650-210-855- C-52	W3HQV 390,744-201-648- B-65
WB2MZJ/3 305,982-191-534- B-73	W3MYB 384,330-230-557- C-41
W3ISE 285,056-176-502- B-43	W3EYF 362,341-250-467- A-53
K3BUE 213,188-161-442- A-60	W3QQJ 352,070-190-621- B-58
W3KCT 210,807-177-397- C-	W2NQZ/3 317,952-225-471- C-66
K3BIV 195,195-169-385- C-42	W3DPT 260,094-189-461- A-
W3AIG 175,014-152-384- C-40	WA3GTX 256,836-204-420- A-53
W3NOH 172,914-161-358- C-14	W3AFM 240,100-140-573- C-64
W3BQA 168,320-173-328- C-28	W3AYD 236,530-217-564- C-53
W3GRS 157,206-197-266- C-15	K3JYF 201,249-177-379- C-32
W3KFK 148,101-149-332- C-	W3MZF 133,840-140-322- C-22
WA3ATX/3 136,353-151-301- B-45	W3AXW 125,452-158-266- C-39
W3ROP 128,700-159-288- C-29	W3HVM 124,845-145-287- C-23
W3INH 122,958-138-297- C-15	W3BQN 119,472-131-304- B-65
W3QOR 122,760-129-341- A-28	K4GSU/3 68,400-81-289- B-24
W3GHM 113,652-132-287- C-20	W3JXS 61,880-91-228- A-41
K3JGJ 113,181-131-288- C-70	W3AYS 56,052-108-173- C-
W3PN 89,787-134-173- C-20	W3KA 44,226-81-182- C-20
W3AEQ (WA3BJD, opr.) 77,592-122-212- A-24	W3IMZ 35,972-93-131- A-35
W3CAA 69,328-104-219- C-16	W3PBE (W4TRF, opr.) 30,024-72-139- B-15
W3ADZ 67,530-102-225- C-25	W3RNY 28,968-71-136- C-14
W3BYX 66,822-86-259- C-32	WA3HAN 28,116-71-132- B-18
WA3BGN 62,988-116-181- A-42	W3CSZ 22,110-67-110- B-11
W3CBF 57,783-107-180- B-35	W3DFL 17,328-76-76- C-
K3QLV 46,800-81-195- B-20	W3WIS 13,392-62-72- C-36
W3RUY 34,713-87-133- B-32	W3AEL 11,828-51-76- C-6
K3PTK 32,394-78-41- A-21	W3AZD 7,215-37-65- C-10
W3QMB 27,000-72-123- C-19	W3DRP 5,292-42-42- B-
W3LPT 24,750-66-123- A-40	WA3DSD 3,066-21-43- A-8
W3DBX 24,150-79-115- B-	W3ONQ 492-12-14- A-12
K3RFV 16,886-57-100- B-26	W3TMZ/3 (7 oprs.) 2,331,394-102-2099- A-48
W3DRI 13,895-47-99- C-3	W3MSK (9 oprs.) 2,492,037-409-2031- A-48
W3DQR 11,934-51-78- A-36	
W3GCU 10,212-37-63- C-16	
K3RNP 6,201-39-53- C-	
W3GHD 1,596-19-28- B-	
W3IPS 96-4-8- A-4	
W3YUW (5 oprs.) 3,370,996-132-2801- C-	
W3GHS (W3GHS, W3YOV) 701,892-268-873- C-86	
W3OK (4 oprs.) 389,990-170-763- C-93	

Maryland-D.C.	
W3GRF/1 417,249-336-1406- C-70	W3GRTX 256,836-204-420- A-53
W3FKW 856,991-313-918- A-68	W3AFM 240,100-140-573- C-64
W3MSR 778,397-257-1097- C-78	W3AYD 236,530-217-564- C-53
W3MCG 597,555-271-735- A-60	K3JYF 201,249-177-379- C-32
W3PZW 490,580-220-613- C-30	W3MZF 133,840-140-322- C-22
W3HQV 390,744-201-648- B-65	W3AXW 125,452-158-266- C-39
W3MYB 384,330-230-557- C-41	W3HVM 124,845-145-287- C-23
W3EYF 362,341-250-467- A-53	W3BQN 119,472-131-304- B-65
W3QQJ 352,070-190-621- B-58	K4GSU/3 68,400-81-289- B-24
W2NQZ/3 317,952-225-471- C-66	W3JXS 61,880-91-228- A-41
W3DPT 260,094-189-461- A-	W3AYS 56,052-108-173- C-
WA3GTX 256,836-204-420- A-53	W3KA 44,226-81-182- C-20
W3AFM 240,100-140-573- C-64	W3IMZ 35,972-93-131- A-35
W3AYD 236,530-217-564- C-53	W3PBE (W4TRF, opr.) 30,024-72-139- B-15
K3JYF 201,249-177-379- C-32	W3RNY 28,968-71-136- C-14
W3MZF 133,840-140-322- C-22	WA3HAN 28,116-71-132- B-18
W3AXW 125,452-158-266- C-39	W3CSZ 22,110-67-110- B-11
W3HVM 124,845-145-287- C-23	W3DFL 17,328-76-76- C-
W3BQN 119,472-131-304- B-65	W3WIS 13,392-62-72- C-36
K4GSU/3 68,400-81-289- B-24	W3AEL 11,828-51-76- C-6
W3JXS 61,880-91-228- A-41	W3AZD 7,215-37-65- C-10
W3AYS 56,052-108-173- C-	W3DRP 5,292-42-42- B-
W3KA 44,226-81-182- C-20	WA3DSD 3,066-21-43- A-8
W3IMZ 35,972-93-131- A-35	W3ONQ 492-12-14- A-12
W3PBE (W4TRF, opr.) 30,024-72-139- B-15	W3TMZ/3 (7 oprs.) 2,331,394-102-2099- A-48
W3RNY 28,968-71-136- C-14	W3MSK (9 oprs.) 2,492,037-409-2031- A-48
WA3HAN 28,116-71-132- B-18	
W3CSZ 22,110-67-110- B-11	
W3DFL 17,328-76-76- C-	
W3WIS 13,392-62-72- C-36	
W3AEL 11,828-51-76- C-6	
W3AZD 7,215-37-65- C-10	

WA0CPX 5,184-36-48- C-15
DELTA DIVISION
 Arkansas
 K5TYW 80,724-124-217- C-20
 WA50WZ 21,240-60-118- A-18

Louisiana
 W5KC 427,314-229-622- C-60
 W5BIK 271,488-202-448- C-57
 W5BJG 14,400-60-80- B-35
 W5MQQ 13,338-57-78- C-16
 WA5JWU 8,241-41-67- B-11
 W5JFB 540-12-15- A-

Mississippi
 K511N 443,538-246-601- C-66
 W5CKY 208,256-247-416- C-38
 W5MUG 119,472-152-262- -
 W5WZ 25,185-73-115- A-30
 WA5HEC 10,500-50-70- A-30

Tennessee
 W4NBV 595,602-261-763- C-70
 W4RKV 150,630-149-337- C-60
 W4EWR 3,132-29-37- B-
 W40CG 288- 8-12- B-8

GREAT LAKES DIVISION

Kentucky
 WA4TWB 73,500-100-245- C-37
 W4CVT 66,120-145-152- A-39
 W4MPV 35,298-74-159- C-10
 K4GOU/4 13,356-53-84- B-
 K4DZM 5,880-40-49- B-11
 WA4ZIR 1,518-22-33- A-3

Michigan
 W8DUS 577,710-262-735- C-85
 W8RXY 453,435-215-703- C-80
 W8BGT 203,087-189-411- C-40
 W8VFC 202,402-167-402- C-45
 W8EW 143,445-131-365- AC-48
 K8EJZ 140,094-129-362-BC-31
 W8SCU 79,500-106-250- C-34
 W8WVU 49,350-94-175- A-57
 K8CGD 35,697-73-163- B-34
 W8DGP 29,028-59-164- A-20
 W8EJZ 15,456-46-111- C-19
 W8SS 11,232-48-78- C-14
 WA8CZH 5,766-31-82- B-2
 W8TJW 4,560-34-45- C-8
 W80FW 4,092-31-44- C-18
 W8ECP 1,425-19-25- A-7
 K8HKM 972-18-18- A-18
 WA8OSL 900-15-20- A-6
 WA8MCQ 588-14-14- A-4

W8UM (8 oprs.)
 2,007,800-450-2228-BC-96
 WA8GLY (WAs8 GLY HJ) 504,804-236-713- C-91
 W8REN (WAs8 MAM QAF RVE) 27,729-79-117- B-48

K8ZXM 42,660-79-180- A-33
 W8UFX 42,042-98-143- C-16
 W8GOC 35,313-79-149- A-
 W8LUZ 34,125-91-135- C-14
 K8S8Z 32,550-62-175- B-42
 WA8TYF 31,098-71-146- A-24

W2GGE 1,118,271-329-1139- C-70
 W2LXK 966,300-300-1007-BC-72
 WA2UWA 588,336-238-824- B-60
 W2IRV 502,994-248-676- B-57
 W28UC 423,384-236-598- C-47
 W2AYJ 389,856-248-524- C-35
 W2GKZ 283,095-233-405- C-30
 W2WZ 263,520-180-488- C-27
 W2YCW 262,086-209-418- C-35
 W2ZKQ 244,602-214-381- C-42
 WB2PON 213,954-169-422-AC-32
 W2RDD 178,011-171-347- C-31
 W2AZS 174,348-167-348- C-43
 W2ZV 99,750-133-250- A-51
 WB2PCF 52,020-85-204- B-26
 W2HAE 37,638-82-154- B-21
 W2CR 33,102-54-205- B-36
 W2TVT 29,250-65-150- B-54
 DJ1ZN/W2 26,151-69-127- B-30
 W2NGG 25,480-70-122- A-32
 WB2JOX 23,856-71-112- C-16
 W2EQG 22,875-61-125- A-24
 WB2RNL 22,374-66-113- A-21
 WA2PNY 11,139-47-79- C-10
 WA2YJN 7,068-38-62-AB-13
 W2JB 6,018-31-59- A-12
 K2UVV 5,106-37-46- B-3
 W2AFM 4,500-30-50- B-21
 K2QOU 2,464-28-30- B-4
 WB2QHQ 2,028-26-26- A-4
 W2RPP 1,254-19-22- B-7
 W2NHH 1,122-17-22- A-12
 K2HGR 396-11-12- B-1
 WA2LQO (7 oprs.)
 232,686-186-417- C-60



That little message reflects the feelings of the W8UM crew after two months of preparation in cold snowy weather that saw the main tower fall two days before the first weekend. Last year they thought it couldn't be done but (left to right) here's the successful task force, WB2FIT W8FAW W8VSK W8CQN and K2SIL.

Ohio
 W8ZJM 544,492-283-644- C-61
 W8GQU 381,231-231-551-BC-76
 W8ZCQ 373,824-226-528- C-50
 W8RWU 358,248-236-506-AC-67
 W8FDD 292,608-192-508- B-56
 W8TFL 283,692-209-459- B-67
 W8CLD 187,995-151-415- C-70
 W8AJW 152,496-144-353- A-49
 W8ELE 147,201-139-353-AC-65
 W8GIM 129,987-143-303- B-37
 K8EHL 123,255-163-249-AC-29
 W8PDC 110,559-134-275- C-59
 WA8CIA 100,464-104-322- B-66
 K8WPF 91,134-122-249- C-43
 W8KPO 89,259-125-338- C-28
 W8YGR 83,952-132-212- B-18
 W80KB 79,596-134-198- C-
 W8MCR 73,485-115-213- C-21
 W8QXQ 68,310-115-198- A-32

W8YCP 26,880-89-112- C-
 W8MKE 25,920-64-135- A-20
 K8BSM 24,570-78-105- C-16
 W8PKU 22,230-65-114- C-
 W8FTNO 20,670-65-106- A-31
 W8QDH 19,758-74-89- B-15
 W8H8K 19,404-66-98- C-19
 K8NMG 18,786-62-101- B-11
 W8LVT 17,472-52-112- B-26
 W8BWM 16,848-72-78- B-13
 W8KC 16,005-55-97- C-16
 W8PC8 15,120-60-84- B-10
 W8KMP 13,311-51-87- B-10
 K8BPX 12,768-56-76- C-10
 W8ICF 11,928-56-71-AB-25
 K8GVK 8,385-43-65- C-15
 W8ILC 7,236-36-67- A-
 W8SRQ 5,328-37-48- B-8
 W8BSR 5,310-30-59- A-37
 W8VZE 4,653-33-47- B-7
 W8AJH 4,536-36-42- C-13
 W8EZW 3,996-36-37- C-9
 W8KYD 3,967-27-49- A-12
 WA8MQQ 2,958-29-34- A-8
 W8DZG 2,112-22-32- B-12
 WA8LWH 2,046-22-31- B-4
 W8AEB 1,482-19-26- A-4
 K8KRZ 243-9-9- B-9
 K8DZR 168-7-8- A-2
 K8PYD 168-7-8- A-2
 K8PXD 3-1-1- A-1
 W8EDU (W8s AJR AZA, WA8MGI)
 237,762-189-028- C-64
 WA8LJK (WAs8 ADJ OHS RCN)
 51,243-93-184-AB-39
 W8DKI (W8DKI, WA8PZA)
 6,663-39-57- C-8

Northern New Jersey
 W2VJN 1,543,566-493-1258- C-78
 K2GUN 731,442-303-808- C-71
 WB2CRX 471,096-216-727-AC-70
 W2HUG 249,054-186-481- A-56
 WA2HTU 200,940-470-394- B-60
 K2DNL 167,814-142-394- B-65
 K2KFT 165,215-165-335- B-40
 K2KPT 150,213-161-311- B-40
 K2KPF 147,888-158-312- B-27
 W2LYO 121,365-155-261- B-32
 WB2RJJ 87,123-113-257- A-54
 WB2RKK 85,122-122-234- A-42
 W2IWP 74,520-120-207- A-31
 W2HL 72,324-123-196- C-18
 WB2NZU 71,253-91-261- A-
 WB2JGO 66,708-109-204- A-42
 W2NEP 61,605-111-185- A-18
 W2DMJ 55,536-104-178- A-22
 WB2TFK 55,200-92-200- A-32
 K2ABC 45,600-89-190- B-55
 W2AZZE 42,120-90-156- B-38
 W2JK 16,863-73-77- A-10
 WB2PMK 8,775-39-75- A-9
 W2CJY 8,178-47-58- B-12
 W2ADP 5,957-37-55- A-26
 WB2OHK 5,358-38-47- C-
 WA2IDM 2,772-28-33- B-6
 WB2NLH 2,415-23-36- A-21
 WB2VIS 330-10-11- A-
 W2MNV 243-9-9- A-7
 K2USA (4 oprs.)
 529,970-226-785- C-50
 WB2WID (WB2s UGX WID)
 31,434-62-160- A-34

MIDWEST DIVISION

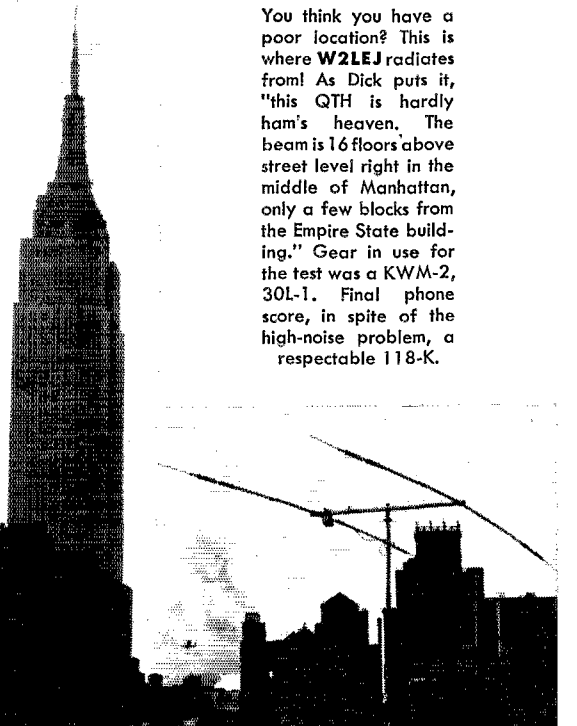
Iowa
 W0FDL 443,667-259-571- C-60
 W0HNA 300,120-205-488- C-60
 W0CQC 139,464-156-298- B-49
 W0BSY 130,032-144-301- C-46
 WA0KXJ 5,700-38-50- A-12
 WA0KST 2,550-25-31- B-13

Kansas
 W01NH 70,110-123-190- C-31
 K0BYC 24,024-77-104- A-53
 W0WPL 13,635-45-101- B-44
 W0IEM 9,798-46-71- B-29

Missouri
 W0BMM 402,054-226-503- C-75
 W0TDR 347,424-224-517- C-63
 W0BEM 336,334-192-584- C-55
 W0OAW 267,249-229-389-BC-74
 W0RSZ 74,400-120-207- B-55
 K0CSV 43,982-98-153- C-12
 W0GAX 42,777-97-147- B-
 W0AFV 40,185-95-141- B-48
 K0TDP 31,050-75-138- C-
 K0GPF 16,356-47-116- A-

Eastern New York
 W2MEL 1,173-395-331-1183- C-80
 WA2OJD 576,816-244-788- C-54
 W2HO 559,602-241-744- C-72
 W2HSZ 327,375-225-485- B-45
 W82YNX 47,376-112-144-AC-39
 WB2UDF 38,916-69-188- A-33
 W2AWF 31,428-76-151-BC-15
 K2AJA 28,560-89-119- B-7
 WB2HBI 20,460-62-110- A-
 WB2VUD 10,767-37-97- A-37
 W2IP 3,132-29-36- B-
 WB2WRH 192-8-8- A-1
 K2SSX/2 48-4-1-AC-1
 W2YWO (W2YWO, WA2CPG)
 339,270-215-526- B-84
 N.Y.C.-L.I.
 WB2CKS 1,160,499-339-1157- C-80

You think you have a poor location? This is where W2LEJ radiates from! As Dick puts it, "this QTH is hardly ham's heaven. The beam is 16 floors above street level right in the middle of Manhattan, only a few blocks from the Empire State building." Gear in use for the test was a KWM-2, 30L-1. Final phone score, in spite of the high-noise problem, a respectable 118-K.



K0JPL 12,996-57-76-B-12
 WA#NOH 10,086-41-82-A-33
 WA6OXO 2,139-23-31-A-24

Nebraska

W8IDW 258,630-185-166-ABC-
 K9OAL 2,214-18-41-A-9

NEW ENGLAND DIVISION

Connecticut

W1BIH 1,268,064-336-1258-C-71
 W1ECH 850,626-301-942-B-70
 K1ZND 731,557-277-881-A-70
 W1BGD* 429,885-233-615-C-40
 K1ZVU 340,416-192-591-C-35
 W1DIT 220,800-184-400-C-51
 W1CNU 211,464-198-356-B-45
 W1TX 176,472-152-387-ABC-33
 W1WPO* 157,950-117-450-C-
 W1IAH 150,398-139-367-BC-55
 W1AJO 134,808-137-328-B-33
 W1BDI 113,230-130-291-BC-37
 W1FTX 94,119-137-229-B-28
 W1GYE 85,320-90-316-C-30
 W1ZJJ 75,810-95-266-AC-
 K9CVO/1 73,715-115-214-AB-50
 W1WY 53,217-81-225-AC-21
 W1A1CQW 27,454-74-124-A-37
 K1HTV 25,620-70-122-A-
 W1EZM 17,172-54-106-A-29
 K1THEQ 3,978-26-51-A-3
 W1AFGN 1,932-23-28-B-4
 W1LVQ* 300-10-10-B-1
 W1AW (W1s Q1S WPR,
 WA1CYT) 97,920-120-272-C-
 Eastern Massachusetts
 K1DIR 1,817,174-382-1583-C-81
 W1BPW 1,479,450-350-1428-AC-68
 W1JYH 1,401,177-359-1301-C-64
 K1UHY 929,781-309-1003-C-60
 K1YKT 635,006-266-800-B-65
 K1EUF 591,336-258-764-C-
 K1CDN 453,980-291-520-C-66
 K2CHQ/1 400,527-233-573-C-56
 W1FJJ 376,380-246-510-C-53
 W1EHT 255,348-164-519-B-50
 W1NIV 180,120-136-265-C-30
 W1M0 80,400-134-200-AB-17
 W1BQL 79,930-110-221-A-33
 W1AGRP 72,105-115-209-B-
 K1EIN 37,350-75-166-C-18
 W1DDO 29,700-99-100-A-19
 W1PLJ 4,538-31-52-B-12
 K1UOA 3,532-32-38-B-12

Maine

W3MQR/1 2,442-22-37-B-

New Hampshire

W1DTY 209,520-180-388-C-53
 W1DYE/1 159,738-151-346-A-20
 W1DXB 37,944-72-177-A-47
 W1AFGN 21,905-65-113-A-4
 K7LUP/1 11,868-46-86-B-20

Rhode Island

W1GOG 287,028-201-476-B-51
 W1AGP 127,800-150-284-A-38
 W1YRC 70,308-108-217-C-15
 K1UKC 34,272-84-136-B-36
 WA1BLC 31,317-73-143-A-
 W1RFQ 10,065-45-79-B-8
 K1UX 765-15-17-A-4
 K1NQG/1 (W1s BOP GD) 22,525-53-178-AB-37

Vermont

K1NHR 44,175-93-158-B-24
 W1ETV 22,557-73-103-A-15

Western Massachusetts

W1EOB 472,149-261-603-C-40
 W1E2D 285,120-180-533-C-
 W1UZX 252,486-169-498-B-49
 W1YK (4 oprs.) 72,261-111-217-A-21

NORTHWESTERN DIVISION

Idaho

K7CPC 44,229-69-208-A-40
 K7MKW 1,260-20-21-AC-5

DIVISION LEADERS

C.W.			Phone	
Single Operator	Multioperator		Single Operator	Multioperator
W3BES	W3YUW	Atlantic	W3BES	W3MSK
W9IOP	W9GIM	Central	W9EWC	.....
K9ORK	.....	Dakota	K9EIA	W9IVZ
W4NBV	.....	Delta	W4NBV	.....
W8DUS	W8UM	Great Lakes	K8DOC	WA8GUF
W2VJN	K2USA	Hudson	W2FON	K2GL
W8FDL	.....	Midwest	WA6EMS	W8LTE
K1DIR	W1AW	New England	K1DIR	W1YQF
W7MX	W7SFA	Northwestern	W7ESK	.....
W6WX	W6UMI	Pacific	W6OHJ	W6UMI
W4KFC	W4BVV	Ronoke	W4CQW	W4BVV
W5DQV	.....	Rocky Mountain	W9GAA	.....
W4LCP	W4ZXI	Southeastern	W4AXE	W4ZYS
W8ITA	W6RW	Southwestern	W8ITA	W6CCP
W5BRR	W5AC	West Gulf	W5KTR	W5EHY
3C2NV	3C5US	Canadian	VE1PL	3C3FHO

Montana

K7ABV 114,912-126-304-C-25
 W7QB 20,223-63-107-A-20

Oregon

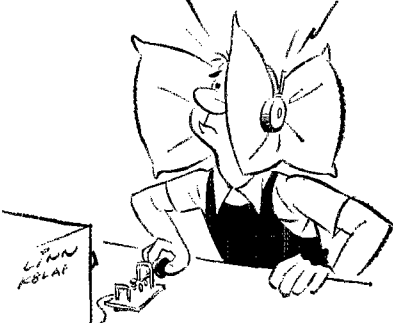
W7BTH 64,386-98-219-C-21
 W7CGR 57,672-72-272-A-39
 W7PJC 52,243-84-209-C-35
 WA7DAC 28,896-43-224-A-50
 WA7ANB 27,537-67-137-BC-26
 W7YEX 21,546-57-126-C-24
 W7ACC/7 10,701-41-87-C-24
 WA7CAC 9,657-87-87-A-24
 K7KCZ 231-7-11-B-5

Washington

W6CNA 94,572-111-284-C-60
 WB6TOJ 90,210-97-310-B-68
 W6AW 16,680-40-139-B-17
 W6RGG (K6ALH, W6RGG) 532,080-240-739-C-80

Sacramento Valley

W6NKR 390,661-241-541-C-72
 W6GRX/6309,813-199-519-C-66
 W6E0U 237,744-156-508-C-76
 WA6JDT 19,293-59-109-A-21
 K6DQB 4,500-30-50-A-19
 K6TWE 2,601-17-51-A-8
 W6BLI 756-14-18-B-



EARS WERE IRRITATED FROM WEARING HEADSETS ... HAD TO PUT BAND-AIDS ON BOTH EARS!
 (W2SLC)

California

W6JKJ 275,310-190-483-C-42
 W6ISQ 258,336-184-468-C-45
 WA6YMX 210,864-184-382-C-76
 W6DZZ 199,920-170-392-C-50
 VE3DXV/96 196,992-152-432-C-57
 157,320-152-345-C-44
 W6VVR 124,848-136-306-C-30
 W6BKBK 81,732-98-278-B-59
 W6PLS 77,490-109-237-C-32
 K6CQF 56,604-108-178-C-
 W6BCE 55,550-90-205-C-24
 W6BKRW 50,160-80-209-A-36
 W6ATO 42,240-64-220-C-
 W6KHS 36,654-82-149-B-18
 W6QDE 28,298-72-131-C-23
 W6CLM 27,456-64-143-C-39
 K6TZX 16,929-57-99-A-20
 W6AMBL 9,360-40-78-A-11
 K6VFN/6 3,000-25-40-A-8
 W6CLZ 2,738-19-49-B-7
 W6GUOL 84-4-7-A-2
 W6UMI (W6UMI, WA6SII, W6BKIC) 657,068-246-033-C-
 W6GQK (W6s GQK SR) 580,554-234-827-C-87
 K6LY (W5RFI, W7YAQ, VE3DRV) 236,493-171-461-C-49

ROANOKE DIVISION

North Carolina

W4OMW 210,160-142-494-C-54
 W4TMR 125,871-126-333-A-60
 W4DUQ/4 76,590-111-230-C-
 W4WUX 27,864-72-129-A-23
 WA4LSA 24,388-67-122-C-
 W4VON 912-16-19-C-6
 WN4ERT 528-11-16-A-6

South Carolina

WA4KU 657,720-290-756-C-80
 W4DMT 263,670-170-517-AB-70

Virginia

W4KFC 1,749,840-368-1585-C-74
 W4CKD 659,232-327-672-C-68
 W4PTR 649,587-271-799-C-72
 W4YGY 620,016-268-777-B-66
 W4DKU 392,418-234-559-C-47
 W4ZSH 359,315-235-511-C-65
 W4CQI 316,992-208-508-B-42
 309,843-199-521-A-54
 W4DVT 271,846-218-415-C-55
 W44VL 201,960-153-441-C-48
 186,366-178-351-C-54
 167,739-149-391-C-21
 W4CRW 158,925-163-325-A-62
 W4ZM 129,438-153-282-C-18
 K4AEV 119,136-136-292-C-12
 85,120-112-254-C-18
 21,948-62-118-A-22
 12,535-57-85-B-
 12,084-53-76-B-15
 8,556-46-62-A-5
 W4YZC 5,916-34-53-C-5

Washington

W7MX 246,510-165-498-C-56
 W7VRO 214,245-135-529-C-55
 W7RGL 38,893-79-156-C-25
 W7CRR 17,568-48-122-B-10
 W7IEU 13,923-51-91-A-
 WA7BDF 8,849-49-47-A-30
 WA7FOE 5,184-24-72-A-15
 W7DZW 3,425-25-47-B-10
 W7SFA (W7s DC HAX SFA) 1,095,120-270-1352-AC-96

PACIFIC DIVISION

East Bay

WA6IVN 406,575-195-698-C-51
 W6LLD 387,168-218-593-C-60
 W6BSY 217,405-183-396-C-44
 W6EWN 208,656-168-414-C-23
 W6PQW 180,960-104-580-C-
 W6KJS 159,294-139-382-C-33
 W6FLT 117,936-112-351-C-
 WA6HAE 101,205-117-293-C-30

San Francisco

W6WB 393,543-219-599-C-75
 WA6IVM 337,746-181-622-C-61
 W6ERS 560,232-251-744-C-85
 K6ANP 249,875-185-506-C-70
 W6B1P 176,565-149-395-C-40
 W6CYV 65,007-93-233-C-20

San Quentin Valley

W6UJ 429,495-209-685-C-80
 W6KTV 261,096-184-473-C-61
 W6QQW 15,141-49-103-C-37
 W6BYH 2,310-32-35-A-7
 W6FYM 1,827-21-29-C-6
 W6MMH 1,425-19-25-B-7

Santa Clara Valley

W6WX 828,828-276-1001-C-68
 W6CUF 792,945-263-1005-C-66
 W6HOC 582,876-252-771-C-68
 K6ERV 323,010-185-582-C-40
 W6KEV 316,932-196-539-C-48
 WA6QGW 288,900-214-450-C-36

W4NXXF 5,250-35-50-B-13	K5STL 335,475-213-525-C-72	WA4HOM 3,534-31-38-C-	Georgia
W4JVN 390-10-13-A-3	W5DWB 202,391-151-477-AB-40	WA4WAO 3,108-28-37-C-7	W4DXI 574,740-279-689-AC-79
W4RVV (7 oprs.)	W5QBV 23,010-65-118-C-18	K4KJD 1,326-17-26-C-7	WA4CZM 12,831-47-91-A-25
1,790,980-477-3348-AC-96	K5MAT 10,656-48-74-A-17	WB4ADT 1,134-18-21-A-9	WA4EPM 2,886-26-37-A-12
K4ZA/4 (5 oprs.)	Utah	WN4ENX 48-4-4-A-1	WB4DRA 75-5-5-A-6
1,441,650-350-1373-3-48	W7NPU 280,670-170-565-C-65	Eastern Florida	Western Florida
W4KXV (5 oprs.)	K7OXB 94,500-105-300-C-30	W4LCP 949,491-329-982-C-76	K40A 274,023-199-459-C-49
1,199,622-323-1238-AC-48	W7EZC 5,538-26-71-A-14	W4BRB 707,183-287-819-A-85	
West Virginia	Wyoming	K4YYL 508,515-251-755-C-85	SOUTHWESTERN DIVISION
WA8QYK 10,920-56-65-A-34	W7PSO 70,686-102-231-C-29	W4WYJ 238,360-216-447-A-44	Arizona
W8HKK 3,016-24-28-A-	SOUTHEASTERN DIVISION	W4KET 243,747-219-371-C-39	W9ERU/7 552,500-260-714-C-87
WASHSB 1,350-18-25-A-11	Alabama	W4HOS 219,024-208-351-B-56	W7PGX 440,073-243-605-C-66
ROCKY MOUNTAIN DIVISION	W4GRG 635,964-268-791-C-80	W4ELE 194,856-184-333-C-53	W7AYY 284,598-163-582-C-61
Colorado	W4FVY 205,590-178-385-C-39	W4PRO 119,103-150-265-A-C-27	W7ATA 208,054-193-360-C-51
WA0CVS 248,886-198-419-C-50	W4CGS 187,313-198-333-C-42	W4FZW 108,051-138-261-A-35	W7IMA 272,550-230-395-B-48
VE7BEN/W6	W4KVC 177,855-167-355-C-65	W4BYB 70,956-81-292-A-58	W7ATV 208,054-193-360-C-51
17,419-99-228-C-32	W4DII 101,010-130-259-C-31	WB4DJT 68,587-107-214-B-58	W7ENA 9,960-72-151-C-20
W0LBP 13,455-39-115-A-16	W4NML 67,710-122-185-C-33	K4DGL 26,352-72-122-A-19	K7TVS 9,960-40-83-A-49
W0EYS 8,424-39-72-A-35	W4USM 62,376-113-184-C-14	W4ZOK 21,390-62-115-B-4	W7UUU 2,574-26-33-A-16
W0KFX 1,224-17-24-B-3	K6SRM/4 43,776-96-152-B-30	K4YBE 5,880-40-49-B-14	Los Angeles
New Mexico	K4WSE 25,338-82-103-B-47	WA4SDK 2,958-29-34-A-12	W6FTA 1,160,583-283-1367-C-84
W5DQV 351,575-175-671-C-57	K9KWB/4 22,152-71-104-B-18	W4ZXI (5 oprs.)	W6NJU 663,000-250-884-C-60
		1,213,112-347-1166-C-96	WA6EPQ 605,772-237-852-C-76
		W4ZYQ (W4s ZYQ ZYS)	
		27,784-92-102-C-10	

Over 300 QSOs/band — DX											
	75	40	20	15	10		75	40	20	15	10
CR6GM				333		OH2AM*			1388	1159	504
VQ9AR			420			OK1MP			343	613	315
ZD3G			1966			ON4NAI				503	
ZD5R			183	954	573	ON4ZU			366		620
ZS4JB			505			N5GF				445	
ZS6DW			799	471	921	Z7BG					359
ZS6FN					323	V08L			327	963	430
ZS8L			368	418	492	PA8DEC				359	
3C3FJZ/SU*			1034	466	341	PA8UC					384
5N2AAF			395	437	838	PA8XPQ			445	668	1115
7X0AH			457			SM4CLH					338
9Q5FV					327	SM4CMG			646	752	726
			648			SM6DLL			363	731	
EP2BQ			847	587		SM0RUO					365
EP3AM				440		V0VL			343		
HL9US*				633		FXWKE					345
JA1CIB				647		GARTEK*			492		
JA1CG				455		A3DR				507	
JA1OCA				521		A6XG			651		
JA1MIN				404		UITU*			438	775	647
JA8SW				437							
KA2JP				764	722	O8RA				522	
KA7AB			460	336	820	H18XAL	388	807	794	1216	1224
KA9MF*			401		428	HK6AI					318
KG6LJ*				482		HPLJC			352	666	785
KR6AB						KL7EBK			918	560	
VU2KV			355			KL7GAK		407			
ZC4FN					603	L7VAH*				570	341
						P4AST			1498	915	913
DJ2YA			1046	1042	843	V4AM			842	584	1092
DJ2YL				627		Z5SO			379		683
DJ6QT			987	1150	1101	P2AZ					530
DJ6TS*			1111	874	429	P2KR					567
DJ9LI				559		P5RB			694	1328	674
DL4NS				321		VP5RS			516	655	1378
DL6VP					442	VP7NH			633	589	691
DL6WE					308	YSXOB			379	525	922
DL7LJ					370						
DL8PC				421		DUIFH			678		330
DL8RM			334			G6AQA					472
DL9PU				577	683	H6BZF					802
DL0EV*				339	351	H6LJ			1027	1107	1686
EA2EL				320		H6UL		494	686	899	1498
F2SI			311	532		0PAN/KH6			555	553	1062
F2YS					325	N6DB			462	445	
F3KW			938	1375	729	K2FU		318	1197	329	553
G2QT				467	562	K3ARX			404		
G3CAZ				338	612	ZK1AR			664	429	595
G3IAR			335	665	670	ZL1AGO			328	334	337
G3LNO				443		ZL1KG			871	685	732
G3SME*			380	509	514	ZL3QH			888	450	477
G3UML			650	557	650						
G3USF					561	E6FF					574
G4JZ			451	394	1234	G6EJZ			763	999	1382
G82DX*			607	1232	636	CX2CN					815
GM3BCL					874	CX9CO					522
HB9DX				339		HK3RQ			556	432	522
HBAF			1197	1365		HK4KL			1961	1588	773
HFLD				433	377	HY1BYK/7			1360	1280	527
HKPK				418	425	X1CK			424	724	367
IIMOL						XY2NM*			371		
IIMQJ			1014			YV5BPG			1378	571	527
IIRB*				534	690	8RIG			667	689	339
IS1VAZ				560	459						468
LAIH				335	371						

* Multi-operator Station.

W6TED 493,506-222-741- C-50
W6MUB 340,389-185-610- C-68
WB6IQI 255,130-178-479- C-45
W6VNJ 234,468-167-468- C-47
W6FSJ 228,150-169-450- -
W6RCV 170,940-140-407- C-46
K8YYQ 162,540-140-387- C-68
WB6LED 157,500-125-420- C-50
W6NEX 152,862-148-349- C-54
K8YRD 148,365-138-367- C-33
W6AM 119,246-109-366- C-40
W6PQT 94,656-136-232- C-30
W6EJJ 80,640-112-240-AC-56
WB6MOC 60,300-100-201- C-
W6JZP 52,170- 94-185- C-26
W6FRZ 50,730- 89-190- C-
WA6URY 49,170-110-149- C-32
WA6KHK 45,075- 75-201- A-50
W6APH 43,788- 89-164- C-54
W6ONG 41,736- 74-188- A-30
W6IBD 41,712- 88-158- -
WB6UHF 36,465- 65-187- A-22
W6UED 23,598- 57-414- -
W6TMP 21,384- 66-108- -
W6HS 4,875- 25- 65- C- 8
W6BUD 2,052- 18- 38- C- 4
W6FZX 1,638- 21- 26- A- 6
WB6TMC 1,620- 18- 30- A- 7
W6DGH 1,482- 19- 26- C- 2
K6SUC 990- 15- 22- B- 4
WB6LCS/6 210- 7- 10- B- 1
W6AM/6 27- 3- 3- C- 1
W6RW (9 oprs.)
2,734,884-418-2180-AC-94
K6CEO (K6s CEO DDO)
217,800-150-484- C-70
WB6HGU (WB6s HGU NWK)
105,948-108-327- C-96
K6OYG (K6s OYG TTJ)
55,404- 76-245- C-67

Orange

WB6CWD 466,320-240-650- C-60
W6SRF 264,075-175-503- C-40
WA6TLL 148,700-150-326- A-56
W6AMO 44,814- 77-194- A-50
W6QFU 33,406- 85-131- B-34
WB6RTJ 21,285- 55-129- C-19
C32ATU/W6
15,264- 53- 96- C-
WB6PFV 1,152- 13- 32- A-10
W6ANN (W6s ANN DFY,
WA6GLD)
737,586-261-942- C-88
W6CCP (W6s CCP HOH)
436,278-178-838-

San Diego

W6CHV 148,863-143-347- B-57
WB6IEX 30,240- 72-140- B-35
K6CNV 12,528- 48- 87- A-15
WA6DMN 9,576- 38- 84- B-13
W6GBI 4,617- 27- 57-
WB6VKB 912- 16- 19- A-15
W6DCM (WA5CAC, K7WPC)
1,551- 11- 47- C-

Santa Barbara

W6AGO 219,000-200-365- C-52
W6ULS 150,732-159-316- C-28
WB6SCQ 12,804- 44- 97- A-
W6GEB 3,276- 28- 39- A- 6
WB6DPV 3,128- 23- 46- A-10

WEST GULF DIVISION

Northern Texas

WA5BFB (WA5CBE, opr.)
544,877-279-651- C-79
WA5JMK 182,880-160-381- C-35
WA5RQA 102,582-139-246- C-39
W5OBS 67,628-106-214- C-53
WA5JSI 44,232- 97-152- C-50
WA5PQI 31,440- 80-131- A-25
W5QG 9,348- 41- 76- A-13
W5PQY 8,280- 40- 69- C-19
WA5LFD 5,022- 31- 54- A-
WA5BXC 4,752- 33- 48- B-28
WA5AUR/5 1,122- 17- 22- A-10
W5MSG 540- 12- 15- B- 7
WA5NHI 126- 6- 7- A- 5

Oklahoma

W8KGF 265,065-205-431- B-55
K5VTA 170,172-163-350- B-65
K5JVF 24,603- 59-140- B-40

DX CONTINENTAL CHAMPIONS

C.W.

Phone

<i>Single Operator</i>	<i>Multipoperator</i>		<i>Single Operator</i>	<i>Multipoperator</i>
ZD8J	.....	<i>Africa</i>	ZS6DW	3C3FJZ/SU
JALCWZ	UA6KFG	<i>Asia</i>	KA7AB	KA9MF
GI3OQR	OH2AM	<i>Europe</i>	DJ6QT	OH2AM
H18XAL	KL7AIZ	<i>N. A.</i>	H18XAL	KL7WAH
KH6IJ		<i>Oceania</i>	KH6IJ	KS6BV
PY2BGL	LU1DAY	<i>S. A.</i>	HK3RQ	PY2NM

*Single-operator continental DX champions win the plaque.

K5JZN (K5JZN, WA5KFS)
47,460- 70-226- C-26

Southern Texas

W5BRR 790,128-279-944- C-89
K5ABY 361,383-233-517- A-72
W5MCO 109,368-147-248-AC-48
K5QMG 81,360-120-226- B-72
W5LJT 54,495-105-173- C-13
WA5OKC 7,296- 38- 64- A-14
WA5ENK 3,042- 26- 39- A-36
W5ULN 612- 12- 17- A- 4
W5ACL 126- 6- 7- C- 1
W5A7 (7 oprs.)
386,022-202-637- C-96

CANADIAN DIVISION

Maritime

VO1HH 195,951-147-475- B-33
VO1AW 187,085-141-395-AC-40
VE1EK 55,536- 89-208- A-32
VE1HM 47,472- 92-172- -
VE1AE 28,224- 49-192- A-30
3C1ZF 10,125- 45- 75- A-31

Quebec

3C2NV 605,472-272-742- A-85
VE2WA 377,316-233-564- C-55
3C2BV 305,250-185-550- B-49
VE2AYU 278,970-170-547- A-81
3C2DCW (VE2s HOW DCW)
92,344-119-259- A-49

Ontario

VE3ES 126,048- 96-438- C-41
VE3DBB 53,400- 89-200- B-35
VE3WB 52,155- 95-183- B-47
VE3IJ 26,331- 67-131- C-36

VE3FID 12,528- 59- 72- C- 9
VE3BS 11,715- 55- 71- A- 9
3C3MZ 6,480- 40- 54- B-10
3C3EUP 3,627- 31- 39- A-
3C3FYP (3C3s FYP GCS)
100,764-108-311- B-55
VE3UR (VE3s CTJ UR)

Saskatchewan

VF5PM 56,448- 98-192- B-
VE5DP 15,219- 57- 89- B-25
VE5DZ 1,326- 17- 27- A-12
3C5US (VE5s DK UP)
491,385-235-722- C-85

Alberta

3C8ASH 43,452- 71-206- A-40
VE6SX 18,144- 54-112- A-
VE6VY 4,563- 38- 47- B-11
3C6ATH 2,604- 28- 31- C- 6

British Columbia

VE7HQ 8,330- 35- 80- A-25

AFRICA

Angola

CR6GO 1,363,635-185-2457- B-70
CR6AI 727,698-164-1479- B-52
CR6CK 633,786-146-1447- A-
Mozambique
CR7CI 1,536- 16- 32- A- 2

Canary Islands

EAS8J 18,048- 47- 128- A- 5

Liberia

EL2Y 253,800-120- 705- B-26

Seychelles

VQ9AR 602,280-140-1463- A-26

Swaziland

ZD5M 25,245- 51- 165- A- 7

Ascension Island

ZD8J 1,380,942-214-2151- A-48
ZD8UD 123,165-105- 391- A-
South Africa
ZS5RS 700,770-142-1645- A-44
ZS6FN 258,984-132- 654- A-24
ZS6AJU 152,746-106- 481- A-18
ZS6CW 28,812- 49- 196- A- 7
ZS1O 56- 4- 5- A-18

Tanzania

5H3KJ 243,712-112- 726- A-32

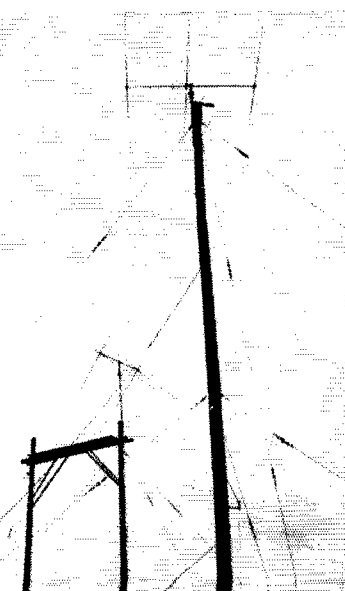
Somali Republic

6O6BW 229,308- 97- 778- C-
Senegal Republic
6W8BF 612- 12 16- A-
Algeria
7X6AH 22,278- 47- 158- A-
Sierra Leone
9L1TL 702,918-162-1451- A-52

ASIA

Iran
EP3AM 284,148-108- 877- B-44
EP2BQ 142,290- 85- 558- B-

A final phone effort from Asia for KA7AB did the trick to lead the continent with 1,104,846 and take a trophy back home to the U.S. Noteworthy too this year was the excellent participation by JAs on both phone and c.w.



Japan

JA1CWZ	707,940-171-1382	A-71
JA1EUV	503,460-157-1069	A-
JA2JAA	270,750-125-722	B-45
JA6TQ	208,104-92-756	A-28
JA5AB	184,590-105-586	A-
JA6TQ	208,104-92-756	A-28
JA5AB	184,590-105-576	A-
JA6AKW	183,744-87-707	A-
JA1MIN	182,730-94-648	A-
JA1EZX	161,298-103-522	C-8
KA2JP	151,872-113-448	C-17
JA1JKG	137,514-86-533	A-
JA3IGG	126-144-73-576	A-42
JA7FC	92,133-87-359	A-
JA2HO	81,120-80-338	A-
JA2LA	65,650-65-338	A-40
JA8SW	52,058-67-259	A-26
JA1NEC	47,338-97-488	A-29
JA2CPK	24,976-56-149	A-49
JA8BYP	16,695-45-124	A-
JA2FCR	14,314-34-140	A-
JA1JUQ	12,750-34-128	A-
JA2BTE	12,750-34-128	A-
JA2BTE	11,375-35-109	A-23
JA2IFH	10,836-36-103	A-22
JA8GR	10,296-22-156	A-5
JA1LXE	9,594-26-133	A-10
JA1QXC	6,678-18-124	A-
JA7UQ	6,650-25-90	A-
JA8BZL	5,038-22-77	A-10
JA2HFB	4,810-26-62	A-
JA3HCJ	4,460-20-75	A-14
JA2IRI	4,095-21-65	A-
JA1SKE	3,927-17-77	A-8
JA1SMA	3,102-22-49	A-17
JA7BP	3,021-19-63	A-
JA8BVX	2,890-13-57	A-16
JA8QA	2,720-16-57	B-
JA1ACA	2,538-18-47	A-
JA1RST	1,441-11-44	A-
JA2BNN	1,248-16-26	A-
JA2AIR	990-10-39	A-5
JA5BVV	940-10-28	A-
JA1BZM	495-11-15	A-3
JA7JW	483-7-24	A-
JA2GRM	440-10-15	A-
JA3EGC	264-8-11	A-
JA1WVY	198-6-12	A-
JA8J	15-1-5	A-3
JA4AEZ	6-1-2	A-
KA9MF (6 ops.)	213,900-115-620	C-

Ryukyu Islands

KR6AG	666-6-37-AB-3	
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Bahrain

MP4BFK	6,048-24-84	A-5
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Lebanon

OD5EJ	245,767-118-694	A-
OD5FC	12,936-42-103	A-

Turkey

TA2AC	178,752-98-608	A-36
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Asiatic Russian S. F. S. R.

UA9KCO	200,208-97-688	B-
UW9OU	131,976-52-846	A-
UA9PP	102,204-51-523	B-
UA6LH	62,400-52-400	A-



Russian c.w. multioperator competition is terrific. The UA0KFG crew led all activity from the Asiatic Russian S.F.S.R. with 826-K points. From left to right, replacing after the rigors of 1659 exchanges are UW0FM, UW0FK and UA0ER.

UA0TD	25,650-38-225	A-
UA9WS	25,272-54-159	A-
UA0TR	20,039-29-231	A-13
UA0KCA	14,964-29-172	B-
UA0MR	13,405-35-130	A-
UA0FV	11,616-32-121	A-
UA9AB	11,556-36-107	B-
UA9WR	7,569-29-87	A-
UA0LS	7,344-24-102	A-
UA9PL	4,347-23-68	A-
UA9JO	1,482-19-26	A-
UW9PT	1,260-15-28	A-
UA9KCC	900-15-20	B-
UA0KDA	396-3-44	B-
UA0KFG (5 ops.)	825,684-166-1659	B-67
UA0KZB (multiop.)	352,170-105-1118	B-
UA0KCO (2 ops.)	207,854-103-668	B-
UA0KUV (3 ops.)	161,380-80-672	B-
UA0KIA (4 ops.)	79,797-67-397	B-
UA0KCS (2 ops.)	10,602-31-114	A-
UA0KTE (2 ops.)	3,935-19-69	A-

Turkoman

UH8DH	4,248-24-50	A-
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Uzbek

UT8AI	15,840-30-176	A-
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Kazakh

UL7CG	21,600-45-162	B-
UL7JE	19,920-40-169	A-
UL7RL	15,327-39-131	A-
UL7GW	13,020-31-140	A-
UL7KAA	3,240-20-54	B-

Andaman and Nicobar

VU2DIA	18,768-34-184	A-
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India

VU2KV	54,990-45-408	A-
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VU2MSK	48,896-64-261	A-16
VU2GW	6,075-27-75	A-

Saudi Arabia

7Z3AB	25,812-36-239	B-11
9V1MT	2,256-16-47	A-
9V1OB	76-2-13	A-6

EUROPE

Portugal		
CT1OI	314,900-134-785	A-
CT1IQ	73,073-77-321	A-
CT1LN	8,568-34-84	A-

Germany

DL6WD	913,740-194-1570	B-
DL7AA	891,990-187-1595	B-80
DL1JW	782,320-176-1507	B-55
DL8KJ	666,630-162-1374	B-55
DM4WPL	567,900-150-1262	B-

DJ2XP	532,800-200-888	A-
DL1RK	381,120-160-794	A-
DJ2RT	285,798-109-874	B-
DK1CU	192,920-106-609	A-
DL6WE	125,557-103-409	A-
DL6VP	108,288-94-387	B-27
DJ4HR	95,496-92-346	A-
DL6DF	77,292-76-339	A-
DL7MQ	77,112-84-300	A-27
DL9EM	67,782-82-284	B-
DL2JO	62,964-81-259	AB-17
DM3LOG	59,882-79-257	B-
DL1JC	49,794-86-205	A-
DL1QT	49,608-78-212	B-9
DL3CM	49,059-79-207	B-
DM3YPD	46,605-65-239	A-
DL4ZI	45,990-70-219	B-
DL1TA	41,280-64-215	A-15
DK1DB	37,725-75-168	A-
DL4LA	35,053-57-205	A-34
DM3VGO	30,105-45-223	A-
DM4YEL	24,705-61-135	A-

DL5TK	24,552-44-187	A-25
DL1MD	18,792-58-108	B-20
DJ6OM	6,231-31-62	A-
DL4BC	3,795-23-55	B-
DL3WF	3,381-23-49	-
DM3RMA	1,890-14-45	-
DL1LP	756-12-21	A-
DM2AUG	378-9-14	A-
DJ7TK (DJ6TS, DJ7K)	1,169,532-189-2122	B-
DL8KO (DJ6WD, DL8KO)	942,462-186-1689	B-71
DL0FR (5 ops.)	866,187-189-1528	B-
DK1FZ (4 ops.)	224,409-127-589	B-

Spain

EA3KT	201,223-121-557	A-55
EA3NA	45,927-63-213	A-
EA2CR	11,220-34-110	A-

Balearic Islands

EA6BH	10,350-23-150	-
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Republic of Ireland

EI9J	662,590-193-1280	A-
EI5F	252,72-54-156	A-
EI3AK (multiop.)	694,200-135-1246	BC-

France

F8VJ	697,424-182-1278	A-49
F8ZF	254,001-129-711	A-40
F5SF	251,442-122-687	A-49
F8TM	135,309-111-409	A-
F2PO	134,748-114-395	A-
F8TQ	51,173-73-235	A-
F9BB	6,876-36-64	A-5

England

G4CP	1,446,552-222-2199	A-40
G2RO	861,883-187-1538	A-62
G2QT	610,050-166-1225	A-55
G3IAR	457,530-151-1010	A-
G2MI	452,790-162-1010	A-52
G3DC	447,447-149-1001	A-
G3JYP	441,450-150-981	A-
G3APN	233,610-130-599	A-
G3KQ	215,855-115-626	A-40
G3KMA	200,970-110-609	A-48
G3TFX	126,090-90-467	A-24
G2JB	64,242-83-258	A-
G3VNR	55,160-70-263	A-
G5AGA	42,570-43-330	B-7
G3OXI	44,835-43-115	A-23
G3WP	10,179-39-87	A-11
G3JFY	6,612-38-59	A-6
G3SSO (7 ops.)	1,912,464-228-2796	A-94
G3GRS (8 ops.)	1,007,064-197-1704	A-96
G3LPC (4 ops.)	787,169-181-1454	A-96

Ile of Man

GD3AIM	50,688-64-264	A-
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Northern Ireland

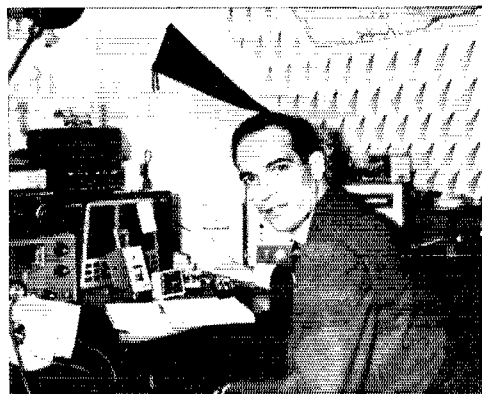
G13OQR	1,886,304-224-2807	A-70
G13SXG (G13s OTV SXG)	1,170,112-188-2171	A-58

TOP TEN
Single Operator

W/V/E	C.W.	DX	W/V/E	Phone	DX		
K1DIR	1,817,174	.H18XAL	3,257,550.	K8DOC	1,438,086	H18XAL	3,727,719
W4KFC	1,749,840.	KH6LJ	3,006,954.	W6ITA	1,369,170.	KP4AST.	3,142,500
W2VJN	1,543,566.	PY2BGL	2,572,434.	K1DIR	1,308,384.	KH6LJ	3,045,120
W9IOP	1,512,618.	KP4CRT	2,465,100.	W4QCW	1,243,350.	HK3RQ	2,876,246
W1BPW	1,479,450	HK0AI	2,425,686	W3RES	1,212,435	KH6UL	2,798,712
W3BES	1,472,499	PK2SO	2,315,502	W3BGN	1,157,760	HC1TH	2,676,398
W3GRF	1,417,248	HK3RQ	2,303,235.	W4AXE	1,157,652.	HK4KL	2,269,944
W1JYH	1,401,177.	KH6UL	2,083,200.	K2GXI	1,083,361.	DU6QT	2,247,264
W9EWC	1,358,016.	HK3BAE	2,076,737.	W4BCV	1,078,398.	VP6RS	2,053,350
W3MFW	1,296,552.	G13OQR	1,886,304.	K3NHL	1,065,594.	CE6EZ	2,012,208

<i>Scotland</i>		LA5GF	17,950-50-120-A-
GM3SVK	119,277-87-457-A-	LA2Q	14,964-43-116-A-24
GM2HCZ	47,586-77-206-A-21	LA7HJ	8,816-38-78-A-
<i>Wales</i>		LA1P	5,313-23-77-A-5
GW3JI	828,240-203-1360-A-88	LA5SH (LA2QK, LA5SH)	264,942-123-718-A-
GW3ITZ	(6 oprs.)	<i>Lucembourg</i>	
	735,098-182-1347-A-96	DJ6SI/LX	25,116-46-182-A-
<i>Hungary</i>		LX1LF	7,560-30-84-A-
HA1KSA	548,640-160-1164-B-67	<i>Bulgaria</i>	
HA5DJ	213,405-123-590-A-	LZ1YW	6,324-31-68-A-
HA8UH	26,835-53-235-B-	LZ2KO (2 oprs.)	8,160-34-80-A-
HA1ZH	25,338-41-206-A-	LZ2KRS (3 oprs.)	4,230-15-94-A-
HA3MB	22,500-60-125-A-	<i>Austria</i>	
HA8UF	14,157-39-121-A-	OE5KE	538,720-148-1214-B-
HA1VE	13,968-24-194-B-	OE3PWW	309,888-128-807-A-
HA5DA	12,936-28-154-A-	OE9SKI	116,430-97-397-A-30
HA5FE	12,330-30-137-B-	OE5CA	85,860-81-355-A-8
HA1VA	10,323-37-93-A-	OE3AX	1,581-17-31-A-8
HA3GA	4,050-25-54-A-	<i>Finland</i>	
HA5BI	3,705-19-65-A-	OH2BCZ	406,215-135-1003-B-
HA8CT	576-8-21-A-	OH1VA	353,808-144-827-B-
HA0LL	570-10-19-A-	OH1AD	322,920-138-780-B-
HA5DL	168-7-10-A-	OH2BCP	141,435-105-457-A-
HA5KQD (HA5s DE DI FK)	569,772-171-1133-B-96	OH5UQ	82,410-82-335-B-
HA4KYB (2 oprs.)	534,180-145-1228-B-86	OH2RR	74,460-85-304-A-
HA8KUC (multiopr)	128,412-87-492-A-	OH3MK	57,456-76-252-B-
HA9KOB (2 oprs.)	105,588-84-419-B-	OH3MF	55,224-78-240-A-
HA1KVM (3 oprs.)	88,620-70-423-A-	OH3YI	45,240-65-232-A-
HA9KOL (2 oprs.)	50,034-62-269-A-	OH3WW	19,872-46-144-B-
HA8KCC (multiopr.)	26,649-47-191-A-	OH3MU	14,766-46-107-A-
HA6KNB (2 oprs.)	8,439-29-97-A-	OH2YL	13,299-39-117-B-
HA5KFZ (2 oprs.)	7,632-24-106-A-	OH5WH	10,197-33-103-A-15
<i>Switzerland</i>		OH5WF	10,185-35-102-A-
HB0JG	322,245-135-798-B-	OH4PX	8,126-34-239-B-
HB0KC	229,068-126-606-B-22	OH6NH	6,061-29-70-B-
HB0RX	137,190-85-557-B-20	OH5WT	1,161-19-73-B-
HB0DX	135,072-96-469-B-	OH1UR	1,104-16-23-B-
HB0AFG	2,760-23-40-A-	OH2AM (7 oprs.)	2,092,524-203-3436-B-
B9Z (HB9s AFG AGE)	489,978-163-1002-A-	OH2AC (4 oprs.)	325,150-150-167-B-44
<i>Italy</i>		<i>Aland Islands</i>	
IINT	1,248,060-155-2684-B-68	OH0NM	54,054-63-286-A-
IIKE	498,582-126-1319-A-54	<i>Czechoslovakia</i>	
IIBLF	228,045-115-061-A-	OK1ZL	1,029,108-191-1796-C-56
IILAG	59,736-76-262-A-8	OK1PD	622,278-181-1154-A-45
IHCJ	47,658-47-338-A-21	OK1AHZ	296,958-129-752-B-
IHL	38,308-61-211-A-18	OK3DG	212,533-113-630-A-
IHER	4,743-31-51-AB-	OK1XV	141,775-107-459-A-
<i>Jan Mayen</i>		OK1AFN	138,034-97-475-A-
JX6XF	1,305-15-29-A-	OK1AR	137,196-103-444-A-
<i>Norway</i>		OK1SV	105,072-88-398-B-14
LA1H (LA9OI, opr.)	190,855-95-676-A-25	OK2QX	104,805-85-411-A-
LA3X	36,516-68-179-A-29	OK3DL	100,800-80-420-A-
LA6U	24,960-65-128-A-	OK1AC	88,620-84-358-A-
LA7Q1	21,546-54-133-A-	OK3CGI	48,720-80-203-A-
		OK2ABU	39,222-51-191-B-
		OK1BY	28,476-42-226-B-
		OK1ARN	19,800-44-150-A-
		OK3CGP	18,963-49-129-A-
		OK3CEG	18,093-37-163-A-

1968 ARRL DX COMPETITION
 Phone: February 3-4, March 2-3
 C.W.: February 17-18, March 16-17



On the left is **ZK1AR** with almost a million phone points and an admonition to those with duplicate contacts causing him to miss that mighty mark. From top to bottom we have **OH3YI** with 232 c.w. exchanges running all of 4 watts output on 10, 6 watts on 15 and 10 watts on 20, using a 3-band quad; **9A1AA** (DL2AA, opr.) and a very tired look after 35 hours in the car caught in an Alpine snowstorm prior to arrival in San Marino; **HK3BAE** a Colombian crackerjack operator and a close second only to **HK3RQ** for Colombian c.w. plaundits.



These fellows worked a long time getting ready for the DX test and it is a pleasure to show their smiling faces in this report. The c.w. score submitted by **W3YUW** amounted to a resounding 3.3 million points, top multiplier, in the tough E. Pa. section. On the top (left) is **K3FGO** operating 20, on the right is **Dick W3YCI** doing a fine job filling in. On the bottom (left) is the chief op. **W3YUW** on 40 meters while another of the crew **K3FPY** (who also took the photos) is on the right. Not shown is **W3BGN** who did a fabulous job on both 80 and 15.

OK2BCX	15,744-32-164-A-
OK3CAU	14,025-33-144-A-
OK3CFP	13,770-45-102-A-
OK1AIG	7,254-26-93-A-
OK1XM	6,210-30-89-B-
OK1DK	6,642-27-82-A-
OK3ODY	6,342-14-51-A-
OK2BEN	3,780-28-45-B-
OK3CFL	2,640-20-44-A-
OK3BT	2,553-23-37-A-
OK2BCI	1,326-13-34-A-
OK2BZR	1,221-11-37-A-
OK1AII	1,053-13-27-A-
OK1AAU	660-11-20-A-
OK3BG	630-10-21-A-11
OK1ZW	198-6-11-A-
OK1KTL (multiop.)	
1,068,795-189-1885-C-	
OK1KOK (multiop.)	
98,280-81-360-A-	

Belgium

ON4XG	583,656-166-1172-A-41
ON4NM	226,497-103-783-B-19
ON5AZ	41,520-40-346-A-
ON5KD	29,097-61-159-A-

Denmark

OZ1LO	670,425-175-1277-A-70
OZ5DX	575,172-156-1229-B-
OZ7BG	495,840-160-1033-B-30
OZ1W	405,237-161-843-A-55
OZ7X	263,736-132-667-A-80
OZ3PO	52,800-75-240-A-
OZ7G	50,820-44-385-A-21
OZ4H	33,660-51-220-A-
OZ4DX	32,130-63-170-B-
OZ7KV	15,120-45-112-B-
OZ8E	7,743-29-89-A-
OZ1QW	6,264-29-72-A-
OZ8PM	1,287-13-33-A-

Faro Islands

OY2H	10,944-24-53-A-
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Netherlands

PA8XPQ	779,205-181-1442-A-52
PA8LOU	604,464-168-1234-A-55
PA8NSG	430,900-139-1034-A-
PA8VB	114,048-90-396-A-
PA8WAC	49,335-65-253-A-15
PA8KOR	45,942-82-247-A-
PA8FLX	19,716-62-106-A-
PA8NLC	12-2-3-A-1

<i>Sweden</i>	
SM4CMG	663,668-160-1347-B-
SM5BNX	324,289-117-639-B-
SM8BUO	165,000-110-560-B-24
SM5UO	153,360-120-426-B-
SM6APQ	137,358-78-587-B-
SM6CCE	108,225-75-495-B-
SM8BDS	80,892-84-326-AB-22
SM4DXL	67,600-80-282-A-
SM5CAC	47,864-62-254-B-
SM5ACQ	36,712-64-191-B-8
SM5COVH	35,673-64-188-A-13
SM7ACB	34,155-55-207-A-
SM6CUK	22,005-45-164-A-
SM5AUN	8,348-23-93-B-
SM5BEI	4,212-27-53-A-6
SM5BDY	4,104-24-57-A-
SM7CBZ	3,264-17-64-B-
SM8KV	384-8-16-A-

Poland

SP3AJJ	333,324-141-797-A-
SP8AKY	111,573-77-488-A-39
SP8AG	91,927-61-515-B-
SP8MJ	74,025-75-334-B-57
SP8HR	57,000-76-250-A-
SP9AXV	26,142-35-266-A-
SP2AEL	18,375-49-129-A-
SP8DDU	11,640-30-133-A-
SP6AXW	11,088-28-132-A-17
SP6ZA	8,154-27-101-A-17
SP9AGS	5,025-25-67-A-
SP7GH	3,375-15-73-B-13
SP6AWY	3,192-19-56-A-
SP9AWY	3,150-21-50-A-
SP6OQ	3,125-25-42-B-
SP3KAU	1,755-15-39-B-
SP8AFL	648-12-18-B-
SP9ZD	585-13-15-B-
SP9AAB	528-11-16-A-
SP9AJN	510-10-17-A-
SP9AMA	270-9-10-A-
SP9BQG	162-6-9-A-
SP4BET	27-3-3-A-

Iceland

TF2WJN	351,009-129-907-A-
TF3AU	4,091-23-60-A-

European Russian S.F.S.R.

UA1TL	52,923-59-299-B-
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UV3AAM	48,789-39-417-A-
UA1IA	32,256-42-256-A-
UW6BA	13,392-31-144-A-
UA6YD	12,555-31-135-B-
UA6KAF	12,474-27-157-A-
UA1KUM	11,970-35-114-A-
UA4HW	11,528-39-99-A-
UA6YI	8,532-32-92-A-
UA1DI	8,640-32-92-A-
UW3GU	6,468-28-81-A-
UA1KMC	6,162-26-79-B-
UA3GU	5,022-27-62-A-
UA1CC	4,845-19-85-B-
UA1NR	4,798-21-76-A-
UV3TC	3,720-20-62-A-1
UW6AO	3,717-21-66-A-
UW3HD	3,672-18-68-A-
UA6KJG	3,450-25-46-A-
UA3TA	3,363-19-62-B-6
UA4ZA	3,168-24-44-A-
UA1MV	2,214-18-41-A-
UA3GM	2,028-13-52-A-
UV3XX	1,785-17-35-B-
UA1MA	1,134-14-27-A-
UW3BX	837-9-31-A-
UA3JD	660-11-20-A-
UW3IT	621-9-23-A-
UW1AY	384-8-16-A-
UW3HV	295-7-14-A-
UA3KBO (3 oprs.)	
379,894-136-981-A-	

UA1KUA (3 oprs.)	122,140-103-460-B-
UA1KAG (4 oprs.)	135,405-85-531-B-
UA1KUZ (3 oprs.)	110,628-86-429-A-
UA1KAN (5 oprs.)	89,628-77-415-B-
UA1KMF (2 oprs.)	36,855-65-194-B-
UA1KCU (3 oprs.)	21,204-38-186-A-
UA1KAC (3 oprs.)	20,160-42-160-B-
UA1KBC (3 oprs.)	15,936-32-168-B-
UA1OE (multiop.)	10,935-27-135-B-

Kaliningradsk

UA2BD	93,240-70-444-B-
UA2WO	21,216-35-208-A-
UA2KAP	20,202-37-182-B-

Ukraine

UB5WJ	233,211-111-711-B-35
UB5TR	57,981-77-255-B-
UY5CW	21,252-46-154-A-
UB5KLD	19,278-30-144-B-
UT5BP	13,148-30-146-A-
UT5FW	10,752-32-112-A-
UB5EF	9,240-28-110-A-
UT5HP	3,960-22-60-A-
UB5NS	2,475-15-165-A-
UB5OK	1,872-16-39-B-
UB5KBV	1,428-17-25-B-
UB5RR	1,089-11-33-B-
UB5KFF (3 oprs.)	
474,504-142-1114-B-	

UB5KED (3 oprs.)	332,388-109-712-B-92
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U5ARTEX (2 oprs.)	134,784-78-576-B-
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UB5KNH (2 oprs.)	24,840-41-202-A-
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UB5KIW (3 oprs.)	23,100-35-220-A-
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UT5KDP (2 oprs.)	3,315-17-65-A-
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White Russian S.F.S.R.

UC2WP	51,315-55-311-A-
UC2SE	20,910-34-206-A-
UC2AW	11,005-31-119-A-
UC2AR	3,753-27-49-A-

Azerbaijan

UD6AM	26,460-49-180-B-
UD6AY	8,010-30-89-B-
UD6BQ	4,356-22-66-A-
UD6AY	1,728-16-36-B-
UD6KAW	150-5-10-A-

Georgia

UF6LA	91,195-65-530-B-28
UF6HK	2,919-21-139-B-
UF6BD	756-12-21-A-

UF6KAE	108-6-6-B-
UF6KAF (UF6s AAA GM)	2,916-18-54-B-0

Armenia

UG6JJ	90-3-5-A-
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Moldavia

UO5SA	3,192-14-76-B-
UO5KBB (3 oprs.)	36,192-58-208-A-

Lithuania

UP2PT	214,644-124-577-B-
UP2KNP	62,721-69-304-A-
UP2NV	23,400-50-156-B-
UP2BU	16,500-41-125-A-
UP2KBA	13,098-37-118-B-
UP2DX	7,254-26-93-B-
UP2NX	2,880-20-48-A-
UP2KBC (multiop.)	602,205-153-1312-B-

Latvia

UQ2AB	103,194-54-637-B-
UQ2KAA	5,244-23-76-B-
UQ2KCR (3 oprs.)	32,400-54-200-B-
UQ2KCR (multiop.)	3,102-22-47-B-

Estonia

UR2LO	29,850-50-199-B-9
UR2DZ	5,400-24-75-B-

Rumania

YO2BU	53,352-76-234-B-31
YO6UX	42,970-48-312-A-
YO6CR	34,668-54-215-A-
YO2FU	15,093-43-117-B-
YO8DD	11,712-32-122-C-
YO8RF	4,578-22-70-B-
YO5AIR	3,312-23-144-A-
YO7VS	2,168-19-38-A-
YO8AMT	1,053-13-81-A-
YO8FR	690-10-24-A-
YO8GP	504-7-28-A-
YO8QU	168-7-8-A-
YO4ADM	135-5-9-A-
YO4CT	128-3-7-A-

Yugoslavia

YU1NOH	30,560-44-230-A-22
YU1SF	2,331-10-50-A-
YU3LB (YU3s CB BU LB)	2,049,909-206-3321-B-85
YU1BCD (4 oprs.)	687,492-169-1356-B-96

L.T.U. Geneva

4U1ITU (HB9AU/WA6QAU, SM6CCE)	1,632,820-204-2793-C-
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Sun Marino

9A1AA	5,655-29-65-A-
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NORTH AMERICA

Cuba

CM2BL	1,373,790-230-1991-AB-
CM2BA	615,888-168-1222-A-

Guadeloupe

FG7XX	740,322-168-1348-A-
FG7XF	133,600-100-462-A-
KL7XL (W9VXO, opr.)	852-27-12-A-

Dominican Republic

HI8XAL	3,257,550-285-3810-BC-57
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San Andres & Providencia

HK9AI	2,425,686-218-3709-B-54
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Panama

HP1BR	326,970-126-865-B-28
HP1XHG	185,076-106-582-B-22

Alaska

KL7FRY	627,642-197-1062-AC-27
KL7IR	576,459-169-1139-C-32
KL7FRZ	161,925-104-519-BC-
KL7MF	50,688-48-352-C-
KL7AIZ (K1ZYW, K6OZL, WB6KNN)	611,556-164-1234-C-35

Puerto Rico
 KP1CRT 2,465,100-249-3300- B-74
Virgin Islands
 KV4AM 1,831,728-248-2462- C-60
Canal Zone
 KZ5JF 1,763,574-246-2360-AC-50
 KZ5MF 84,450-75-384- A-10
Antigua
 VP2AZ (WØVXO, opr.) 3-1-1 A-A
St. Kitts, Nevis
 VP2KR 252,146-139-606- A-19
Montserrat
 VP2MK 72,996-79-308- A-
Mexico
 XE2AAG 1,175,811-219-1795- A-55
 XE2OK 938,172-222-1410- A-60
 XE2HHD 145,849-103-472- A-
Nicaragua
 YN3KM 518,670-170-1017- B-42
Jamaica
 ØY5BS 391,573-169-776- A-23

OCEANIA

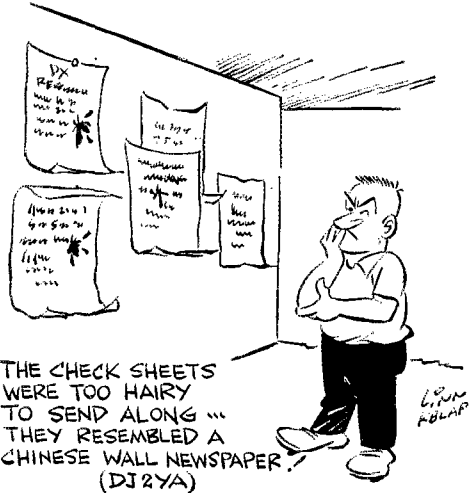
Guam
 KG6AQ 2,700-20-45- A-1
Hawaiian Islands
 KH6IJ 3,006,954-287-3754-AC-72
 KH6UL (K7RSM, opr.) 2,083,203-248-2800-AC-76
 KH6FSP 697,668-188-1237- B-
 KH6PON 256,410-110-777- B-50
 KH6GEW 97,650-75-434- C-16
 WØPAN/KH6 9,213-37-84- B-5
Marshall Islands
 KX6ER 1,584-16-37- B-4
Australia
 VK2EO 1,571,760-222-2360- A-51
 VK3AXK 817,908-182-1498- A-52
 VK2GW 487,056-146-1112- A-56
 VK2VN 219,438-146-501- A-11
 VK3TC 172,078-97-593- A-
 VK6KO 82,826-31-131- A-12
 VK4FH 52,920-63-280- A-
 VK3XB 34,860-70-166- A-39
 VK3FH 33,040-40-276- A-
 VK3APN 28,987-41-238- A-
 VK3OP 36,828-38-238- A-
 VK3KS 15,732-46-114- A-25
 VK3UM 6,696-24-93- A-4
 VK4WO 1,260-14-30- A-
Territory of New Guinea
 VK9GN 159,840-120-444- A-17

Fiji Islands
 VR2DK 473,598-166-951- A-37
Solomon Islands
 VR4CR 63,788-44-478- A-
Cook Islands
 ZK1AR 130,860-90-486- A-21
New Zealand
 ZL3QH 1,012,092-193-1748- A-64
 ZL1HW 354,560-128-945- A-
 ZL1AFW 183,486-106-577- A-24
 ZL1AMQ 80,928-48-562- A-
 ZL1OY 37,620-55-228- A-

SOUTH AMERICA

Chile
 CE2OR 107,536-94-383- A-
 CE2BC 58,950-75-262-
 CE2EF 17,226-58-99- B-
Bolivia
 CP3OD 7,272-24-101- A-
Uruguay
 CX1OP 34,560-72-161- A-
Ecuador
 HC1TH 4,950-33-150- B-
 HC1GC 3,105-23-45- A-
Colombia
 HK3RQ 2,303,235-235-3277- C-48
 HK3BAE 2,076,737-221-3133- B-60
 HK4ALE 353,748-164-719- A-60
 HK3ASJ 6,650-25-90- A-
Argentina
 LUBAJ 264,924-132-670- B-
 LUBFBT 22,052-37-199- A-
 LU4CE 15,708-44-119- A-11
 LUIDAY (4 oprs.) 1,455,478-211-2336- C-86
Peru
 OA4PF 1,139,067-201-1889- B-
 WØVXO/OA4 5,918-29-68- A-
 OA4O (WØVXO, opr.) 324-12-9- A-
Brazil
 PY2BGL 2,572,434-241-3571- C-70
 PY2SO 2,315,502-238-3155- C-61
 PY7AKQ 939,080-185-1692- C-47
 PY1NO 183,406-154-1047- A-58
 PY1BYK/7 204,624-116-588- B-
 PY7SOL 210,010-110-637- B-21
 PY1CKV 37,062-58-214- A-
 PY2BBO 12,078-33-122- A-
 PY2PH 4,092-22-62- B-
Surinam
 PZ1CQ 137,070-90-510- A-20

Venezuela
 YV1DF/5 979,020-222-1470- B-36
 YV1OB 870,390-190-1527- B-67
Trinidad Tobago
 9Y4VU 10,431-19-185- A-

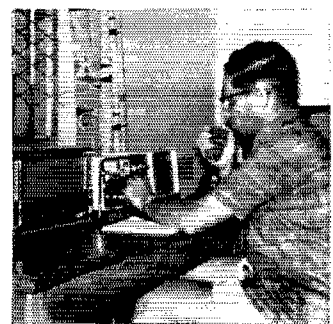


PHONE SCORES

ATLANTIC DIVISION

Delaware
 K3NHL 1,065,594-337-1062- C-85
 W3DRD 84,864-128-221- C-30
 K3NMY 64,260-105-204- H-39
 W3MDJ 54,426-94-193- C-34
 K3NYG 663-13-17- C-4
 W3IYE (W3s IYE TGP) 377,520-220-572-BC-70
Eastern Pennsylvania
 W3BES 1,212,435-315-1283- C-80
 W3BGN (K3FGO, opr.) 1,157,760-335-1152- C-88
 K3TPL 708,948-282-838- C-73
 W3HHK 588,978-234-839- C-
 W3YUW 480,249-231-693- C-
 W3DHM 338,940-210-538- C-52
 W3BYX 328,032-204-536- C-58
 W3KFK 234,360-180-434- C-30
 W3EQA 210,654-169-425- C-40
 W3N3M 189,476-134-473-ABC-42
 K3TGM 152,295-143-355- A-
 K3BNS 147,030-145-338- C-30
 K3PSW 128,954-122-353- C-40
 W3CGS 100,149-133-251- C-35
 W3KDF 99,630-123-270- C-22
 W3GRS 97,395-151-215- C-12
 W3UZF 71,868-113-212- C-29
 W3HA 70,308-84-279- B-36
 W3CAA 67,098-106-211- C-15
 W3NOH 60,600-100-202- B-10
 W3GHS 55,146-101-182- C-13
 W3GHM 49,662-93-178- C-19
 W3KTC 44,322-83-178- C-
 W3QOR 36,096-64-188- A-14
 K3FDP 21,306-53-134- A-15
 W3DNI 17,766-63-96-BC-
 W3QHD 7,866-46-57- B-
 W3CBF 7,245-35-69- A-8
 W3CUI 6,448-31-66- C-10
 K3JGJ 4,512-32-47- C-6
 K3ZPG 1,254-19-22- B-
 W3WJD (7 oprs.) 3,922,550-475-2753- C-96
 K3MTK/3 (4 oprs.) 435,150-225-647- B-84
 W3HHA (W3s HHA WPG) 361,536-224-538- C-75
 K3JH (K3s JH JLI) 191,520-160-399- C-33
 K3MBF (K3s JLI MBF) 9,504-36-88- C-7
Maryland-D. C.
 W3KMW 397,544-248-537- C-72
 W3MVB 316,296-191-552- C-52
 W3FYS 264,810-182-485-AC-40
 W3MCG 261,870-203-430- C-49
 W3BQN 182,574-161-378- C-80

African natives, left to right; **CR6GO** in a fine c.w. 1.4 million point effort and a close 2nd in continental competition, **ZD8J** taking African honors; and a brand-new plaque with a scorching 48-hour 1.4 meg c.w. performance, **5N2AAF** providing a welcome Nigeria phone multiplier to 1670 participants.



W3GRF	125,452-158-399-	C-30
W3AYD	84,753-129-219-	C-23
W3ZNB	73,344-128-191-	B-33
W3KDD	62,211-89-233-A	C-38
K3CBW	54,060-106-170-	B-28
W3AYS	36,720-90-136-	C-
W3EPR	34,320-88-130-	C-26
W3EIS	30,855-85-121-	A-16
W3LVC	28,944-72-134-	B-7
W3ADCQ	27,063-93-97-	C-19
W3ACGE	19,467-63-103-	B-13
W3IWS	12,705-55-77-	C-30
W3NMX	8,127-43-63-	C-17
W3CSZ	216-6-12-	B-2
W3A8AN	48-4-4-	B-2
W3MSK (8 oprs.)	6,218,108-547-3788-	AC-96
WA3GTX (WA3s FFX GTX)	11,400-50-76-	A-9

Southern New Jersey

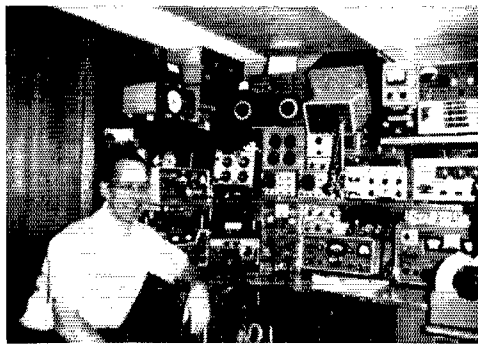
W3UNJ/2	269,498-193-482-	C-46
W2QKJ	227,385-163-465-	C-30
W2QDY	212,826-158-449-	C-50
K2Q1L	140,448-133-352-	B-35
W3MDE/2	137,772-129-356-	C-
K2PZF	62,976-128-164-	C-27
W2SDO	34,170-85-134-	C-30
W2ORA	23,125-59-125-	A-17
K2AGA	18,414-62-99-	C-13
K2SNQ	17,934-49-122-	B-28
W2MDR	17,019-61-93-	C-21
K2CPR	16,800-56-100-	A-15
WB2CGV	13,197-53-83-	A-18
WA2BLV	10,800-45-80-	C-
K3SWU/2	5,118-33-82-	B-20
K2OEA	5,616-36-52-	A-8
WB2FOC	5,600-35-52-	A-12
WA21ZS	2,420-28-30-	C-
WA2EMB	188-7-8-	A-3
W2SDB	64-4-4-	C-1

Western New York

K2GXI	1,093,361-361-1001-	C-84
K2LWR	652,680-296-735-	C-76
W2QWS	540,054-274-657-	C-65
W2FZJ	415,785-265-528-	C-66
W2PDB	389,400-236-550-	C-60
WA2BEX	301,875-175-575-	B-68
K2TQC	241,572-164-491-	B-23
WB2CON	189,618-169-374-	C-37
WB2HZG	184,353-163-377-	C-32
WA2GHW	156,768-142-368-	B-60
W2FXA	129,360-140-308-	C-15
W2SSC	124,146-121-342-	C-22
W2SNI	113,025-137-275-	C-54
W2LVE	85,536-132-216-	C-25
WB2NXL	75,348-92-273-	C-30
W3TBF/2	71,262-107-222-	C-31
WB2RXX	63,054-93-226-	A-42
W2IIV	58,464-96-203-	C-40
K2KNV	50,745-85-199-	C-20
W2MKN	46,629-99-157-	C-34
WB2MEX	35,088-68-172-	C-36
K2KBI	9,372-44-71-	B-23
WB2PGM	1,028-18-19-	C-8
K2SWT	240-8-10-	C-6
K2CC (6 oprs.)	44,676-73-204-	C-35

Western Pennsylvania

W3LOE	751,740-330-760-	C-71
W3NKM	85,536-96-297-	B-39
W3LNE	36,940-77-160-	A-8
W3VKD	36,000-75-160-	-
W3OJW	26,040-70-127-	A-15
WA3ENR	21,960-60-122-	A-20
W3VK	2,916-27-36-	A-15



K3JH was manned solo during the c.w. session to the tune of 539-K and along with K3JLI, multiop'd. on phone. What isn't shown here is an elegant "big Bertha" supplying additional muscle.

CENTRAL DIVISION

<i>Illinois</i>		W0LJM	84,180-122-230-	B-37		
W0LRH	491,040-240-682-	C-66	WA0LTK	50,985-103-165-	C-29	
WA91VL	333,234-198-561-	B-60	WA0KDI	48,960-102-160-	C-36	
K9ZJV	210,405-169-415-	C-70	WA0LAW	27,281-59-153-	A-19	
K9ZBI	197,472-176-374-	C-49	WA0JKT	10,944-48-76-	C-24	
K9PPX	170,766-159-358-	B-20	WA0KQU	3,024-28-36-	A-8	
W9T9T	169,371-139-369-	C-60	W0VIP	1,350-18-25-	C-	
WA9HJM	164,472-154-356-	A-64	W0LVZ (W0s ISJ IVZ, K0UYN)	306,128-212-482-	C-06	
W9QXO	107,081-127-283-	C-41	<i>North Dakota</i>			
W9WJY	54,315-85-213-	A-41	K0EIA	157,314-167-314-	C-58	
WA9NFL	34,611-83-139-	B-29	W0CAQ	14,533-49-113-	C-15	
W9GRWM	29,700-66-150-	C-16	WA0LJN	2,112-32-82-	A-8	
W9RCIN	23,140-60-123-	C-	WA0OAT	1,782-18-33-	A-13	
W91GJ	14,196-52-91-	B-12	<i>South Dakota</i>			
WA9NJB	8,235-45-61-	C-15	WA0CPX	155,040-160-323-	C-48	
W9W1O	7,920-40-66-	B-	W9CUC	35,768-67-168-	C-	
K9WYV	2,436-28-29-	C-	WA0CJY	2,625-25-35-	A-9	
WA9OIT	1,512-21-24-	A-24	<i>Arkansas</i>			
<i>Indiana</i>		W0LKI	436,917-221-659-	C-50		
K9TZT	312,984-207-503-	B-60	K5LNN	112,518-141-266-	A-51	
K9DZV	271,544-182-498-	A-65	WA5LLX	37,206-78-159-	B-50	
WA9CYV	135,780-146-310-	C-40	WA5AER	5,700-38-50-	B-10	
W9A9Q	90,630-114-265-	C-29	<i>Louisiana</i>			
W91QD	71,043-119-199-	B-22	W5KC	314,400-200-524-	C-6	
K9B2G	59,040-96-205-	B-29	WA5EAM	30,324-76-133-	B-9	
W92TD	42,282-87-162-	C-	W5LXX	26,640-80-111-	C-	
K9VQK	11,448-53-72-	A-27	K5MFA	18,054-59-102-	C-24	
K9CUL	6,045-39-53-	C-	K7YUC/5	13,230-49-90-	A-36	
K9CEY	1,620-20-27-	C-9	WA5JWU	1,425-19-25-	B-4	
K9ODF	672-14-16-	C-10	W5JFB	294-7-14-	A-	
<i>Wisconsin</i>		W9EWC	700,650-270-865-	AC-78	<i>Mississippi</i>	
W9G1L	461,535-231-666-	C-	W9RQM	187,740-149-420-	B-37	
W9RQM	187,740-149-420-	B-37	W9KXK	111,804-121-308-	B-39	
W9KXK	111,804-121-308-	B-39	W9VZP	100,203-127-263-	C-39	
W9VZP	100,203-127-263-	C-39	W9GMV	81,840-124-220-	B-34	
W9NLJ	32,148-94-114-	C-14	W9W1J	32,148-94-114-	C-14	
W9MG	9,546-43-74-	A-28	W9A1T	7,626-41-62-	B-9	
WA91AT	7,626-41-62-	B-9	WA9NBU	2,664-24-37-	C-7	
WA9NBU	2,664-24-37-	C-7	WA9JDK	1,680-20-28-	B-10	
WA9JDK	1,680-20-28-	B-10	WA9OTH	855-15-19-	A-26	
WA9OTH	855-15-19-	A-26	W9UMQ	546-13-14-	C-14	
W9UMQ	546-13-14-	C-14	<i>Tennessee</i>			

DAKOTA DIVISION

<i>Minnesota</i>		W0AIH	139,062-154-301-	C-22
WA0GCP	124,488-133-312-	C-68	<i>Kentucky</i>	

GREAT LAKES DIVISION

<i>Kentucky</i>		W4BCV	1,078,398-331-1086-	C-75	
K4RZK	103,161-137-251-	C-30	W4CVI	15,732-69-76-	A-24
W4CVI	15,732-69-76-	A-24	K4GOU/4	6,120-34-60-	B-20
K4GOU/4	6,120-34-60-	B-20	WA4ZIR	3-1-1-	A-1
WA4ZIR	3-1-1-	A-1	<i>Michigan</i>		
<i>Michigan</i>		W8TWA/8	434,754-249-582-	C-88	
WA8RGT	388,512-228-568-	C-60	W8RXY	360,300-205-588-	C-74
W8RXY	360,300-205-588-	C-74	K8OVK	207,776-151-459-	AC-47
K8OVK	207,776-151-459-	AC-47	WA8RSL	183,222-174-351-	C-35
WA8RSL	183,222-174-351-	C-35	WA8LYF	177,489-123-481-	B-42
WA8LYF	177,489-123-481-	B-42	K8HZU	159,414-163-326-	BC-49
K8HZU	159,414-163-326-	BC-49	W8LQJ	128,304-132-324-	B-51
W8LQJ	128,304-132-324-	B-51	K8BZL	122,688-142-288-	C-
K8BZL	122,688-142-288-	C-	W8W1T	69,300-77-300-	C-45
W8W1T	69,300-77-300-	C-45	WA8LNL	38,448-89-144-	C-38
WA8LNL	38,448-89-144-	C-38	W8CG	29,748-74-134-	C-16
W8CG	29,748-74-134-	C-16	W8SS	22,134-62-119-	C-20
W8SS	22,134-62-119-	C-20	WA8OSL	10,512-48-73-	A-17
WA8OSL	10,512-48-73-	A-17	W8BEZ	9,963-41-81-	-26
W8BEZ	9,963-41-81-	-26	WA8MGO	5,586-38-49-	A-14
WA8MGO	5,586-38-49-	A-14	W8TWJ	4,902-38-43-	C-7
W8TWJ	4,902-38-43-	C-7	WA8GUF (K8s DCP HLR, WA8GUF)	327,540-206-530-	B-52
WA8GUF (K8s DCP HLR, WA8GUF)	327,540-206-530-	B-52	K8TFO (K8TFO, WA8MOA)	61,182-103-198-	C-52
K8TFO (K8TFO, WA8MOA)	61,182-103-198-	C-52	W8VPV (W8s TJQ VFC, K8UDJ)	54,800-80-145-	C-20
W8VPV (W8s TJQ VFC, K8UDJ)	54,800-80-145-	C-20	K8HPS (8 oprs.)	35,800-72-109-	C-
K8HPS (8 oprs.)	35,800-72-109-	C-	<i>Ohio</i>		
<i>Ohio</i>		K8DOC (K8YWG, opr.)	1,438,086-363-1339-	C-90	
K8DOC (K8YWG, opr.)	1,438,086-363-1339-	C-90	W8LXU	515,997-261-659-	AB-76
W8LXU	515,997-261-659-	AB-76	WA8LEO	431,946-213-676-	B-64
WA8LEO	431,946-213-676-	B-64	K8AXG	387,387-231-559-	B-69
K8AXG	387,387-231-559-	B-69	WA8MCR	377,970-215-588-	C-51
WA8MCR	377,970-215-588-	C-51	W8ECA	320,544-216-495-	A-67
W8ECA	320,544-216-495-	A-67	WA8AJY	175,851-167-351-	C-42
WA8AJY	175,851-167-351-	C-42	K8B8M	144,045-165-291-	C-38
K8B8M	144,045-165-291-	C-38	W8CXR	139,725-135-345-	C-74
W8CXR	139,725-135-345-	C-74	W8CFG	117,180-155-252-	C-45
W8CFG	117,180-155-252-	C-45	W8CEA	112,980-140-264-	C-24
W8CEA	112,980-140-264-	C-24	K8WUO	112,860-132-285-	C-36
K8WUO	112,860-132-285-	C-36	K8EPU	109,377-137-267-	AC-33
K8EPU	109,377-137-267-	AC-33	W8BF	108,252-124-291-	C-38
W8BF	108,252-124-291-	C-38	W8HVF	101,898-111-306-	C-51
W8HVF	101,898-111-306-	C-51	W8HVP	91,908-138-222-	B-56
W8HVP	91,908-138-222-	B-56	W8NPF	90,240-128-235-	C-41
W8NPF	90,240-128-235-	C-41	W8VC	87,048-124-234-	BC-40
W8VC	87,048-124-234-	BC-40	W8DKI	77,004-124-207-	C-36
W8DKI	77,004-124-207-	C-36	W8CGE	68,796-117-196-	C-23
W8CGE	68,796-117-196-	C-23	W8GKA	66,836-77-290-	B-43
W8GKA	66,836-77-290-	B-43	K8GVK	61,710-100-187-	C-23
K8GVK	61,710-100-187-	C-23	W8HBR	53,628-82-218-	C-20
W8HBR	53,628-82-218-	C-20	W8YGR	51,516-106-162-	A-17
W8YGR	51,516-106-162-	A-17	WA8GKW	42,525-105-135-	C-47
WA8GKW	42,525-105-135-	C-47	W8BOJ	41,454-94-147-	C-12
W8BOJ	41,454-94-147-	C-12	W8LUJ	39,481-101-127-	C-12
W8LUJ	39,481-101-127-	C-12	W8OKF	33,567-67-167-	C-25
W8OKF	33,567-67-167-	C-25	WA8CDP	32,076-81-132-	C-8
WA8CDP	32,076-81-132-	C-8	K8PYD	31,833-81-131-	AC-20
K8PYD	31,833-81-131-	AC-20	WA8RXU	30,030-65-154-	B-32
WA8RXU	30,030-65-154-	B-32	WA8PVS	29,079-81-120-	C-24
WA8PVS	29,079-81-120-	C-24	WA8OSE	25,530-74-115-	C-29
WA8OSE	25,530-74-115-	C-29	W8QDH	23,715-85-93-	A-13
W8QDH	23,715-85-93-	A-13	W81JZ	22,646-64-117-	C-24
W81JZ	22,646-64-117-	C-24	W8PTK/8	22,230-78-95-	C-24
W8PTK/8	22,230-78-95-	C-24	WA8RWU	14,694-62-79-	AC-13
WA8RWU	14,694-62-79-	AC-13	WA8KPO	14,442-58-83-	C-9
WA8KPO	14,442-58-83-	C-9	K8BPX	14,400-48-100-	C-10
K8BPX	14,400-48-100-	C-10	WA8SKV	13,680-60-76-	B-23
WA8SKV	13,680-60-76-	B-23	W8TQL	12,985-53-82-	B-26
W8TQL	12,985-53-82-	B-26	W8AJW	12,906-54-80-	A-14
W8AJW	12,906-54-80-	A-14	W8CHX	12,087-51-79-	A-18
W8CHX	12,087-51-79-	A-18	W8PKU	10,500-50-70-	C-
W8PKU	10,500-50-70-	C-	W8UEX	10,428-44-79-	C-10
W8UEX	10,428-44-79-	C-10	W8DWP	10,200-50-68-	A-25
W8DWP	10,200-50-68-	A-25	K8NMG	7,371-39-63-	B-6
K8NMG	7,371-39-63-	B-6	W8DZG	7,056-42-56-	B-17
W8DZG	7,056-42-56-	B-17	W81LC	6,222-34-61-	A-
W81LC	6,222-34-61-	A-	W8ZCQ	3,255-31-35-	C-
W8ZCQ	3,255-31-35-	C-	W8GMK	3,078-27-38-	B-12
W8GMK	3,078-27-38-	B-12	K8DWQ	1,425-19-25-	



Here's a look at the future first-placers, left to right: **K9TZH** 2nd high phone in Indiana with 300K-plus, **WA1DJG** 4th high Connecticut phone at 235-K, **WA8RWU** number 4 in Ohio's 56 single-operator c.w. scores.

K8PXD (K8s PXD PYD)
2,436-28-29- A-1

HUDSON DIVISION

Eastern New York

W2EGG 196,416-176-372- C-
K2OIX 75,864-116-218- B-18
K2BQO 61,455-85-241- C-35
W2BWR 58,760-104-189-BC-22
W2ZYNX 10,653-53-64-AB-13
W2ZUVD 6,264-29-72- A-25
W2ZP 3,102-22-17- A-
W2GTQ 2,376-22-36- B-8
K2GL (14 oprs.)
6,183,322-551-3749-AC-96

N.Y.C.-L.I.

WB2FON 660,888-274-804-BC-66
W2WZ 403,029-253-531- C-40
W2SUC 384,408-228-562- C-42
WB2OIV 193,356-164-393- C-46
K2QOU 188,892-159-396- B-51
W2LEJ 117,390-130-301- B-42
WB2PCF 114,480-106-360- B-36
W2GKZ 99,051-137-241- C-19
WB2RSW 54,248-107-169- A-33
WB2OBO 51,000-100-175-AB-
WB2JOX 49,086-101-162- C-24
WB2ZGG 46,431-77-201- B-26
W2YCW 32,880-80-137- C-13
WA2QEB 32,832-76-144- C-
W2GKW 22,302-59-126- B-29
W2ZV 18,054-59-102- A-31
W2PCJ 15,600-52-100- C-7
W2AZS 15,015-55-91- C-14
W2AYJ 9,828-42-78- C-10
WB2ZTQ 5,853-37-53- B-8
WA2YJN 4,500-30-50-AB-11
WB2VIO 4,230-30-47- A-14
W2JB 4,176-29-48- A-14
K2LOT 3,813-31-41- A-7
K2DGG 2,260-25-30- B-8
WB2VTP 1,512-18-28- A-
W2CKR 924-14-22- A-4
WB2MDH (WB2s MDH QZD)
329,688-228-482- B-52
W2NOD (4 oprs.)
76,590-111-230- B-48

Northern New Jersey

K2GUN 126,522-142-296- C-30
WB2WID 102,312,116-294- A-31
W2FFQ 101,760-128-265- C-58
W2IUU 71,280-108-220- C-30
W2MKN 33,264-72-154- A-32
W2AGM 32,850-73-150- C-30
WB2PAR 30,438-57-178- A-46
WB2VPT 29,820-71-140- A-23
W2YSQ 20,978-63-111- B-22
W2KJH 12,402-53-78- A-11
WA2IDM 5,460-35-52- B-1
W2CJY 3,168-24-44- A-7
WB2OHK 1,995-19-35- C-5
W2MNV 770-14-19- A-8
K2USA (8 oprs.)
761,233-254-990- C-93

MIDWEST DIVISION

Iowa

W0LBS 500,736-256-652- C-70
W0IYH 105,931-117-301- C-
W0KXJ 14,250-50-85- A-16
K0IIR 4,092-31-44-
K0PLJ 3,219-29-37- A-5
W0JAQ 147-7-7- A-

Kansas

W0BAA 324,450-206-525- C-51

W0IEM 75,366-106-237- B-53
W0PAH 37,192-88-103- C-21
W0YUQ (W0s HLU YUQ)
210,888-171-404- C-70

Missouri

W0CU 652,674-319-682- C-
W0LBB 253,170-174-485- C-59
WA5FFN/0 35,358-83-142- B-31
K0GVS 23,112-72-107- C-18
K0YIP 18,060-70-86- A-20
W0BUL 15,477-67-78- A-
W0PEM 7,503-41-61- B-13
K0JPL 2,592-24-36- B-14
K0REV 2,574-26-33- B-3
K0BHT (5 oprs.)
429-462-241-594- C-90

W1AJO 11,760-49-80- B-14
W1ADLM 5,610-34-55- B-6
K1TPA 3,096-21-43- A-8
K1HTY 180-6-10- A-
W1ECH/1 18-2-3- A-1
W1ECP (W1s QY YNP)
229,392-177-432- C-40
W1AW (WA1CYT, W1Q1S)
3,120-26-40- C-

Eastern Massachusetts

K1DIR 1,308,384-352-1139- C-78
W1JYH 868,509-309-965- C-58
W1UOP 377,580-217-580- B-55
W1AXA 313,344-204-512- C-45
W1OKF 315,840-188-560- C-64
K1VYF 253,287-177-477-

New Hampshire

K1OBT 318,096-188-564- B-18
W1D7Y 283,128-188-502- C-88
WA1GIA 166,140-142-390- B-62
W1DYE/1 159,996-134-398- A-26
WA1DZX 150,220-148-339- C-48
WA1FSV 105,570-138-255- C-48

Rhode Island

W1YRC 318,978-198-537- C-37
W1HQV 171,387-139-411- C-
K1HKX 23,868-68-117- A-14
W1RFQ 5,349-29-71- B-5
K1UJX 5,202-34-57- A-15
K1NQG/1 (5 oprs.)
40,590-82-165- C-13

Vermont

W1CBW 265,815-179-495-

Western Massachusetts

W1RF 290,087-203-479- C-45
W1EOB 2,400-25-32- C-3
W1YK 330-10-11- A-1

NORTHWESTERN DIVISION

Idaho

WA7BVM 24,570-65-126- B-

Montana

W7EOI 20,520-60-114- C-26

Oregon

K7WWG 36,186-74-163- C-44
W7YEX 27,126-66-137- C-40
W7BTH 21,909-67-109-AC-18
K7STK 15,390-45-114- C-17
W7AGQ 13,386-46-97- B-19
W7LXR 12,384-43-96- A-16
WA7DAC 10,287-27-127- A-25

Washington

W7ESK 740,000-250-987- C-80
K7VAL 263,169-171-513- C-72
W7M7X 140,847-133-353- C-50
W7HRH 128,143-127-341- C-60

PACIFIC DIVISION

East Bay

W6RGG 212,598-186-381- B-63
WB6WN 203,796-148-459- C-21
W6B5Y 166,803-169-329- C-38
W6LDD 153,090-162-315- C-45
W6VNH 147,768-131-376- C-39
W6PQW 124,200-92-450- B-52
WA6LVN 26,910-65-138- B-9

Nevada

K7TCW 240-7-10- B-7

Sacramento Valley

W6SLA 91,125-125-243- C-31
W6BMZX 14,784-56-88- B-16
WA6JDT 1,566-18-29- A-7

San Francisco

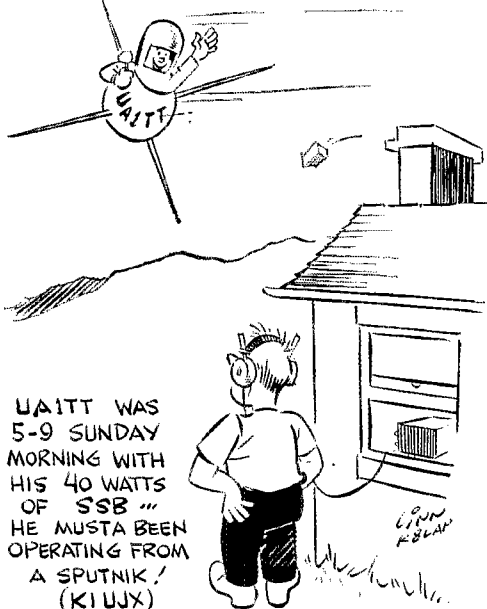
W6ERS 246,760-199-414- C-80
W6GPB 58,512-92-212- C-2

San Joaquin Valley

W6PYM 10,530-45-78- C-
W6MNH 1,836-18-34- B-6

Santa Clara Valley

K6OHJ (W6BHY, opr.)
739,622-262-941- C-82
W6WX 511,884-241-708- C-68
K6ERY 254,016-189-448- C-35



LAITT WAS
5-9 SUNDAY
MORNING WITH
HIS 40 WATTS
OF SSB
HE MUSTA BEEN
OPERATING FROM
A SPUTNIK,
(KIJJX)

Nebraska

WA0LXD 53,062-86-206- B-40
WA0MOB 44,550-99-150- C-23
WA0DTP 28,194-74-127- B-36
W0LTE (10 oprs.)
699,720-280-833- C-96

NEW ENGLAND DIVISION

Connecticut

W1BIH 667,377-261-853- C-58
W1CKA 888,050-210-616- C-30
K1THQ 306,600-175-584- A-35
W1ADJG 235,343-157-503- A-46
W1BGD* 133,823-147-303- C-17
K1ZND 117,348-127-308- A-30
W1CNU 73,602-94-261- B-29
K1DPB 59,616-92-216- A-31
K1FHS 57,267-101-189- C-20
W1DIT 37,536-92-136- C-26
K1EZZ 28,674-59-162- B-20
K1RPZ 22,563-69-109- C-16
W1EZM 17,004-52-109- A-29

W9MLJ/1

196,098-147-445- C-42
W1ORY 154,584-152-339- C-36
WA1GRP 104,931-131-267- B-
W1EJE 101,952-118-288- A-28
W1FJJ 58,482-114-171- C-17
K1SHN 48,762-86-189-
W1MO 43,424-92-158- A-23
W1DVA 13,200-44-100- B-17
W1TKG 12,750-50-85- A-16
W1PLJ 4,032-28-48- B-11
W1NJL 3,726-27-46- A-8
W1FJJ/1 510-12-15- A-2
K1YKT 230-7-11- A-1
WA1FGN 12-2-3- B-1
W1YQF (W1s WQR YBO YQF)
551,310-235-782- A-30
WA1FZK (WA1s EOX FZK)
78,642-102-257- B-54

Maine

W1BFA 344,867-199-580- C-42
W1PCD 55,476-65-92- C-16
W3MQR/1 2,580-20-43- B-19

W6KJ	233.061-166-468-	C-38
W6DZZ	166.263-163-340-	C-55
W6ISQ	156.618-154-339-	C-53
K6PLH	131.454-109-402-	B-43
W6BCCV	111.612-131-284-	B-52
W6VVR	64.176-112-191-	C-29
W6CUP	44.100-84-175-	C-15
W6QBY	34.038-62-183-	C-28
W6RFT	23.665-65-147-	B-22
K6HOR	22.743-67-133-	C-17
W6PLS	19.470-59-110-	B-16
K6UKV	9.768-44-74-	B-19
K6CQP	612-12-17-	C-6
W6M7P	210-7-10-	A-4
W6UMI (W6UMI, W6K6IG)	153,321-241-631-	C-1

WA6YMX (WA6YMX, W6Bs RCC SWL)
213,690-170-419- C-84

ROANOKE DIVISION

North Carolina

K4KZZ	384.132-238-538-	C-35
W4ZWF	23.010-59-130-	C-13
W4OMW	21.357-63-113-	C-16
WA4ISA	15.512-56-93-	C-18
WA4KWC	2.520-21-39-	B-18

South Carolina

WA4VZK	165.966-139-394-	B-55
WA4IKU	160.803-160-335-	C-30

Virginia

W4QCW	1.243.350-405-1025-	C-84
W4PTR	148.482-148-339-	C-32
K4VYN	138.996-99-468-	A-52
W4KFC	110.878-128-289-	A-18
W4MOJ	71.736-122-196-	C-47
W4DKU	59.116-114-179-	B-24
W4WBC	48.672-96-169-	C-26
K4WHY	48.216-98-164-	AC-22
K4AEV	45.567-83-183-	B-14
W4JVN	39.672-76-174-	C-25
W4KRS	19.858-56-117-	A-24
W4KHF	18.303-61-100-	C-9
W4HKH	16.170-49-110-	C-3
W4ZM	3.720-31-40-	C-3
W4BVV (6 ops.)	3.502-845-465-2511-AC-96	

West Virginia

K8YBU	589.785-205-959-	C-81
K8UZZ	66.447-107-207-	C-16

ROCKY MOUNTAIN DIVISION

Colorado

W6GAA	216.996-169-428-	C-60
W6EXS	9.416-44-72-	A-40
W6KFX	4.032-28-48-	B-9

New Mexico

W50DJ	202.089-160-421-	B-76
W5DQV	186.030-130-477-	B-48
K5STL	149.799-167-299-	B-52
W5QBV	17.100-50-111-	C-15

Utah

W7NPU	209.752-167-419-	C-65
K7OXB	30.870-70-147-	C-13
K7JLF	28.608-64-149-	A-25

Wyoming

W7P80	29.781-73-136-	C-16
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SOUTHEASTERN DIVISION

Alabama

WA4WAO	754.127-311-819-	C-82
WA4GCS	681.312-302-752-	C-66
W4NML	128.061-153-279-	AC-
W4PZY	127.896-146-292-	B-30
W4RLS	117.198-153-256-	C-25
W4USM	60.192-114-176-	C-23
K4WSE	55.703-108-175-	A-50
W4DS	55.536-104-178-	C-29
WA4HOM	55.458-117-158-	C-
K4KJD	54.144-94-192-	C-27
W4ZNI	51.888-94-184-	A-35
W4BRE	29.154-86-113-	C-10
K4IKR	23.664-68-116-	C-
W4GRG	21.411-61-117-	C-11
K6SRM/4	19.208-66-97-	B-25
W4HA	16.632-56-99-	B-12
W4GQL	11.748-44-89-	B-
WA4ZFA	1.558-19-28-	B-12
WA4BTA	1.200-20-20-	B-4
W4BDG	792-12-22-	B-5
K9KBW	189-7-10-	B-3
WA4QVQ (WA4s BTA QVQ)	152.550-150-339-	B-43

Eastern Florida

W4AXE	1.157.652-397-972-	C-80
W4QBK	712.503-297-801-	C-78
W4MVB	327.084-194-562-	C-49
W4HOS	108.315-145-249-	AB-15
WA4FWF	37.368-72-173-	A-25
W4RQE	20.193-53-127-	C-42
W4BYB	14.664-52-94-	A-56
W4ND	14.193-57-83-	C-9
K4THA	10.176-53-64-	A-
W4ZYS (W4s ZYQ ZYS)	699.684-293-798-	C-82

Georgia

K4EZ	454.285-241-630-	BC-60
WA4TWQ	42.240-88-160-	C-22
W4DQD	19.162-67-100-	A-32

Western Florida

W4PC	157.896-153-344-	C-60
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WHUR 32,841- 89- 125- C-23

SOUTHWESTERN DIVISION

Arizona

W5HVV/7	220.158-162-453-	A-77
W7AYY	183,063-139-439-	C-94
K7PXI	165,645-135-409-	B-62
W7GQC	32.508-86-129-	C-21
W7LBN	26.970-63-145-	C-20
W7ENA	6,764-38-60-	-7
W7FCD	4,446-26-57-	A-11
K7RDH	1,440-16-30-	A-6

Los Angeles

W6ITA	1,369,170-330-1383-	C-84
W6NJU	551,772-262-702-	C-70
W6LCS	237,600-180-440-	A-69
W6PTZ	125,952-128-328-	C-40
W6IBD	79,092-78-338-	C-
W6FRZ	72,828-102-238-	C-
W6MUB	62,418-101-206-	C-20
K6YRA	59,869-93-211-	C-39
W6AM	54,825-85-215-	C-60
W6DGH	51,888-94-184-	C-18
W6BHGU	36,936-72-171-	C-72
W6BNW	32,175-65-165-	A-20
K6HZU	25,680-70-107-	BC-14
W6DYJ	25,410-70-121-	C-
W6RCV	18,792-58-108-	B-20
W6PQT	18,005-65-93-	C-12
W6UED	16,677-51-377-	-
W6HS	13,968-42-111-	C-26
W6BIO	8,400-40-70-	AC-10
W6BNO	4,608-32-48-	A-11
K6SUC	2,448-24-34-	C-
W6TMP	3-1-1-	B-1
K6CEO (K6s CEO DDO)	146.883-136-360-	C-60
W6BURS (W6Bs SCP URS)	73,703-110-224-	A-60

Orange

K6YNB	309.859-187-553-	C-56
W6SRF	296.976-184-538-	C-60
K6GJD/6	281,010-190-493-	C-57
W6BNRK	161,238-154-349-	B-80
W6MYM	135,378-138-327-	C-54
W6BCT	38,395-81-158-	B-15
W6AYSE	360-9-14-	A-11
W6CCP (W6s COP HOH)	277.689-151-613-	C-

San Diego

WA6ZQU	302.592-197-512-	C-60
W6BGGI	71.379-103-231-	C-45
W6CHV	53.790-110-163-	B-43
K6AVF	36.516-88-179-	AC-35
W6LCU	31,464-89-152-	A-27
W6IMN	6,498-38-57-	A-23
W6BIEU	300-10-10-	B-6
W6BTSJ (multiopr.)	7,020-45-52-	B-16

Santa Barbara

W6GRX	187.245-171-365-	C-60
WA6EYP	101.640-132-258-	C-37
W6AGO	101.346-133-254-	C-30
W6BLV	6,144-32-64-	B-8
W6GEB	912-16-19-	A-4

WEST GULF DIVISION

Northern Texas

W5KTR	660.645-277-797-	C-73
WA5ALB	596.250-265-750-	C-72
W5OGS	446.532-254-586-	C-58
K5AKQ	168.216-172-326-	C-60
K5ASM	72.924-103-236-	BC-40
WA5JSL	60.681-113-179-	-50
WA4SUR/5	38.220-91-140-	C-18
W5TMZ	12.750-50-85-	A-14
WA5AUR/5	189-7-9-	A-4
W5MSG	126-6-7-	A-5

Oklahoma

WA5LOB	207.900-175-396-	C-45
W5KGF	170.766-159-358-	B-60
W5BHR	53.781-91-197-	C-31
W5EHY (K5VTA, W5EHY)	160.344-153-350-	A-62

Southern Texas

K5JZY	575.280-255-752-	BC-78
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W5NMA	277.263-189-489-	C-38
W5JVM	113,828-143-267-	ABC-6
W5LZZ	105,324-134-262-	B-36
W5RO	95,904-74-432-	B-
K5QMC	88,854-118-251-	C-74
W5MHV	66,054-101-218-	C-45
W5LJT	22,470-70-107-	C-12
W5EDX	6,480-45-48-	B-20
W5LUN	6,156-38-54-	A-19
W5FLN	3,219-29-37-	B-22
W5OP	1,800-21-30-	B-6

CANADIAN DIVISION

Maritime

VE1PL	762,468-313-812-	C-76
VE1IM	45,318-83-182-	-
3C1ANT	5,376-32-56-	B-16
VE1NV (VE1s AKW NV)	278,460-155-595-	B-96

Quebec

VE2ANK	243,645-185-439-	C-50
VE2VA	208,950-175-398-	C-52
3C2BV	118,930-133-298-	B-28
VE2BK	66,270-66-135-	A-11
VE2ABR	17,544-42-139-	-
VE2DCX	1,176-14-28-	A-11

Ontario

VE3US	501,984-249-672-	C-67
VE3ES	51,552-72-240-	C-33
VE3DEU	46,480-83-187-	A-41
VE3BRE	34,560-64-180-	A-33
VE3BSJ	25,380-60-141-	B-19
3C3PHO (3C3s PHO GCO)	524,949-233-751-	C-94

Manitoba

VE4SD	100,284-37-246-	B-60
VE4RP	23,919-67-121-	B-57

Saskatchewan

VE5DP	61,311-107-191-	AB-44
VE5GF	10,244-52-67-	B-
VE5TY	671-11-21-	A-1
3C5US (VE5s DK TF)	238,638-186-430-	C-85

Alberta

VE6GX (VE6AAV, opr.)	64,125-95-225-	A-26
3C6SF	46,410-85-182-	B-18
VE6ABR	43,659-77-189-	B-49
VE6AGV	40,953-73-187-	B-41
VE6ALX	16,200-60-90-	C-17
VE6PL	13,550-50-99-	B-23
3C6IN	6,270-38-55-	C-
VE6TP	5,400-36-50-	C-4
VE6AJY	324-9-12-	A-2

British Columbia

VE7EH	178,785-145-411-	C-47
3C7NW	22,680-63-120-	C-49
3C7SE	4,320-30-50-	A-21
VE7AXJ	3,038-23-44-	A-25

AFRICA

Angola

CR6GM	226,938-109-694-	A-
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Mozambique

CR7DS	52,380-60-291-	A-
CR7CI	7,704-24-107-	B-3

Egypt

3C3FJZ/SU (multiopr.)	802,575-145-1845-	C-56
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Congo Republic

TN8AA	11,520-32-120-	B-
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Seychelles

YQ9AR	223,311-101-738-	A-16
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The Gambia

ZD3G	474,237-79-2001-	A-47
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Swaziland

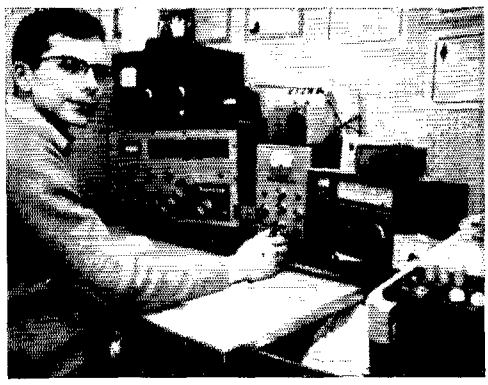
ZD5R	223,110-111-670-	A-
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St. Helena

ZD7KH	9,312-32-96-	A-
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South Africa

ZS6DW	1,202,880-179-2240-	B-
ZS6FN	326,400-136-800-	A-20



The top low-power c.w. score was submitted by Connecticut's **K1ZND**. This fine young operator wound up with 881 two-ways and a multiplier of 277 for 731,557 points. That Navigator is a post-DX test addition to Dave's shack. Antennas in use were dipoles for 80 and 40 and a tri-bander for 10 and 15 up about 25 feet. The QTH about average for an urban area.

ZS4JB 71,205-47-505-A-
ZS6AOU 38,116-52-249-A-

Basutoland

ZS8L 506,088-132-1278-B-

Nigeria

5N2AAF 701,400-140-1670-A-40

Niger Republic

5U7AL 39,555-45-293-A-

Senegal Republic

6W8CD (W6s DOD KG)
884,972-159-1436-A-26

Algeria

7X0AH 203,600-100-679-A-

Republic of the Congo

9Q5FV 254,018-107-793-A-46

ASIA

Iran

EP3AM 653,265-135-1613-B-51
EP2BQ 202,008-84-804-B-

Korea

HL0US (4 oprs.)
349,870-118-992-A-80

Japan

KA7AB 1,104,846-178-2069-AB-45
JA1CG 486,460-145-1116-A-60
JA2JA 302,976-128-789-A-37
JA1CB 301,950-110-915-A-4
JA8SW 264,960-120-736-A-50
KA2JP 233,688-107-728-C-15
JA1MIN 203,046-86-787-A-17
JA1OCA 101,010-65-518-A-21
JA1IF 66,624-64-347-A-4
JA4FK 17,922-29-206-A-4
JA6APL 17,442-34-171-A-4
JA1EZF 15,030-30-167-C-5
JA1JUQ 13,572-29-159-A-4
JA1EU 9,792-16-70-A-20
JA3IG 9,216-24-128-A-20
JA1CWX 8,556-31-92-A-4
JA8QA 6,670-23-98-B-4
JA3NP 225-5-17-A-4
JA1NEZ 36-2-6-A-4
JA2GRM 24-1-8-A-4
KA9MF (6 oprs.)
738,738-154-1599-AC-
JA3YKM (5 oprs.)
1,083-11-10-A-9

Ryukyu Islands

KR6AB 244,860-106-773-B-

Lebanon

OD5FC 20,790-55-126-A-

Isiatic R.S.F.S.R.

UW9CC 56,234-62-304-A-
UA9DT 33,507-51-217-A-
UW0AA 792-12-22-B-

India

VU2KV 43,655-41-355-A-
VU2FN 4,758-26-61-A-

Afghanistan

YA5KG 1,274-14-31-B-6

Cyprus

ZC4CN 79,420-41-603-B-
ZC4RM 77,095-85-307-A-35

EUROPE

Portugal

CT1IW 449,616-136-1102-B-20
CT1SQ 369,117-147-837-A-25
CT1IN 16,485-35-157-A-15

Germany

DJ6QT 2,247,264-216-3468-B-70
DJ2YA 1,830,605-208-3194-A-75
DL0PU 537,705-135-1419-C-39
DL8RM 348,705-123-945-C-
DL4NS 346,380-138-837-B-51
DL8PC 258,048-128-870-A-
DJ9LI 238,461-101-787-A-
DL6WE 191,966-106-612-A-
DL6VP 181,355-95-640-B-24
DL3RA 95,970-70-457-A-



A single rig was operated on phone, by **W8GUF** and **K8s** DCP and HLR for top Michigan multiop. score of 328-K. **W8GUF** (center) operates while **K8HLR** (right) logs and **K8DCP** (left) spots using a spare receiver. The device on the table between HLR and the spare receiver is a broadcast type cartridge tape machine used for CQs, saves the lungs!

DJ2YL 88,407-47-627-B-
DL7CM 71,883-49-489-B-
DI7LJ 68,488-56-409-B-20
DL7DE 59,364-68-291-A-
DI4LA 36,516-68-179-A-23
DL6KG 34,068-68-167-B-10
DL5KS 17,670-31-190-A-13
DJ8YQ 12,900-43-100-A-
DL4EC 8,652-28-104-B-
DL7FP 6,624-32-69-
DJ4ZD 4,392-24-61-A-
DL1IP 567-9-21-A-
DM3LOG 3-1-1-A-
DJ6TS (DJ6TS, DJ7IK)
1,452,132-193-2575-B-
DL0EV (DL6s JL LE OH)
263,070-111-791-B-

Spain

EA2EL 229,950-105-730-A-
EA3QW 22,680-45-168-A-

Republic of Ireland

FI3AK (multiopr.)
500,096-128-1309-BC-

France

F3KW 1,490,562-162-3067-A-59
F2SI 481,922-151-1064-A-
F2YS 139,293-99-469-A-20
F2VX 9,120-38-80-A-

England

G4IZ 1,171,596-178-2194-B-53
G3UML 1,162,800-190-2040-A-65
G3IAR 905,958-171-1766-B-
G2QT 588,141-159-1233-B-48

G3CAZ 587,020-140-1398-AB-56
G3LNO 315,960-120-880-A-25
G3TMN 133,522-101-441-B-24
G3USF 75,735-45-561-B-29
G2AJB 24,882-58-143-A-
G5HZ 22,176-42-178-B-
G3RRJ (G3s JXC RRJ)
1,589,193-213-2487-A-
GB2DX (G3s JBC MPM)
1,342,191-177-2572-B-71
G3SME (G3s SME UQR)
701,552-163-1441-B-47

Scotland

GM3BGL 329,703-103-1067-A-
GM5AFF 23,214-53-146-B-

Hungary

HA5AM 110,839-87-425-B-
HA5CQ 3,059-19-59-A-
HA5BY 180-6-10-A-
HA5FE 168-7-8-B-

Switzerland

HB9DX 87,360-64-455-B-
HB9RX 71,808-66-375-B-22

Italy

I1BAF 1,725,750-195-2950-A-57
I1FLD 453,248-128-1182-B-43
I1KPK 295,056-108-911-B-47
I1PGL 149,076-101-493-A-30
I1MOL 142,974-47-1014-A-48
I1LCK 86,292-68-423-B-9
I1RB (I1s RB RBJ)
1,143,750-250-1525-B-
I1QMJ (I1s LK QMJ RKV)
67,080-40-563-A-28



W2MEL presents a real case for "home brew" with that E.N.Y. c.w. topper of 1.2 million. On the shelves at the left is the receiver (a prototype in a constant state of change, therefore without panels). At the right is the control for switching outside antennas and exciter (v.f.o. through 2-6146s). At the extreme right is a small rack housing a pair of 813s and power supplies.

Sardinia

IS1VAZ 522,000-125-1394-C-38

Norway

LA1H (LA9OI, opr.)
264,385-115-790-B-53
LA3QG 125,832-98-428-B-18
LA6U 22,326-61-122-A-
LA4LG 21,060-60-119-A-7
LA8RI 11,550-25-155-B-
LA1MG 10,664-31-115-A-11
LA8EJ 9,288-36-86-A-
LA4AF 7,350-35-210-A-
LA5SH 3,510-30-39-A-3
LA5AH 1,998-18-37-A-
LA7QI 910-14-65-A-

Austria

OE2EGL 1,135,035-165-2293-A-

Finland

OH5SM 427,101-127-1127-B-
OH1VE 75,969-69-397-B-
OH5OL 5,727-23-85-B-
OH2BR 4,092-31-44-A-
OH1UR 2,622-19-46-B-
OH1AG 2,472-24-35-A-
OH5VT 2,322-18-43-B-
OH5UQ 2,208-23-32-B-
OH2AM (6 oprs.)
1,668,570-178-3125-B-
OH2AC (multiopr.)
286,134-103-926-B-23

Alam Islands

OH0NI 14,760-41-120-B-

Czechoslovakia

OK1MP 585,192-148-1318-B-46
OK2ABU 64,255-71-308-B-
OK1AEZ 47,532-68-238-B-
OK2BEN 20,520-38-180-B-
OK1ADM 4,089-29-47-A-

Belgium

ON4YU 466,973-127-1226-B-
ON4NM 277,833-107-872-B-23
ON5GF 80,760-60-449-B-
ON4XG 79,326-78-339-A-16
ON4AK 2,016-16-42-B-

Denmark

OZ9SL 898,434-161-1798-A-60
OZ3KE 235,710-97-810-B-32
OZ7BG 189,750-110-575-A-16
OZ7DX 33,672-61-184-A-
OZ5DX 10,800-30-120-B-
OZ7SS 1,071-17-21-A-

Netherlands

PA0XPQ 1,241,478-177-2350-F-51
PA0DEC 174,048-98-592-A-
PA0UC 116,034-89-466-B-25
PA0TU 61,992-72-287-B-
PA0LOU 56,952-72-265-AB-12
PA0VB 13,240-40-114-A-

Sweden

SM6DLL 580,050-150-1359-B-53
SM6ARK 531,216-136-1302-B-26
SM4CMG 487,719-141-1155-A-
SM0BUO 131,976-94-486-B-19
SM5BPJ 47,676-58-274-B-
SM6CLH 47,748-46-346-B-
SM2BYW 23,430-55-142-B-
SM0BDS 429-11-13-B-
SM6CAS (5 oprs.)
1,167,120-180-2162-C-90

Poland

SP8AJK 116,565-95-409-B-
SP6AT 34,986-51-233-B-
SP8ANH 9,540-30-106-A-
SP3AMZ 60-4-5-A-

Greece

SV1BL 39,000-44-300-A-

Crete

SV0WL 166,408-88-635-B-30

Iceland

TF2WKE 164,690-86-639-A-21

European Russian S.F.S.R.

UA3DR 209,484-92-759- B-
 UA1CS 72,576-72-336- B-
 UA1TT 66,865-65-343- A-
 UA3CO 35,280-42-283- A-
 UA6XG 29,295-45-217- B-
 UA3TU 3,480-58-174- A-
 UA3KBO (2 oprs.)
 203,580-116-607- B-
 UA3KND (2 oprs.)
 16,884-42-134- B-

Ukraine

U5ARTEK (2 oprs.)
 78,312-52-502- B-

White Russian, S.S.R.

UC2BF 25,493-37-230- B-

Lithuania

UP2OU 15,930-30-177- A-
 UP2NV 9,108-33-92- B-

I.T.U. Geneva

4UIITU (multiopr.)
 720,328-133-1860- C-

NORTH AMERICA

Cuba

CO8RA 399,168-144-925- A-34

Dominican Republic

HI8XAL 3,727,719-279-4452-BC-60

San Andres and Providencia

HK8AI 263,235-109-805- B-12

Panama

HP1JC 1,528,325-235-2165-AB-

Alaska

KL7EBK 1,316,952-216-2037-AC-
 KL7FRZ 40,779-69-193- C-
 KL7GAC 14,652-36-407- B-
 KL7WAH (multiopr.)
 516,834-153-1126- C-16

Puerto Rico

KP4AST 3,142,500-250-4190- C-78

Virgin Islands

KV4AM 1,289,916-171-2532- C-60
 KV4EY 216,384-112-646- C-16

Canal Zone

KZ5SO 531,732-146-1214- A-16
 KZ5MF 70,077-71-329- C-7

Costa Rica

T12NA 35,910-63-190- C-

Antigua

VP2AZ (VEIMX, opr.)
 359,625-125-959- B-18

St. Kitts, Nevis

VP2KR 542,658-149-1214- A-50

Montserrat

VP2MK 154,770-110-469- A-



There is hardly a DX signal today that sounds more like DX than that of **VU2DIA**. Hegde's regular c.w. activity, in addition to the contest, has made the Andaman and Nicobar Islands a snap for any 20-meter DXer.

Turks & Caicos Islands

VP5RS 2,053,350-234-2925- A-54
 VP5RB 1,892,376-216-2935- A-51

Bahama Islands

VP7NH 1,230,761-193-2126- A-49

Salvador

YS2OB 1,120,896-192-1946- B-29

Jamaica

6Y6BS 59,202-69-290- A-8

OCEANIA

Philippine Islands

DUIFH 545,632-136-1339- C-56

Baker, Howland & American Phoenix Islands

KB6CZ 399,330-145-918- B-

Guam

KG6AQ 176,832-96-614- A-35

Bonin & Volcano Islands

KG6LJ (K4CFC, KH6GEM)
 131,544-84-522- B-14

Hawaiian Islands

KH6LJ 3,045,120-244-4160- C-72
 KH6UL 2,798,712-252-3702- B-80
 W0PAN/KH6

American Samoa

1,369,518-199-2299- A-60
 KH6BZF 311,849-109-955- C-
 KH6FON 7,560-21-120- A-6

Marshall Islands

KS6BV (KS6s BT BV, W4SFFJ)
 2,590,146-234-3690- C-80

Marshall Islands

KX6DB 477,477-143-1113- C-16

SOUTH AMERICA

Chile

CE6EZ 2,012,208-206-3256- B-
 CE6EF 91,266-53-574- B-

Uruguay

CX9CO 867,160-152-1911- B-45
 CX2CN 136,920-86-815- A-20

Ecuador

HC1TH 2,876,398-254-3513- B-84
 HC4TB 128,620-109-394- A-19
 HC4TB/1 3- 1- 1- A-1

Colombia

HK3RQ 2,876,256-216-4456- C-52

HK4KL 2,269,944-226-3348- B-

HK3AQL 328,020-142-770- A-

Argentina

LU2FAO 19,314-37-174- B-7

Brazil

PY1BYK/7 713,310-155-1534- B-
 PY1CK 144,235-91-529- C-16
 PY7TS 117,936-104-378- C-
 PY4KL 53,928-42-428- B-
 PY1BAR 50,820-70-242- A-24
 PY7SO 38,628-58-222- C-
 PY3HT 34,056-44-258- B-
 PY2BGO 33,858-57-198- C-
 PY3BXW 20,664-41-168- B-
 PY2DBV 8,832-32-92- A-
 PY2DCA 3,312-24-46- C-4
 PY2NM (PY2s DXT NM)
 1,590,708-203-2612- B-

Surinam

PZ1BW 58,944-64-307- A-

Venezuela

YV5BPG 1,405,346-223-2106-BC-

Paraguay

ZP5JB 123,372-92-447- B-

Guyana

SRIG 736,200-200-1227- A-30

Australia

VK2APK 910,860-190-1598- B-
 VK3ZR 540,216-104-1098- A-
 VK2WD 236,988-116-681- B-
 VK3ARX 56,964-47-404- A-12
 VK2VN 42,822-61-234- A-4
 VK3XB 7,884-35-73- A-18
 VK3KS 1,275-17-25- A-13
 VK2FU (multiopr.)
 1,459,773-203-2397- A-

Territory of New Guinea

VK9GN 168,300-110-510- A-9

Cook Islands

ZK1AR 989,820-188-1756- A-58

New Zealand

ZL1KG 1,522,125-205-2475- A-59
 ZL3QH 860,310-158-1815- A-43
 ZL1AGO 560,001-173-1099- A-4
 ZL1IL 266,832-109-816- A-
 ZL3AB 51,528-76-226- A-

Megathanks to the following OMs submitting logs for checking purposes, C.w.: W1CBW W2s EGI KFB K2KMF/1 WA2VSO W3s JO NNL UHN W4JUK W5VA W6s EYR PIZ V7s GGG LBV W9GIC K8CUV/VO1 3C1s DB OM VE3ATF 3C6VO, DM2s BTO BZN CCM DM3BE DMHPKL F2SQ LA4s K LG LA8s CJ SJ OHISH OH2BAC OH3XZ OH5PB OK1s ADM AT MX NK OH TA US OK2s BEU FBX BKH DB QR WDC OZ7ON SM3s CJD CXS SM5s HFJ BTX BXT CRV FC SP2BMAI SP5YQ SP6AK UO5AA UW3AX UW6BK VK2BRJ/9 VU2JA YO3JW 5N2AAF HA1-403 UB5-5382 SM5-3669 YO8-7099. Phone: WA1s CYT ECV EDR W1OUZ K1QPJ DJ1ZN/W2 W2EGI WB2VZW W4s KEB LRN W5FFW W7GGG VE3s CEAE ECI 3C6AKV VE6SX VE8BB DL1A F2MO HK5BDS KL7FBA LA5S LU9DAH SM5BFJ SM7CSN SM8BNX YV3KV A-5177 A-5206 UC2-33087.



The sole Vermont phone entry by **W1CBW** registered 479 two-ways. This must have been a popular place to be from during the test!



K55TL furnished a nifty New Mexico multiplier to over 800 DX stations operating from this tidy shack. That banned-country Siamese doesn't make it multiop!



Strays



Coinciding with the 44th year of standard frequency broadcasting from WWV was the formal dedication of the new WWV facilities at Fort Collins, Colorado¹ on July 29. Attending the WWV day ceremonies were top officials of the Bureau of Standards and many distinguished guests. Carl Smith, WØBWJ, (left) Director of the Rocky Mountain Division represented the ARRL. Shown with Director Smith is Willard Solfermoser, KØDVI, who sent in the earliest postmarked QSL of "first-day operation²." This photograph was taken in front of the QSL board displaying cards from amateurs in each of the fifty states and many foreign countries—including six continents—which qualified WWV for a special WAC award.

¹ "WWV Moves to Colorado," *QST*, January and February, 1967.

² "WWV To QSL 'First-Day' Reception," *QST*, November 1966, p. 53.

THE U. S. Navy has two hospital ships operating near Vietnam, the *USS Repose* (AH-16) and the *USS Sanctuary* (AH-17). Each ship is a floating hospital of 750 beds capacity, fully staffed by physicians expert in the various specialties of medical practice, and completely equipped in all respects. *Repose* and *Sanctuary* carry on a long Naval tradition, originating more than a century ago with the first such vessel, the *Red Rover*, back in 1862.

Both of the above ships carry facilities for amateur radio operation. The station on the *Sanctuary* is WA4LGD/MM and K7YCH/MM is on the *Repose*. Equipment aboard both ships is Collins S-line with a 6-element tri-band beam up 145 feet.

Operating is usually done between 1300 and 1900 GMT around 14.345 Mc. Anywhere from 15 to



RM1 Vernard Grady, WB6VES operating the rig aboard the *Repose*. (Official U.S. Navy photograph)

20 messages per day is typical of the traffic and the messages are relayed by hams all over the United States. During an average stay of 6 weeks in the hospital ship, each patient will have about 2 or 3 messages relayed. It is unfortunate that space does not permit listing all of the calls of U. S. operators who have given most generously of their time helping with traffic from these ships. Anyway, the men of the *Sanctuary* and *Repose* say "thanks" and "well done" to all of those who helped.

The moral value of amateur radio to servicemen patients aboard these hospital ships is of inestimable value, and another illustration of the importance of the amateur service — *George H. Reifenstein, M.D. W3CKN/K6LZL, Rear Admiral (MC) USNR-R, Technical Director, Clinical Research and Medical Education, U. S. Navy, National Naval Medical Center, Bethesda, Maryland 20014.*



Messages to home from the *Repose*. Here, operator RMSN Paul Spann, WA5RJA (left) hands the mike to ET1 George Ellson. (Official U.S. Navy photograph)

AMATEUR RADIO PUBLIC SERVICE CORPS

CONDUCTED BY GEORGE HART,* WINJMJ

Whither Public Service?

WE have often wondered, in this day of emphasis on hero worship, glamour and ways and means of influencing the public mind, if we could be wrong in trying to perform public service by organizational means. It's a good thing, occasionally, to wonder if you could be wrong. Anybody can be wrong — yes, even thou.

Once the thought occurs, it can be given impetus by browsing through the daily mail. For example, we might come upon a reference to a 20-meter sideband net we have scarcely ever heard of which is apparently performing a very real and useful service just by being on the air most of the time and occupying a frequency. No real organization apparent, but the net is available. Or here might be a letter from a non-amateur expounding the virtues of some amateur who handled a Vietnam communication for her; she says he ought to get an award of some kind. Here is a clipping from a local paper that says John Hamm of that city converses familiarly with exotic and romantic places every night. A letter from the manager of an independent net asks how he goes about joining the National Traffic System, but it's pretty obvious that what he really wants is for NTS to join *him*. An SEC tells us that ARPSC isn't working in his section, everybody is going MARS (including himself). An RO says we should keep our hands off RACES, it's none of our business; another RO says we should concentrate 100% on RACES and forget AREC and NTS. A thoughtful and far-seeing old timer tells us that in emergencies amateurs will always have to improvise, regardless of how well organized we think we are, and that 95% of our preparedness will go out the window when the chips are down, so why waste all the effort? Another letter firmly espouses the organizational concept, but insists we are going about it the wrong way, that we should embrace a government-sponsored service and not try to operate as an amateur service except as an adjunct thereof.

Not exactly a typical day's mail receipts, but over a period of time such comments are received and it is difficult and confusing to keep your eye on the organizational objective in the midst of all these diversions and differences of opinion. Maybe it would be the path of least resistance to discontinue coordinated organizational efforts, let all the nets be formed and operated according to their own standards, loosely centralized and

*Communications Manager.

coordinated at headquarters just for information purposes, without any attempt at control or direction. Maybe we could get more flexibility, more participation and a resulting greater public service this way. Instead of beating our brains out trying to *organize* public service, we could spend our time and efforts publicizing the nets in existence, telling the general public about them, expounding their virtues and ignoring their faults (if any). The appeal would shift from the nationwide organized system to the individual net and the individual amateur and what each does in its or his sphere of influence. Maybe we should spend less time trying to do things and more time talking about what we do.

Anyway, that's one way to look at it.

On the other hand, the way we are now doing it, or trying to do it, is not something that was thought up on the spur of the moment, or imposed on the membership by an individual or group without their knowledge, consent, chance to comment, or promise of cooperation and assistance. AREC started in 1935 and has developed over the years into the emergency division of ARPSC which it is today. It was loosely organized at first, became more tightly organized as time progressed and the need for a tighter organization became apparent, but still maintains a high degree of flexibility. Some of its leaders think it is *too* flexible; some of its critics feel it is ineffective because of its adherence to amateur procedures and principles of operation. The biggest difficulty is getting participation in the face of all the competition for use of amateurs and the amateur bands by others.

Traffic organization started out the same way, growing like Topsy, becoming organized as the



This is WA2AWK who is the Emergency Coordinator for Onondaga County, N.Y.

need for it arose. But most of the traffic handlers, following the World War II break and partly as a result of wartime training, were dissatisfied with the methods and procedures carried over from pre-war times, and demanded a new setup. We produced one, with their help, presented it, put it into effect and today are still operating it. It's not perfect (is anything?) but it works if implemented according to plan.

Then, in 1951, up popped civil defense and RACES. Originally intended to be the amateur stake in any wartime operation, it soon expanded to cover certain peacetime operations as well, and the spectre of competition between AREC and RACES, both amateur services, arose. In 1966, the Board of Directors of the League tried to soothe the troubled waters by making RACES a part of ARPSC; but c.d. amateurs and other RACES people made some fuss about this, saying that RACES wasn't the League's to adopt, making us feel that although we may want RACES, there is some doubt that it wants us.

There seems to be little question that the majority of amateurs feel we should have League-



Here is the shack of W8DSW, who organized a 2-meter emergency net during the Detroit riot. Twenty-two amateurs reported into the emergency net during the three-day period that started on July 24.

sponsored public service organization. The question is, what *kind* of organization? How tight? Made up of whom? Based on what principles? It is easy enough to criticize what already exists, which is supported by enough to make it work after a fashion, but there is a startling and significant lack of unanimity in any of the alternative proposals. Which way should we go? Should we tighten up AREC, loosen NTS and let go go of RACES? Should we try to be all things to all served agencies, or should we try to serve them all through one central amateur facility? If the latter, how do we meet the competition from those who want amateurs exclusively for their own use and who offer them material things that we cannot offer? Or should we even try?

We don't know the answers to all these questions. Maybe you do. If so, we *wish* you would let us in on them.



Always a big event in the east is the NYS picnic. This year it was held at the home of W2MTA in Newark Valley, N.Y., and SEC W2RUF succeeded in getting a few of them together for a snapshot. Kneeling, l. to r. are WB2IFN, W2FCG, K2JBX, WB2JCE, W2RUF, WB2OYE, K2KTK. Standing are K2RYH, W2EQM (partially hidden), W2LYG, W2ZPO, WB2HZY, W3EML, K2SSX, W2SEI, WB2YBX, K2AJA, K2KIR. Some mighty familiar calls!

What, NO SET?

That's right, there is no Simulated Emergency Test announcement in this issue of *QST*. Why not? Because the SET for 1967 is being held in 1968—that is, the date has been moved from October to January (27–28, to be exact) at the request of a considerable segment of participants throughout the years. It seems that the October date interferes with something almost everywhere—Thanksgiving in Canada, hurricanes down south and along the east coast, sporting events everywhere. From all we could gather, almost nobody liked the October date, except possibly those who weren't complaining. So this year we are going to try a late January date and hear from those who *liked* the October date, plus those who didn't like October but who like January even less.

We realize that emergencies don't happen at our convenience, but test emergencies have to consider this or suffer diminished turnout. In a real emergency, nobody is going to worry too much about his convenience; but you can't really blame an AREC member, for example, for not participating in a test if it interferes with something else he has planned or regularly with another event in which he is equally or more interested. We hope that those we lose by the change (if any) will be more than made up for by those we gain because the new date is more convenient. Full details in the SET Bulletin later this year, and the regular announcement will be in January *QST*. — *W1NJM*.

National Traffic System

The first formal meeting of the Central Area Staff of NTS took place at the Central Division ARRL Convention in Milwaukee, Wis., on July 7–8, with Chairman W9JUK presiding. Also present were PAN Manager W9DYG-9RN Manager W9QLW and Members-at-Large W5CEZ, W9VAY and W8LCX. Absent were RN5 Manager K5IBZ and TEN Manager W8LGG. The principal item on the agenda was the finalization of the Terms of Reference for the Staff. This document has now been completed and the CAS is now formally established as a working part of the NTS, just as PAS and EAS have been formalized before it.

Other matters brought up at the meeting and subsequently surveyed by mail to include all staffers include such things as having two region net representatives on each CAN session, one for transmit and one for receive (this has been a practice in EAN for some time), including TCC representatives in the "percent representation" figure of the area net, and CAS sponsorship of an ARPSC award. The CAS has also gone on record as (1) favoring the new

S&T date, (2) lukewarm about the "new method" of traffic reporting (i.e., destination first, number of messages second), (3) lukewarm about the "versatility factor" for appointment ratings, (4) in favor of the proposed new appointment structure and (5) in favor of more considerate treatment of newcomers at region and area levels, although reaffirming that the proper place for their training is at section level.

Another CAS meeting is possible this year, but nothing definite yet. The Pacific Area Staff of NTS is planning a meeting at the Pacific-Southwestern Division Convention in Los Angeles in September. By the time you read this, it will be history.

New subject. With the coming of the active fall season (it should be a lulu, with propagation conditions looking up), many NTS section nets will be looking toward possible re-establishment of the unpopular "late" session, normally occurring at ten o'clock local time. W16KZI, manager of SCN, comprising four of the nine California sections, has combined their late session with a training session for newcomers to NTS. A welcome message in standard form is originated and sent by one of the regular net members to each newcomer when he reports in, requesting he send the manager his address and inviting him to continue participation. No "brush off" or brusque treatment on the late SCN. Once the manager gets the address, the newcomer receives in the mail some information to help him in traffic work and to understand how NTS works.

While conducting the training session at the time usually used for the late section net session is a new wrinkle, the practice of welcoming newcomers and dealing patiently and considerately with their shortcomings in procedure is or should be standard. Section training nets can be considered a part of NTS if they conduct liaison with the regular section net or the region net. More recruitment and training are needed. You don't acquire or retain new operators by telling them they are lids. Make them feel wanted, needed, appreciated, and help them get off on the right foot. Establish an NTS section training net. — W1NJM.

July Reports:

Net	Ses- sions	Traf- fic	Average Rate	Average age	Representa- tion %
EAN.....	31	1242	.895	40.1	94.0
CAN.....	30	1113	.833	37.1	96.8
PAN.....	31	1014	.668	32.7	89.2
1RN.....	62	320	.249	5.2	87.4
2RN.....	59	387	.533	11.7	90.4
3RN.....	62	472	.383	7.6	98.4
4RN.....	57	358	.266	6.4	86.5
RN6.....	62	1073	.801	21.5	100.0
SRN.....	62	485	.347	7.8	98.4
9RN.....	62	496	.404	8.0	95.2
TEN.....	48	542	.602	11.0	76.3
ECN.....	28	81	.172	3.0	58.0 ¹
TWN.....	12	59	.216	4.9	20.7 ¹
Sections ²	2284	12188		5.4	
TCC Eastern.....	124 ³	479			
TCC Central.....	93 ³	582			
TCC Pacific.....	111 ³	620			
Summary.....	2890	21,814	EAN	12.6	62.7
Record.....	2542	21,744	1.267	15.2	—



Shown are W8ELW (RM of QMN) and W8FX (SCM Mich) at a meeting of the Michigan Traffic Net held in April.

¹ Representation based on one session per day.

² Section and Local nets reporting (81) AENB, D, H, M, O, R, T (Ala.); ARSN, OZK (Ark.); NCN, SCN (Cal.); EVN, HN (Colo.); CN, CPN (Conn.); FAST, FATT, FMTN, FPFN, GN, QFN, SATN, TPTN, WFPN (Fla.); BEN, QIN (Ind.); Iowa 75; KPN, KSN, OKN, OKS (Kans.); FCATN, KRN, KTN, KYN (Ky.); LAN (La.); PTN (Me.); MDD5, MEFN, Termitte (Md.-Del.); EMINN (Mass.); M6MTN (Mich.); MJN, MSN, MISP, MISTN (Minn.); MITN, MINN, PHD (Mo.); NJN, NJPN (N.J.); Roa/Irunner (N.Mex.); NLI, NLPN, NLS, NYS (N.Y.); NCN, NCSB, THEN (N.C.); OSSB (Ohio); STFN (Okla.); KPA, EPEN, PFN, PTN, VHTN, WPA (Pa.); RISP (R.I.); SCN (S.C.); TN (Tenn.); NTTN, TEX (Tex.); HUN (Utah); VN, VSN, VSN (Va.); WSN (Wash.); WBSN (Wis.); APSN (Alta.); RTQ, AREC (Que.).

³ TCC functions performed not counted as sessions.

July, in spite of the comments, broke some of the records mainly because of the great number of Section and Local net reports received. The two missing Region Net reports certainly did not help the statistics, but we are happy to see that only two Region nets are holding to a single session per day. Even the Eastern Canada Net is considering two sessions per day in order to conform to NTS principles.

W9DYG reports that the storms over Central USA just do not seem to let up; many thanks to the extra efforts during the bad conditions by the members of CAN, W6VNO of PAN sez that after June's horrors he didn't expect anything worse, but here it is. W42GQZ reports that vacations made a few holes in the skegs; traffic totals are still down but there is a little improvement over June. K3MVO sez only a little gain. W6BBO reports that much of the traffic is from non-NTS sources and there is very little traffic from the Section nets. W9QLW issued Region Net Certificates to W19s KAG MXG QXT, WA4UII, WB4CJM, VE3BZB reports that under consideration for the winter are two nightly sessions with at least one, perhaps both, on 7 mc; because of short skip on 3.5, something must be done to cover VE1/VO land.

Transcontinental Corps: W3EML sez that July was not one of the better months, with traffic totals about the same as July 66; not too bad, considering the foul-up because of the change of time and the daily thunderstorms. W9JUK is not proud of the July report but nevertheless it's all he has to give; poor conditions, vacations, unforeseen emergencies, you name it, we had them all this month. W7DZX sez a terrible report but now that the cherry harvest is finished he should get things working right again.

July TCC reports:

Area	Func- tions	% Suc- cessful	Traffic	Out-of-Net Traffic
Eastern.....	111	83.2	1363	479
Central.....	93	68.8	1244	582
Pacific.....	111	84.8	1240	620
Summary.....	315	82.9	3847	1681

July FCC roster: Eastern Area (W3EML, Dir.) W1s BJG EFW NJM, W2s GKZ GVH SEI, K2s KTK RYII SSX, W4s BLV UPC, W7s MOQ OHL RCKT, W3s EALL NEM, K3MVO, W4s DVT NLC ZM, W8HT, K8KMQ, W4As CFJ OCG PAMN, Central Area (W9JUK, Dir.) W4OGG, K4s BSS DZM, W5s GHP KRX, W8FAW/G, W9s OXY DYG JUK VAY, W19s MIO NFS NPB, K9DHN, W0LCX, K9s AEM YBD, WA0IAW.

Other Net Reports

Net	Sessions	Check-ins	Traffic
QTC.....	21	238	166
7290.....	40	1320	707
HBN.....	31	376	584
Eastern Area Traffic.....	16	159	103
Mike Farad.....	47	340	307
75 Interstate.....	31	1022	755
20 Interstate.....	22	358	2986
Clearing House.....	21	225	177
New England Teenage.....	31	291	120
North American.....	26	769	592

Diary of the AREC and RACES

On May 12 through 15, in Northern Alabama, there were six different alerts because of threatened severe weather. It started when the Civil Defense Director notified W4YFN that the weather bureau wanted additional help during

the tornado threat. The amateurs provide the tornado watch anytime, day or night, when North Alabama is threatened with severe weather and have been doing this for the weather bureau and civil defense for the past seven years. The Madison County Civil Defense Communication Center is the control center with 2-meter a.m. link to the weather bureau. Six-meter a.m., 75-meter s.s.b. and 2-meter f.m. is used to cover the county, plus Morgan, Limestone and Lauderdale Counties. There always seem to be more than enough amateurs available to do the job. In this particular alert the following amateurs participated: W4s EKL ERX FVY HFU UVM WEY WGI YFN YXQ. K4s IQU RSB TUT VJL WHW. W44s DBQ DZF FYO JSM KMA VQI WGF WB4ALW WA5KXI/4 — W4YFN EC Madison, Ala.

On June 11, WA6TPN called in on 7255 kc. (West Coast Amateur Radio Service monitored frequency) at 4:17 p.m. reporting that a Southern California girl traveling in the far East became ill and additional medical information was needed in order to treat her correctly. K6KZI and W6QJE were instrumental in conveying the rather complex medical information to Thailand. With the proper treatment the girl recovered successfully — W6I1ZF

On June 14, there was a flood and tornado alert in East, South Central and Southeastern Nebraska. As flood conditions occurred in several areas of Nebraska, the Nebraska AREC Net on 3982 kc. was alerted with WA0HO acting net control. Net members stood by and effectively handled weather, flood, tornado damage, road closing, rainfall and other reports. Some of the agencies served were the American Red Cross, Power and Gas Companies, Police, Civil Defense and National Guard. Several amateurs operated mobile in the disaster areas. Grand Island and Kinesaw amateurs in the two worst-hit areas set up individual nets on 3976 and 3990 kc. W0ZWG, EC for Seward County, also set up a local net with W0CRK/mobile passing rising river reports via W0ZWG to W0ZOU based at civil defense headquarters. W0FHL, EC for Grand Island, was contacted by the civil defense director because of a report of a tornado touchdown at Cairo. WA0KOC/mobile was dispatched and when he arrived used 75 s.s.b. to radio that the report was false. Other rumors were then checked out by the mobile who communicated with W0FHL, W0KLB and K0BRG. When it was evident that the area would be flooded, a mobile truck was set up outside police headquarters and communications were established with W0HSO, whose house was completely surrounded by water. The Soldiers Home was without power or any form of communications so the amateurs provided a link and found that flashlights, water and other supplies were urgently needed. With the combined efforts of the amateurs and civil defense, 500 gallons of water and flashlights were taken by boat to the hospital. Throughout the emergency W0HNT/mobile, W0FXK, W0BRG and W0FHL were active — K00AL, SEC Nebr. and W0FHL, EC Grand Island, Nebr.

Sometime about the second week of July, K7WJF was bitten by a scorpion. He lived several miles from Apache Junction, Arizona with no transportation or telephone. He then turned on the "sixer" and heard WA7EWS. After a brief discussion, WA7EWS called the sheriff and then K7WJF was brought into town to the doctor. The sheriff and doctor commented that it was better to be an hour early than five minutes late. Several days later the bitten hand was sore but on the way to recovery.

On the evening of July 11 a heavy rain fell on Oak Ridge, Tennessee. The nearby town of Oliver Springs was inundated and several houses were washed away in the flood. The civil defense director, W4SGI, contacted radio officer K4VOP, who then went to the scene mobile and reported to W4SGI that there was no communications emergency and there appeared to be no need for any further amateur alert because emergency measures were going satisfactorily. The operation was secured at 0230 (GMT). Civil defense evacuated about 350 people from Oliver Springs.

On July 15, five Quebec amateurs provided communications for the Cartierville Boating Club Regatta under the direction of VE2ANH. The wide-band 2-meter repeater



This is a display at the Yakima, Washington Hamfest held in July showing W0ELW/7 (left) and W7UWT (SEC Wash.)

was used and 75 messages were handled from 0900 to 1700. VE2s BSQ DEX ZA ROQ and ANH performed the communications and some equipment for the operation was loaned by VE2s AUU and BXW. — VE2ALE, SEC Quebec.

On July 18, the civil defense director requested the services of the Owensboro-Davies County AREC be used to assist in a search for an elderly man who was missed from a rural rest home. Mobiles patrolled roads in the search area for several hours and coordinated the search efforts which were on horseback and afoot. One "horse mobile" was used. All activity was on 2 meter FM with the Club/CD station W4YOQ as net control. This was the group's second alert in eight days but the man was not found. Stations that participated were W4s MMY SUD TOY LUB OYI, W44s FMY MXD KFO LJM, WB4EEH, W44s FAY FDZ. — W4OYI, SEC Kentucky.

Also on July 18, K6GAF/mobile between Los Gatos and Santa Cruz called in on 7255 kc. at 1739 to report a stalled car that presented a hazard on the heavily traveled highway. K6KZI, net control, asked for a station in the area and none responded, but W6I1ZF in King City, nearly 70 miles south, did manage to raise W6VXF in San Jose through the 2-meter repeater WB6OQS, of the Santa Clara Valley VHF Repeater Society. W6VXF then responded and completed the call to the Highway Patrol at 1744 — W6I1ZF.

On July 22, K6TWB/mobile about 50 miles north of San Francisco on a remote stretch of Highway 1, came upon an automobile accident with injuries. He called in on 7255 at 1414 for ambulance services. K6KZI received the call and asked for a station in San Francisco. WB6SOX answered and called the Highway Patrol. At 1428 K6TWB/mobile at the scene reported the arrival of the ambulance. K6EJT and WB6UXP also helped out in making the related calls — W6I1ZF.

On July 21 through 26, seventeen amateurs participated in a search for a lost boy in Saratoga County, New York. It was thought that the boy had gone hunting in the heavily wooded area near Ganessvort and Wilton. After dark, when he did not return, WB2KBQ was contacted and the search was initiated. On the 24th at 1120 P.M., WB2KBQ/mobile originated a call for assistance to help with the search of the 15-year-old boy. The call on 51 mc. was answered by WB2UEX and K2AYQ. Phone calls alerted the AREC members then WB2VVD and WB2RPL proceeded to the search area operating mobile. WB2UEX/mobile later

(Continued on page 158)

Happenings of the Month

Incentive Licensing Adopted by FCC

ARRL Comments on RACES FAX

INCENTIVE LICENSING ADOPTED

The Federal Communications Commission has reinstated incentive licensing in a Report and Order on Docket 15928, with changes in the rules effective November 22, 1967 and changes in privileges effective a year later.

The Commission dropped completely its proposals for special call signs keyed to license class. It has added, however, to the rules for eligibility of two-letter licenses a provision that those who were first licensed by the U.S. 25 years ago, and who now hold Extra Class, may request a two-letter call. The \$20 fee must be submitted with the FCC Form 610 to Gettysburg, on or after November 22, 1967; no special combinations within the two-letter group can be asked for, however.

The Advanced Class license is reactivated — all present holders and all new licensees of this class will have privileges not available to General and Conditional Class licensees after November 22, 1968. New applicants for Advanced will take a fifty-question multiple-choice test on technical subjects, less difficult than Extra but tougher than General. In addition, Conditional, Technician and Novice applicants for Advanced will take the regular General Class written exam and the 13 word-per-minute sending and receiving tests in the International Morse Code. Thus, only 13 w.p.m. is required of Advanced Class applicants. No waiting period or "time-in-Grade" requirement has been established for Advanced, but the two-year service requirement (as Conditional or higher) for Extra remains in effect.

Advanced Class and Extra Class licensees will have exclusive use of the following phone subbands after November 22, 1968: 3825-3850, 3825-3900, 7200-7225, 14200-14235 and 21275-21300 kc.; additionally 50.0-50.1 Mc. will be reserved for Advanced and Extra. After November 22, 1969 these exclusive privileges will be expanded to: 7200-7250, 14200-14275, 21275-21350 kc. and 50.0-50.25 Mc.

Extra Class licensees will have exclusive use of 3500-3525, 3800-3825, 7000-7025, 14000-14025, 21000-21025 and 21250-21275 kc. effective November 22, 1968. A year later, the c.w. frequencies for Extra will be 3500-3550, 7000-7050, 14000-14050 and 21000-21050 kc.

General and Conditional Class licensees may continue to use the upper portion (i.e., any frequencies not mentioned above) of each of these bands after the above effective dates. There is no change in eligibility requirements, examinations, or renewal privileges for these licensees.

Technician class licensees have no changes at all, except in respect to the one small segment at the bottom of 6 meters which is later to be reserved for Advanced and Extra.

Novices issued their licenses after the effective date of the order (November 22, 1967) can expect a two-year license term; after November 22, 1968, the phone privileges currently available on 145-147 Mc. will be withdrawn.

The full text of the Report and Order, the new rules, the FCC's Public Notice, and a chart to aid in understanding the effect of the rules on various licensees, appear below.

Before the FEDERAL COMMUNICATIONS COMMISSION

Washington, D. C., 20554

In the Matter of

Amendment of the Amateur Radio Service Rules to provide for Incentive Licensing and Distinctive Call Signs	DOCKET NO. 15928 RM-378, 455, 470, 474, 480, 481, 499, 516, 517, 538, 577; also, 385, 389, 464, 773, 775, 805
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REPORT AND ORDER

By the commission: Commissioner Bartley not participating; Commissioner Cox absent.

1. On April 1, 1965, the Commission released a Notice of Proposed Rule Making to amend its rules to provide for incentive licensing and distinctive call signs in the Amateur Radio Service. The Notice was duly published in the Federal Register on



When French amateurs toured the U. S. and Canada in June and July, hospitality awaited in every city. Here's the New York version. Clockwise, from left: Hudson Vice Director K2SJO, and Mrs. Zak; Mrs. Dannels and Hudson Division director W2TUK; F1LE; F3ZM, 5T5YL/F2YR, F1IB. Far right, "Mrs. WA2DIG." (Photo by WA2DIG)



Dryden, Ontario, held a hobbies show in July as part of its centennial celebration. Local amateurs manned this booth, shown here with SWL Terry Brown having a listen.

April 7, 1965 (30 FR 4496). By Order released July 15, 1965, the Commission extended the time for filing original comments and reply comments in response to the Notice until September 1, 1965 and October 1, 1965, respectively. This Order was duly published in the Federal Register on July 22, 1965 (30 FR 9175).

2. In addition to those filed by organized amateur groups, over 1700 formal comments representing the views of about 4000 licensees were received in response to the Notice. Each of these comments has been considered by the Commission. Almost without exception, the comments were set forth in an intelligent and thoughtful manner and, as a result, they have been very helpful to the Commission.

3. The proposals in this proceeding were extensive and provided for higher classes of licenses with reserved frequency operating privileges as an incentive to the general "upgrading" of licensees, the revision of the privileges and term of the Novice Class license, the modification of a basis of eligibility for the Conditional Class license, and distinctive station call signs.

4. The primary purpose of this proceeding is to consider the establishment of an incentive licensing program. A program of this nature was endorsed in two out of every three of the comments. Essentially, these favorable comments concurred in the Commission's view that, in order to justify the continued allocation to the Amateur Radio Service of a substantial portion of the spectrum in the face of incessant and important demands by other radio services, there must be a continuing movement towards the goals set forth in Section 97.1 of the Rules. The most frequently presented argument against incentive licensing was not based upon disagreement with the Commission's view but, instead, was predicated upon the contention that an incentive licensing program would have no long range effect. It was felt that licensees who trained and educated themselves to obtain the higher classes of licenses would merely fall back to their present level of competence after achieving the higher status. This view cannot be accepted by the Commission for it is our belief that the education and training processes in any field of endeavor lead naturally to permanent improvement and progress in some measurable degree. Thus, we cannot reasonably conclude that a licensee who develops his skills and increases his knowledge to the extent required to successfully pass higher amateur radio examination requirements would then fail to retain

a significant measure of that proficiency and learning.

5. To support its proposal for an incentive licensing program, the Commission stated in the Notice its opinion that revision of the present license operating privilege structure is an appropriate and desirable step to take at this time to insure progress and to place a proper emphasis upon the quality of the service as well as upon its mere numerical growth and activity. It is apparent from the comments that the large majority of amateur licensees support the Commission's view and that the factors which prompted this proceeding remain valid. Accordingly, the Commission concludes that a program providing for licensees with special privileges as an incentive to the general "upgrading" of licensees is in the public interest and should be adopted.

6. The Commission proposed two higher classes of licenses for the incentive licensing program which would include the present Amateur Extra Class license and a new license to be designated the Amateur First Class license. Eligibility for the Amateur First Class license was proposed to be limited to an Advanced, General or Conditional Class licensee who has held such license for at least one year. The examination for the new Amateur First Class license was to comprise a 16 word per minute code test and a written examination of a difficulty level between the present General and Amateur Extra Class license examinations. Incident to the foregoing, it was also proposed that the present Advanced Class license would no longer be renewed as such and that present holders of this license would be issued the General Class license upon renewal.

7. The proposal for creation of a new higher class of license to be known as the Amateur First Class license was very favorably received. The purpose of this license was to provide an intermediate advanced license as a "stepping-stone" to the highest license attainable, the Amateur Extra Class license. A large number of comments recommended that the Advanced Class licensees be granted "grandfather" privileges to the new higher class license. Typical of these comments were the following:

"In most fields of technical endeavor, long experience and demonstrated technical ability are generally accepted as standard measures of competence in the particular field. I believe both of these apply directly to the measurement of competence in the amateur radio field and it is my belief that the present Advanced Class licensees rate very highly on both measures. The Advanced Class, in addition to the Amateur Extra Class, licensees are believed to be the most competent and experienced amateur operators at the present time. Since no new Advanced Class licenses have been issued since 1952, all Advanced Class licensees have a minimum of 13½ years (including a minimum of one year as a Class B licensee) of amateur radio experience in addition to having successfully passed a higher level of examination to obtain the incentive privileges which existed prior to 1953. It would, therefore, appear that there should be no doubt as to the competence of the Advanced Class licensees to have the proposed new incentive privileges, since all of the licensees are the relative 'Old-Timers' of amateur radio in terms of amateur experience and all have previously demonstrated their higher level of competence by already having passed a higher level

(Continued on page 81)

Incentive Licensing For Amateur Radio Service Adopted by FCC

Major rule changes, to establish an Incentive Licensing Program in the Amateur Radio Service, have been adopted by the Federal Communications Commission. The new rules provide for assignment of special frequency operating privileges to licensees with Advanced Class or Amateur Extra Class licenses. The object of the program is to provide an incentive to amateurs to upgrade their licenses. (Docket No. 15928).

There are about 200,000 eligible lower class licensees who may be expected to apply for higher class licenses. About half of these hold General Class licenses and are being given code test credit for the new Advanced Class license under the rule changes.

Under the new rules, the code speed requirement has been reduced from 16 to 13 words per minute for applicants for the Advanced Class license.

In issuing the order, the Commission stated that it ". . . has made every reasonable effort to provide an opportunity for the remodeling and revitalization of the Amateur Radio Service without changing its basic character and spirit and without depriving any amateur licensee of the major portion of his present operating privileges. It remains only for a licensee to prove himself and to improve the Amateur Radio Service by voluntarily upgrading his license to the highest level of achievement of which he is capable. We are confident that we can rely upon the amateurs in this regard and that, therefore, this incentive licensing program will result in a radio service which will be a source of pride to both amateur licensees and the Commission."

The rules call for the present Advanced License class to serve as an intermediate step between the General Class and the Amateur Extra Class.

The Commission adopted a recommendation that existing Advanced Class licensees be granted "grandfather rights" to the intermediate higher class license because of their maturity and experience as amateur operators. There are about 40,000 Advanced Class license holders averaging 40 years of age. This means that existing advance class licensees automatically receive reserve frequency operating privileges without the necessity of taking any further tests.

The Commission did not adopt a proposal to use distinctive station call signs to denote the class of operator license held. Purpose of the proposal was to provide a means of rapidly identifying operators by FCC monitoring personnel, but the Commission determined that means of identification now in use are satisfactory.

The Incentive Licensing Program was initiated in response to petitions asking for improvement in licensing structure and quality in the Amateur Radio Service. A Notice of Proposed Rule Making was issued in April, 1965, to provide for an amateur incentive licensing program. The Notice generated 1724 formal comments by some 4000 licensees. Two-thirds of the comments supported an incentive licensing program.

The Commission also issued an Order terminating an inquiry into the status of the Extra Class Amateur Radio License (Docket 12912). The Order stated that the issues in the proceeding were covered in the Incentive Licensing action.

Actions by the Commission August 24, 1967 by Order (Docket 12912), and by Report and Order (Docket 15928). Commissioners Hyde (Chairman), Lee, Loevinger, Wadsworth and Johnson, with Commissioner Bartley not participating.

HOW ABOUT YOU?

If you hold	And you want Advanced Class privileges:	And you want Extra Class privileges:
Amateur Extra	Do nothing; it's automatic	Do nothing; it's automatic.
Advanced (Old Class A)	Do nothing; it's automatic.	Take written exam elements 4B; 20 w.p.m. plain text code test, sending and receiving; have two years' experience as Conditional or higher.
General (Old Class B)	Take written exam element 4A	Take written exam elements 4A and 4B; 20 w.p.m. plain-text code test, sending and receiving; have two years' experience as Conditional or higher.
Conditional (Old Class C)	Take written exam elements 3 and 4A; 13 w.p.m. code test, sending and receiving	Take written exam elements 3, 4A and 4B; 20 w.p.m. plain text code test, sending and receiving; have two years' experience as Conditional or higher.
Technician and Novice	Take written exam elements 3 and 4A; 13 w.p.m. code test, sending and receiving.	Not eligible yet; two years' experience as Conditional or higher is required.

NOTE: The new rules become effective November 22, 1967. General and Conditional Class licensees sitting for Extra before that date will not take Element 4A, the new 50-question Advanced Class written test.

examination to earn incentive privileges within the amateur bands. . . ."

"I believe you do an unjust disservice to this Advanced Class amateur group. These amateurs at one time or other did qualify for a more advanced technical knowledge than was required for an Amateur Radio Operators License. These operators have had many years of additional experience and it would normally be expected that they have advanced their technical skills with the development of the art. This is usually presumed in the case of all the professions. . . ."

"If the Commission will refer back to the 1946 issues . . . they will note the magazines carried almost nothing in their advertisements pertaining to the sale of kits or complete units such as transmitters or transceivers. They were virtually non-existent in 1946 and for some years to come. This would point to another important fact favoring the advanced licensee. Specifically, we had to build everything except receivers from scratch. This included no small amount of designing, testing, layout, learning new and better ways, and above all furthering our ability technically as well as an amateur. Isn't this one of the Commission's requirements in Section 97.1? . . ."

The American Radio Relay League stated that . . .

"With no new Advanced Class licenses issued since 1952, it is readily apparent that the 40,000 Advanced Class licensees constitute the largest group of 'old timers' which has contributed so significantly to the amateur radio service and the communications field generally. Almost without exception, the Advanced Class licensees sincerely believe that the Commission will 'break faith' with them if their licenses are down-graded once again to the General Class. . . ."

We believe that these arguments have considerable merit. The Advanced Class licensees, who qualified by examination for the incentive privileges in effect prior to 1952, have operating experience of at least fifteen years and presumably have qualities which it is the purpose of this proceeding to foster. Accordingly, the recommendation for "grandfather" rights to the new license will be adopted and will apply to present holders of the Advanced Class license.

8. Many comments in favor of the new license suggested that it be made available to any lower

class licensee without a one year waiting period. They contended that, although the primary purpose of the incentive licensing program was to encourage licensees to upgrade, the Commission's proposal would actually discourage licensees by imposing license tenure and waiting time requirements. It was also frequently recommended that the proposed 16 word per minute code test requirement for the new license be reduced to 13 words per minute, the requirement for the present General and Conditional Class licensees. Usually, the basis for this suggestion was that an increased code speed bears little relationship to the telephony frequency privileges which are proposed to be reserved to holders of the new license and that such a requirement would, therefore, present an unwarranted deterrent to obtaining the new license. Both of these suggestions, for the reasons presented, are considered valid and will be adopted herein.

9. In the light of the foregoing, the Commission concludes that its proposal for a new higher class of license should be adopted with the following modifications. The present Advanced Class license shall be retained as the new higher class of license instead of creating the Amateur First Class license. Present holders of the Advanced Class license will be renewed as such with all the privileges and status appertaining to the new Advanced Class license. The Advanced Class license shall be available to any eligible applicant who successfully passes the examination requirements which include code test of 13 words per minute and a written examination comprising elements 3 and 4(A) as set forth in Section 97.21 of the Commission's Rules, as amended herein. Since the code test for this license is being reduced to 13 words per minute, code test credit as well as credit for other elements, in accordance with Section 97.25 of the Commission's Rules, will be given to those applicants for the Advanced Class license who hold the General Class license.

10. In its Notice, the Commission specifically invited comments as to whether there was sufficient interest and utility in the retention of the Amateur Extra Class license in view of the establishment of a new higher class of license. Most of the comments in this regard urged continuation of the Amateur Extra Class license for reasons typified by the following:

"Great need exists for a license class that

encompasses the operating and technical requirements of the Extra Class license. Continued sophistication of electronic communications systems and techniques requires parallel achievement on the part of the individual operator.

The Extra Class license provides the avenue to this achievement, requiring as it does, a broad knowledge of most modern communications techniques. Its utility is logical with respect to the proposed Amateur First Class license in that it offers further opportunity for individual maturation. . . ."

"The continuance of the Amateur Extra Class license is desirable in any case. Given the incentives, the majority of currently licensed amateurs are capable of acquiring the qualifications for that class of license. For some, the effort required will be greater than for others, and comments submitted on this Docket will undoubtedly provide profuse evidence of the natural resistance of human nature to make such an effort if any other way of achieving the same benefits exists. But the fact remains, the requirements are reasonable and represent a reasonable standard of competence for the reservoir of trained personnel which is one of the purposes of the Amateur Radio Service. . . ."

"Retention of the Extra Class as the pinnacle of the amateur licensing system is strongly urged. If the qualification of the Extra Class was desirable in 1952, at the time of creating the Extra Class, it is much more so in 1965, with tremendous advances in radio technique, all of which should see corresponding advance in the technical level of amateur radio. . . ."

In addition to the comments, we note renewed interest in the Amateur Extra Class license since the inception of this proceeding. The number of holders of this license has increased over 25% in little more than one year. On the basis of these factors, the Commission concludes that the continued issuance of the Amateur Extra Class license as part of the incentive licensing program is appropriate and warranted.

11. As the incentive for the upgrading of licenses,



At the New England Convention in April, Division Director Robert York Chapman W1QV (at right) presented the Paul Revere Bowl to Honorary Vice President F. E. Handy, W1BDI, who recently retired as ARRL Communications Manager.

the Commission proposed the reservation of frequency segments in the 2, 6, 15, 20, 40 and 80 meter bands for the exclusive use of the higher class licensees. Exclusive frequency operating privileges were endorsed in the majority of comments as the most meaningful incentive which could be offered to licensees. A small number of comments recommended instead a reduction of power for lower licensee classes with the maximum authorized power reserved to the higher classes of licensees. The proposal for operating power privileges has been previously considered by the Commission but was not regarded as feasible for a number of reasons. These include the likelihood that power limitations would present numerous enforcement difficulties. Also, the Commission has noted that a great many licensees do not need or utilize more than about 200 watts of power so that, apparently, power limitations are not particularly meaningful to at least these licensees. With regard to the reservation of frequency segments, the majority of the comments favored the proposal as adequately representing those frequencies which are attractive and useful to licensees. An important exception related to the fact that there was no provision for any exclusive telephony segments for holders of the Amateur Extra Class license. This it was felt resulted in a total lack of incentive for amateurs who are primarily interested in radiotelephony to advance to this license class. The Commission believes that some exclusive telephony operating privileges as an incentive for the Amateur Extra Class license are appropriate. The other exception related to the proposal for reserved frequency space in the 2 meter band. Many licensees maintained that since this band is very useful for experimental operations, it should continue to be available to all licensees. The Commission agrees and will delete reservation of the proposed 144-145 Mcs segment. In light of the foregoing, the Commission concludes that the proposal for the reservation of frequency segments for the exclusive use of higher class licensees as the incentive for licensee upgrading should be adopted. With regard to the particular frequency segments proposed in the Notice of Proposed Rule Making, it is determined that they should also be adopted with the modifications that Amateur Extra Class licensees shall be additionally exclusively entitled to operation in the segments 3800-3825 kc/s and 21250-21275 kc/s and the proposal for reservation of frequencies in the 2 meter band will be deleted. A time schedule, which provides that the reservation of about one half of the frequency segments will be implemented in one year and the other half one year later, was proposed and will be adopted as modified to include, in the first year, the segments additionally reserved for the Amateur Extra Class license. Notwithstanding this schedule, the Commission intends careful review and if it is determined that there is insufficient occupancy of any part of the reserved frequency segments then the effective date of the implementation schedule will necessarily be stayed in whole or in part, as appropriate.

12. The Commission proposed that the Conditional Class license would no longer be available to new applicants who claim eligibility solely by virtue of active duty in the armed forces. With the recent increases in the armed forces, it is apparent that adoption of this proposal may adversely affect numerous persons on active duty. Accordingly, the Commission has determined that this proposal should not be adopted at this time.

13. The Commission also proposed that new holders of the Novice Class license shall be given



Canada is really enjoying its 100th birthday, from Vancouver to Goose Bay. In Brantford, Ontario, a city of 59,000, a gigantic parade was held on Dominion Day, July 1. Among the 106 floats was this one, organized by the Brantford Amateur Radio Club. At left, club vice president VE3FFH puts on the finishing touches. At right, VE3BA is operated by VE3FFH and past president VE3DBN. The club also provided communication to keep the parade on schedule; it required 2½ hours to pass a given spot!

a two year non-renewable license term in lieu of the present one year non-renewable term. It was further proposed that, effective one year after adoption of these rule changes, telephony privileges for the Novice Class licensees in the frequency segment 145-147 Mc/s shall be deleted. Extension of the Novice Class term was intended to afford licensees an additional period for the development of their proficiency and knowledge before attempting to advance to higher classes of licenses. Deletion of Novice Class telephony privileges was designed to foster the code proficiency of these licensees. Almost without exception, the few comments on these proposals supported these rule amendments. The Commission concludes that the considerations which prompted these proposals remain valid and that, therefore, these rule changes should be adopted.

14. The Commission proposed that amateur stations would be assigned distinctive call signs to denote the licensee's class of operator privileges. The proposed schedule for assignment of distinctive call signs provided that call signs of most lower class licensees would have three letter suffixes and a license class identifier in the prefix and that higher class licensees would have new call signs consisting of single or double letter prefixes and double letter suffixes. Essentially, therefore, the proposal contemplated that most present station call signs would be changed to some extent. As stated in our Notice, the primary purpose of a distinctive call sign schedule was to enable the Commission's monitoring personnel to readily determine whether licensees are operating within the range of their privileges. A very large percentage of the licensees who commented objected to this proposal usually for the reason that they had become both attached to and widely associated with their call signs. In its comment, the American Radio Relay League, Inc., sums up this attitude as follows:

"Most amateur radio operators regard their call signs as next in importance to their names. The suffix, in particular, has assumed the character of a person's last name. For many amateurs, years of effort and operating proficiency have earned awards recognized by other amateurs and amateur organizations throughout the world."

The Commission is sympathetic to the importance

which the majority of amateurs appear to attach to their present call signs. For this reason, we have carefully re-examined the basis for this proposal to determine if the interests of the effective administration and enforcement of the Amateur Radio Service can otherwise be served. We have concluded that there are two factors which warrant at least the postponement of a distinctive call sign schedule. First, we believe that in the future, as in the past, the Commission can rely upon the proven ability of most amateur licensees to operate within the limits of prescribed authority and to largely regulate their own radio service. Second, automatic data processing now makes available listings of amateur licensees with their classes of operator licenses which can be utilized by monitoring personnel for reasonably prompt identification purposes provided that enforcement requirements remain minimal. In view of the foregoing, the Commission has decided not to adopt the proposal for distinctive call signs at this time.

15. One aspect of the proposed distinctive call sign schedule related to the assignment of call signs with a single letter prefix and a double letter suffix (e.g. W2AB, K1AA). These call signs are popularly referred to as "two letter" call signs and are cherished as the mark of an "old timer". At the present time the Commission has about 8,000 of these call signs available for assignment and it is our finding that the proposal for their disposition remains essentially appropriate. Accordingly, the following rule changes relating to the assignment of two letter call signs are adopted. To reflect both longevity and/or attainment in amateur licensing, the available two letter call signs will continue to be assigned to previous holders and will also be assigned to holders of the Amateur Extra Class license who submit proof of having held an amateur radio station license issued by the United States Government 25 years or more prior to the date of application therefor. Present holders of two letter call signs can continue to hold them even if they do not meet this criteria. The \$20.00 special call sign request fee will be applicable to these requests. Applicants will not be permitted to select specific two letter call signs. However, a former holder of a specific two letter call sign may regain such call sign if it is available in accordance with Section 97.51(a) (1) and (2).

Finally, new holders of these call signs will be limited to one such assignment since there are so few available.

16. A number of alternative and counter proposals relating to incentive licensing are reflected in the following formal petitions which have been considered but must be denied for the reasons stated. RM-775, submitted by Mr. Joseph L. Kofron (K7VUI) of Las Vegas, Nevada, proposes that in order to afford youngsters a longer opportunity to gain amateur operating experience the Novice Class license be made renewable by licensees twelve years of age or younger. The Novice Class license term will be extended in this proceeding to two years for all licensees, thus obviating the basic purpose for this proposal. In RM-389, Mr. Martin K. Barrack (WA2ZKR) of Bronx, New York, proposes the deletion of telephony privileges for Novice Class licensees, a proposal already adopted herein. He also proposes the reduction of frequency operating privileges for the Technician Class license. This proposal, to the extent feasible and necessary at this time, has been partially adopted herein. In the other direction, Mr. Alex S. Labounsky (WA2MTB) of Oyster Bay, New York, submitted RM-464, proposing extension of Technician Class privileges to the entire 144-148 Mc/s frequency band. This proposal is, of course, inconsistent with the reduction of Technician Class privileges adopted herein. Mr. Labounsky also submitted RM-771 in which he proposes a new "Engineer" Class amateur license with examination to exceed the difficulty of that for the Amateur Extra Class license. An "Intermediate Class" license is suggested in RM-385 by Mr. Chester L. Smith (K1CCL) of Bedford, Massachusetts, to serve as a "stepping stone" between the Technician Class and higher classes of licenses. Finally, in RM-805, Lt. Col. Irving B. Mickey (W2LCB) of Schenectady, New York, would like only three classes of amateur licenses with new operating power limitations. All of these proposals for new or limited classes of licenses are contrary to the license class structure adopted herein.

17. Docket 12912, entitled "Inquiry into the status of the Extra Class Amateur Radio license set forth in Part 12 of the Commission's Rules", has not yet been terminated. The Notice in that proceeding requested comments as to whether or not special privileges should be given to holders of the Amateur Extra Class license. The issues raised in Docket 12912 have been considered and resolved herein, and, accordingly, that proceeding will be terminated in a separate Order.

18. The foregoing determinations represent the Commission's disposition of each of the proposals and counter proposals in this proceeding. In reaching its conclusions, the Commission has made every reasonable effort to provide an opportunity for the remodeling and revitalization of the Amateur Radio Service without changing its basic character and spirit and without depriving any amateur licensee of the major portion of his present operating privileges. It remains only for a licensee to prove himself and to improve the Amateur Radio Service by voluntarily upgrading his license to the highest level of achievement of which he is capable. We are confident that we can rely upon the amateurs in this regard and that, therefore, this incentive licensing program will result in a radio service which will be a source of pride to both amateur licensees and the Commission.

19. In view of the foregoing, the Commission finds that the amendments to Part 97, Amateur Radio Service, as set forth in the attached Appendix are

in the public interest, convenience and necessity. The authority for such amendments is contained in Section 4(i) and 303 of the Communications Act of 1934, as amended.

20. Accordingly, IT IS ORDERED, That effective November 22, 1967, Part 97 of the Commission's Rules IS AMENDED as set forth in the attached Appendix.

21. IT IS FURTHER ORDERED, That, in addition to the eleven petitions set forth in the heading to this proceeding, the pending petitions of Lt. Col. Irving B. Mickey (RM-805) filed June 14, 1965, Mr. Joseph L. Kofron, (RM-775) filed April 28, 1965, Mr. Alex S. Labounsky (RM-773 and RM-464), filed April 27, 1965 and July 10, 1963, respectively, Mr. Martin K. Barrack (RM-389), filed December 12, 1962, and Mr. Chester L. Smith, (RM-385), filed November 9, 1962, have been fully considered and, to the extent that they are at variance with the rule changes adopted herein, they ARE DENIED.

22. IT IS FURTHER ORDERED, That this proceeding IS TERMINATED.

FEDERAL COMMUNICATIONS COMMISSION
Ben F. Waple
Secretary

APPENDIX

Part 97 of the Commission's Rules is amended as follows:

1. Section 97.7 is amended to read as follows:

§ 97.7 Privileges of operator licenses

(a) Amateur Extra Class and Advanced Class. All authorized amateur privileges including exclusive frequency operating authority in accordance with the following table, effective on the dates shown:

Frequencies	Class of license authorized	Effective Date
3500-3525 kc/s 3800-3825 kc/s 7000-7025 kc/s 14000-14025 kc/s 21000-21025 kc/s 21250-21275 kc/s	Amateur Extra only	November 22, 1968
3500-3550 kc/s 7000-7050 kc/s 14000-14050 kc/s 21000-21050 kc/s	Amateur Extra only	November 22, 1969
3825-3850 kc/s 7200-7225 kc/s 14260-14235 kc/s 21275-21300 kc/s 50-50.1 Mc/s	Amateur Extra and Advanced	November 22, 1968
3825-3900 kc/s 7200-7250 kc/s 14200-14275 kc/s 21275-21350 kc/s 50-50.25 Mc/s	Amateur Extra and Advanced	November 22, 1969

(b) General Class and Conditional Class. All authorized amateur privileges except those exclusive frequency operating privileges which are reserved to the Advanced Class and/or the Amateur Extra Class.

(c) Technician Class. All authorized amateur privileges on the frequencies 50.25-54 Mc/s and 145-147 Mc/s and in the amateur frequency bands above 220 Mc/s.

Note: Technician Class licensees may additionally operate on the frequencies 50-50.1 Mc/s until November 22, 1968, and 50.1 to 50.25 Mc/s until November 22, 1969.

(d) Novice Class. Those amateur privileges designated and limited as follows:

(1) The d.c. plate power input to the vacuum tube or tubes supplying power to the antenna shall not exceed 75 watts, and the transmitter shall be crystal-controlled;

(2) Operation on the frequency bands 3700-3750 kc/s.



Thomas J. Brooks, Jr., W5OSL, left and Kenner E. Day, W5TAB, right, each received a QST cover plaque award from Delta Division Director Philip P. Spencer W5LDH at the Jackson, Mississippi, Hamfest in July. W5OSL's article, "Ninety feet for One Hundred Dollars," was voted best of the March issue and W5TAB's "A 50-watt PEP Output Transceiver for 75" best in the June issue. The ARRL Merit and Award Committee polls directors each month and awards the plaque to the winner.

7150-7200 kc/s, 21.10 to 21.25 Mc/s, and 145-147 Mc/s is authorized for radiotelegraphy using only type A-1 emission.

Note: Novice Class licensees may additionally operate until November 22, 1968, on 145-147 Mc/s for radiotelephony using types of emission as set forth in § 97.61.

2. Section 97.9(b) is amended to read as follows:

§ 97.9 Eligibility for new operator license . . .

(b) Advanced Class. Any citizen or national of the United States . . .

3. Section 97.21 is amended to read as follows:

§ 97.21 Examination elements.

Examinations for amateur operator privileges will comprise one or more of the following examination elements:

(a) Element 1(A): Beginner's code test at five (5) words per minute;

(b) Element 1(B): General code test at thirteen (13) words per minute;

(c) Element 1(C): Expert's code test at twenty (20) words per minute;

(d) Element 2: Basic law comprising rules and regulations essential to beginners' operation, including sufficient elementary radio theory for the understanding of those rules;

(e) Element 3: General amateur practice and regulations involving radio operation and apparatus and provisions of treaties, statutes, and rules affecting amateur stations and operators;

(f) Element 4(A): Intermediate amateur practice involving intermediate level radio theory and operation as applicable to modern amateur techniques, including, but not limited to, radiotelephony and radiotelegraphy;

(g) Element 4(B): Advanced amateur practice involving advanced radio theory and operation as applicable to modern amateur techniques, including, but not limited to, radiotelephony, radiotelegraphy, and transmissions of energy for measurements and observations applied to propagation, for the radio control of remote objects and for similar experimental purposes.

4. Section 97.23 is amended to read as follows:

§ 97.23 Examination requirements.

Applicants for original licenses will be required to pass the following examination elements:

(a) Amateur Extra Class: Elements 1(C), 3, 4(A), and 4(B);

(b) Advanced Class: Elements 1(B), 3, and 4(A);

(c) General Class and Conditional Class: Elements 1(B) and 3;

(d) Technician Class: Elements 1(A) and 3;

(e) Novice Class: Elements 1(A) and 2.

5. Section 97.25(c) is amended to read as follows:

§ 97.25 Examination credit . . .

(c) An applicant for the Amateur Extra Class operator license will be given credit for examination elements 1(C), 4(A), and 4(B), if he so requests and submits evidence of having held a valid amateur radio station or operator license issued by any agency of the United States Government during or prior to April 1917, and qualifies for or currently holds a valid amateur operator license of the General or Advanced Class . . .

6. Section 97.29(a) is amended to read as follows:

§ 97.29 Manner of conducting examinations.

(a) The examination for Amateur Extra, Advanced, and General Classes of amateur operator licenses will be conducted by an authorized Commission employee or representative at locations and at times specified by the Commission . . .

7. Section 97.31(b) is amended to read as follows:

§ 97.31 Grading of examinations . . .

(b) Seventy-four percent (74%) is the passing grade for written examinations. For the purpose of grading, each element required in qualifying for a particular license will be considered as a separate examination. All written examinations will be graded only by Commission personnel.

8. Section 97.33 is amended to read as follows:

§ 97.33 Eligibility for reexamination.

An applicant who fails examination for an amateur operator license may not take another examination for the same or a higher class amateur operator license within 30 days, except that this limitation shall not apply to an examination for an Advanced or General Class license following an examination conducted by a volunteer examiner for a Novice, Technician, or Conditional Class license.

9. Section 97.51(a) (5) is amended to read as follows:

§ 97.51 Assignment of call signs . . .

(a) (5) One unassigned two-letter call sign (a call sign having two letters following the numeral) may be assigned to a previous holder of a two-letter call sign the prefix of which consisted of not more than a single letter. Additionally, a two-letter call sign may be assigned to an Amateur Extra Class licensee who first held an amateur radio station license issued by the United States Government 25 years or more prior to the receipt date of an application for such assignment. Applicants for two-letter call signs are not permitted to select a specific assignment except in accordance with subparagraphs (1) and (2) of this paragraph . . .

10. Sections 97.59(a) and (b) are amended to read as follows:

§ 97.59 License term.

(a) Amateur operator licenses are normally valid for a period of 5 years from the date of issuance of a new or renewed license, except the Novice Class which is normally valid for a period of 2 years from the date of issuance.

(b) The license for an amateur station is normally valid for a period of 5 years from the date of issuance of a new or renewed license except that an amateur station license issued to the holder of a Novice Class amateur operator license is normally valid for a period of 2 years from the date of issuance . . .

ARRL COMMENTS ON RACES FAX

In Docket 17315, the Federal Communications Commission proposes to permit 3A4 and 3F4 facsimile operation by RACES stations in the 1800-1825, 1975-2000 and 3990-4000 kc. RACES segments. Additionally, RACES stations would be able to use 3F4 on those of its frequencies above 28 Mc. where 3A4 fax is already permitted.

The ARRL directors could not develop enthusiasm for the proposal at the Board meeting in May; instead, they expressed alarm at growing routine use of the amateur bands by non-amateur RACES personnel in some parts of the country, and saw the current proposal as another step in the wrong direction. The text of the filing appears below.

In the Matter of

Amendment of Section 97.193 and
Section 97.195 of the Radio Amateur
Civil Emergency Service
Rules to provide for the use of F4
and A4 facsimile

DOCKET NO. 17315
RMI-964

*COMMENTS OF THE AMERICAN RADIO
RELAY LEAGUE, INC.*

The American Radio Relay League, Incorporated, by its General Counsel, respectfully submits the following comments in response to the Commission's Notice of Proposed Rule Making in the above-styled proceeding.

The Radio Amateur Civil Emergency Service (RACES) was initiated by the Commission in 1950, with not only the cooperation of the League but also with its active assistance in implementation. The League has long believed in, and promoted, the organized emergency communications capabilities of the Amateur Radio Service. These facilities should remain available to the nation in the event of national emergency, which was and is the primary objective of RACES.

Directors of the League have become increasingly concerned in recent years, however, over trends in RACES administration and operations which stray beyond the bounds of both the intent and the rules. These trends concern the use of non-amateur operators in some areas almost to the exclusion of licensed amateurs, often without the necessary authorization of the appropriate civil defense official, and use of RACES facilities for communications not authorized or contemplated by the rules.

The League recognizes the need for supplementary operator personnel holding other than amateur licenses, as provided in the rules, and for drills. Its concern is with the tendency for certain areas of RACES to act on their own, in routine fashion, which gradually erodes the basic concept of the Amateur Radio Service and tends to set up a non-amateur communications service in the amateur bands.

The League has previously expressed similar views to the Commission, specifically in the proceedings of Docket 16420, relating to the elimination of the "temporary" status of RACES.

The current proposal to authorize facsimile transmission in certain RACES segments appear to the League as another possible step in this same undesirable direction. Such operations, in particular, tend to become routine rather than as a standby back-up for commercial circuits, and tend further to ignore the basic concept of RACES as an emergency back-up facility.

The League further notes that the Commission proposes to authorize in some RACES segments a type of emission not permitted in the parent amateur bands. While there are minor instances of such authorizations in the current rules, the League feels it necessary now to raise the question of the principle of such actions. An occasional exception is perhaps understandable; but the continuation and extension of exceptions will soon make them the rule. This can only have the effect of undermining the intent in the original formation of RACES, which basically is to make amateur equipment and skills available for the public interest in time of national emergency.

For the foregoing reasons, the League is unable to support the proposed amendments. Should the Commission nevertheless choose to grant the authority, it is the League's continuing plea that adequate safeguards be applied so that RACES will operate under its true concept and not become a routine non-amateur communications activity.

THE AMERICAN RADIO RELAY LEAGUE, INC.

Robert M. Booth, Jr.
Its General Counsel

W4TE RETIRES

John F. "Tex" DeBardleben, W4TE chief, Emergency Communications Resources Branch in the office of FCC's Executive Director retired on August 31, 1967. Tex was radio op aboard the SS Bessemer City and then spent 10 years with



R. F. Latter, W2YFM, won the May QST Cover Plaque for his article, "The Vacation Special." Hudson Division Director Harry J. Dannels, W2TUK, left, makes the presentation; the winning rig is in the background.

a broadcasting station in Houston before joining FCC's Radio Intelligence Division in 1940. He was in charge of monitoring stations at Brownsville and Kingsville, Texas, and built new ones at Broken Arrow and Muskogee, Oklahoma. Then he served as assistant chief of the Monitoring Division in Washington until 1959. After nearly six years in a classified post Tex returned to the FCC in Washington and his job in emergency communications.

Tex is president of the Foundation for Amateur Radio, a council of radio clubs in Greater Washington, and advertising manager of its publication, Autocall. He is active on the air with phone and c.w., ragchewing and handling traffic. He is married to the former Ethel Smith, K4LMB.

CALLBOOK TO SHOW LICENSE CLASS

The Radio Amateur Callbook, Inc., of Chicago has announced that its Fall 1967 edition will include, after each call sign, a letter indicating the class of license held by the amateur. In this edition, the license class is shown for amateurs in the "old 48" only; the remainder will be picked up in later editions.

(Continued on page 15*)

QRX, OM

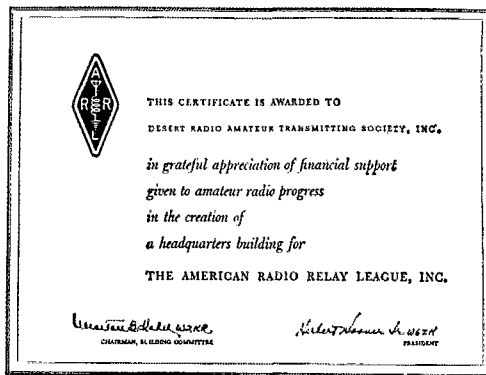
FCC's study questions for Advanced Class are not expected until the end of November. ARRL will then start on a new edition of the *License Manual*, which hopefully would be in circulation shortly thereafter.

Nevertheless, since the Advanced Class is to be less difficult than the Extra, the study material for the latter — a part of every *License Manual* since the early 50s — should be more than adequate for those who wish to be earlybirds. Two-letter calls for Extra first licensed 25 years ago are not available until November 22, 1967.

Building Fund

THE flow of contributions to the Building Fund continues to be steady, though small. The greatest gains this summer were in the Great Lakes Division, which still has a way to go to meet its quota, and the Southwestern Division, where the goal is not very far away. In fact, if there were to be a \$100-a-plate dinner in the Southwestern Division, with the proceeds to go to the Building Fund, eight diners would put the division over the top!

If you'd be interested in some other Building Fund statistics, consider these: Both the largest individual contribution (\$15,000) and the smallest (30¢) came from the Southwestern Division. The greatest amount from a single division (over \$30,000) has come from Hudson. The Division which has exceeded its quota by the greatest percentage is Dakota. The Division which has



exceeded its quota by the greatest dollar amount is New England. Twelve Divisions have so far exceeded the quotas originally set by the League's Executive Committee. The total amount contributed is only some \$15,000 short of the \$250,000 goal.

We are now in the closing months of the Building Fund Drive, as it is to end on December 31, 1967. There's still time to contribute to your League's Building Fund and to receive one of the certificates shown in the accompanying illustration. May we hear from you? **QST**



... This month's cover shows John Huntoon, acting communications manager, manning a CD station. He appears to be taking this job quite seriously.

... K. B. Warner comments at length on the large number of people, not all licensed amateurs, who are diligently studying theory and code, following George Grammer's *A Course in Radio Fundamentals* now appearing in *QST*. He also reminds us that licenses have a way of lapsing without the owner being aware of it. No new station licenses are being issued at this time.

... The transceiver shown on the cover is fully described by George Grammer, W1DF. He tells how to make use of receiving type tubes and other parts generally to be found in the shack. It is pretty much a "standard" transceiver circuit.

... Robert G. Ling, W1BF, sets forth WERS frequency allocations used in Massachusetts Region 4, whereby the net can operate without mutual interference, all in accordance with the FCC's tolerances for band width.

... Walter Bradley, W1FWH, presents an interesting article on a radio parts checker using a neon lamp. This gadget measures condensers,

resistors and voltage without a meter. No? Read it and see.

... We have an article on a crystal-controlled f.m. exciter, looking ahead to the time when f.m. may play an important part in amateur activities. This is written by W. P. Bollinger, W3JDF. The merits and limitations of this mode of communication are pointed out.

... Clinton DeSoto, W1CBD, visits Fort Monmouth, N. J. and describes the activities there in training a fighting corps of radio operators and repair men. Signal Corps men must be not only communications specialists but also equipped for and ready for combat. Some of you O.T.ers remember the field signal battalions of WW1?

... Boy, you gotta be a confirmed cryptanalyst to follow through on John Huntoon's "Easy Lessons in Cryptanalysis, Part IV." If you have studied the previous lessons, this isn't so bad, really, and can be very exciting, especially when you are listening for foreign cipher messages, etc. ... Experimenter's Section reports on doings in the various projects previously reported on, such as carrier current, audio frequency induction, etc.

... John Huntoon, W1LVQ gives a list of typical questions and answers for applicants for Radiotelephone License, third class. This is the easiest way to get going for a WERS permit.

... Clinton DeSoto, W1CBD winds up his series on "How Recordings Are Made" with considerable detail on the pick-ups, heads, shapes of "needles," etc. This is a really involved subject if you like it. — *W1ANA*



Correspondence From Members-

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

TECHNICAL ADVANCEMENT— CONTINUED

¶ Anent the "Gospel of Solid State," according to Jackson S. Wright (Aug. 67): It is a rare occasion when a man can lean that far forward without falling flat on his face. He would be surprised to know that barges still carry freight on the Mississippi River, they still put wheels on automobiles and people still eat when they get hungry. And all this goes on in the advanced years of the twentieth century, too. My, my.

One wonders if Mr. Wright used anything as old fashioned as a pen or typewriter in his enlightened correspondence or perchance, he selected a couple of transistors from his "goodie box" and whipped up a little old voice sensitive, phonom discriminating alpha-numerical permanent optical read-out transponder to do the job. — *T. K. Rigger, K2HNM, Elmira, New York.*

¶ I would like to gripe about people who gripe. True, there are some useful gripes (like this one, I tell myself), but I am talking about the useless "gripping-for-the-sake-of-gripping" type of gripe. In August, K2IYC/K1RUH complained bitterly about the fact that *QST* is "continuously" printing "archaic" vacuum tube circuits and projects, when there are "cheap, reliable transistors and integrated circuits" on the market. Okay, Jack. What transistor do you plan to use in a six-meter final amplifier which runs a full gallon input, as described in the March *QST*? What single transistor would you use in W0EPV's squeeze keyer to replace the 12AU7A? I admit, this keyer probably could be completely changed to transistors to have the same features, but I'll wager the average ham has neither the experience nor the endurance for such an undertaking. What dirt cheap transistor do you plan to use in January's two tube novice transmitter which the beginning Novice could afford? As far as I know, they aren't making them yet!

Also, after a brief count, I found that out of 39 projects and articles since January, 1967, there have been 21 transistor projects, and only 18 tube projects and articles. Only 8 of all the tube projects could possibly be converted to transistors (with varying degrees of extreme difficulty). At any rate, though, the transistor projects outnumber the tube projects, even though the tubes are definitely *not* on the way out. What have you got to complain about???

Instead of complaining, why didn't you write me an article on transistors using all that energy to a good cause? This goes for all of us. Instead of griping about something and sitting on our duffs to watch it get worse, and then griping some more (like "the bad emergency radio situation" or "those rats who interfere with phone patchers"), let's get up and go do something about it. Like lighting a fire under the EC, or becoming one, or writing that rat a letter, or going out and getting new club members, or writing a letter to *QST*, or writing an article for the local paper for publicity, or, on, and on, and on. This society doesn't run on com-

plaints. Neither does the ARRL, or hams as a whole. Let's have some action! — *Robert G. Richards, WA7ADN, Helena, Montana.*

¶ K1RUH suggests that *QST* "has fallen from the forefront to the rear-guard in electronics" because it does not drop vacuum tubes and shift exclusively to transistors.

The *QST* staff is to be congratulated on a realistic usage of transistors, and in making full use of the transistor technique wherever practical. — *Walter S. Rogers, W1DFS, Melrose, Massachusetts.*

¶ I found the August letters on technical advancement interesting. I would like to take this opportunity to say that I feel that *QST* is up to date, and gives tubes, transistors, and integrated circuits the amount of space that each merits.

Unfortunately, I cannot say the same for the *Handbook*. It needs more information on solid-state devices and solid-state circuit design, more solid-state projects, and most important, a transistor table similar to the present tube table. Only typical base types are now given, along with characteristics of some semiconductor diodes. — *Craig Richardson, WA5RDP, New Orleans, Louisiana.*

[The 1968 edition, currently in preparation, is being revised with such points in mind — Editor.]

"MEAN HAM" PUBLICITY—CONTINUED

¶ The "Mean Ham" publicity correspondence was most interesting to me as an English radio amateur.

It has long seemed to me that the American amateurs are altogether too preoccupied with publicity. Here, fortunately, we are less publicity conscious and are prepared to allow the public to take us as they find us; and, if they do not find us at all, it doesn't matter much.

As several of your correspondents point out, "the damage done by one bit of front page coverage like this can offset years of good hard P.R. work."

Perhaps this "front page" publicity would never have gotten into print if the amateurs of the U.S.A. had not been so keen on getting publicity.

It often pays to be unobtrusive and not seek to attract so much publicity.

But, this is clearly a very British view, probably quite unacceptable in the U.S.A., where publicity appears to be almost a religion — one doesn't question its value. — *Edgar Wagner, G3BID, London, England.*

2 METER DXCC?

¶ I am writing to urge the League to promote the experimental phase of ham radio (ATV, u.h.f., v.h.f., s.h.f., moonbounce, Oscar program, etc.). In these days we have to orient people towards fields of science and technology to keep up with our increasing need for scientists and technicians. Maybe the League should give an award like DXCC or RCC to foreign amateurs that contact the U.S. on all h.f. bands and add endorsements or individual awards for every v.h.f. and u.h.f. band used. A

special award for satellite QSOs and other awards might be devised to give more hams incentive to experiment in v.h.f., u.h.f., and s.h.f. The same kind of awards could be given to U.S. guys for each country on each v.h.f. band.

So as a League member worried about the future of amateur radio, I'm just sending in my gripes. — *Sammy Wells, WA5KTF, Colfax, Louisiana.*

HELLO TEST

¶ Please put on a campaign to reduce this unnecessary testing on the c.w. bands. Point out that it is illegal and quote the law. It's obvious that many do not realize it is illegal. This is shown by their signing their call, after testing for 20 minutes!

Suggest we revive the custom of sending IE a couple of times before opening up in order to make sure the frequency is clear. This would prevent CQs covering up DX signals. — *R. J. Anderson, W8BIE, Midland, Michigan.*

INCENTIVE LICENSING

¶ Kindly accept my six dollars and fifty cents for renewal of ARRL membership and *QST* subscription. If I had the money to spare, I would join for life.

The ARRL has my 100 percent support on all its affairs. I am entirely in favor of incentive licensing. It seems that those who complain about losing their privileges are merely ungrateful slob who shudder to think of self-improvement. I suggest that we go ahead with the new system of license issuing and ignore the childish complaints from the above-type hams who are a discredit rather than a credit to amateur radio. We must remember that operation in our service is a privilege and not a right.

Learning about radio is not as all-consuming as many hams think. Being sixteen years old, with ½ of a high school education, (I am not an electrical engineer, not yet anyway), I am managing to grasp the theory quite handily. Very soon I will be taking the examination for my Extra Class ticket. Besides being very easy for me to understand, the lessons are very enjoyable to me. Why would any ham even learn the code and become a Novice if he wasn't out for a little enjoyment working up to his Extra Class?

Thanks, ARRL, for all the benefits that you have provided for me and good luck in the future. You have my honest support. — *David L. Aldridge, WA9MQI, Indianapolis, Indiana.*

¶ When the FCC proposed an incentive licensing system, I opposed it. I thought that for someone to learn more about radio would prove ineffective because new knowledge is quickly forgotten and therefore useless.

Today, I have received my Amateur Extra ticket. During the past two years I have changed my opinion. The General Class is much too easy. Someone knowing very little about radio can obtain full amateur privileges without too much effort. I confess I was such a person. However, by studying for the Extra, I increased my radio knowledge by a huge amount. I have also found that radio is just fascinating!

But the main opponents of incentive licensing are not interested in radio or increasing their knowledge in it. They think it's boring. But who really got radio and electronics started? Of course, people who were interested in that new field. And is it not a

similar interest in it something we hams are supposed to share? We must preserve technical proficiency in the ham ranks! And one good way to do this is to grant extra privileges to those who are ambitious enough to pass the Extra. To encourage hams to study further will, in many cases, instill in them a sincere and genuine interest in radio, as it has done to me. If hams were of a higher calibre, they would be helping the general public as well as themselves.

Therefore, I advocate some form of incentive licensing program. There need not be any drastic call changing as the FCC proposed, though. I believe that it would suffice to make small changes to the prefixes *only*, if necessary. But however instituted, an incentive licensing program would certainly be beneficial to all. — *William H. Eilberg, WA3BBB, Philadelphia, Pennsylvania.*

VOTE FOR ARRL

¶ For your records, please note that this new membership is a vote of confidence for ARRL and your efforts in behalf of the majority. When I allowed my membership to drop in the past, it was due to inactivity rather than lack of support for the League.

After occasional periods of inactivity, it has been my practice to read back issues of *QST* as a refresher, both for technical and operational review. In doing so, I have found many policy issues handled by the League which were of great benefit to amateur radio.

Perhaps the "hostiles" should be made aware of your "batting average" over the years, much of which occurred long before they ever heard of amateur radio. — *Harry Marschausen, Jr., W2VBJ, Babylon, L. I., New York.*

¶ Each month when I receive my *QST*, I read letters concerning high dues, "freeloaders", and other things that the ARRL is continually being criticized for. I however, am not writing to criticize but rather to thank. Without the League's technical help and its many publications, I probably would not even be close to obtaining an amateur license. I was 13 when I got my Novice license and now at 14, I hope to take my General exam next week. For a guy like me, what with so many expenses, five dollars means a lot of work. Even so, I don't mind paying my dues high because I know this money is going to an organization with one thing in mind: The enjoyment of amateur radio by all hams be he ARRL member or not. As far as I'm concerned, a League member I am, and a member I'll stay. — *Jack Atkinson, WN3GKH, Towson, Maryland.*

¶ After an involuntary period of low activity and a lapse from League membership, I have just renewed my membership and have been soaking up *QST*. Frankly, I am appalled at the adverse comment I read and heard about ARRL. Most of these comments appear to originate from narrow, selfish and very minuscule points of view. People with these points of view never criticize constructively although, in their minds, they do suggest change. Such change is usually for the *one* amateur and not for *all* amateurs.

I shall try not to forget that the League has been and shall continue to be, the one reason for amateur radio to exist and to survive. Without the League working in the best interests of both country and *all* amateurs, the value, status and existence of hams would have long since ceased. Keep up the fine job. — *Albert E. Martin, Jr., W4THV, Richmond, Virginia.*

VOLUNTEER EXAMINERS

☐ Today a young fellow asked me to administer the code test for a Novice Class license. I did, and he passed. There is of course nothing unusual in that. What surprised and disturbed me, however, was his statement that he had approached two other amateurs with the same request and had been turned down. Not because they didn't want to be bothered (although that would have been bad enough) but because, being phone operators exclusively, neither of them felt qualified to administer a code test at five words per minute! These are General Class amateurs who, every time they renew their licenses, state that they can still send and receive Morse code at the speed required when they were first licensed. Has the renewal application lost all its meaning? Has honesty become an outmoded virtue? Or am I wrong in believing that morality and Morse both have a place in amateur radio? — *Theodore M. Hannah, K3UUI, Silver Spring, Maryland.*

[EDITOR'S NOTE: Headquarters will supply license applicants the name and address of a local club to assist them in locating a volunteer examiner.]

MORE ON DUES

☐ Though the subject of dues has been well covered, I can't help expressing my opinions after reading the August letters. To begin with, I was shocked at the letter that dared you to print it (and I admire you for doing so). I am sure nearly all hams were angry or laughed at this.

I agree with WA6WEK, who wrote that even a kid can rake up \$5. Despite it being somewhat harder to earn cash at 14, I would gladly pay twice the standing dues. I remind K9HNG that *QST* is far from all our \$5 gets. How about W1AW, operating aids, contests, awards, etc.? All this has made me feel I've "taken advantage" during my first year of membership, as well as a superb magazine.

So let the dues rise. A real member knows it's needed, while a quitter or non-member should feel unrepresented and isolated, missing the best deal an amateur can find. — *Richard Hanau, W1HCL, Newton, Massachusetts.*

☐ The extra buck and a half you will find enclosed is to make up for the revenue you won't get from the guy who would only send five bucks for his combined ARRL membership and *QST* last month.

Don't send him the magazine, that would only encourage him to write more letters. I am sick and tired of birds like this who bellyache about a measly six-fifty a year to keep amateur radio alive and fighting, but probably blow that much on a single ball game the next night. Send the five-spot back.

There are plenty of us around who realize ARRL is much, much more than just *QST*, and we will just have to go on subsidizing his kind. Someday maybe he will realize as he switches on the rig that the band he is using is his *only* thanks to ARRL.

Amateur radio is here today and will be here tomorrow, because of our little organization, even for non-ARRL members. Or, maybe in spite of them. — Member first, *QST* reader second. — *G. R. Norberg, W0ORZ, Columbia Heights, Minnesota.*

☐ I have passed my General Class test, and have already built a 60 watt, 40-meter transmitter with the help of Art Greenberg, W2CYK/W2CQP. As soon as I get my call, you can expect to receive my application for League membership. . . . While I'm writing, I may as well tell you that I think you

made a mistake in raising the dues from \$5.00 to \$6.50 — *John M. Zapisek, Wading River, New York.*

☐ The League should just stop being the League for about six months! Those lids would find out fast enough just how much the League really does for our hobby.

I feel the League does more for hams than most realize and I would gladly pay \$10.00 for all those extras that make ham radio more fun than it already is, not even to mention *QST*! — *Mark A. Ewing, W3GMC, Frederick, Maryland.*

HE WHO HAS — GETS

☐ Having seen the write-up in *QST* about the latest Novice Round-up, I am amazed at the intricate and costly rigs owned by the leaders in the contest. Admittedly, the transmitter sections of most of the participants were almost identical: 75 watts to the final amplifier.

However, one glance at the photographs shows that the top scorers of almost every division had top class receivers, two and three element beams, bugs, keyers, etc. It is true that a certain amount of operating proficiency is necessary, and the code multipliers certainly helped the scores. But it is undeniable that in this contest, as in almost all others (except of course Field Day), those with the most money, thus the best rigs, run up the best and highest scores.

In the Sweepstakes, the DX contests, the QSO parties, and almost all other ham contests, it is not the best operators who win. Rather it is the 2-kw, S-line, six element beam (up 358 feet) rigs which consistently bring home the certificates.

I believe that Murphy's first law of economy (the fifth law of actions) also holds true for ham contests: He who has — Gets.

Those with the finest rigs, those with the most money, those who have, will surely amass the most points. No longer is good operating procedure or patience or persistence the paramount question in determining the winner. The question is: Money? — *Clifford Stoll, WB2PSX, Buffalo, New York.*

[EDITOR'S NOTE: See "Typical Novice Gear," page 73, August *QST*.]

QTH HR IS . . .

☐ I suppose we all develop some pet peeves over the years. Somewhere around the top of my list is the "hidden transmitter" who calls interminable CQs without ever once giving his physical location. If I had my druthers, the Rules and Regulations would require this to be done at least once during each call as an aid to listeners for checking on propagation conditions. A lot of stations are looking for traffic outlets and don't have time always for engaging in endless ragchews trying to get it passed. Others may be looking for a new county, state, etc. And if a station calling CQ doesn't want to provide such accommodations, then he should never ask or expect any favors for himself. . . . but then that's another peeve, isn't it?

For examples, a "7" could be anywhere between Vancouver, B. C. and Nogales, Mexico; a "4" from north of the nation's capitol to Key West in the Caribbean.

At the very least, an ID as being "near" a well-known city or other landmark (say within a 100 miles), or just the state would be better than nothing at all but a call sign!

What say, fellers — let's put this plea down somewhere in our list of "good operating techniques," hmh? — *Tom Hall, W5OPH, El Paso, Texas.*



YL news and views

CONDUCTED BY LOUISE RAMSEY MOREAU,* WB6BBO



The "Sky Wave" station at St. Mary's Hospital, Rochester, Minn. Seated: Sister Cordel, WNØQWR; Sister Lauren, WNØRRJ; Standing: Sister Mateo, WNØQWS; Sister Pia, WNØQWQ.

The Seven Sisters of RARC

ON Sunday, April 30, 1967, Minnesota had some wind, and by 4:30 A.M. a "thunderstorm watch" had been activated on 2, 6, and 75 meters. At station "Sky Wave," in Rochester, Minnesota, at St. Mary's Hospital, Sister Pia, WNØQWQ, Sister Cordel, WNØQWR, Sister Laurent, WNØRRJ, and Sister Mateo, WNØQWS were at their station, operating as a part of the activity. At Assisi Heights Convent, Sister Martine, WNØQVN, with Sister Alverna and Sister Baptistine, who are awaiting the arrival of their Novice licenses, had activated that station. As one storm watch ended, another began, and by 5:00 P.M., a "tornado warning," meaning "real tornado danger," was in effect. The Sisters were cautioned to watch carefully and report in full, but were to head for the shelter if the funnel clouds appeared. So, in addition to their duties at the hospital, including emergency measures for the protection of patients, these Sisters maintained their duties as a part of the communications group, finally reporting the appearance of a funnel from the southwest.

* YL Editor, QST. Please send all news notes to WB6BBO's home address; 1036 East Boston St., Altadena, Calif. 91001.

These six nuns of the Order of St. Francis came into amateur radio as the result of an appeal from the RACES unit of the Rochester Civil Defense. A series of tests had proved that a communications link between the large shelters, and the Civil Defense center was best on 2 meters, and a call went out for operators to staff these stations. These Sisters responded, and despite their very busy duties, as well as the hours required in following their religious life, managed to work in the time required to attend the Rochester Amateur Radio Club classes in code and theory. When the Novice licenses arrived for some of them, Novice c.w., and 2 meter stations were set up at both the Assisi Heights Convent, and St. Mary's Hospital. The equipment is privately owned, as well as Civil Defense gear. They have joined the v.h.f. group on 2 meters, which includes not only the usual casual pleasure of roundtables, but over half of the 2-meter sessions have taped code practice sessions from tapes, and c.w. contacts by means of audio oscillators. Thanks to this help, it is expected that before long all these Sisters will be joining Sister Cletus, WAØJIE in General Class operation.

Sister Cletus, who is Minnesota's first nun to hold a General Class License, is well known to all the people who operate the major YL net schedules. First licensed in 1964, she got her ticket in the hardest way possible, without a teacher. She learned the theory from the manual, and the code from a set of old cracked code records and no oscillator! But the tests were passed, and WAØJIE is well known on the air.



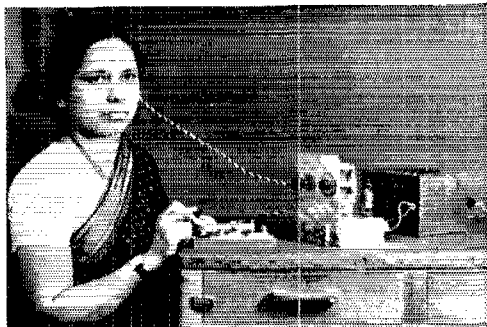
Sister Cletus, WAØJIE, Breckenridge, Minn.

As a floor supervisor at the St. Francis Nursing Home in Breckenridge, Minnesota, Sister Cletus handles messages from the hundred plus patients at the nursing home, as well as traffic to members of the Franciscan Order in Peru through OA7BA. A member of YLRL, she is also active in the YL International SSB, and handles their mailing that includes some 6500 members in 240 countries!

Sister Cletus will continue to be the first nun in Minnesota to become a General Class operator, but she won't be alone for long. The six nuns of Rochester will soon be joining her, and, with the quality of work they have done, and are doing, whether it be in the casual relaxed QSO type of operation, or the deadly serious business of Public Service, the Seven Sisters of RARC will all shine as beautifully in the amateur radio fraternity, as the stars in the constellation.

28th YLRL Anniversary Party

		C.w.	
Start	October 18, 1967	1700 GMT	
End	October 1967	2300 GMT	
		Phone	
Start	November 1, 1967	1700 GMT	
End	November 2, 1967	2300 GMT	



VU2CPZ, Mrs. Leela Chowdappan, YL Editor of the Indian Radio Amateur. Leela is from the Mysore State in South India, and is active on the 7 and 14 Mc. c.w. bands.

Eligibility: All licensed women operators throughout the world are invited to participate. YLRL member-only are eligible for the cup awards. Non-members will receive certificates. Only YLRL members are eligible for the Corcoran Award. Contacts with OMs will not count. Contacts on nets do not count. **Procedure:** Call "CQ YL."

Operation: All bands may be used. Cross hand operation is NOT permitted. Only one contact with each station will be counted in each contest.

Exchange: Station worked, QSO number, R S, or R S T, ARRL section or country. Entries in log should show the time, band, date, transmitter and power.

Scoring: c.w. and phone sections will be scored as separate contests. Submit separate logs for each contest.

All YLs located within one ARRL section, score one (1) point for each QSO with another station located within an ARRL section. Score two (2) points for each contact with a station not located within an ARRL section, (i.e. DX) Definition of DX is all stations not located within an ARRL section. DX YLs shall score two (2) points for each



MINOW Net annual picnic at Columbia Park, Richland, Washington. Front row: K7MFS, K7TWQ, K7RAM, K7OFX, Second row: W7NJS, W7IXR, K7ZUV, K7UBX, WA7BDD, W7HHH, WB7RFE. Back row: K7MRX, K7PVG, K7KSF, K7UTT.

contact with a station located within an ARRL section, and score one (1) point for each contact with another DX station. (Note: Please know your ARRL section. Section lists are available from the vice president. Send S.A.S.E. to receive list)

Multiply number of contact points by total number of different ARRL sections, and/or countries worked. Contestants running 150 watts d.c. input at all times, may multiply results of the above by 1.25 (low power multiplier.)

SSB contestants running 300 watts p.e.p., or less at all times may also use the low power multiplier. (1.25)

Awards:

Highest c.w. score	Gold Cup (YLRL member only)
Highest phone score	Gold Cup (YLRL member only)

Highest c.w. and highest phone log from each district and county will receive a certificate.

Corcoran Award Highest combined c.w. and phone score. For YLRL members only.

DX only: Highest combined c.w. and phone score from North and Central America, including the Greater and Lesser Antilles, will receive an award from Arlie Hager, W4HLF. Highest combined scores from any other part of the world will also receive this award.

Logs: Copies of all logs must show claimed score, be signed by the operator, and postmarked no later

(Continued on page 150)



Hoosier Women's Club at the Midwest YL Convention. Front row: K9QGR, W9RTH, W9LYU, K9IVG, WA9EYL. Back row: K8MZT, W8QQA, K9FZX, W9HGO, K9ZLB, K9ILK, WA9BGE, K9FZX. (W9EJW photo.)

CONDUCTED BY BILL SMITH,* KØCER/4

More About Meteors and Aurora

THE last two editions of this column dealt with two of the less common modes of propagation, meteor scatter and aurora. Both have prompted further comment.

Arnie Olean, K1WHT, of Monroe, Connecticut, wrote defending the use of s.s.b. for meteor scatter and to take exception to my statement that meteor scatter is primarily a c.w. game. Arnie believes s.s.b. to be better than c.w. when top-notch equipment, in the hands of experienced operators, is used. He bases his opinion on the information exchange rate, which admittedly, is what we're after. He uses a 3.1 kc. filter and says it seems to exhibit the same signal-to-noise ratio on s.s.b. as it does on c.w.

While attending the Central States V.h.f. Conference near Wagoner, Oklahoma in late August, I had the opportunity to talk with Glenn Smith, WØDQY, of Woodson Terrace, near St. Louis, Missouri, about the use of s.s.b. for m.s. Smitty is sold on s.s.b. and has worked 41 states using s.s.b. on his end of the contact, and a number of the contacts were two-way s.s.b. He estimates the voice exchange rate at five times that of c.w., or some 150 w.p.m. WØDQY says, "weak signals are not the problem, but the time element is and s.s.b. stations working m.s. should use 5-second calling sequences." Several others attending the conference voiced approval of s.s.b. for m.s. And it appears that more operators are using s.s.b. on m.s. than has been generally thought.

Which mode is the most effective depends mostly upon the operator. Most meteor scatter men use a 2 to 3 kc. bandwidth. Narrower bandwidths cause difficulty in locating a fleeting signal, and the doppler shift cannot be contained in a narrow bandpass. Which is better, s.s.b. or c.w.? Personal preference is probably the deciding factor. Our ears become "trained" to a specific mode of transmission. Take a 2.1 kc. filter and two operators, one c.w. and the other s.s.b., and let them listen first to a signal of their preferred mode and then to the other mode. Each will better understand the mode to which his ears are "tuned." One will say s.s.b. is best, the other will say c.w. Both are correct — for them.

Many operators find a mistuned s.s.b. signal extremely difficult to understand, but a c.w. signal is always intelligible and varies only in

*Send reports and correspondence to Bill Smith, KØCER/4, ARRL, 225 Main St., Newington, Conn. 06111.

its pitch. Similar sounding letters may also be a problem on s.s.b., especially if you don't know ahead of time to whom you are listening. The popular Sunday night sessions on 3,815 Mc. certainly indicate that the lion's share of meteor scatter is being done on c.w. Are they all right, or all wrong, in their choice of c.w.? Or is it because c.w. was used successfully before s.s.b. came on the v.h.f. scene? The more rapid information exchange rate of s.s.b. — you can talk faster than you can send — and the possibility of voice breakin to complete an exchange in a few short bursts are certainly worth consideration. Perhaps those of you who have worked about everything you can from your particular location on c.w. m.s. would be interested in developing s.s.b. m.s. techniques.

Before leaving the meteor scatter topic, KØMQS and others find the revised meteor shower chart on page 78 of May, 1967 *QST* to be quite helpful. In fact, Dick found the extended Perseids period during the first week of August very productive. He worked at least 8 stations during that period and says the signals were of longer duration than during the previously heralded August 10-14 period. Anyone else note similar results? The interest in random m.s. schedules during non-shower periods has increased markedly in the last year, and the results make continued exploration of these periods worthwhile.

Don Lund, WAØIQN, of the National Bureau of Standards at Boulder, Colorado, has several



Louis Anclaux operated WB6NMT/KH6 from Honolulu, Hawaii this summer and in June made contact W6PUZ and WB6PMN on 50 Mc. See *QST*, August 1967, page 78 for additional details.

interesting observations on aurora. He says the color is probably a good indication to the distance a station may expect to work. Green auroras are always at low heights, while some of the red displays are at very high altitudes. The higher the auroral region, the greater the horizontal distance that can be covered.

Aurora and sporadic-E are similar inasmuch as both are high-ionized reflective patches. However, when an aurora is overhead, its reflective characteristics are quite different from *Es*. The difference is in the physical form. Don says no one really knows for sure yet, but a good guess is that *Es* is in the form of thin horizontal sheets of ionization, while the aurora is sheets or columns that are not quite vertical, but tipped at the local dip angle of the magnetic field. Data taken from topside sounders often show *Es* under the aurora at high latitudes. Don suggests that when particle precipitation becomes strong enough, sufficient electrons collect at the bottom of the field line and form a "puddle" which can spread horizontally, appearing as *Es*. This may explain why, during some periods of auroral propagation, signals fail to exhibit characteristics normally associated with auroral propagation and take on those more common to *Es*. This may be responsible for the type of propagation reported on 50 Mc. by W4GJO in the August column, and others before.

Michigan V.h.f. Conference

Western Michigan University's 13th annual v.h.f. conference will be held on the Kalamazoo campus October 21. General Chairman, Glade Wilcox, W9UHF/8, says the conference begins at 9 a.m. with a three hour swap and shop program followed by a variety of technical sessions. The evening dinner program features a talk by ARRL V.h.f. Editor, Edward P. Tilton, W1HDQ.

Additional information is available from Glade Wilcox, W9UHF/8, Western Michigan University, Kalamazoo, Michigan 49001.

Central States V.h.f. Conference Successful

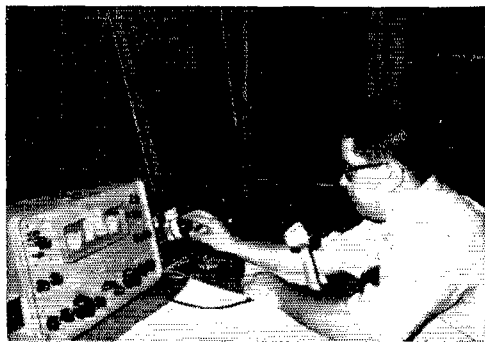
What is hoped to be the first of a series of annual conferences was held near Wagoner, Oklahoma August 19-20. The conference was highly successful with 15 states from coast-to-coast being represented. Plans are being formulated for next year's conference to be held at Boulder, Colorado. We'll have a full report on this year's conference, including the results of a 432-Mc. antenna measuring contest, next month.

Address Change

Your writer is now living in Virginia and signing K0CER/4 while awaiting a 4th district call sign. All OVS and routine reports should continue to be mailed to Headquarters for processing by the Communications Department and V.h.f. Editor, W1HDQ. The reports are then forwarded to me at least once each week. Those of you who want to contact me direct may write to 1233 Woodcroft Road, Richmond, Virginia 23235. My telephone number is 703-272-5995.

OVS and Operating News

50 Mc. conditions were not especially productive during the early summer, but mid and late summer *Es* more than



K0GJX operated this past summer from Fort Churchill, Manitoba on the shore of Hudson Bay. From his K0GJX/VE4 location, Chuck Munce worked 156 stations in 18 states on 50 Mc. s.s.b. Chuck is now active from his Sioux Falls, South Dakota home on 50 and 144 Mc. and is open for schedules.

made up for a slow May and June. Reports were received from K7ICW, W9JFP, K1FWF, WA0DZI, WA2PMV, W1HDQ, W5SEW, K4KYL, WA4STJ, K3URE, K3AKR, W4GDS, KC2TQ, WA1CTC, WA1DFL, WA4DBQ, WA6FWJ, W6ABN and WA1DPX. Here, briefly, is some of the better DX heard and worked. VO1DW, Newfoundland; WB6SEW/VP9, and VP9WB, Bermuda; KP4CQG, KP4BCS, KP4BRR, KP4CQM, all Puerto Rico; CO5CN, Cuba; TT2NA, Costa Rica, and VP7DD, Bahamas, were widely reported stateside. One operator in the midwest said he heard several Alaskans, but failed to mention calls, date or frequencies. Specific details would be appreciated by all the brethren on this type of opening! W1HDQ, at Canton, Connecticut reports at least one outstanding double hop opening to the West Coast in late July. Ed worked WB6NMT, WB6SIY, K6AWL and W6ABN. He says the usual tipoff to such conditions was present; very strong single hop *Es* from widely-distributed close-in points, in this case W4s, 8s and 9s, early in the session. During these periods it is wise to listen and transmit even after all signals have apparently disappeared. There may be a "sleeper" there, and often it is good DX.

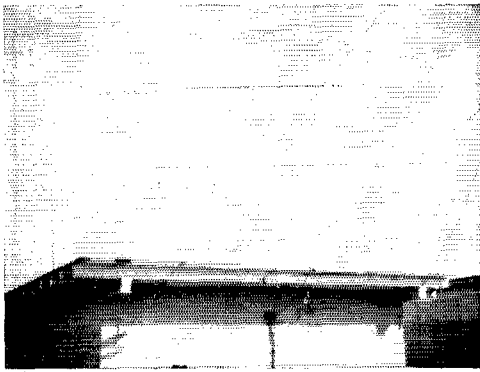
W5SFV, Amarillo, Texas reports working VE8BY in mid July. Phil says it was the first time he has heard a VE8 since January, 1958. July 23 appears to have been about the best session of the season. The report from W4GDS at Pompano Beach, Florida is typical. "During this opening I worked all call areas, 33 states, and made 86 contacts on s.s.b." Bob says his best DX was K7BAG in Washington. He is also looking for scatter schedules, as is K0GJX at Sioux Falls, South Dakota.

Al Olecott, K7ICW, Las Vegas, Nevada summed up the late *Es* season thus: "An outstanding month (July), and a complete reversal of June. A complete report would list what was not worked, since the band was open to nearly everywhere, including Puerto Rico." Al sent along a nine page report of what he either worked or heard to support his observations.

Now for some brief notes. Well-known Bob Findley, W6NZX, has moved to Phoenix, Arizona. His address is 2310 East Roosevelt. OX4AA is active in Greenland and may be contacted by writing Vince Varnas, Box 648, APO New York 09121. North Dakota's K0RDF was often worked during the summer. His address is Robert C. Howard, Jr., Box 447, Casselton, North Dakota 58012.

144 Mc. meteor scatter enthusiasts were well treated by the faithful August Perseids shower. This year's shower apparently exceeded those of the past two years. Iowa's W0BFB, John Hinggardner of near Des Moines, worked his 45th 2-meter state. K1UGQ in Maine, and then added K1MTJ, also Maine, for insurance. Dozens of contacts were made during the shower, but because of a rapid approaching deadline, I can only report those contacts which were immediately made known.

K1ABR, Rhode Island: W5GVE/4, W5BAU/5, W5RCI, K0MQS.



This was the 6-element Yagi at WB6NMT/KH6. Louis was on again as we go to press, and hopefully was successful in getting another station or two on 50 Mc. for the upcoming DX season.

K1HTV, Connecticut: W4WDH, W5BAU/5, W5RCI, W0LFE, W0NXF.

K1MTJ, Maine: W0BFB, W0DQY.

K2HLA, New York: W4WDH, W5BAU/5, W5RCI.

W2AZL, New Jersey: W5HFV, W5ORH.

W3BDP, Delaware: W5UGO.

K0CER/4, Virginia: K4IXC, W5ORH, K0MQS.

K4IXC, Florida: Identified W0ENC, Rapid City, South Dakota during their schedule, 1650 miles! K4QIF, W4SPIE.

K4QIF/4, Virginia: K1BKK, K4IXC, W5GVE/4, W9ADOT, K0MQS, W0LCN, W0LFE.

K4YYJ, North Carolina: W9ADOT, K0MQS.

W5GV E/4, Alabama: K1ABR, K1HTV, K4QIF/4.

W5BAU/5, Arkansas: K1ABR, K1HTV, K2HLA, W4CKB

W5RCI, Mississippi: K1ABR, K1HTV, K2HLA.

W7JRG, Montana: W9ADOT, W0LER.

W9ADOT, Wisconsin: W1AZK, K1UGQ, K4QIF/4.

K4YYJ, W4WDH, W5RCI, W7JRG.

K0MQS, Iowa: K1ABR, K1BKK, K1UGQ, K0CER/4.

K4QIF/4, K4YYJ, W4WDH.

W0BFB, Iowa: K1UGQ, K1MTJ.

W0NXF, Nebraska: K1ABR, K1HTV, K4EJQ, W4WDH,

W5GVE/4, W8AEC.

Bursts of 30 to 90 seconds duration were not uncommon and I understand that K5WXZ, Texas, and K2GUG, New York, carried on a QSO of some 2 minutes duration as a large meteor burned up over the midwest on August 12. W2AZL suggests extending the chart predictions for the SW-NE path 1½ hours, from 0800 to 1300 local time, and says the E-W path is "open" all night. Judging from the amount of activity during the shower it may be possible to alter some, or all, of the times given in the chart. I'll compile and publish the observations, if I receive them, for you.

K0MQS, who scored 12 contacts in 8 new states to bring his total to 41 worked, says too many of the m.s. operators are congregating in the first 100 kc. of the band causing an interference problem. Dick operates on 144.20 and suggests that we spread out. He also lost out on a m.s. contact when a Chicago station tuned up for one solid hour on the same frequency being used by Dick's schedule station. When the W9 finally signed, Dick called him, and you guessed it, the 9 didn't come back! Ah, shades of the Wouff Hong.

VE3EZC has a pair of 4CX300As, feeding stacked Yagis. He has 20 states, wants schedules, and says too many U.S. stations don't turn their beams towards Canada. VE3EZC lives in Agincourt, Ontario, and is a close neighbor of Tony, VE3DIR.

Elsewhere in 144-Mc. news, K4IXC says VP7DD is active from the Bahamas and will schedule. John got him started with a five-watt rig, but VP7DD now has an amplifier and s.s.b. John and several other Florida stations worked the 5-watt signal in August. Art Bates, W5ML, Vivian, Louisiana offers m.s. schedules to those needing Louisiana. W6WSQ at Covina, Cal., will arrange m.s. schedules. K6GCD has moved to Las Vegas, Nevada and will help K7ICW dish out m.s. contacts at 35 w.p.m.

K6GCD may be contacted through Al. And W6DQJ, near Los Angeles, has a pair of 4CX250Bs and 40 elements waiting for schedules.

Also from Los Angeles, WB6GHB suggests purchasing one of the inexpensive transistor radios covering the 108-135 Mc. aviation band. Many VOR's transmit weather information in voice at 15 and 45 minutes past the hour which is helpful in locating tropospheric openings. Your local airport can give you the VOR frequency, if the service is available in your locality. The receivers sell for \$25 or so and might be a worthwhile investment.

From Auckland, New Zealand comes our only moonbounce news this month. Ralph Carter, ZL1TFE, says he has a special kilowatt license and is running the rig into an array of quads patterned after the W8HHS/W1CER design. He is scheduling K6MYC and hearing signals, so a contact is probably not too far off. Several other moonbouncers have spent this past summer rebuilding for the winter. VK3ATN is expected on 432 e.m.e. before long.

200, 1200 Mc. and up activity is slow. K1YON, Connecticut's 220 faithful, reports contacts with W1NOC, Connecticut; WB2CNK, W42FFB, and K2JDI, New York; W4GHK/2, New Jersey and K1SFF in Mass. Not much to show for a summer's work, and like K7ICW says, "what happens to all of those who are supposedly active?" With his 44-element array, W2SEU, Freeport, New York, worked W1OOP and W1GAN, both Mass. 220 certainly does need more activity — who will be the first to work 220 meteor scatter and moonbounce?

432 Mc. news is led this month by Al Tyler, W0DRL, Topeka, Kansas. Tropospheric conditions are not as common in Kansas as they are along the coasts, but Al caught several good openings during the summer, including a 540-mile hop to W8PT in Michigan. Al now has 7 states, 4 call areas and the contact with W8PT is his best DX. His rig is a W1QWJ 500-watt final into a 44-element W1HDQ Yagi array. The receiver and converter are commercial. Al's frequency is 432.004 and he is available for schedules. *Nice work from Kansas, Al.*

At Opalocka, Florida, Harry Conowal, WA4OFS, is active on the band, as well as W4HDX at West Palm Beach. Harry has just completed an extended collinear with silver plated brass rod elements! "Bunky" Botta, K4EJQ, is working on several 432 projects at his Bristol, Tennessee location, including an extended collinear and a W4HHK converter. In Dollard-des-Ormeaux, Quebec, Don Watters, VE2HV, is stirring up activity on 432. He runs 120 watts output to a box array of four W2CCY 13-element Yagis. Don's frequency is 431.99.

W6DQJ in Pico Rivera is conducting tests with K7ICW in Las Vegas and K6RIL near San Francisco. Russ is running a pair of 4CX250Bs and a 48-element collinear. Schedules with K6RIL have been quite successful, but since W6DQJ raised his antenna from 40 to 60 feet, he has had trouble working K7ICW. He and Al plan further antenna height tests. Additionally, K7ICW is scheduling and working K6HAA at Redlands.

VE3EZC vacationed in Puerto Rico this summer and guess who put him to work? Cliff helped Sam, W1FZJ/KP4, with the welding on Sam's new 150-foot dish for e.m.e. Cliff says the "dish" is square and is being built on the ground. Sam will use a moveable feed atop a 60-foot tower. He is starting with a mere 50-footer for 432 and 1296, but Cliff says he will increase it to 150 feet, for 144. The completion date is undetermined as Sam has difficulty in obtaining help with the project. VE3EZC is on 432 with a 4CX250B and 21-element Yagi up 70 feet. His frequency is almost exactly 432 and he wants the stateside boys to look for him from his near-Toronto location.

Latest OSCAR News

The evaluation of Euro-OSCAR (2-meter translator package) has been completed, and correspondence with its constructor, DJ4ZC, indicates that additional work is necessary. The package has, therefore, been returned to Germany. This can be considered a normal stage in the production of a flyable satellite. Karl has done a great deal of hard work on the project, and when he has completed the changes indicated it should be a first-class communications satellite. The additional work required makes it impossible to give a reliable estimate of the launch date for a communications-type satellite.

ARIES, a California-based project to construct an amateur repeater-type satellite, has been disbanded. QST



How's DX?

CONDUCTED BY ROD NEWKIRK,* W9BRD

How:

Foreign folk attending their first U.S.A. baseball games usually are shocked by ominous shouts from the grandstand. They immediately marvel at the precarious existence of those hardy officials in blue. "The ump is a bum!" (Blimey, how disrespectful.) Even the players jump up and down from time to time, strenuously impugning the judgment of the arbiter. "He was safe a mile!" One team captain presents business cards from reliable opticians before he heads for the showers. Anyway, the louder this noise, the more interest in the game.

Let us assure our overseas friends that such spirited and vociferous protest is traditionally required in our sports. It's as American as the hot dog, an essential part of the pastime be it baseball, DX, Sunday driving or what have you. Shucks, if anybody really scrubbed the ump it would just delay the fun till another was found to scream at.

These thoughts come to mind because one referee (us) finds it necessary to adopt a rules change for "DXCC" (photo p. 101, June '67 *QST*, etc.). *Viz.*, claims hereafter are restricted to photographs of QSLs from active Century Club members as indicated by listings in the most recent 36-month stretch of *QST*'s. Okay, now — all together —

"KILL the umpire!"

Long Island DX Association's *DX Bulletin* discloses interesting results of an extensive most-needed-DXCC-countries poll. In order of most desirable, they turn out to be

Albania, Laccadives, Iraq, Navassa, St. Brandon, Malpelo, Spanish Guinea, Bouvet, Clipperton, Rio de Oro, Rodriguez, South Sandwich, British Phoenix, Kuwait-Saudi Arabia Neutral Zone, Cambodia, W. Pakistan, E. Pakistan, Sikkim, etc.

You'll recall (May *QST*) that the German society, DARC, recently ran a similar referendum among European subscribers, coming out with

Clipperton, Malpelo, Revilla Gizedos, Willis, British Phoenix, Rio de Oro, Heard, Aves, Pitcairn, Navassa, Marcus, Kure, Laccadives, Juan Fernandez, Easter, Spanish Guinea, South Georgia, Rodriguez, Tonga, etc.

Not surprisingly, few Europeans hunger for Albania, and few North Americans sweat Revilla Gizedos. The yearning for Clipperton and Malpelo, however, is universal.

What:

Autumnal equinox high on the sunspot curve, lads and ladies! Better stock up on some spare logs and another stack of QSL stock for those grid-blocking 28-Mc. openings, those speaker-shattering 21- and 14-Mc. breakthroughs, those antipodal 7-Mc. developments, those static-free 3.5-Mc. long hauls and those delicious 1.8-Mc. transoceanics. (Between all those fadeouts and auroral an-

noyances, of course.) . . . Summer has been quite kind enough, judging from Jeevesie's mailsack. It's a multi-band month for your "How's" Bandwagon, first stop:

15 Novice DX trails, well worn by WNs 1HHO 2ZQE 4FBY 6UVH and 8VZS, display such DX scenery as CBs 1 DB 1FF 1HQ at 1600 GMT, 3GZ 0, 3JP 2, 3NL 3, CMIAR 21, CN8FC, COs 2BO 7AL, CP6GC, CRs 3KD 4BA 23, 5CA 6AL 6FA 7IU 0, CTICN, CXs 1JM 2, 2FD 23, a dozen DJ/DLs, EAs 3HE 8FE 8FG 1, E18H, ELs 2D 19, 2NA 2NE 22, ET3USA, Fs 5BR 9AO 9BO FB8Y 6, FG3XT 20, FM7WQ, FW8RC 6, plenty of Gs, GC8HT, GD3RFK, G3TME, GM3SKX, GW3UXS 18, HAs 4VB 5DA, HB9AJI, HC1TH, HIs 3AGS 8DWS 0, 8BC 23, HKs 3RQ 4PP 3, 7AMJ 1, HMs 1DH 9DH/p, HPLXUH 21, HR1JMF, IIs BBJ BUD CUV TJD TOA, IS1SCB, JAs 1DIC 1ERB 1HQG 1IMZ 1JAN 1KMG 1KSO 1LIW 1LXE 1NRQ 1NRY 1PSA 1QMS 1SDX 1SKY 1TAC 1UYZ 1WJQ 1WJQ 1WVQ 1XOD 1YCE 1YFL 1YTX 2HUC 2IIQ 2JPA 3AQN 3AYL 3AYU 3BN 3BNN 3BRI 3CZH 3EA 3EGE 3FBG 3FCV 3GRO 3HCJ 3IPJ 3JFE 3KCT 4DIA 4IO 4OK 5AB 5BJT 5CBG 5CKG 6DGV 6YCU 7CPV 7ND 8BA 8BP 8CEU 8CTG 8CX 8LI 9BES 8SX, KA2TJ, KG6AQQ, KH6s DED DUM FRI GAV SP 18, KL7s CGB CVX EKZ FAO FKO 5QP FRY WAX 1-2, KP4s AQL 23, BFI 2, KR6s OE 5, SS, KV4s EX EY 16, nine KZ7s, LARLG, gobs of LU/PYs, LX1LF, LZ1BK, OA4FW, OD5LX, OE8s INY 9, ISFW 3PWW 3SPL, OHs 1TT 2BAD 2BZ 2TI 2ZK 3MG 6NH 6UE, OKs 1BP 3DG, ON5s KL PA, OY7ML, OZs 2X 9HO, PA0s FAK NV VO, PJs 2ME 3AT 3CE 23, SMs 4CMX 6CAW 6CUX 6UG, SPs 3AJI 5ZA 2BMM 5YC, SV0WCC, TF3EA, TG0EP, UA0s KZB 3, NGT 4, UB5s NM TQ, UC2s AW SE, UD6AN, UO2GA, YKs 2ADN 3, 2APK 5, 2BKM 5, 2QK 4, 4MY 4, 5AF 5, 6IZ 4, 7SM 6, VP8s 1MW 2GW 2KJ 5NK 6PJ 7NA 0, 9FO 0, VO8s 8AW 9TC, VS9ASP, WH6s GDA GDO GEC 1, GEQ 3, GFD 3, GFM, WL7s FLG FQL PRO, WP4s CRF CSA 2, CSZ 2, XEs 1BI 1GGW 2, 2CCI 2, YO8OP, YS2OB, YU8s 1UK 2EAB, nine YVs, ZB2AM, ZC4KF, ZD8SKI, ZE1As, ZLs 1ACW 1A00 1OT 2GH 4, ZS8s 5QU 6US 19, 4X4s NYO NYZ, 5A5TJ, 5N2AAX 0, 6W8DD, 6Y5RM, 7Q7EN, 9G1s DU FY 0, 9HIAK, 9J2IE, 9L1TL, 9Q5KL and 9Y4DS. Nice sampling — who'll be the first Novich to score double-DXCC?

15 phone prosperity is enjoyed by Ws 1CNU 2DY 2GTQ 3HNK 5EHY 6AEM 8VGR 9LNU, Ks 4HPR 5VTA 7BOA 7BOB 7YDZ 8MCQ 8PKG, WAs 1GGN 2LOR 2WIJ 3DSD 4YDR 5PUQ 6JDT 6VVS



Reprinted from May 1955 *QST*.

* 7862-B West Lawrence Ave., Chicago, Ill., 60656.

7ROB, WB6KVA and s.w.l. P. Kilroy thanks to CE5
 2AK 3CZ (21,390 kc.) #200 (GMIT, 3KW 6AE (312) 21,
 CN8s FC FV (340) 23, CO7EC*, CPs IEM 6EX (360),
 6HY (280) 21, 8AU, CRs 4BB (308) 1, 4BC 5CA* 6BF
 6CN (338) 9, 6DA (310) 11-15, 6DQ* 6FE (345) 20,
 6IV (405) 11, 6IX (342) 11, 7CM 7CX* 7GL* 7IZ*, CTs
 1BX (330) 21, IEE 1KT IAC (305) 23, 2AP* (255) 23,
 CX8s AAW (362), CZ (310) 22, DV*, DUIFH (350) 20,
 EAs 6AR (396) 18-19, 8BQ (300) 20, 8BW (285), 8CB
 (333) 18, 9AQ* 16, FIs 3Y (310) 23-0, ELs 2AF
 (405) 17, 2AK (400) 12, 2AR (370) 8, 2E (340) 17, 8C 9A
 (400) 23-0, 9B (322) 17, EPs 2AM (397) 15, 2KW 3AM
 (310) 16, ET3RB, FG7XX* (300), FH8s CD 18, CE,
 FK8AU (318) 19, FO8BU (318) 9, GC2JZ (400) 13, GD3s
 HVD (358) 17-18, RPK (400) 15, HCs 1LG 1PB (172)
 20, 1XC (320) 20, 8FN 16-18, 8JG, HIs 3AMF* 8XDA
 (404) 22, SXHL (400) 21, HK3s ABI (300), AXY* HL9KQ
 (315) 16-17, 8J, 8Ks DG (397) 15, 8Ls 2AF
 HEH (435) 22, KS (365) 20, ISIs POL (337) 14, MKD*
 19, RUA (380) 14-15, SCB SEL* VAZ, JAs 1FAF* 15,
 1FRE HZZ (320) 17, 1JAN (353) 1, 1OCA 18YK 1YKT*
 2BSM 2CW 2EPZ 3BLG (340) 15, 4EAA* 6BUK 7OD
 (340) 5, 7UJ 7YAG* 9AGP 9J 9BLU, JHIs BEE BFF
 (328) 6, ECG, Ks 6KIL/KG6 8NHV/XV5, KAs 2VT 21,
 7AB, KC4USB (424) 6, KG6s AAY (390) 22-1, IG (309)
 1, KH6s GFI HV (360) 8, LJ, KR6s DB 6, HP 1L LS
 (300) 14, USA (280) 17, KSACE (418) 0, KV4s CX (290)
 20, ES* (380) FA (320) 22, KW6s EG 10, LJ (362) 16,
 KX6s BU (350) 4, DB FJ 12, KZ5s NS (410) 20, RJ SY
 TX* (280), LA6TF (320) 22-23, LXIs DB RB 17, LZ1WD
 (346) 14, MP4s BBA BCC (302) 21, BGL* 9, MAY (280)
 14, OAs 80 8AE, OD5BZ (380), OH0s AA (310) 16, NI
 (364) 21, PE2EVO, PJs 3CC (280), PZ1BH*, SL2AMH,
 SV0s WFF (360) 18, WU (295) 22, WY, TF2s WKM
 WKN 23, TG9ST*, TIs 2HE* 2LSA 2LT* 5YOR (350),
 TJs AC (334) 21-22, AG, TN8BK (330) 20, TU2s AU
 AY (312) 18-19, BD (305) 15, BQ (340) 14, Tys 3ATB
 5ATD, UA9s KCE (375) 15, KDL, UB5KTF, UC2AA,
 UH8AE (298) 13-19, UP2s CP (285) 18, NV, UV4BH,
 UWIKAT, Vks 6DA* 7GK 9DJ 12, 9VM (312) 12-13,
 9WD (400) 11, 9XI (345) 14-15, VPs 1MW* 2GC* 2SC*
 (285), 5CH 6FD (400) 20, 8HZ 17, 8JD (298) 18, VOs
 8AW 21-22, 9BC (410) 18-19, VR6TC 0, VSs 6FZ 9ABL
 (360) 14, 9AHN (375) 12, 9ALY 9ARS (322) 19-2, 9ASL
 14, 9MB (285) 16-21, VU2s BK (400) 11, DKZ (339) 18,
 KH (397) 13, SM (353) 8, WB (325) 17, W3DVG/VR6
 (345) 6, XEIs AL 1, CE 20, DDK, XW8s AK (350) 16,
 AX (350) 18, BG (302) 11, BJ 1, CG (360) 16-17, YAs
 1DAN (370) 16, 1FV (317) 17, 1KO 18, 4AR (360) 18,
 YJ8BW (340) 9-10, YNs 1BKC 0, 1AAD 22, 3LH, YSs
 1EME (396) 3, 1RCP 3FH (273) 19, many YVs, YU3LP,
 ZB2AM, ZC4MO*, ZDs 5R 10, ZDI 19-20, 8CW (340)
 17, 8DX (330) 22, ZE1J5Y 19, ZLs IARO* 1HW 5, 2AFP
 2ALV* 5, ZPs 3CW (346) 1, 5DV (322) 5EE 5JB (340)
 19, 7BM, ZS3s AY 16, JJ, 3B2HA, 3V8BZ (310) 9, 4S7PR,
 4UISU, 4X4s CW (355) 15-16, LL* SO WD, 5As ITS
 1TV 3TN (322), 5H3s JR (400) 20-21, KJ (359) 19,
 5N2s AAF (318) 15, AAX (415) 16, AAY ABG (420)
 16-17, ADE, 5R8AS, 5UTAK, 5W1AA (326) 3, 5ZAs AA
 (210) 17, KK (335) 19-23, KM (395) 19, KN (340) 19,
 KW (375) 9, 6OIs GC (324) 18, PF, 6W8DX, 6Y5s GG

RJ RM*, 7P8AR (310) 13, 7Q7LZ 18, 7X0BB*, 8R1s C
 (350) 20, S (332) 2, 9GIs BE DF (310) 17, ED FF (370)
 15, FL 17, GA GB (350) 9, 9HIs AAI (322) 15, R (300)
 11, 9J2AB (333) 23, 9Ms 2AV 10, 2GJ 2NF 2NY 2PO
 (370) 15-16, 6MG (305), 9O5s CAI DV* EB IA (328) 21,
 KS (377) 18, SJ, 9U5s DL 19, DP 20, VP (370) 9VIs FF
 (350) 16, LK MI (410) 17, MY (370) 15, NV (300) 18,
 OA (281) 16, 9X5s CC* GG IH (282) 15-16, PB (255) 17,
 9Y4s 1S (350) 22-23 and VT, the asterisks denoting hardy
 non-s.s.b. souls.

15 c.w. is a lark among the Generals-plus, too, with
 Ws 1CNU 2JBL 3HNK 5EIH 6AEM 7VCB 8YGR,
 Ks 4HRP 4MYO 4TWV 4UTI 5MHG 6VTA 6JPI,
 WAs 1CYT 1FHU 1GXE 2LOR 3DSD 3GJU 4YDR
 5PUQ 6DPT 7AUW 7BOA 7BOB 7DUB 7GPT 8MCO
 9SXQ 9OXO, WBs 2RJJ 2UOO 2VVO 2WKR 4EPE
 6KVA 6VVS and IHER hobnobbing with CE5 IHQ 3, IHR
 (30) 16-17, 3JP (90), 4AT 4CT (55) 22, 5AA 8CF, CMs
 1AR (43) 20, 1ARC (40) 22, 2BA (40) 21, CN8s FC (67),
 FF (50), COs 2BB (50) 23, 2CO 15, 2DR 20, 2JB (102)
 2MI 5FS (35) 22, CPs 1BX (290) 15, 3CN 6FN (115) 22,
 KRs 3AB 16, 4AG 5CA (75) 16, 6AI (30) 19, 6AL (50) 18,
 6CK (49) 12, 6G0 6HT (72) 18, 6KB 7BN (70) 17, 7HC
 7IZ, CTs 1BO 18, 1HT (101), 1IT (102), 1LN (99) 23,
 1LQ (98), 1OI 3AS (17) 22, 1Xs 1AAC (20) 22, 1JM
 (K76) 23, 2AL (50), 2FD (60), 2XA (22) 12, 3BD (48) 15,
 DMs 2ADC 2AFP 2AIO (45) 21, 2BBK 3EN, EAs 6B 18
 (88) 16, 6BH 20, 8EB (90) 18, 8PJ (32) 18, 8FO (60)
 16-21, 9AQ (40) 23-0, 9AY (59) 19, 9EO (70) 11, 9EJ
 (2) 0, 9ELs AJ AM 16, D (25) 17-19, J (54) 14, NE Y
 (10), ET3USA (80) 20, Fs 2CB/RC STP/RC (50) 18,
 9VN/FC, FC8IL (30) 16, FG8s XJ XX (5), FL8RA 23-0,
 FO8s BC, BU, FW8RC (68) 8-9, GD3AM (45) 16-17,
 HAs 1KSA 21, 1KZE 23, 3MB 17, 5BN (81), 5BQ (52),
 5KDO (45) 23, 5KZ (75) 19, 6NC 21, 8KUN 21, HCs
 1MF 1ZA 2SB (71) 0, HIs 7JMP 7MRC (95), 7NSL (160)
 15, Hks 3BAE 20, 3RQ 4ADY (82) 21, 4AO (42) 14,
 4IC 7UL (48) 22, 6AI 16, HL9s KA (25) 14-15, TK (51),
 HMs 1DH (15) 3, 5FP 9DC, HPIAC (26) 22, HZ2AT
 (25) 21, ISIs SCB 22, SEV, ITIOM 23, JAs 1AJE 1BPM
 1CEU 1GBC 1JFT 1KLT 1NUH 1RQA 1RYO 1ITGZ
 1ITGZ 1ULW 2FM 2FOR 3AYL 3BN 3CZII 3EA 3GYQ
 3KFG 3KWZ 3LGG 4EFA 4EFA 5CEU 5PL 6BJT,
 6LQ 6KNG 6CUX 6GH 7BQY 8SW 9UR/0 6DBF,
 JHIs BUG BXR PIR, K1FRV/HR1 (30) 19, KH6s
 COB DED CGI 1J AL, K17s AIZ FKW IR PI (45) 10,
 KP4CSM KR6s 6AB (30) 2, 6AG 6CF (19) 10, 6DE (29)
 18, 6DET 6JM (40) 17, 6KJ (38) 16, 8DE (32) 17, KV4s
 AM (50), DB 21, DN EX, lots of KZ5s, KX6FA (65) 9,
 a lotful of LU-PY brethren, LX2BQ, LZs 1BC IFO (40),
 1KSE 1YW 20, 2KST, MP4s BEU (35) 9, BFK (20) 19,
 MAW (54) 11, OAs PF (20) 17, QN 22, UO (77) 20,
 OD5s EJ LX, OY8NS 20, OX3s NJ 2, WX (62), PJ3CJ
 22, PZIs AB, CQ 5, SLs 4BA 5BO 6BH 6BU 7BZ 9CB
 (20) 18, SMs 2COP (74) 17, 6DSG (5) 16, TA2AC, TF3PF,
 TIs 1H LA 18, PZ, T11Q (53) 16, TR8AH (20) 9
 TT8AR (30) 7, TU2BK (72) 19, UAs 2AG 2BD 2KAT 21
 9PR 9SR 9WS 9KUV (31), 6MX 20, 7UBs LS YV 21,
 UC2AX (60), UF6s KAM 8, LA, UG6AB (57) 3, UH8BO,
 (15) 20, UH8s AM (6) 6, UD (69) 2, KAA 4, UJ8AB,
 UL7s BG (34) 10, IQ 6, GR (50) 7, UNIKAC, UO5KBB



The Seychelles, once a DX rarity of the first water, now are thoroughly worked thanks to Uncle Sam's space program. In fact Mahe is beginning to resemble the approaches to Yellowstone Park. That's VQ9TC's antenna among the trailers, VQ9EF's operating quarters. Wes, the latter, who supplies this photography, signs W0BIG/1 in Massachusetts after working 120 countries from that shack.



TG5WJ, the station of Fr. William J. O'Donnel, M.M., specializes in sideband on 20, 40 and 75 meters. Antenna maintenance is a problem in Huehuetenango because Buzzards, protected by law, keep blundering into Bill's quad rigging TG5WJ, who prefers liessurely rag chews in English or Spanish, is WB2GJR back home. (Photos via K2DDK)

(81) UP2KBC (33) 7, UO2s FF IQ KCJ KCR, UR2s BV LO 3, UT5s BL (60) 15, CC 6, UWs 3AU 3JJ 6LP (20) 12, VESYC/8 (20) 20, VKs 7SM 8UG (65) 14, 9VM (55) 13, 9XI 13-14, VPs 1MV 1VR 2AZ 16, 2GLE (50) 18, 6BX (64) 22, 6FN 6PJ (40), 7EF (30) 23, 7NP (80), 8HJ 8JD (50) 19, 9GIA (100) 20, VR2DK (75) 9, VSs 6FX (50) 8, 9AJM (50) 15, 9APW (30) 7, 9MB (87) 18, VU2s DIA 11, JA (15) 1, MWP, WA1EAV/VP9 22-23, WP4DAC (175) 0, XEs ICD 1HD 1ZV 22, 2AA 2DN (160) 14, XZZZZ (9) 16-17, YAs AN (23) 11, KO (94) 19, YNIs GMR (26) 18, AA, YOs 2QM (20), 3RG 21, 5CV 5DH 5LC 6KAF (76) 20, 8AP 8DD, some YVs, YS2OB (8) 23, ZBs AM (13), AP (57) 19, BC (30) 22, ZC4s GB (82) 16, TX (22) 14, ZDs 3G 5X (29) 10, 8HAL (29) 21-22, 8J (23) 14-15, 8JG 16, 8JS 8NK (70) 18, 8PMG 11, 8RB (25) 9, 8RC (35) 17, 8SK (80) 17, ZE4JS (60) 18, ZK2AU (35) 3-4, a dozen ZLs, ZPs EC (26) 22, ML (95) 22, ZS9Q (42) 16, IS7s LB NG (88) 0, 4U1TU (60) 12, 4WIs C 16, L (20) 14, 4X4s CJ MZ (7), NY (100) 0, NZN VF (10), 4Z4AG, 5H3KJ (40) 18, 5R8s AM (52) 16, AS 13-14, CQ (55) 16, 5N2ABD (80) 11, 5ZAKL (24) 21, 6W8s CD CQ (70) 10, 1DD DW (80), 6Y5s AH (92) 0, 6W8s CD CQ (70) 10, 7Q7LZ (46) 18, 9GIs FY HM (35) 17, 9HIs A 23-0, AB (97), AG 22, AI AK (50) 19, 9J2s HZ (53) 16, 1E (115) 17, MX (50) 17, 9LITL (57) 17, 9Ms 2AV (18) 15, 2LN (47) 18, MX (66) 18, 8II 15, 9VIs LT MY (10) 16, NV (18) 14, 9X5PS (60) 18, 9Y4s LA 0 and TR.

40 c.w.'s making its comeback assisted by Ws 3HNK 7VCB, Ks 2YJU/KL7 4HPR 41EX 4MYO 5MHG, WAs 1FHU 7DUB 8MCC 8PVN 9MQL 9SXQ 9KVC, WBs 2RJJ 6KVA 6VVS and WN3GQO with the cooperation of GM5LM (30) 0, CO2IC, GT1DJ (10) 6, CX1AAC, 6GZXF (10) 23, FM7W0 (5) 10, HMD1H, JAs 1CKE 1CSX 1GUM 1JCE 1KUU 1NOG 1NUT 1OYN 1QIP 1QVR 1RMV 1RNI 1SRG 1SYW 1THL 1VDL 1VDM 2PAI 2JXI 3LUG 5WU 7AFV 7CUA 7ERN 7FX 8BMI 8JS all around sun-up, KG6FAE, KH6s ALD DQ 7, FEW GFM 5, QR 7, KL7FSX 7, KZ6s FX TX, LU2s ZE ZI 4-5, loads of OKs, OY4M, PYs 2NE 7AMX (12) 3-6, SP5ARN (4), TA2BK (25) 23, TUZBK (26) 23, UA6s DA ZV (20) 6, UJ8AV, UM8BA (34) 23, a hatful of mainland VK-ZLs, VPs 1MW (4), 1VR (3) 2, 6KL (3) 22, 8AP (40) 7, 9BO (2), 9BY (10), VQ8CC (5) 14, YN3KM (24) 3, YOs 8FR 9AE, YU2ABW (1), ZD3G (15) 21-22, ZS6KP (4) 21, 6W8DD (25) 23, 6Y5GS (10) 12, and 9V1LK (1) 20. --- WN3GQO scored upband with WH6GEC (180) and KZ5NG (070). --- Forty phone is stubborn but GN8AW, KC4USV, KG6AFE, KH6GDM, KL7SPO, OA4TE 6, ON4VS, PA8RCA, PY7s ARP GAY VKG, TG7EH, TIGNA, VK3AC (87) 7, VP2DC (a.m.) 9, VS9MB, YVs 1BI (94) 5, 3KX (93) 5,

ZD8RD, ZL3s RJ RK, 4W1L, 8R1C, 9G1CA, 9HIs AM N and R fill holes between the SWBC splatter.

75 phone returns to DX life led by DU1AV, GB3PDN/a, PJ2AE (a.m.) 7, PY7AKQ, KL7s BJW 7, PNI 7, KP4CST (3943) 2, VE0NC, VKs 1GU 3LA, YN4JRS (a.m.) 8, ZL2KS and 7P8AR, most just below the Yank subband as a rule. --- 80 c.w. is starting slow but CO2DR, FC7IJ, JA7DMO, KZ5FX, PY7AN, PZ1AH (45), TA3FA, UA0FR and UL7GW are beginning to find the range.

10 c.w. is off and running, K4HPR, WAs 7AUW 7BOA 7BOB 9MQL, WB6VVS, 11ER, KH6BZF and 5Z4SS tangling with CE6EF, CM2BL, CR6CK (69) 18, CT3AS, CX1AAC, EI9J, FO8BU (10) 3, G13SXG, GM3MCI, GW3FSP, HB9KG, HG2KRD of Hungary, HKs 3RQ 6AI, 11ZIX, JAs IHMM IQCC 1RUJ 2ENG 5AOG 5DOC (25) 3, 6TQ, JH1AHR (21) 0, KJ6CD, KH6s IJ SP, KP4BFF, KV4AM, KW6DS, LUDYD, OA4s KF (25) 10, PH, OH0NH, OK3DG, ON4CK, OY2H (40) 18, OZ4DX, PA6L0U, PY2s DBU 80, SM6CKV, TR8AH, UA0KFG, UP6DR (54) 13, UO5AA 10, UV3AAM (60) 15, VKs 2EO 3AKN 4VO 7SM, VP1VR (52) 18, VR2DK, VQ9AR, YN3KM, YV1OB, ZDs 7WR 8J, ZL1AH, 4U1TU, 5H3KG (38) 12, 5Z4s KO (55) 19, 8S (50) 18, 6W8CD, 7Q7RM, 9J2s BC (50) 0, JC and 9X5SA before the band really swung open.

10 phone's early-season returns are encouraging to say the least. Ws 1 CNU 8YGR 9TGG, K7YDZ, WAs 2LOR 4YDR 7BOA 8MCC, WB2WHB and KH6BZF scoop up CE3RC* CR6s CK FW (610) 19, IL (640) 18, CTs 1BH (595) 15, 1IK 3AS* 16, EA7JT* EIs 7A* 9Q 9S, FK8BB (820), FM7WQ, HC8FN (645) 21-22, H18JXP (555) 19, HP1JC (565) 0, HRL1K, IS1BYR*, ITTOR* 13, JAs 1WPX* 2BZY* 3ATQ* 3KVT* 5BLX 5BRI* 7CYC* SCFA* 9BSL*, JHIs AG3* CYG*, K6KH/KG6 (592) SCFA* 9BSL*, JHIs AG3* CYG*, K6KH/KG6 (592) 0, KA2s BZ (625) 0, MB, KG6s FAE (635) 23, IJ (610) 7, KH6s BZF (570) 20, RS, KP4s CSU (551) 20, FAC, KR6Is (620) 0, KV4EY (593) 23, KZ5s NS WL (592) 19, LA5KH* MP4BBA, OD5BZ (580), OK2s BFH* WE*, ON4YB, PY2s BGL CAN*, SM0ANH, SV6WU, TG9US* UP2FU* VKs 2AVA (575) 21, 2FU (590) 22, 5MF (550) 22, SAU* 3, VPIWR (630) 23, VS9s ALP MB (600) 17, XE1s FU CCC (565) 0-1, YN1ALAV* 22, YQ2QC* YS2CBN (596) 18, YV7AY, ZC4GB (660) 16-17, ZDs 7DI (605) 17, 8BUD (625) 19, 8CX (570) 20, a half dozen ZLs, ZP5JB (570) 19, a pack of ZSs including 3IT, 4U1s 1TU (95) 9, SU (615) 15, 4W1G, 4X4CV, 5N2ABII (690) 16, 5R8As, 7X9WV, 9J2s DF* DT (700) 17-18, 9I1s GQ (730) 17-18, JP* and 9Q5EP (600) 19, the stars twinkling for straight-a.m. signals, still plentiful on 10.

Next stop for the "How's"-mobile will be 14 Mc. where we'll get the voice view from Ws 2DY 3HNK 3LE 3SEJ 4NXD 6ABM 8YGR 9LNQ, Ks 4HPR 5VTA 7INE 7YDZ, WAs 2LOR 2WJ 3GJU 5PUQ 8MICQ 9SXQ, WBs 2ZUB 6KVA and listener Kilroy; the pump-handle picture via Ws 3HNK 3FZJ/9 4NXD 4YOK 7VCB, K4UTI, WAs 1CYT 1PHU 2LOR 2WJ 3GJU 5PUQ 6JDT 7BOA 7BOB 8MICQ 9QBM 9SXQ, WBs 2RJJ 2ZUB 6KVA, 11ER and others reporting in the interim. **Gotha** check up on 160, too — signs of a rumble up there!

Where:

EUROPE — Finland's SARL announces, "From October 18 to December 6, 1967, all Finnish club stations are authorized to use the prefix OF instead of OH. There are approximately fifty such stations. QSLs for OF contacts will bear symbols of the 50th anniversary of independent Finland and will be sent automatically via bureaus." No more OHs after December 6th, Finland's independence holiday. . . . W8FXR tells us that the 8V0W listed in our August QTHs now signs SV0WV in Athens. QSLable as indicated in the following. . . . 1M1OL apologizes for lardy PA9CN confirmations, delayed because of heavy family and business activities. . . . *DX News Sheet* has it that those three-letter F5K calls go for club stations, new French hams sign three-letter F1 labels, and LX3 calls haven't been issued for years, current spurious evidence notwithstanding. . . . GM5AHS/WA2DHF asserts, "All of my U. S. QSLs are sent direct, same day of QSO."

OCEANIA — WA6AHF affirms, "I am KW6EO's QSL manager as of July 21, 1967. I'll also attempt to confirm prior contacts." . . . W4NJF notifies, "I hold YJ8BW logs for QSOs from mid-June through July, and all QSLs received have been answered. Self-addressed stamped envelopes from W/Ks, self-addressed envelopes with International Reply Coupons from others, are musts." Gay indicates that though YJ8 is the official New Hebrides prefix, scattered YJ1 and FUS usage may crop up now and then.

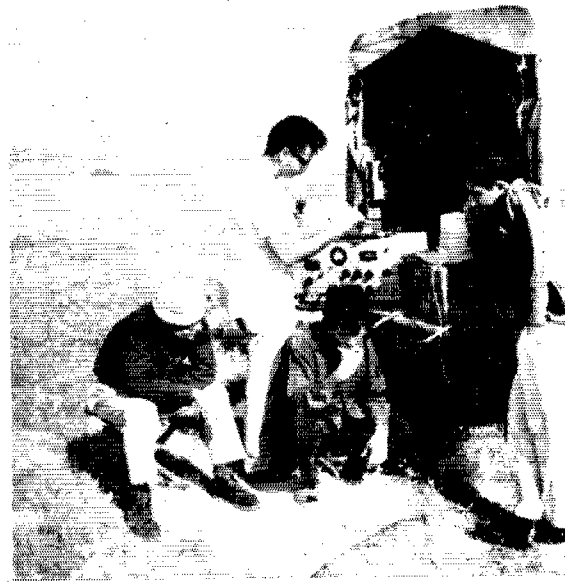
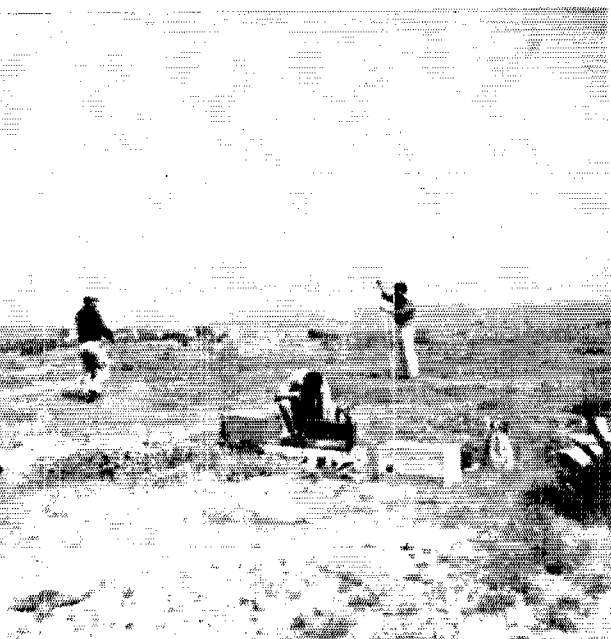
ASIA — "I'm still trying to get a copy of OD5EE's logs for September-October '66," says W7VRO, meanwhile suggesting the address in the listings to follow. . . . 1D2PJ tells W8FNV he does QSL chores for TAs 2BK 2FM 2YC and 5EE. DL2OE handles TAISK's European QSLs, SM0KV is QSL aide to TAs AV and DS, and K4AMC assists TA2AC. "There will be many more licensed amateurs in Turkey in the very near future in addition to TAs 1AB 1AX 1BD 1DX 1JK 1KT 1MDS 1TU 2AA 2AB 2AJ 2BF 2BZ 2DS 2PA 2FE 2J 2JK 2KAI 2RK 3AY 3BC 3FA 3FAS 3LU and 4RZ. TAs are in European Turkey." . . . UA1CK/JT1 reminds WA6AHF of NCDXC that International Reply Coupons are not redeemable in the M.P.R. "I'll QSL 100 per cent to all stations worked, preferring s.a.s.c. for direct reply, others to go via bureaus." Vlad should be back home by now, reachable through Box N-2, GPO, Leningrad, and W2SAW can probably supply the desirable Russian mint postage. . . . HL9KA confirms, "Anyone needing my QSL for contact after March, 1967, can apply via W3CTN." . . . NCDXC's WA6IVM hears that some 250 U. S. sixes have failed to answer JA1KSO's QSLs. Gentlemen!

AFRICA — VQ9EF declares, "Every QSL I received on Mahe was answered before my departure. I'll be glad to answer other requests for cards sent to [the address in the list to follow]. We desire s.a.s.c. from Statesiders. Others may QSL to W8BIG via ARRL's Zero Bureau. . . . G3APA tells WA1EOT, "I'm attempting to QSL at least first QSOs with VQ8CG, some subsequent contacts as well." Most will come via bureaus. . . . WA1CYT understands that G6ZY/CN will confirm his Tangiers QSOs from home, all via the bureau route. "ZD8J sent QSLs for all QSOs to mid-May, some 15,000." notes W4DQS, John's QSL manager for contacts after May 15, 1967. . . . W4NJF advises, "7Q7LC finally sent logs for the period January 21 through June of '67 but I still have about fifty cards claiming QSOs on prior dates." Gay forwarded a batch of QSLs from EASCB but wants it known that he's not the latter's QSL manager. . . . "Still awaiting 5N2AAF logs to confirm contacts since March 6, 1967," states W7VRO, who also mentions that family and job duties temporarily slowed ZS1XR's log deliveries. . . . Z88 joins Silent Prefixes. Lesotho now uses the ITU-assigned 7P block.

HEREABOUTS — "QSLers of the Month" in volume this trip, all commended by correspondents for paste-board promptitude: CT3AS, CX1JM, DLs 3UJ 5OU DU1OR, EA6BD, EI9J, FP8DD, G13PY, GMs 38SB 5NW, HP1CG, H18XAL, HP1RC, HR3WW, HZ1AT, JA31XJ, K9OXZ/CEB, KG6SB, KP4AD, KV4AA, KX6ER, LZ1B BC YW, OA5AE, OE3PWW, PJ3CC, SM7BTN, SP6AAT, TF3AU, TN8BK, UA9PO, VKs 2AV 5FM 6IZ 6XX, VP9GA, VQ8S AW CG, VR3L, VS6PX 9ASP 9MB, XE2DL, XW8BJ, YU3EH, YV4NS, ZG4GB, ZF1CG, ZK1AR, 3C3FJZ/SU, 4U1TU, 4X4NZN, 5H3KJ, 5R8AM, 6Y5JR, 8R1C and 9L1TL. The "How's" laudatory committee includes Ws 21Y 2IP 8YGR, K4UTI, WAs 1CYT 1EOT 3DMH, 3DSJ 4UXU 5MIN 5PUQ 7BOA 7BOB 7GFT 9QBM 98XQ and WB2ZUB who also

applaud QSL tenders Ws 2CTN 2GHK 6RGG 7PHO 7VRO 9WHM, Ks 2KTK 4SHB 8EHU, WAs 2WUV 4UOE, G3s APA and DYY for snappy service. . . . "11p! The following italicized colleagues seek hints toward glomming QSLs from holdouts specified: W2DY, 1IARI/MI, KR6HP, VK7GK, VP 2s 2AM 3YG, ZC4MO, ZF1EP, W6AEM, FP8DS; K4ADK, PX2AB; K9KLR, FG7XF, HT8s XAL XJP; W41CYT, 1IAV/MI; W41EOT, 5R8AM; W42FLJ, HR2ABC '65, KG6J '66, KR6UL '66, VPs 2LS '66, 6BW '64, YNs 1LH '64, 3FP '65; W43DSJ, VS9ASP; W45OUV, 5N2ABH; and W49QBM, PZ1CM. Any secrets for the seekers? . . . WAs 1CYT 4KXQ 6AHF 98XQ and WB2RJ stand ready to perform as QSL agents for DX stations in need. . . . "All QSLs for W/K/VEs have gone direct if postage has been provided, others via ARRL bureaus," advises K6KA regarding his recent globegirdling tour. . . . W3HINK notifies, "I can confirm TI2JCC QSOs made this August and after." Joe needs the customary s.a.s.c. from W/Ks, IRCs from others, in lieu of bureau shipment. . . . W3AYD, guest operator at PJ3CT this August 9th-17th, offers to confirm his own Curacao contacts from the home address. . . . *DX News-Sheet* notes that Honduras has been redivided into six call areas, HR9EB becoming HR6EB in the shuffle. . . . G. Baker, W8GIU/5, 413 Maple, Dalhart, Texas, 79022, is the new address for CR6FW, FG7s XJ XY and FM7WI QSL applications. . . . Concerning QSL managers, don't forget that each new *Callbook* contains several pages of such data, also that W6G5V publishes a periodical dealing with this angle. . . . Fresh suggestions from the flock now, but remember that each QTH is necessarily neither accurate, complete nor "official". . . .

- BV2A, T. Chen, P.O. Box 101, Taipei, Taiwan
- GE0AE, Ham Shack, P.O. Box 37, APO, New York, N. Y., 09339
- CP5BQ, Aptdo. 449, Cochabamba, Bolivia
- CP6GQ, J. Slaid, Casilla 642, Santa Cruz, Bolivia
- CP6GX, Aptdo. 679, Santa Cruz, Bolivia
- CP6HE, Aptdo. 47, Santa Cruz, Bolivia
- CP6HG, R. P. J. Sullivan, Padres de Santiago Apostol, Casilla 919, Santa Cruz, Bolivia (or via W1MD)
- CP6HI, R. Courneed, M.M., Padres de Maryknoll, Casilla 353, Santa Cruz, Bolivia
- CP6HY, R. Bush, Mission Militaire, Casilla 835, Santa Cruz, Bolivia
- CR6AD, Box 13, Caconda, Angola
- CR6BT, Box 7, Caconda, Angola
- CT2AP, V. Ramos, Angra do Heroismo, Terceira, Azores
- EL2AG, T. Chappell (WB6ODJ), USAID, U. S. Embassy, Monrovia, Liberia
- FG7s XJ XY, FM7WI (via W8GIU/5; see preceding text)
- H18XR, Aptdo. 432, Santiairo, D.R.
- H18FHV, Box 1157, Santo Domingo, D.R.
- H18XDA, P.O. Box 1157, Santo Domingo, D.R.
- HMs 1AJ 1AM 9AJ, Cho Dong-in, Shindaebangdong 360-38, Seoul, Korea
- JA1EVM, Y. Namiki, 925-9 Simizu Yamato-Machi, Kitatama-gun, Tokyo, Japan
- JA2BYA, Box 1, Nagoya, Japan
- KG4AD, Box 26, FPO, San Francisco, Calif., 96692
- KG6SA, USCG, Navy 935, Box 338, FPO, San Francisco, Calif., 96950
- KS4CD, A. Franze, Box 1148, Miami, Fla., 33148
- KS6CN, Dept. of Education, Pago Pago, U. S. Samoa, 99920
- OA1CA, P.O. Box 65, Chiclayo, Peru
- ex-OD5EE, J. Garrett, W5LAK, 5438 Kingfisher Dr., Houston, Texas
- PJ3CL, P.O. Box 2147, Curacao, N. A.
- TAs 1AV IDS 1SK 2AC 2BK 2FM 2YG 5EE (see preceding text)
- TF2WKM, Box 27, FPO, New York, N. Y., 09571
- TC9RC/HPI, Box 8374, Panama City, R. P.
- VK1GD, I. Deagle St., Red Hill, Canberra, ACT, Australia
- VP8JH, H. Taylor, Box 45, Port Stanley, Falklands
- VP9GA, W. Teltz, Carlton Beach Hotel, Bermuda
- VQ9EF, J. Fleurdelys, W8BIG/1, 5 Marriot Ct., Chelmsford, Mass.
- VS9ARE, RAF Khormaksar, BFPO 69, London, England
- VU2MWP, W. Pullen, U. S. Embassy, APO, New York, N. Y., 09675 (or to W9RQV)
- XE1GP, P.O. Box 16-116, Mexico City 16, D.F., Mexico
- XPIAA, 1983rd Comm. Sqdn., APO, New York, N. Y., 09023
- XW8BQ, 2146th Comm. Gp., Box 1859, APO, San Francisco, Calif., 96352
- XW8BS, U. S. Embassy, APO, San Francisco, Calif., 96352
- XW8BV, R. Pann, U. S. Embassy, APO, San Francisco, Calif., 96352
- XW8CG, G. Collier, APO, San Francisco, Calif., 96352
- XW8CH, F. Walker, U. S. Embassy, CAS-USAID, APO, San Francisco, Calif., 96352
- YN1RTZ, c/o U. S. Embassy, Managua, Nicaragua
- ZD8PMG, P. Geldart, BBC, Ascension AAFB, Patrick AFB, Fla., 32925
- ZF1ES, E. Sandy (G3UEU), Box 293, Grand Cayman, W. I.
- 4X9GV, Box 9142, Beersheba, Israel



4X4s UM TI MR VZ (group, l. to r.) and SK demonstrate a favorite sport among Israeli amateurs, a DX-oriented Field Day. "Aw, who forgot the cables?" might be a gag caption for the right-hand photo. At left 4X4s UM and VZ run out guys while 4X4SK checks gear. (Photos via W2IWP)

- 5A2TZ, Box 1763, APO, New York, N. Y., 09231
 5W1AS, P.O. Box 498, Apia, W. Samoa
 5Z4IW, Box 992, Nakuru, Kenya
 5Z4KM, P.O. Box 488, Kitale, Kenya
 6Y5ET, Box 254, Kingston, Jamaica
 9G1KT, c/o Clark Co. ARC, 310 E. Evergreen Blvd., Vancouver, Wash., 98660
 9L1GO, P.O. Box 907, Freetown, Sierra Leone
 9L1HW, H. Williams, 4 Meadowbank Rd., Farsham, Hants., England
 9L1KG, Yasmee Foundation, P.O. Box 2025, Castro Valley, Calif.
 9X5CC, B.P. 61, Nyanza, Rwanda
 9Y4TW, T. Wood, USTO, Omega Trinidad, P.O. Box 4187, Patrick AFB, Fla., 32925; or 10 Pleasant Pl., Shorelands, Pt. Cumana, Trinidad

- DJ5CQ/LX (to DJ5CQ)
 DJ5JK/LX (via DJ21W)
 EI3SU (via G3KMI)
 EP2KW (via DL3NS)
 F2WS/FG (to F2WS)
 F6CG (to HB9RG)
 FC8IL (to F2IL)
 G3BID/LX (to G3BID)
 G3MOX/LX/p (to G3MOJ)
 GB2LS (via G3TYE)
 GB3FRC (via G3VGN)
 GB3HH (via G3WAO)
 GB3SES (via G3WCN)
 GD2HFD/a (to G2HFD)
 HB8AAI (to HB9AAI)
 HB8ADC/m (to HB9ADC)
 HL9KA (via W2CTN)
 HR6EB (to HR9EB)
 IT9ARI (to IT1JR)
 JW3NI (to LA3NI)
 K1FRV/HRI (to K1FRV)
 K1ZJT/KH6 (via KH6DQ)
 KG6AOI (to WA0PQF)
 KW6EO (via WA6AHF)
 M1SS (to I1SSK)
 OA4s KF PZ (via RCP)
 OH0SC (via VK6XX)
 ON4GK/LX (via K2MYR)

- PX1EQ (to DJ8EQ)
 PX1IR (to F9JS)
 PX1OE (to W2OEH)
 PX1UX (to F9UX)
 PY0TX (to PY1TX)
 SM2XA/LA (to SM7DBF)
 SV0WV (via WB6UVU)
 TG4VH (via WA5HZY)
 TILJCC (via W3HNC)
 TL8DL (via WA3CGE)
 ex-VK9WE (to VK2ABL)
 VK0BJ (via VK7ZKJ)
 VS9ARS (via VS9ABL)
 VU2WB (to HB9TK)
 W3DWG/VR6 (via K4YFQ)
 W0IRF/KL7 (to KL7EFX)
 XE0OPC/m (to K5OPC)
 XW8CAL (via XW8AX)
 YA1KO (via W7WDM)
 ZB2BD (to G3TTG)
 ZD7ZI (via F9OE)
 ZD8HAL (via K0ETY)
 ZD9BI (via GB2SM)
 ZS6BEJ (via DL9PU)
 4X6-7-8HW (via W2AAH)
 7P8AR (via WA4BRE)
 9M6LR (via MARTS)
 9Y4DS (via K9KLR)

Rd., Norwich, Nor. 72T, England), Florida DX Club *DX Report* (W4BRB), International Short Wave League *Monitor* (A. Miller, 62 Warward Ln., Selly Oak, Birmingham 20, England), Japan DX Radio Club *Bulletin* (JA1DM), Long Island DX Association *DX Bulletin* (WB2EPG), Newark News Radio Club *Bulletin* (L. Waite, 39 Haanum St., Ballston Spa, N.Y.), North Eastern DX Association *DX Bulletin* (K1IMP), Northern California DX Club *DXer* (Box 608, Menlo Park, Calif., 94025), Ontario DX Association *Long Skip* (VE3EWY), Southern California DX Club *Bulletin* (WA6GLD), UBA's *On the Air* (ON4AD), Utah DX Association *Bulletin* (W7LEB) and VERON'S *DXpress* (PA6s FX LOU TO VDV WWVP) Encore!

Whence:

EUROPE — CCRC (Czechoslovakia) invites world-wide participation in its *International OK DX Contest*, a c.w.-only affair scheduled for 0000-2400 GMT the 12th of November. Stations will exchange serials consisting of RST plus two digits representing the number of years the operator has been licensed as an amateur; e.g., 45903 if licensed in '64. Work any country but your own at one point per contact for non-OK QSOs, three points for each contact with OKs, one band-contact per station. For final score multiply this point total by the total number of prefixes worked — VE1 VE2, G2 G3, OK1 OK2, for example, make six. Monoband, multiband and multioperator categories are available, a separate log for each band listing (GMT, station, serials sent-received, points claimed and new prefix as worked, for each QSO. An accompanying summary sheet should include the declaration, "I hereby state that my station was operated in accordance with the rules of the contest as well as all regulations established for amateur radio in my country, and that my report is correct and true to the best of my belief." To be eligible for possible certificates of creditable performance, log entries, shipped to Central Radio Club Post Box 89, Prague 1, Czechoslovakia, must be postmarked no later than December 31, 1967. Will we give those U.S.S.R. contest hawks more competition in this one? . . . In addition to the VK/ZL/Oceania brawl, remember that this month features East Germany's WADM affair and the Italian Columbus Contest, both slated for the 7th-8th week end. Man, three DX tests and the Massachusetts QSO Party all going full tilt on the same week end! . . . W1BB reports Czech novice OL4AFI working G3PLQ and PA6PN on 160-meter c.w. with an 0.1-watt transistor rig, also that G8RXH made it across to W1s BB/1 and DE0 on 1.8 Mc., July 30th. There were usable midsummer openings on top band August 6th and 10th, too, W1BB working Gs 3RXH 3VYF and 6BQ at

(Continued on page 164)



Operating News



GEORGE HART, WINJM, Communications Manager
ELLEN WHITE, WIYYM, Deputy Comms. Mgr.

Administration: LILLIAN M. SALTER, WIZJE
Public Service: WILLIAM A. OWEN, WIENF

DXCC: ROBERT L. WHITE, WIWPO
Training Aids: GERALD PINARD

The Affiliated Club Program. The League started "affiliating" clubs in 1919, and there are still two¹ of those originally affiliated which are still active. Thus, almost since the dawn of our history, the local amateur radio club has been an integral partner with ARRL in guiding the destiny of amateur radio.

Today, this unique partnership is stronger than ever. As of the end of 1966 there were 1274 active affiliated clubs. This is not, however, the total number of affiliates. There are also "inactive" and disbanded clubs, which have not returned an annual questionnaire. They need only to indicate renewed activity to get back on our active mailing list. We would guess that

the total throughout the years would approximate 3,000 clubs.

The affiliated club program has always been a function of the Communications Department, and we have tried to make it an energetic one. Weekly postcard bulletins are mailed to clubs as well as to OBS appointees. Clubs get the quarterly *CD Bulletin*, and special club bulletins and releases from time to time. Need a candidate for SCM? Ask the clubs. Need an EC for your town? The local club is an excellent source and vehicle. Want to throw a hamfest or convention? The club organizes for it and puts it on. Field Day? You bet, most clubs wouldn't miss it. In addition, clubs have played always important roles in amateur affairs and are therefore major points of contact for ARRL directors and director candidates.

¹Eight clubs were affiliated in Dec., 1919. Of the eight, the Houston Amateur Radio Club and the Milwaukee Radio Amateur Club are still in business on the active file.

The special relationship between ARRL and its affiliated clubs has been mutually beneficial. There is a long list of services headquarters which any club can take advantage of simply by qualifying and applying for ARRL affiliation. Details are available on request, so we won't go into them here, except to make one observation: The average amateur radio club has everything to gain and nothing to lose in affiliation.

In recent years, relations between headquarters and affiliated clubs have come in for special attention. At least one director has issued regular divisional letters to clubs; others follow up on affiliation requests and arrange for personal presentation of affiliation charters. Club federations have been formed, both for the purpose of putting on large conventions and for otherwise solidifying the organization concept in large-population areas. No doubt about it, clubs always have and will continue to play a crucial role in League affairs.

But there is still more to be done. We hope and expect that clubs will continue to do more for amateur radio. Headquarters is planning a more energetic club program, to pay even greater attention to this aspect of communication with the average amateur. Just as a beginning example, affiliated clubs will soon be receiving more frequent bulletins from headquarters aimed exclusively at them, containing information both from and for them.

Once each year, we'll continue to enclose the annual questionnaire, by means of which we



Meet your SCMs

North Dakota SCM Harold L. Sheets, W0DM is an old pro at amateur radio. "Prof" was first licensed in 1923 and served as SCM back in the early thirties as well as for the past two terms. Professionally he specialized in teaching and school administration. This versatile amateur works all bands and holds ORS RCC WAS (on ten mefers) WAC, has worked 90 countries and is a member of the OOTC. In addition to amateur radio "Prof" enjoys photography, leatherwork and wood carving.

ensure your continued interest in being kept on the mailing list and adherence to the principles of affiliation. (We'll try to shorten this questionnaire, make it easier for your secretary to fill it out.)

Ah yes, your secretary. We've been secretary many times of many clubs, and it's not the easiest job to have. Some secretaries are good, some only fair, and once in a while you get one who just doesn't do anything. Nevertheless, most clubs give the secretary's address as the club mailing address. If this is the case with your ARRL-affiliated club and you are not receiving ARRL mailings, see your secretary; maybe he is forgetting to bring the stuff to meetings. From now on, the club is going to be missing something extra if this happens. Make sure you get to see the stuff! It's your right as a club member.

What, you don't belong to a club? Tch, tch! You're missing out on a big chunk of amateur radio. Join one. If you don't like the program, do what you can to shape it, but go along with the majority in any case. You say there is no club? We'll be glad to help you get one started, just ask us.

SCM Qualifications Upgraded. For many years the qualifications of the SCM have remained the same -- a licensed amateur for two years and a member of the League for at least a year. Recently it has come to our attention that under these rules a technician licensee, who cannot hold a number of appointments in the field organization, could nevertheless be elected SCM and make these appointments.

Well, this didn't seem right, so we sought advice from our superiors. Having subsequently considered the matter in some detail, we have

BRASS POUNDERS LEAGUE

Winners of BPL Certificate for July Traffic:

Call	Orig.	Recd.	Del.	Total
K6BPH	531	2301	2129	9333
W3CUL	660	1085	996	2808
W7BA	7	942	873	1827
K8ONK	121	793	722	1648
W5OBD	28	729	727	1484
K5TEY	21	1076	354	1457
W6GYH	105	877	652	1440
W4BRQ	4	455	445	909
W6R8Y	30	440	331	801
K7UCY	5	442	403	889
W7HMA	23	401	395	823
W4FOR	4	403	328	814
W7ZTW	11	383	389	786
K8YFK	30	350	4	740
K7NQX	23	356	0	732
W6IAW	12	355	333	718
W0LGG	15	352	330	707
W0LCX	23	325	315	673
W3VH	67	297	264	613
K9VIG	20	349	4	613
K0YBD	8	253	199	553
W3EML	49	290	200	541
WB6HYA	25	281	111	541
WB6BBO	54	235	231	525
W4BMC	370	83	60	516
WB2FTW	48	226	202	502
WA4UAZ	58	226	163	502

BPL for 100 or more originations-plus deliveries

W8TV 236	W4RHA 117	WA3EEC 106
K0ZSQ 222	WA9CCP 116	WA6VU 106
W4YDT 161	WA4TUF 113	WA6YZ 105
W9ET 146	WA5NY 113	WA7BD 104
WA3RFP 144	WA4DYL 112	K1PGQ 101
WA1VH 142	WA9GJU 108	WB2TFK/2 100
W2OE 137	K6IRI 107	Late Reports:
WA4PDM/2 125	WA9OMO 107	WDSC (June) 239
		WA9GJU (June) 101

More-Than-One-Operator Stations

K4CG 240	WA0HQR/ø 194	Late Report:
		K4CG (June) 219

BPL medallions (see Aug. 1954, p. 54) have been awarded to the following amateurs since last month's listing: WA3BLE, WA4AUG, W0BSJ, K0YFK, K0ZSQ.

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 a sum origination and delivery points of 100 or more for any calendar month. All messages must be handled on amateur frequencies within 48 hours of receipt in standard ARRL form.

decided that effective Dec. 1, 1967, candidates for SCM must also have a conditional class amateur license or higher. This action is in

OPERATING EVENTS (Dates in GMT)

ARRL-IARU-SCM-Affiliated Club-Operating Events

October	November	December
6 Qualifying Run, W6OWP 7 LO Time (League Officials, only). 7-8 VK/ZL Contest , phone, (p. 88, Sept. QST). WADM Contest (p. 88, Sept. QST). Massachusetts QSO Party , (p. 110, Sept. QST). Columbus Contest , (p. 88, Sept. QST). 14 Qualifying Run, W1AW 14-15 VK/ZL Contest , c.w., (p. 88, Sept. QST). California QSO Party , (p. 42, this issue). 14-16 CD Party, phone* RTTY SS , (p. 57, Sept. QST). 18-19 YLRL Anniversary Party , c.w. 21-23 CD Party, c.w.* 23-30 Alabama QSO Party , (p. 38, this issue). * League Officials and Communications Department Appointees only.	1-2 YLRL Anniversary Party , phone. 2 Qualifying Run, W6OWP 4 LO Time (League Officials, only). 4-6 Delaware QSO Party , (p. 107, this issue). 11 Frequency Measuring Test (ARRL Official Observers only). 11-13 SS, phone 12 OK DX Contest (p. 101, this issue). 14 Qualifying Run, W1AW 18-20 SS, c.w.	1 Qualifying Run, W6OWP 2 LO Time (League Officials only). 9-10 9Q5 DX Test , (next issue). 13 Qualifying Run, W1AW <p style="text-align: center;">1968</p> Jan. 27-28 SET Feb. 3- 4 DX Test (phone) 17-18 DX Test (c.w.) Mar. 2- 3 DX Test (phone) 16-17 DX Test (c.w.) June 22-23 Field Day

accordance with Rule 20, *Rules and Regulations of the Communications Department*, as printed in the Articles of Association and By-Laws of ARRL, vesting changes in the Communications Manager. The affected rule is Rule 4, which shall now read:

4. Any candidate for the office of Section Communications Manager must hold a conditional class amateur license or higher, and must have been both a member of the League for a continuous term of at least one year and a licensed radio amateur operator for at least two years preceding receipt of his petition of nomination.

The revision will be made in the next available reprint, which will be in mid-1968.

More on WAS/DXCC Service Charges. Last month we mentioned that service charges for WAS and DXCC to certain non-members would be effective Oct. 1, but we hadn't talked yet about the rules regarding them. As it turns out,

they are quite simple: Two dollars for WAS, four dollars for DXCC, one dollar for DXCC endorsement. The two dollars for WAS is inflexible, because although we offer just about any kind of WAS endorsement, it always involves reshipping the cards and re-examining all fifty. The four bucks for DXCC is for either a basic (general) DXCC or a phone DXCC, and the buck for endorsement is for *each* endorsement.

These charges do *not* apply to League members, or to foreign amateurs outside the League's operating organization. — *WINJM*.

ELECTION NOTICE

To all ARRL members in the Sections listed below:

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

Nominating petitions are solicited. The signatures of five



DX CENTURY CLUB AWARDS



From July 1, through July 31, 1967 DXCC Certificates based on contacts with 100-or-more countries have been issued by the ARRL Communications Department to the Amateurs listed below.

New Members

YV5BPJ ... 303	KP4CQZ ... 125	VE3FFY ... 108	K1NBO ... 104	W9OYZ ... 103	WA2TIF ... 101
D1AKD ... 225	WA4LJH ... 124	D36OZ ... 107	K9YTP ... 104	DJ4GA ... 102	WA8GDR ... 101
W5KHL ... 208	HB9AGL ... 122	J8NTU ... 107	L1L1QGB ... 104	DJ5YQ ... 102	D18VP ... 100
JA3RQ ... 203	W1JN ... 122	WB2RSW ... 107	WA4EKF ... 104	J88SW ... 102	G3EFC ... 100
J4IMIN ... 200	WA5KAJ ... 117	K2CC ... 106	K2JFE ... 103	K1SOP ... 102	K1MILH ... 100
FSOP ... 164	GM2HCZ ... 112	K8AXK ... 106	K4BUJ ... 103	SM7DQC ... 102	K6AAW ... 100
W2HZS ... 150	JA9CCE ... 112	PA0JAL ... 106	OK3CCC ... 103	W4PME ... 102	K9CVO/1 ... 100
W6QNJ ... 133	G3NWG ... 110	W9TV ... 106	VE3ACU ... 103	WB6PGK ... 102	OK1AJM ... 100
K4MQL ... 129	G3SYC ... 109	W7JH ... 105	W2GTF ... 103	W7HO ... 102	W3NNL ... 100
JA4AQR ... 126					

Radiotelephone

K1DFC ... 185	W5KHL ... 120	K4ELK ... 110	HK5ACL ... 105	W3ABT ... 102	WA9SUJ ... 101
JA3RQ ... 166	Z13AL ... 120	V45RG ... 109	D18LH ... 104	W7HO ... 102	CR4BC ... 100
DJ4PT ... 149	ZL3RP ... 118	K3TRZ ... 107	VE3CFR ... 103	JA8NU ... 102	WA1CKE ... 100
W1JN ... 124	P43E ... 111	W45RQA ... 107	VF2A ... 103	CT2FM ... 101	WA2LKW ... 100
HB9AGL ... 120	D1AAN ... 110	Y77AV ... 107	WA1BJY ... 102	W4RMT ... 101	

Endorsements

Endorsements issued for confirmations submitted from July 1, through July 31, 1967 are listed below. Endorsement listings through the 300 level are given in increments of 20, above the 300 level they are given in increments of 10. The totals shown do not necessarily represent the exact credits given but only that the participant has reached the endorsement group indicated.

340	W2KIR	K2TQC	W2CES	W6EOZ	200	4X4CJ	K3HTZ	140	120
ZL1HY	W6REH	VE3AAZ	W2RA	W220	I1IR	K8UDJ	DJ9GG	K1QZV	
		W3DKT	W7MX	48CW	K8WDY	K8BHT	DL1VN	K3QJE	
330	300	W4EEU	ZS2RM	K1ZSI	VP7NA	K5TIN	K6GSR	H45AW	K9LJ
G3DO	K9BGIM	W4QVJ		K2HVN	W1DBM	VE3EU	W10R	H45KQ	K8ARS
K20EA	VE3ES	W4L4S	240	K4IEP	W1GVZ	W2ABL	WB2KTO	HK7UL	SM6OZU
	W3DRD	W6KTE	HK3RQ	K1IF0	W2BXY	WB2CON	W3CGE	HM5BF	W42UWA
320	W4HA	W6VUU	K1CDN	K5BXG	W6KNH	WA5RQA	W31OP	K5DC0	WB9PWU
W1MQV			K1CDB	K5SSZ	W491BT	W6KHN	W3ZAQ	K9KBW/4	W3HCW
W3GRS	280	260	K1DFC	W1BGD	W6LBS	W6MPY	W4YKH	LA5YJ	W6HCX
	H89DX	OZ3Y	UC2AR	WA3ATP	XE1KKV	160	WA47BOA	W1AJ0	W48PYL
G8JM	JA6AD	SM5WI	W1BFA	W7DQM	ZE1JS	HK3AVK	W8MSCG	WA4CZM	W9HPB
	K1YZW					K1NHR	W4U5Q		

Radiotelephone

320	280	ZS6BBP	K6OHJ	220	KH6BB	180	W6KNH	W3NM
PA8HBO	K1SHN		OK1MP	JA6AD	VE3AAZ	W18EB	JA1MIN	W8LFR
W1LFF	K6ENX	260	OZ3Y	WA5DAJ	W1DBM	WB2WOU	W2LJF	W4WR
	VR2WY	W3GRS	SM0ATN		W3DRD	W6KHN	W3WOU	140
300	W4HA	W4EEU	SM0HK	200	WA3ATP	W6RGG	WA4LSK	CT1LN
W9NZM	W6KTE		VE3WS	U1TRA	W8GUZ	XE1YG	WA4WTG	LA5YJ
YV5BPJ	W6VUU	240		K1ZSI	ZL3MN		W6DZZ	K4SDW
		I1JT		K4IEP			WA3CGE	WA9IYG

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, zip code and station call of the candidate and signers 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.

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.

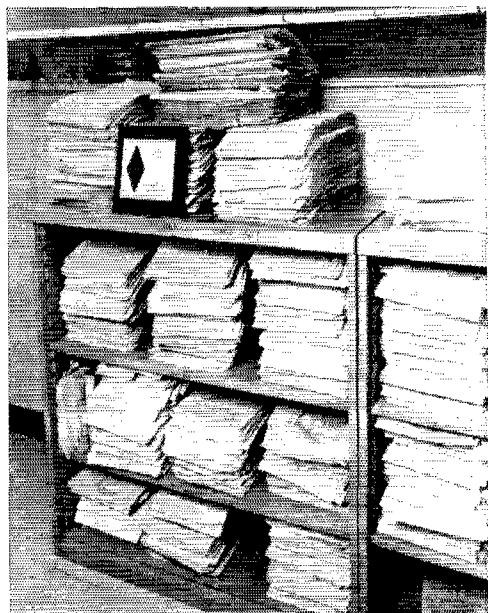
The following nominating form is suggested. (Signers should be sure to give city, street address and zip code to facilitate checking membership.)

Communications Manager, ARRL (Place and date)
 225 Main St., Newington, Conn. 06111
 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.

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.

— George Hart, W1NJM, Communications Manager

Section	Closing Date	SCM	Present	Term Ends
Santa Barbara.....	Oct. 10, 1967	Cecil D. Hinson	Aug. 10, 1966	
Alberta.....	Oct. 10, 1967	Harry Harrold	Apr. 10, 1967	
Manitoba.....	Oct. 10, 1967	John T. Stacey	July 1, 1967	
Virginia.....	Oct. 10, 1967	H. J. Hopkins	Oct. 11, 1967	
Oklahoma.....	Oct. 10, 1967	Daniel B. Prater	Oct. 11, 1967	
Vermont.....	Oct. 10, 1967	E. R. Murray	Oct. 17, 1967	
Delaware.....	Oct. 10, 1967	John Thompson	Deceased	
Wisconsin.....	Oct. 10, 1967	K. A. Ebneter	Dec. 10, 1967	
Western Florida	Oct. 10, 1967	F. M. Butler, Jr.	Dec. 15, 1967	
Illinois.....	Oct. 10, 1967	Edmond A. Metzger	Dec. 15, 1967	
New York City & Long Island.....	Oct. 10, 1967	Blaine S. Johnson	Jan. 2, 1968	
Ontario.....	Oct. 10, 1967	Richard W. Roberts	Deceased	
West Indies.....	Nov. 10, 1967	A. R. Crumley, Jr.	Jan. 10, 1968	
Alaska.....	Nov. 10, 1967	John P. Trent	Resigned	
Canal Zone.....	Nov. 10, 1967	Mrs. L. C. Smith	Resigned	
Eastern New York	Dec. 11, 1967	George W. Tracy	Feb. 10, 1968	
East Bay.....	Dec. 11, 1967	Richard Wilson	Feb. 10, 1968	
Southern New Jersey.....	Dec. 11, 1967	Edward G. Raser	Mar. 4, 1968	
Georgia.....	Jan. 10, 1968	H. L. Schonher	Mar. 26, 1968	
Ohio.....	Jan. 10, 1968	Wilson E. Weckel	Mar. 28, 1968	



Visitors to the ARRL Communications Department invariably point to a bookcase crammed full of papers and say "What's that?" "That" just happens to be the complete file on the 1967 ARRL International DX Competition (reported elsewhere in this issue). This is what 2400-plus logs (just one of our contests) means in terms of volume! The case on the right houses the influx of Field Day entries (QRX for that one, OMs!).

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.

West Virginia	Donald B. Morris, W8JM	Sept. 18, 1967
Rhode Island	John E. Johnson, KIAAV	Oct. 12, 1967
Arkansas	Curtis R. Williams, W5DTR	Oct. 13, 1967

In the Kansas Section of the Midwest Division, Mr. Robert M. Summers, K0BXF, and Mr. Norman F. Stackhouse, K0EMB, were nominated. Mr. Summers received 267 votes and Mr. Stackhouse received 179 votes. Mr. Summers' term of office began Aug. 18, 1967.

In the New Mexico Section of the Rocky Mountain Division, Mr. Kenneth D. Mills, W5WZK, and Mr. Martin A. Peterson, WA5MCX, were nominated. Mr. Mills received 144 votes and Mr. Peterson received 52 votes. Mr. Mills' term of office began Aug. 18, 1967.

34th ARRL Sweepstakes—Nov. 11-13 (phone), 18-20 (c.w.) All W/VE Amateurs Invited To Participate

The highlight of Fall activity, the 34th ARRL Sweepstakes, will soon be here. As is our usual custom, this early announcement is for the benefit of those amateurs in remote ARRL sections who may not receive their November issues in time for the test. The contest period will run a full 30 hours from 2100 GMT Saturday night until 0300 GMT Monday morning on each of the weekends. Only 24 hours of participation will be permitted, however. Time-out periods may not be taken in less than half-hour increments. This will permit a *maximum* of twelve off periods of a half hour apiece or six off-periods of one hour, etc. See the rules in November 1966 *QST* concerning the message exchange which will be worth a stock 1000 points. Rules are the same as last year, in accordance with comments from the field. Convenient reporting forms are now ready for your request. Write early to the ARRL Communications Department, 225 Main St., Newington, Conn. 06111.

JULY CD PARTIES

The following are high-claimed scores, contacts, sections and operating times, with final corrected results to appear in the October *CD Bulletin*.

C. W.	
K4BAI	222,180-637-69-20
K2SSX/2	218,620-636-68-30
W6DGH	211,830-607-69-20
W9YT (K9LQB, opr.)	210,715-622-67-17
K7RAJ	208,035-621-67-20
K2EIIU/5	203,895-584-69-18
K8MFO	177,540-531-66-12
K6BPC (K6QPH, opr.)	176,550-530-66-20
K2AJA	173,250-518-66-11
W9AUM	170,625-519-65-20
K4RIN/5	159,060-478-66-20
W8ASH	158,070-469-66-19
W6OJD	157,665-454-69-14
W6INH	157,115-462-67-13
W6ZKK	156,420-467-66-20
K8HKB	153,765-453-67-18
3C7BDJ	149,820-447-66-19
W2CKZ	148,050-463-63-15
K25FX	141,050-427-65-16
K4RAD/2	140,400-427-65-20
W8SET	137,610-410-66-15
W2MRD	135,680-420-64-17
W4BZE	133,575-406-65-13
W2MOQ	131,985-412-63-20
W6DTR	127,725-387-65-20
W4BGL	127,490-387-65-13
W1ECH	127,305-362-69-9
W1DGH	125,440-388-64-13
W6BUK	125,290-367-65-15
K3HNP	122,450-390-62-12
W6UZX	122,440-360-68-16
W2KSG	121,600-376-64-17
W6FHH	120,120-360-66-16
W8CFJ	120,015-375-63-11
W8PBO	118,730-377-62-18
W4AIN/4	117,480-351-66-17
W8QXQ	111,825-350-63-13
K2KTK (K2KIR, opr.)	111,805-372-59-8
K1OQG	110,565-345-63-17
W80CC	110,430-340-64-13
W8FANZ	110,360-356-62-10
K9DHN	107,290-330-64-11
K6ORL	106,875-369-57-10
W8ZLN (W8QBP, opr.)	104,640-327-64-18
W8GVI	104,380-302-68-7
W2FAJ	103,035-321-63-11
W4KFC	102,690-319-63-5
W4AWWT	102,000-335-60-13
W43BG	101,990-324-62-14
W1BYM	101,760-313-64-13
W1BGD	101,725-306-65-3
W4YGY	101,703-332-60-6
W6NKR	100,163-306-64-9
K9AZJ (multi-opr.)	173,740-507-68-20

PHONE

K2QDT	96,000-316-60-17
K2EIU/5	83,160-301-54-18
K9DHN	81,510-281-57-20
K9LRQ	79,110-288-54-14
K8HKB	65,610-237-54-14
W2SZ (W2PJJ, opr.)	62,150-219-55-9
K2ARY	58,000-200-58-9
W6DGH	54,855-200-53-12
W1PYM	54,390-217-49-18
W9ITB	47,000-195-47-9
W1FVH	42,900-190-44-18
W3KJJ	38,720-170-44-12
W1JYH	35,720-145-47-6
W2GKZ	31,255-126-47-5
W2ZVW	30,200-144-40-6
K4BAI	29,610-134-42-5
K4TPN	26,241-128-41-18
K6BPC (K6s AVQ QPH, W6FNE)	71,500-255-55-18
W1AEC (multi-opr.)	35,465-173-41-20

tificate. The next qualifying run from W1AW will be made Oct. 14 at 0130 GMT. Identical texts will be sent simultaneously by transmitters on c.w. listed frequencies. The next qualifying run from W6OWP only will be transmitted Oct. 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 Oct. 14 becomes 2130 EDT Oct. 13.

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.

Code practice is sent daily by W1AW at 2330 and 0130 GMT, simultaneously on listed c.w. frequencies. At 0130 GMT Tuesday, Thursday and Saturday, speeds are 15 20 25 30 and 35 w.p.m.; on Monday, Wednesday, Friday and Sundays, speeds are 5 7½ 10 13 20 and 25 w.p.m. For practice purposes, the order of words in each line may be reversed during the 5 through 13 w.p.m. tests. At 2330 GMT daily, speeds are 10 13 and 15 w.p.m. The 0130-0220 GMT runs are omitted four times each year, on designated nights when Frequency Measuring Tests are made in this period. To permit improving your first by sending *in step with W1AW* (but not on the air!) and to allow checking strict accuracy of your copy on certain tapes note the GMT dates and texts to be sent in the 0130-0220 GMT practice on those dates:

Date Subject of Practice Text August *QST*.

- Oct. 2: *It Seems to Us*, p. 9
- Oct. 10: *432-Mc. Solar Patrol*,* p. 26
- Oct. 18: *Electrical Safety*, p. 54
- Oct. 19: *Meteor Scatter DX*,* p. 74

Date Subject of Practice Text from *Understanding Amateur Radio*, First Edition

- Oct. 23: *Flywheel Effect*, p. 74
- Oct. 25: *Neutralizing*, p. 75

CODE PROFICIENCY PROGRAM

Twice each month special transmissions are made to enable you to qualify for the ARRL Code Proficiency Cer-

* Speeds will be sent in reverse order, with highest speed first.

W1AW SCHEDULE, OCTOBER ** 1967

The ARRL Maxim Memorial Station welcomes visitors. Operating-visiting hours are Monday through Friday 1 P.M.-1 A.M. EDST, Saturday 7 P.M.-2:30 A.M. EDST and Sunday 3 P.M.-10:30 P.M. EDST. The station address is 225 Main Street, Newington, Conn., about 7 miles south of Hartford. A map showing local street detail will be sent upon request.

GMT*	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
0000	CW-OBS ¹	CW-OBS ¹	CW-OBS ¹	CW-OBS ¹	CW-OBS ¹	CW-OBS ¹
0020-0100 ⁴	3,555 ⁵	14.1	1,805	7,08 ⁶	14.1
0100	Phone-OBS ²	Phone-OBS ²	Phone-OBS ²	Phone-OBS ²	Phone-OBS ²	Phone-OBS ²
0105-0130 ⁴	145.6	3,945	145.6	50.7	1.82	21.41
0130	Code Practice Daily¹ 15-35 w.p.m. TThSat., 5-25 w.p.m. MWFSun.					
0230-0300 ⁴	3,555	7.08	14.1	7.08	3,555
0300	RTTY-OBS ³	.....	RTTY-OBS ³	RTTY-OBS ³	RTTY-OBS ³	RTTY-OBS ³	RTTY-OBS ³
0310-0330 ⁴	3,625	14,095	3,625	14,095	3,625
0330	Phone-OBS ²	.....	Phone-OBS ²	Phone-OBS ²	Phone-OBS ²	Phone-OBS ²	Phone-OBS ²
0335-0400 ⁴	7,255	3,945	7,255	3,945	7,255
0400	CW-OBS ¹	.....	CW-OBS ¹	CW-OBS ¹	CW-OBS ¹	CW-OBS ¹	CW-OBS ¹
0420-0500 ⁴	3,555 ⁵	7.08	3,945	7,08 ⁶	3,555
1700-1800	21/28 ⁶	21/28 ⁶	21/28 ⁶	21/28 ⁶	21/28 ⁶	.....
1900-2000	14.28	7,255	14.28	7,255	14.28	.....
2000-2100	14.1	14.28	14,095	21/28 ⁶	7.08	.....
2200-2300	21/28 ⁶	21/28 ⁶	21/28 ⁶	7,255	14.28	.....
2330	RTTY-OBS ^{3,7}	.....	.....	.....
2330	Code Practice¹ Daily 10, 13 and 15 w.p.m.					

¹ C.W. OBS (bulletins, 18 w.p.m.) and code practice on 1,805, 3,555, 7,08, 14.1, 21,075, 50.7 and 145.6 Mc.

² Phone OBS (bulletins) on 1.82, 3,945, 7,255, 14.28, 21.41, 50.7 and 145.6 Mc.

³ RTTY OBS (bulletins) on 3,625, 7,045, 14,095 and 21,095 Mc. 170/850 cycle shift optional in RTTY general operation.

⁴ Starting time approximate. Operating period follows conclusion of bulletin or code practice.

⁵ Operation will be on one of the following frequencies: 21,075, 21.1, 21.41, 28.08 or 28.7 Mc.

⁶ W1AW will listen in the novice segments for Novices on band indicated before looking for other contacts.

⁷ Bulletin sent with 170-cycle shift, repeated with 850-cycle shift.

Maintenance Staff: W1QIS W1WPR W1NPG.

*All times/days in GMT, general operating frequencies are approximate.

** November *QST* will carry the W1AW fall-winter schedule, which will become effective October 29, 1967.

• 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

DELAWARE—Acting SCM, John L. Penrod, K3NYG—RM: W3EEB. New appointments: WA3HWC as OVS, K3KAJ as ORS. Endorsements: W3EEB as ORS and RM, K3GKF as OBS. Take note v.h.f. men: WA3HVC made 445 contacts on 2 meters in just one year; K3NYG visited his home in Kansas for a vacation; WA3CDV, WA3FRC and K3NVV spent their vacation camping; K3KAJ is very active in the MDD; K3URP is sporting a new 6-meter walkie-talkie; W3JFR was appointed Radio Officer for Kent County; W3PM is in desperate need of volunteers to man the c.d. station at Fort Miles; K3FFD's inactivity is caused by heavy workload and school. DEPN reports QNI 65, traffic 14. Traffic: W3EEB 138, WA3DUM 15, W3DKX 13, K3NVV 8, K3NYG 8, WA3DYG 2.

DELAWARE QSO PARTY

November 4-6

The Delaware Amateur Radio Club of Wilmington announces its 12th Delaware QSO Party and invites all amateurs to participate. Delaware hams are urged to work as many out-of-state stations as possible, so that those interested can earn credit toward WAS and the W-DEL certificate. Here are the details:

(1) Time: 30-hour period from 2300 GMT Nov. 4 to 0500 GMT Nov. 6.

(2) No time limit and no power restrictions.

(3) Scoring: *Delaware stations*: 1 point per contact and multiply total by the number of states, Canadian provinces and foreign countries worked during the contest period. *Outside stations*: 5 points for each Delaware station worked and multiply total by the number of counties in Delaware worked during the contest period.

(4) Credit will be given for contacts with the same station on more than one band.

(5) A certificate will be awarded to the highest-scoring station in each state, Canadian Province and foreign country (with 3 or more contacts) and to the highest-scoring station in each Delaware county. In addition, a W-DEL certificate will be sent to any station working all 3 Delaware counties. Party logs showing required data will be accepted in lieu of QSLs.

(6) *Suggested freqs.*: A.m. 3825, 7225, 14,225, 21,325, 29,000 kc. C.w.: 3525, 7025, 14,025, 21,025, 28,025 kc. S.s.b.: 3975, 7275, 14,325, 21,425, 28,650 kc. V.h.f. 50, 50.4 and 144 Mc.

(7) General call: "CD DEL." Delaware c.w. stations should identify themselves by signing *de (call)* DEL K. Phones say, "Delaware calling."

(8) Contact information required: Delaware stations send number of QSO, RS(T) and county (New Castle, Kent or Sussex). All others send number of QSO, RS(T) report, and state, province, or county.

(9) Logs and scores must be postmarked not later than Dec. 4, 1967, and should be sent to the Delaware Amateur Radio Club, c/o Ross Hawkins, W3BGE, 214 Spruceglen Drive, Newark, Delaware 19711. Applications for the W-DEL certificates should also be addressed there.

EASTERN PENNSYLVANIA—SCM, George S. Van Dyke, Jr., W3ELI—SEC: W3AES, RMs: W3EML, K3YVG, K3MVO, W3MPX. PAM: K3MYS, V.H.F. PAM: W3FGQ, EPA, QNI 350, QTC 272. PTTN, QTC 180. FPN, QNI 335, QTC 309, EPAP2T, QNI 625. QTC 281. OO reports were received from K3HNP, K3NOX, K3KEK, K3TXG, K3PSW and K3MYS; OVS reports from W3ZRR, K3MSG, WA3EEC. OBS reports from WA3AFI. New officers of the Mt. Airy V.H.F. ARC are W3LHF, pres.; K3HSS, vice-pres.; W3MFV, treas.; K3ZPN rec. secy.; W3SAO, corr. secy.; W3KKN and K3UJD, directors. Ole K3YVG still is waving the baton between swipes at the bug. WA3GAT is building a kw. final. WA3FPM has a new bug. W3ABT closed for vacation. WA3EXW has his 10th grandchild. W3EU is about mended. K3WEU is home from Maine. Harrisburg ARC is active on 3940. W3NNL made DXCC at last! WA3EMO is beginning to pile up a traffic total. WA3FUE just made WAS. W3RV couldn't stand being inactive and is back on the nets. K3VBA reports EPA NCS tougher than Marine Boot Camp. WA3BSV is back from summer camp. WA3CFU is building a 160 rig. K3KTH was on from Mass. while on vacation. W3AES, SEC, is busy rounding up new ECs. Anyone interested? K3RUA is back from a wet vacation. K3MDG mobilized through New England. WA3CKA has built a complete transistorized emergency station. K3NOX has a new LR-1 frequency meter. The EPA c.w. gang had a swell time at Heisler's. W3ZRQ was an excellent host. W3ZRR now is retired and will be more active. W3ISN is on v.h.f. with high power and a new beam antenna. W3IVS is on a new work schedule. W3CUL is active on PFN. The Pack Rats Annual Picnic was shared by the Del. Val. QCWA, Phila Co. ARPSC and EPA section members. The fall season will bring with it plenty of traffic so let's be ready to put out that little bit of extra effort to do a good job of public service for the boys. Traffic: (July) W3CUL 2308, W3VR 639, W3EML 541, K3MYS 390, WA3CTP 227, K3MVO 162, WA3GLI 148, W3FGQ 146, WA3EEC 119, K3YVG 117, W3MPX 109, WA3EXW 101, W3ELI 97, WA3EMO 87, W3AES 81, WA3ATQ 70, WA3FPM 70, WA3AIB 65, W3HNK 60, WA3AFI 55, W3VAP 54, W3VBA 54, WA3CFU 53, WA3CKA 51, K3RUA 49, W3NNL 48, WA3GAT 43, K3VAJ 40, K3NSN 35, W3KJJ 25, W3OY 22, W3RV 18, WA3GEC 13, K3MDG 11, K3WEU 8, W3BUR 4, W3ADE 3, WA3BJQ 3, W3ID 2, W3KEK 2, K3TXG 2, W3ABT 1, WA3BSV 1, W3FU 1, WA3FUE 1, K3KTH 1, W3YPF 1. (June) WA3GAT 33, WA3EXB 30, WA3EEC 21, K3KTH 15. K3NSN 10.

MARYLAND-DISTRICT OF COLUMBIA—SCM, Carl E. Anderson, K3JYZ—SEC: W3LDD.

Net	Freq.	Time	Days	Sess.	OTC QNI	Mgr.
MDD	3643	2300Z	Daily	31	159 8.9	K3OAE, RM Ave.
MDDS	3643	0630Z	Daily	31	32 2.8	W3ZNM, RM
MEPN	3820	2200Z	M-W-F	21	49 20.4	K3NCM, PAM
			1700Z S-S			
MTMTN	145.206	0100Z	M-W-F-S	14	2 6.9	K3NOQ
CVTN	145.615	0200Z	T-S	9	46 8.1	WA3CFK
BNON	50.250	0300Z	Daily	31	12 9.0	K3URE
MSTN	50.150	2300Z	Daily	20	9 1.8	K3URE

MSTN has been discontinued because of lack of participation. New appointments: W3ATQ, ORS and OO Class IV; W3JPT, OO Class III; W3GRB as EC for Dorchester County; WA3FRL as EC for Queen Anne County; K3NCM, Asst. SEC for MEPN operations; WA3EOP, Asst. EC Washington County; WA3BM 2-meters, K3FNP and WA3ELA 6 meters Asst. EC, Montgomery County; W3EZO, Asst. EC Wicomico County; W3PBV, Asst. EC St. Marys County. Renewals: W3MSR as OO Class I and OVS. WA3EOP is looking for additional CVTN members. WA3FCN reports his first traffic activity. W3TN reports a sick transmitter, resulting in very low activity. W3MCG has acquired a new 5-acre antenna farm. W3CBG received a 40-w.p.m. c.w. certificate. K3CYA reports 3 intruders in June and 8 in July. WA3BDK is off to the Bahamas. W3EOV is off to KIH-Land for a vacation. W2NIY/3 is on the air at last. W3DPR placed first for Md. in the Ariz. QSO Party and reports he is leaving our section soon to return to Ohio. K3FKU has been assigned the MDD-

3RN liaison spot Alon W3GEB acquired an HRO-60 and is trying to improve his 80-meter antenna. WA3-CPK has signed up K3QOY, W3OAY, K3OYD, WA3-AIY, W3EVP, K3HJZ, K3MVL, W3ATQ, WA3GLN, WN3HYG, WA3CUC, K3EXH, W3JFP, WA3FOT, WA3-GDC, WA3GDB and WA3EQQ as new AREC members. K3LFD is rebuilding the shack and equipment for the winter operations. W3ZNV has a new homebrew eight-element 2-meter beam. K3QDC has cleaned house and will be back on shortly with wall-to-wall Heathkits. K3URE will be on 2 meters with a rebuilt TDQ transmitter. W3MVB finds that Double O reports are appreciated by stations with rig trouble. K3VLS reports high v.h.f. activity for the PVARs. WA3CBC and K3VLS have received Section Net certificates for their MSTN operation. W3GKP has gone to 2 meter RTTY-f.s.k. Traffic: (July) WA3EKP 251, WA3CFK 165, K3FKU 104, WA3ERL 67, K3GZK 59, W3PQT 57, W3TN 57, K3JYZ 51, WA3EOP 43, W3M1C 38, W3ZNV 35, WA3GLP 32, W3EOV 31, W3ATQ 29, K3ORW 26, W3CBG 24, K3-QDC 23, W3DDR 22, K3RFQ 19, K3URE 19, K3LFD 12, WA3GDG 11, WA3FCN 10, K3VLS 10, K3NCM 9, WA3BDK 8, K3LFN 8, K3VUW 8, WA3CVH 7, W3-JZY 4, W3GEB 2. (June) K3QDC 36, W3LDD 13, W3-MSR 2.

SOUTHERN NEW JERSEY—SCM, Edward G. Raser, W2ZI—Asst. SCM: Charles B. Travers, W2YPZ. SEC: W2BZJ. RMs: WA2KIP, WA2BLV, PAM and NJPN Net Mgr.: W2ZI. SEC W2BZJ reports that with the appointment of WB2ADE as EC for Atlantic and Cape May Counties, there are now only two counties not covered in SNJ. Any volunteers? The 8th Annual N.J. QSO Party was held Aug. 19/20. The SJRA Annual Picnic will be held Sept. 24 at Molia Farms, Malaga. Rain date Oct. 1. W2VX is chairman. The SCARA Annual Picnic was held at Egg Harbor Lake, near Egg Harbor Aug. 27. New SCARA officers for 1967 are: K2BKG, pres.; WA2QQA, vice-pres.; K3WGC, secy.; WB2TFD, treas.; WB2ERV, SCARA News editor. W2KGM, WB2VCC and WB2YVU are new members of NJPN. WB2APX and WB2MNF are new OPS. WB2URO is the call of the North Woodland Amateur Radio Club. WB2GTE made Expo 67. We regret to report that WB2RRA became a Silent Key July 12. WB2RVE is experimenting with color ATV. W2ZI has a new antenna on two 40-ft. telephone poles, also a new t.r. switch. W2BZJ is back with all new Heath gear and a new inverted "V." WB2WXA is now on 432 Mc. WB2APX recently joined RACES. NJPN reports QNI of 480 and traffic as 161. N.J.N reports a QNI of 471 and a traffic total of 304. WB2MOQ was high traffic man in July. Congrats. GM, Traffic: (July) WB2MOQ 201, W2ABLV 109, WA2KIP 61, W2AANL 28, W2ZI 28, WB2MNF 21, W2BZJ 16, WA2KAP 5, W2ORS 4, WB2WXA 2, WB2SBD 1. (June) WB2MRD 15, WB2-MNF 2.

WESTERN NEW YORK—SCM, Charles T. Hansen, K2HUK—SEC: W2RUF. PAM: W2PVI. RMs: W2EZB and W2FEB. NYS C.W. Net meets on 3670 kc. at 1900. ESS on 3590 kc. at 1800. NYSPTFN on 3925 kc. at 2200 GMT. NYS C.D. on 3510.5 and 3993 kc. (s.s.b.) at 0900 Sun. and 3510 kc. at 1930 Wed., TCPN 2nd Call Area on 3970 kc. at 0045 and 2345 GMT, NYS County Net on 3510 kc. Sun. at 1400 GMT and 2345 GMT on Mon. Appointments: K2GUG as OVS. Endorsements: W2PVI as PAM, W2EMW as ORS, W2PVI as OPS, W2KKB as CO, W2RUF now is mobile with a TR-4. K2MIQ moved to Texas. WA2YTH is now WA3-HPF. K2EE will be operating from his apartment. WB2TAG is on 160 meters with a Ranger, Tomkins County RC, WB2VHX, operated from the Town and Country Fair in Ithaca Aug. 15-19. W2FEP attended the Glacier Hamfest in Montana. WA2YNS is building a new house in New Hartford. W2SEI is building an EICO 753 for a portable/mobile. The BARRA had an unofficial tour of the new Erie County c.d. facilities. The new district office for the western area of the state for c.d. and RACES was dedicated in Batavia, N.Y. W2EMW is acquiring a DX-60B. K2HUK has installed a 5-kw. generator at his home QTH and is contemplating a 700-ft. long wire. W2OE and WA4PDM/2 made the BPL in July. PDM/2 was at Camp Idylwild for boys and passed four boys for Novice. WB2TAG is on RTTY with a Model 26 and Ranger. WB2VSL put up a 75-meter antenna and is checking into the traffic nets. The W.N.Y. section consists of all the Western, Central, Northern and Southern Tier counties of N.Y. State, 44 in all. It does not include Albany County and those counties south of Albany that border the Hudson River. Within the next year the section will be completely linked via 2-meter f.m. and an associated repeater network. A state-wide f.m. traffic net is urgently needed and your SCM is looking for a net manager. The Toronto and Buffalo repeaters are now linked via 450 Mc. (legally). Chaplain Valley ARC was set up at the Clinton County

Fair for traffic and did a very effective job via a booklet entitled *Amateur Radio, King of Hobbies* by WA2-VKT. Traffic: (July) W2OE 473, W2SEI 431, WA2NDC 190, WA4PDM/2 143, W2RUF 107, WB2TAG 79, WB2GAL 72, W2FEB 68, WB2OYE 48, W2MTA 37, WB2VSL 33, W2RFQ 26, K2OPV 19, WB2SMD 19, W2FCG 18, K2-HOH 15, K2IMI 15, WA2AWK 10, W2PVI 10, WA2YNS 8, W2BLO 5, W2EFD 5, WA2GLA 2, W2EMW 1.

WESTERN PENNSYLVANIA—SCM, Robert E. Gawryla, W3NEM—SEC: K3KMO. PAM: K3VPI (v.h.f.). RMs: W3KUN, W3MFB, W3UHN, K3SOH. Traffic nets: WPA, 3585 kc. daily at 2300 GMT; KSSN 3585 kc. Mon. through Fri. at 2230 GMT. New officers of the Breezshooters are K3EED, pres.; K3HZL, treas.; K3OTY, checker; W3SIR, K3VYO and WA3EOL, wind-gaugers. New Generals are K3PYI and WA3IBL. The *Radial* reports two new Generals in that area—WA3-GYN and ex-WN3GUE. WA3ILB is an ORS transfer from Ohio, where he held the call WA8KUW. K3HZL has a new homebrew 40-ft. pipe tower. K3OTY has a new 50-ft. Rohn foldover tower. Appointment endorsements during July are W3KNG and K3EXE as ORS; K3TEZ as OBS. K3ASI is a new OVS and OBS, WA9-QKE/3 is a new OVS. It appears the summer slump is really here. Because of a lack of newsletters and individual comments from the WPA gang, this column will be rather short. Traffic: W3NEM 165, WA3BLE 154, W3LOS 132, K3PYS 109, W3KUN 66, WA3AKB 48, K3SOH 15, K3EDO 10, K3S3N 7, W3LOD 5, WA3-RGE 2.

CENTRAL DIVISION

ILLINOIS—SCM, Edmond A. Metzger, W9RNP—SEC: W9RYU. RM: WA9GUM. PAMs: W9VWJ, WA9-CCP, W9KLB and WA9BLA (v.h.f.). Cook County EC: W9HPG. Net reports:

Net	Freq.	Times	Days	T/c.
ILN	3940 kc.	1400Z	Sun.	5
ILN	3760 kc.	0000Z	Daily	137
NCPN	3915 kc.	1200Z	Mon.-Sat.	168
NCPN	3915 kc.	1700Z	Mon.-Sat.	166
PI PON	3925 kc.	2300Z	Mon.-Fri.	458
PI PON	50.28 Mc.	0200Z	Mon. & Thurs.	
PI PON	145.5 Mc.	0200Z	M.W.F.	326
TNT	145.36 Mc.	0200Z	Sun.-Fri.	

The Interstate Single Sideband Net had a traffic count of 755 and the 9th RN net handled 496 pieces of traffic during July. The Sangamon Valley Radio Club, Inc. (Springfield) participated in the activities of the Illinois State Fair with an amateur radio exhibit. The Joliet Amateur Radio Society is installing a 2-meter repeater system. W9BUB, representing SRO, was interviewed on Channel 32, WFLD, in Chicago, with Field Day operation as the televised topic. WN9TGU passed the General Class test and is sweating out his ticket. WA9QRM received the WAS certificate. K9UIY joined the ranks of the married amateurs. WA9RNB is back on the air. WA9SDT has been appointed net control for the Tri-City Amateur Radio Club with 145.5 frequency at 8:00 p.m. Sat. The Shawnee Amateur Radio Association held its annual picnic at Herrin Aug. 6. Many of this section's amateurs operated from the World Scout Jamboree in Idaho. WN9UHA was appointed an OVS. W9-GFF, K9LDQ, WA9ESO and WA9KHR were elected officers of Radio Amateur Megacycle Society (RAMS). WA9SPA received his Technician Class license. EC W9LDU reports that his AREC gang has secured a new 3000-watt portable generator and f.m. 2-meter units. K9IDQ has a new tower and beam to bring in the 20-meter signals. The Hamfesters picnic in Santa Fe Park broke all records and many an eyeball QSO was held by those attending. W9EET and WA9CCP made the BPL. Traffic: (July) W9EET 365, K9KZB 245, WA9-MRU 237, WA9OTD 216, WA9CCP 182, W9NXG 126, W9JXV 120, W9QDO 117, WA9SPA 96, W9EVJ 94, WA9-GUM 77, WA9LDC 67, W9HOT 67, K9BTE 56, W9LDU 47, WA9QXT 42, W9CGC 40, WA9HSZ 39, WN9UHA 37, WA9PPA 34, K9AUD 33, WA9PFB 33, W9YCH 27, WA9QPT 25, W9PRN 24, WA9FIH 22, WA9POZ 18, WA9PIJ 15, WA9NFS 14, W9LNF 12, WA9RLJ 12, WN9-UHB 10, K9HSK 9, W9IDY 8, WA9SFB 5, K9VVL 2. (June) WA9PPA 75, WA9PIJ 15.

INDIANA—SCM, Mrs. M. Roberta Kronlik, K9IVG—Asst. SCM: Ernest Nichols, W9YYX. SEC: WA9GKF.

Net	Freq.	Time	July T/c.	Mgr.
IFN	3910	1330 daily 2300Z MF	213	K9IVG
ISN	3910	0000Z daily 2130Z M-S	373	K9GRS
QIN	3656	0000Z daily	145	W9HRY

W9PMT, mgr. of the Hoosier v.h.f. nets, reports July traffic of 45. K9EFY, mgr. of 1PON, reports July traffic of 37. K9YFT, mgr. of the White River Valley AREC, reports July traffic 3. QIN Honor Roll: K9VHY 27, W9QLW 26, W9AFDQ 23, K9HVV 22, W9AKAG 21, W9MXG 19, W9UQP 18, K9HWY 16. W9QLW, RM/-9RN, reports Indiana was represented 100% in July. W9GKF reports Randolph Co. AREC Net traffic of 5. K9OXA was awarded the Outstanding Amateur Award for 1967. W9NTR has been appointed chaplain of St. Meinrads College & Academy. W9JVF is QSL Mgr. for ZD3D in Gambia, W. Africa. The new EC for La Porte Co. is K9HYV. K9KFS is building a 20-meter s.s.b. rig. K9HIS has moved to Ohio; his new call is W8YDH. W9GHO has moved back to Indianapolis. W9JUK is Asst. RO of Wayne Co. C.D. W9CUC is enjoying a new Swan 500 and W8LXA is now mobile with an HW-12. W9FJI keeps regular skeds on 6 with W9UWL. W9AB1 has built a five-element beam for 6 meters. K9HIV is busy hunting lost planes with the CAP. W9YB soon will be on with a full kw. K9FZX and her OM enjoyed a trip to Bermuda. *Amateur Radio* exists because of the service it renders. A BPL certificate went to K9IVG. Traffic: (July) K9IVG 613, W9QLW 146, K9FZX 144, K9HYV 137, W9HRY 136, W9AFDQ 134, W9MXG 100, W9JUK 72, W9AKAG 64, K9CRS 59, W9MAM 54, W9AIZR 46, K9DHN 40, K9VHY 35, W9UQ 32, W9ABHG 31, K9OXA 29, W9AKV 27, W9DKR 25, W9SNQ 24, W9LTI 23, K9C8Y 22, K9KTB 16, K9EFY 15, K9RWQ 14, W9YXX 14, K9HZY 13, W9CLF 12, W9CMT 12, K9FUJ 12, K9LLK 12, W9MFI 12, W9PMT 12, W9URQ 12, W9VAY 12, W9DOK 11, W9FJ 11, W9FWH 11, K9KFM 10, W9GJZ 9, W9BZ1 8, W9ACFW 8, W9D8K 8, K9JQY 8, W9RNT 8, W9RTH 8, K9B8L 7, K9GBR 7, K9LIV 7, W9TKZ 7, K9UEO 7, W9ACX 6, W9ACHY 6, W9AFSZ 6, W9UB 5, K9UEO 5, W9CUC 4, K9VGN 4, K9YFT 4, W9ZZR 4, W9BDP 3, W9HWR 3. (June) K9DHN 81, W9MXG 75, W9VAY 21, W9AQW 2.

WISCONSIN—SCM, Kenneth A. Ebneter, K9GSC—SEC: K9ZNP. RM: WA9MIO. PAMs: W9NRP, WA9QNI and WA9QKF.

Net	Freq.	Time	QNI	QTC	Mgr.
BEN	3985 kc.	1200Z Mon.-Sat.	253	108	W9NRP
BEN	3985 kc.	1700Z Daily	611	85	WA9QKF
WSBN	3985 kc.	2215Z Daily	1007	215	WA9QNI
WIN	3662 kc.	0015Z Daily			WA9MIO
SWRN	50.4 Mc.	0200Z Mon.-Sat.	139	2	W9JZD

Net certificates went to WA9OMO, W9ABH and K9JEK for WSBN and WA9QNI for BEN. New appointments: WA9QNI as PAM for WSBN and OPS. Renewed appointments: K9GDF as ORS and W9NGT as EC. BPL certificates went to WA9OMO and WA9GJU for July and WA9GJU for June. WA9SRV placed 8th nationally in the Teen C.W. Contest. W9DYG hosted many of the 9RN/CAN gang before and during the Milwaukee Convention. WA9OMO has a new Ranger II. WA9RAK is 9RN/CAN liaison station. WA9LHJ has a mobile rig in his car. The Racine Megacycle Club is sponsoring a QSO Party Nov. 4-5 and Dec. 2-3. For details contact Ray Bayer, W9QGR, 1012 Walton Ave., Racine, Wis. 53402. Traffic: (July) WA9GJU 210, WA9NBP 206, WA9OMIO 198, W9DYG 186, W9RAK 168, WA9QNI 149, W9IFS 98, K9GDF 77, W9ESJ 56, K9JMP 55, W9NRY 50, WA9NDV 46, W9NRP 39, W9DXV 37, K9CPM 27, W9CBE 16, W9HWQ 16, K9FHI 11, WA9PKM 11, W9BCH 6, WA9KFL 5, W9APPV 2, W9NIV 2. (June) WA9GJU 173, WA9OMO 132, K9GDF 58, W9CBE 19. (May) K9GDF 76.

DAKOTA DIVISION

MINNESOTA—SCM, Herman R. Kopischke, Jr., W0TCR—SEC: WA9IEF. RMs: K0ORK, WA9EPX. PAMs: WA9MMV, WA9JKT, WA9DWM. MSN meets daily on 3595 kc. at 2330Z. MSN meets Tue.-Sun. on 3595 kc. at 0000Z. Noon MSN meets M.-Sat. on 3820 kc. at 1705Z and Sun. and holidays at 1400Z. Evening MSN meets daily on 3820 kc. at 2300Z. AISTN meets Tue.-Sat. on 50.4 Mc. at 0330Z. Sun. at 0100Z. Minn. WX Net meets daily on 3830 kc. at 2300Z. Congrats to K0ORK, new RM for MSN, and to WA9EPX, who is continuing as RM for MSN. Let's support both these c.w. net leaders with our increased activity. Our sincere thanks to W0ISJ for his activities as MSN RM the past two years. Appointments renewed: WA9LAW as OO and W0ISJ as ORS. MSPN NCS WA9HRM will be away from the nets but will try to keep in touch with Minnesota hams while he is away in the Army for the next two years. We welcome to Minnesota W0PAN, who recently moved to Minneapolis from Hawaii. WA9KVC has moved to Onk Park, Ill. K6EA and his XYL, W0MFW, visited Expo 67 and the League Headquarters

during an extended trip through Canada and New England. W0HYE has received his WAC and WAS awards and has almost completed DXCC. Mankato ARC members provided communications for the "Festag" celebration in Minnesota Lake and the "Indian Days" Parade in Tintonka, Iowa. WA9HRM, K0ADI, WA9CXN, WA9DRP, WA9DWM, K0EJA, W0IRO, W0JGY, K0KGW, WA9MOK and WA9MTN assisted the Police with communications during the Minneapolis Aquatennial Parade. Congrats to the Albert Lea ARC, which is now an ARRL affiliated club. A number of additional stations are going on 2-meter f.m. with the increasing number of inexpensive rigs becoming available. WA9LAW received the BPL award for July traffic. Traffic: (July) WA9LAW 718, WA9OEE 120, WA9QAK 118, W0KYG 91, WA9MMV 70, WA9EPX 28, WA9HRM 27, WA9DFT 26, W0TCR 25, WA9JKT 24, W0UMX 21, WA9ODB 20, K0FLT 18, K0ZRD 16, K0IGZ 12, W0KNR 9, WA9JPR 7, WA9ONQH 3, WA9EZQ 2, W0SZZ 1. (June) WA9ODB 12.

NORTH DAKOTA—SCM, Harold L. Sheets, W0DM—SEC: WA9AYL. OBS: K0SPH. W0KSL is home and able to operate the rig from his bedroom. W0CGM has been doing his annual stint with the State Radio Communications in Bismarck this summer. KOOVE and his XYL, WA9PPK, and family are in Texas on a job assignment. K0RSA is back on the air on 15- and 20-meter c.w. Three eighth-graders have received their Novice tickets from Valley Jr. High in Grand Forks: WN0SBD and two YLs, WN0RWB and WN0SDZ. WA9OWK's new quad has been giving a good account of itself with nice 20-meter DX. W0ETQ has a five-element Yagi up 65 ft. and running 80 watts on 2 meters. The Fourth Annual International Hamfest was held at the Peace Garden on July 15-16 on the Canadian side at the new Erick, F. Willis Centennial Pavilion. Those who attended enjoyed the program and fellowship very much. Congrats to WA9HUD and W0FNZ and the many others who made this possible. One of the items discussed at the hamfest was the possibility of a c.w. net to help take traffic from TEN. WA9ELO and WA9HUD are doing a fine job on that net but are experiencing difficulty getting it to the destination. We would like a c.w. or phone operator in each of the major cities and larger towns to help. Speed is not necessary. Let us know if any of you will be available. WA9AYL has returned from his annual jaunt down East and is back at work at the University checking graduate work until the regular term starts in the speech department. K0SPH, W0GFE and WA9AYL have been taking care in the slack season calling the RACES Net. WA9HUD reports for the PON—8 sessions, 19 messages. W0PHH and ex-YL W0ORY are leaving Cando for the West Coast. Traffic: WA9ELO 161, WA9HUD 56, WA9AYL 9, WA9JPT 9.

SOUTH DAKOTA—SCM, Seward P. Holt, K0TXW—SEC: W0SCT. RM: WA9A0Y. PAM: K0BSW. New calls: WN0SCA, Vermillion; WA9SAN, Chamberlain; WN0SBR, Sioux Falls; WN0PJF, also Sioux Falls. We are sorry to lose W0FAM to the West Coast. K0TXW has been holding regular schedules on 20 meters with K0FKK/2, who is at Ft. Monmouth. The South Dakota S.S.B. Net reports 918 QNI, 34 QTC and 137 informals for July. South Dakota C.W. Net reports 23 QNI, 17 QTC in 11 sessions during July. Traffic: WA9LLG 76, K0VYY 64, W0SCT 57, W0FJZ 9, W0DJO 5, W0DVB 5, K0TMA 5, WA9BZD 4, WA9BWD 2, K0K0Y 2, W0RWA 2.

DELTA DIVISION

ARKANSAS—SCM, Don W. Whitney, K5GKN—SEC: W5DTR. PAM: WA5GPO. RM: W5NND. NMs: WA5PPD, W5DTR, W5MJO and K5ABE. Our beloved Charley, W5DYL, for so many years the net control station for Mon. morning on the Arkansas Fone Net, died of a heart attack in July. Summer doldrums have caught up with our traffic nets and they are running at the usual "slow summer speed." It is hoped that with cool weather and a new SCM the Arkansas section will blossom out with a loud clear signal. I shall not be a candidate for reelection as your SCM and by the time this writing goes to press you will already be our congratulating W5DTR, your new SCM. My heartiest best wishes to him. Net reports for July:

Net	Freq.	Time	Day	Sess.	QTC	QNI	Time
RN	3815 kc.	0030Z	Daily	?	?	?	?
AFN	3885 kc.	1100Z	Mon.-Sat.	25	9	504	1418 min.
OZK	3790 kc.	0001Z	Daily	31	37	?	?
AFON	3825 kc.	2130Z	Mon.-Fri.	20	175	248	600 min.

Traffic: W5OBD 1484, W5NND 101, W5MJO 100, W5DTR 83, WA5KEF 75, WA5PRO 8.

LOUISIANA—SCM, J. Allen Swanson, Jr., W5PM—SEC: W5BUEK. RM: W5CEZ, V.H.F. PAMs: W5UQR and WA5DXA. Fellows, if your letters and requests are slow in being answered please bear with me. I have been on vacation in North Carolina. W5EA claims his only activity besides hamming is fishing. New Officers of the Westside ARC are W5BUEK, pres.; W5LHS, vice-pres.; W5ERR, secy.; W5KOQ, treas.; WA5PWX, act. mgr. The new slate of the Chetmachi ARC is W5SWS, pres.; WA5LIS, vice-pres.; K5DKR, secy.-treas.; K5JKR, act. mgr. WA5PSA is interested in setting up a 40-meter s.s.b. and c.w. ten net. Contact him if you would like to join. WA5NYY again made the BPL! W5MXQ says he has a new TR-4. W5GHP reports traffic slowed because of summer activities. The QNOARC held an emergency test in July on 50.25 Mc. with many of the NOLA gang participating. The main control station was in the new International Trade Mark up 400 ft! WA5KLF says his new job has curtailed his activities. Please report your activities as well as your traffic count. W5CEZ has been busy traveling. Curt made the Central Division Convention and the Dallas Hamboree. The Lafayette ARC had a big chicken dinner instead of a meeting recently. W5EXI will start a new Novice class. WN5SON is a new Novice in NOLA. W5BUEK is up Canada way and will tour 5000 miles before returning. He is mobile on 7-Mc. s.s.b. Traffic: W5GHP 296, W5CEZ 209, WA5NYY 180, WA5PWX 76, W5MBC 61, WA5DXA 51, WA5KLF 14, W5KC 9, W5-AJY 8, W5MXQ 8, WA5LGO 5, W5EA 4.

MISSISSIPPI—SCM, S. H. Hairston, W5EMM—SEC: W5JDF. The Jackson ARC really put on a fine hamfest and I was pleased to see all my friends there. We welcome the following new Mississippi licensees: WN5-RWF, WN5RWC, WN5RYD, WN5RTO, WN5RZN, WN5-RRE, WN5RRA, WN5RZY, WN5SBN, WB5SAA, WN5-SBS, WN5SEV, WN5SEG, WN5SDH, WN5RXV, WN5-RYB, WN5SIN, WN5STM. I am very proud of our new Novices. Let's all help them to get higher class licenses soon. WA5OKI has really done a job as secretary of the Miss. SSN. K2DEM/5 reported a forest fire which K5UII and others from the Keesler ARC helped put out. WA5CSJ is the new K5TYP manager. W5BW is back on the air after rig trouble. WA5CAM now is running an 800-watt p.e.p. linear. Congratulations to our two section members who were awarded QST cover awards. Traffic: WA5OKI 334, WA2WBA/5 57, K5TYP 9.

TENNESSEE—SCM, Harry A. Phillips, K4RC—RM: K4UWH. PAMs: W4PPP, WA4CGK, WA4EWW.

Net	Freq.	Days	Time	Sess.	QNI	QTC	Mgr.
TSSB	3980	M-Sat.	2330Z	25	1262	215	WA4CGK
TPN	3980	M-Sat.	1145	31	1090	246	W4PPP
		Sun.	1300				
ETPN	3980	M-F	1040	22	384	18Jn.	WA4EWW
TN	3635	Daily	0000	59	403	237	K4JWH

New officers of the Tenn. Council of Amateur Radio Clubs are W4OGG, chmn.; W4PHQ, vice-chmn.; W4-PRY, secy.-treas. A special meeting held in July with the RATS in Nashville was very rewarding. On July 28, K4VOP, K4UWH and K4FKO participated in a civil defense drill in Oak Ridge and Johnson City. Stations are needed to serve as liaison with the Tenn. C.W. Net. The AREC in Tullahoma meets on 145.32 Mc. at 2000 every Thurs. K4AYD is net control. On July 30, WA4VHM relayed information necessary for PYICK in Brazil to obtain a Pacemaker for a young lad who had a heart rate of only 24 beats per min. Now he has a normal rate of 70, thanks to hams. Traffic: K4UWH 186, WA4YDM 180, W4FX 162, WA-MX 117, WA4YHO 114, WA4YHT 82, W4POP 66, WA4-YEM 64, W4DIY 54, WA4EWW 40, WA4TWL 38, WA-OGG 35, WA4CGK 26, WA4NEC 26, W4WBK 26, WA4-TZJ 17, W4TZB 14, WA4ZBC 14, WA4AJB 12, K4MIQI 12, W4PPP 12, WA4DJF 10, W4TYV 10, K4PUZ 7, K4UMW 6.

GREAT LAKES DIVISION

KENTUCKY—SCM, Lawrence F. Jeffrey, WA4KFO—SEC: W4OYI. Appointments: WB4CJM, WA4UIH and WA4VEC as ORSs. Endorsements: WB4AFH as OVS and WA4IBG as OPS.

Net	Freq.	Days	GMT	QNI	QTC	Mgr.
KRN	3960	M-F	1130	331	53	K4KIS
MKPN	3960	Daily	1330	355	132	WB4RTM
KTN	3960	Daily	0000	764	720	WA4AGH
KYN	3600	Daily	0000/0300	552	610	W4BAZ

The Falls City Area Traffic Net reports over 70 QNI each month. K4KZII has WB4BKG and WB4AFH QNI

NCSS on the net. W4JUI is back on 80. K4LOA is working on 6-meter traffic skeds from Bowling Green. W4YOK/4 works the traffic nets and DX. WA4WWT has a new R-4A receiver and placed third in the c.w. contest at Jenny Wiley State Park. K4TXJ has moved to a new QTH in Louisville. WA4VEC swapped transmitters and is working hard on nets. K4KZH has radiotelephone second now. July hamfests included Paducah, Henderson and Jenny Wiley. W4OYL, our SEC, flew to the Paducah Hamfest and took your SCM along as ballast. The Owensboro AREC was alerted for a possible tornado and to assist in the search for a missing person. W4BAZ badly needs a Paducah area station to QNI KYN. How about it out there? WB4-BTM finds he has to resign as MKPN-PAM because of his health. Many thanks for a job well done. Larry, W4WNH has a new portable beam for 2 meters to carry in his new car. Traffic: WA4IAZ 502, WA4DYL 337, WA4WWT 295, WA4UIH 205, W4BAZ 169, WA4AGH 161, WB4AIN 140, W4OTU 137, WA4YUE 121, WA4KFO 115, WA4RCE 65, WB4CJM 48, W4KJP 44, WB4-AGO 43, WA4TVB 38, W4NBZ 37, WA4VEC 36, WB4-ACQ 27, WA4GHQ 25, K4CSH 24, W4OYI 21, WA4ZIR 15, WB4BKG 14, K4LOA 14, W4MWX 13, W4YOK/4 12, K4HOE 10, W4RKG 10, K4VDO 8, W4BTA 6, K4KZH 6, WB4AFH 3, W4CDA 2.

MICHIGAN—SCM, Ralph P. Thetreau, W8FX—SEC: K8GOU. RMs: K8QLL, W8EU, K8KMG, PAMs: W8CQU, K8JED, W8WFW, V.H.F. PAMs: W8CVQ, W8-YAN. Appointments: W8PT and WN8WHG as OVSs; W8ALG as EC and OPS; K8ETU as OBS; K8HKM as OO. Net reports:

Net	Freq.	Time	Day	QNI	QTC	Sess.	Mgr.
QMN	3663	2315	Dy	429	280	31	W8RTN
WSSB	3935	2300	Dy	1054	146	31	W8IWF
U.P.N.	3920	2330	Dy	480	49	31	WA8LHC
PON-DAY	3860	1500	M-Sat.	401	322	26	WA8GR
PON-CW	3645	2400	M-Sat.	135	33	26	3C3DPO
B.R.	3930	2130	M-F	810	77	21	K8JED
Mich 6	50.7	2400	M-Sat.	295	42	26	WA8LRC
Lenawee 2	144.36	0100	Dy	239	50	27	WA8AAQ
M.T.N.	3605	0145	Dy.	28	8	23	WA8QAF
M.E.N.	3930	1300	Sun.	273	18	5	K8JED
SW Mich 2	145.26	2300	Mon.	63	—	5	W8CVQ

W8IV made the BPL again on Navy MARS Vietnam reflexes. W8BJS, of the Old City of The Straits RC of 1920, retired and moved to California. He was a partner of Harold Osgood, 8AQR, in '21. W8FZ lost his mother. Work done at C.D. Hq. by W8SS during the Detroit riots deserves high commendation. K8SKZ and K8NTI also were active, while the Plymouth RC helped e.d. and police. Mike Zurich, ex-W8FTW now DL4EC, who helped originate the famous "QN" signals, recently was in Detroit on a visit. W8TII NCsed the B/R Net while W8BXO telephone relayed to people worried about the riot. K8LNB, ex-8COZ will be writing an old-timers column in GMARC's *The Scope*. WA8BQZ: Sorry, I cannot accept "informal" traffic reports. The WSSB puts out a real good net bulletin, as does the QMN. WA8IIV worked into Ohio on a Twoer. Another retiree is W8OQV. The new Coast Guard Radio Club at the Soo, WA8BCN conducts code classes. Traffic: (July) K8KMG 300, W8IWF 236, W8IWF 161, WA8OGR 158, W8OQK 87, W8OQV/8 87, W8EU 75, WA8LKI 71, K8ETU 65, W8NOH 62, K8ZJU 58, WA8-VBZ 46, K8JED 43, W8BEZ 42, WA8MAM 38, WA8-LRC 37, W8FX 34, W8CQB 32, W8IUC 30, K8KRX/8 29, W8VAN 28, K8MIX 27, WA8ORC 21, WA8IAQ 18, WA8SQC 18, W8GTM 17, WA8MCQ 17, WA8SVE 16, WA8TSB 10, W8FWQ 14, W8AUD 12, W8UFS 11, K8-GOU 10, WA8KRH 9, W8TDA 9, K8VDA 8, W8ICH 7, W8SFW 7, W8DSE 6, W8TBP 5, WA8VHG 4, WA8-PZT 1. (June) K8ELLR 25, K8GOU 49, WA8AAQ 29, WA8LRC 37, W8YAN 29, K8MIX 8, W8HKT 1.

OHIO—SCM, Wilson E. Weckel, W8AL—Asst. SCM: J. C. Erickson, W8DAE. SEC: W8OUU. RM: WA8-CFJ. PAMs: W8WZ and K8UBK.

Net	QNI	QTC	Sess.	Ans.
O8SBN	1369	638	57	11.
OSN	100	48		1.6

K8BXT reports that WA8VBS received his General Class license and has a new Galaxy 5. WN8VZA has a new HQ-110A, WA8ORL received his General Class license and has a new 22er, W8TAE operating high power with a Heath Warrior and W8AUE, W8MSP, W8KCE, W8-KGD, W8OYI, W8PKC, W8SFN, W8WOL, K8LDX and K8OZK handled communications for the Trumbull County Soapbox Derby. South Shore RC's *Mike Talk* says K8-EJH, K8KRG, WA8CNS, WA8FXP, WA8IOZ, WA8-OJP and WA8RUU were in Veterans Hospital. WA8-

K8UC is now WA3LLB. The Buckeye Net held a picnic in Mt. Vernon with W8BXX, W8CHT, W8CQP, W8ERD, W8IMI, W8LZE, W8QXQ, W8TV, W8VWX, K8DLG, K8SEV, W8CZF, W8MVP, W8NSL, W8NTA, W8SPMN, W8PZA, W8TYF, W8UAV, W8VNU and W8VNU attending. Canton ARC's *Feedline* tells us that W8EK joined the Silent Keys, W8SQW is out of the hospital, K8JZN vacationed in Florida, VE1XK visited with W8ER, W8SWB is now WB6WMI and warned its members that the *Feedline* would be published by-monthly because of lack of news. See what I mean when you do not give me news. It is suggested that editors of club bulletins in larger cities phone radio dealers and get the calls of persons buying new receivers, transmitters, beams, etc. Indian Hills RC's 1967 officers are W8QXQ, pres.; W8PBM, vice-pres.; W8SZF, secy.-treas. Toledo's *Ham Shack Gossip* informs us that WN8VVB, WN8WVO, WN8WIG, WN8WJH, WN8WHV, WN8WQJ, WN8WPO and WN8WPU are new Novices; WA8WTZ is a new Technician; WA8WCB was home on a 30-day leave and K8MYN vacationed in the West. W8QCU completed his associate command general staff course at Fort Leavenworth. W8ERD has a new R4A receiver. WA8RYC has a new HQ-110A receiver and is a freshman at Ohio State. Springfield ARC's *Q Five* reports the club held an auction. WA8IKN was in the hospital and WA8BGG joined the Silent Keys. WA8EVD reports that WA8PBR joined the Silent Keys. WA8COA writes a column "Ham Call," for the *Cincinnati Enquirer* every Sun. Please send him news. South East ARC's *Ham Fax* informs us that K8JFK resigned as corr. secy. because of business complications and WA8PPD was appointed to replace him and WA8ROK to the board of directors. K8BQY resigned as editor of Parma RC's *P.R.C. Bulletin*. Greater Cincinnati ARA's *the Mike & Key* says the club toured through the Tedford Crystal Laboratories to see grinding and testing of crystals. A bulletin was received from the MARS Youth Training Program called the *Short Circuit*, which informs us that if we want information on how we may be part of the MARS youth training or on starting our own program in the State of Ohio to write to State MARS Youth Training Manager, AFA8WQJ, 9118 North Dixie Drive, Dayton, Ohio 45414. The Apricot Net held a picnic with about 150 attending. The net's members attended a month-long course in message-handling given by WA8OFT. W8LRC visited Expo 67 and VE2XPO. Ex-82V became a Silent Key.

Net	QNT	QTC	Sess.	Ave.
HN	510	330	62	
OSSBN	1591	1050	58	18.1

Traffic: WA8UPI 434, WA8CFJ 404, W8UPH 402, K8LGA 326, WA8OCG 205, W8NAL 181, WA8PMN 175, WA8LVT 168, W8IMI 149, W8CHT 119, WA8SED 110, WA8PQL 111, W8DAE 109, W8QZK 105, WA8AUZ 101, W8TV 91, W8ERD 83, WA8NTA 80, WA8FSX 77, W8WEM 68, WA8DWL 67, K8LGB 63, WA8LHM 49, K8ONA 47, W8QCU 45, W8QXQ 44, W8MHMO 43, W8VNU 38, WA8SHP 32, W8GVX 22, W8OE 22, W8FGD 21, WA8NSL 21, K8BYR 20, WA8KPN 19, WA8QFK 16, WA8PPK 15, WA8QNN 15, K8WZI 14, K8BXT 13, W8LRC 12, W8LAG 10, K8DHJ 9, K8DDG 8, W8UIR 8, W8UX 8, WA8RYC 7, W8WEG 7, W8VND 5, W8EEQ 4, W8VVL 3, K8PJH 2, WA8PRR 2, W8SVU 2.

HUDSON DIVISION

EASTERN NEW YORK—SCM, George W. Tracy, W2EFU—SEC: W2KGC, RM: WA2VYS, PAM: W2LJG. Section nets: NYS on 3670 kc. nightly at 2400 GMT; NYSPTEN on 3925 kc. nightly at 2300 GMT; ESS on 3590 kc. nightly at 2300 GMT. Appointments: WA2BRF and WB2YQU as OVSS. WB2FOA reports construction of 50 watts on 50 and 144 Mc. A nuvistor and I.e.t. converter for 432 Mc. is the new project at WB2VUK. A new Westchester County Traffic Net, which meets Thurs. on 3945 kc. at 2330 GMT, is reported by WB2VVT, WB2VVS and WB2VUK. WB2UHZ has a new short dipole because of lack of room for a half-wave on 80. Also building gear for 432 Mc. is WA2BRF. There were only a few days in July that the 6-meter band was not open, according to WB2RBB. This agrees closely with a similar report from WB2OIM. Among the new hams at Union College operating W2UC is WB2VVT. Wide-band I.m. with repeaters is gaining popularity in the section. A recent survey showed 78 participants in the Schenectady area on 2-meter I.m.; many with base, mobile and portable stations. There are two repeaters for selectable long-range operations with input frequencies of 146.460 and 146.340 Mc. The common output frequency is 146.940 Mc. Many newer hams are sending AREC applications to the SCM. This is fine, but he has to remail them to the Emergency Coordinator with a resulting

delay. Ask your older hams for the call and address of your local EC and forward your applications to him to save time. Traffic: WB2UHZ 148, K2SSX/2, 112, W2EAF 105, WA2HGB 105, WB2TNB 69, WB2HZY 55, K2SJM 33, W2ANV 20, W2PKY 20, WB2VUK 18, W2UC 13, WA2WGS 13, WB2FOA 11, W2URP 9, WB2UEQ 5, WB2SHU 4, WA2JWL 2, WA2BRF 1.

NEW YORK CITY AND LONG ISLAND—SCM, Blaine S. Johnson, K2LDB—Asst. SCM: Fred J. Brunjes, K2DGI. SEC: K2OVN, PAM: W2EW. Traffic acts:

NLI*	3630 kc.	1915 Nightly	WA2UWA-RM
NLI VHF*	148.5 Mc.	1900 Nightly	WB2RQF-PAM
NLI Phone*	3932 kc.	1600 Daily	WB2SLH-PAM
NLS Slow*	3715 kc.	1845 Nightly	WB2UQP-RM
Clear. I.se.	3925 kc.	1100 MTWTF	WA2GPT-Mgr.
Mic. Farad	3925 kc.	1300 Ex Sun.	K2UBG-Mgr.
All Svc.	3925 kc.	1300 Sun.	K2AAS-Mgr.
NYSPTEN	3925 kc.	1800 Daily	WB2QAP-Mgr.

* Section NTS Nets

The Clearing House Emergency and Traffic Net, organized and put into operation by WA2GPT this past July, is the latest net to embark on the popular net frequency of 3925 kc. The Clearing House was off to a good start with 124 check-ins, 177 traffic in 21 sessions. Since 3925 kc. is so busy locally, I thought we'd add these nets to the masthead in addition to the Section NTS nets. WB2UQP, who now has a 40-meter version of the "Lazy Don" antenna, handled so much traffic from Camp, K1PGQ, that it drove his monthly traffic total way up! K2CWQ/K1NOC spent the summer up Camp Spruce Hill near Tolland, Mass., and managed to show the youngsters quite a bit about traffic-handling. WB2ZEL would like to get in touch with anyone interested in sailing in the Long Island Sound area. New ORS, WB2QLL, also holds an NCS sked on NLS. Had a chat with WB2AEK on 75 meters while he was mobilizing around Vermont country. WB2JJW has been doing a lot of telephone relaying for both foreign and domestic traffic recently. WB2DVK, our OBS on 445-Mc. TV, has been receiving TV SWL cards...? WA2QJU had a relaxing summer on amateur radio before returning to Columbia to do battle for another term. WB2UGP spent the summer making french fries at the local hamburger emporium. Heard the dulcet tones of WB2EUH back on the nets this summer while between terms at Notre Dame. W2BCB says he's boning up on the saxophone again! W2DBQ, reversed old first RM-NLI, is setting up for RTTY. NYC-LI's roving-type ambassador, W2PF, recently returned from visits to H8XDA in Santo Domingo and W5YVJ in Houston. The lesson for today was wiped from the *Scandal Sheet* of the Rotary Club of Graham, Tex.; "His thoughts were slow, his words were few, and never formed to listen. But what a joy to all his friends, you should have heard him listen!" New officers of the New York RC, which meets every 2nd Mon. of the month at 8 p.m. in the Hotel Geo. Washington are W2OOM, pres.; K2MYR, vice-pres.; K2CON, secy.; K2MOM, treas.; W2UAL, North Hempstead EC, reports encountering the best summer in many a year! WA2JZX reports K17GDD (ex-WB2JIDZ), with the USAF in Anchorage, is heard regularly on 20 c.w. W2LXL reports the TuBoro RC auction will be held at 8 p.m. Oct. 11, 1967, at the club's meeting rooms, 104-19 127th St., Richmond Hill. W2KWM operated portable VE1 up in Nova Scotia in Aug. The Suffolk C.D. provided the communications for the North American Sailing Regatta at Hellsport last July. Gee, they had a whole flock of 2-meter f.m.-type guys like K2BRC, W2BCKN, W2DID, K2DQC, W2BGNZ, WB2HIR, K2KJX, W2MZY, W2OQL, WA2QBB, W2RSM, WB2RVC and WA2USS. Now ain't that some flock? Bet most of 'em ended up at the big annual Suffolk County RC Clam Bake in August too! Shouldn't you myself! Traffic: WA2UWA 496, WA2GPT 271, WB2UQP 202, WB2ZEL 144, WB2QLL 78, WB2AEK 76, WB2SLH 61, WB2JJW 51, K2IDB 37, WA2LJS 33, WB2DVK 25, W2EC 25, WA2QJU 23, WB2UGP 16, WB2EUH 15, W2BFC 8, W2DBQ 7, W2PF 6, WA2PMW 5, WB2RWD 3.

NORTHERN NEW JERSEY—SCM, Louis J. Amoroso, W2LQP—Asst. SCM: Edward F. Erickson, W2CVW. SEC: K2ZFI.

ARPSC Section Net Schedules

NJN	3695 kc.	Daily	7:00 p.m.	W2BVE	RM
NJ Phone	3900 kc.	Ex. Sun.	6:00 p.m.	W2PEV	PAM
NJ Phone	3900 kc.	Sun.	9:00 a.m.	W2ZI	PAM
NJ PON	3900 kc.	Sun.	6:00 p.m.	WA2TEK	PAM
NJ 6	51,150 kc.	M-W-Sat.	11:00 p.m.	K2VNL	PAM
NJ ECTN	146,700 kc.	Ex. Fri.	10:00 p.m.	WB2IYO	PAM

All times shown local in effect. New appointments: WB2VFW and WB2VFX as OVSS, a father-and-son team, welcome to our section. WB2IYO operated portable during his vacation in VEI-Land. WB2ZSH completed his keyer and is now working on break-in operation. W2JDH claims the best c.w. operators are found in the CD Parties. We agree. W2TFM moved to Wayne. WB2-JWB took in Expo 67 after the ARRL National Convention. WA2RIN is now DL4EF with WB2RJJ as QSL Mgr. WB2SEZ got a 32V-2. WB2YGL would like to hear from anyone interested in starting a traffic net on 15. WB2TFK/2 kept NJN busy with summer traffic and made the HPL. Good luck to WB2VNH, who moved to Houston, Tex. Both the NJN and ECTN will miss him. W2CVW was in both CD Parties in July. WB2GMR will attend NCE. WB2JWB, WB2NYK and WB2LWA are all going to Stevens this fall. WA2DMY runs an RTTY school for N.J. Army MARS. The Fairlawn ARC has new quarters in the Old Library Building on River Road in Fairlawn. WA2QZF reports meetings will be held Fri. at 9:00 p.m. The program includes code and theory classes for Novice and General Class. W2LQP joined Army MARS. K2ZFI is recovering from his recent illness. I am looking for KCs in Hudson, Hunterdon and Ocean County. If interested, please contact K2ZFI or your SCM. Traffic: (July) WB2FUW 502, WA2IGQ 205, WB2-RKK/1 181, WA2TBS 128, WB2KSG 127, WB2TFK/2 105, WB2YVU 97, WB2JWB 90, K2EQP 79, WB2UTV 76, WB2SSZ 72, WB2IYO/1 68, WB2WFO 42, WB2ZSH 39, WB2SEZ 37, WB2CWH 37, WA2TEK 15, W2CVW 20, W2LQP 17, WB2CGI 15, WAZCF 11, WB2QMP 11, WB2XPO 10, WB2SJJ 7, K2ZFI 7, WB2TKP 5, W2ABL 4, K2MFX 4, W2NAJV 2, W2JDH 1, WB2NZU 1. (June) WB2FIT 57, WB2SEZ 21, K2VNL 10.

MIDWEST DIVISION

IOWA—SCM, Owen G. Hill, W0BZD—Asst. SCM: Bertha V. Willis, W0LGG. SEC: K0BRE. PAM: W0NGS. RMs: W0TUI, W0SCA. Visitors at the Central Ia. ARC in July included W0NWV, JX5HE/LA5HE, vice-pres. of the amateurs of Norway, and G13KYP, pres. of the RSGB. Amateurs interested in the Iowa Weather Observers Net should monitor 3855 kc, daily at 0001Z. WA0ATA reports several good openings on 50 Mc. in July. Ex-W8FAW is now WA0SDC at Cedar Rapids. W0LSE is the new pres. of International ARMS Nets as of June. W0DRE is NCS for TLGN Mon. on 3560 kc. at 6:30 p.m. daily. More checkers are needed. WA0OCD has a new HB-572 linear. W0LGG and OM W0EFL vacationed for two weeks at Leach Lake during July and Aug. Silent Keys in Waterloo are W0AEB and K0JFF. The 75-Meter Phone Net had 26 sessions, QNI 1181, QTC 198. The 160-Meter Net had 31 sessions, QNI 510, QTC 5. The TLGN C.W. Net had 24 sessions, QNI 112, QTC 22. Traffic: (July) W0LGG 707, W0LXC 573, W0CZ 138, W0VAU 110, WA0SDC 38, K0BRE 22, W0VWF 21, K0TDO 16, W0PJP 15, WA0BSF 12, WA0JUT 9, WA0-DUB 8, WA0IYH 8, WA0JEG 6, W0NGS 5, W0DRE 3. (June) W8FAW/0 24, WA0BSU 20.

KANSAS—SCM, Robert M. Summers, K0BXF—SEC: K0MMB. PAM: K0JMF. RM: WA0MLE. V.H.F. PAMs: WA0CCW, W0HJ, WA0KSK, WA0LSH. Another Silent Key in the K.C. area is WA0IPS. WA0LLC was awarded the Raymond Baker, W0FNS, Memorial Trophy for being the Kansas Amateur of the Year. K0GZP is out of the hospital. W0GHU also is out of the hospital and operating a little. 2-meter mobiles in Salina provided communications as spotters and liaison communication for Sports Car Racing on Labor Day. Ham operators assisted the Police Force Aug. 7-12 at the Tri-Rivers Fair. WA0PSF and W0JAS lost towers and antennas in high winds around Salina. Wheat Belt ARC's new officers are K0UYH, pres.; WA0DAY, vice-pres.; K0JFI, sec.; K0MXU, treas.; K0RKR, act. mgr. W0OKH now is farming 2½ acres in San Bernardino, Calif. WA0DZA and WA0NGS now are in Hayes Center, Nebr. K0VGP moved to Logan. K0MZZ has moved to K.C. and will be working with KCMO. The National Convention was attended by WA0LLC, K0NL and W0PB. K0EMB reported 573 AREC members as of June 30, 1967, with 26 emergency nets. Zone 2, Junction City-Mannhattan, reports 3 sessions of severe WX operations on July 15 and 21. WA0LSH is operating 2 meters using a five-element Yagi. Kans. 6-Meter net: QNI 3, QTC 2. 2-Meter AREC Nets: Zone 7, QNI 34, QTC 4; Zone 10, QNI 18, QTC 6; Zone 2, QNI 32, QTC 12. 6-Meter AREC Nets: Zone 15, QNI 15, QTC 0. N.C. K., 2 meters, QNI 30, QTC 0; 6 meters, QNI 2, QTC 0. Coffeyville Amateur Radio Club 2-Meter Net, QNI 6. Kansas PI Net, 2 areas reporting, NE and NCK, QNI 69, QTC 4. NCSs WA0HMZ, WA0CCW.

	Mgr.	QNI	QTC		
QKN	WA0JTV	11	0	4 P.M. Sun.	2735
KPN	K0JMF	226	36	8 A.M. Sun.	3920
				6:45 A.M. M-W-F	3920
KSNB	K0JMF	418	108	6:30 M-Sat.	3920
QKS	K0KED	218	124	7 & 9 P.M. Daily	3610

Traffic: (July) WA0KQD 125, K0BXF 111, K0JMF 107, WA0VX 103, WA0MLE 79, WA0LLC 73, W0FTI 70, K0KED 63, K0EMB 60, K0HGI 53, W0CWI 51, WA0JOG 39, WA0CCW 31, K0LPE 20, K0UYH 12, WA0RMZ 7, K0GII 3, WA0LSH 2, K0MRI 2, WA0-EMQ 1. (June) K0LPE 2, WA0EMQ 1. (May) WA0-EMQ 7.

MISSOURI—SCM, Alfred E. Schwaneke, W0TPK—SEC: W0BUL. K0YBD is now an ORS. K0DFQ renewed as ORS. I am sorry to report that WA0AQN is now a Silent Key. W0RYY is a new Nov. CI. in Rolla. W0NSAO is a new Nov. in South K.C. WA0LKF is a new Gen. CI. in Cabool. WA0RAC also received Gen. CI. W0KIK/N0RFN reports that Navy MARS has 19 nets going in Mo. WA0EMIS will operate at the Scout Jamboree. WA0HQR wishes to pass along his appreciation to all who helped with the summer Scout Camp traffic. Communications for the Annual Clay Co. Farm Tour were furnished by WA0MO, K0IQS, WA0-KUH, WA0QLN, W0NRFD and W0UQP. K0GYK graduated from M.U. and will be at Keesler AFB, Miss., for Comm. Officer School. K0JPS has a new Swan 500. W0TPK lost all antennas during a windstorm. W0-FNK worked Cuba and Puerto Rico on 6 meters. WA0-DGG has a new SB-101. WA0MIG/MHP have a new WRL Duobander 84. MON net certifies go to K0JFM, WA0QBF, WA0QOA and K0YBD. WA0ITU is working on a 6-meter i.m. net for the K.C. area with over 100 surplus commercial rigs to convert. K0ONK attended a theater workshop at the U. of Nebr. The international s.s.b. work of K0MAS was featured in an article in the July 18 St. Louis Post-Dispatch. Net reports for July:

Net	Freq.	Time	Days	Sess.	QNI	QTC	Mgr.
MEN	3885	2230Z	M-W-F	13	122	8	W0BUL
MON	3585	2400Z	Daily	31	136	70	W0TRD
MNN	7063	1900Z	M-Sat.	26	108	190	W0UDU
SMN	3585	0300Z	Daily	18	43	38	K0AEM
MTTN	3940	2200Z	M-F	18	189	166	WA0ELM
MoPON	3810	2100Z	M-F	11	183	93	W0HVJ
QMO	3585	2100Z	Sun.	5	16	—	WA0PKD
PHD	50.4	2430Z	Mon.	5	67	9	WA0KUH
HBN	7280	1705Z	M-F	20	531	101	WA0BHG

Traffic: (July) K0ONK 1648, K0YBD 553, WA0HQR/0 246, WA0QOA 176, W0ZLN 165, WA0PPU 95, K0AEM 86, W0HVJ 85, W0UDU 85, WA0EMS 66, WA0DGG 45, K0ORB 34, WA0ELM 32, W0BUL 19, K0REY 19, W0GQR 18, WA0ITU 17, WA0FMD 16, K0VYH/0 13, WA0JH 6, WA0KUH 6, WA0QBF 6, WA0FL 5, WA0OVG 4. (June) WA0LOG 18, WA0QOA 17. (May) W0TDR 116, WA0EMS 29.

NEBRASKA—SCM, Frank Allen, W0GGP—SEC: K0OAL. Monthly net reports for July: Nebr. Morning Phone Net, WA0JUF, QNI 848, QTC 52. Nebr. AREC Phone Net, W0IRZ, QNI 178. Nebr. Emergency Phone Net, WA0GHZ, QNI 124, QTC 79. Nebr. C.W. Net (NEB), WA0GHZ, 1st session, QNI 93, QTC 136; 2nd session, QNI 124, QTC 103. Nebr. AREC C.W. Net, WA0EEL, QNI 20. West Nebr. Phone Net, W0NIK, QNI 628, QTC 38. W0FBY has been selected to receive the Jerry Cox Memorial Award. K0RRL was elected State Navy MARS Coordinator at a meeting at Victoria Springs in July. K0ODF will edit MARS Newsletter. With fall weather, net activity is expected to increase. Traffic: (July) WA0GHZ 236, WA0RO 201, WA0HWR 130, WA0QMZ 83, K0ITW 58, K0IXY 57, WA0KGD 57, W0IOT 52, WA0HO 46, K0LJP 37, WA0PCR 24, K0QIX 22, WA0GVJ 21, W0RFV 14, W0GGP 12, W0-HTA 9, W0VEA 9, W0NIK 7, W0EOP 6, WA0IBB 6, WA0EEL 5, K0ODF 5, W0HOP 4, WA0IBL 4, WA0-IXD 4, K0OAL 4, WA0JUF 3, W0YFR 2. (June) WA0-KGD 13.

NEW ENGLAND DIVISION

CONNECTICUT—SCM, John J. McNassor, W1GVT—SEC: W1PRT. RM: W1ZFM. PAM: W1YBH. Net reports for July:

Net	Freq.	Days	Time	Sess.	QNI	QTC
CN	3640	Daily	1845	31	354	255
CPN	3880	M-S	1800	31	429	152

High QNT: CN—K1TKS, WA1ESN and W1EFW. CPN: WA1FVH and W1GVT 26, K1FIC 25, WA1EEJ 24, WA1-FAZ and W1YBH 23, W1LUE 21, W1YU 18, K1LFW 17

EIMAC

250 kW tetrode now ready for tomorrow's super-power transmitters

The EIMAC 4CV250,000A is the world's highest power tetrode. It is designed for service in super-power broadcast transmitters, and was developed on the foundation of technology which produced its "little brother," the hundred-kilowatt 4CV100,000C, now used by the USIA. The giant new vapor-cooled tube combines high power gain with long life. Vapor cooling is accepted as an efficient and economical method of cooling in advanced broadcast systems. As EIMAC's latest addition to its line of power tetrodes, the 4CV250,000A is ideally suited for service as an audio modulator, a pulse modulator, or a regulator, and as an rf amplifier in linear accelerators. Ready now for the super-power transmitters of the future, this 250 kW tetrode is another example of how EIMAC's experience in power tube technology paves the way for the developments of tomorrow. For a power tube to fit your needs—big or small—write Product Manager, Power Grid Tubes, or contact your nearest EIMAC distributor.

TYPICAL OPERATION

(as a Plate-Modulated Power Amplifier
at Frequencies below 30 MHz)

DC Plate Voltage.....	14 kV
DC Screen Voltage.....	800 V
Peak AF Screen Voltage (for 100% Modulation).....	800 V
DC Grid Voltage.....	-800 V
DC Plate Current.....	.29 Amps
DC Screen Current.....	3.6 Amps
DC Grid Current.....	1.8 Amps
Peak RF Grid Voltage.....	1200 V
Grid Driving Power.....	2.5 kW
Plate Output Power.....	292 kW

EIMAC

Division of Varian

San Carlos, California 94070

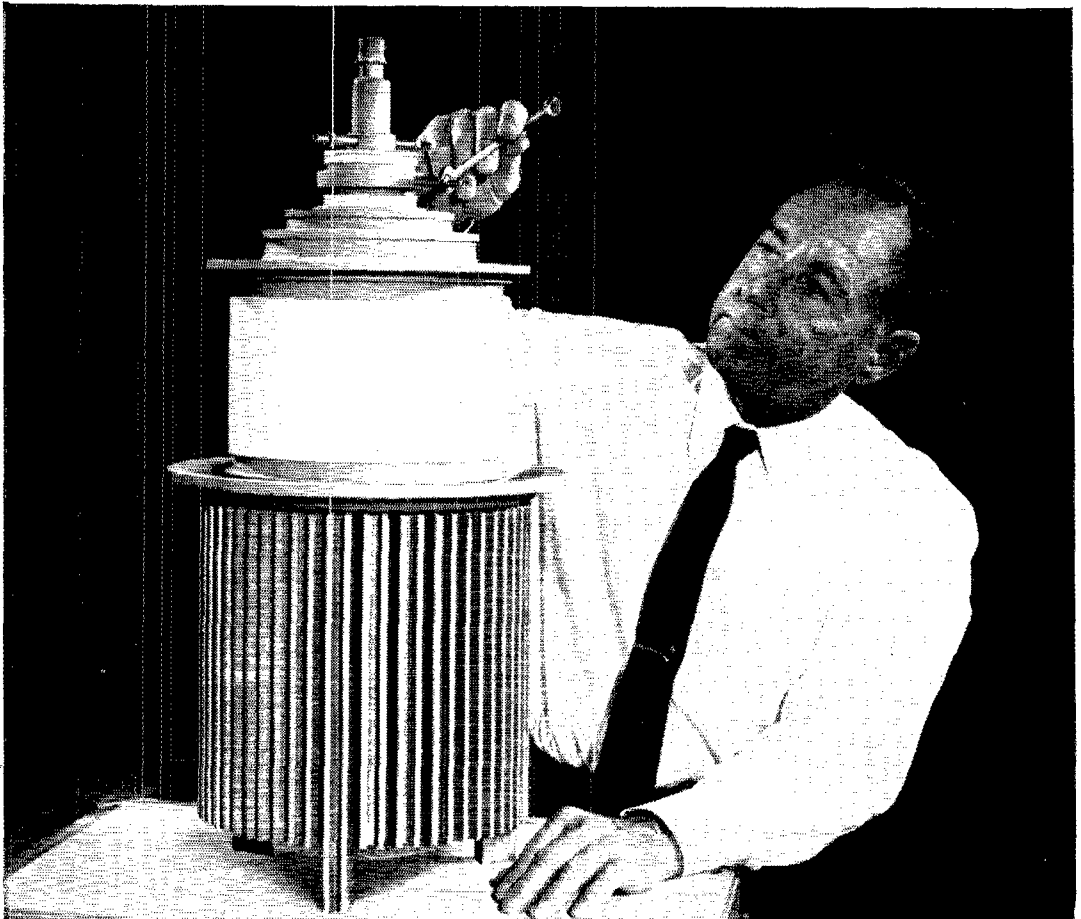


CHART YOUR COURSE TO EIMAC

for dependable, high quality power tubes

EIMAC TYPE	CLASS OF OPERATION SERVICE	TYPICAL OPERATION — SINGLE TUBE								FILAMENT VOLTS AMPERES
		D. C. PLATE VOLTAGE	D. C. PLATE CURRENT (AMPERES)	D. C. SCREEN VOLTAGE	D. C. GRID VOLTAGE	APPROX. MAX. DRIVE POWER (WATTS)	APPROX. D. C. SCREEN CURRENT (AMPERES)	APPROX. D. C. GRID CURRENT (AMPERES)	APPROX. MAX. POWER OUTPUT (WATTS)	
3-400Z	B	3000	.100	—	0	32	—	.12	655	5.0
	SSB		.333 ⁽³⁾							14.5
3-1000Z	B	3000	.240	—	0	65	—	.30	1360	7.5
	SSB		.670 ⁽³⁾							21.3
4CX250B ⁽¹⁾	AB1/SSB	2000	.1/.25 ⁽³⁾	350	-55 ⁽⁵⁾	0	0/.005 ⁽³⁾	0	300	6.0 2.5
	C/CW	2000	.25	250	-90	2.9	.019	.026	390	
	C/AM	1500	.20	250	-100	1.7	.02	.014	235	
4CX300A	AB1/SSB	2500 ⁽⁴⁾	.1/.25 ⁽³⁾	350	-55 ⁽⁵⁾	0	0/.004	0	400	6.0 2.5
	C/CW	2500 ⁽⁴⁾	.25	250	-90	2.8	.016	.025	500	
	C/AM	1500	.20	250	-100	1.7	.02	.014	235	
4CX1000A	AB1/SSB	3000	.25/.90 ⁽³⁾	325	-60 ⁽⁵⁾	0	-.002/.035	0	1680	6.0 10.5
4-65A	AB1/SSB	3000	.015/.065 ⁽³⁾	360	-85 ⁽⁵⁾	0	0/.006	0	130	6.0 3.5
	C/CW	3000	.112	250	-105	1.6	.022	.009	270	
	C/AM	2500	.102	250	-150	3.1	.026	.013	210	
4-125A	AB1/SSB	3000	.03/.105 ⁽³⁾	510	-95 ⁽⁵⁾	0	0/.006	0	200	5.0 6.5
	B/SSB ⁽⁴⁾	3000	.02/.115 ⁽³⁾	0	0	16	0/.03	0/.055	240	
	C/CW	3000	.167	350	-150	2.5	.03	.009	375	
	C/AM	2500	.152	350	-210	3.3	.03	.009	300	
4-250A	AB1/SSB	3000	.055/.21	600	-110 ⁽⁵⁾	0	0/.012	0	400	5.0 14.5
	C/CW	3000	.345	500	-180	2.6	.06	.01	800	
	C/AM	3000	.225	400	-310	3.2	.03	.009	510	
4-400A	AB1/SSB	3000	.09/.30 ⁽³⁾	810	-140 ⁽⁵⁾	0	0/.018	0	500	5.0 14.5
	B/SSB ^{(2) (4)}	3000	.07/.30 ⁽³⁾	0	0	40	0/.055	0/.10	520	
	C/CW	3000	.35	500	-220	6.1	.046	.019	800	
	C/AM	3000	.275	500	-220	3.5	.026	.012	630	
4-1000A	AB1/SSB	4000	.17/.48 ⁽³⁾	1000	-130 ⁽⁵⁾	0	0/.04	0	1130	7.5 21.0
	B/SSB ⁽⁴⁾	4000	.12/.67 ⁽³⁾	0	0	105	0/.08	0/.15	1870	
	C/CW	4000	.70	500	-150	12	.137	.039	2100	
	C/AM	4000	.60	500	-200	11	.132	.033	1910	
3CX100A5	C/CW ⁽⁷⁾	800	.08	—	-20	6	—	.03	27	6.3
2C39A	C/AM ⁽⁷⁾	600	.065	—	-16	5	—	.035	16	1.0

(1) Ratings also apply to 4X250B.

(2) Ratings apply to 4-250A within plate dissipation limitation.

(3) Zero signal and maximum signal dc current.

(4) Grid and screen grounded, cathode driven.

(5) Adjust to give stated zero-signal plate current.

(6) For operation below 250 Mc only.

(7) At 500 Mc.

Above you see popular Eimac tube types suitable for ham transmitters. Remember this chart when you need a tube. And remember the name Eimac. It means power. Quality. Dependability. For Eimac has more know-how, more experience with power tubes than any other manufacturer. Your local Eimac distributor can supply you with any of these tubes listed and Eimac sockets to match. Or for complete data, write Amateur Services Department, EIMAC—a division of Varian Associates, San Carlos, California.



and WAIFZE 16. All stations are welcome to check into these nets. SEC W1PRT feels that more can be done to promote EC work. Please help your local EC to develop local and inter-city nets operating regularly. N.E. Director WIQV would like club activity reports—everyone is invited to the Tri-City Hamfest in New London Oct. 7. Please have your club report to the Conn. Council via W1WHQ. New officers of the Shoreline ARC are WAIGJL, pres.; WAIFSK, vice-pres.; WAIFLZ, jr. vice-pres.; WAIGTP, secy.; WAICPB, treas.; WAIFOK, chaplain; W1ERM, trustee. New officers of the Conn. Wireless Assn. are W1ECH, pres.; K1HTV, vice-pres.; W1CNY, secy.; W1RZG, treas.; W1BGD, comm. mgr. The E. Conn. ARC 6-Meter "ECHIO" Net, Sun. at 10 A.M. on 50.538 Mc., would like more Conn. check-ins. A certificate is offered. Candlewood ARA is on 3775 at 8 P.M. Congratulations to WA1FVH and K1PGQ on making the BPL; to WA1FNG for Conn. first place in the Tenn. QSO Party and to WA1CRS for his efforts to interest others in amateur radio! The Tri-City Oscar group is now active. W1BGJ is active on 20-meter s.s.b. W1APA is operating 40-meter c.w. and s.s.b. W1BDI is rebuilding some of his equipment. W1CNY is very active on MARS nets. WA1FNJ operated portable during vacation. K1YON is working 220 Mc. Now is the time to contact ARRL with any Field Day suggestions for next year! Traffic: (July) WA1FVH 290, W1EFW 253, WA1HSN 175, WA1FE 163, K1PGQ 115, K1ELR 113, K1TKS 101, W1AW 98, W1EEN 89, K1EIC 89, W1GVT 69, K1RQO 52, W1KAM 50, K1EYV 48, K1UWO 42, K1SYT 32, W1BDI 31, WA1FNJ 30, WA1CBW 29, W1CTI 29, K1SXF 23, WA1FAZ 22, K1LMS 20, W1UY 15, K1OQG 12, K1YGS 12, WA1FNG 11, W1YBH 10, W1QV 9, W1WHR 9, W1BNN 6, W1CUH 6, WA1GOI 5, W1APA 4, W1ZL 4. (June) K1KSG/1 2.

EASTERN MASSACHUSETTS—SCM, Frank L. Baker, Jr., W1ALP—W1AOG, our SEC, received reports from Wis LVK, QMN, K1s H1N, WVW and PNB, all ECs. Sorry to report W1ADD is a Silent Key. E1M8OCWN had 31 sessions, QN1s 210, traffic 169, EM2N had 21 sessions, 100 QN1s, 92 traffic. WA1HX, ex-1CPW is in Andover. W1ZLX and his XYL went to the CHC/FHC Convention in Louisville, Ky. WA1ETC/GFT have an eleven-element beam for 2. WA1EC was in the July CD Party. W1KHV has a rig with an accuracy of + or - 10 cycles. K1C1L has a 110A-v.h.f. receiver. Heard on 75: Wis HE, PH, WA1s AOH, CFT, W1NHFC and WA1DHH are on 80 c.w. K2VTK is attending Harvard. WA1FSH has an SB-401. W1BGW reworked his 32S for better c.w. K1DZG had VE1s XK and NZ staying at his QTH. VO1E1 passed through. WA1HCL is now General Class and has an HQ-110C receiver. W1HHRX/4 is in Greensboro, N.C. K1H1N is equipped for all bands and modes. K1HRV is Asst. EC in Norwood. The Central N. E. Net for June had 1061 QN1, QTC 28, WA1GXC is building RTTY gear. W1DAL is DXing on 20, 40, 80 c.w. WA1EYQ got the receiver fixed. W1AOG has a new NC-200 and Hy-Gain trap antenna. K1KNI is on a mobile trip to Canada and the Midwest. W1N1FN is new in Freetown. WA1FIQ has a new beam for 6 and 2 meters. W1ADLT got the transmitter fixed. W1H1L handled a message for W1MJ from W4TY/2; they were at the Harvard Radio School in 1917. WA1EOT/1 is in So. Newbury, N.H. W1ADJC has antenna for all bands. New appointments: WA1FSH as EC for Natick, W1DAL as OO, WA1DGG as ORS. Appointments endorsed: Wis BGW, DFS, AYG, THT, K1C1L as OOs; K1ERO, W1s UB, Y1, STX as ECs; K1LGM, W1ZLX as ORSs; K1SCJ as OBS; K1PNE as RM for the Novice 80 c.w. band; K1FJM as OVS. The 6-Meter Crossband Net for June had 21 sessions, 189 QN1s, 11 traffic. WA1FTW is on many RTTY bands. WA1HVV has a rig for 80-10. The 6-Meter Crossband Net had 16 sessions, 107 QN1s, 2 traffic for July. W1ADOB has 1 kw. on 2. W1ADSZ has a new Zepp for all bands. K1CBB had a meeting of the Capeway RC at his QTH. WA1FWZ is the father of K1LEK. WA1ETC has a four-element beam for 6. W1AOG attended a meeting of the Cauton c.d. group with the Director W1REP, RO WA1CFT, Alt. RO and K1s SRP, HTN, WA1CON, W1s RYE and YZU present. WA1GFM has a three-element beam for 6 and a five-element beam for 2. We wish the new SCM of Western Mass., W1STR, the best of luck, and to W1BVR, who is retiring, the same. W1DPX says July was very good for 6-meter DX. K1FFE completed a 2 4-x-5 element Yagi for 2. K1FWF is building a final for 6. K1ZCU got hit by a car. K1FJM has 25 states on 6. WA1DFL says the Yogi Bear V.H.F. Society has been formed to help raise money for the Jimmy Fund. Look for members on 2 and 6, send reports to K1ZGH, work 4 members. Please note that this section is made up by the following counties: Barnstable, Bristol, Dukes, Essex, Middlesex, Nantucket, Norfolk, Plymouth, Suffolk. All others are in West. Mass. In Hudson we have 3 new Novices in one family: W1N1s IDJ, IDK and IDL. W1D1VX moved to

Westwood. K1BUF has an HX-50. WA1FKQ has an HA-1 keyer. W1UFB now is in Florida. New Novices: W1N1s IDM, IDO, IDQ, IDD, IDP, IDH, IDF, ID8. Other new ones: WA1s ICW, ICU, CCH, IDA, IBM, IBN, IAW, IBL, IAY, IAG, IAA, IAF, HXA, HXZ, HXD, HYT, HXC, HYU, HXV, HYK, HYW, HXR, HYY, HXE, HXF. Traffic: (July) W1PEX 308, WA1EYV 244, W1DOM 163, WA1EYV 109, W1EMG 107, WA1GXC 72, WA1FSI 70, W1CTR 69, W1UIR 63, W1EAE 43, WA1FKQ 43, W1DAL 42, W1EJCF/1 27, K1C1M 19, W1AOG 16, W1AD1E 16, WA1EYV 16, W1FJ1 16, K1LCQ 16, W1OFK 14, K1KNI 10, K1ZGH 10, K1H1N 6, K1OKE 6, K1VOK 6, K1YUB 4, W1ADLT 3, K1BUF 2, W1A1E2 2, W1H1L 2, W1NF 2, WA1EOT 1. (June) WA1GXC 58, W1EJCF/1 33, WA1EYV 29, K1KNI 20, W1C1T 14, W1ADJC 1.

MAINE—SCM, Herbert A. Davis, K1DYG—SEC; K1DYG, RM; W1BJG, PAM; WA1FCM. Traffic nets: Sea Gull Net, Mon. through Sat. on 3940 kc, at 1700; Pine Tree Net, daily on 3596 kc, at 1900. Welcome to WA1FCM our new PAM. He needs the support of all stations. There was a second annual gathering in Bangor at the home of W1OLQ. Among those attending were W1EOP, W1WST, W1FWA, W1KW, W1ANR, W1OCU, WA1FQO, W1LVC and K1PRR; also SWL Fred Tibbetts and wife. A fine time was had by all. About thirty hams and their families were on hand at the gathering at St. Albans with K1WQL. It was a great week and for all. W1GKJ worked K1DYG on 2 meters with very good results. WA1GTT, from Biddeford, is in the Berlin Brigade and active on 20 meters as DL4QG and looking for Maine stations. Dick, the old judge from Dexter, is operating from Labrador and looking for Maine stations. K1GUP and WA1FCM are helping out on the PTN. Duif has joined the TCC; he has a full schedule now. The PAWA has its station ready and will be active. K1TAL is home from the Pacific for three weeks. K1ACT has left for FBI training. Traffic: W1BJG 108, W1GU 30.

NEW HAMPSHIRE—SCM, Robert C. Mitchell, W1SWX/K1DSA—SEC; K1QES, PAM; K1APQ, RM: Open. Welcome to new hams WA1HZD, W1NHZM, W1NHZN, W1NHZO, W1NHZP, W1NHZS, WA1LAL, W1NHCE, W1NHCF, W1NHCL and W1NHCM. The GSPN report by K1APQ shows 804 check-ins and 74 traffic. K1D1WK has two new ones on 6 meters, South Dakota and New Mexico. K1PQV is busy with the Little League and 40-meter DX. The M1VAREC report by K1D1WK shows 180 check-ins and 19 traffic. W1RCC is at Expo 67 and checks into the nets from Montreal. K1NDA is in Goffstown and is net control on the GSPN and NHARECN. W1DYE is on a trip to California and other points. Your SEC, K1QES, is on vacation. K1SHC operates mobile from his vacation spot on the Kancamagus Highway. Several have reported working K1RNN portable in California. W1UXR is having a good time working 20-meter mobile. K1DVM is back from DU-Land and is on 6-meter mobile. W1ADA0 has moved to New London, N.H. Many of the GSPN members are heard often on CNEN in the mornings. We are short of news this month because of vacations and other reasons. Traffic: K1BGI 59, W1MHX 31, WA1EUJ/1 16, K1PQV 8, W1SWX 6, W1NHGL 4.

RHODE ISLAND—SCM, John E. Johnson, K1AAV—SEC; K1L1L, RM; W1BTV, PAM; W1TXL, V.H.F. PAM; K1TPK, RISP report: 31 sessions, 390 QN1, 67 traffic. An additional Field Day message was received by the SCM to be added to last month's report: FD message from W1CFT/1. W1E1E reports that he is the proud owner of a new NCX-5 Mark II and a VX-501. The SCM would be very glad to receive reports on activities of all hams. The W1AQ Club of Rumford, held a family picnic at Lincoln Woods. K1AMG, who was horseshoe pitching champion, was chairman of the picnic. K1CBO supplied the music with his portable stereo. W1WAC, K1CZB, K1LXQ, K1AAV, K1AGA and W1FNH all tried to win the horseshoe championship. K1L1L, of the club, is installing a Hy-Gain tower at his QTH. K1AGA and his XYL are proud parents of a new harmonic. W1LFW has plans to put his c.w. station on the air as soon as he completes renovations to his shack. K1HMO has purchased a new set of golf clubs but said this won't stop his ham activities. K1CZD is on s.s.b. with his Heathkit equipment. Traffic: (July) W1TXL 158, WA1EEJ 118, W1YKQ 29, K1VYC 24, K1TPK 11. (June) W1YKQ 107.

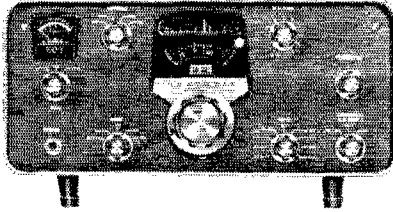
VERMONT—SCM, E. Reginald Murray, K1MPN—

(Gr. Mt.)	3855	2130Z	M-S (June)	660	27	W1VMC
Vt. Fone	3855	1300Z	Sun.	no		W1U1C
VTNH	3885	2230Z	M-F	report		K1U7C
VTCD	3890 1/2	1400Z	Sun.	33	1	W1AD
VT8B	3909	2130Z	M-S	693	73	W1CBW
		1230Z	Sun.			

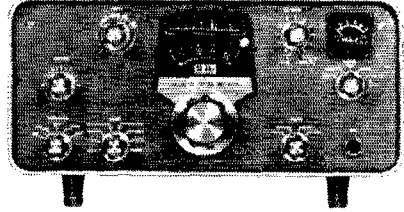


The World's Largest

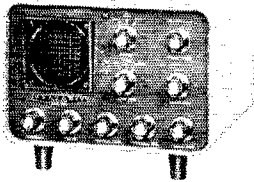
THE FAMOUS HEATHKIT® SB-SERIES . . .



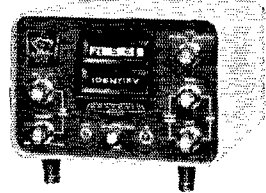
SB-301 Amateur Band Receiver . . . SSB, AM, CW, and RTTY reception on 80 through 10 meters plus 15 MHz WWV reception. Tunes 6 & 2 meters with SBA-300-3 and SBA-300-4 plug-in converters. (less speaker)
Kit SB-301, 25 lbs., no money dn., \$24 mo. **\$260.00**



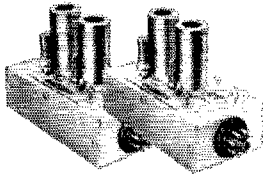
SB-401 Amateur Band SSB Transmitter . . . 180 watts PEP SSB, 170 watts CW on 80 through 10 meters. Operates "Transceive" with SB-301 — requires SBA-401-1 crystal pack for independent operation.
Kit SB-401, 36 lbs., no money dn., \$27 mo. **\$285.00**
SBA-401-1, crystal pack, 1 lb., no money dn., \$5 mo. **\$29.95**



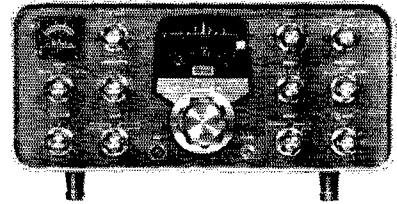
SB-610 Signal Monitor Scope . . . operates with transmitters on 160 through 6 meters at power levels from 15 watts through 1 kw. Shows transmitted envelope. Operates with receiver IF's up to 6 MHz. Spots signal distortion, over-modulation, etc.
Kit SB-610, 14 lbs., no money dn., \$7 mo. **\$69.95**



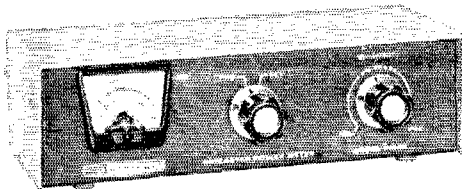
SB-630 Amateur Station Console . . . including 24-hour clock, SWR meter, 10 minute timer with audio-visual signaling, and more. Styled to match your SB-Series station.
Kit SB-630, 10 lbs., no money dn., \$8 mo. **\$74.95**



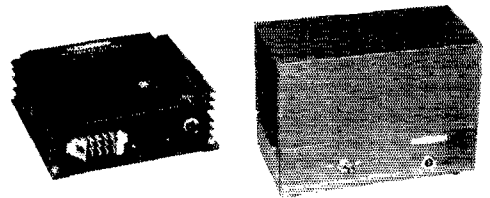
6 & 2 Meter Plug-In Converters For SB-301 . . . 10 meter output — operate from front panel switch on SB-301. Better than 0.2 uv sensitivity for 6 db signal-plus-noise to noise ratio.
SBA-300-3 (6 meter), 2 lbs. **\$19.95**
SBA-300-4 (2 meter), 2 lbs. **\$19.95**



SB-110 6-Meter SSB Transceiver . . . puts the famous Heath SB-Series on "6". 180 watts PEP input SSB . . . 150 watts CW — with single-knob linear tuning, 1 kHz dial calibration, and the ultimate in stability (less speaker).
SB-110, 23 lbs., no money dn., \$28 mo. **\$299.00**



HM-15 Relative Power SWR Meter . . . indicates forward and reflected power and SWR. Band coverage is 160 through 6 meters. Handles peak power well over 1 kw. Wiring options permit operation with either 50 or 75 ohm transmission lines.
Kit HM-15, 2 lbs. **\$14.95**

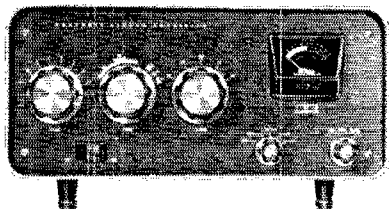


SBA-100-1 SB-Series Mobile Mounting Bracket . . . cantilever mounting for SB-110 and SB-101. Allows quick-change from fixed to mobile installation.
Kit SBA-100-1, 6 lbs. **\$14.95**
HP-13 Mobile & HP-23 Fixed Power Supplies . . . for SB-110 and SB-101 and "Single-Banders." All necessary voltages.
Kit HP-13, 7 lbs., no money dn., \$7 mo. **\$64.95**
Kit HP-23, 19 lbs., no money dn., \$5 mo. **\$49.95**

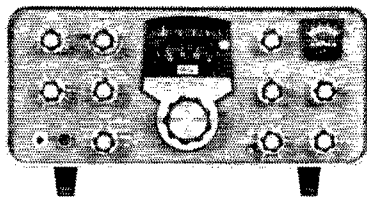
No-Money-Down Credit . . . Write for Application Blank

Selection of Amateur Radio Kits

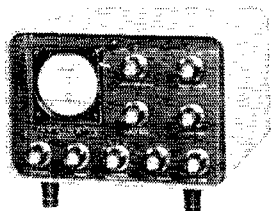
FINE EQUIPMENT AT LOWER COST



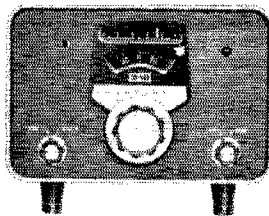
SB-200 KW SSB Linear Amplifier . . . 1200 watts PEP input SSB, 1000 watts CW on 80 through 10 meters. Built-in antenna relay, SWR meter, and power supply. Drives with most popular SSB transmitters & transceivers.
Kit SB-200, 41 lbs., no money dn., \$21 mo. **\$220.00**



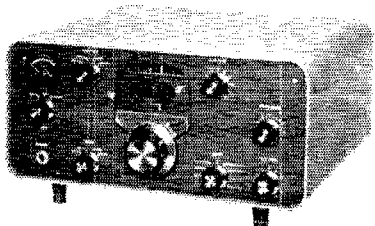
SB-101 80 Through 10 Meter SSB/CW Transceiver . . . 180 watts PEP input SSB, 170 watts CW. Front panel selection of SSB filter or optional CW filter makes the SB-101 an exceptional CW rig. Unmatched in engineering and performance.
Kit SB-101, 23 lbs., \$37 dn., \$35 mo. **\$370.00**



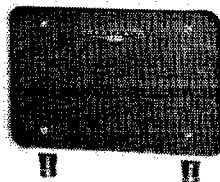
SB-620 Amateur Radio Spectrum Monitor . . . displays all received signals up to 250 kHz either side of receiver tuned frequency. New narrow sweep function shows 10 kHz for single signal analysis.
Kit SB-620, 15 lbs., no money dn., \$11 mo. **\$119.95**



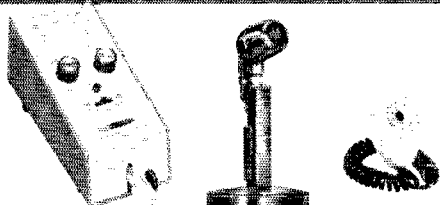
SB-640 External LMO . . . provides an additional LMO (Linear Master Oscillator) for independent control of SB-101 transmitter and receiver frequency.
Kit SB-640, 9 lbs., no money dn., \$10 mo. **\$99.00**



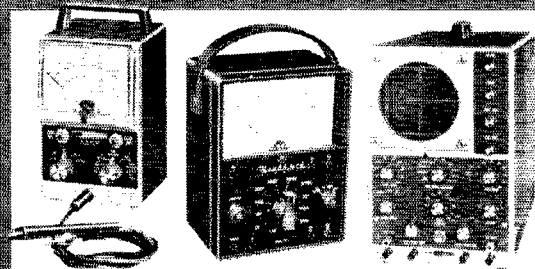
SB-310 Shortwave Listener/Amateur Band Receiver . . . covers 49, 41, 31, 25, 19 & 16 meter bands plus amateur bands 80, 40 & 20 and 11 meter CB. SB-Series performance and quality (less speaker).
Kit SB-310, 20 lbs., no money dn., \$23 mo. **\$249.00**



SB-600 Communications Speaker . . . matches the Heathkit SB-Series line and includes space for HP-23 fixed-station power supply. Features an 8 ohm 6" x 9" speaker with 300 to 3000 Hz response.
Kit SB-600, 6 lbs. **\$18.95**



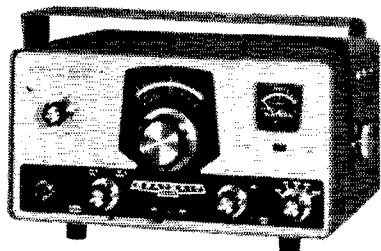
Communications Microphones & Solid-State Electronic Keyer . . . Heathkit recommended microphones for optimum voice communications. Electronic keyer features built-in sidetone to provide audio monitor . . . no relays to stick or chatter . . . speed ranges 10 to 20 wpm and 15 to 60 wpm. Grid block keying transmitters only.
HDP-21A Desk-top microphone, 4 lbs., no money dn., \$5 mo. **\$29.40**
GH-12 Hand-held PTT mike, 2 lbs. **\$6.95**
HD-10 Electronic Keyer, 6 lbs., no money dn., \$5 mo. **\$39.95**



A Complete Line Of Test Instruments . . . to provide the ham with professional instrumentation at a price he can afford. Features **New Heathkit Instrumentation Series** . . . solid-state Volt-Ohm meters, power supplies, and more! See the "new look", new performance instruments in the 1968 Heathkit catalog.

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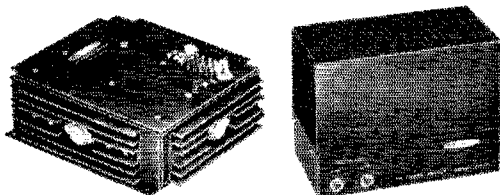
The New Single-Bander Transceivers . . . provide 200 watts PEP SSB input on the band of your choice. Now with LSB or USB on 80, 40, or 20. New styling, plus AVC, ALC, S-meter, PTT, and VOX.

Kit HW-12A, 80-mtr., 15 lbs., no mon. dn., \$10 mo., **\$99.95**
Kit HW-22A, 40-mtr., 15 lbs., no mon. dn., \$11 mo., **\$104.95**
Kit HW-32A, 20-mtr., 15 lbs., no mon. dn., \$11 mo., **\$104.95**



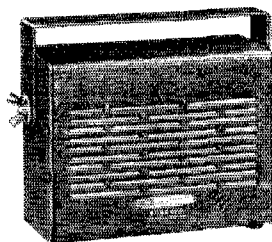
HA-14 "KW Compact" KW SSB Linear Amplifier . . . 1000 watts PEP input SSB on 80 through 10 meters. Built-in SWR meter. Built-in antenna changeover relay. Pretuned broad-band input circuit requires no tuning. Full provisions for control of "remotely" located fixed or mobile power supplies.

Kit HA-14, 10 lbs., no money dn., \$10 mo. **\$99.95**



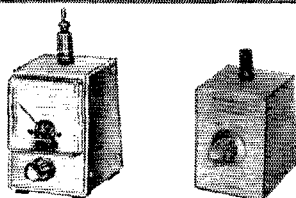
HP-14 Mobile & HP-24 Fixed Station Power Supplies . . . for the "KW Compact". Provide all necessary operating voltages. HP-14 recommended for 12 v. alternator, negative ground cars only.

Kit HP-14, 10 lbs., no money dn., \$8 mo. **\$79.95**
Kit HP-24, 22 lbs., no money dn., \$5 mo. **\$49.95**



HS-24 Mobile Speaker . . . this 8 ohm speaker provides excellent communications response. Features a husky steel cabinet & gimballed mounting bracket.

Kit HS-24, 4 lbs. **\$7.00**



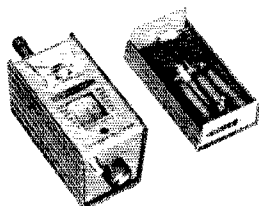
Amateur Station Accessories . . . PM-2 RF Power Meter indicates transmitter relative power. Covers 100 kHz to 250 MHz. No power connections or battery required. **HD-20 100 kHz Crystal Calibrator** provides accurate calibrating signals every 100 kHz up to and beyond 54 MHz. Uses 9 volt battery (not included.)

Kit PM-2, 2 lbs. **\$12.95**
Kit HD-20, 1 lb. **\$14.95**



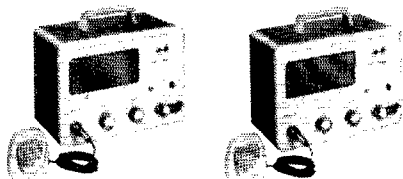
Tools For The Amateur Station . . . HN-31 "Cantenna" Transmitter Dummy Load . . . provides a non reactive 50 ohm load to transmitters up to 1 kw . . . better than 1.5:1 SWR for frequencies 160 to 2 meters. Oil coolant not included. Soldering iron kits, needle nose pliers, nut drivers, and more are included in the new 1968 Heathkit catalog.

Kit HN-31, 3 lbs. **\$9.95**



HM-10A Solid-State "Tunnel Dipper" . . . a solid-state version of the classic grid-dip meter. Features a tunnel diode oscillator. Covers 3 to 260 MHz. Uses an AA penlite cell (not included.)

Kit HM-10A, 3 lbs., no money dn., \$5 mo. **\$29.95**

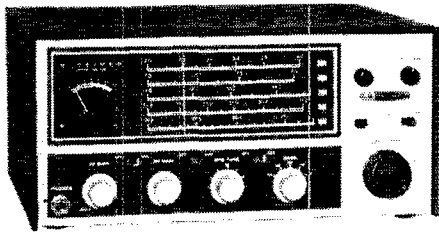


Benton Harbor Lunch Boxes — Complete Transceivers . . . for 6 and 2 meters. Feature crystal-controlled transmitters with 5-watt input and tunable super-regenerative receivers with RF stage. Built-in 115 VAC power supply and speaker. Mike included. Less crystal.

Kit HW-29A, 6-meter, 9 lbs., no money dn., \$5 mo., **\$44.95**
Kit HW-30, 2-meter, 9 lbs., no money dn., \$5 mo., **\$44.95**
Kit GP-11, Mobile Vibrator Power Supply, 6 lbs. . . **\$17.95**

Selection of Amateur Radio Kits

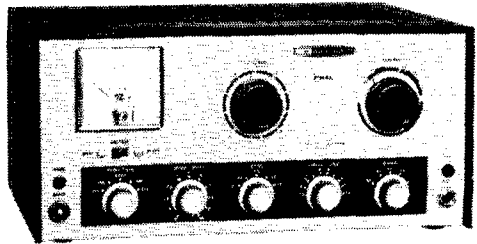
ON \$25 TO \$300 PURCHASES...WRITE FOR APPLICATION



HR-10B Amateur Band Receiver ... with new extra-durable two-tone wrinkle finish to match the new "Single-Banders" and novice transceiver. Tune AM, CW, and SSB with 80 through 10 meter coverage. Provisions for plug-in 100 kHz crystal calibrator.

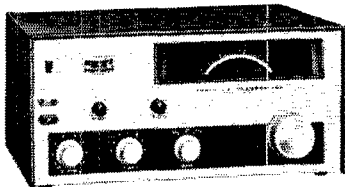
Kit HR-10B, 20 lbs., no money dn., \$8 mo. **\$79.95**

Kit HRA-10-1, 100 kHz crystal calibrator, 1 lb. **\$8.95**



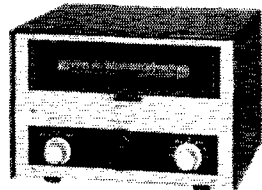
DX-60B Phone & CW Transmitter ... with new wrinkle finish matching HR-10B and the new "Single-Banders". Here's 90 watts on 80 through 10 meters ... operates at reduced power for novice class.

Kit DX-60B, 24 lbs., no money dn., \$8 mo. **\$79.95**



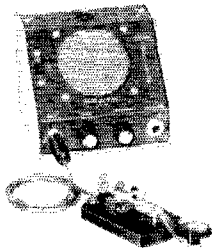
New HW-16 Novice CW Transceiver ... a high-performance 3-band CW transceiver ... covers the lower 250 kHz of 80, 40, & 15 meters. 75 watts input for novice class — 90 watts for general class. Provisions for VFO transmitter control with Heathkit HG-10B.

Kit HW-16, 25 lbs., no money dn., \$10 mo. **\$99.50**



HG-10B VFO — Perfect For The DX-60B or HW-16 ... provides 5 volts RMS signal — plenty of RF for Heathkit rigs and ample for most transmitters. Calibrated for 80 through 2 meters. Requires 108 volts DC @ 25 ma., 6.3 VAC @ 0.75 amperes.

Kit HG-10B, 12 lbs., no money dn., \$5 mo. **\$37.95**

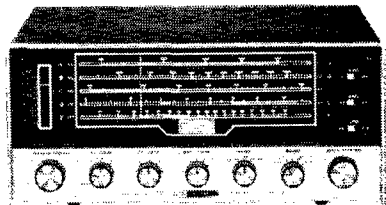


New HD-16 Code Practice Oscillator ... includes radio telegraph key ... a complete code-practice outfit. Perfect for future hams. Controls let you adjust both tone and volume. Switch for blinker light or tone. Build-in speaker and jack for headphones. Requires two 9 volt batteries and one "C" cell (not included).

Kit HD-16, 3 lbs. **\$8.95**

Heath Recommended Headphones GD-396 ... excellent for shortwave listening or code practice.

GD-396, 1 lb. **\$3.50**



GR-54 General Coverage Receiver ... 5-bands covering 2 MHz to 30 MHz plus broadcast band & 180 kHz to 420 kHz navigation frequencies. A selective, stable receiver for AM, CW, & SSB. Excellent for the novice, beginner, or short wave listener.

Kit GR-54, 25 lbs., no money dn., \$9 mo. **\$87.95**



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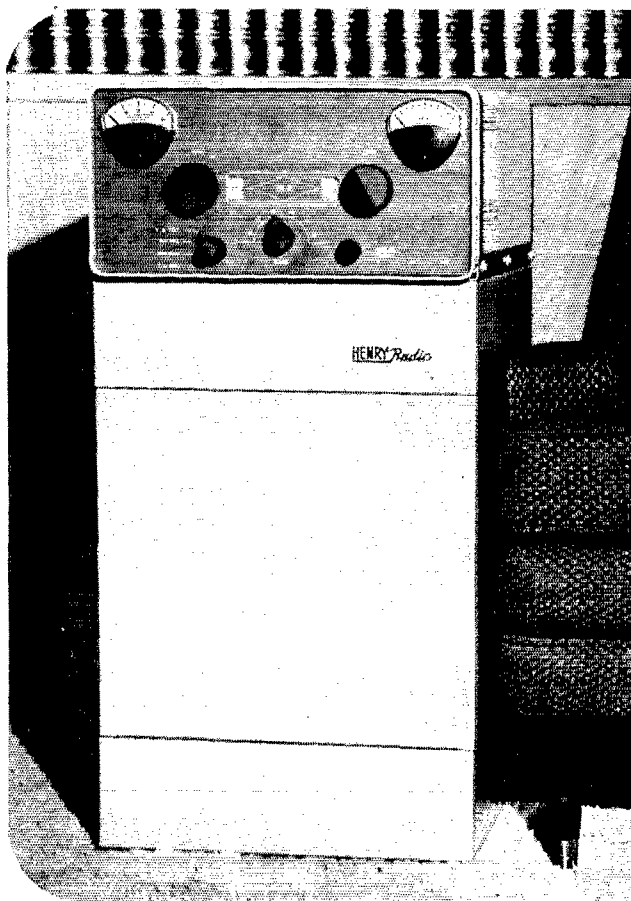
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Welcome to new calls in Vermont: WA1HXU, Springfield; WN1HYG, Rutland; WN1IBW, Northfield. Credit and thanks should go to many Vermonters for considerable help and patience in assisting the search for a Kentucky boy bitten by a rabid dog. Hope we will get reports from the Vt. Intercom Net soon. Quite a few 2-meter f.m. units are now in the area with an anticipated increase of activity. Net reports are slow reaching me. It's good to hear W4SCY/1 again. K1LJ has a new SB-101. Traffic: (July) K1BQB 287, WA1GUV 12, K1MPN 12. (June) W1FRT 5.

WESTERN MASSACHUSETTS—SCM, Norman P. Forest, W1STR—C.W. RM: W1DWA, W1UPI has a new shack in his back yard, pot-bellied stove and all. Congratulations to K1AEC, newly appointed as ORS in the WAIN C.W. W1DNE is helping the Boy Scouts to obtain their Novice licenses. Bob Patten, ex-W1GIV, is now in Florida with the call W4OZF. Congratulations to W1MING, recently appointed instructor at Westfield State College where he surely will introduce amateur radio. Frank Miller has eliminated the "N" from his call and is WA1GOK. K1PMK is now a double grandpa. K1NWE is using his swimming pool for r.f. ground with good success. W1ZPB finally mounted his tri-band on a telephone pole but is not convinced of much improvement. However, he has enjoyed 6-meter openings. Information from the Worcester County area would be appreciated. We need volunteers to gather news items for this column, which would be much appreciated. W1MN: 21 sessions with 45 messages handled. The following were active at least 10 sessions: W1DWW, K1AEC, K1WZY, K1LJV, W1ZPB, W1BVR reports that he is gradually getting settled at his new QTH in Hinsdale. The boys already have indicated they miss you, Perce. Many important appointments are open and need filling very badly. We need your help so please write today. Don't wait. Traffic: K1LJV 56, W1DWW 41, K1AEC 31, W1DWA 24, W1ZPB 10, W1N1HHA 1.

NORTHWESTERN DIVISION

ALASKA—Acting SCM, Albert F. Weber, K17AEQ—KL7DG, who had to give up the SCM post, will be Asst. SCM in the Anchorage area. We would like to hear from all Alaskan hams who are League members and interested in League appointments. The ARRL convention at Anchorage was a huge success and we were all happy to see John Hutton and other League officials up here in the Northland. KL7EKZ has been transferred to Sitka. DXers who knew KL7ADR will be saddened to hear he was killed recently in an auto accident near Fairbanks. KL7COX is now operating from Nenana. KL7IS has retired from FAA and he and Flo, KL7DDB, are building a cabin across the lake. Their 2-meter signal is just as good from the new QTH into Fairbanks via McKinley, Nancy. KL7FCG, can be heard around 14.255 using VK7ZA and Sandy is holding down the home-stead and cranky power plant at KL7EWH. Bill and Rose, ex-KL7AN and ZR, were up from Oregon for the convention. Nenana was flooded recently and June, KL7-DEJ, flew down with KL7DP moved the traffic to Fairbanks on 2. W1CB/KL7 is back on the air. Would like to get news from all Alaska areas. How about club papers? Traffic: KL7CAH 94.

IDAHO—SCM, Donald A. Crisp, W7ZNN—The FARM Net convenes Mon. through Fri. on 3935 kc. at 0100 GMT. W7DWE has a new NCX-3 mobile installation. K7UAE installed an end-fed long-wire. W7FBL is building a linear with two 4-440s. The Pocatello Club held a farewell dinner party for K7IMB, who is moving to Laramie, Wyo. K7LCW is pres. and Dave Billock is secy.-treas. of the Pocatello Club. W7BDD built a nice-sounding completely home-made s.s.b. station. W7UO is a new OO. 175 amateurs and their families attended the WIMU Hamfest at Mack's Inn. W7DYG was elected pres. for 1968, replacing K7GOG. W7AHGV is a new ham at Soda Springs. K7CPC moved and is installing new antennas. W7BDD made the BPL for the second month. Velma, W7YON, rode a motorcycle from Boise to the Yakima Hamfest, FARM Net report for July: 19 sessions, 408 check-ins, 26 traffic handled. Traffic: W7BDD 183, W7AETO 50, W7ZNN 22, W7GGV 12, K7OQZ 12, K7OAB 6.

MONTANA—SCM, Joseph A. D'Arcy, W7TYN—Asst. SCM/SEC: Harry Roylance, W7RZY. OBSs: K7EGJ, K7UPEL.

Montana Traffic Net	3910 kc.	1900	MDST	M-F
Montana PON	3885 kc.	0900	MDST	Sun.
Montana RACES	3906.5 kc.	0900	MDST	1-3 Sun.
Missoula Area Net	3900 kc.	0900	MDST	Sun.
Great Falls AREC Net	3910 kc.	0930	MDST	Sun.

WA7DMA is a new ORS. The hamfest held at Apgar in Glacier Park was a great success. The gang from Kaspell and Columbia Falls did a great job. Next year's hamfest will be on the Canadian side at Waterton Lakes and will be sponsored by the Alberta Relay League. The Gallatin Radio Club station, W7ED, has a new tri-band beam. W7DFC is moving to Billings from Bozeman. W7CGG has moved from Helena to Bozeman. W7ROE has moved to Butte from Columbia Falls. W7CPS is back on the air with an HT-32, SX-115 station. W7NJI made two trips to San Diego during July to assist with planning of the new communications system for the U.S. Navy. The WIMU Hamfest this year was sponsored by Wyoming and K7GOG was pres. Next year it will be sponsored by Montana and W7WYG will be pres. W7-FOB and W7TUO both operated portable from Seeley Lake on their vacations. Traffic: K7LDZ 20, K7EGJ 10, W7FL 8.

OREGON—SCM, Dale T. Justice, K7WWR—RM: W7ZFH, PAM: K7RQZ. Section nets inviting your participation:

Net	Freq.	Time	Days	Net Mgr.
AREC	3875 kc.	0200Z	Daily	WA7AHW
BSN	3823 kc.	0030Z-1900Z	Daily	K7IFG
OSN	3585 kc.	0200Z	Tue.-Sat.	W7ZFH

WA7AHW reports for the AREC Net, July, sessions 31, check-ins 582, traffic 11, contacts 65, QSTs 8, maximum number of counties 15. K7IFG reports for BSN, June, sessions 60, traffic 150, contacts 182, check-ins 911. WA7-RYP is sending code practice on 3643 kc. and 7083 kc. at 2100 Pacific Time Wed. and Sat. Speeds of 10, 15, 20, and 25 w.p.m. are sent for ten minutes each. WA7CPI has a linear now with a pair of 4-125s. WA7BYP is also going high power with a homebrew pair of 811s. New hams in Grants Pass are WN7HRG and WN7HYE. WA7GFS is portable at Baltimore, Md., where he is going to school. WA7CIP is on 2-meter f.m. and working Pendleton and The Dalles via the repeater. K7RXV, portable at El Paso, has been on 20 meters telephone relaying. K7RQZ keeps knocking on the BPL door, but still hasn't made it. K7WWR is now located in Forest Grove. Traffic: (July) K7RQZ 404, WA7BYP 198, W7ZFB 143, K7IFG 112, WA7CIP 66, K7WWR 66, WA7DOX 33, WA7DPK 26, W7DEM 11, WA7GFS 10, K7KPT 8, WA7-CPI 6, WA7EES 5, W7MLJ 5. (June) W7ZB 104.

WASHINGTON—SCM, William R. Watson, K7JHA—SEC: W7UWT, RM: K7C7P, PAM: W7BUN.

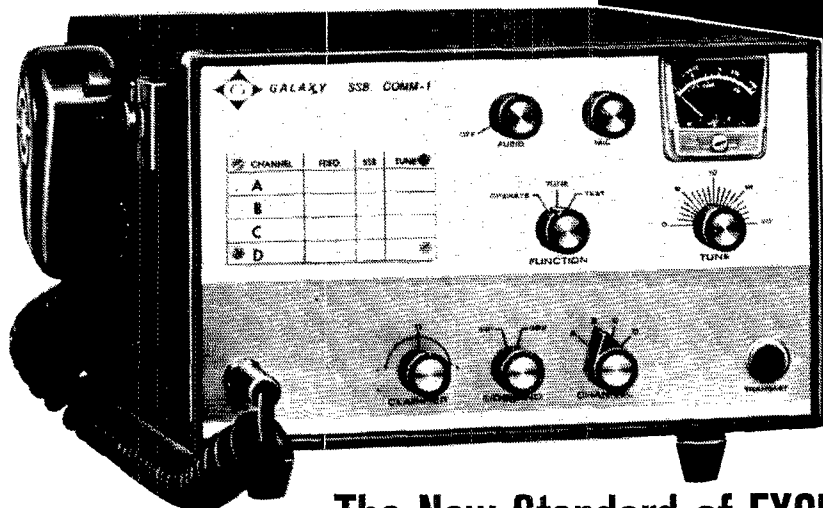
WSN	3535 kc.	0200Z	Daily Traffic 482,	QNI 342,	Sess. 31
NTN	3970 kc.	1830Z	Daily Traffic 547,	QNI 920,	Sess. 31
WARTS	3970 kc.	0100Z	Daily Traffic 134,	QNI 1261,	Sess. 26

The Washington State Hamfest, sponsored jointly by WARTS, NTN, CBN, and supported by the Puget Sound Council of Amateur Radio Clubs, kicked off a busy month. ARRL, QCWA and Eyebank Net displays trimmed the lobby at the Yakima County Fairgrounds. Compliments to the Yakima Club on the planning and arrangements. New officers of the WARTS Net—Directors: W7IEU, NW: W7ZHZ, SW: WA7DXI, NE: K7-RAO, SE: Director at large, K7MGA; mgr., K7YFJ; secy., K7JAJ, recorder, W7MCW. Charter Life Members of ARRL reported to date: K7YFJ, W7UWJ, W7UJAN/7, W7UO, K7JHA, WA7DXI, WA7DTO signed for 5 years. W7PGY, K7JHA and W7SAB attended the Alaska Convention. Main speaker at the Yacoma Club in July was State C.D. Radio Officer Don Downing, who has made himself available on request to address clubs throughout the state. The Dial Twisters of Spokane went over the top in ARRL membership. SCM K7JHA will attend the club's Oct. meeting. SEC W7UWT is moving ahead in reorganization of the AREC. The Walla Walla Club will have its Annual Hamfest Oct. 1 in Walla Walla. New appointments: W7AG, W7AXT, W7PUL as OBSs; W7-PUL, WA7DXI as OVSs. WSN Net members now are sporting new net certificates. Spokane hosted the NW QCWA meeting with 53 attending. K7EAM reports code and theory classes will be started in Oct. by the Spokane Amateur Radio Club. K7YDZ is a new OPS. The Skagit Club continues week-end camp outings. W7REC/K7KXN toured Reno. W7GSP is building a new DX site. K7YDZ got his WAC and worked YJ1 and DL2. OBS W7IEU has been busy filling in on transmissions for other nets during vacations. OO W7AXT worked over his measurement gear and OO WHDL sends in another FB report. J7MGA reports a new call for the week-end retreat at High Valley Park near Packwood is WA7HYB. WA7DXI returns from a vacation in W6-Land to help with Boy Scout Jamboree station K7WSJ via the 2-meter link. K7VNB is pitching in with an FB assist to the Scouts. W7ZIW now has QSK. W7DZX says, "Too many cherries this season." W7RXH finally got the beam up and a 40-meter dipole. W7AMC now is on 6 meters for the

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AMPLIDYNE 621 VHF Xmttr \$149	COLLINS 310B-1 Exciter \$ 49 75A-2 Receiver 219 75A-3 Receiver 269 75A-4 (ser. 1729) 375 75A-4 (ser. 1765) 375 75A-4 (ser. 2208) 395 75A-4 (ser. 2289) 395 75A-4 (ser. 3159) 425 Sptr. (A1, A2, A3) 9 75S-1 Receiver 295 75S-3 Receiver 399 75S-3B Receiver 449 51 J-4 Receiver 895 32V-1 Transmitter 99 32V-3 Transmitter 199 KW-1 AM Xmttr 995 32S-1 Transmitter 375 312B-3 Speaker 15 KWM-2 Xcvr 750 136B-2 Blanker 75 516F-2 AC supply 115 516E-2 DC sup (28v) 95 MP-1 DC supply 119 PM-2 AC supply 95 CC-2 Carrying case 65	ELMAC A-54 Xmttr (AS-IS) \$ 15 AF-67 Transmitter 49 AF-68 Transmitter 65 PRM-8 Receiver 89 PSA-500 AC supply 12	GLOBE/GALAXY/WRL Scout Deluxe \$ 49 Scout 680 Xmttr 29 LA-1 Lin. Xmttr 69 Chief 90 Xmttr 29 Hi-Bander 62 89 King 500A Xmttr 225 King 500B Xmttr 249 DSB-100 SSB Xmttr 49 SB-175 SSB Xmttr 59 755 VFO 24 755A VFO 29 V-10 VFO 29 PSA-300C AC sup. 49 Galaxy V Xcvr 295 RV-1 Remote VFO 49 VX-1 VOX 12 DAC-35 Console 69 UM-1 Modulator 29 Rejector 15 Compressor 15 CW Monitor 9	3275 6m 12v conv. 29 6m H.V. conv. 15 Squeich/Clipper 9	HALLICRAFTERS S-20R Receiver \$ 49 S-38E Receiver 34 S-85 Receiver 69 SX-96 Receiver 125 SX-100 Receiver 139 SX-101 Mk I Rec 125 SX-101A Receiver 199 S-107 Receiver 59 S-108 Receiver 69 SX-110 Receiver 89 SX-111 Receiver 139 SX-115 Receiver 349 SX-117 Receiver 225 S-120 Receiver 45 SX-130 Receiver 119 R-48 Speaker 12 HT-32 Transmitter 249 HT-32A Xmttr 299 HT-33B Linear 395 HT-40 Transmitter 49 SR-150 Xcvr 325 SR-160 Xcvr 189 PS-150-12 DC sup. 75 HA-6 Transverter 89 P-26 AC supply 45 SR-34(AC) Xcvr 175 SR-46 6m Xcvr 125 SR-46A 6m Xcvr 139 HA-10 L.F. tuner 12	PIERSON KE-93 AC supply \$ 12	POLYTRONICS PC-2 2m Xcvr \$175 PC-6 6m Xcvr 149 PC-62B 6-2m Xcvr 189
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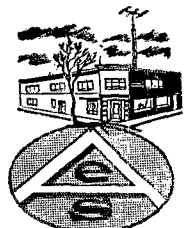
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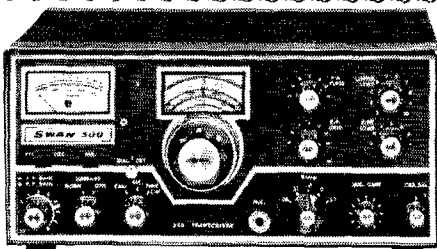
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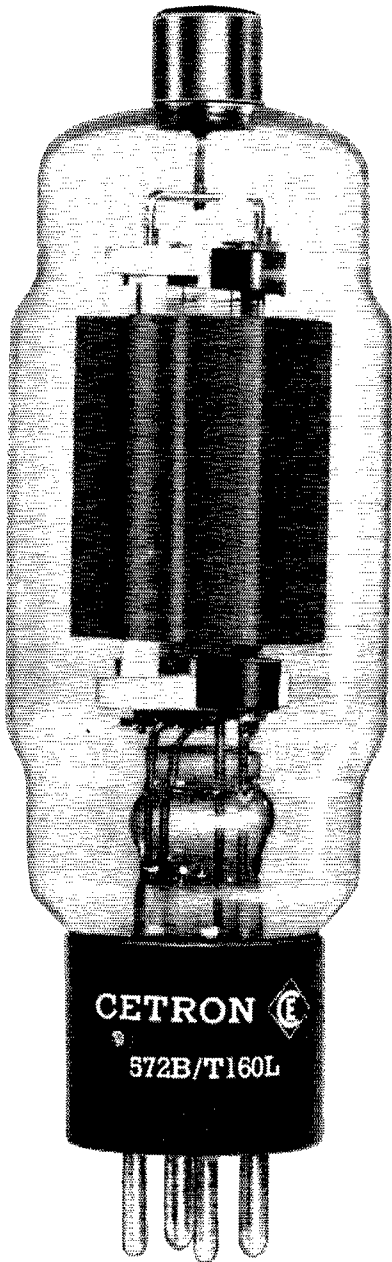
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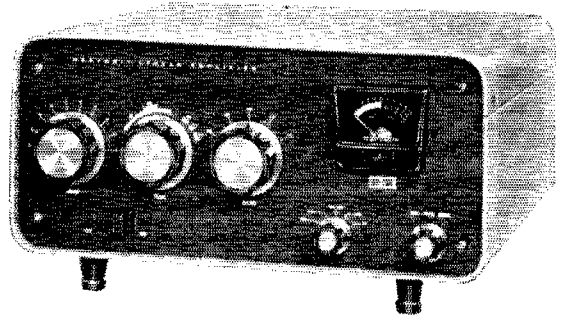
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572B/T-160L SSB Grounded Grid Linear Amplifier Service Maximum Ratings Per Tube

DC Plate Voltage.....	2750 volts
DC Plate Current.....	275 ma
Plate Dissipation.....	160 watts
Filament Voltage & Current.....	6.3 v @ 4.0A

Typical Operation — Two Tubes (ICAS)

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DC Grid Voltage.....	-2.0 volts
Single Tone DC Plate Current.....	500 ma
Zero Signal DC Plate Current.....	90 ma
Driving Power.....	100 watts

- Features a rugged graphite anode • Durable bonded thoriated tungsten filament • Optimum envelope size for minimum cooling requirements vs. space considerations • Low operating voltage for minimum power supply cost

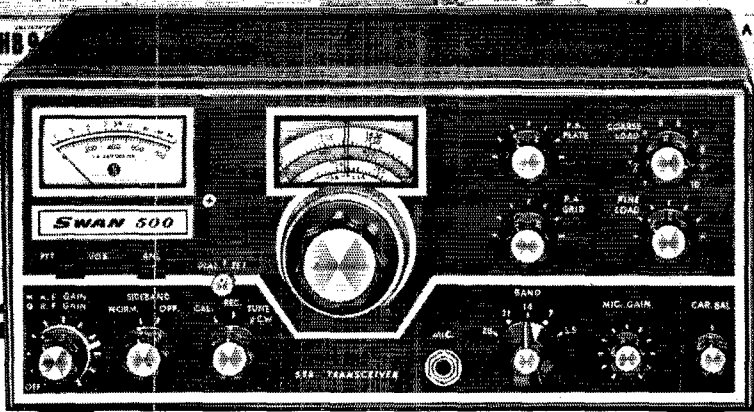
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At the top of the Swan line, the 500 offers many extra features: Automatic noise limiter, selectable upper and lower sideband, 100 kc crystal calibrator, and provision for installation of an internal speaker.

The new 500 is equipped with the finest sideband filter used in any transceiver today. With a shape factor of 1.7, ultimate rejection better than 100 db, and a carefully selected bandwidth of 2.7 kc, this superior crystal filter combines good channel separation with the excellent audio quality for which Swan transceivers are so well known.

Frequency coverage of the five bands is complete: 3.5-4.0 mc, 7.0-7.5 mc, 13.85-14.35 mc, 21-21.5 mc, 28-29.7 mc. (In addition, the 500 covers Mars frequencies with the 405X accessory crystal oscillator.)

If you are a QSL collector, then the new Swan 500 is the item for you. **\$495**

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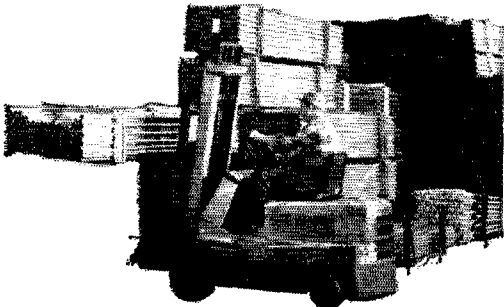
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o.d. W7BTB is shuttling traffic back and forth to Alaska. K7KSF/KSE left for San Jose. K7VNV is working on a new 6-meter repeater at Rattlesnake Mountain. W7OEB and WA7GCW worked Field Day at Farragut, Idaho. Appointments are open as OVSS. Traffic: (July) W7BA 1887, K7TCY 889, W7HMA 828, W7ZIW 786, W7PI 323, W7JEY 232, K7CTP 225, WA7DXI 169, W7BTB 105, W7AXT 96, W7DZX 92, K7JHA 88, W7MCW 60, W7IEU 53, WA7EDQ 50, W7AIB 31, W7APS 31, W7AMC 27, K7MGA 27, W7UU 17, W7OEB 16, W7PGY 14, W7RXH 11, K7ULJ 9, K7YDZ 9, WA7EMM 8, (June) W7OEB 66, W7AIB 10, K7MGA 9.

PACIFIC DIVISION

EAST BAY—SCM, Richard Wilson, K6LRN—W6EY sends his July report from Expo 67. Vice-Director W6ZF sends his report on a 20-year-old Form 1 and says he is getting his gear ready for winter operations. Last winter he said he was getting ready for summer. W6TYM was chairman of LARK's Field Day operation from Camp Parks. W6OA's XYL now has her General and is WB6TZG. They are located in Orinda. W6UZX is manager of NCN/2, the slow-speed section of NCN, and made 124.4K QSOs in the July CD. WB6FHH made 121K in the same test and then took off for a vacation at Tahoe. W6UB and others in the San Leandro Amateur Radio Club had a display of ham radio at the Bayfair Shopping Center in San Leandro and originated many MARS messages. K6TFT is working part-time in a TV store and worked with the NBARA providing July 4 activities communications in Vallejo. W6HUY, Napa, has his rig operative again. WA6RRH still is plugging away at BARN. How about giving Chuck a blast on 145.42 at 8 p.m.? W6NZ has been very active telephone relaying for the USS *Repose* and USS *Sanctuary*, in July 159 with 128 completed and in June 82 with 65 completed. WB6PCQ is now operating with a 100V-600L combo. K6LRN is on PAN. The East Bay section was 40th out of the 74 ARRL sections. We did not gain any ground nor did we lose. It takes many traffic reports not just a few with large totals. Even if you only handle 1 or 2 messages per month it will all add up and help our average. Traffic: (July) W6IDY 361, WB6PCQ 272, W6UZX 182, WB6FHH 108, K6LRN 34, K6TFT 6, WA6RRH 4. (June) W6TYM 92.

HAWAII—SCM, Leo R. Wical, KH6BZF—SEC: KH6GHZ. PAM: Vacant. V.H.F. PAM: KH6EEM. RM: KH6GGR.

Net	Freq. (Mc.)	Time (GMT)	Days
League Appointees	7.290	0700Z	Wed
Friendly Net	7.290	2030Z	M-F
Pacific Interisland	14.330	0830Z	All

A recent trip took me to W6-0-, 9-, 8-, 4-, 3-, 2-, 1-, VE1-, VE2-, W7- and XE1-Lands. Met K8HQR, W8OOH, W8NTZ, hubby and XYL team W8SZU/W8EFB, K8KEM, K8PSM, drove past W8TNZ, called WB6WEG, ex-KH6FIF, missed KH6EPW and KH6FBJ/3, visited WA6QHQ, K6UJW and W1AW. When my family and I arrived at Montreal Expo 67 was just as 3C2BSK pictured it on the June '87 QST cover. The Hawaii QSO Party logs and QSLs are rolling in. KH6AX has been on with his new KWM-2. KH6BZF spoke at the recent Central Pacific ARC meeting at Kemoo Farms. KH6GEW was TAD/TDY to KL7-Land and has returned to our sunny shores. KH6FON moved with his family to No. Car. KH6GAJ is off to school in St. Louis. Remember the FEARL in Japan meets regularly each 2nd Fri. of the month. The Schofield Bks Education Center (East) just finished another radio class. KH6GAP is a vice-pres. with Page Comm. Engineers. KH6FOC is on the West Coast. Ex-KH6CRL mans KR6USA, the U.S. Army StratCom station on Okinawa. WOHDQ/KH6 has completed a new linear. KH6GHZ, CHC No. 269, made FHC No. 1229. KC6PE has closed down on Ponape because of the closing of the Pacific Scatter system that linked Oahu, Kauai, Midway, Wake, Guam, Ponape, Koror and Okinawa on 50.0 Mc. KH6GGR writes that W6OUL and his XYL were Hawaiian house guests. W6RGG was in the islands attending the ABA Convention. WB4DWB/9Y4TW, ex-KH6EWD, ex-WA4CLK and ex-WA2OMH, writes from Trinidad. W.I. KH6IJ recently returned from KA2LJ/Fuehu Air Station. KH6DQ, KH6CJL and KH6COB all work at Waipahu Garage. W4UAF/KH6 is recuperating from surgery. Traffic: (July) KH6GHZ 148, (June) KH6GHZ 128, KH6EOQ 12. (May) KH6EOQ 40.

NEVADA—SCM, Leonard M. Norman, W7PBV—SEC: WA7BEU. The southernmost amateur in Nevada is K7JUN. K7RKH and family are visiting in W4-Land. W7TVF still is providing contacts for those needing Nevada DX and stateside. W7PRM and family are visiting in the Northwestern Division. The Southern Nev-

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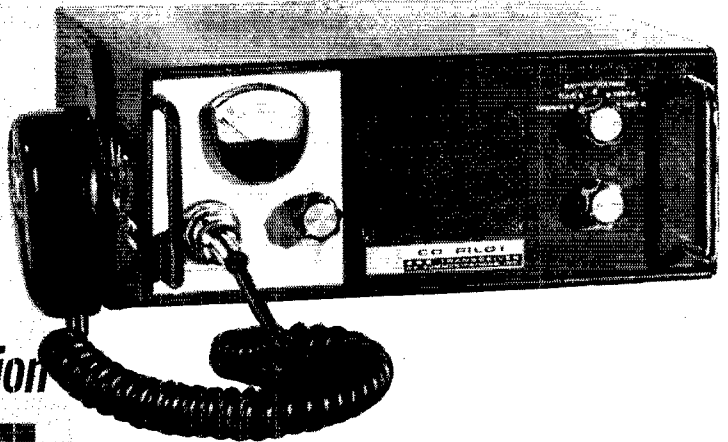
vada f.m. group has its repeater 146.94 receive and 147.5 transmit located on a hill between North Las Vegas and Boulder City which provides coverage for most of Southern Nevada. W7BF is looking for more Collins gear to complete his home station. NARA members are coming out with new QSL cards, thanks to one of the local clubs. W7VYC is a local pilot and is looking forward to being checked out in a glider. W7JU is on s.s.b. W7YRY has a model 15 teletypewriter.

SACRAMENTO VALLEY—SCM, John F. Minke, III, WA6JDT—SEC; WB6BW B, ECs; WB6MXD, K6KHW, WB6RSY, W6SMU, WA6TQJ, RM; W6LNZ. The ARPSC Bulletin has just been distributed. Section standings for AREC activities shows Sacramento Valley in 2nd place in its class (13th last year) and 2nd place overall. Last year we placed 53rd overall! We can thank the prompt and constant reporting of our SEC and ECs for this great improvement. Let's get behind our SEC and ECs and give them support. As for NTS activities we went from 53rd to 51st place. To all traffic-handlers: Please report your traffic count to me so we can credit it to the section. WB6QZZ, in Anderson, is a new ORS. The RAMS held its July 4th Outing at Grover Hot Springs in Alpine County. That should have driven the rare county hunters wild! WA6FWU is enjoying 6-meter activity in Soda Springs. WA6CXB is now chief NCS of the SCEN. WB6MPP put up a new 20-meter beam. WB6VBB is now on s.s.b. in Carmichael. K6IKV has been handling traffic from W6LZ/6 at the Loon Lake Boy Scout camp. Winter is approaching—let's get those antennas in shape before the rains (or snow at WA6-FWU's QTH). Traffic: (July) W6LNZ 145, WA6JDT 40, K6IKV 16, K6YZU 5, WB6EAG 4, WB6MXD 3, WA6-CXB 1, W6VUZ 1. (June) W6NKR 7.

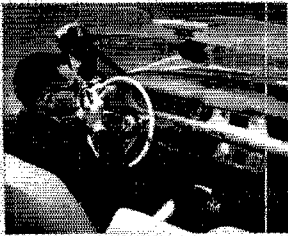
SAN FRANCISCO—SCM, Hugh Cassidy, WA6AUD—WB6QAT has his Viking II working fine after some modifications and is working the high-speed c.w. San Francisco moved from 48th to 37th place in 1966 in the standings of the ARRL sections for traffic-handling. Big traffic totals from W6WLW, W6KVQ and W6JXK helped move the section way up. W6CYO has gone the full Collins line and is looking for more DX after making the DXCC. K6TZN and W6KVQ can be heard as net controls on the Mission Trail Net. Checking into and handling traffic on the Northern Calif. Net are WA6BYZ, W6WLW and W6JXK. More check-ins to this traffic system are needed—especially Marin and Mendocino Counties. W6DTV has been operating portable from Old Station on the north slopes of Mt. Lassen. The Tri-County Emergency Net Picnic was held in Crescent City Aug. 6 with a good turnout. WB6GVT still is waiting for orders from the U.S. Navy. W6PTS and WB6UJO both put up 54-ft. crank-up towers on the same week end with the same crew. WB6WDP has a new call—W6ZC. K6MND, of Mill Valley, became a Silent Key. WA6ALK and W6UDL are looking for band openings with a new Heath Scanalyzer. K6TWJ continues to be a faithful check-in with the Golden Bear Net. The Tamalpais Radio Club held an outing at Lake Berryessa in Aug. The Marin Club continues to turn out large attendances at its meetings. Seen at the Pacific/Southwestern Division Convention were W6PTS, WB6-UJO and WA6AUD. In between DXing W6GPB has filled out the gaps in his 38-year collection of QSTs. WA6IVM scored second highest in the 1966 All-Asia DX Contest. The San Francisco Section Net continues to meet Mon. and Fri. at 1830 local time on 3900 kc. W6-BWV reports lots of 2-meter f.m. activity in the Humboldt area on 146.760 Mc., also that the Humboldt Radio Club is planning a 2-meter repeater. W6SLX still plans to move to the Seattle area. WB6DGJ worked a maritime mobile well off the California Coast on 2 meters for some exciting DX. WA6PYN finds 6 meters is opening more frequently. WA6JUV has added Tennessee for his WAS. W6GQA was active in both of the July CD Parties. WA6AUD has put up a new TH6DX antenna. WB6UJO, another DXCC, has been accepted into the Northern Calif. DX Club. WA6YJB has moved from Eureka to the Bay Area. WA6MGG is heard from Atascadero now. Traffic: WA6BYZ 188, W6WLW 127, W6KVQ 90, K6TWJ 26, WA6AUD 15, W6BWV 13, K6TZN 10, WB6GVT 6, W6CYO 4.

SAN JOAQUIN VALLEY—SCM, Ralph Saroyan, W6JPU—SEC; WA6BUH, ECs; WB6TFU, W6ARE, WA6TZN, ORS; K6KOL, K6OZL, WB6MZU, WA6TZN, W6ADB, WB6HVA, WA6SCE, WA6TZN newly lost his excitement surfing at Waikiki. K6JQT is now located in Stockton using an SB-100. W6TFD has a new EICO 753. WB6LQL is in the Air Force. WB6JOQ is on 2 meters. WA6ZLP is having mobile difficulties. W6DKI is having loading problems, and getting them solved. WB6UWM is now a General. WB6PGS is mobile with a Lincoln transceiver. The Delta Amateur Radio Club en-

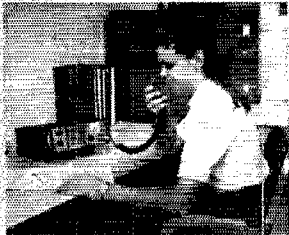
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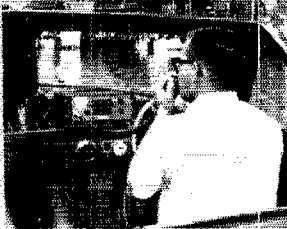
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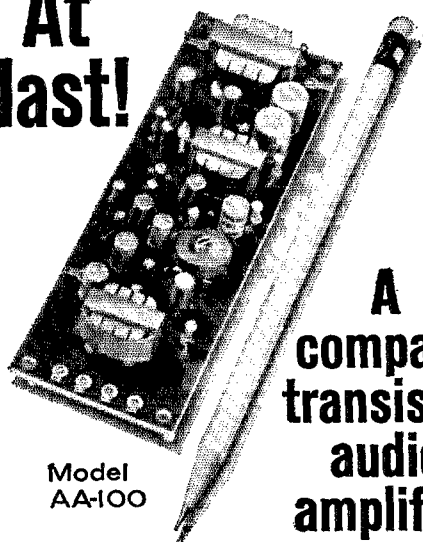
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joyed a very successful Field Day with very good results on 2 meters and reports more contacts were made on that band than ever before. K6OER is active in Navy MARS, using a Clegg 22 on 2 meters. WB6ETQ is mobilizing in Alaska on 20 and 40 meters. WB6JRL has a Swan 350 and installed an Alternator in his VW. W6-KOK is playing with RTTY with success. W6EYU is on 10 meters working DX. This is the middle of summer, and activities seem to be slow. Take time out and drop me a line regarding your activities. Traffic: WB6HV 541, W6ADB 491, K6KOL 44, W6ASCE 11.

SANTA CLARA VALLEY—SCM, Jean A. Gmelin, W6ZRJ—Asst. SCM: Ed Turner, W6NVO. SEC: W6VZE, RM: W6QMO. W6AUC reports that he telephone relayed with YVILK/5 in Caracas concerning heavy earthquakes involving property damage and injuries. Most of the traffic was for W6CQK, who had just returned from Venezuela. K6DYX informs us that the club station of the Naval Post Grad School in Monterey, K6LY, has a new project for making 2-meter transceivers. All participating live within a few blocks of each other, which makes it easy for the gang to get together. W6RFF reports that he has held his ORS since 1940 and renews again this year. W6VZE is busy making plans with the clubs and sends in a nice SEC report. ECs reporting this month are W6PLS, Half Moon Bay; WB6LZF, South Monterey County; W6DEK, Redwood City; W6ASH, Palo Alto/Mountain View/Los Altos; W6YBT, Pacific; K6BDD, Santa Cruz and W6VZE for Burlingame. If your area is not listed, contact us for EC information. W6RSY vacationed the latter part of July, but still made the BPL. W6YBV is active on NTS nets. W6DEF reports that W6LFA is now active on NCN from Mountain View. Hal is busy making AREC plans for the coming year. W6PLS reports that DX is slow during the summer but Gene is busy with many activities. W6MYL was the main speaker at the SCCARA meeting. W6BPT is busy building a new product detector and works 75-meter phone. W6YHM is using a Boehme keyer and likes the sound of his "new list." The July PARRA meeting was devoted to club organization and business. The main speaker for the July meeting of the SCARS was Jim Leper, who spoke on electronics in air pollution work. Traffic: W6RSY 891, W6YBV 377, W6DEF 132, W6PLS 30, K6-DYX 23, W6VZE 14, W6RFF 8, W6ZRJ 3.

ROANOKE DIVISION

NORTH CAROLINA—SCM, Barnett S. Dodd, W4-BNU—Asst. SCM: James O. Pullman, W44FJM. SEC: W44LWE, RM: K4CWX, PAM: W4AJT, V.H.F. PAM: W4HJZ. The N.C. Section NTS Picnic was held at Morrow Mountain State Park July 23 with W4KFC, Roanoke Division Director; W4GF, of FCC; W4ACY, Vice-Director; and W4ZM, Asst. Director, as guests of honor. About 70 netters and their families, including some visiting traffickers from S.C. and Virginia, enjoyed the festivities. W4EYN and W44VTV were presented the N.C. Service Award and Trophy. W4NQA is the publisher of *Smoke Test*, the FB club bulletin of the Buncombe County ARC of Asheville. W4ANEZ, Asst. EC of the Rockingham County AREC, has a new Swan 20 for 6 meters. W44KWC recently had an article published in another ham magazine. K4EO has received his 500 County Award certificate. W44BGL says he finally broke 100k in the C.W. CD Party. W4NQA has been appointed OO and W4YML OBS.

Net	Freq.	Time	Days	OTC	Mgr.
NCN(E)	3573 kc.	2230Z	Daily	128	W4IRE
THEN	3865 kc.	0030Z	Daily	105	W44GMC
NCN(L)	3573 kc.	0200Z	Daily	85	W44CFN
SSBN (June)	3988 kc.	2330Z	Daily	31	W44LWE

Traffic: WB4BGL 200, W44CFN 122, W44EVN 102, W4-RWL 82, W4LWZ 71, W44VNV 52, K4CWX 32, K4EO 30, W44FJM 29, W44ZLK 27, K4TTN 24, W4UWS 20, W4BNU 13, W4ACY 6, W4NAP 3, W44KWC 2, K4ZKQ 2.

SOUTH CAROLINA—SCM, Clark M. Hubbard, K4-LNJ—SEC: W44EJ, Asst. SEC: W44WQM, K4I: K4-LND. PAM: W44EFP.

SCN	3795 kc.	Daily	0100Z/0400Z	May Traffic 119
SCSSBN	3915 kc.	Daily	0100Z	May Traffic 109

The Greenville V.H.F. Society will hold a V.H.F. Convention on Nov. 5 in Duncan, S.C., at the Byrnes High School. W44LTS and the members have an excellent program organized. RACES and AREC members met at the Camden Picnic Aug. 13. W44YAU is on 6 meters with a new beam. K4LNU and W44MTO have beams on 2 meters. WB4DOT is back on after being QRT by lightning. W44GOF is a new Novice in Anderson. W4-DXX is aging a 758-1 fast on the SCN, SCSSBN, 4RN

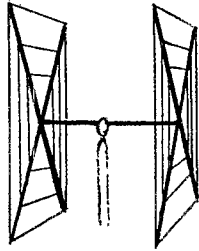
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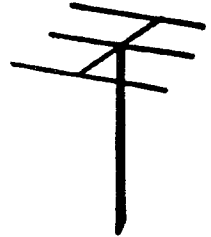
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4 E1 20	32*	4 E1 6	15
2 E1 15	12	8 E1 6	28*
3 E1 15	16	12 E1 2	25*
4 E1 15	25*		
5 E1 15	28*		

*20' boom

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V40 vertical for 40, 20, 15,	
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and EAN. W4NTO reports only 3 Novices among 122 cards from his OOnig. K4VVE has been appointed ORES. HAILAB will attend the University of S.C. Traffic: WB4DXX 116, K4VVE 73, WA4UDC 56, WB4BZA 52, WA4NWI 50, W4NTO 32, K4LNIJ 31, W4FVV 18, W4PED 13, W4JA 10.

VIRGINIA—SCM, H. J. Hopkins, W4SBJ—SEC: K4LMB, RM: W4AEUL, PAM: W4OKN. Members again are reminded that activity reports that are postmarked or filed as messages after the fifth of the month are often not carried with the preceding month's reports; get your reports to the SCM prior to the seventh of each month. Director W4KFC has been busy traveling to meetings and hamfests throughout the division. W4ZM still is trying to make the BPL. WA2UFI is now signing WB4GTS. K4MILC is now the VSN manager. W8FCI got his old call back: K4TSJ, W4SHJ is absent from the 80-meter nets because of antenna problems. Travel, heat, vacations and summer work still prevail as the chief causes of low activity. K4BAV is in (or on the way to) Viet Nam. Be prepared to voice your opinions on the value of adjusting net operating times during summer periods. Virginia net frequencies:

(summer schedule)
3680 2230-2330 daily GMT
3935 2200 & 0200 daily GMT
3985 7 p.m. local daily

Traffic: (July) W4ZM 340, K4CG 296, WA4DXJ 218, W4RLL 193, W4NLC 159, W4AEUL 135, W4DVT 105, K4KNP 91, K4FSS 82, WB4GTS 70, W4OKN 59, W4MTUJ 56, WB4DRB 33, W4LA 30, W4BZE 22, WA4FCS 22, WB6DC1/4 22, W4KFC 19, K4MILC 18, WA4WFO 17, K4TSJ 16, WA4PBG 10, W4TE 9, K4ASU 7, K4GR 7, W4AWQG 7, W4CRK 6, W4QLF 6, W4MK 4, W4LK 2, WA4DAI 1, W4KC 1, W4PTR 1, WA4QOC 1. (June) K4CG 245, W4LA 29, WA4FCS 11, W4QVE 1. (May) W4LA 38.

WEST VIRGINIA—SCM, Donald B. Morris, W8JM—SEC: W8IRN. RMs: W8HZA, K8TPF. PAMs: K8CHW, W8IYD, W8SSA. Congratulations to W8SSA on a fine job as SEC over a long period. Because of an increased work load Keith felt it necessary to resign. Your new SEC is W8IRN, of South Charleston. W8GUL was quite active in the Monogalia Measles Vaccination Drive, furnishing communications for the County Health Dept. W8SQO assisted W8POS with a new antenna for traffic work in WVN and 8RN. K8MQB and K8BIT toured vacation spots in the East with trailer and mobile gear. W8JM was guest speaker at the Sept. meeting of the Kanawha Radio Club. W8KUW, formerly of Wheeling, now is W8ILB in Pema. W8RQB reports the WVN Phone Net had 19 sessions, 443 stations and 81 messages. Active in the Powder Puff Derby communications at Martinsburg were W8AEC, W8AFC8, W8ADYO, K8-WXB, K8SDI, K8KML, K8UXP, K8QYG. All QCWA members are invited to attend the Dinner in Charleston in Oct. Contact W8HZA or W8QR for details. Traffic: W8APOS 168, W8SQO 74, W8CKX 55, W8GUL 54, W8A-RQB 36, K8MYU 34, W8IMX 22, K8BIT 15, W8IMX 7, K8SCHW 5, W8IYD 5, W8JM 5, K8CFT 4, K8MQB 4, W8FKB/8 3, W8KQX 3, W8AND 2, W8APW 2, W8CUL 1, W8ADJP 1, W8FGD 1, K8OQL 1, W8RWM 1, W8TGF 1, W8VKP 1.

ROCKY MOUNTAIN DIVISION

COLORADO—SCM, Richard Hoppe, KØFDH—Asst. SCM: A. Hankinson, WAØNL. SEC: WØSIN, PAM: WØCXW. RM: WAØLCM. Nets:

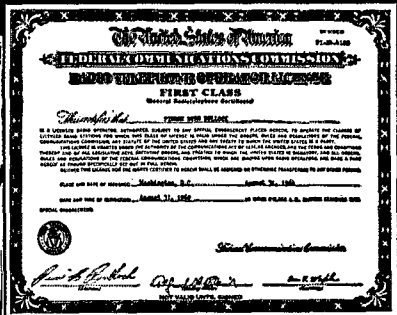
Colorado Weather Net 3945 kc. 6:30 A.M. daily
High Noon Net 7020 kc. noon M-S
Columbine Net 3989.5 kc. 8:00 P.M. M-S
Evergreen Net 3808 kc. 9:00 P.M. daily
Colorado Code Net 3780 kc. 6:30 P.M. daily
Sleepyhead Net 3820 kc. 7:00 A.M. f. daily
Colorado Emergency Phone Net 3890 kc. 8:00 A.M. Sun.

Summer doldrums and QRN are taking their usual toll on net activity but we are especially pleased with the recently-formed Evergreen Net set up to handle regional incoming traffic. Congratulations to the new net manager, WAØPGM, for keeping the average net time to 12 minutes while handling 140 pieces of formal traffic with a QTC of 361. As per usual, KØYFK wins another BPL award for his work on the Weather Net. WØTES and KØSZQ worked themselves hard but stopped just short of BPL. Because of my vacation and illness in my family I regret the scanty coverage of last month but want to thank all of you who helped during my absence. Traffic: (July) KØYFK 740, KØSZQ 462, WØTES 458, WAØLCM 56, WAØMNL 35, WØWYX 76, KØDCW 68, WØUAT 34, WAØJTB 17, KØSPR 12, KØECR 7. (June) WAØLCM 91, WAØMNL 91.

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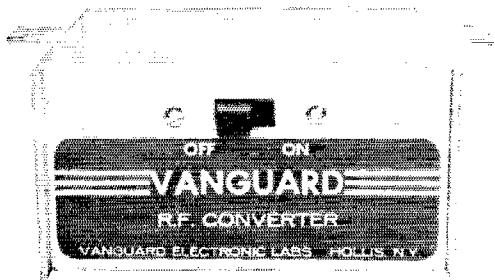
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NEW MEXICO—SCM, Bill Farley, WA3FLG—SEC: W3ALL. PAM: WA5MCX. Welcome to a new OBS, WA5LFX, in Alamogordo. He is very active with the Southwestern Fone Net on 40 meters. Why don't you make it a point to check in the net at 1830Z. W8BZY/5 has moved to Florida. We wish him and luck and hearty thanks for his excellent work while here in New Mexico. We will miss Jim and his strong signal on the Roadrunner and TWN Nets. W5PTQ is now a resident of the Island of Guam. If you wish to hear of the latest happenings on the Island look around 14,294 or 21,294 every evening. Congratulations to Rose Stewart, WA5ALX. Rose has been awarded the Rocky Mountain PICON plaque for this year. She has been active in the Las Cruces Area Emergency Net and helps out on 75 meters when needed. This is my last article as your SCM. Thanks for everything these past two years. I have enjoyed serving you. Traffic: K5DAB 57, WA5LFX 55, WA5FLG 32, W5DMG 25, W5NUI 13, WA5MCX 7, W5PNY 7, WA5MIY 4, WA5RBU 3.

UTAH—SCM, Gerald F. Warner, W7VSS—SEC: W7WKF. RM: W7OXC. Traffic nets:

BUN	Daily	7272 kc.	1830Z
UARN	Sat.-Sun.	3987.5 kc.	1400Z
URN	Mon.-Fri	143.2-146.8 Mc.	0030Z

W7RQT is the recipient of the 1966 PICON award in Utah. Pat has a long history of service to his fellow amateurs, as well as to the public in traffic and emergency work. A good-sized crowd from Utah was in attendance at the WIMU Hamfest at Mac's Inn, Idaho. All hands reported having a great time at WIMU despite some unforecasted rain. Utah will not have a summer hamfest, but will instead, have a "Hamvention" at Provo, Utah, during Feb. 1968, sponsored by the Utah Council of Amateur Radio Clubs. Contact K7JLF for details. Traffic: K7RAJ 183, W7LQE 121, W7OXC 82.

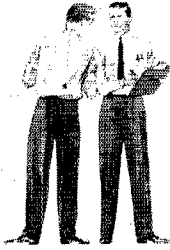
WYOMING—SCM, Wayne M. Moore, W7CQL—SEC: W7YWE. RM: WA7CLF. PAMs: W7TZK, K7SLM. OBSs: W7TZK, K7SLM, K7NQX. Nets: Pony Express, Sun. at 0830 on 3920; YO, daily at 1830 on 3610; Jackalope Mon. through Sat. at 1215 on 7255, Wx Net, 0630 Mon. through Sat. on 3920. New appointment: K7NQX as OBS. Notice the listing of the Wx Net. It started out as a winter net and won't die down for the summer. It saddens me to report that K7OWW, Capt. Bill Graves, was killed in a plane in Viet Nam the latter part of July. WA7BJZ is taking his Army basic training at Ft. Leonard Wood. K7IVJ is back on the air. K6UVJ/7 has a new station on the air. Keep the monthly reports cards coming so we can have news of your area in this column. The Casper Club is busy remodeling its club house to accommodate the new transceiver. Traffic: K7NQX 732, W7TZK 44, WA7CLF 40, W7NKR 19, W7YWW 19, K7QJW 18, K7YWA 18, WA7BPO 17, W7YJI 17, K7KSA 15, K7SLM 11, K7POX 7, W7HAB 2, K7RFL 2.

SOUTHEASTERN DIVISION

ALABAMA—SCM, Edward L. Stone, K4VHW—SEC: W4FPI. PAM: WA4EEC. RM: WA4FXA. The Huntsville ARC presented its annual "Outstanding Amateur" Award to WA4WED. Congratulations also to W4PKA, of Decatur, who was awarded a citation for Outstanding Service as Communications Officer by the Alabama Civil Defense Association. We welcome back to the ranks of amateur radio after an absence of 42 years, John Blackman (3AJA), now on c.w. as W4LYJ from Dothan. Old-timers may remember him from NSS and NAA during the "Twenties." Hats off to the AENM and all its fine members. They averaged over 10 traffic per session every day during the entire month of July. The big event for the week end of Oct. 28-30 is the 2nd Annual Alabama QSO Party. Work any 24 hours of the 30-hour period between 2000 Oct. 28 and 0200 Oct. 30. Keep those Form 1 reports coming in. Let's get credit for all our efforts. Please send them by the 5th of each month. Traffic: (July) W4FVY 165, K4AOZ 150, WA4FYO 150, WA4UXC 146, K4GXS 101, WB4EKK 89, WA4EXA 86, K4BSK 74, WB4BLX 65, WA4GGD 55, WB4DCR 53, WA4EEC 48, K4NUW 47, WA4YYV 47, K4VHW 43, WB4CYU 37, WB4EKJ 28, K4UPL 28, W4NML 20, W4DGH 15, WA4ROP 13, K4UUC 10, WB4CII 8, W4YRM 8, K4HJM 7, W4FPI 6, K4KJD 5, WA4DBQ 4, (June) WB4DGF 70, WB4BLX 32, K4UPL 17, WA4ZFA 6.

ALABAMA QSO PARTY

see page 138

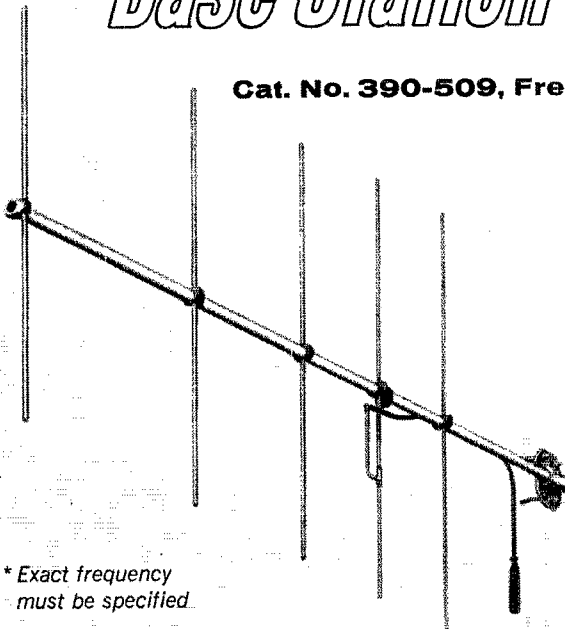


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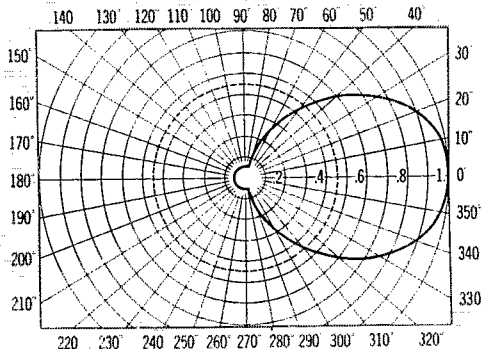
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ELEMENT SUPPORT LENGTH.....	80" at 150 Mc.
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LATERAL THRUST AT RATED WIND.....	29 lbs.
WEIGHT.....	8 lbs.

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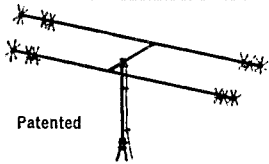
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ALABAMA QSO PARTY

Oct. 28-30, 1967

Sponsored by the Huntsville Amateur Radio Club, the second annual Alabama QSO Party will take place from 2000 GMT Oct. 28 to 0200 GMT Oct. 30 (operate any 24 hours out of the 30 hour period).

Rules: Contacts will be between Alabama stations and stations outside Alabama, or between two Alabama stations. Suggested frequencies: 3577, 3965, 7040, 7230, 14,060, 14,290, 21,040, 21,390, 28,600, 50,550 and 145,350 kc. as well as all Novice bands. (Please listen carefully and avoid nets.) Exchange QSO and county (for Alabama stations) or ARRL section or country name. Outside stations score 3 points per Alabama QSO multiplied by the number of Alabama counties worked (total of 67). Alabama stations score one point per QSO. All foreign countries are grouped together and a multiplier of no more than one (per band) may be claimed for contacts with all foreign stations worked. The score is the number of exchanges multiplied by the number of ARRL sections worked plus one for all foreign countries worked. (The same station may be worked once per band.) Phone and c.w. are to be considered the same contest. Appropriate certificates will be awarded high scorers and a trophy will go to the highest Alabama and outside stations. Logs should include a score computation and be postmarked no later than Dec. 4, 1967. (include an s.a.s.e. if final results are desired). No logs will be returned. Send logs to the club c/o Phil Irvine, WA4RBH, 2103 Suzanne Terr. N.W., Huntsville, Ala. 35810.

CANAL ZONE—Acting SCM, Russell E. Oberholtzer, KZ5OB—SEC: KZ5MV. RM: KZ5FX. Our 73 and 88 to Lil and Ben Smith (KZ5TT and KZ5LT) for a job well done. Our loss is Texas' gain. KZ5AJ, KZ5GN and KZ5WR put up new towers. KZ5JF is QSY to Westover AFB, Mass. KZ5JC mobilized to Guatemala for a vacation. WA4KXC, of Mobile, Ala., visited KZ5IQ. The CZARA discussed plans for a QSO Party. The CARC meets each Tue. on 28.9 at 1900 EST. New KZ5s are KZ5BXN, KZ5SA and KZ5WD. Traffic: KZ5SF 426, KZ5OA 100, KZ5CT 33, KZ5OB 18, KZ5AJ 12, KZ5FX 12, KZ5WR 12.

EASTERN FLORIDA—SCM, Jesse H. Morris, W4-MVB—SEC: W4IYT. Asst. SEC: W4FP. RM C.W.: W4ILE. RM RTY: W4RWL. PAM S.S.B.: W4OGX. PAM 40M: W4SDR. PAM 75M: W4TUB. V.H.F. PAM: W4BMC. WA4OH0 is off to the Caribbean and WA4-JYB is off to Mexico for vacations. The lead story of the month is of the Silver Springs ARC of Ocala. These fellows, headed by K4ANJ, have built a complete club house and station including a 21-Mc. rhombic over a thousand feet long to run traffic for servicemen in Viet Nam. Although this communication takes place on MARS frequencies (the only frequencies available at this time for third-party traffic to much of the Far East) it is no less an amateur venture. As a matter of fact, it is a story of amateur radio and the local citizens working together on a public service project. The land and much of the equipment and supplies came from local business men and merchants. The rest came from members themselves. They provide a much-needed public service and at the same time get some good publicity for amateur radio. Hats off to the Silver Springs ARC. Traffic: (July) W4RQR 909, WA4BMC 516, WA4SCK 443, WA4NEV 345, WB4AIW 244, W4FPC 132, K4COO 126, W4IAD 122, WB4DSP 113, WA4FGH 108, W4ILE 92, W4AKB 89, W4MVB 89, W4SDR 80, WA4IJJ 77, WA4-NBT 76, WA4DEL 75, W4EHW 73, WA4YII 72, W4YXP 64, W34OH0 63, K4DAX 61, W4EHDH 49, W44TWD 40, W4SMK 39, W44BGW 37, W4NGR 35, W4VDC 33, W4-ZAK 33, W44CIQ 28, K4ILB 28, W44JYB 28, W4FP 27, W4TRS 25, W44EYU 24, K4LPS 24, W4AVZD 23, W4DVO 22, W4OGX 22, W4PBK 21, W44TIS 21, K4EXE 20, K4BLAI 16, W4IE 16, W44WOW 16, K4QCG 15, W4DSN 13, W4GUJ 13, W44MIO 11, W44DFE 10, W4SME 10, W4CWI 8, K4SCL 6, W4ANBE 5, W4VPQ 4, W44ADN 3, W4TJM 3, K4EBE 1. (June) W4EHW 48, W44EYU 14, W4GUJ 13, W4DVO 10, W4N4FAK 8.

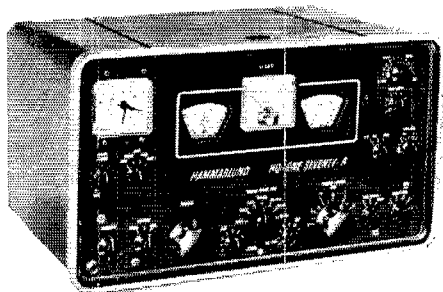
GEORGIA—SCM, Howard L. Schonher, W4RZL—Asst. SCM: James W. Parker, Sr., W4KGP. SEC: W4-DDY. RM: W4CZN. PAM: K4PKK. K4HQ reports that July was an excellent month for 50-Mc. DX. All call areas were heard, plus CO VP7, VP9, YV, TI, HK, XE and VE. T12NA was worked with signals 20 over 9 at

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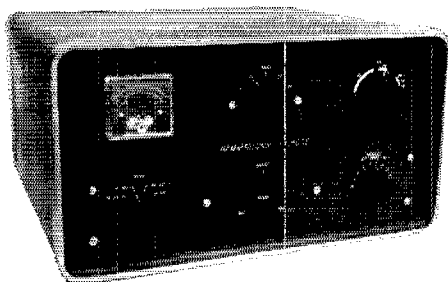
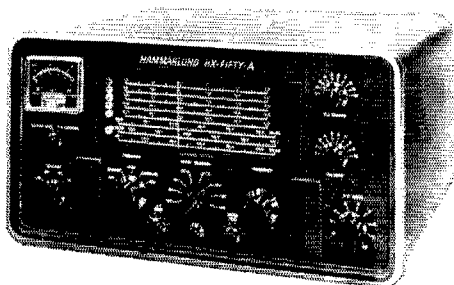


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times. WB4EMF increased activity and joined Army MARS. The Georgia Post Office Net has been organized under P.O. net rules and regulations coinciding with those of ARRL and international message-handling and net procedure. It is designated as a traffic net. K4FLR is the present net manager. WA4MDT is NCS and WA4-LMA alternate. The net meets each Sun. at 0900 EDST on 3990 kc. K4FLR is relatively inactive these days because of college work. W4HYW took part in the Minnesota and 'CH QSO Parties. W4LRR is enjoying 2-meter mobile-f.m. K4TXK reports 2-meter activity good and DX FB with 12 watts. WB4EOQ has his General Class license and new R-4A and T-4X to TA-33 at 55-ft. level. K4GCP was married recently. WA4NED has retired and gone into full-time hamming. W4UVD has his antenna up to 70 ft. WB4BCL is General Class. W4MZQ and WB4FMY are active on 2. The Gainesville Tech. School has a complete s.s.b. station. Congratulations to K4TXK on his marriage June 23 to Jan Langford. Traffic: W4FOE 814, W4C7N 144, K4BAI 115, WA4RAV 62, W4GXU 38, W4FDN 28, W44LLI 18, K4FLR 11, W4FQN 8, W4YE 7, WA4JES 5, W4RZL 5, K4AJF 2, K4TXK 1.

WESTERN FLORIDA—SCM, Frank M. Butler, Jr., W4RKH—SFC: W4IKB, PAM: WA4ZGI, RM: W4BVE. Section net reports:

Net	Freq.	Time	Days	Sess.	QNI	OTC
WFPN	3957 kc.	2200Z	Daily	31	500	70
QFN	3651 kc.	2230/0200Z	"	62	—	—

Pensacola: W7BNR/4 laments the lack of West Fla. stations in the Phone CD Parties. W4DAO finally got back his rig that was stolen months ago. W4MS, K4KIF, K4PIN and K4RUG are hunting DX on 6-meter s.s.b. K4SOI has reactivated the 10-meter net; check in Mon. at 7 P.M. WA4IZM runs 120 watts mobile on 2-meter f.m.; he is looking for a base station. Fort Walton/Edin: New EARS officers are WB4FER, W4JNI and W4RKH. Newest Novices are WN4GMI and WN4GMH. WB4GSD, the XYL of W44EUV, finally received her Technician ticket. K4QHR and W4BENK are fully operational on RTTY. W4MMW repaired the PE-75 just in time for the hurricane season. Crestview: A 2-meter antenna was installed atop the Courthouse to serve the C.D. Center, thanks to K4JFL. Defuniak Springs: K4VWE was transferred to Chicago. Chipley: A c.d. communications exercise was held recently with WB4FLK, W4IKB, WA4SRR and WA4ZIM taking part. WB4GQP is a new ham in the Vernon area. K4SGY is doing graduate work at the U. of Fla. Port St. Joe: K4RFZ and W4MXN monitor 3957 kc. during the day from the office. Traffic: (July) WA4JIM 207, K4BSS/4 135, W4BVE 122, W4IKB 53, WA4EOQ 10. (June) K4BSS/4 116.

SOUTHWESTERN DIVISION

ARIZONA—SCM, Floyd C. Colvar, W7FKK—PAM: W7CAF, RM: K7NHL, K7RUR attended the Mission Trail Net Roundup held in Bakersfield, Calif. OO reports were received from K7OLX and W7C3L. The Kaiser Net meets every Mon. at 0250 GMT on 50.340 Mc. All amateurs are invited to participate. The net is informal and usually carries discussions of solid state v.h.f. circuits and amateur television. New appointees include K7MTZ as OBS. It is with deep regret that we report that W7LSK, of Flagstaff, has become a Silent Key. The Ft. Tuthill Annual Hamfest was a great success with the largest attendance ever. There were 250 persons registered, of which 129 had amateur licenses. Special guest was W6KW, Southwestern Division Director. The success of the hamfest is attributed to the efforts of K7VOR and the Amateur Radio Council of Arizona. Plans are presently being made for the 1968 Southwestern Division Convention to be held in Phoenix May 31, June 1 and June 2, 1968. Net activities have been in the summer doldrums. Those who participate are to be commended for their interest in keeping them alive. Traffic: W7FKK 11, W7DQS 3.

LOS ANGELES—SCM, Donald R. Etheredge, K6-UMY—SFC: K6QPH, WA6KZI is now net manager for SCN. W6ORS reports being a part-time electronics teacher for an Explorer group. We regretfully record the passing of WA6HYY from the San Fernando Valley area. K6EA and his XYL were able to visit W1AW Headquarters during the past summer. W6WPF is now quite active in the Navy MARS program. K6SUJ received a medal from the U.S. Jr. Chamber of Commerce for outstanding achievement for his participation in the Alhambra III Neighbor Parade. W6PUZ is now busy building a 432-Mc. kw. WB6SCK is handling 8-meter traffic in addition to SCN. W6DQX is reported to be an owner of a new Toyota from JA-Land. W6BYKP now has a 2nd-class telegraph license and probably is operating /ADM in the Pacific. W6YRA is expected to expand the UCLA campus radiogram service. WB6TMC is now

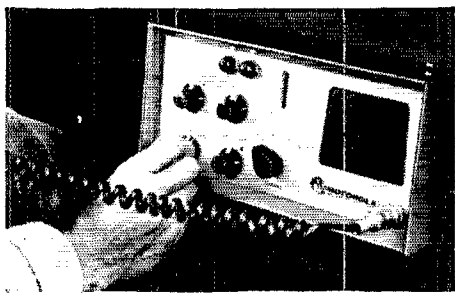
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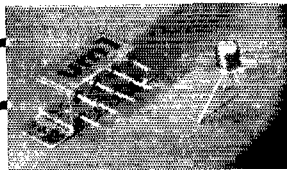
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active from a new QTH and WB6OLD is attempting to organize a contest-oriented club. The TRW Radio Club now has the call WB6WPO. K6ASK is running skeds on 433, Mc. n.i.m. with K6VBT. K6BPC is now participating on the SCN and RTTY RATT'S Net. Traffic nets: SCN, 3600 kc. 0230 daily. SCS, 50.4 Mc. 0130Z daily. New AREC members include W6UQU, K6HSQ, W6UXF, WB6WRI, W6A0Y/6, W6VVF and W6YBR. Traffic: (Judy) W6GYH 1440, WB6BBO 525, W6QAE 273, WB6OLD 230, W6MLF 260, K6CDW 172, W6QXY 130, W6OEO 123, W6DSC 113, W6FD 87, W6SCK 78, K5ANS/6 63, WB6TMC 60, WB6KKG 47, W6BTG 43, WB6GGL 43, K6ASK 39, K6IOV 26, W6MLZ 21, W6PCP 17, W6AM 16, W6USY 16, W6HUJ 14, W6MIF 14, W6QMF 14, K6BPC 12, K6QPH 11, W6TN 10, K6UMY 8, W6DGH 6, W6DQX 6, K6KA 6, W6WKF 6, W6AEL 5, W6ORS 5, W6TNJ 4, W6GOD 3, W6RCY 3, W6YRA 1. (May) WB6TMC 51.

SECOND CALIFORNIA QSO PARTY

October 14-15

Rules: 1) The contest runs from 2200 GMT Saturday, October 14 until 2200 GMT Sunday, October 15. 2) Use all bands, c.w. and phone. The same stations may be worked and counted for a point on each band mode. 3) California stations score one point for each contact, including contacts with other California stations. All others score one point for each California contact only. 4) California stations multiply total QSO points by the total number of different states, Canadian provinces and foreign countries worked. All others use California counties as the multiplier. 5) California stations send QSO number, RS(T) and county. All others send QSO number, RS(T) and state, province or country. 6) Suggested frequencies are 1910 3550 3725 3900 7075 7175 7220 14075 14270 21075 21125 21370 28075 and 28700 kc. 7) The top 15 entries in California will be awarded certificates. In addition, a certificate will go to the top scorer in each state and province and the top scorer in each country. The top five Novices will also receive awards, as well as the top two club stations. 8) Logs must show dates, times, stations worked, exchanges, bands, mode and total claimed score. They must be postmarked by November 10, 1967 and sent to Mr. Tom Frenaye, WB6KIL, The Claremont Ham Club, 617 Purdue Drive, Claremont, Calif. 91711. (Enclose an s.a.s.e. for scoring results.)

ORANGE—SCM, Roy R. Maxson, W6DEY—**SEC:** W6WRL advises that W6LFO is the new EC for the Six-Meter AREC on 50.40 Mc. Wed. at 7:30 p.m. W6TIF and W6LRJQ have 160-meter antennas up and looking for local activity. W6UTC gives considerable time to working and helping Novices on the air. K6LFX, pres. of Desert RATS and other members ran the Palm Springs Relay for the Powder Puff Derby. W6FB became a Charter Life Member of ARRL and also knocked off EA6AR and 3V8BZ for Nos. 213 and 214. RM WA6ROF worked OK2RZ, F8VN, KX6DB and JA7CDV on 20 with a little dipole. LU9JH now is portable W6 in Santa Ana. EC WA6TAG is at his home QTH for a change. W6NJJ furnished FD summary and information on how Newport ARS fare. Riverside ARA meets the 2nd Wed. 7:30 p.m. at the Red Cross Bldg., 8880 Magnolia Ave. We welcome new AREC members WB6SIE, W6CJM and WB6ILE. Form 1 is available for your reports from the SCM. Traffic: WA6ROF 186, W6TYZ 150, WB6UTC 124, K6IBI 119, W6TIF 99, W6LFO 73, K6IME 57, WB6MVL 33, W6WRJ 26, W6VQE 11.

SAN DIEGO—SCM, Don Stansifer, W6LRU/WA6VUL—K7JRA/6, who operated mobile in San Diego during the summer, has returned to college in Oregon. The SOBARS 10th Annual Picnic and Swapmeet was held Sept. 17 in National City. PAM WB6GMM is active on the Mission Trail Net (s.s.h.) and the Southern California Net (c.w.). W6BGF, EC/RM, has compiled an excellent liaison packet for SDSN members to aid in traffic-handling. Section hams are reminded that the San Diego DX Club handles incoming QSL cards not received by direct mail. If you work DX make sure you have a self-addressed legal-size stamped envelope addressed to you with your call on it on file with them. Their address P.O. Box 6029, San Diego, Cal. 92106. A good letter was received from a Silvergate Club member KN6TLP, who later was KX6AF and WA6CILL and is now WA5IPS. He is with the Air Force in Europe. W6JVA and family



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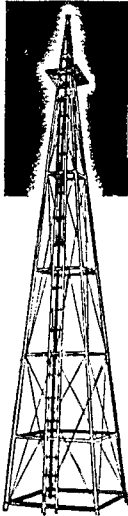


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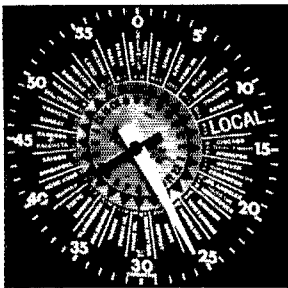
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vacationed to VE7-Land and met K8VRR for a family reunion there. The annual Palomar Club Picnic was held at Live Oak Park near Fallbrook in Aug. W6QJW keeps skeds with the Hospital Ship's Sanctuary and Repose. A new General in San Diego is WB6WEX. By error last month WA6HWX was listed as a Silent Key. It should have been WA6HQX. Add K6LPA as a Silent Key this month. Traffic: K6BPI 9933, W6VNU 482, W6BGF 406, W6EOT 284, W6QJW 188, WB6GMM 154, WB6MPD 11, WA6TAD 8.

SANTA BARBARA—SCM, Cecil D. Hinson, WA6-OKN—SEC: K6GV. Our Director, myself and the SEC all journeyed to Vandenberg AFB to meet with the Satellite ARC and a most enjoyable visit resulted. Several friends were present from the Morro Bay area some 60 miles away. WA6PFF should have fired off his new 20-meter rig by now and should be putting Santa Barbara on the map. I undersatd WB6FZU had a problem when trying to run a kw. on his DX-40. When the smoke clears away we will get you a report on the problem. W6BJM has returned from Hawaii. The hams of the Simi Valley provided communications with the outside world recently when the telephone cable serving the area was accidentally cut. Activity reports were received from WB6DPV and WN6VKN. WB6DPV is a regular check-in on MTN and PON with his "new" DX-100. New appointment: K6GV as SEC. Traffic: WB6DPV 31, WN6VKN 2.

WEST GULF DIVISION

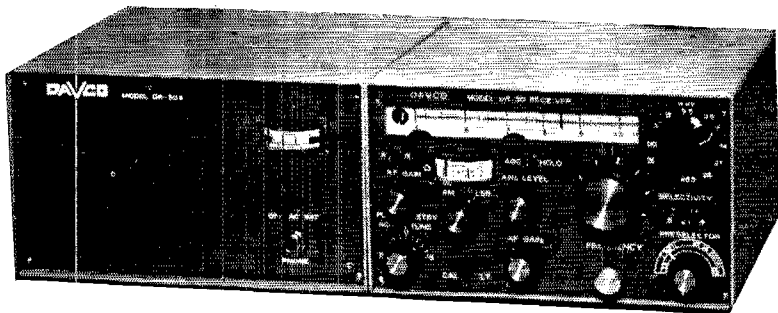
NORTHERN TEXAS—SCM, L. L. Harbin, W5BNG—Asst. SCM: E. C. Pool, W5NFO. SEC: W5PYY. PAM: W5BOU. RM: W5LR. Two meters in this area seems to be gaining notice as more repeaters are being activated. With the help of many hams interested in 2-meter operation this area has been able to make contact with distant stations that we were unable to contact before. Austin, Tulsa and Terri have been contacted with increasing reliability. The Texas V.H.F. FM Society held a meeting July 30, in Ft. Worth with 75 hams present. The Story of the Tulsa 2-Meter Group was presented on film and enjoyed by all. It is surprising what you can do with the help of a repeater station mounted on the top of some high building in your area. The possibilities of 2 meters should be investigated and I think it is well worth the time and effort. The Big "D" Ham-boree was a huge success with more than 1200 hams registered. I made many contacts that I would not have been able to if I had not attended. W5QKF, West Gulf Division Director, gave a good talk and signed up one new member for the League. The Irving ARC manned the talk-in station for the Ham-boree and did an FB job of directing incoming amateurs to the location of the hamfest. Traffic: K5DBJ 85, WA5EVS 49, W5PBN 22, WA5AGH 20, W5LR 15.

OKLAHOMA—SCM, Daniel B. Prater, K5CAY—Asst. SCM: Sam Whitley, W5WAX. SEC: K5ZCJ. RM: W5QMJ. PAM-75: W5PML. I am happy to report that our Vice-Director, W5UYQ, is home after a short stay at Oklahoma City hospital. The Tulsa 2-meter repeater group has incorporated. Membership is growing and dues for using the repeater is one dollar a month; if you live more than 40 airline miles away the ten-dollar initiation fee is waived. Enid area stations now on 2-meter f.m. are WA5QYE, WA5MEL, WA5OUF, WA5OWO, WA5FVJ, K5DSR, K5KHA and K5CAY. WA5OWO is kept busy holding skeds with Hawaii with his new station, R-4A, T-4X and SB-200 using a Mosley tri-bander. K5BKF is using high power on 2 meters now. WA5OHX made good use of his HW-12 at Boy Scout Camp sending messages for Scouts back home. WA5REL just got his Tech. Class license and is on 2 meters with a 60-watt rig. WA5KNR, using the call KZ5NR for the past two months, returned home. He worked 40, 20 and 15 meters while TDY in Canal Zone. I am still working W5GIQ every Fri. at 1330Z on 20 meters. His call is 7Q7EC. OLZ Traffic Net reports 21 sessions, QNI 41, QTC 57; SSZ, 21 sessions, QNI 39, QTC 61; Sooner Traffic Net, QNI 543, QTC 135. WA5FSN is General Class now. Traffic: K5TEY 1457, WA5IMO 119, W5QMJ 31, W5PML 17, WA5OHX 9, WA5-NIT 8, WA5DZP 4, K5WPP 4.

SOUTHERN TEXAS—SCM, G. D. Jerry Sears, W5-AIR—SEC: K5QQG. PAM: W5KLV. RM: W5EZY. The new EC for Jeff Davis County in West Texas is W5YCK, formerly of Houston, now at Harvard Radio Astronomy Station at Fort Davis. Also the new OPS and ORS for South Texas, K2ELU/5, is very active on the c.w. and phone traffic nets from the 1968 National Convention City, San Antonio. EC K5HZR has just returned from an Illinois vacation. The Corpus Christi W5MS Bulletin advises that K5UDU, W5IRQ and WA5EZD passed the General Class test. WA5KHE now has a 2-meter beam

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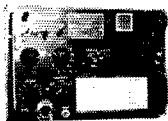
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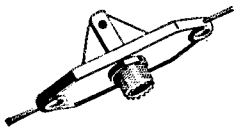
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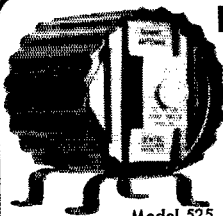
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up 50 feet, according to his harmonic, WA5KIV. WA5-MIN is QRT until his reconitioned rig gets back from the factory. He put up a gigantic 20-meter beam and says he is going to stay up all night on 20 to see what's around when his rig gets back. Most are doing well after Field Day and some are working on plans for next year already. RM W5EZY reports traffic is bucking up on TEX. July traffic more than doubled that of June. Many new stations are checking into TEX. Come on in, fellows, the traffic is fine—at 1900 and 2200 CDST daily on 3770 kc. The hurricane season is here. Check your emergency gear and power plants often. You may need them. Check into an emergency net in your area. Be sure you know the proper procedure and *always listen before you transmit*. Traffic: WA5OKE 319, WA5MBC 96, W5BGE 79, W5EZY 73, W5EMW 72, W5KLV 70, W5ABQ 67, WA5GZC 66, K2E1U/5 37, W5AQN 35, K5-HZR 23, W5TFW 18, WA5OFN 13, W5AIR 10, K5WYN 4.

CANADIAN DIVISION

ALBERTA—SCM, Harry Harrold, VE6TG—SEC: VE6FK, PAM APSN: VE6ADS. ECs: VE6SA, VE6SS, VE6XC, VE6PL, VE6AFQ. ORSs: VE6BR, VE6ATH, VE6ATG. OPSs: VE6HM, VE6SS, VE6ADS. OOs: VE6HM, VE6TY, OBSs: VE6HM, VE6AIF. It is with regret that we announce the passing of Albert Potoski, VE6EV. Our SEC reports that all activities with AREC such as car rally, canoe races, balloon races and Field Day turned out very well and he wishes to thank all who helped in any way. Thanks are in order to the hamfest committee for a job well done. It is time to be liming up your fall activities. Let your SCM know so that he can keep the members posted. What is the matter? No takers in Calgary or Edmonton for the SCM post? Yours truly's term ran out last April and he is only carrying on until someone is elected. Traffic: VE6ATH 93, VE6HM 75, VE6XC 22, VE6FK 6, VE6AO 4, VE6FS 4, VE6SS 4, VE6WN 3.

BRITISH COLUMBIA—SCM, H. E. Savage, VE7FB —Field Day was one of the highlights of July with the hottest weather for some years for most; also it was the hottest contested Field Day for B.C. with more clubs and their members out. The Okanagan International Hamfest was held at Okanagan Falls, B.C. Two hundred or better tented, trailed or motelled for the biggest B.C. Centennial gathering of amateurs. Penticon and Oliver ARC were the hosts, with VE7DB the M.C. VE7SH, Jamie and I visited the amateurs in Kimberley Trail and O.K. Falls after a visit to Calgary. Innisfail and Sundre, VE7BHH attended the Calgary Convention and reported the VETs who were there sure had a good time. VE7BLO visited many VEs while in VES-Land and also stopped at Calgary. One of the highlights at O.K. Falls was Mr. Fish's demonstration of flying; his model radio-controlled plane did more than any big plane could do. Even VE7FS, who few in, claimed he would not try to do as much. A nice report was received from Kamloops ARC; you will be able to recognize its members with their crest. VE7ASY has been busy fighting forest fires. Traffic: VE7AC 24, VE7BLO 14, VE7BLS 8, VE7SE 6, VE7BOQ 3.

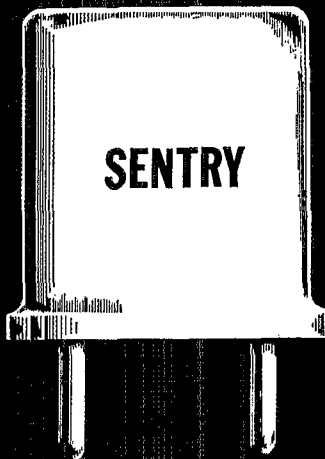
MANITOBA—SCM, John Thomas Stacey, VE4JT—SEC: VE4JC, PAM: VE4EX, RM: VE4EI. OPS: VE4EF, ORSs VE4LG, VE4NE, OBS: VE4QJ, OVSs: VE4RE, VE4HL. A new call in Brandon is VE4YJ, the daughter of VE4YM and a product of the Brandon ARC instruction class. The hamfest at the Peace Garden was a big success and well attended. The Centennial Balloon Race in Brandon was supplied communications by the Brandon ARC. Those participating were VE4AO, VE4DQ, VE4DG, VE4FW, VE4EF, VE4XN and VE4HJ. The club station, VE4QD, provided base operations. VE4NN is active out of Winnipeg on 80-meter c.w. VE4YC is on from Kennav with a Viking I. VE4LG is in Toronto on a course with IBM and handling traffic as portable 3. The C.W. Net moves to 3615 kc. at 0100Z Oct. 1 and our RM is hoping that more stations will check in. Additional stations in Winnipeg are needed to maintain a seven-day-a-week schedule. Our PAM reports that the phone net is in good shape with a full NCS roster consisting of VE4DQ, VE4EF, VE4IK, VE4LQ, VE4OL, VE4WT, VE4XN and VE4EX. Phone net report for July: Sessions 31, QNI 350, QTC 4. Traffic: VE4JT 61, VE4RW 13, VE4EF 7, VE4GN 7, VE4JA 2, VE4DQ 1, VE4NW 1, VE4XN 1.

MARITIME—SCM, J. Harley Grimmer, VE1MX—Asst. SCM: R. P. Thorpe, VO1EL. SEC: VE1HJ. In a previous column I stated that VO1AI was the first YL to win the WAWO Award, I have since been advised that VE1ANX was the first YL to win the award. My

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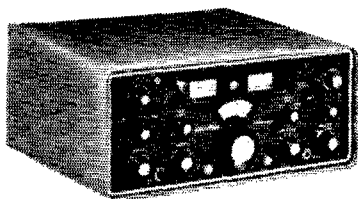


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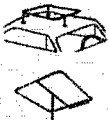
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apologies to VE1ANX. I have been advised by my company that I will be transferred to Montreal at the first of the New Year. As a result of this, I must tender my resignation as SCM. It is with regret that I make this announcement; however, there are many amateurs in this area who could handle this post effectively. K2-SQM is again active from Peggy's Cove this summer. VO1EI has been busy with the Sea Cadets and recently travelled to Pensacola, Fla., where he and a group of 25 cadets boarded the U.S. Aircraft Carrier *Lexington* for a nine-day cruise. VO1AF and VO1HV are new calls on the air in Newfoundland. VE1ADH has left this area for Toronto, where he will join the technical staff of the University of Toronto.

APN 3635 kc. Daily QNI 119 QTC 20 Sess.31
Traffic: VE1ARB 24, VE1AMR 14, VE1MX 7.

ONTARIO—Acting SCM, Rees Powell, VE3DJK—On July 1 members of the Brantford Amateur Radio Club and Emergency Measures Organization volunteers took over with their equipment to assist in communications for the form-up of the Brantford Canada Centennial Parade. Ten radio-equipped vehicles were moved to designated positions along the parade route. The equipment was used to call tow trucks, ambulances, first aid attendants and police and helped to keep the parade moving

Richard W. Roberts, VE3RO

Our Ontario Section and numerous friends mourn the passing of our SCM, who died suddenly in Portland, Me., in late July. He had served a number of terms as SCM and had held appointments as OPS, OBS and EC. Dick was first licensed in 1949 and was one of the founders of the Nortown Amateur Radio Club of Toronto and a member of the RSGB. He will be greatly missed.

smoothly. VE3DU reports that VE3EBH took over as manager of OQN July 1 because of the inability of VE3CYR to carry on and he has applied for RM appointment; VE3GI sent in his ORS certificate for endorsement; VE3CYR and VE3BZB were away on vacation in July and net attendance was down considerably. Traffic: VE3DBG 95, VE3EBH 68, VE3ATI 46, VE3AWE 36, VE3BUR 31, VE3DVE 28, VE3GI 19, VE3DU 16.

QUEBEC—SCM, J. W. Ihey, VE20J—SEC: VE2ALE, RA1: VE2DR, PA1MS: VE2BWL and VE2AGQ. First a correction to last month's report. It should be VE3CYR we thank for the excellent work for OQN and not VE2CYR. And about OQN—it has had the same problems during the summer as have the other nets like EON, RTQ, QPN and the Quebec AREC Sun, Morning Net. We gather that VE3IV is our gain in VE2YH and Ontario's gain is our VE2IV. The many friends of former VE2TT will be pleased to know that he now has the call VE3RP. VE2ALE, VE2BU, VE2ZA, VE2DB and VE2BOP took part in the hamfest at Morrisonville, N.Y., and reported a very pleasant time. We welcome back to activity VE2BMS who has long been dormant. He will be a help to us during what we hope will be a busy winter traffic season. It is hoped that all the Eastern and Northern stations are copying VE2WM with his official Bulletins on 3770 kc. VE2ALE reports the following: Comme vous avez vu le section francais QST mois Aout 67 svp encourage nous que nous puissions publier d'autre information mes cofreres francais merci. Tous les EC de Quebec doit rapporter form 5 tous les mois que ils se rend chez VE2ALE non plus tard que le 26 de chaque mois. Neuve ECs: VE2WMI, VE2AJD, VE2BTZ. Traffic: VE2DR 102, VE2BRD 73, VE2AGQ 50, VE2OJ 40, VE2BVY 36, VE2ALE 19, VE2AJD 17, VE2EC 11, VE2WMI 10, VE2CK 8, VE2DCW 7.

Solution to the QST Clue Crypt

(Continued from page 24)

NOW THAT FCC HAS GIVEN US
THE NEW AMATEUR REGULATIONS
THAT START TO GO INTO EFFECT
DURING NEXT YEAR, LET'S QUASH ALL
THE WILD RUMORS, REALIZING THAT
JUSTIFICATION OF INCENTIVE LICENSING
WILL SOON BE COMMON KNOWLEDGE

QST

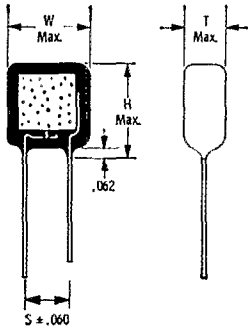
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TSD5	.450	.450	.325	.250

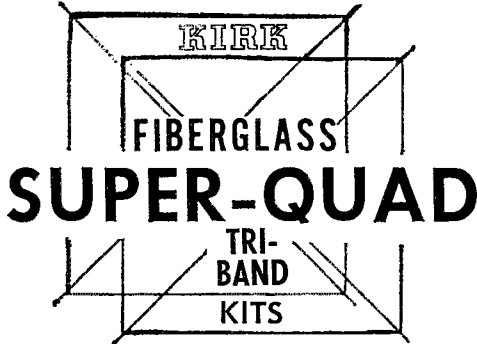
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YL News and Views

(Continued from page 93)

than November 22, 1967, and received no later than December 6, 1967, or they will be disqualified. Mail copies of logs to:

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Liberal, Kansas, zip 67901

Please read the rules carefully, and note the post-mark deadline!!!

The YLAP is one of the two major YLRL events of the year. Do try to join in the fun even if you can participate for only a short time, we want and need you in the contest. Added hint, the frequencies 14.288, and 14.265 are popular with YLs, but the gals will be on all bands as always.

One YLs view of the Powder Puff Derby, 1967.

Alfreda Folk, WA8DOY, in Martinsburg, West Virginia sends the following story of her part in the Powder Puff Derby:

"The Derby was to begin at dawn Saturday, July 11, at Atlantic City, but due to heavy overcast in the east, it never got off the ground until Monday. This made it difficult all across the country for finding operators for various stages across the country. Here, it was said, we had one of the best set-ups. At the airport we had 2-meter f.m. stations in the tower, and in the lobby for the FAA and the pilots, as well as to monitor the other 2-meter stations. The one in the tower passed the arrival and departure times to our base station which passed them on to the next stop in Cincinnati. Each station had the complete schedule of stops, planes (TAR number) and pilots.

"The take off in New Jersey was about 9:00 A.M. Monday, at the rate of three a minute. Soon Martinsburg was literally buzzing with planes arriving too fast for clearance to land. By noon several had left, but by afternoon the weather reports became questionable, and all afternoon the remaining pilots were undecided. Since only flying time counted, most stayed here because the Cincinnati stop, as well as the mountains were hazardous. About ten planes took off by six that evening, but were forced down around Parkersburg. One or two were able to get off to Cincinnati but the others were disqualified for remaining at an unauthorized stop over night.

"Well Tuesday was worse. In the first place no one had anticipated any of them remaining over night, four finally took off but the opening wasn't there. They had clouds to 15,000 feet. Two of them made it to Cincinnati, one got to Morgantown and came back due to weather, and the fourth went home.

"Wednesday, at the crack of dawn all remaining planes were off, half of them before our operator got to the tower. They made good time across as we followed their progress on the base net.

"All in all it was quite an experience.

73,

Alfreda, WA8DOY."



Gimmicks and Gadgets

(Continued from page 48)


that is necessary for matching to a 50-ohm line. A slight adjustment of the length may be needed when making final tuneup.

The BNC fitting (other types can be used) is soldered to the bottom plate by making a fillet of solder around the shoulder on the fitting. The center terminal is connected to the top plate.

In the car installation the feed line can be a short (not over 5 or 6 feet) piece of RG-58/AU. RG-8/U is preferable, and an adapter (UG-255/U)


(Continued on page 152)

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	200	39¢	1000	79¢
	400	45¢		

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16	39	91

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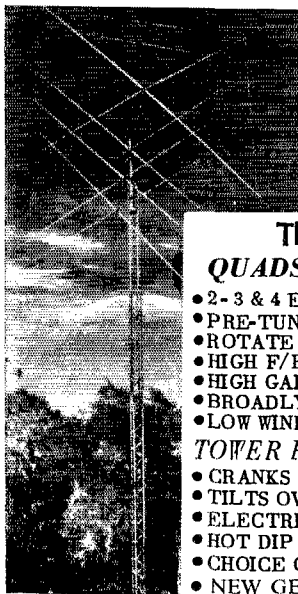
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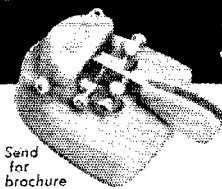
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can be used for making the connection to the BNC fitting.

In mobile operation, many contacts have been made from a Detroit suburb to Toledo, Ohio, a distance of over 50 miles, as well as over shorter distances. In fact, several contacts have been made from our basement shack, with the antenna three feet below ground level, over a distance of 17 miles, using about 50 watts output. The transmitter in the car is a modified T44A6A Motorola f.m. unit having about 10 watts output. Rain and snow don't seem to affect the standing-wave ratio.

It should be possible to boost the signal by approximately 3 db. by using two stacked Mini-Wheels. The stacking distance would be about 15 inches.

QST

"It Seems to Us . . ."

(Continued from page 9)

sion has now chosen represents its careful and joint evaluation after a several-year study. It appears to have accepted the League's recommendations in essence, dropping the most controversial proposals such as new call letters and a higher code speed requirement which we have opposed.

In the days of earlier incentive licensing systems most amateurs were willing — even eager — to put forth extra effort to upgrade, both for personal satisfaction and to strengthen the position of amateur radio itself. They felt that operating privileges should reflect in some degree demonstrated competence.

We believe a substantial majority of today's hams have this same sincerity and dedication, and will look upon the Commission's action as a personal challenge and opportunity.

QST

Happenings of the Month

(Continued from page 86)

TECHNICAL CHANGE IN FCC RULES

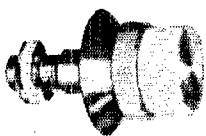
The Federal Communications Commission has amended Part 97 of its rules, governing the amateur radio service, by deleting sections 97.139, 97.141 and 97.143 relating to the suspension and revocation of licenses. Essentially the same information appears in Part 1, Practice and Procedure, so the separate listing in the amateur rules is regarded as repetitious.

No actual change in Commission procedure or ability to revoke or suspend amateur licenses has occurred. The amendment is solely editorial in nature, following recent trends in gathering all the Commission's rules for practices and procedures affecting several radio services into one Part.

QST

SWITCH TO SAFETY!

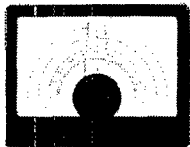




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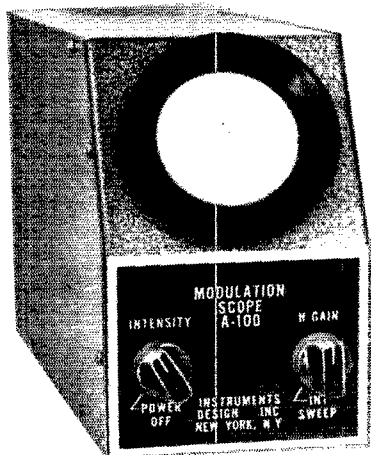
Model 4832/2K\$7.50



NEW 6/36 DRIVE

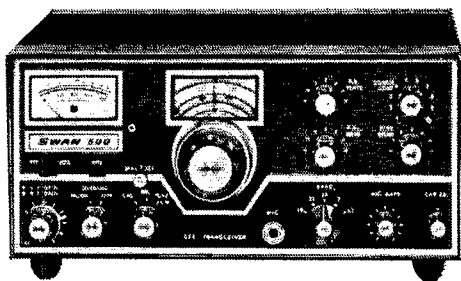
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It is with deep regret that we record the passing of these amateurs:

W1AAL, Raymond S. Brown, Attleboro, Mass.
 W1ADL, Henry V. Atherton, Cambridge, Mass.
 W1EPB, Aime N. Duchaine, Westbrook, Me.
 W2AE, Robert W. Murphy, Liverpool, N. Y.
 W2COH, Leo E. Mills, Endicott, N. Y.
 K2EFV, Joseph A. Alvarino, Ridgewood, N. Y.
 K2HLB, Harold J. Megibow, Ramsey, N. J.
 W2LDS, Edward B. Chapman, Poughkeepsie, N. Y.
 WA2UMA, Robert E. Fountain, Broadalbin, N. Y.
 W3AJJ, Robert L. Graham, Sr., Columbia, Pa.
 K3FIB, Albert V. Masket, Chevy Chase, Md.
 K3GVZ, George Snow, Jr., Callery, Pa.
 K3PKT, Carmen J. Diodati, Churchville, Pa.
 K3THE, Regis W. Hart, Pittsburgh, Pa.
 W3TKE, John A. Ross, Silver Spring, Md.
 W4RKF, Walter Rogers, Memphis, Tenn.
 W4SUE, Clarence S. Davis, Huntsville, Ala.
 W5SHN, Sims C. Saylor, San Angelo, Texas
 W6AZB, Clark H. Sphar, Menlo Park, Calif.
 W6LYG, George G. Doty, Los Angeles, Calif.
 W6NUN, Nathaniel S. Rees, Quincy, Calif.
 K6PNZ, Harry C. Williams, Salinas, Calif.
 W6TBK, Geoffrey Almy, Menlo Park, Calif.
 W7AMI, Foster Detrick, Mercer Island, Wash.
 K7OWW, William Graves, Douglas, Wyo.
 W8EK, Robert Sell, Alliance, Ohio
 W8KKZ, Peter Long, Southgate, Mich.
 K8OPA, Stanley Moeschl, Cincinnati, Ohio
 WA8OYD, J. Cameron Hall, Troy, Mich.
 K8QWP, Lawrence P. Lemihan, Walled Lake, Mich.
 W9ECZ, Harry E. Niece, Niota, Ill.
 WA9FHJ, Tom Murphey, Chicago, Ill.
 K9IBH, Waldemar C. Fischer, Eau Claire, Wisc.
 W9KRJ, Kenneth Moreau, East Gary, Ind.
 W9RH, Emil R. Felber, Jr., Milwaukee, Wisc.
 W0EOP, Donald O. Olson, Wazata, Minn.
 W0IUY, Fred Cook, Cedar Rapids, Iowa
 W0OVV, Everett E. Ernst, Dixon, Mo.
 HP1EV, Ernesto Valencia, Panama, R. P.
 ex-U2GU, Mark Losseff, Tulsa, U.S.S.R.
 VE3DN, David Harvey, Doyensview, Ont.
 VE3NG, Richard Roberts, Willowdale, Ont.
 VE3OR, Miles V. Rowcliffe, Weston, Ont.
 VK6MU, Malcolm S. Urquhart, Cottesloe, W. Aust.
 ZS9G, Dave Baird, Kangula, Bechuanaland, Africa



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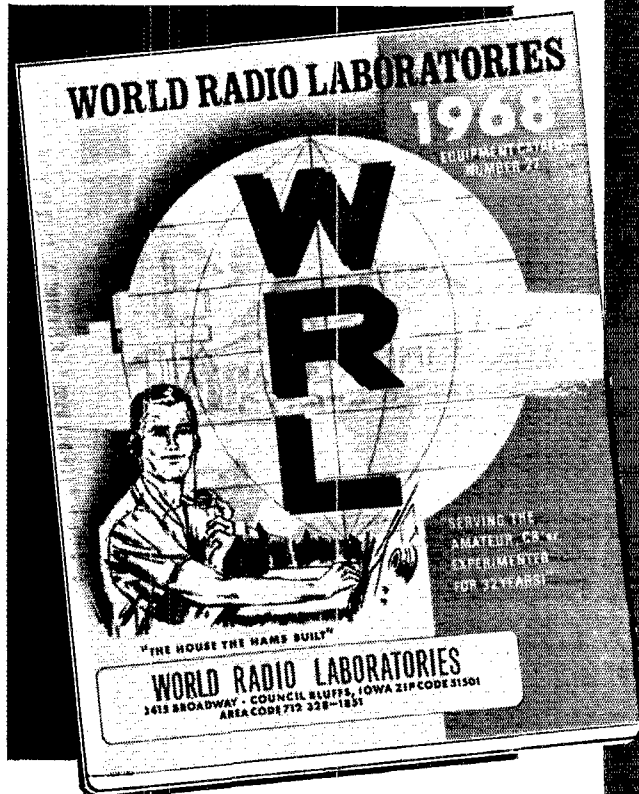
How's DX?

(Continued from page 101)

0300-0400 GMT. Next month we expect to present this season's 100-Meter Transatlantic & World-Wide DX Tests details courtesy Stew and friends. . . . Albania dusts off the welcome sign for tourists but no r.f. is allowed as yet.

ASIA — UA1CK/JT1 managed about three kiloQSOs from the Ulan Bator balliwick before heading back to Leningrad, Vlad used 150 watts, a ground-plane and 17-tube receiver, all homespun. At his home QTH UA1CK has worked nearly 300 sideband countries with a selfmade 200-watter, 17-tube inahaler, 2-el, beam on 20, 15-meter g.p. and long-wire radiators for 40 and 80. These data via WA6AHF HMLAJ writes, "I look for W/Ks on 14,200-14,235 kc. at 1100-1300 GMT, Europe and Africa on 14,100-14,150 at 2000-2200, running 150 watts s.s.b. with an HX-10 and NC-303." Cho's new cube quad is also used by the XYL, HMLAM WB2CGW observes that MP4MAX will be on furlough till late next month, leaving MP4MAY to hold down Muscat 4X4CJ, 20 and 15 c.w. and s.s.b., tells WA1CYT of ARRL Hq. he's about to fire up a 100-ft. high 4-el. spinner in downtown Tel Aviv W7VCB mentions JA1EVM's desire for correspondence from teen-agers for his high school pupils. Yasu's address appears in "Where" UA9PO, according to W2IP, can help with your WAC-YL, Answers

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to Anna "Been on the air since March," comments HL9KA, "with an SB-100 and triband quad. I also try 80 and 40 but not much DX luck so far." Art formerly signed Ks 3ZDC 7R1T, WB6EYG and KL7EFV. Far East addenda courtesy aforementioned clubs and groups: XW8AX signed XW8CAL in a club festivity August 1st. VS9ABL threatens more Kamarin contacts. AP2NMK resumes his Pakistan sideband solo. HB9TK expects to sign VU2WB for the next three years at the Swiss embassy in New Delhi, code and phone. BV2A, formerly C3YW and XU6A, likes Europeans on 20 c.w. at 0200-0600 and 1000-1600 GMT with 400 watts, an SP-600 and 3-el. whirler. KA2s St' and JC were respectively re-elected Far East Auxiliary Radio League vep and trez in July. KA2VT reigns as prexy. New or renewed FEAREL memberships are held by KAs 2DE (WA6FHB), 2ET (WA5LNZ), 2LS (K7EMA-W5YOJ), 2MB (WB4CMB), 2USA (W4ZGN), 7AB (K1KTH), 7CW (WA2AVJ), 7RF (WA7FCV) and 8AB (WA5PPO). KAs are understandably elated over their brand new 80-meter operating privileges.

AFRICA— Personnel turnover in the Seychelles con-
tinues at a hectic clip. VQ9EF (W0BIG) says that he,
VQ9s AR HJB MB and RH have closed down, but VQ9s B
BC DH EP G HB and TC may still be going strong. Most
are associated with the Mahe tracking station on contract
with RCA or Philco. W4NJF signs ex-9J2MIM is
setting up DX shop as ZE1CX. WA1CYT has it
that G6ZY/CN will be back on from Tangiers around
Christmas, mainly 21-Mc. c.w. Relax — WA1EOT
says VQ8CG has another year or more on Mauritius.
"9G1KT is available on sideband, 14,100-14,350 or 21,300-
21,400 kc, almost daily," informs K7SUX. Earl is W7KTL
on our side. It will be 9Q5s working the world in a
DX contest sponsored by the Congo's UORA, December
9th-10th. We'll try to include participation particulars in
next month's "How's". Good opportunity to gun for the
society's DRDC and DVK diplomas, details available from
9Q5EP. More African items via club newshawks:
W9WNV-WA6SBO turned up at VQ8CB in August
to kick off a series of Indian Ocean DXcursions. G3UDU
intends to include 160 meters in a six-month Aldabras
VQ9JW c.w. and sideband sojourn. EA9EJ featured
guest on W4QCW in August. ZS8L surprises pals as
7PSAR, a new-style Lesotho label. 5U7AL may sign
a TT8 tag next month or next.

SOUTH AMERICA— Ws 1BB and 0VXO chorus glad
to tidings from Brazil. PYs, formerly restricted to a few
hours of QRP per day on 160 meters, now have full operating
authorization on 1800-1850 kc, PYs 1CK 1NFC 2CQ and
2PA are highly interested, the latter with a T4-X, so the
coming top-band season has a new DX dimension.
9Y4TW, according to KH6BZF, previously signed
WB4DWB and KH6EWD. CX9AAN is said to be
old VQ1GDW. PYTAAO intends a swipe at St.
Peter & Paul next month or next. LU2ZI radiates
South Shetlands on 20 or 40 c.w. with 100 watts and a lofty
dipole.

HEREABOUTS— Ex-WN2ZUB, now a WB2, muses,
"I thought I did pretty good with fifty Novice countries
until I read about WNBTD in August QST." Bob did
mighty well with only two rocks. WA8PVN
likes 7-Mc. giant-killing with 50 watts and a vertical.
"My QRP needs more DX to work. Tell the overseas gang
not to give up on 7 Mc.!" K2YJU/KL7 can't
seem to hear Africa at his Shemaya outpost in the Aleutians.
Tom's near-by neighbor is KL7FRY of 160-meter DX fame.
. WA9SXQ notes rare U.S. counties congregating
near 14,337 kc, at 1800 GMT and after. Mobiles abound.
. VE3ACD tells W4NXD that VK and ZL applicants
outnumber W/Ks in pursuit of Canada's Centennial
Award. VE8MB was W4NXD's 100th VE-3C victim.
. W3JZJ/9 finds OX3LP packing for return to
Denmark. KZ5IQ extended hospitality to visitor
WA4KXC. Cuba's scarce fourth call area got a
DX workout at an Isle of Pines spearfishing contest early
last month. Ex-PA9MOT guns for his PACC
certification as WB2NDH on 15 phone. We close
with W8ZCQ's cheery observation that soaring sulphurous-
content air pollution is steadily dissolving our beams.
Echhh!

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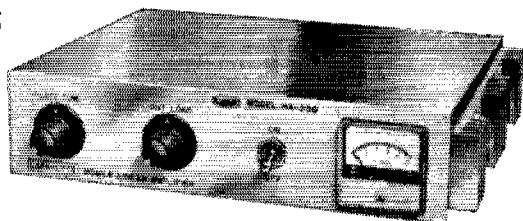
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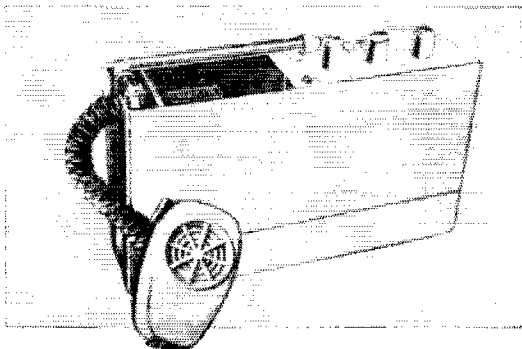
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ARPSC

(Continued from page 77)

joined and K2AYQ acted net control. One mobile stayed where the boy was last seen while the others patrolled the roads in the area. Because of the activity on the frequency, WB2VRR called in and offered his services which included a hand-carried 6-meter transceiver. It was nearly 3 A.M. when the State Police secured the search until daylight. At 6:30 A.M. till 3:30 P.M., WB2KBQ, K2AYQ, WB2VRR and WB2UEX made further searches. At 5:00 P.M. the search resumed and some State Police bloodhounds were used. W7BZ* RPL JDD, K2RIH and WA2LJI joined the search which continued until about 9:15 P.M. At 7:30 A.M. July 26, W2OP manned the Red Cross Headquarters radio station throughout the day and linked the search center with the Red Cross facilities that provided sandwiches and coffee for all the persons participating in the search effort. The search was finally called off by the State Police at 5:30 P.M. but it was not until July 27 that the boy was found safe in North Carolina — K2AYQ, EC Glens Falls, New York.

On July 28, the Lake Emergency Net of Jacksonville, Florida, was placed on standby alert for over an hour because a parked tank car was leaking deadly chlorine gas. The alert was secured when the car had been moved away from the densely populated area. — WA4TJS, EC Leesburg, Fla.

After the North Texas Traffic Net session which began at 2330Z July 30, WA5AZQ broke in and requested assistance. He was trying to locate a boy who had left New York for Dallas. The boy was to spend nights at YMCAs in Washington, Chicago and Kansas City. It was important that he contact Dallas because his cousin was in critical condition in a Dallas hospital as a result of an automobile accident. WA5ALB and WA5QKE switched to 20 and 15 meters and within 20 minutes the three cities were contacted and the information passed. The next evening on the net WA5ALB reported that the boy called Dallas at 0500Z July 31. It would have been costly and nearly impossible to locate this boy using conventional means — WA5QKE

On August 5 at 2320Z, W6IZS/mobile 10 miles east of Cedar City, Utah, reported a flood with car-size boulders and mud blocking Highway 14; all traffic was at a standstill. K6KZI was net control and relayed to K6JQB. W7PCY in Phoenix assisted. The message provided rapid assistance to all motorists. At 2355Z W6IZS/mobile secured when he found that the Cedar City equipment was on the way to the spot. — W6VX.

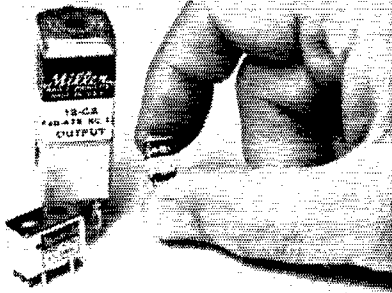
On August 6 at 2200Z, K6TGE/mobile reported a four-car accident with minor injuries on Highway 191 near Morgan Hill, nearly 100 miles south of San Francisco. K6MJU was net control and WA6DXJ relayed the information to the Highway Patrol who reached the scene, about ten minutes after the initial call for help. — W6JX.

Thirty-eight SEC reports were received for the month of June, representing 16,021 AREC members. This is seven fewer reports and 1,952 fewer members than a year ago. Sections reported are: Ala, Alta, Ark, Colo, Conn, Del, EFla, EMass, Ga, Ind, Ill, Kans, Ky, Mar, Mich, Miss, Mo, Mont, NC, Neb, Nev, NLI, NNJ, Ohio, Okla, Que, Sask, SCV, SDgo, SNJ, STex, Tenn, Utah, Va, Wash, WFla, WNY, WPa.

At the half way mark for 1967, 249 SEC reports have been received from 52 different sections. This represents a decrease of 31 reports and a decrease of 7 sections from 1966. Those sections at the 100% mark are: Ala, Alta, Ark, Colo, Conn, Del, EFla, EMass, Ga, Ill, Kans, Ky, Mar, Mich, Mo, Mont, NC, Neb, Nev, NNJ, Ohio, Okla, Que, Sask, SNJ, STex, Utah, Va, WNY, WPa.

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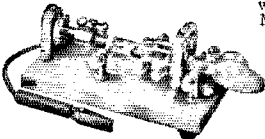
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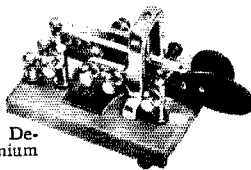
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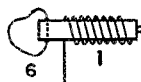
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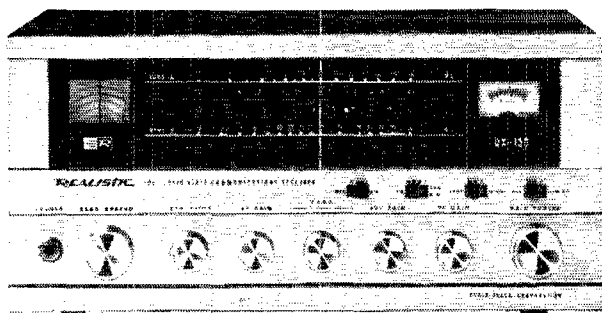
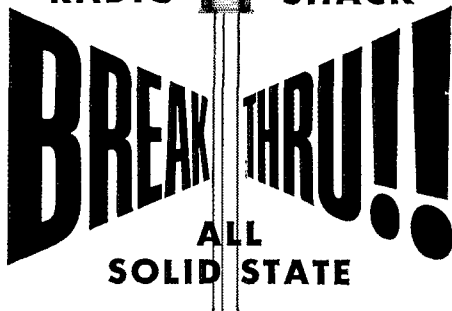
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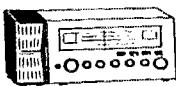
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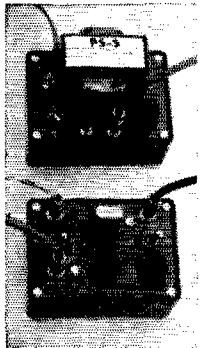
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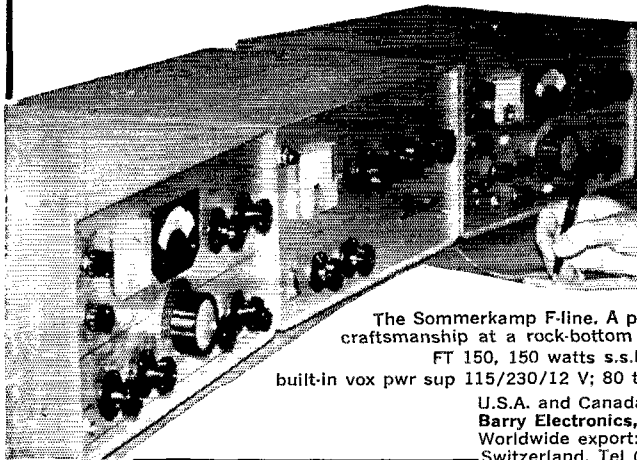
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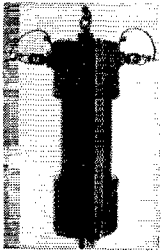
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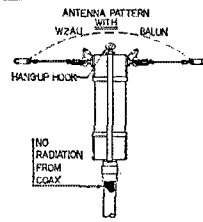
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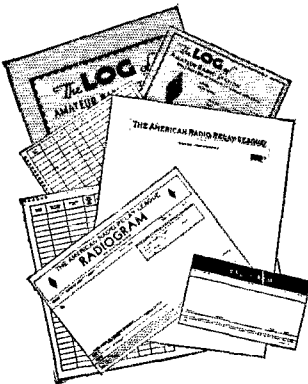
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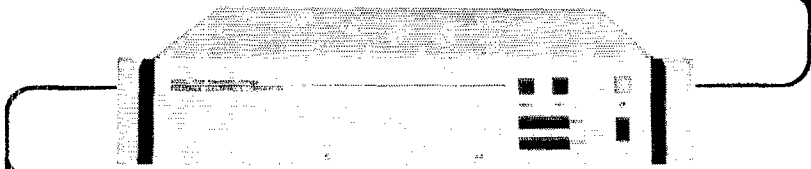
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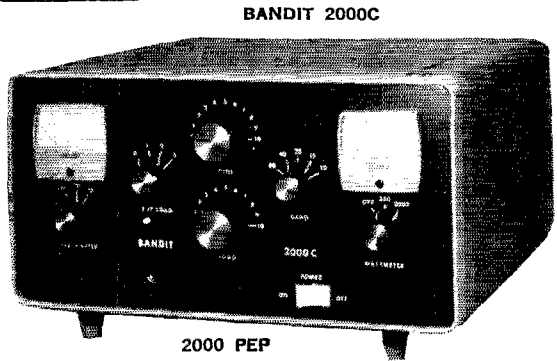
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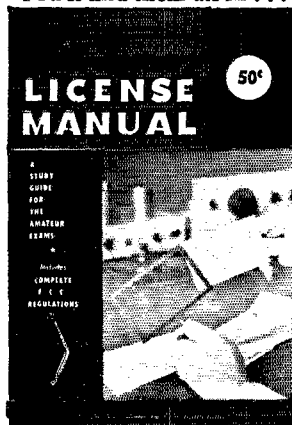
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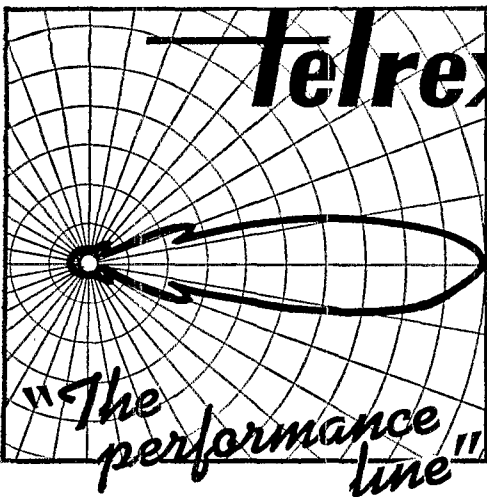
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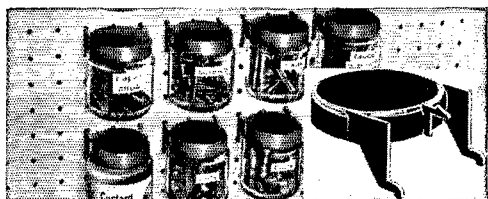
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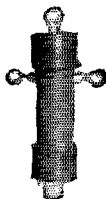
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JOHNSON RANGER.....99	NC303.....229	SB300.....199
RANGER II.....177	NCX5.....559	DX60A.....77
S108.....79	GONSET 677A.....59	SENECA VHF1.....177
SX110.....97	GALAXY III & AC 199	HAI4 & HP24.....139
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(1) 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, except there is no charge for zip code, which is essential you furnish. An attempt to do 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. No checking-copies can be supplied.

(8) No advertiser may use more than 100 words in any one advertisement, nor more than one ad in one issue.

(9) Due to the tightness of production schedules, cancellation of a Ham-Ad already accepted cannot be guaranteed beyond the deadline noted in paragraph (5) above.

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.

THE QCWA will hold their 20th Anniversary Dinner Meeting at the Hotel Statler-Hilton, New York City, on Friday, October 27, 1967. Write A. J. Gironda, W2JE, Executive-Secretary, 1417 Stonybrook Avenue, Mamaroneck, N.Y. 10543 for tickets at \$8.50 each. Ladies invited.

INVITATION: New York Radio Club cordially invites New York City area hams and SWLs to its regular monthly meetings, Second Monday of each month at George Washington Hotel, 23rd St. and Lexington Ave., at 8 P.M. All are welcome. W2ATF, New York Radio Club.

SESQUICENTENNIAL: Help celebrate Illinois' 150th Birthday. Attend the 1968 ARRL Lab of Lincoln Central Division Convention, August 3-4. For information, please write: Convention, 104 North 6th Street, Springfield, Illinois 62701.

OLD Old Timers Club now over 760 members with verified 2-way contacts before 1926. Life membership \$15.00. Bi-monthly "Spark Gap Timers" \$2.50 annually. Roster free to members. Write Secretary, W5VA, Box 840, Corpus Christi, Texas 78403.

FAIRBANKS, Alaska Centennial Exposition, KLTACS Official Station. Visitors call on 3866 or 145350. Informal get-togethers. Kings Klub, Noble Street, noon Saturdays. Commemorative QSLs issued.

MOTOROLA used FM communication equipment bought and sold. W5BCO, Ralph Hicks, 813B No. Federal Hiway, Fort Lauderdale, Florida.

WANT Callbooks, catalogs, magazines, pre-1920 for historical library. W4AA, Wayne Nelson, Concord, N.C. 28025.

SELL: Eimac 4K250B tubes. Guaranteed gud condx. \$6.50 each. \$10.00 paid repair in U.S.A. Send check or m.o. Everett Siddham, Jr., W5LQ, 722 So. 30th, Muskogee, Okla.

TUBES, Diodes and Transistors wanted. Astral Electronics Corp., 150 Miller St., Elizabeth, N.J. 07207.

SELL, swap and buy ancient radio set and parts magazines. Lavery, 118 N. Wycomb, Landsdowne, Penna.

TUBES Wanted. All types higher prices paid. Write or phone Ceco Communications, 120 West 18th St., N.Y. 11, N.Y. Tel: 242-7359.

DUMMY Loads, 1 KW, all-band, \$7.95; wired, \$12.95. Ham Kits, P.O. Box 175, Cranford, N.J.

WANTED: 2 to 12 304TL tubes, Callanan, W9AU, 118 S. Clinton, Chicago 6, Ill.

MANUALS for surplus electronics. List 10¢. S. Consalvo, 4905 Roanne Drive, Washington, D.C. 20021.

WANTED: Collins Parts, BC-610, GRC-2, Autodyne, Bethpage, L.I., N.Y. 11714.

5-BAND receiver. Portable, with direction finder. Following coverage: 30-50 mc, 150-175 mc, 190-400 kc, 550-1600 kc, 1.6-4.5 mc. Free 18-page Instruction Book, packed with interesting information. Nova-Tech, Dept. 245, Redondo Beach, Calif. 90278.

SELL: receivers SX-111, BC312-N w/power supply, LA400C 1KW linear; Johnson Matchbox 275 w/SWR; Johnson TR switch; Teltek 1KM831K balun, mint condx. Package only: \$350.00. K4EOP.

QSTs: 1935 through 1960. All intact and in gud condx: 1935-1946 bound, One 1931 bound. Write Mrs. A. B. Martini, 500 Carteret St., Camden, N.J. 08103.

QSLs?? SWLs?? Personalized made-to-order! One-day service! Samples 25¢. DeLuxe, 35¢. (refundable). Sakkers, W3ED, Box 218, Holland, Michigan 49423 (Religious samples 25¢).
QSLs "Brownie" W3CFL, 3111 Lehigh, Allentown, Penna. Samples 10¢. Catalog 25¢.

C. FRITZ—QSLs that you're proud to send, bring greater return. Samples 25¢ deductible. Box 1684, Scottsdale, Arizona 85252 (formerly Joliet, Illinois).

HUNDRED QSLs \$1.25 postpaid. Samples, dime. Holland, R3, Box 649, Duluth, Minn. 55803.

QSLs-SMS. Samples 10¢. Malgo Press, Box 373, M.O., Toledo, Ohio 43601.

DELUXE QSL Petty, W2HAZ, P.O. Box 5237, Trenton, N.J. 08638. Samples, 10¢.

10¢ Brings free samples. Harry R. Sims, 3227 Missouri Ave., St. Louis, Mo. 63118.

CREATIVE QSL Cards, 25¢ for catalog, samples, 50¢ coupon. Personal attention, imaginative new designs. Wilkins Printing, Box 787-1, Atascadero, California 93422.

RUBBER Stamps \$1.15 includes tax and postage. Clints' Radio W2UDO, 32 Cumberland Ave., Verona, N.J. 07044.

QSL, finest YLRL's. OMs samples 10¢. W2DJH Press, Warrensburg, N.Y. 12885.

QSLs, SWLs, XYL-OMs (sample assortment approximately 9¢) covering designing, planning, printing, arranging, mailing, eye-catching, comic, sedate, fabulous, DX-attracting, prototype snazy, unparagoned cards (Wow!) Rogers K8AAB, 961 Arcade St., St. Paul, Minn. 55106.

3-D QSL cards, recognized leader among raised designs. Compliments aptent! Prized collector's item. Samples 25¢ (refundable). 3-D QSL Co., Monson, Mass. 01037.

QSL, SWLs, WPE. Samples 10¢ in adv. Nicholas & Son Printery, P.O. Box 11184, Phoenix 17, Ariz. 85017.

QSLs 300 for \$4.35, samples 10¢. W9SKR, George Vesely Rte. #1, 100 Wilson Road, Ingleside, Ill. 60041.

QSLs 3-color glossy 100, \$4.50, Rutgers Vari-Typing Service. Free samples. Thomas St., Riesel Ridge, Milford, N.J.

QSLs-100 3-color glossy \$3.00; silver globe on front, report form on back. Free samples. Rusprint, Box 7575, Kansas City, Mo. 64116.

ORIGINAL EX-IN double holders display 20 cards each in plastic, 3 for \$1.00 or 10 for \$3.00 prepaid and guaranteed. Free sample to dealers on clubs. Tepabco, John K4MNT, Box 198T, Gallatin, Tenn. 37066.

QSL's: Quality with service. Samples free. R. A. Larson Press. Box 45, Fairport, N.Y. 14450.

QSL's, Free samples, attractive designs. Fast return. W7IIZ Press, Box 2387, Eugene, Ore. 97402.

QSLs. Kromkote glossy 2 & 3 colors, attractive, distinctive, different. Choice of colors 100-\$3.00 up. Samples 15¢. Agent for Call-D-Cals, K2VOB Press, 31 Argyle Terrace, Irvingston, New Jersey 07111.

QSLs, Fast service. Free samples, Bolles, W5OWC, Box 9363, Austin, Texas.

QSL, SWL, cards that are different. Quality Card stock. Samples 10¢. Home Print, 2416 Elmo Ave., Hamilton, Ohio.

FINE Embossed QSL's Samples. Ace Printing, 6801 Clark Ave., Cleveland, Ohio 44102.

QSLs Glossy coated, 100, \$2.00, 3 and 4 colors. Samples, dime. Bob Garra, Lehighton, Penna. 18235.

RUBBER Stamps, 3-line address \$1.50, J. P. Maguire Company, 448 Proctor Avenue, Revere, Massachusetts 02151.

QSLs by Jansen, K2HVN, samples 25¢, 860 Atlantic Street, Lindenhurst, N.Y. 11757.

QSLs. Information book and samples. 25¢. WIOFB Press, Hadley, Mass. 01035.

QSLs, Fast. Catalog, 10¢. Filmercrafters, Box 304, Martins Ferry, Ohio

QSLs Fast. Joe, WB2YIV, 518 Glenmere Ave., Neptune, N.J. 07753.

QSLs, Second to none. Your personal combination from largest selection. glossy reds, blacks, cyanops, Pincraft, vellum, and Crystallon. All ink colors. Many card styles. Fast service. Samples, 25¢. Includes your call in beautiful 4 1/2" letters. Ray, K7HLR, Box 1176, Twin Falls, Idaho 83301.

SPECIAL! Deluxe rubber stamp, or 1000 labels with name, address, call, only 89¢. Jim Nelson, SE11, Waseca, Minn. 56093.

CANADIANS: Best used gear list in Canada. Free Etc. c/o Marv. VE2ANN, Box 744, Montreal 3.

WANTED: Collins mechanical filters type F250A20 and B&W 850 1 kw PI inductor. E. J. Kirchner, 2 Andironack Ave., Agincourt, Ont., Canada.

CANADIANS: 75A-4 with speaker-control console, in excellent condition: \$520.00; Viking 500, unused, \$450.00; Johnson KW Matchbox with indicator. R. Hulme, P.O. Box 44, Garson, Ont. P., Canada.

CANADIANS: Must clean out the place. Receiver, HQ-170 Hammarlund with speaker, \$350.00; Transmitter HX-20 Heathkit with mic, power supply, \$250.00; RTTY equipment Model 14 typewriter, perforator, plus typing perforator with power supply, \$100. Tube-checker 666, \$85.00. Score 40, Eico \$110.00, with probes. Contact VE2BQU, B. Felgar, 4970 Maplewood, Apt. 14, Montreal, 29, Quebec P., Canada. Tel: 7372758.

COLLINS Owners: Now is the time to get that long awaited conversion. If you want the very best in receiving capabilities this upcoming season, a VCZ front end conversion is your answer. 75A4's, \$69.95; 75-S series, \$34.95 complete, in stock; converted 75A4's for immediate shipment. Dealers in fine used C. Collins gear. Write for details. VCZ Sales, 5 Pinetree Rd., Ramsey, N.J. 07446. Tel: (201)-327-9494.

WE Buy all types of tubes for cash, especially Eimac, subject to our test. Maritime International Co., Box 516, Hempstead, N.Y.
RTTY Gear for sale. List issued monthly, 88 or 44 mhz toroids, five for \$1.50 postpaid, Elliott Buchanan, W6VVC, 1067 Mandana Blvd., Oakland, Calif. 94610.

WANTED: Tubes, all types, write or phone Bill Salerno, WZONV, 243 Harrison Avenue, Garfield, N.J., Tel: Garfield Area code (201)-773-3320.

WANTED: Military and commercial laboratory test equipment. Electronicraft, Box 13, Binghamton, N.Y. 13902.

TELEPRINTONICS—Toroids, 6/2.00 postpaid. List. Type-tonics, Box 8873, Ft. Lauderdale, Fla. 33311.

ESTATE Liquidation offers, Big list, Parad Engineering Service, 284 Rte. 10, Dover, N.J. 07801.

WANTED: Model #28 Teletype equipment, R-388, R-390A, Cash or trade for new amateur equipment. Alltrons-Howard Co., Box 19, Boston, Mass. 02101.

TOROIDS, 88 mh uncased, \$52.50. Postpaid, Humphrey, WA6FKN, Box 34, Dixon, Calif.

SELL: CO, QST, Handbooks, old radio magazines, any quantity. Buy Old radio gear and publications, Erv Rasmussen, 164 Lowell, Redwood City, Calif.

NOVICE Crystals, all bands, \$1.30 each. Free list, Nat Stintette, Umatilla, Fla. 32784.

FREE Catalog. Loads of electronic Bargains, R. W. Electronica, Inc., 2244 South Michigan Ave., Chicago, Illinois 60616.

ILLUSTRATED Certificate Guide; Radio Amateur's Vocabulary German/English. \$1.00 each. Zangerl, OE9CZI Dornbirn 1, Nachbaurstrasse 28, Austria.

TOOGOBBS: 6146B, \$4.00; 6CW4, \$1.40; 811A, \$4.25; 4D32, \$15.90. All new, boxed, guaranteed. Free catalog, Vanbar Distr., Box 442Z, Stirling, N.J. 07980.

SHOP Around, get the best deal you can and then try Gell 17 years of service to amateurs in South Texas and now ready to serve Hams anywhere. Bob Douglas, W5GEL, Douglas Electronics, 1118 S. Staples, Corpus Christi, Texas 78404.

WANTED: Tubes and all aircraft and ground radios. Units like 17L, 51X, 61RT or S. R388, R390. GRC. Any 51 series Collins unit. Test equipment, everything. URM, ARM, GRM, etc. Best offer paid. 22 years of fair dealing. Ted Dames Co., 308 Hickory St., Arlington, New Jersey 07032.

INTERESTING Sample copy free Write: "The Ham Trader," Sycamore, Illinois 60178.

SELL: Hallcrafters SX-62A with Q-Multiplier, excellent condition. With 15" speaker in portable cabinet, \$300.00 M. Pellegrino, 65 Maspath Ave., Brooklyn, N.Y. 11211. Tel: ST 2-5830.

WANTED: For personal collection: QST, May 1916; Learning the Radiotelegraph Code, 4th Ed.; How to Become a Radio Amateur, Edition 12; The Radio Amateur's License Manual, Edition 10, 11, 12. List of Stations (1914); Map of Member Stations (1914), WICUT, 18 Mohawk Dr., Unionville, Conn. 06085.

HAM'S Spanish-English manual, Gabriel K4BZY, 1329 N.E. 4th Ave., Fort Lauderdale, Florida 33304.

TR-4, \$480.00; AC-4, \$83.00; DC-3, \$123.00; R-4, \$330.00; T4X, \$330.00; MS-4, \$17.50; RV-4, \$83.00; L-4, \$580.00. Factory-sealed boxes, fully warranted. Mel Palmer, K4LGR, Box 10021, Greensboro, N.C. 27404.

BEST Offer paid for any piece of aircraft or ground radios, tubes or test equipment. In a hurry? Cash-in-advance arranged. Turn those unused units into money. Air Ground Electronics, 64 Grand Place, Kearny, N.J.

FOR Sale: SB-101 and SB-200. Wanted, kits to wire, Heath preferred. 12% of cost, some in stock. Professionally wired, Lan Richter, K3SUN, 131 Florence Drive, Harrisburg, Penna. 17112.

1076 QSTS needed for personal collection. Price secondary. Ted Dames, WZKUW, 308 Hickory Street, Arlington, New Jersey 07032.

RTTY Channel Filters, octal mounted, 2125/2975, \$5.95 pair. ESK units or 32.5-144 variable shift, easy installation, \$14.95. 88 mh. toroids, uncased, 5 for \$2.50. Herman Zachry, WA6JGI, 3232 Selby Ave., Los Angeles, Calif. 90034.

WANTED: Military, Commercial, Surplus, Airborne, Ground, transmitters, receivers, test-sets, accessories. Specialty Collins. We pay cash and freight. Ritco Electronics, Box 15650, Annandale, Va. Tel: 703-560-5480 collect.

HAM Discount House. Latest amateur equipment. Factory sealed cartons. Send self-addressed stamped envelope for lowest quotation on your needs. HDH Sales Co., 170 Lockwood Ave., Stamford, Conn. 06902.

COLLINS 75S3B, new, \$550.00; 32S-3, new, \$650.00; 30L-1, \$400.00; 32S-3 power supply, \$50.00. Full allowance for transmitter trade-in on entire package. All equipment high serial, in excellent condition. K8SRV, 4990 Ardmore Ave., Detroit, Michigan 48235. Phone 342-1731.

CRYSTALS Airmailed: SSB, Nets, MAR, Novice etc. Custom finished etch stabilized FT-243 .01% any kilocycle or fraction, 3500 to 8600 \$1.90, (five or more this range \$1.75 each), (Nets ten or more same frequency \$1.40). 1700 to 3499 and 8601 to 20,000 \$2.75 with overtones supplied above 10,000. 10,000 to 13,500 fundamentals \$2.95. Add 50¢ each for 0015%. Add 75¢ each for HC-6/u metal miniatures above 2000. Crystals—crystal grounds for construction see ARRL publications—QST, Handbook, SSB and Mobile Manuals and other. Inquire. Write for order-bulletin and listings. Crystals since 1933. Airmail 160/crystal, surface 5¢. C-W Crystals, Marshfield, Missouri 65706.

SQUEEZE Keyer (W0EPV circuit, July QST) is world's best. Complete kit (less paddle) includes my printed circuit board, pre-punched cabinet and instructions: \$69.50 (plus postage). Brown double-lever paddle, \$16.95 (plus postage). Satisfaction guaranteed. Jimmy Moss, W5GRJ, Box 442, Natcoches, Lga. 71457.

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 48104, Tel. Normandy 8-8262.

WANTED: Hycon crystal filters 2800 and 220 cycles wide as per QST article page 13 January 1957. Walter Lindgren, W2AJR, Box 1148, Easthampton, N.Y. 11937.

SAVE On all makes of new and used ham equipment. Write or call Bob Grimes, 89 Aspen Road, Swampscott, Massachusetts, 617-598-2530 for the gear you want at the prices you want to pay.

TELETYPE: Bu 288, sell parts, W4NYF, Schmidt, 405 NW-30th Terr., Ft. Lauderdale, Fla.

SELL: Model 19 teletype set with communications keyboard. Make offer. W2KIT, 151 Rock Creek Lane, Scarsdale, N.Y. 10583, phone 914-723-5493.

WRL's used transceiver bonanza! Guarantee-trial-terms. Without trades: SR-150, \$299.95; SR-46, \$129.95; G-76, \$129.95; KVM-1, \$249.95; Thor 6 and AC, \$219.95; Galaxy 111, \$179.95; Galaxy V, \$269.95; Galaxy 300, \$149.95; Eico 73, \$149.95; NCG-3, \$179.95; SB-34, \$284.95; Utica 650 and VFO, \$129.95; Hundreds more. Free list, WRL, Box 919, Council Bluffs, Iowa 51501.

GROUNDED Grid filament chokes 30 amp, \$4.00, pp USA48, William Deane, 8831 Sovereign Rd., San Diego, Calif. 92123.

COLLEGE: Must sell. Valiant w/Dow-Key relay and Turner 454C mic \$150.00; HQ-100A w/xtal cal. and original carton, \$120.00; SBE-33 w/12 VDC inverter and SBE mobile mount, and mic, \$200.00. Will deliver in southern Missouri or ship if you pay charges. WA9KXC, Box 146, Crocker, Mo. 65452.

FOR Sale: Complete SSB mobile rig. Hallcrafters SR-160 with 12-volt DC supply (PS-150) 20 M Mark Helitwip antenna, PFT microphone, speaker, mounting rack, complete with cables and manuals. Like new, \$200.00. H. Slutske, W6ACB, 103 S. W. Croster St., Los Angeles, Calif. 90035.

DRAKE 2-B for sale. Serial No. 4426. Absolutely perfect condition. No scratches \$150.00. W9PFT, 611 East Fairview, Arlington Heights, Illinois 60005.

HALLCRAFTERS SX-117, WWV and complete 10m xtals, HT-44, spare finals, PS-150-120, transceiver cables, mint condition, No trades, \$550. Alan Koserup, Tel: a.c. (312)-894-1328, 324 Crestwood, Roselle, Ill. 60172.

TBW-4 xmtr, pwr supp., mic, key, spares, instrux bk, 2 cyl. gas alt/gen, all cables, 5 waterproof cases w/opr. leers. Ready to use, like new, \$100. W3BYK, Box 152, Boalsburg, Penna. 16827. Call a.c. (814)-466-6012.

WANTED: IRE-IEEE-IEE-AIEE publications. Also BSTJ, RCA Review, TPI, Box 67, Palo Alto, Calif. 94301.

GOING Out of business: 30S-1 with new spare 4CX1000A tube, \$795.00; KVM-2 with 516F2, \$795.00; 32S-3 with 516F2, \$595.00; 7-5 3B, \$400.00; 312B4, \$125.00; Clegg 22'er, \$150.00; T-O Keyer with Ylec, Mike Farnowsky, 24 S. Middletown Rd., Montvale, N.J. 07645. Tel: 201-391-6450.

QST, CO 1953-1966, 25¢; Popular Electronics 1957-1960, 15¢. Send stamped envelope for list, W4ABF, Gordon Edwards, 5220 Backlick Rd., Springfield, Va. 22151.

LATHE: Craftsman 6-inch, mounted motor, attachments, used 5 hours, sell or trade; also Vibroplex Champion, \$15.00. Ameco CN-144, \$30.00; Dow-Key DK-60—G2C, \$10.00. All like new condx. K8GNZ, Box 683, Fairmont, W. Va. 26554.

SX-101A. Excellent, no-drift receiver. \$160.00, with prepaid shipping in U.S. exc. Alaska and Hawaii. W5WZYS, Mike Farnowsky, 24 S. Middletown Rd., Montvale, N.J. 07645. Tel: 201-391-6450.

C.P. Claire relays, HG51059, HG1002, (please specify) ideal for keyers, \$5.00 each, pp. R. Isenstein, 26 Plymouth Ave., Belmont, Mass. 02178.

SELL: for college: Apache with SB-10, \$200.00; Mohawk, \$140.00, both \$300.00. WA0JNA, 1541 Atlantic St., St. Paul, Minnesota 55106.

DRAKE 2C perfect condx, \$215.00. DX-60, \$65.00. Dow-Key relay and key, \$10.00. Package deal, \$275.00. Drake R4 receiver, \$275.00; Drake T4X transmitter and all cables, \$325.00. AC-3 supply, \$75.00. TR-3, \$275.00. Roy E. Pellegrini, K9CQV, P.O. 215 North Ave., Lombard, Ill. 60148. Tel: a.c. (312)-627-3475.

COLLINS 75S-3, 32S-1, 516E-2, late serial numbers, original factory cartons, \$750.00; E-2, Way 40' tower with ground post, \$60.00. Warrior amplifier, \$90.00. WA6ADET, 2733 Graylake Rd., Palos Verdes, Calif. 90274. Phone (213)-377-6266.

SAVE at Evansville Amateur Radio Supply: "Cash prices, no trade deals on bonus offers" New equipment: bonus No. 1, Drake TR-4, \$599.95, free AC-4 and MS-4. Bonus No. 2, Drake T4X and R4A, \$799.95, free AC-4 and MS-4. Bonus No. 3, Swan-500, \$420.00, free 117KC. Bonus No. 4, Galaxy-MK II \$420.00, free AC-35. Bonus No. 5, Moseley TA-33, \$399.00. Bonus No. 6, Ham-M, \$95.00. Freight 10¢. SASE for the best deal on new or used gear, 1629 S. Kentucky, Evansville, Inc. 47714. Tel: a.c. (812)-422-4551. Bill Ogg, WA9RMO.

SALE: Viking Challenger, condx cond; Lafayette HE-30 with HE-56 6M converter condx exclnt; Utica 650A 6M xcivr with VFO, condx exclnt; Lafayette HE-45 80-6m VFO with power supply, exclnt. Best offer, piece or whole. Will ship. K rakauer, WB2DKF, 3 Rural Drive, Scarsdale, New York 10583.

RANGER I, excellent, \$100. Hammarlund HQ-110 equivalent to new, \$150.00. Will ship. Dave, W2ZVL, 919 So. Long Beach Ave., Freeport, L.I., N.Y. 11520.

500 w. output modulation transformer, RCA, 5500/5500 ohms 1.14 KVA, never used, in original carton, \$50.00; RT-19/ARC-4, 144 mhz, transceiver, \$25.00; signal generator, Espy, 15-25 and 180-230 mhz modulated, \$19.00; 5 1/2 foot enclosed metal cabinet, \$40.00. Shipped collect. Givens, WA4-PPY, 2271 Belclair Rd., Clearwater, Fla. 33516.

SELL: Heath HX-10; Drake 2-B with all xtals, calibrator and 2B07. Transtenna 102-C 27R switch. All excellent condx. Best offer, takes, going transceiver, WA8GDR, S. J. Stansfield, Box 471, Leslie, Michigan 49251.

NCX-3, NCX-A, \$250.00; Waters Codax keyer, \$50.00. John Brooks, 36 AE CMR 584, N. Y. APO 91332.

FOR Sale: New 50 hours service Clegg 22'er with 12 crystals and Poly-Comm 6 with VFO, WA2UXD, Edward Pardocch, 117 Woodbine Street, Brooklyn, N.Y. 11221. Tel: GL-5-9922 after 5 PM.

SX-122 with calibrator, \$160.00. Swan 14-117 supply, \$60.00; Eldico 50 watt modulator, \$25.00; Morrow MB-56, \$30.00; Globe VFO deluxe, \$35.00, others. W2BWL 215 E. Main, 3K, Somerville, N.J. 08876.

NEW Eimac 4CX300As, sealed, \$20.00; new Eimac 4CX250s, sealed, \$25.00; 4D32s, new, \$15.00; 100THs, new, \$10.00; Astatic D-104, G-stand, \$20.00. W91MP, 222 Cedar Avenue, Danville, Ill. 61832.

HG-10 VFO, assembled and used once, then acquired xmt, with built-in VFO, \$27.50. WASJDH, 3442 Wheatley, Jackson, Miss. 39212.

SWAN 350. AC power supply, Superb condition, \$350.00. Original cartons. Manual. Will ship. K2YMO, 38 Mead Lane, Westbury, N.Y. 11590. Tel: (516)-334-5816.

FOR Sale: Collins 75A-4, serial 4213. Clean and in gud cond. in original packing, \$400.00. Also old Bunnell side-sweeper key, to best offer. Ivan Fry, 202 W. High St., Minerva, Ohio 44657.

FOR Sale: 6 Kc filter for 75-A4. \$35.00. W4BYU, 1130 Cumberland Road N.E. Atlanta, Georgia 30306.

75A-4, matching speaker, \$375.00; KWS-1, \$575.00. Excellent. Bill, K6TVN, 3049 Keystone, Burbank, Calif. 91504. Tel: 845-6131.

DRAKE TR-3/RV-3/AC-3, excnt condx, HO-10 'scope, TA-33 Sr., 110 VAC DPDT, Dow-Key relay, misc. WA8AEY, 817 So. Center St., Springfield, Ohio 45506.

WANTED: Hallcrafters S-36A receiver, 27.8 mcs. to 143 mcs., State price and condition. W1JVE, 328 Saybrook Street, Hartford, Conn. 06106.

"AMATEUR Radio: Its Effect On Society." Master's research paper, \$2.00. Michael Gauthier, K6ICS, Box 216, Lynwood, Calif. 90262.

WRITE, Phone, or visit us for the best deal on new or reconditioned Collins, Drake, Swan, National, Galaxy, Gonset, Hallcrafters, Hammarlund, Hy-Gain, Johnson, Millen, Mosley, SBE, Henry linear, and most other equipment. We try to give you the best service, best price, best payment terms, best trade-in. Write for price lists. Your inquiries invited. Henry Radio, Butler, Missouri 64730.

CLEGG—Complete 185 watt VHF station, Zeus transmitter, \$350.00; Interceptor B receiver, \$250.00. Both for 6 and 2 meters. Will trade in Dow-Key relay for package deal at \$550.00. Ship anywhere in original cartons. Excellent condition throughout. Shipped prepaid with certified check. K4MLY/K3FUS, J. H. Hill, Box 246, Ashland, Virginia 23005. Tel: (703)-798-6727.

DX Antenna bargain. E-Z Way RBS-40 and RBZ-66 self-supporting towers, Telrex 15 and 20 meter three element beams, Ham-M rotator left at former QTH. Pick up at Darien, Connecticut, and save. Naylor, WA1CP-WB6WSB, 485 Pullman Road, Hillsborough, Calif. 94010.

WANTED: Mechanical filter F455Y-21. Have F455Y-40 with xtals and slightly used Dow-Key DK2-60B-2C 115VAC for switching linear. Each \$20.00. Two xtals, \$5.00. Will deal separately on all. W0DAA, 1641 Eleanor, St. Paul, Minn. 55116.

FOR SALE: Going to college. Drake line of equipment T-4X, R-4, AC-4, MS-4. Price \$650.00. Thomas Sloan, 204 W. Third, Assumption, Ill. 62510.

WANTED: HQ-129-X with breadboard scale. Dave J. Cook, 3917-A Kingsbridge Rd., Chattanooga, Tennessee 37416.

MOVING, must sell: Valiant II, HQ-110, speaker, Matchbox, TA-33 Jr., rotor, Preslector, in exclnt condx. Best offer. K2KZZ, 734 Vermont St., Brooklyn, N.Y. 11207.

EICO 753 Transceiver in gud condx. Solid state VFO, stable after warm-up, \$125.00. Knight R-100A receiver with crystal calibrator and S-meter for \$65.00. Orton Kaufman, WA9-AQZ, 2605 College Ave., Goshen, Ind. 46526.

HEATH HW-12 75-meter transceiver, \$79.00; Knight R-100 all-band receiver, calibrator, S-meter, \$89.00, 2-meter Nu-visor converter, \$15.00. Will swap for quad antenna or a piano. Chuck, WB2VXR, 1080 Jackson Road, Webster, N.Y. 14580.

MINT—Collins 75A-4 (#1487) with 3 kc. filter, spinner knob, and matching speaker, \$425.00 firm. R. G. Dick, WA1DPX, 6 Herbert Rd., Arlington, Mass. 02174.

HALLCRAFTERS SX-99 and Eico 720 with antenna relay key, \$150.00. Both in A-1 condx. Will deliver 200 miles. Roger, G1oegs, 2202 South Osage, Wichita, Kansas 67213.

HALLCRAFTERS HT-37, \$250.00. SX-111 with speaker, \$130.00. Heath Ham-Scan, \$40.00. W2UWM, 1302-8th St., North Bergen, N.J. 07047.

SELL: HRO-60 w/calibrator, nine coils, 50 Kc. to 54 Mc. Perfect, \$350.00, or best offer. Will ship. Also Command set, ARC-33. Want 51J (URR388), W2VWN, 516 WEB-7221, 15 Chemung Place, Jericho, L.I., N.Y. 11753.

COLLINS 75S-3, 32S-3, 351D-2, 516F-2 mint condition. Original packing. Manuals, \$1100. Mosley TA-33 and TT-31 portable antenna; Hy-Gain 23, Fincio 6 and 2 meter beam; Hallcrafters SX-62A and CRX-3; Lafayette HE-99 and HE-45. All in excellent condition. Packing and manuals. Best offers, W1USP, tel: 617-934-2342.

TR-3, \$369.00; AC-3, \$39.00 perfect, certified check. W4YER, 3037 Teresa Drive, Birmingham, Ala. 35217. Tel: 631-7831.

SELL Beam, brand new, Hy-Gain 203BA, 3-element, 20 meters, \$80 list, \$55.00 net. F.o.b. Webster, 850 Groff, Pomona, Calif. 91766.

SX-43 and R-44 speaker. All in good condition except that receiver has noisy audio gain control. Reasonably priced. W4VG, 68 Bentwood Road, West Hartford, Conn. 06107. Phone 203-521-0416.

SELL: DX-60, \$50.00, Triplett 631, \$60.00. W4MVM, 5801 Shadowview, Mobile, Alabama 36608.

VALIANT: Excellent condition, \$150.00. W2CTO.

FREE standing 50 ft. E-Z Way tower. Ground post. Ham-M rotor, Mosley A-203-C beam. All in FB condx. \$350.00. Tel: 583-5433. Ernie LeFebvre, K1PNL.

SELL: HT-37, has PTT and 4 xtals with front panel control for full 10 meter coverage, \$215.00; SX-101A, \$185.00. Both perfect. W2CMD.

HAMMARLUND HO-180 receiver and Hallcrafters speaker R-46B. With manual, in excellent condition, \$290.00. Cash. J. Gerald Ingham, 75 East Broadway, Haverhill, Mass. 01830.

FOR Sale: Clegg Thor 6 meter transceiver, with AC power supply, \$200. Prepaid express. M. E. Atkins, W9CFB, Calhoun, Illinois 62419.

HQ-170AC, like new, \$200.00. Going transceiver, Stan Davis, WB2HZK, 84 Studley Street, Rochester, N.Y. 14616.

HAMMARLUND HQ-120 receiver, \$75.00. Bevilacqua, RD 1, Elizabethtown, Penna. 17022. Tel: 367-2601.

SELLING Out: Viking II, \$79.00; Eico 720, \$59.00; BC-221-AN, best offer. More. Ask for list. W8YHU, 921 South Woodside, North Canton, Ohio 44720.

MINT 75A-4 and speaker, \$395.00; CW and SSB filters, \$35.00 each. Husky 3 kv. p/s. \$50.00. W61KJ.

MOSLEY TA-33 beam, 40 foot tower, AR-22 rotor, Valiant I transmitter, SX-71 receiver. K6SOB, P.O. Box 4461, Daventry, Iowa 52808.

SALE: Globe Scout 65, mic, \$40-B rcvr; 10M Telrex beam. You make offer. K2KZZ, 734 Vermont St., Bklyn, N.Y. 11207.

RCA FM, lowband, CMV, 2E5, 12V, complete. Ideal for GM, \$60.00. K2ZLI, G. Evans, 17 George St., Frechold, N. 07728.

SR-150 Hallcrafters transceiver and matching ac supply. One owner, in perfect condx, \$445.00. Gallagher, K2JJE, 41 Briarwood Road, Fairhaven, New Jersey 07701.

KWM-2, Waters notch, FVT, Channeller, 6 xtals, \$12R5 and p/s, \$1200.00; 351D-2, \$40.00; MP-1, \$100; Swan VFO-406B, \$30.00, TDT Antenna, \$30.00. All excellent. Bill, WA2IZU, 516-PV6-9122, 15 Family Lane, Levittown, L.I., N.Y. 11756.

HALLCRAFTERS SX-101 MK III, Ham-bands only receiver. In perfect condx, \$140.00. Central Electronics 10-A SSB exciter, \$55.00. Address A. Ahrens, WB6LQG, 6843 Woodsey Apt. #3, Van Nuys, Calif.

EICO 720 transmitter, 730 modulator, Knight R-100, Heath VFO, coaxial relay. Best offer takes each, William Robinson, Route 2, Box 209, Petersburg, Va. 23805.

EICO 753 with matching AC transistor VFO, PTT stand mike, Heath key, Knight SWR bridge. Offer cash, or bid rrv in trade. WA4NEM, 4210 Braemar Avenue, Lakeland, Fla. 33803.

MUST Sell excellent Rohn 54 ft. crank-up tower. Includes base-plate, ground anchors, new guy wire, and all hardware. Can include 2-element, Tri-band quad antenna in sale. William Semonavick, K3RMZ, 71 Saxton Road, Dover, Delaware 19901.

WANTED: Lampkin 105-B, Johnson J KW Matchbox, HO-180-A, HQ-170A-VHF, complete 2 meter Johnson 6M2 set-up. State condition and lowest price in your first letter. John Waskowitz, 541 Marcy Ave., Bklyn, N.Y. 11206.

HEATHKITS: SB-400 with Waters compream, \$260.00; SB-300 with all filters and 2-meter converter, \$220.00; SB-200, \$200.00. All are beautifully wired and updated. Also new Alliance C-225 rotor, \$25.00, TA-33 beam, \$25.00. Dave Smith, K2CHS, 510 West 112th St., New York, N.Y. 10025.

FOR Sale: Johnson 6 and 2 Thunderbolt 700 watts AM, 1200 Watts SSB. One extra pair of thin tubes included. Call evenings. Donald Chew, WA8NTM, tel: 382-2863, 465 Burdel Dr., Wilmington, Ohio 45177.

SELL: HQ-180A General Coverage receiver, 54 thru 30 megacycles. Factory installed noise-immunizer, Mint condx, \$275.00. G. Glosa 212, 60-watt, 80 thru 10M, AM-CW transmitter, 807 final, 807 modulators, Mint condx, \$60.00. Morrow MBR-5 and RVP-250 p/s, \$30.00, K2CFC, 127 Van Kannel Ave., Yardville, N.J. 08620. Tel: (609)-585-5184.

COLLEGE-Bound: HT-44 plus P.S./150, SX-117 Clegg 99'er. In excellent condition. Peter Williams, 615 Marview Terrace, Cincinnati, Ohio 45231.

FIELD Day? 17 ft. TeePee complete, \$350.00. Write "Critch," K7MOC, Critch Industries, 120 West 400 South, Nephi, Utah 84648.

CASH Paid for your unused Tubes, and good Ham and Commercial Equipment. Send list to Harry, W2LNL, Barry Electronics, 512 Broadway, NYC 10012. Call 212-WAiker 5-700.

WANTED: Frequency meters, series type CWS 60028, Navy Dept. Bureau of Ships, R. W. Hobbs, Alliance Mfg. Co., Alliance, Ohio 44601.

SELL: Webster electric tape-recorder, accessories. Excellent for music, \$45.00. For details write Rod Vlach, WA0QMP, Benson, Minnesota 56213.

CUSTOM Kilowatt: New pair #13's, Groth turncount dial, rotor, inductor, MID filament transformer, etc. with 2600 VDC, 500 MA bias and 12 VDC supplies. Both separate rackmounting chassis with cables. Input-output networks need work, but all parts are there. A steal for \$65.00. RTTY Model 15 with matching table, naugehyde cover, \$50.00. Custom rackmount W2VAV RTTY converter with balance-meter, works and looks fine, \$25.00. Both 15 and T1, \$70.00. Absolutely mint HQ-145A with clock-timer, matching speaker. Heath Q-multiplier, \$160.00. Johnson Matchbox for 50 ohm coax, \$20.00. Custom Handbook keyer with mercury relay, sidetone, \$15.00. All F.o.b. K9YVV, 908 Country Lane, Mount Prospect, Illinois 60056.

SOLID State rectifiers. Replace those tubes and up operating efficiency. 5U4, 5V4 and 5Y5 units, \$4.00; 5R4 units, \$9.00. Both units, \$15.95 postpaid. Merely plug them in. RF Devices, Box #15, Ramsey, N.J. 07446.

WANTED: Vernier knob for 75A-4, also cabinet for 75A-1 or 75A-2. W4DRF, Rte. 2, Box 62-B, Belton, S.C. 29627.

FOR Sale: Drake TR-3 with matching AC supply, like new, \$325.00; late SBE-33 with matching mike, \$150.00; Heathkit Warrior linear, like new condx, \$140.00; Swan 175 modified but works OK, \$75.00; Century 500 d.c. supply, \$65.00; Hi-Verter 6M xmittr conv., \$25.00; Commaig 6 and 2 ant. tuner with built-in SVR meter, \$25.00; Challenger, \$45.00; H-10-100 \$90.00. Phone 3724911. Juring days, and 3726957 nights, or write K8AON, Box 8, Ripley, West Virginia 25271.

WANTED: Blonder audio baton. WA8YIM, 2143 Pressler, Akron, Ohio 44312.

TR-4 with Drake AC-3 and speaker, in excellent condition \$500. Harry Dagley, 722 Paradise Lane, Libertyville, Ill. 60048.

SELL HQ-110-AC perfect condition, Manual. Will ship, \$95.00 cash. K2IK, P. E. Hadlock, RD #2, Hammond, N.Y. 13646.

NC-300 and DX-100 with WVV converter and T-R switch, sell together only \$250.00. W7DQS, 2418 E. Pierson, Phoenix, Ariz. 85016.

HAMMARLUND HQ-180, \$235.00; DX-60A, \$50.00; HG-10 VFO, \$25.00. Will demonstrate in southern Arizona or Phoenix area. Jay Sewell, WA7GEI, Box 57, Sells, Arizona 85634.

SELLING: Two AN/PRC-6 handie-talkies 6 meter FM with spare tubes and antennas, two handsets, loudspeaker and manuals. Best offer. Brettschneider, Box 22074, Louisville, Kentucky 40222.

FOR Sale: NC-303, only \$205.00; SBE-33 transceiver with SB2DCP DC power inverter, \$195.00, WA2AVY, Gary Schmidt, 238 East 58th St., New York, N.Y. 10022. Phone PL-9-3591.

HY-GAIN DB24 4-el. beam, \$60.00; 3-el. Fiberglass quad kit, \$55.00, factory recondx Ham-M rotator-control, \$100.00, or trade for KW Matchbox, Drake DC-3 supply, mobile ant. keyer, F.o.b. W9JOD, 34712 Merrifield, Mishawaka, Ind. 46544.

REBUILDING Beam? Write Walt on fasteners. Brass, some stainless hardware. See August ad. Bronze lock washers. Samples 25¢ postpaid. Special long machine screws. Lists available. Walt, WB8LR, 29716 Briarbank, Southfield, Mich. 48075.

WANTED: Early Hallicrafters, Hammarlund, National receivers. Best price and condition in your first letter, please! Howard Hoagland, Jr., 639 North Sierra Bonita Ave., Los Angeles, Calif. 90036.

FIELD Effect transistors, MPF 102, MPF 104, T 1XM-12, \$1.20 each. Bob, W3TOO, 4015 Montpelier Rd., Rockville, Md. 20853.

FALL Specials! 30L-1, \$395.00; 312B-5, \$250.00; 312B-4, \$135.00; HT-44, \$225.00; SR-160, \$190.00; GSB-100, \$164.50; HRO-60 w/6 feet calibr., \$99.00; Valiant, \$39.00; H-20; HX-2 and HR-23 clean, \$225.00. Free list. Howard Radio, P.O. Box 1269, Abilene, Texas 79604.

HTI LK-2000 linear, \$680.00; 32S-3 xmittr and 516F-2 power supply, \$550; 75-S-3-B with 5-2.5 kc filters, \$485.00; all this equipment mint condx. Purchased in January 1967, less than 25 hours use. Package price, \$1,600. You pay shipping. Would consider high quality guns or '66-'67 model travel-trailer in trade. L. Scarpa, 1168 Mayfair Court, Vineland, N.J. 08360.

WILL Buy: Final coil to Johnson Challenger. Name price. Write or call Frank Rodio, WAZGKA, 243 Senator St., Brooklyn, N.Y. 11220. Tel: 748-7473.

SELL Mint, Drake line, used 10 hours. In original packing and guarantee: R-44, \$350.00; T4X with P/S, \$350.00. Includes extra crystals for 160 and 10 M. Packages: \$250.00. Wagner, 3600-0-3600 at 1 amp, 110/220 v primary, \$25.00. All f.o.b. Rev. Paul Bittner, W0AIH, 814 4th St., Virginia, Minnesota 55792.

COLLINS KWM-2/516F-2, \$875.00; 75S-1 with 500 kc. filter and rejection tuning, \$275.00. National NCL-2000 linear, \$450.00; HQ-110 with clock, \$110.00. Homebrew 4-811A GG linear, \$100.00, WB2DND Don Greenbaum, 20 Sunnyfield Terrace, Neptune, N.J. 07753.

URGENTLY Need: Multi-Elvac power supply for both AF-67 xciter and PMR-6A rcvr. Also schematic. K5TXZ, 1520 Holly Vista, Waco, Texas 76711.

SSB-CW-AM KW station for sale, in exlnt condx. Drake TR-3 with AC-3 power supply, Heathkit SB-200 linear amplifier with 2 new JFETs. Sacrifice, \$500 firm. Pick up, or you pay shipping. WB2HC, Stan Schwartz, Phone 212-CH2-3925 after 6 P.M. weekdays, 365 W 28th, NYC, N.Y. 10001.

SELL: Lafayette 5 band VFO with build-in power supply. Absolutely mint condx, \$22.50, Mike Wilke, P.O. Box 6020, Montgomery, Alabama 36106.

FOR Sale: Heath SB-400 and SB-300, new condition, complete, \$500.00. Heath Monitor scope HQ-10, new condition, \$50.00. Ted Brix, 5573 No. Van Ness Blvd., Fresno, Calif. 93705.

SWAN 400, 406 VFO, 117BAC, in exlnt condx, hardly used. \$365.00, Joe Locascio, K5CIT/6, 3466 West Garryana, Beale AFB, Calif. 95903.

TRANSISTORS, Brand new, \$1.00 each. JAN 2N 1049A silicon transistor corp. and Jan 2N1016BM Westinghouse. No reasonable cash offer refused. C. Grimes, 1197 Anderson Ave., Bronx, N.Y.

COMMUNICATIONS Specialists, transmitters, receivers repaired, kits wired, tested; custom building. Product detectors added. I-J Electronics, Canterbury, Conn. 06331.

FOR Sale: Heathkit DX-60, \$80.00; Mohawk receiver, \$225.00; Twoer, \$45.00; 2 meter FM transceiver, \$25.00; micro to keyer AURST OST, Ross Lunan, 56 Parkdale, Pointe Claire, Quebec, P., Canada.

WILL Swap new Henry 4K for Collins KWM-2A/2, or will sell for \$750. Will also sell Collins 75S-3 for \$400. John Williams, 103 Midland St., Greenville, S.C. 29607.

TELETYPE: In excellent condition; Model 14 TD, \$45.00; 14 typing reperiator with keyboard, \$50.00; TM 11-352 covering Model 15 printer, \$4.25. W4NZY, 119 North Birchwood Ave., Louisville, Kentucky 40206.

FOR Sale: Johnson Matchbox 250-23-3, like new, \$5.00; Heath power supply HP-13, \$65.00, H. Griffiths, 39-82 65th Place, Woodside, L.I. N.Y. 11377.

WANTED: Good used Heath electronic keyer. Charles Willis, Rte. 1, Pittsburg, Texas 75686.

INCENTIVE Licensing? You need Posi-Check, Amateur Extra and General Class FCC type exams, complete in detail and style, even to IBM type answer sheets. A very good aid to learning and a Must in preparation for FCC Amateur exams. General Posi-Check consists of 297 questions and explained answers for only \$2.98. Extra Class, 115 questions and diagrams with explained answers, \$2.00. 139 questions of the 297 in the General Posi-Check apply directly to Extra Class also. Get both for only \$4.50 postpaid. Posi-Check, P.O. Box 3564, Urbandale Station, Des Moines, Iowa 50322.

SELL Or Swap: Fisher KX-100 50-watt stereo amp., \$75.00; Heath AJ-12 FM stereo tuner, \$50.00; Mosley 80-meter dipole loading coil, \$5.00. K1YGS, 142 Torrington Heights, Torrington, Conn. 06790.

CHALLENGER: Excellent xmitr in vy gud condx. My Novice WAC in 4 months with this rig, and a vertical, \$60.00, WN0RAG, Box 326, Dawson, Minnesota 56232.

WANTED: Heathkit SB-10. Adaptor and ESI bridge oscillator/detector. Model 855A-1. W5QMI.

TRANSMITTER, Heathkit "Apache" Model TX-1, excellent, professionally EE built, Hy-Gain 18-HT antenna. Nagel, James Road, Reading, Mass. 01867.

SELL 2-B, 2BQ, xtal cal, 160M conv, A-1 condx, Ranger I, 275W Matchbox, best offer. Fred Riess, WA2RGG, R. #1, Woodnd, N.J. 08221.

SB-100 and HP-23 Heathkits, completely wired and in operation works perfectly, good clean wiring, \$500.00 cash. W1KBO, 52 Washington St., Stoneham, Mass. 02180.

COLLEGE Expenses! Hallicrafters SR-42A, 714 mike, beam, Cornell-Dubilier rotor, mint condx. Sacrifice for \$175.00. Lafayette HE-30, \$30.00, James J. Mozillo, 3144 Schley Avenue, Bronx, N.Y. 10465.

SWAN 350 xtal calibr. adaptor 22 Ext VFO 410 power supply 230XC, like new, \$520.00. Linear Hunter Bandit 2000B, factory-wired with 2 extra tubes, Like new condx, \$320.00. K7SPH, Box 4099 Tucson, Ariz. 85717. Tel: 296-6466.

75S-1, \$275.00; 32S-1, \$325.00; HRO 50/SSB, \$175.00; NC-156 Receiver, \$75.00; Comanche receiver, \$40.00; DX-20 transmitter, \$20.00; Tecraft converters 2-meters \$12.00; 6 meters, \$12.00; Vibrotax bug, \$12.00; RDZ UHF receiver, \$45.00; ABC 5's, \$5.00; HRO coils, \$5.00. R. Higgins, 104 Maple Pl., Cranford, N.J. 07016.

HEATH Marauder and Warrior sets for best offer. One or both, in exlnt condx. W. Bowman, K8RIJ, 3621 Niles Rd., St. Joseph, Michigan 49085.

100 Components, \$1.50 postpaid, 600 for \$5.50, on surplus computer cards. Mostly diodes, resistors; some capacitors, transistors. MMARC, 15½ Independence Court, Concord, Mass. 01742.

HT-32B, \$325.00; SX-115, \$325.00. Both like new. Gonset 2-meter Sidewinder, less supply, \$150.00; SR-42 plus VFO, \$150.00. W4MVC, 10 Carlen Avenue, Asheville, N.C. 28804.

FOR Sale: TA-32 Jr. \$35.00; NC-270 receiver, 80 thru 6, recently factory aligned, \$110.00. Heath VOX-1, with Ranger adapter, \$8.00. All in mint condx. H. J. Galloway, 46 Oak Hill Dr., Arlington, Mass. 02174.

FOR Sale: P&H electronic linear, amplifier, Model LA-400C (no shipping), \$100.00; Eico signal generator, wired, Model 315, like new, \$25.00. Mrs. Herbert Wilcox, 39 Woodbine St., Auburndale, Mass. 02166. Tel: LA-7-8506.

TRANSMITTER: Heathkit SB-400, excellent condition; \$290.00. New GD-104 microphone w/PT stand, \$23.00. Mike Tortorella, WA2TGL, 2805 Pond Place, Bronx, N.Y. 10458.

EXPANDING National sales organization needs new amateur products and accessories. You make it and we'll sell it, our trade name or yours. Mann Enterprises, P.O. Box 292, Deerfield, Illinois 60015.

SELL: Gonset 2-meter Sidewinder and AC power supply. In factory cartons, first offer over \$230.00. Certified check or money order. John Kroll, 3528 Craig Drive, Flint, Michigan 48506.

RANGER I in gud condx, \$70.00; Lafayette HA-700 rcvr in new condition, \$60.00. Both for \$125.00. Manuals included, excellent Novice outfit shipping collect. Roger Klingman, K4MZN, 709 N. W. 19 Ave., Gainesville, Fla. 32601.

SELL: Homebrew KW linear, 4-811As, \$75.00; Heath 10-21 scope, \$50.00; HM-15 SWR bridge, \$12.00; Hammarlund keyer, \$15.00. Mike Coulter, W2CCR, 57 Drake Dr., Rochester, N.Y. 14617. Phone 266-9958.

SBE-33 rcvr with microphone, \$250.00. Also SBI-LA 1 kw linear, \$175. Both for \$400. Purchased new in 1965 but used only about 20 hours. WA4VLH, Peter Smith, RD #1, Mechanicsville, Maryland (nr. DC). Phone (301)-884-4110 after 5.

MAGNIFICENT Drake 2-8-4 with cover, Heath Q-multiplier, speaker, \$190.00. Eico 720 transmitter and 722 VFO, factory assembled, \$110.00. Hy-Gain 4-element Tribander, \$20.00; Globe VOX, \$10.00. Complete station with all manuals, \$300.00. Philip Mills, WA1FHW, Pioneer Valley Academy, New Braintree, Mass. 01531.

SELL: Central Electronics 600L linear, \$150.00; 20A xciter SSB with Q-1, \$90.00, all-band factory converted VFO for 20A, \$35.00. HQ-180C receiver, \$225.00. Hy-Gain 10-meter beam, 3-el. All in mint condx. with manuals, Orlando O. Okleshen, W9EXE, 22637 Ridgeway, Richton Park, Illinois 60471. Local hams see antennas and tower at a bargain!

COME And get it! E-Z Tower GPRBS 40/45, \$75.00; Ham-M rotator, \$70.00; HT-32, \$150.00; SX-101A, \$175.00; Johnson Courier 500W CW/SSB amp., \$50.00, Nickey Paddle, \$10.00. Numechron 24-hour clock, \$5.00. Hornet 500W Tribander, \$10.00. Alex Ekblad, 161 Evans St., New Hyde Park, N.Y. 11040.

DX-06, like new, with key, mike, xtal, spare 6146, \$45.00, plus shipping. Dow-Key bug, \$5.00, Joe Nester, W3KUN, Emporium, Penna. 15834.

SELL: HT-37, Drake 2-A, Heath KW linear, IA-33 beam. Leon Ste.nourger, W2EYV, tel: (212) BU2-4737.

COLLINS Receivers, immaculate like-new condition, high serial numbers: 75S-3B, \$495.00; 75S-1, \$390.00. Satisfaction guaranteed. Would trade on KWM-2. Don Payne, Box 525, Springfield, Tenn. 37172. Nitefone: 615-384-5643.

HQ-170 and Speaker, \$175.00; Viking II, factory-wired and matching VFO, \$90.00; B&W LP filter, \$10.00. 14 AVS like-new, \$15.00; manuals included. Will ship, you pay postage. WB2FGJ, A. S. Baran, Line Road, Trenton, N.J. 08690.

TOROIDS: 88 mhy, unpotted-center/tapped, 5/81.50 postpaid. Brand new Ameco CN144V, 2-meter converter with power supply and xtal, \$35.00; Dow-Key relay, \$7.00; Heath VF1, VFO, \$10.00; like-new Johnson 250-23-3 Matchbox, \$65.00; v-1000A socket and filament xfrmer, \$10.00; Valiant, \$135.00. Super-Pro receiver (30 mhz) with power supply, \$65.00. Teletype paper, \$5.50/case. Tape \$3.00/box. Heath SB-300 receiver, \$230.00. Wanted: SX-28 receiver, rotator, Triband beam, Communicator III, Van. W2D1L, 302Z Passaic Ave., Stirling, N.J. 07980.

HUNTER BANDIT 2000A, \$250.00; Clegg 9'er, \$70.00; Elmec AF68A, \$50.00; Knight Auto-Analyzer, \$30.00. Sideband Engineers SB2MIC \$10.00, Philip Schwabler, W9CCG, 4536 N. 50 St. M. Iwaukce, Wis. 53218.

NC-300, in gud condx, with National 50 Mc, and 220 Mc. converters. Tcraft 144 Mc. converter (needs repair), all for \$160.00. F.o.b. Ralph Gaze, 5305 Wehawan Rd., Washington, D.C. 20016.

SELL: SB-10, mint condition, \$75.00. M. Heiman, K7BDY, Box 747, Showlow, Arizona 85901.

HW-32 and HP-23 excellent condition, for \$110.00. Eugene Urstein, W2YVIO, 313 Corwin St., Brooklyn, N.Y. 11225.

COLLINS 75S-3, "Perfect", can't tell from new. \$375.00. K7XP, 3460 Roger Dr., Salt Lake City, Utah 84117. Tel: 277-4995.

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COLLINS 75A1, \$125.00; Ranger, \$70.00. Or make offer. In FB condx. WA9QXT, Richard Karlquist, 461 King Lane, Des Plaines, Ill. 60016.

NC-300 with 6 meter converter, \$150.00; Viking Ranger, \$75.00, together: \$200.00. Excellent condition. Raskoff, Escondido Village #10E, Stanford, California 94305.

SELL: SB-301 w/all filters, \$300.00; SB-401 w/xtal package \$315.00; or both for \$600.00; DX-60B, \$70.00; all built and aligned by Heath engineer, in mint condx. M.O. or certified check, no trades, ship collect, W80FG, 1843 N. Sierra Way, Stevensville, Mich. 49127. Tel: (616) 429-4289.

R-4A, MS-4, perfect condx, in original cartons, \$340.00, or your best offer. R-4A, VFO, Waters coax switch, \$75.00; Dow-Key DK-60B and Heath IM-11 VFO, all in exlnt condx. Best offer. Will sell anything separately. J. D. Fulton, 4977 Palo Dr., Tarzana, Calif. 91356. Tel: 213-343-7641. WB6NBO.

WANTED: Back issues, DXing Horizons magazine. WA9RAO, 8046 Euclid, Ch cago, Ill. 60617.

COMPLETE Collins Station: KWM-2, \$700; 516F2, \$75.00; DC PS and mobile mount, \$200; 312B-5, \$250.00; 30S-1, \$800. All in mint condx, and all for \$1800. Contact Sam Hign, K3WNO, 1618 Ft. Washington Ave., Maple Glen, Penna. 19002.

WANTED: Any or all mint condx NCX-5 MK II, NCXA, XCU27, VX501. Will pick up in 500 miles radius, or arrange stateside shipping destination. A. B. Morgan, VE3OI, 62 Oak, Dundas, Ont., Canada.

SELL: Complete station: Apache, SB10, NC270, Mike, \$225, no splits, pick-up deal only. P. Walton, W2YNR, 409 Hamilton Road, Glassboro, N.J. 08028. Tel: 881-4655.

WANTED: KWS-1, Bill Wessund, W0DNW, 2801 Wright Ave., North Platte, Nebraska 69101.

SB-100 with homebrew supplies, \$295.00. HG-10 VFO, \$9.00; CDR rotator \$39.00. Fused 6146s, \$2.00. All guaranteed. Key condx. WA51BV, 2401 W. Gramercy, San Antonio, Texas 78228.

HEATH Marander, \$150.00 up. HQ-170C, \$100 up. Both in exlnt condx. K0CWW, Jim Brazee, Genoa, Nebraska 68640.

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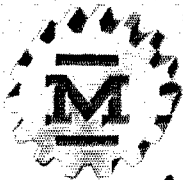
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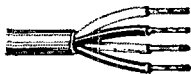
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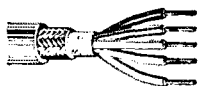
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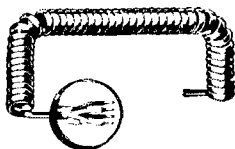
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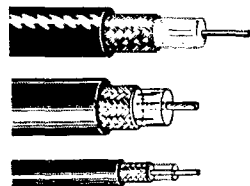
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Provides low impedance for mobile microphone applications. Neoprene jacket remains flexible at low temperatures. Available with or without shielded conductors.



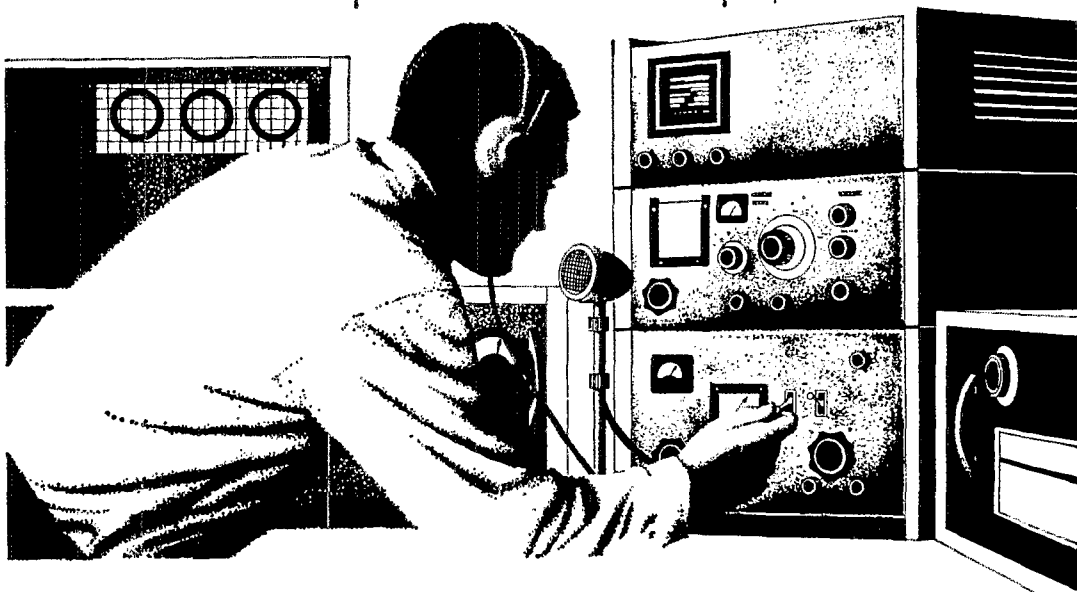
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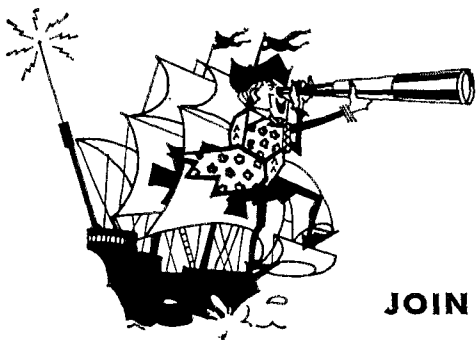
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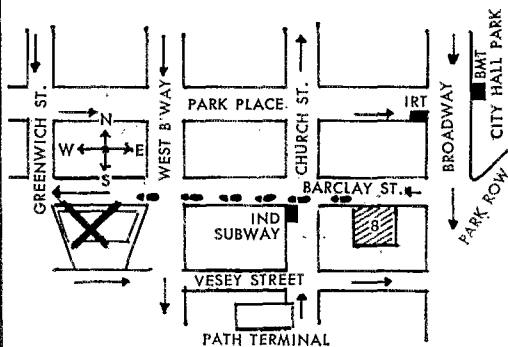
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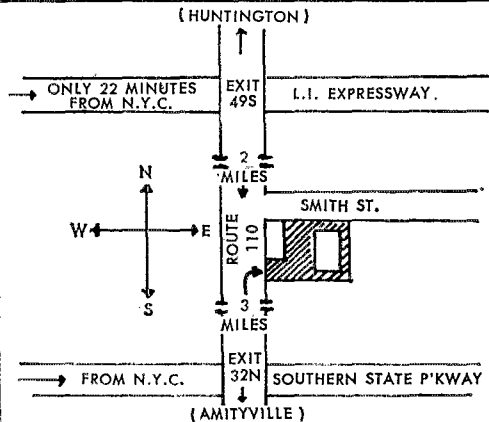
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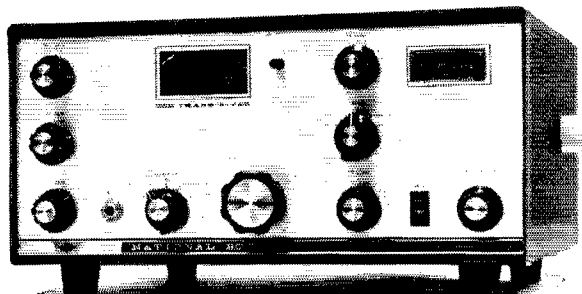
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