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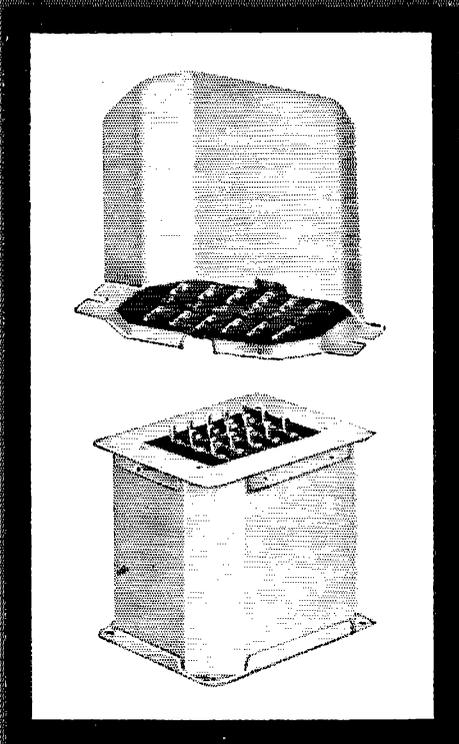
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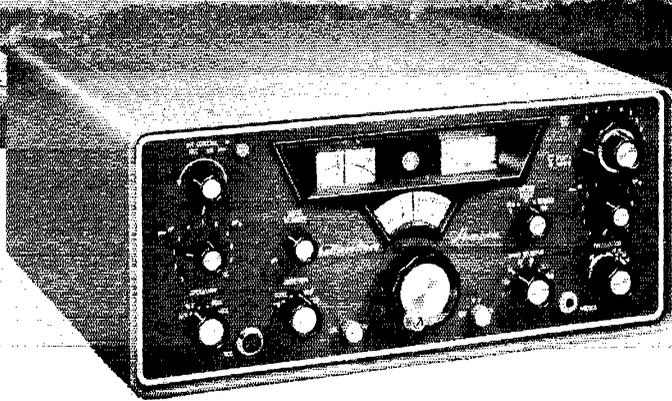


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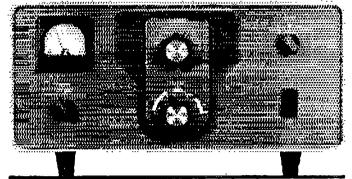
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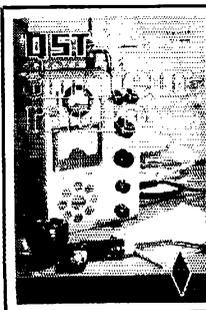
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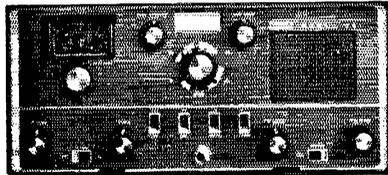
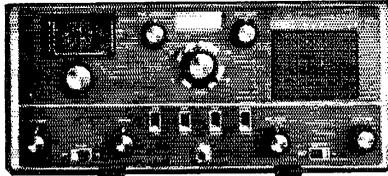
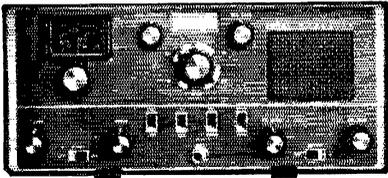
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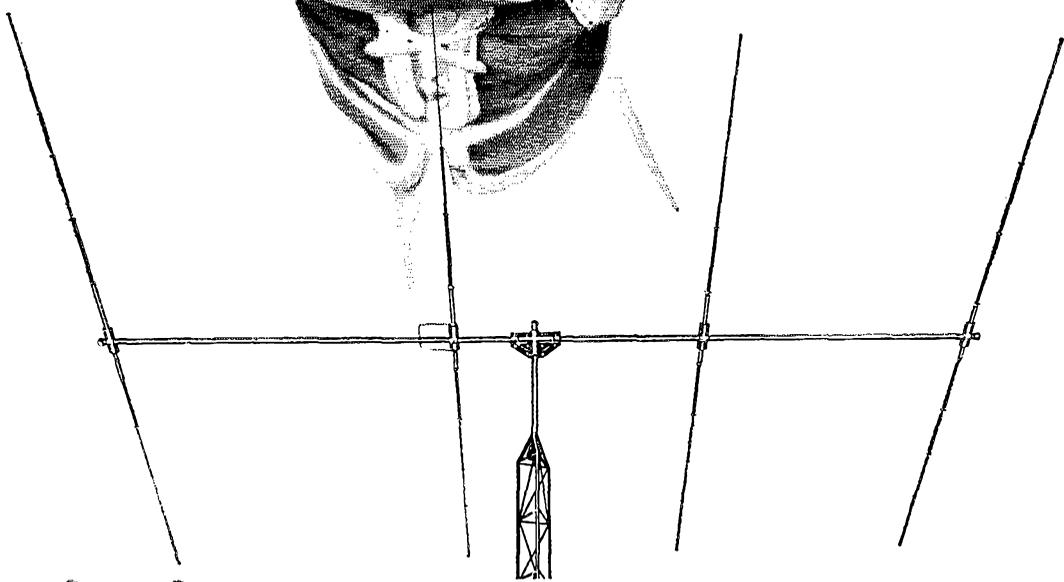
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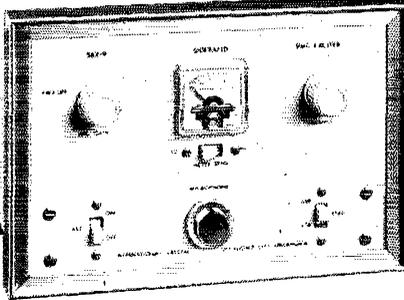
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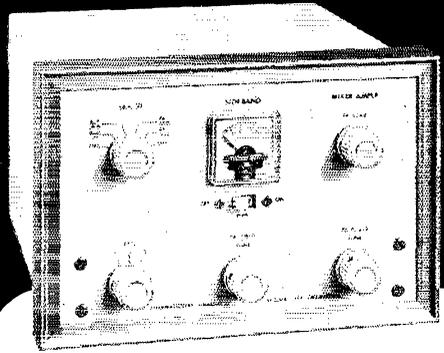
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12AX7 Audio
7360 Bal Modulator
6BA6 RF Amplifier
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6360 Linear power amplifier
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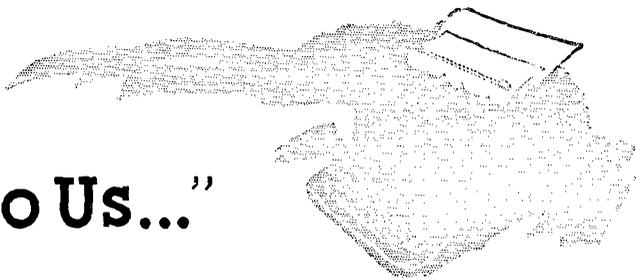
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"It Seems to Us..."



EMERGENCY COMMUNICATIONS — A NATIONAL PLAN

The attack on Pearl Harbor — December, 1941 — prompted immediate Federal action to shut down all amateur activity. Thus, through lack of foresight and advance planning, a valuable backup communications resource was largely lost to the U.S. during World War II. A "War Emergency Radio Service" operating on the old 2 $\frac{1}{2}$ -meter band was eventually set up through ARRL-FCC liaison and did a commendable job; yet had there been serious internal problems for our country, it frankly would have been "too little, too late." But more important, it pointed the need of an organized system for the future.

Accordingly, discussions commenced post-war between the League, FCC, civil defense and other government agencies, finally giving birth in 1950 to the Radio Amateur Civil Emergency Service. RACES is a phase of amateur operation for civil defense communications purposes only, during periods of local, regional or national civil emergencies, including any emergency which may require invoking the President's War Emergency Powers under Section 606 of the Communications Act. At the moment, it is the only amateur facility "cleared" for operation in the event of war.

RACES has not been the resounding success that we all hoped it would be. In some areas, active State and local implementation have produced A-1 set-ups; in others, there is much to be desired. Nevertheless, the RACES concept is a sound one, and fills an essential requirement in the civil defense communications picture.

Continuing shifts in emergency communications concepts by government authorities prompted the issuance, in February 1963, of Presidential Executive Order 11092, which directed the Federal Communications Commission to set up complete national plans for all non-government communications operations. To assist in this extensive responsibility, the Commission formed a National Industry Advisory Committee, consisting of industry communications and executive staff personnel; and subcommittees for each of the major radio services, including amateur. On the latter are W1LVQ, W6MLZ, W1BDI, W2ALS, W2BGO, W2KH, K3UJZ, W4FZ, K4IAG, K5TRY, W6CIS, W6VZA, W9AC and

W0WYK, the first two named being chairman and vice chairman.

The subcommittee on amateur operations found itself in the fortunate position of having already in existence, in the RACES setup, a sound nucleus of emergency planning. This time, foresight *had* paid off. It was only logical that approval of RACES plans be the first step in the amateur field, and this has now been accomplished to form an "interim" plan.

The subcommittee recognizes that this is only a small part of the over-all task. All State and local civil defense officials have been requested to submit two copies of their current RACES plans for evaluation. Since Executive Order 11092 in effect wiped the slate clean, and provided a fresh start, the plans to be developed will encompass all amateur emergency communications organization. They will undoubtedly involve AREC and NTS, among others — either separately or as part of an integrated package. A call has gone out to all entities having communications requirements not already filled by their own facilities; these will be evaluated and, where possible, paired with amateur emergency communications potential. When completed and approved by FCC, the plans will form the basis for all amateur emergency communications ranging from a local storm to national defense in an attack upon the U.S.

These are matters which will be of the utmost concern to all amateurs. Whom will we serve in an emergency situation, and what are their requirements of us? How can all existing amateur emergency communications services most effectively serve the essential industries whose continued operation will be required? What will be the size, the shape, the form of the ultimate basic amateur radio plan? Input from AREC, NTS and RACES officials — among many others — will assist your NIAC subcommittee in answering such questions in the course of its studies.

The goal is to have one cohesive emergency plan which will provide public service under any scope of disaster — not a number of competing plans which serve only to divide amateur radio and lessen the amount of public service it can render.

QST

League Lines . . .

Take part in selecting your ARRL representatives for the coming two years—see announcement page 58 of the autumn director elections in half our divisions.

A pilot project initiated by the League two years ago, as part of a program to encourage amateur growth in "new and developing" countries, is finally bearing fruit in Liberia. With full cooperation of club president EL2S, and the blessing of communications minister EL2L (who was a recent Hq. visitor), ARRL has furnished literature and code practice gear, and the first class of 7 new hams has now been graduated.

Seventeen national amateur societies in Europe and Africa, participating in the Region I conference of the International Amateur Radio Union (see separate story page 64) expressed concern over the attempts of a certain U.S. ham magazine to undermine faith in IARU and ARRL as its headquarters society. On a proposal by the Radio Society of Great Britain, a resolution was unanimously adopted "reaffirming the confidence of the Region I Division in IARU Headquarters." The conference also condemned the "abuse of amateur radio" by certain commercial publishers and their journals. Some irate European society officers wanted the censuring motion to name the guilty magazine and its publisher, but we're certain few hams are so green they won't get the message.

Ever think you'd some day get to see a ham's dream station? Under Ed Handy's (W1BDI) guiding hand, W1AW has undergone modernization and a face-lifting program—expanded space, new furnishings, equipment and antennas, and an impressive master control console. A QST feature picture article is in the works. If you're in the Hartford area, be sure to drop in and see the station at 225 Main St., Newington; we're open until the wee hours each night.

Compliments have replaced complaints on the delivery dates for QST. We didn't accept the brickbats for lateness, and similarly we don't take credit for improvement. Toss the bouquets to the Post Office—with the hope the performance will continue.

The League's budget estimate for 1966 is not encouraging, indicating another—though again small—loss for the year. Fewer newcomers to amateur radio seems to be the primary reason; "freeloaders," mentioned last month, are another. In any event, some action will have to be taken, probably after study by the Finance Committee, within the next year or two. A rise in dues is one possibility. We note we are not alone—the IEEE reports a loss of \$200,000 for 1965, following similar losses in previous years, and has upped its basic dues from \$15 to \$25.

Could you guess how many nets are registered in our cross-indexed Net Directory? 200, 300, 400? Nope—578! If your net is not yet registered, see page 66 of the May issue of QST. If you do not yet have a copy of the latest edition of the Net Directory, write to ARRL's Communications Dept.

A Complete Miniature

Ham Station for 144 Mc.

THE TR-2 is a small, low-cost, 144-Mc. transceiver designed so that it may be used anywhere in the house, taken on vacations or trips and even serve occasionally as a mobile rig. While measuring only 5 X 6 X 9 inches, it features a superheterodyne receiver with a sensitive superregenerative second detector, a crystal-controlled transmitter with an output of one watt, and a built-in power supply for a.c. operation. Power consumption is only 40 watts receiving and 50 watts transmitting — low enough to permit operation from a low-cost inverter when employed in mobile or emergency applications.

Standard readily available parts and reliable circuits are used. Mechanical design is carefully worked out to permit short electrical leads in critical circuits, good ventilation due to chimney effect, low center of gravity and a balanced weight distribution for comfortable carrying, easy accessibility of parts and pleasing appearance. All necessary controls are conveniently arranged on the front panel. The illuminated dial uses a string and drum drive which operates smoothly with a ratio adequate for easy tuning. An output meter is provided to facilitate exact adjustment of the final tank and antenna tuning for maximum power output.

Performance-wise, the TR-2 is nothing short of amazing. For routine communication with local stations up to 25 miles distant, it has proved to be just as effective as the much more involved home station. The principal difference is the lower selectivity of the TR-2, but this is more often a blessing than a disadvantage. During band openings, the TR-2 is capable of providing some real thrills.

Receiver

The receiver front end employs a 6AK5 r.f. stage and a 12AT7 mixer-oscillator. Stray capacitance between the two sections of the 12AT7 provides adequate oscillator injection. The oscillator tuning capacitor, C_5 , is a miniature two-gang job designed for transistor receivers. It was selected because of its small size, low cost and the fact that it is provided with ball bearings for easy tuning. The tuning capacitor is modified as follows: Midway between the two sections, saw through the fiber board which aligns the outer tips of the rotor plates. Remove the fiber piece which is associated with the rear section, being careful not to damage the rotor plates. Remove all the rear-section rotor plates except the one closest to the front section. Remove the rear-section stator plate which is closest to the remaining rear-section rotor plate. This provides

* 82 Virginia Ave., Westmont, N.J.

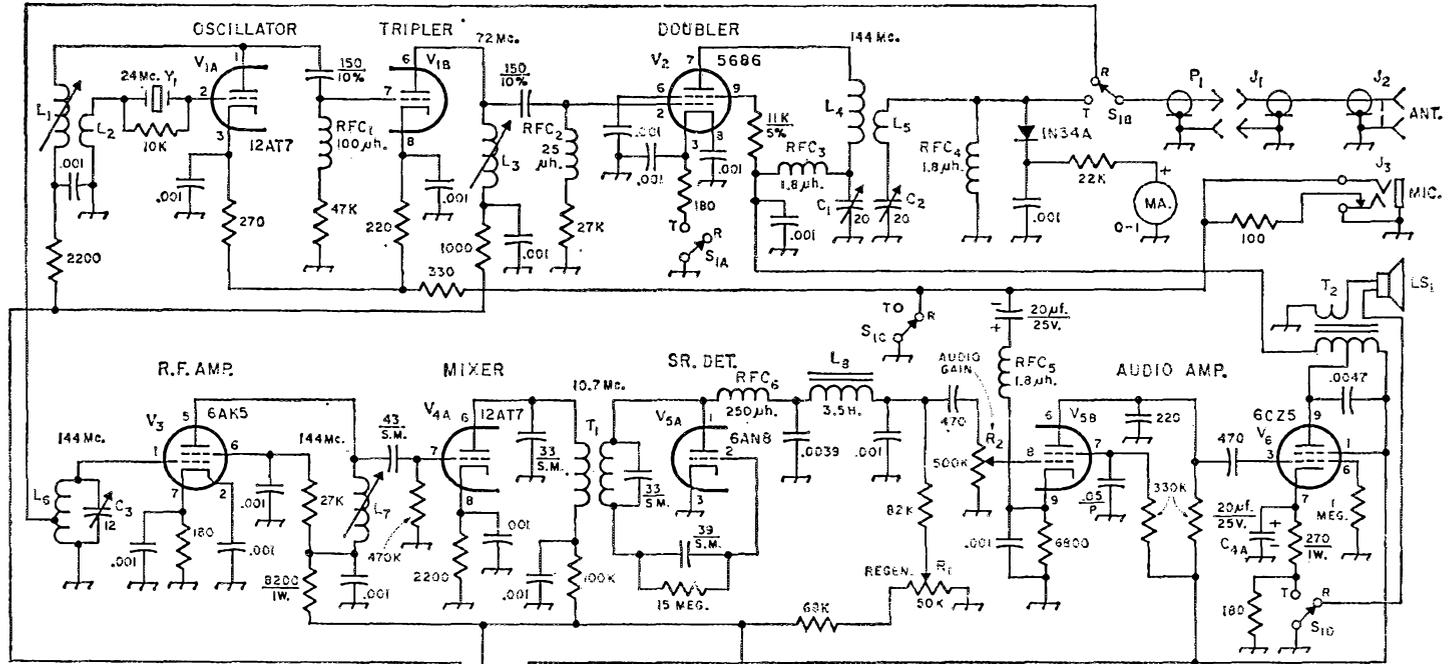


The TR-2 Transceiver

BY R. C. DENNISON,* W2HBE

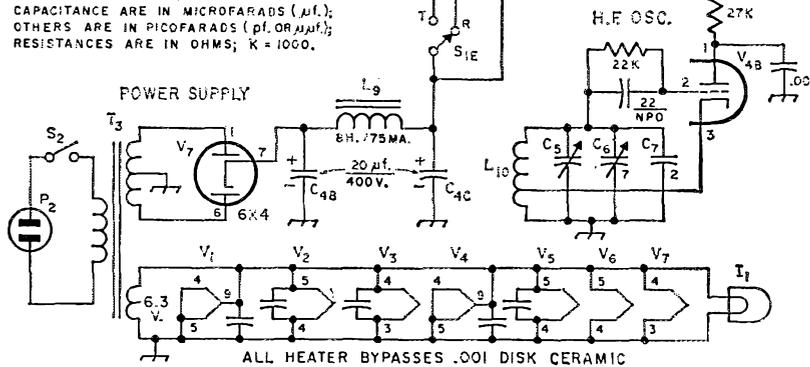
a two-plate, double-spaced capacitor with a capacitance range of 5 to 6.5 p.f. The front section is not used, and its stator plates must be grounded to eliminate a suck-out which otherwise occurs near the high end of the band.

To secure a higher order of selectivity than is ordinarily found in simple transceivers of this type, the intermediate frequency (10.7 Mc.) is chosen as low as possible consistent with obtaining a fair amount of image attenuation, and a double-tuned i.f. transformer, T_1 , is used. The i.f. transformer must satisfy the following conditions: The secondary should have an L/C ratio and Q high enough to encourage superregeneration in the detector, and the coupling between primary and secondary should not be



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

Fig. 1—The complete transceiver circuit. Fixed capacitors are disk ceramic with the following exceptions: S.M.—silver mica; P—paper; polarity shown—electrolytic. Except as indicated, fixed resistors are $\frac{1}{2}$ watt, 10 per cent tolerance.



ALL HEATER BYPASSES .001 DISK CERAMIC

C₁, C₂ — 20-pf. midget variable (Johnson 20M11).
 C₃ — 3-12-pf. ceramic trimmer (Erie 557).
 C₄ — 3-section electrolytic; 20 μ f./25 v.; 20 μ f./400 v.; 20 μ f./400 v. (Sprague TVL-3678).
 C₅ — Tuning capacitor 5-6.5 pf.; Miller 2110 modified as described in text.
 C₆ — 1.5-7-pf. ceramic trimmer, NPO (Erie 557).
 C₇ — 2-pf. neg. temp. coeff. ceramic, -750 p.p.m.
 C₈ — Pilot lamp, 6.3 volts.
 J₁ — Phono jack.
 J₂ — Coaxial connector, chassis mounting.
 J₃ — Closed-circuit microphone jack (Switchcraft S-13B).
 L₁ — 3-5 μ h., slug-tuned (North Hills 120B or equivalent).
 L₂ — 3 $\frac{1}{2}$ turns No. 36 enam. close-wound 1/16 in. below L₁. Wind in same direction as L₁. Ground end next to L₁.
 L₃ — 9 turns No. 20 enam. close-wound on 13/32-inch copper-slug form (Millen 69041).

L₄ — 4 $\frac{1}{2}$ turns No. 18, 1/2-inch diam., 8 turns/inch (B & W Miniuctor 3002).
 L₅ — 2 turns same as L₄.
 L₆ — 4 turns No. 16 enam., 3/8-inch diam., 1/2 inch long. Tap at 1 turn from ground end.
 L₇ — 4 turns No. 20 enam., 1/2 inch long, on 5/16-inch diam. slug-tuned form (CTC PLS-6).
 L₈ — Audio choke, 3.5 henrys, 2 ma. (UTC-DOT-8).
 L₉ — Filter choke, 8 henrys, 75 ma. (Stancor C-1355).
 L₁₀ — 3 turns No. 16 enam., 3/8-inch diam., 7/16 inch long. Tap at 1 turn from ground end.
 L₁₁ — 3 $\frac{1}{2}$ -inch p.m. speaker.
 P₁ — Phono plug.
 P₂ — Line plug, TV interlock type (Waldam VTS-61).
 R₁ — 50,000-ohm control, linear taper.
 R₂ — 0.5-megohm control, audio taper.
 RFC₁ — 100- μ h. r.f. choke (Millen 34300-100 or National R-33).

RFC₂ — 25- μ h. r.f. choke (Millen 34300-25).
 RFC₃ — RFC₅, inc. — 1.8- μ h. r.f. choke (Ohmite Z-144).
 RFC₆ — 250- μ h. r.f. choke (Millen J300-250).
 S₁ — Ceramic rotary, 6 poles, 2 positions, 1 section, non-shorting (Centralab PA-2019).
 S₂ — S.p.s.t. toggle mounted on R₂.
 T₁ — 10.7-Mc. i.f. transformer, on shielded coil-form assembly (North Hills DSF-800); each winding 24 turns No. 36 enam. close-wound, with 5/16-inch separation between windings. Regular 10.7-Mc. transformer (such as Miller 1457 or 1463) may be substituted for T₁ and associated 33-pf. tuning capacitors.
 T₂ — Modulation transformer, Stancor A-3823 modified as described in text.
 T₃ — Power transformer, 480 v. c.t., 70 ma.; 6.3 volts, 3 amp. (Stancor PC-8419).
 Y₁ — 24-Mc. crystal to multiply into 144-Mc. band.

so tight as to unduly load the detector nor should it be so low that gain is adversely affected. A suitable transformer can be made using a North Hills DSF-800 assembly, and consists of two single-layer solenoids of No. 34 d.c.c. wire close-wound on a 1/4-inch diameter form. The spacing between the coils is 3/16-inch. The coils are slug tuned and enclosed in a 7/8-inch diameter aluminum shield. Note that the capacitor which tunes the primary is connected directly from the plate of the mixer to ground using short leads, rather than being connected across the primary terminals of the transformer.

During the breadboard development of the TR-2, many tubes and circuits were tried in order to get a sensitive and smooth-working detector. The resultant circuit goes into superregeneration smoothly with about 20 volts on the plate. The quench frequency is just above the audio range and this necessitates a fairly large inductance in the detector plate filter. The coil specified is somewhat expensive but was chosen because of its small size.

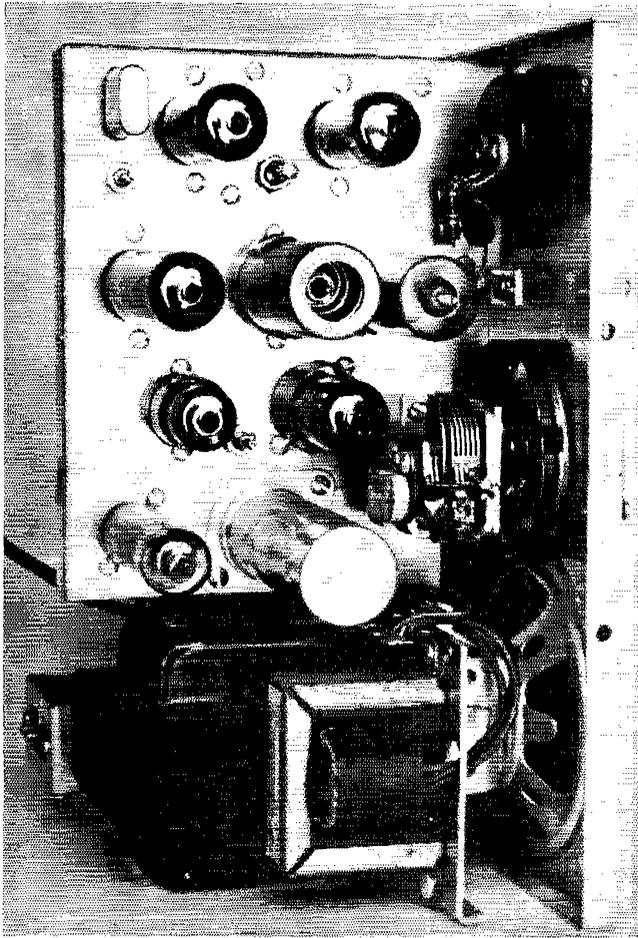
The output of the detector is amplified by the pentode section, V_{5B}, of the 6AN8 to a level sufficient to drive the audio output tube. A 6CZ5 tube was chosen here since it is capable of providing considerable power even at moderate plate voltage. Extra cathode resistance is cut in when receiving, to conserve power. The 3 1/2-inch speaker does an excellent job.

Transmitter

The design of a transceiver involves a lot of juggling of components and circuits in order to get the most performance in a small space. The performance of the receiver must be balanced against that of the transmitter. Another factor is the power supply. A high-powered transmitter requires a large power supply which leaves little room for a receiver. Another problem is the modulator, which must provide enough audio power to modulate the final. Thus the tube line-up and operating voltages are all inter-related and require a number of judicious compromises.

The r.f. section of the transmitter uses a 12AT7 oscillator-tripler driving a 5686 final. The oscillator uses a 24-Mc. 3rd-overtone crystal. The final doubles, so it doesn't require neutralization, and its drive requirements are low. Power input to the final is 4 watts and the r.f. output is 1 watt.

The modulator must supply 2 watts of audio power. To achieve this power with the relatively low plate voltage used, 200 volts, requires a plate load of 5000 ohms. The final presents a load of 10,000 ohms. Since no transceiver transformer meeting these requirements could be found, it was necessary to modify an existing design. The transformer chosen was a Stancor A-3823 which is modified as follows: Remove the frame and the laminations. Remove and save the tapped voice coil winding. What remains now is a push-pull winding with 1400 turns each side of center tap. Remove 820 turns from the outer winding



Vertical chassis mounting is used, with the chassis "top" on the left, as viewed from the front panel. A separate chassis is used for the power supply, at the bottom in this view.

The transformer deck is J shaped. The large area on which the transformers and choke are mounted measures $2\frac{3}{4} \times 5\frac{3}{16}$ inches. The bottom edge of this portion has a $\frac{3}{16}$ -inch flange to stiffen it. The bottom of the J is $1\frac{13}{16}$ inches which is equal to the depth of the speaker. The remainder of the J is $1\frac{3}{8}$ inches long and contains two U-shaped holes which fit around the bushings of the volume and regeneration controls. The back of the speaker has two tapped holes, and screws pass through the transformer deck into these holes. Thus the transformer deck is secured to the rear of the speaker and also to the panel. The bottom of the J also has a $\frac{3}{8}$ -inch hole into which the microphone jack is mounted. A small aluminum bracket is mounted on the rear of the choke and this bracket holds a TV interlock plug (Waldom VTS-61) into which a TV cheater cord is plugged after the back

of the cabinet is attached. and reattach the brown lead. This lead goes to the final. The center tap goes to the plate of the modulator and the remaining lead goes to B plus. Add a layer or two of kraft paper insulation and then wind on 36 turns of the original voice coil winding to complete the transformer. Put back the laminations and the frame.

Construction

The tubes and most components are mounted on an aluminum chassis which bolts to the front panel. This chassis measures $4\frac{7}{8} \times 5\frac{3}{16}$ inches. The front and top edges have a $\frac{3}{16}$ -inch flange and the rear edge has a $\frac{1}{2}$ -inch flange. The front flange is $5\frac{1}{4}$ inches long, being cut away at the lower end to clear the speaker. The tuning capacitor is mounted by means of an L bracket. Cut-outs in the chassis are provided where the dial cord passes through to the dial drive assembly (H.I. Smith No. 126). The oscillator trimmer capacitor is mounted on the tuning capacitor by means of a short strip of brass. The rectifier and filter capacitor are at the bottom of the chassis, the transmitter r.f. circuits are at the top, and the receiver portion occupies the central area.

The dial well is made of aluminum and measures $2\frac{9}{16}$ inches high by $2\frac{3}{4}$ inches wide. It is provided with $\frac{1}{8}$ -inch top and bottom flanges. The escutcheon is made of $\frac{1}{32}$ -inch brass and measures 3 inches wide, $2\frac{1}{2}$ inches high and $\frac{1}{8}$ inch deep. A bezel of $\frac{1}{8}$ -inch lucite is cut to fit inside the escutcheon. The dial well is painted gloss white and the scale arc (red) and the calibration marks (black) are decals. The escutcheon is finished in machine-gray wrinkle paint.

The pilot lamp assembly mounts on the back of the dial well. It consists of a block of bakelite measuring $\frac{3}{8}$ by $\frac{1}{4}$ by $1\frac{13}{16}$ inches which is backed by a piece of $\frac{1}{16}$ aluminum which measures $\frac{3}{8}$ by $\frac{11}{16}$ inches. This sandwich is held to the dial well by screws which pass through the dial well and the bakelite block and rest in tapped holes in the aluminum back plate. A $\frac{1}{4}$ -inch hole passes through the dial well and the sandwich. A type 328 lamp is used, its flange resting against the aluminum backing plate. Contact to the center lamp terminal is made by means of a brass leaf spring $\frac{1}{4}$ inch wide by $\frac{7}{8}$ inch long which is held to the bakelite block by means of a 4-40 screw.

Ventilation of the cabinet is provided by drilling holes near the top and bottom of the sides and rear of the box. The handle (Useco No. 1010) measures $4\frac{1}{4}$ by $1\frac{1}{2}$ inches and is located $2\frac{3}{16}$ inches back from the front edge of the top. The antenna jack is also mounted on the top with its center one inch from the back and $1\frac{5}{16}$ inches from the right side. An RCA phono jack is attached to the underside of the antenna jack. A 10-inch length of miniature coaxial cable runs from the send-receive switch, S_1 , and terminates in an RCA phono plug which in turn plugs into the phono jack. This arrangement eliminates the need for unsoldering the antenna connections when the chassis is removed from the box.

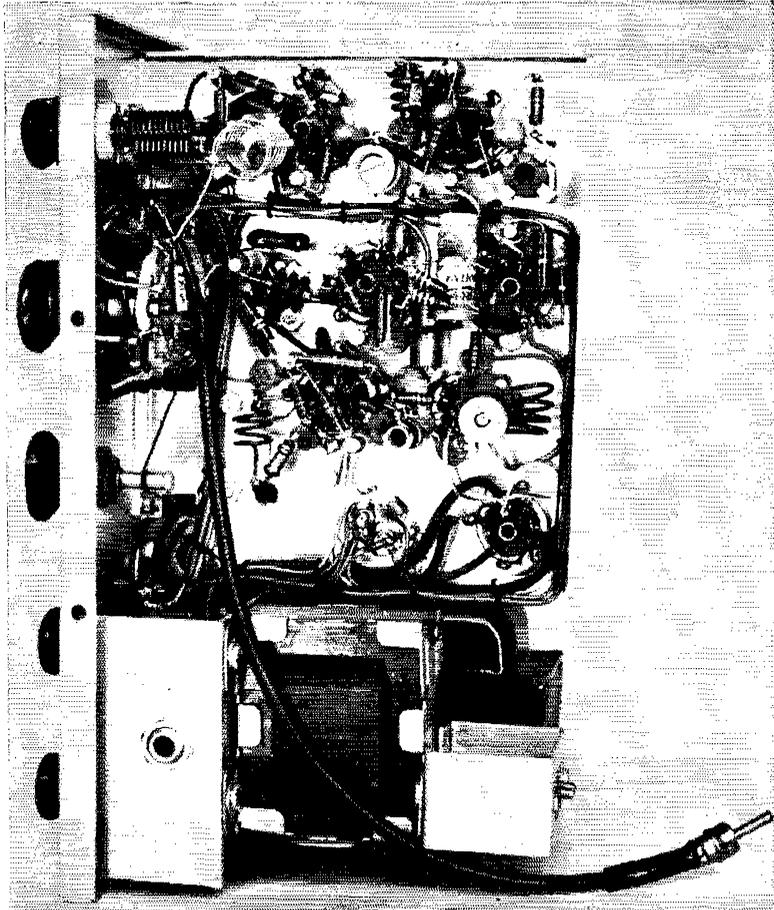
Receiver Alignment

With the receiver turned on, advance the regeneration control until the hissing noise characteristic of superregenerative receivers is heard in the speaker. Disable the oscillator by shorting the tuning capacitor, C_5 . Couple a modulated signal generator set to 10.7 Mc. to the control grid of the mixer. Turn the secondary slug of the i.f.

transformer until the signal is tuned in. Turn off the signal generator and set the regeneration control so that the detector is weakly superregenerative. Adjust the primary slug. As resonance is approached the regeneration control will have to be advanced to maintain superregeneration. Continue this procedure until the primary is tuned to approximate resonance. At this point set the regeneration control so the detector is barely supering and rock the primary slug back and forth through resonance. The point at which the noise level is lowest is the proper tuning.

Now remove the short on the tuning capacitor and set the tuning range to give the desired amount of bandspread. Set the dial near the low-frequency end and tune in a 144-Mc. signal by adjusting the oscillator trimmer capacitor. Now check the bandspread by noting where a 148-Mc. signal falls on the dial. If more bandspread is required, pinch the turns on the oscillator coil together to increase its inductance and repeat the preceding steps. When the tuning range is satis-

(Continued on page 128)



Underside view of the circuit chassis shows arrangement of components and cable for the antenna connector. Circuit layout is described in the text. The jack at the bottom left is for the microphone. The a.c. line plugs into the cheater-cord socket mounted in the bracket at the lower right.

High-Performance RTTY Filters

Improved Designs for Better Reception

In Two Parts — Part I

BY IRVIN M. HOFF,* K8DKC

IN a day when rapid progress is being made in all technological fields, radioteletype has its share of advances. Limiterless a.m. (sometimes called "two-tone") reception has been developed to a level where it offers reliable copy under conditions where conventional demodulators using a limiter fail badly. Even f.m. reception using limiters has been substantially improved. Automatic-threshold computers now enable single demodulators to give diversity reception with fewer errors and better copy than old-style dual-diversity units using separate antennas and receivers. The Mainline TT/L f.s.k. demodulator¹ is an outstanding example of the application of these new concepts.

The selection and proper use of filters for the RTTY demodulator offers the greatest potential improvement that can be made, since in all but a few isolated cases quite elementary filters are being used. The filters in the Mainline TT/L were of this simple variety, using easily-obtained TV width coils. Such a filter system offers excellent reception under many conditions, especially when signals are strong and when unstable transmitters or improper shift are being used. In this case the limiter may be left on, and full use of the unattended autostart facilities is available.

However, when conditions are less than optimum — static, impulse noises, deep selective fading and, in particular, adjacent-channel interference such as c.w. — simple filters, with or without the limiter, can do very little. At a time like this most operators just throw up their hands and quit for the day. It takes more complex filters to separate the desired signal from the surrounding noise. Such filters are rather expensive when purchased commercially.

This paper will show how filters comparable in quality to commercial units costing \$40 and more each can be made at a cost of less than \$3. Yet they can be easily constructed, with surprising precision. Since these filter systems are so inexpensive, the operator can easily construct several of them and then quickly choose the one that suits the conditions the best. As with a good receiver, varying the filter selectivity will often mean the difference between good copy and no copy.

How Narrow Can We Go?

Since the RTTY signal is a pulse-modulated f.s.k. carrier, it does exhibit a certain bandwidth.

* 1733 West Huron River Drive, Ann Arbor, Mich. 48103

¹ Hoff, "The Mainline TT/L F.S.K. Demodulator," *QST*, August, 1965.

Most RTTY converters in amateur service use quite simple filters for separating the two tones of frequency-shift keying. The new concepts using limiterless two-tone reception give much better copy when teamed with well-designed filters. In this article the author describes several filter systems designed specifically for use with the Mainline TT/L f.s.k. demodulator. The filters can be built at very modest cost.

The modulating signal consists of a fundamental frequency determined by the pulse rate, with harmonics determined by the pulse shape. The fundamental audio frequency for 22-ms. pulses will be approximately 22.5 cycles. While the filters for mark and space could be as narrow as 45 cycles and still retain the essential keyed information of a 60-w.p.m. RTTY signal, you wouldn't want a filter *that* narrow. Such narrow filters can readily introduce distortion if the signal is not properly centered in the passband. However, the biggest objection is that the transmitted signal may not be exactly the right shift to fit the specific filters. An associated problem, nearly as serious, is the stability of the transmitter and receiver; obviously the closer the filter gets to minimum bandwidth the more critical the tuning becomes. So you don't get something without being inconvenienced elsewhere. For this reason the broadest filter system that conditions warrant is normally used.

The author suggests that filters of 65-90 cycles bandwidth perhaps fall in the "minimum bandwidth" category. A most interesting technical paper was published by Vic Poor, K3NIO² on this subject, and many of his ideas have been used by the author in the development of the filters to be described. Anyone interested in following up this subject should make an effort to read K3NIO's excellent article.

What Filter?

In general, the broadest filter that is compatible with band conditions would be a safe bet. If there was never any interference from a nearby station, the more simple filters would do an excellent job most of the time. Their broad bandwidths would give good reception on shifts which only vaguely resembled "normal," and would tolerate large amounts of drift in the in-

² Poor, "Filters for RTTY," *RTTY*, May, 1964.

coming signal. However, this utopia just does not exist, not even on "clear" commercial channels.

Unfortunately, on frequencies which must be shared with all comers — a situation peculiar to amateur radio — conditions change, and at an entirely unpredictable rate. What may have been a clear frequency for the past hour or so could in the next moment be clobbered by a strong interfering signal. In this situation the enthusiast who has some means of quickly changing to a different technique has a tremendous advantage over his less versatile counterpart.

Another factor is that many stations are finding that changing to 170-cycle shift, rather than 850, will greatly reduce loss of copy, especially in the case of interference from c.w. stations. Thus the addition of a filter system that is intended primarily for 170 shift should be considered particularly by the operator interested in traffic handling, where errors require repeats and wasted time. Several unattended autostart nets on 80 meters also are getting reliable unattended operation on 170 shift where 850 shift previously gave poor results. Although frequency stability is a greater problem than on 850 shift, the results have more than justified the extra care required.

We should like to suggest, then, that three filter systems be considered by those wishing to obtain maximum benefit from the TT/L demodulator:

1) A broad-filter system for general reception of strong signals where "walk-away" autostart is beneficial.

2) A narrow-bandwidth system exhibiting good skirt selectivity for 850-shift copy in limiterless mode, where interference, weak signals, and selective fading are factors. These same filters, when used with the limiter, will give improved copy during static, aurora (fast) fades, and similar conditions.

3) Narrow filters for 170 shift.

The 88-MH. Toroid

The original Mainline TT/L used TV width coils for several good reasons: first, they can be obtained at any radio-supply house; second, they are adjustable and thus can be tuned to the proper frequency; third, they are easy to install; and fourth, they present a nearly ideal bandwidth for general reception from extremely narrow to more-than-legal shifts.

However, the 88-mh. toroids have been quite popular with amateurs who build RTTY equipment, as they are relatively easy to obtain (check the listings in the Ham-Ads in any *QST* issue) and are quite inexpensive when compared with any other suitable inductor — as little as 35 cents each when purchased in groups of five or more.

The 88-mh. toroid has a quite high Q which makes it ideal for use in some types of filters, but in a simple single-tuned filter the Q could be too high to be satisfactory. For instance, the Q of a TV coil when adjusted to resonate at 2125 cycles with a 0.15- μ f. capacitor would be about

7, while the 88-mh. toroid at this frequency (resonated with 0.064 μ f.) would have a Q of nearly 120, if isolated properly. The bandwidth with the TV coil would be about 300 cycles, but with the 88-mh. toroid would be only about 19 cycles — much too sharp to make a good RTTY filter. (However, it is this property of the toroid that makes it a good tuning indicator under certain conditions, and the Mainline TT/O Semi-Counter takes advantage of the high Q to determine frequencies quite accurately for tuning filters or for checking shifts. Fig. 1 shows Q vs. frequency for a representative 88-mh. toroid. Additional information on the toroid can be found in May *QST*.³)

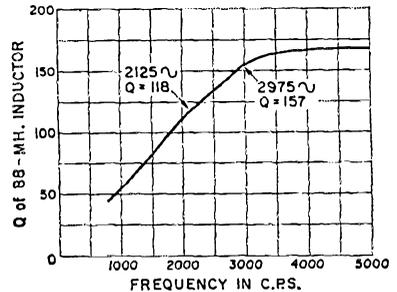


Fig. 1— Q vs. frequency for an 88-mh. toroid, Western Electric type 632.

Ralph Leland, W8DLT, was kind enough to supply the data below, obtained from the manufacturer's (Western Electric) manual:

New Coil	Super-seded Coil	Inductance	D.C. Resistance	1000-Cycle Resistance
632	622	88 mh.	9.0 ohms	9.8 ohms
638	628	44 mh.	5.1	5.5
	628	44 mh.	4.7	5.1
639		22 mh.	2.6	2.8
	629	22 mh.	2.5	2.7

The resistance values include 7½ feet of 22-gauge cable. The 1000-cycle resistance is for a current of 0.5 ma. These are the coil numbers, not the case numbers that most telephone company personnel would use.

Ralph continues that the toroid nearly everyone obtains these days is the type 632, which is about 50 per cent smaller than the older 622. The reduction results from the use of Formex wire; there was no change in the core material used.

Using the 88-mh. Toroid in Filters

When used properly, the 88-mh. toroid makes an excellent basic filter element. To lower the Q to where the bandwidth of the simple single-tuned toroid would make a good filter, resistance can be put either in series or parallel with the inductor.

The parallel impedance of such a circuit goes up with frequency, so the voltage developed across the filter will be much higher for the higher frequencies: Thus, combining mark and space

³ HoE, "Checking RTTY Shifts" *QST*, May, 1966.

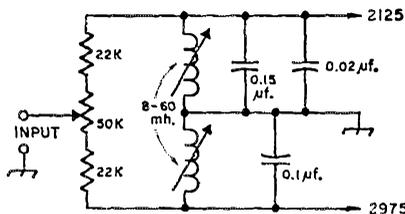


Fig. 2—The Mainline 5850 filter system for broad-band general reception. Bandwidth of the filters is about 300 cycles each. The coils are TV width coils (Miller 6319).

filters on the same drive point in such a manner that the output voltage will be the same for both frequencies, while retaining the same bandwidth, requires some rather fancy juggling. Here empirical testing outweighs the value of the textbook formulas. As means are added for equalizing the output voltages, the bandwidth is changed — and round and round we go. This may in some small way help clear up questions that otherwise might arise from a quick comparison of the various filter diagrams. The problems do not occur with the more complex filters because other means of combining them are used.

Let us list quickly the basic filter types that will be covered:

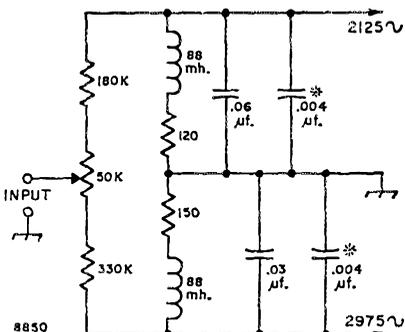
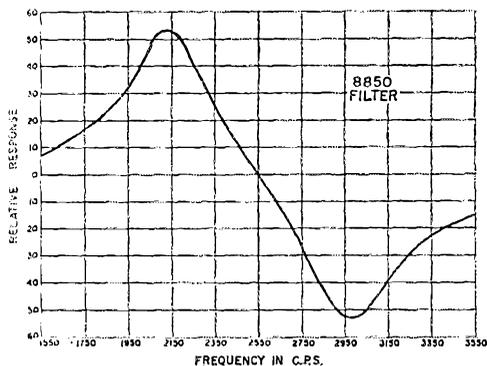


Fig. 3—The Mainline 8850 filter using 88-mh. toroids. Short out the resistors in series with the toroids for maximum sharpness while tuning to frequency. The 0.004-µf. capacitor values (marked *) are approximate because of capacitance tolerance variation. The 8850 is for general reception; filters are each about 300 cycles bandwidth. Resistors are 5 per cent.

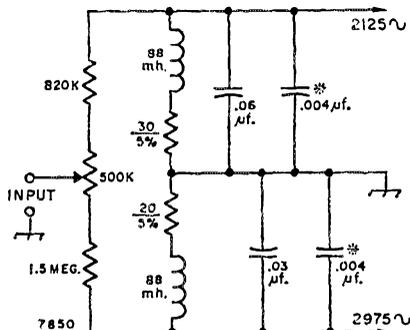
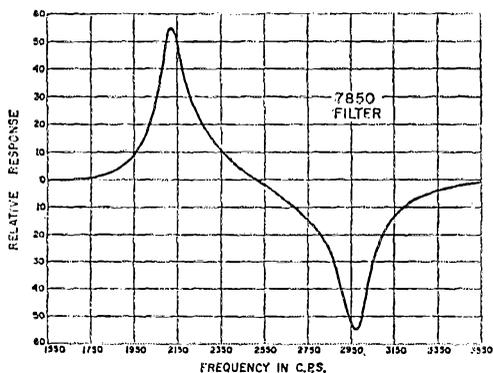


Fig. 4—The Mainline 7850 filter using 88-mh. toroids. The 0.004-µf. capacitor values (marked *) are approximate. Short out the resistors in series with the toroids for maximum sharpness while tuning to frequencies shown. This filter is primarily for limiterless reception of 850 shift. The filters are each about 85 cycles bandwidth.

The "Mainline 5850" Filter (Fig. 2)

This is the broad-band TV-coil filter of the original Mainline TT/I, but updated slightly to provide output voltage comparable to that of the other filters. This will simplify quick switching between the various systems. The crossover frequency in the author's unit was 2554 cycles.

The "Mainline 8850" Filter (Fig. 3)

This is a broad-band filter for 850 shift using 88-mh. toroids. Its output voltage and general characteristics are similar to that of the TV-coil system (the 5850 filter), and it is intended for those who would prefer working with the 88-mh. toroid to using the TV coils. The curve is one actually obtained from the author's TT/L with this filter in use. (The curve for the 5850 was so similar that it need not be published.) The 5850 and 8850 filters are each approximately 300 cycles wide at the -3 db. points. Center crossover for the 8850 filter was 2551 c.p.s. in the author's unit.

Curves were run on the mark and space filters in the 8850 filter system, and the bandwidths were found to be extremely well-balanced:

Filter	-3 db.	-6 db.	-10 db.	-15 db.	-20 db.
2125	313	508	945	1645	3122
2975	306	506	961	1668	3190

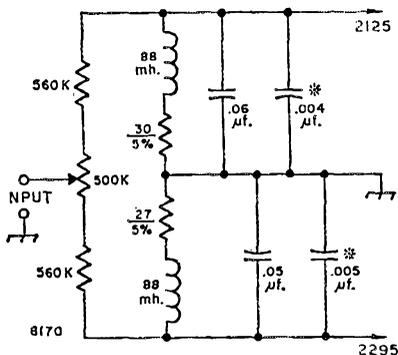
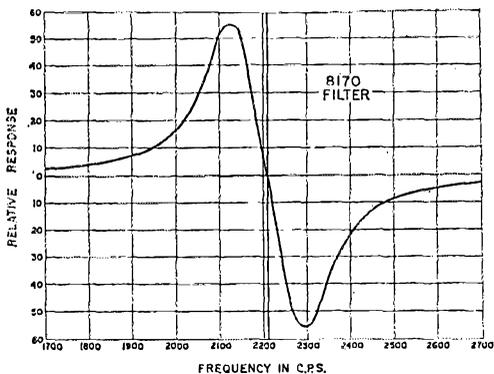


Fig. 5—The Mainline 8170 filter for 170 shift. Each filter is about 85 cycles wide using 88-mh. toroids. Capacitor values marked (*) are approximate, and should be selected to tune the toroids to the indicated frequencies.

The "Mainline 7850" Filter (Fig. 4)

This filter may be rather different from anything the reader has seen before. It has two filters that are simple and yet rather sharp — about 85

cycles each. The characteristics of the 88-mh. toroid when used this way allow reception to some extent of shifts other than 850, but the filter is intended mostly for limiterless copy of 850 shift. It should interest those who do not wish to build the 3-pole Butterworth types which follow (three 88-mh. toroids in each filter). This system may also be used for quickly setting the transmitter shift to a much closer tolerance than would be possible with the 5850 or 8850 filters.

The "Mainline 8170" Filter (Fig. 5)

This is a narrow-shift filter (170 shift) and has bandwidths of approximately 85 cycles. It is nearly the same as that published in November *QST*,⁴ with minor changes that allow more balance range. Center crossover on the author's unit was 2209 cycles with mark at 2125 and space at 2295.

Installing the "5," "7" and "8" Series Filters

A quick glance at August 1965 *QST*, page 30,¹ will show how the original filter section of the Mainline TT/L was installed. Any of the filters just mentioned (the 5850, 8850, 7850 or 8170) can be installed in place of the one shown, or in addition to it, by using a 3-pole multi-position switch or plug-in containers. The switch is preferable, because exchanging the filter containers when going from one system to another destroys most of the value in building the filters in the first place — it is just too much effort to be continually exchanging the filters. QST

(Part II, describing more complicated filters and outlining the method of tuning them initially, will appear in a subsequent issue.)

⁴ Hoff, "Operating the RTTY Station," *QST*, November, 1965.

Strays HOW

The Blue Grass ARC sponsored this entry in the local Soap Box Derby in Lexington, Kentucky. Shown in the driver's seat is 11-year old Kevin Ahlgrim, who went on to win the city championship and became eligible to compete at the national event in Akron, Ohio. The club also furnished a 6-meter net to coordinate the race activities and had stations at the starting line, judges' stand and the recovery area.



Tex Mantell, WB2SSJ, passed a few interesting hours while on training duty with the National Guard in Camp Drum, with this neat 10-watt suitcase rig and a small three-element beam. Tex says he worked several neighboring states with good signal reports from all.

The Simple Super-9

A Solid-State Receiver for 80 and 40 Meters



BY WILLIAM L. NORTH,* W4GEB

LOOKING for a short-term solid-state construction project? Or, perhaps you've been wishing you owned a battery-operated portable receiver for the 40- and 80-meter bands? Whatever the case, the Simple Super-9 should provide the builder with many hours of pleasure and may offer that first chance to try your hand at building your own receiver.

This transistorized receiver contains no trick circuits and is a conventional single-conversion superheterodyne type. Included in the circuit is a Q multiplier to aid the selectivity. Also, a b.f.o. is included to permit copying s.s.b. and c.w. signals. Only 9 transistors are used in the circuit. The unit is built into a small package which measures only $7\frac{1}{2} \times 5 \times 3\frac{1}{2}$ inches.

The receiver is designed for use with headphones and supplies more than enough volume, even on weak signals.

Circuit

A 2N1177 is used as an r.f. amplifier (Fig. 1). Two diodes, CR_1 and CR_2 , are connected back-to-back and are used between the high-impedance end of L_1 and ground, protecting Q_1 from being damaged when high r.f. levels are present at J_1 .

A panel-mounted, 2-gang miniature broadcast variable (C_1) is used to tune the r.f. and mixer stages to resonance in the 3.5- to 7.3-Mc. range. C_1 is tuned for a peak response in the same manner as is the preselector control on many modern receivers. The oscillator, Q_3 , is tuned independently by C_2 and is 455 kc. higher in frequency than the incoming signal.

* 712 Hallwood Ave., Falls Church, Virginia.

Nine transistors, an i.f. module, and a handful of junk-box parts are put to use in this simple low-cost receiver. The W4GEB Super-9 uses a prewired 455-kc. i.f. module which contains two stages of i.f. amplification, a selective ceramic filter at the input, a detector diode, and an a.g.c. circuit. The module greatly reduces the assembly time of the receiver.

Output from the mixer is coupled into a prewired i.f. module (Z_1) through transformer T_1 . The 455-kc. output from Z_1 is fed into the emitter of Q_6 , the product detector. A 455-kc. b.f.o. signal is injected into the base of Q_6 during s.s.b. or c.w. reception. With the b.f.o. turned off, a.m. signals can be copied, or if the operator so desires, the b.f.o. can be left on and the a.m. signals can be tuned in, "sideband style." A 1N63 (CR_3) is used as a variable-capacitance diode and is controlled from the front panel by R_4 . As the voltage across CR_3 is varied by R_4 , the junction capacitance of the diode changes, causing a shift in the resonant frequency of T_2 . This action permits the pitch of the c.w. or s.s.b. signal to be changed by adjustment of R_4 .

One stage of audio amplification is used (Q_7) and output from that stage is fed to J_2 , the headphone jack. Because J_2 is in series with the collector supply voltage, it is insulated from the panel with fiber washers.

The i.f. module (Z_1) requires slight modification so that Q_6 can be used as the detector. Details of the circuit changes are shown in Fig. 2.

The receiver is powered by a 9-volt battery which is connected to the circuit when S_4 is turned on. A silicon diode, CR_4 , is wired in series with the plus 9-volt bus, between S_4 and the receiver circuit. When the battery is properly connected to the circuit the diode conducts and allows the voltage to reach the receiver. Should the battery be mistakenly connected for the wrong polarity, CR_4 will oppose the flow of current, protecting the circuit from damage.

Construction Notes

The cabinet for the Super-9 is an off-standard item which was available to the author. A good substitute, and one that is recommended, is a Bud CU-2109-A Minibox which measures $8 \times 6 \times 3\frac{1}{2}$ inches. The gray hammertone finish of the Minibox will give the receiver a professional look.

A piece of perforated circuit board is used as a chassis (Fig. 4). Flea clips have been added to the "perfboard" chassis and serve as tie points for the components. Most of the parts are mounted on the top side of the circuit board,

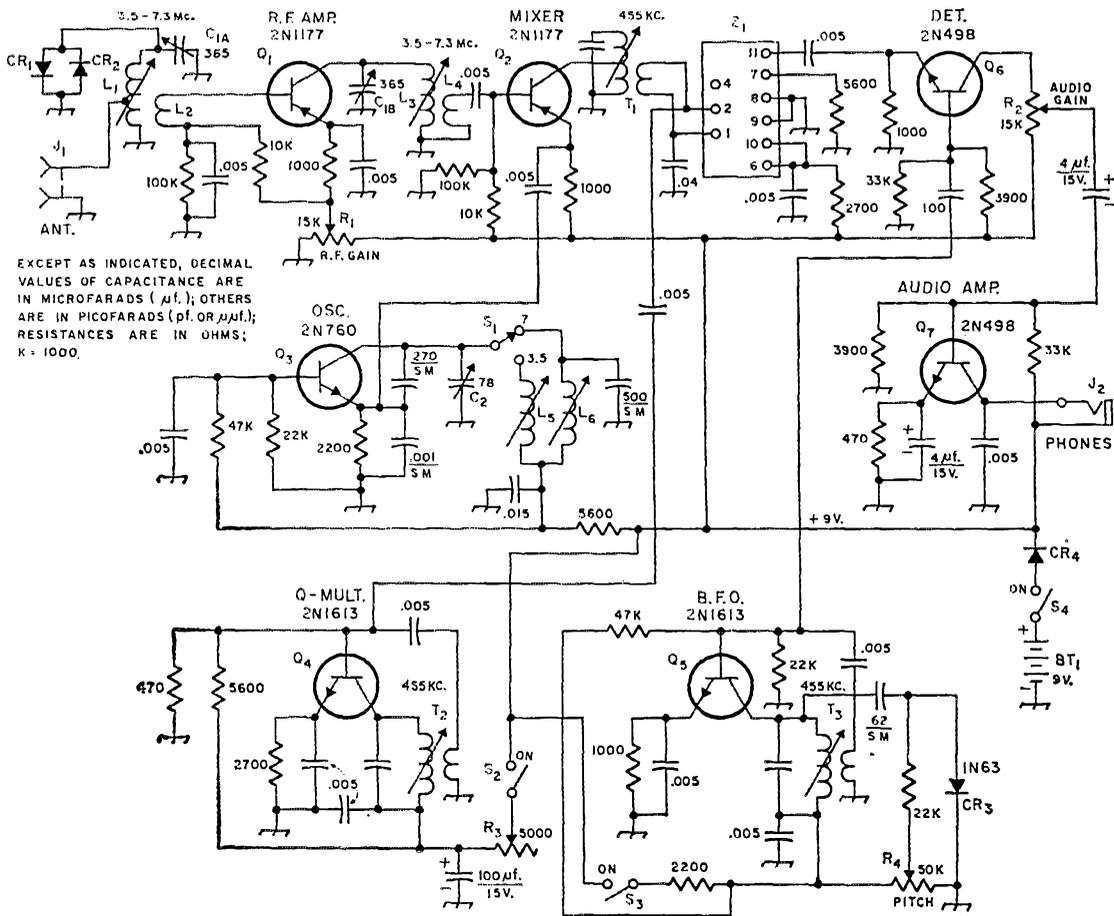


Fig. 1—Circuit of the solid-state receiver. Capacitors are disk ceramic except those bearing polarity marking, which are electrolytic. SM = silver mica. Resistors are $\frac{1}{2}$ -watt composition type. Terminal 11 has been added to Z₁ as shown in Fig. 2. All unmarked capacitors associated with T₁, T₂, and T₃, are contained inside the transformers and are supplied with them. BT₁—9-volt radio battery.

- C₁—2-section variable, 365-pf. per section. Midget t.r.f. type (Lafayette 32R1101 suitable).
- C₂—78-pf. miniature variable (Lafayette 32R1106 suitable. 6.3- to 123.1-pf. section not used).
- CR₁, CR₂—Small-signal silicon diode (HD5004 suitable).
- CR₃—1N63 germanium diode.
- CR₄—Silicon diode, 50 p.r.v., 100 ma. (1N659 or similar).
- J₁—Phono jack.
- J₂—Phone jack, open circuit.
- L₁, L₃—25 turns No. 32 enam. wire on $\frac{1}{4}$ -inch diam. ceramic slug-tuned form (Miller form 41A000CB suitable).
- L₂, L₄—4 turns No. 24 insulated hookup wire over cold ends of L₁ and L₃.

- L₅—33 turns No. 32 enam. wire, close-wound on same type form used for L₁ and L₃.
- L₆—7 turns No. 24 single-cotton-covered wire, close-wound on same type form used for L₅.
- R₁—15,000-ohm linear-taper control.
- R₂—15,000-ohm audio-taper control.
- R₃—5000-ohm linear-taper control.
- R₄—50,000-ohm linear-taper control.
- S₁—S.p.d.t. toggle switch.
- S₂—S.p.s.t. switch (part of R₃ assembly).
- S₃—S.p.s.t. switch (part of R₄ assembly).
- S₄—S.p.s.t. switch (part of R₂ assembly).
- T₁—455-kc. miniature i.f. transformer (comes with Z₁).
- T₂, T₃—455-kc. miniature i.f. transformer (Miller 8901).
- Z₁—455-kc. i.f. amplifier-detector module (Miller 8903 or Lafayette 99R6254).

but there is no reason why some of the components cannot be attached to the opposite side of the chassis, if desired. The main consideration is that the stages are mounted on the chassis in logical sequence and that component lead lengths are kept short and direct.

The photo at the beginning of this article shows a front-panel view of the receiver in which an S-meter is visible. Fig. 3 shows that

no connections have been made to the S-meter terminals. The instruction sheet that comes with i.f. module Z₁ shows how such a meter can be connected to terminal 10 of Z₁, should the builder desire to do so. The meter in this model has not been used because the author plans to experiment further with that part of the circuit. Also, a knob is visible at the lower left of the panel. This control is not used and was placed

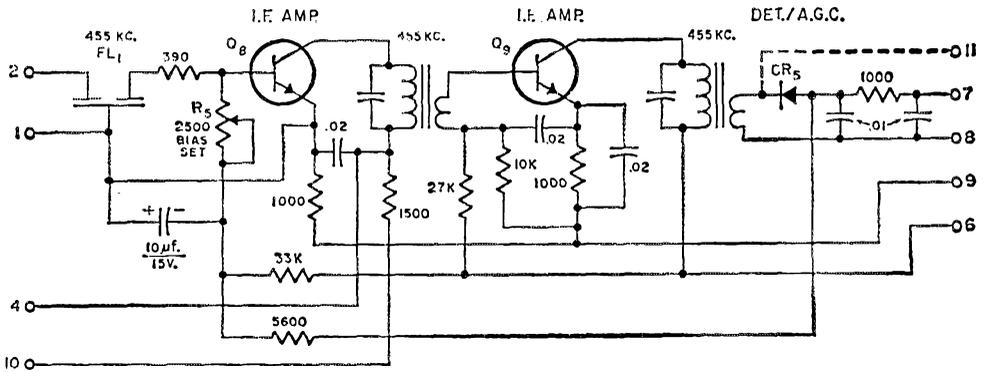


Fig. 2—Schematic of the i.f. module, Z1. Capacitance is in μf . Capacitors are ceramic except those with polarity marks which are electrolytic. Resistance is in ohms. $\text{K} = 1000$. FL_1 is ceramic i.f. filter. Dotted line from CR_5 to Terminal 11 indicates circuit addition (see text). Terminal 11 is made by bringing the new wire out through a small hole drilled in the phenolic baseboard of Z1. R_5 is pre-adjusted at the factory. CR_5 is still used and supplies a.g.c. voltage to Q_8 .

there for additional experiments to be carried out in the future. The dial mechanism is a Millen 10039.

Testing and Alignment

When the wiring has been completed, loosely couple a signal generator to the base of Q_2 through a 5-pf. capacitor. After setting the signal generator to 455 kc. (with 400 or 1000 c.p.s. audio tone) turn the receiver on and advance the audio gain control, R_2 until the signal from the generator is audible. Adjust the slug of T_1 for a peak in signal level, using only enough output from the generator to permit the 455-kc. signal to be heard in the phones. Next, set the b.f.o. pitch control, R_4 , at mid range (this will also turn the b.f.o. on because S_3 is part of R_4). With the signal generator still connected to Q_2 , but without audio tone applied, adjust b.f.o. transformer T_3 until the b.f.o. is zero beat with the 455-kc. signal from the generator. While adjusting R_4 , it should be possible to shift the b.f.o. frequency approximately 5 kilocycles either side of zero beat.

When checking out the Q -multiplier circuit, the signal generator is again connected to the base of Q_2 and is set at 455 kc. Advance the Q -multiplier control, R_3 , until a "plop" is heard in the headphones, indicating that Q_4 is oscillating: S_3 and R_3 are on the same shaft, so the Q multiplier will be turned on when R_3 is advanced. Turn the b.f.o. on and adjust the slug of R_2 until a zero beat is secured. Since some interaction may occur between T_1 and T_2 because they are closely coupled, it may be necessary to touch them up while listening for maximum audio output from the receiver. The setting of R_3 that provides a hollow sound in the phones (similar to that of a receiver using a crystal filter) will occur at the point of best selectivity. At this setting the Q multiplier is just on the verge of oscillation. A definite increase in overall gain will be noted when this circuit is operating correctly.

The next step in receiver alignment is to make

sure that the oscillator stage, Q_3 , tunes the proper range. Place the band switch, S_1 , in the 3.5-Mc. position. With a grid-dip meter coupled to L_5 , adjust the slug in L_5 so that the oscillator tunes to 3955 kc. when the plates of C_2 are fully meshed (maximum capacitance). With C_2 at minimum capacitance, the resonant frequency of the oscillator tank should be approximately 4455 kc. Next, place S_1 in the 7-Mc. position and adjust C_2 to maximum capacitance. While checking with the grid-dip meter, adjust L_6 until the circuit is resonant at 7455 kc. With C_2 set at minimum capacitance, the oscillator should be tuned to approximately 7755 kc. To test for oscillation at Q_3 , apply operating voltage to the circuit and couple the grid dipper to the oscillator tank. If the circuit is performing correctly, there should be sufficient oscillator output to deflect the meter on the grid dipper.

All that remains now is to align the r.f. and mixer tuned circuits. First, place C_1 at maxi-

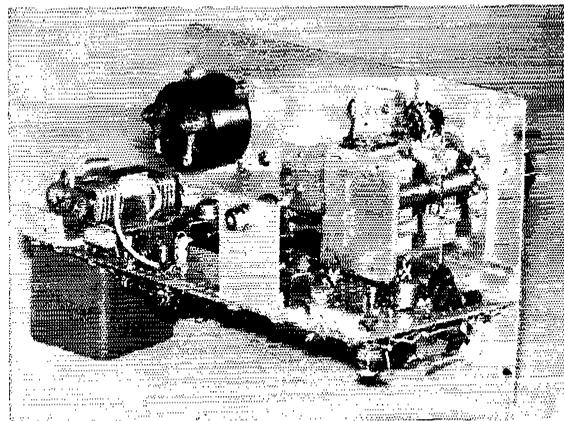
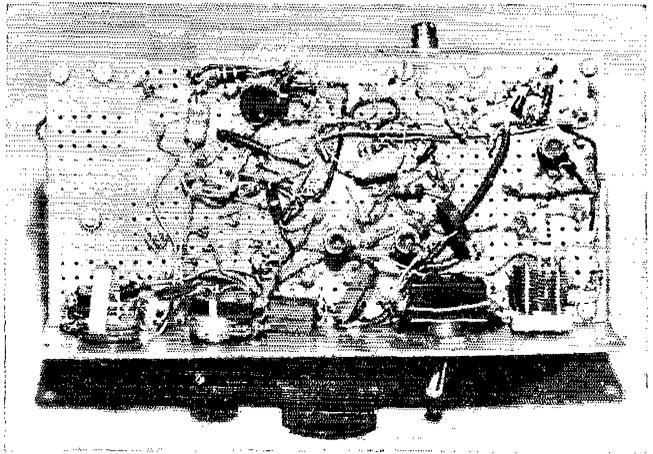


Fig. 3—Top-chassis view of the receiver. Input tuning capacitor C_1 is at the right. C_2 , the main tuning capacitor, is left of C_1 . The antenna jack is at the rear center and is mounted on an L-shaped bracket. (Square block at lower left is not a part of the receiver.)

Fig. 4—Under side of the chassis. Connections are made between various parts of the circuit by running insulated hookup wire between flea clips which are mounted in perforated board. (Variable capacitor at lower right is not used.)



imum capacitance. Place S_1 in the 3.5-Mc. position and apply operating voltage to the receiver. Connect the signal generator to J_1 and feed a 3.5-Mc. signal into the receiver. Tune C_2 until the signal is heard in the phones. Next, adjust L_1 and L_3 (C_1 still at maximum capacitance) for a peak in signal at 3.5 Mc. Make certain that the signal generator is definitely on 3.5 Mc. and not on an image frequency so that when L_1 and L_3 are adjusted, they are peaked at the desired frequency. It will be possible to peak the r.f. and mixer stages of the receiver at some undesired frequencies other than the image frequency. This condition is caused by harmonic energy from the oscillator which produces mixing action at Q_2 , giving rise to response at frequencies outside the 80- and 40-meter bands. A little practice in tuning C_1 will familiarize the operator with the location of the desired peaks. No adjustment of L_1 and L_3 is required for 40-meter operation and the peak for that frequency should occur when C_1 is set near minimum capacitance.

Using the Receiver

Single-signal reception is possible by adjusting the Q multiplier so that it is just below the point of oscillation and offsetting the b.f.o.

frequency for the desired beat tone. The signal on one side of zero beat will be 20 decibels or more stronger than on the other side. When receiving a.m., turn the Q multiplier off. During reception of s.s.b. or c.w. signals, the audio gain should be almost fully on and the r.f. gain control, R_1 , should be used to control the output level of the receiver. This will result in minimum distortion of the received signal.

Although some pretty husky transistors are used in the little receiver, the current drain on the 9-volt battery is only 7.5 milliamperes. With these modest power requirements the Super-9 can supply many hours of portable operation before the battery output is too low to operate the receiver.

The receiver has provided many hours of fun at W4GEB. Furthermore, it is ready to go at any time an emergency creates the need for a battery-powered 40- and 80-meter receiver. To add further to its usefulness as an emergency receiver, converters for 10, 6, and 2 meters could be used ahead of the Super-9. The author is presently designing crystal-controlled converters for that application.

Ready to try your hand at building a solid-state receiver? The Simple Super-9 is made to order for that first project.

QST

Strays

I would like to get in touch with . . .

- . . . anyone interested in starting a Novice net. D. F. Reeder, WN0NDQ.
- . . . Students who are hams and are part of the American Field Service (student-exchange program) to start an AFS net. Christopher Thomas, WA6HTJ.
- . . . anyone who was in contact with or who was operating at Pearl Harbor during the attack and bombing December 7, 1941. Virgil D. Lyon, R. 1, Box 424, DeWitt, Michigan.
- . . . anyone associated with Lehigh University and interested in participating in a summer net. Net meets on Wednesdays at 0001 GMT (Tuesday eve-

- ning EDST) on 3.545 Mc., A1, net call "CQ LURS."
- . . . personnel of the 9th Signal Service Co., stationed at radio station WTJ, Fort Shafter, Honolulu, Hawaii on December 7, 1941. Al Shelleday, W2RJ, Box 92, West Milford, New Jersey 07480.
- . . . early radio amateurs who were broadcasting in the 1920s in and around the state of Oregon. Herb Welch, W6PRD, 669 West Mendocino, Stockton 4, California.
- . . . amateurs who are also members of, or interested in, Alcoholics Anonymous. Ben Lane, W7FNE/MM, SS Hudson, 6801 Empire State Building, New York, N. Y. 10001.



Gimmicks and Gadgets

An Experimental U.H.F. Oscillator

Using the Overlay Transistor

THIS 420-450-Mc. oscillator was built for the purpose of experimenting with the overlay transistor, a new type u.h.f. transistor introduced by RCA in 1964. The overlay transistor has low lead inductance, better collector isolation, and improved thermal conductivity.¹ The circuit of Fig. 1 was empirically developed while using the RCA 2N3553, but other overlay types were tried and delivered comparable performance.

The oscillator can be put to use by the experimenter in many interesting ways: as a signal source for u.h.f. antenna experiments; as a demonstration device for ham-club talks; for low-power ATV transmission; or as a modulated oscillator for short-range 420-Mc. voice communication.

The Circuit

The oscillator (Fig. 1) uses a half-wave line, L_1 , tuned to resonance at the desired frequency by C_1 . The operating voltage, 9 to 12 volts d.c., is brought into the copper box through C_5 and is applied to the cold point of the collector side of the line, L_{1B} , through RFC_2 . Bias current for the base of Q_1 is established by R_1 and is fed into the box through C_4 . RFC_1 isolates the base of Q_1 from the supply voltage.

L_2 , the output link, is tuned to resonance by C_3 , which is a 10-pf. piston trimmer. R.f. output is taken from J_1 , a BNC connector.

While working with a similar circuit, Walt Lange, W1YDS, discovered the need for a small capacitor at C_2 . This capacitor, a 5-pf. silver mica, was necessary to insure oscillation each time the unit was turned on.

¹ Carley, McGeough, O'Brien, *Electronics*, Aug 23, 1965, p. 71.

With the constants given in Fig. 1, the overlay oscillator tunes from 420 to 460 Mc. and delivers enough r.f. output to light a No. 49 bulb beyond normal brilliance.

Construction

The oscillator is built in a 1 × 1 × 5-inch copper trough (Fig. 2). Although light-gauge flashing copper was used, brass or aluminum could be substituted. The box was formed in a bench vise and the ends were soldered to assure good electrical contact. A high-wattage soldering iron was needed for that part of the job.

L_1 is supported at one end by the stator terminals of C_1 , and at the opposite end by a polystyrene block 1 inch square and $\frac{1}{4}$ inch thick. The conductors are 3-inch lengths of No. 10 bus wire.

The case of the 2N3553 is internally connected to the collector, so as to keep lead lengths to a minimum and to provide a heat sink. Q_1 is mounted directly on the end of L_{1B} by means of a copper ring (Fig. 2) which is soldered to the end of L_{1B} . The diameter of the copper ring is such that Q_1 fits snugly into it.

C_4 , C_5 , and J_1 are soldered to the copper trough to assure good electrical contact.

L_3 is insulated by spaghetti tubing, and is spaced approximately $\frac{1}{16}$ inch away from the cold

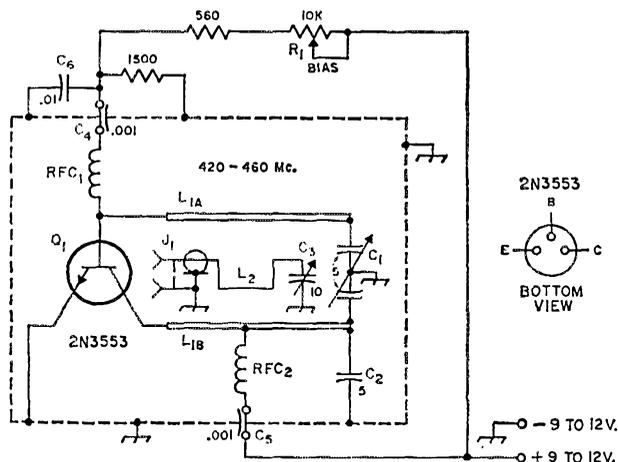


Fig. 1—Schematic of the 432-Mc. oscillator. Resistances are in ohms; K = 1000. Fixed resistors are $\frac{1}{2}$ -watt composition. Decimal values of capacitance are in μ f.; others are in pf.

- C_1 —5-pf. butterfly variable (Hammarlund MACBF-5).
- C_2 —5-pf. silver mica.
- C_3 —10-pf. piston trimmer.
- C_4 , C_5 —Feedthrough capacitor.
- C_6 —Disk ceramic.
- J_1 —BNC chassis connector.

- L_1 —3-inch parallel-conductor line of No. 10 bus wire (See Fig. 2).
- L_2 — $\frac{1}{2}$ -inch length of No. 20 bus wire.
- Q_1 —RCA 2N3553 (RCA 40280 usable).
- R_1 —10,000-ohm $\frac{1}{2}$ -watt control, linear taper.
- RFC_1 —8 turns, close-wound, No. 22 enam., $\frac{1}{8}$ -inch diam.
- RFC_2 —3 turns, close-wound, No. 22 enam., $\frac{1}{8}$ -inch diam.

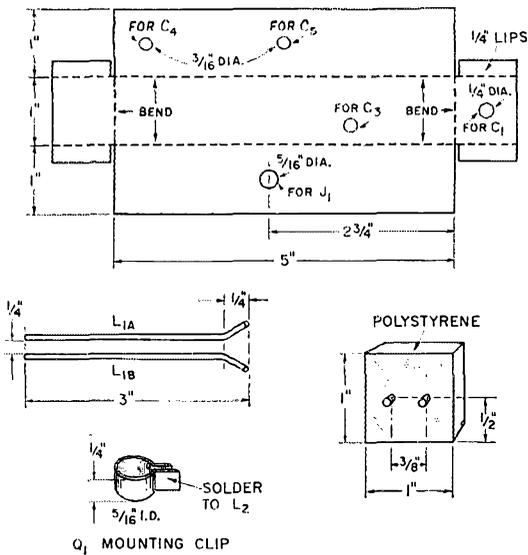


Fig. 2—Layout for the copper trough, the tuned line, and the polystyrene insulating block. Hole diameter for C_4 and C_5 is dependent upon type of feedthrough capacitor used.

area of L_{1B} (near the tap point). It is mounted between J_1 and C_3 .

To keep the emitter lead as short as possible, a copper tab is soldered inside the trough near Q_1 . Better efficiency results when the emitter lead inductance is kept as low as possible.

Adjustment

Connect a No. 49 bulb to J_1 . This will serve as a dummy antenna and will give visual indication of output power during tuneup. Set R_1 at maximum resistance and insert a 200-ma. meter between the power supply and the plus-d.c. terminal of the oscillator. Any d.c. voltage between 9 and 12 volts will be suitable for this circuit. The negative supply lead should be connected to the outer wall of the copper trough. With the power on, adjust R_1 for a meter reading of 80 ma. The dummy load will be lit if the oscillator is working. Next, adjust C_3 for maximum brilliance of the pilot lamp, which should be near normal brilliance at this power level, about 1 watt input at 12 volts.

A word of caution: Do not allow the collector current to exceed 80 ma. when adjusting R_1 . If oscillation should stop, the current will

A close-up look at the u.h.f. oscillator. Q_1 is just to the right of the plastic support block and is mounted on the end of L_{1A} . The tuned line serves as a heat sink for the transistor.

soar to unsafe limits and could destroy the transistor. When the unit is adjusted as outlined, the collector current will rise to approximately 200 ma. in the absence of oscillation, a safe figure for the 2N3553.

If a calibrated wavemeter is not available, the oscillator can be adjusted to frequency with the aid of Lecher wires,² or while listening to it with a 432-Mc. receiver. If on-the-air operation is planned, it would be wise to stay either well above or below 432 Mc., so the broad signal from the oscillator will not interfere with the DX "purists" who haunt the portion of the band near 432 Mc.

Final Remarks

The 2N3553 costs about \$8. Another RCA overlay, the 2N3866, is rated at 5 watts, is good to 800 Mc., and costs \$1.95. The latter might perform even better than the 2N3553 since it has lower internal capacitance. An RCA 40280 was installed in the circuit experimentally, and performed as well as the 2N3553.

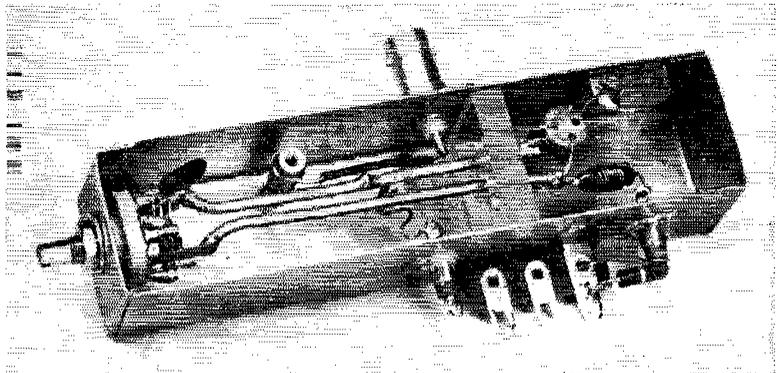
No attempt was made to measure the power output, but 100 milliwatts or more should be easy to secure. Increased collector voltage (up to 25 volts d.c.) was applied and considerably more power output was secured. Similarly, by increasing the base bias, greater collector current flowed and the output increased. The author does not recommend such an increase in power because the transistor could go into thermal runaway if oscillation ceased. This would destroy the transistor almost immediately.

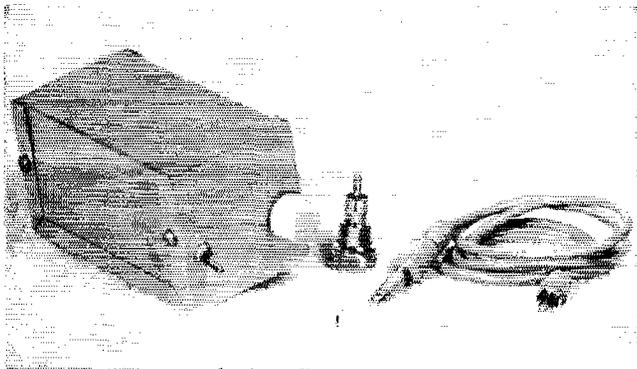
The oscillator can be used on f.m. by applying a small amount of audio in parallel with the base of Q_1 . Audio from a carbon microphone was applied at the junction of RFC_1 and C_4 , through a blocking capacitor, and the resultant f.m. signal sounded excellent on a 432-Mc. superregen receiver. For ATV use, video modulation could be applied to the collector supply voltage; however, a combination of a.m. and f.m. would no doubt result.

If you're interested in semiconductor experiments, this little oscillator can provide many hours of pleasurable tinkering. All that you need is a few parts, some flashing copper, tin shears, a soldering iron, and some enthusiasm.

—WICER

² *The Radio Amateur's V.H.F. Manual*, p. 291.





The two-tone test oscillator and its battery supply fit into a $2\frac{1}{4} \times 2\frac{1}{4} \times 4$ Minibox, with on-off switch and amplitude control for the lower frequency on one end. The cable at right goes to the microphone input to the transmitter. The small adapter is used without a cable to connect the unit to a speech amplifier which takes a standard microphone connector.

A Simple Two-Tone Test Generator

BY ROBERT C. CHEEK,* W3LOE

THIS little two-tone generator can be duplicated for a parts cost under eight dollars. It has admirably filled a need for a convenient source of one or two adequately-pure audio tones for single- and two-tone testing of complete single-sideband transmitting setups.¹ We keep it near the operating position at all times. Transistorized and completely self-contained, it can be quickly plugged into the microphone jack to provide a single tone for tuning, a check on unwanted-sideband suppression, and a check on carrier suppression under dynamic conditions. Alternatively, it provides two tones of adjustable relative amplitude for conventional two-tone testing of overall system performance. We continuously monitor transmitter output with an oscilloscope as a matter of operating practice, and a dummy antenna is kept handy. With the scope already connected, making such checks is a quick and simple procedure.

*3310 Scathelocke Road, Pittsburgh, Pennsylvania 15235.

¹ Blakeslee, "Testing a Single Sideband Transmitter," *QST*, September, 1965.

The unit uses two RCA 2N406 germanium transistors, each in a Twin-T oscillator circuit. The symmetrical Twin-T circuit, shown basically in Fig. 1, differs somewhat from the bridged-T circuit used by Baxter² in his general-purpose audio oscillator. Two complementary symmetrical T's, bridging each other, are used in the RC network. The upper T is a low-pass network, the lower a high-pass network, and at the oscillating frequency there is a 180-degree phase shift across the combination.

This circuit has been analyzed by Maynard,³ who states that for optimum feedback conditions, C_2 should equal $2C_1$, and R_2 should equal $0.1R_1$. These proportions are not unduly critical, but limits on R_1 for a given type of transistor are imposed by bias considerations. The output frequency depends on the entire combination. The frequency can be varied over a considerable range, however, by changing R_2 alone. The output at C_2 is a relatively pure sine wave, with no perceptible distortion under oscilloscope observation.

The component values shown in Fig. 2 were chosen to give tones of approximately 750 cycles and 1800 cycles for the two oscillators with standard values of available capacitors and resistors. The output mixing circuit is arranged so that the 1800-cycle tone appears at roughly constant amplitude, approximating the peak output level of a crystal microphone, at any setting of the output control. The latter controls the amplitude of the 750-cycle tone in the output from zero to nearly twice the higher-frequency amplitude. Thus, with the control at full counterclockwise position, the unit is a single-tone generator. For two-tone testing, the control is advanced as required to balance the amplitudes of the two generated sidebands. Balance is indicated by sharp cross-over points in the resulting oscilloscope pattern. In either case, the desired absolute level is controlled by the regular gain control of the speech amplifier.

The higher tone is used for single-tone testing so that sideband frequencies resulting from harmonics generated by distortion in the audio sys-

² Baxter, "A Transistor Audio Oscillator," *QST*, February, 1965.

³ Maynard, "Twin-T Oscillators for Electronic Musical Instruments," *Electronics World*, June, 1964.

tem will fall outside the pass-band of the usual filter type of exciter. The resulting single-tone pattern thus will deviate from normal only because of inadequate suppression of the carrier or opposite sideband.

Construction

The unit is contained in a $4 \times 2\frac{1}{4} \times 2\frac{1}{2}$ -inch Minibox. Each oscillator is built on a $3\frac{1}{8} \times 2$ -inch piece of phenolic Vectorboard. These are mounted as two decks in the box, supported and separated by $\frac{1}{8}$ -inch metal spacers, two at the rear corners and one at the front center of each board. The boards are mounted far enough to the rear of the box to leave room for the battery, the on-off switch, and the miniature level control. In mounting this control, be sure to place it so that it will not be damaged by the self-tapping screw used to assemble the cover to the box. The battery is held in place by a homemade clip, which is secured to the front panel by the switch mounting. The output phono jack is mounted at the rear of the box, just above the top circuit deck.

The schematic diagram, Fig. 2, shows the circuitry contained on each oscillator deck. Wiring of the decks is a quick and simple procedure. The component leads themselves provide all of the internal interconnections except for one separate lead which picks up the ground points. In most cases, the leads of components which have a common junction are pushed through

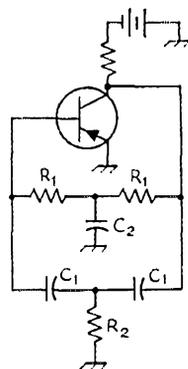
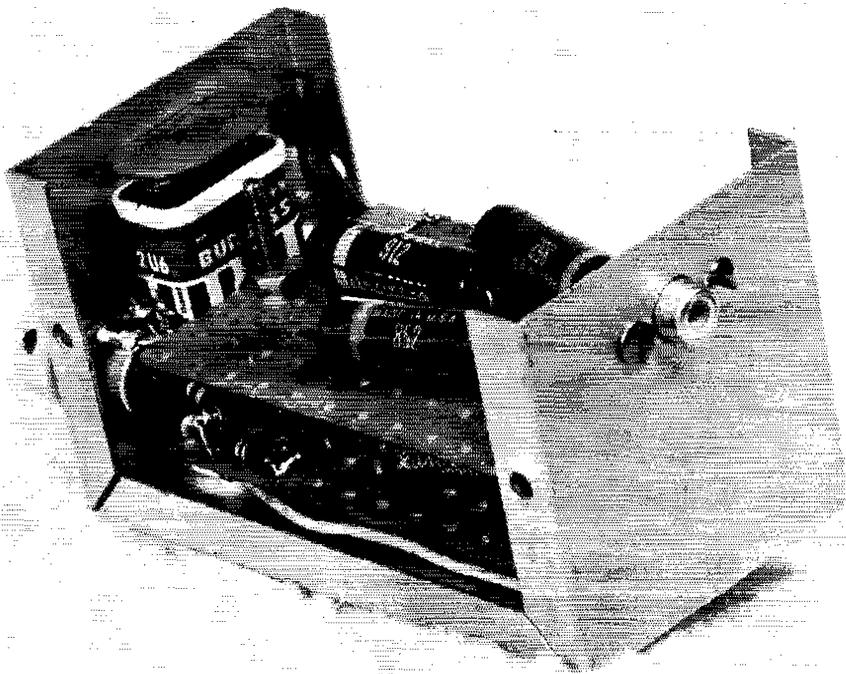


Fig. 1—Basic circuit of the Twin-T oscillator.

the same hole, twisted slightly together, soldered, clipped to about $\frac{1}{4}$ inch, and bent down against the underside of the board. The usual precautions apply to the soldering of junctions involving transistor leads. These should be held close to the underside of the board with a pair of long-nose pliers while the soldering iron is applied and until the joint cools.

Capacitors with 200-volt rating are suggested in the schematic diagram because they are generally less expensive and available in wider variety of ratings than lower voltage units, which could be used. Capacitors of ratings from 100 to 400 volts were used in the actual construction.



Inside the two-tone audio generator. Each oscillator is built on a punched phenolic board; layout is not critical. The battery is held against one end of the box by a homemade clip not visible in this picture.

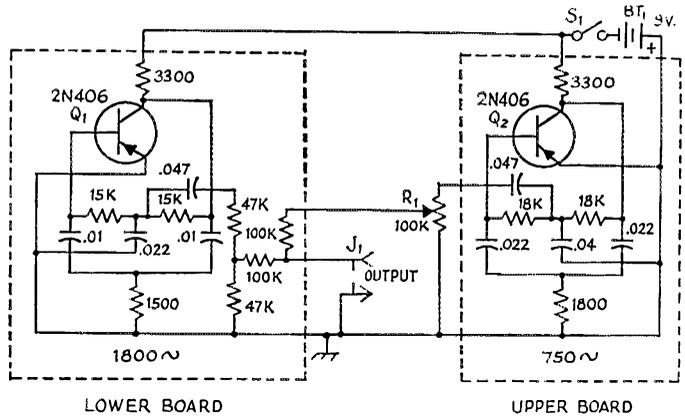
Fig. 2—Circuit of the two-tone test generator. Capacitances are in μf .; capacitors are 200-volt paper tubular. Resistances are in ohms ($K = 1000$); fixed resistors are $\frac{1}{2}$ watt.

BT₁—9-volt transistor battery (Burgess 2U6 or equivalent).

J₁—Phono jack.

R₁—Miniature control, audio taper (Mallory MLC15A).

S₁—Miniature s.p.s.t. toggle.



This was done simply because they were available from the author's parts box at the time the unit was being developed.

Before the boards are mounted in the box, two insulated leads should be soldered to the outer (battery) end of the 3300-ohm collector resistor of the lower board. One of these should be long enough to reach one side of the on-off switch, the other long enough to reach the corresponding end of the 3300-ohm resistor of the upper board after mounting. Similarly, an output lead, long enough to reach the phono jack, should be attached to the junction of the two 100K output resistors on the lower board. The ground lug of the phono jack is used to terminate similar extensions of the ground bus from each board. Examination of the circuit diagram will indicate the external leads that must be provided for the level control.

The negative (black) lead of the battery terminal clip goes to one side of the switch. After

assembly of the boards to the box, the external connections are completed and the positive (red) lead of the battery clip is soldered to any convenient point on the ground bus of the upper board.

A rough check of the operation of the oscillators can be made with a pair of high-impedance earphones. With the level control fully counterclockwise, the higher frequency tone should be clearly audible in a quiet room. As the control is advanced, the lower frequency should appear and become perceptibly louder.

It must be assumed that the builder has an oscilloscope, since the unit will not serve its intended purpose without it. Final checks on the waveform of the two tones should be made by observing each tone separately on the scope. The higher frequency tone can be temporarily eliminated from the output by grounding the junction of the two 47K output resistors on the circuitry of the lower board. QST

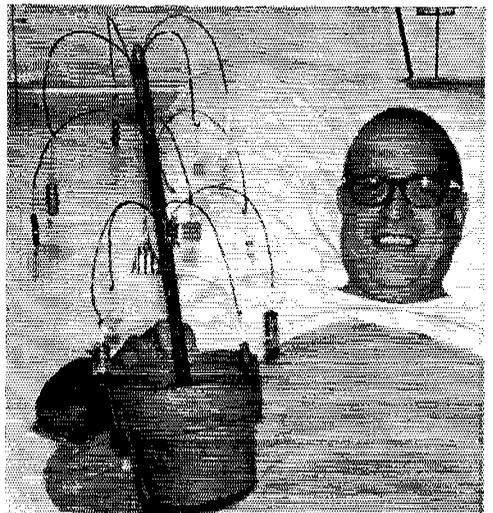
Strays

A conference and meeting of Doctor hams was held at the Hotel Astor in New York City in April and a Medical Amateur Radio Council was organized. All members must be licensed radio amateurs who are also qualified M.D., D.D.S., D.O., D.V.M., and Ph.D. in paramedical sciences. Associate memberships may be held by those men or women who are in postgraduate schools of the first four degrees. Doctors in other countries with equivalent degrees may also join.

Members of the profession are cordially invited to write for information or make application for membership to William L. Sprague, M.D., WA6CRN, 433 North 4th Street, Montebello, California.

— . . . —

When WA1CYS was hospitalized recently, his friends, K1MRA and W1CHX, presented him with this mobile (mobilis amateurius).



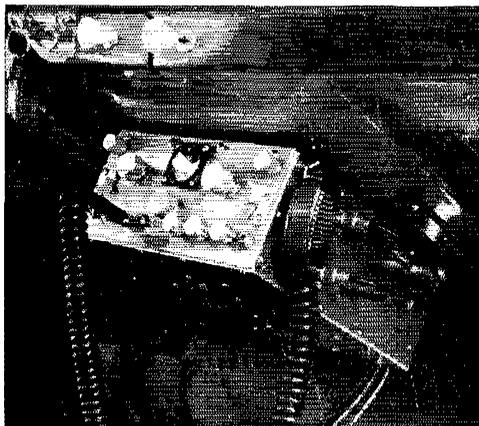
A Ten-Meter Mobile Transmitter/Converter Unit

Compact Construction

for Small Cars

BY J. W. RUSH,* W2BSO

The single package appearing in the photographs includes a 50-watt v.f.o.-controlled a.m. transmitter and a receiving converter designed to feed the car broadcast receiver. The overall efficiency of the screen-modulation system is improved by the use of voice-controlled carrier.

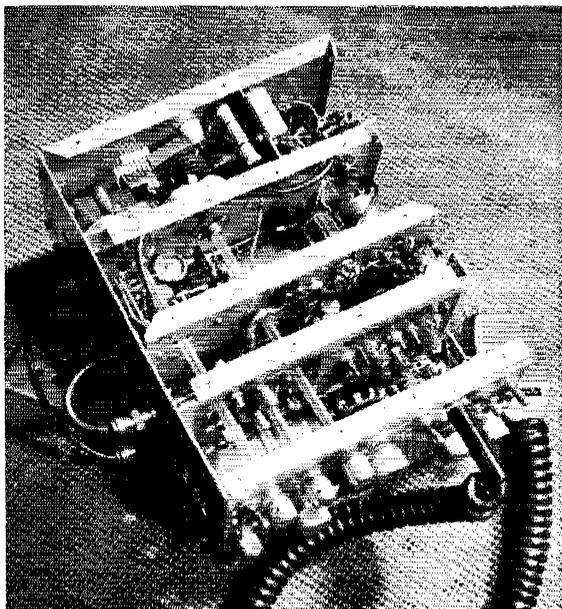


THE author owns a VW sedan, and wanted to go mobile. The 10-meter band was chosen principally for good local coverage, but with the promise of short- and long-skip contacts as the sunspot cycle advances. Because of the small size of the car, compactness was a major objective. This led to the use of the car b.c. receiver as the i.f. and audio sections of the receiving system. Further space was conserved through the use of subminiature tubes in the receiving converter, and in the exciter stages of the transmitter.

Converter

The circuit of the receiving converter is shown in Fig. 1. The incoming signal is amplified in a grounded-grid r.f. stage, and fed to the mixer where it is combined with the signal from the local oscillator to produce mixer output at approximately 1.6 Mc. To obtain good frequency stability, the oscillator fundamental frequency is in the 13-Mc. range, and frequency is doubled in the plate circuit. The output of the mixer is fed to the b.c. receiver which is preset to a clear spot in the vicinity of 1.6 Mc. The only tuning control in the converter is C_2 , which tunes the h.f. oscillator. However, the tuning control of the b.c. receiver may be used for fine tuning. Coverage is approximately from 26 to 30 Mc. with L_5 properly adjusted. It will be noted that this range includes the citizen band as well as the amateur band. Oscillator plate voltage is regulated at about 60 volts by V_2 .

S_1 is used to turn on the heaters of the converter tubes (also the heaters of the tubes in transmitter exciter, Fig. 2). Simultaneously, the low-voltage supply (Fig. 4) and K_1 are actuated.



Interior view showing the general layout. Details are discussed in the text.

* 5092 Jennifer Drive, N. Syracuse, N. Y. 13212.

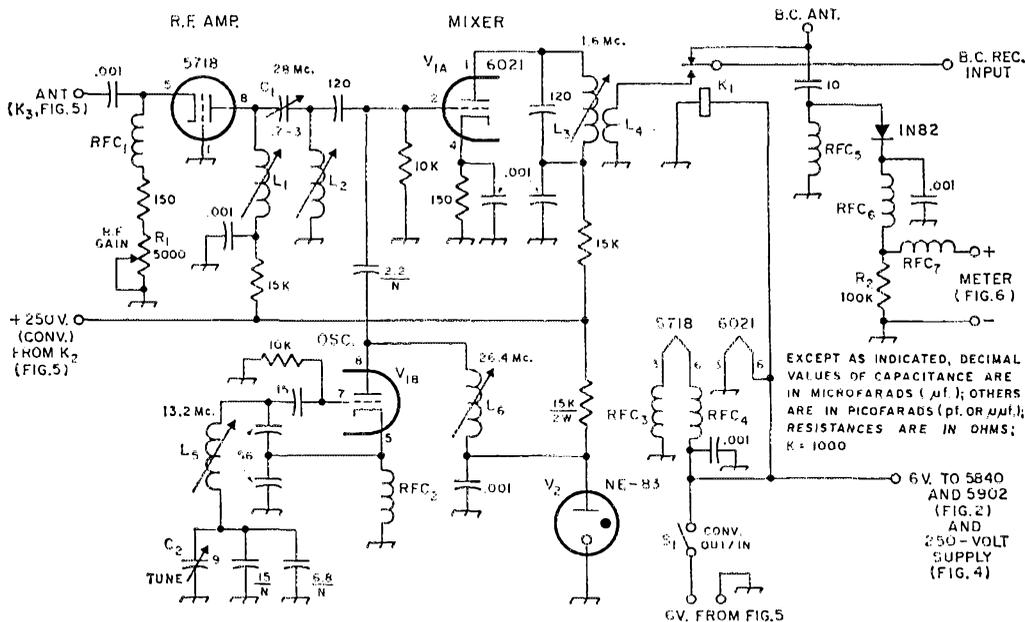


Fig. 1—Converter circuit. Fixed capacitors of decimal value are disk ceramic; others are silver mica or NPO ceramic, except where N indicates N750 negative coefficient. Unless indicated otherwise, fixed resistors are 1/2-watt.

- C₁—Plastic tubular trimmer (Erie 535-000-4R).
- C₂—Miniature air trimmer (Johnson 160-104).
- K₁—6-volt d.c. relay, s.p.d.t.
- L₁, L₂—32 turns No. 32 on 3/16-inch iron-slug form.
- L₃—100 turns No. 32 on 3/8-inch iron-slug form.
- L₄—5 turns No. 22 over low-potential end of L₃.
- L₅—45 turns No. 32 on 3/16-inch iron-slug form.
- L₆—25 turns No. 32 on 3/16-inch iron-slug form.
- R₁—Linear control.
- R₂—Adjust for desired sensitivity (see text).
- RFC₁—RFC₇, incl.—12 turns No. 28 on Ferroxcube toroid for No. 12 wire (form obtainable from Ferroxcube Corp. of America, Saugerties, N. Y.) Conventional chokes such as Ohmite Z-28, or Miller 70F225A1 should also be suitable.
- S₁—S.p.s.t. toggle switch.
- V₂—NE-83 neon bulb.

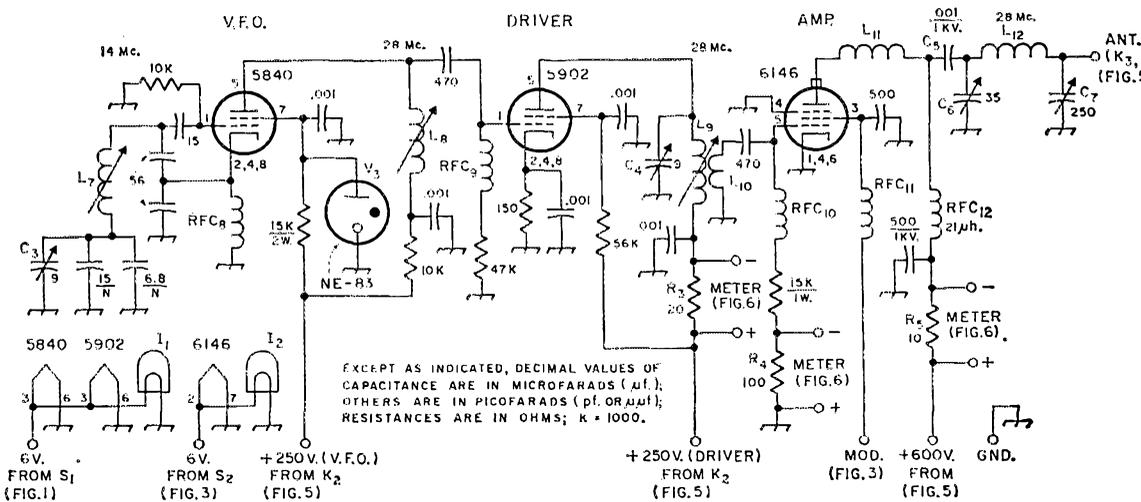


Fig. 2—Transmitter circuit. Fixed capacitors of decimal value not listed below are disk ceramic; others are silver mica or NPO ceramic, except where N indicates N750 negative coefficient. Resistors are 1/2-watt unless indicated otherwise.

- C₃, C₄—Miniature air trimmer (Johnson 160-104).
- C₅—Mica.
- C₆—Air variable, 0.07-inch plate spacing.
- C₇—Air variable, 0.025-inch plate spacing.
- I₁, I₂—6-volt dial lamp.
- L₇—45 turns No. 32 on 3/16-inch iron-slug form.
- L₈—25 turns No. 32 on 3/16-inch iron-slug form.
- L₉—18 turns No. 28 on 1/4-inch iron-slug form.
- L₁₀—3 turns No. 22 wound over low-potential end of L₉.
- L₁₁—0.84 μh. (Ohmite Z-235 r.f. choke).
- L₁₂—6 turns No. 20 1 1/8-inch diam., 16 turns per inch.
- R₃, R₄, R₅—5-percent tolerance.
- RFC₈—RFC₁₁, incl.—Same as RFC₁.
- RFC₁₂—21 μh. (Ohmite Z-28).
- V₃—NE-83 neon bulb.

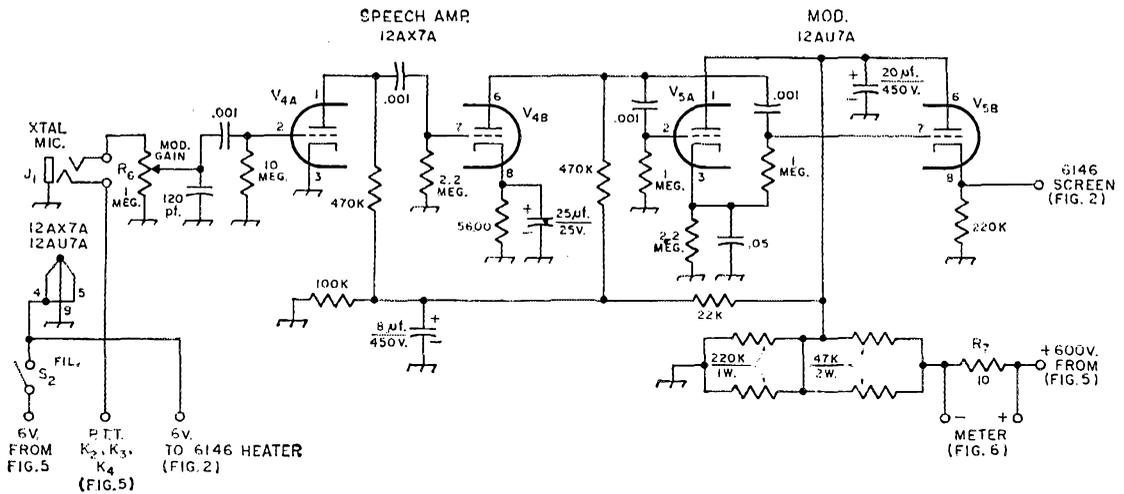


Fig. 3—Modulator circuit. Capacitances are in μf , and resistances are in ohms ($K = 1000$) unless indicated otherwise. Capacitors are disk ceramic or Mylar, except where polarization indicates electrolytic. Fixed resistors are $\frac{1}{2}$ -watt unless indicated otherwise.

J₁—Three-circuit microphone jack.
R₆—Audio-taper control.

R₇—5-percent tolerance.
S₂—S.p.s.t. toggle switch.

K₁ shifts the input of the b.c. receiver from the b.c. antenna to the output of the converter.

A field-strength-indicator circuit, connected permanently to the b.c. whip, aids in tuning up the transmitter. This connection in no way affects the normal operation of the b.c. receiver.

A noise limiter was added to the carrier. The circuit was taken from the ARRL *Handbook*. A subminiature 5896 was used in place of the original 6AL5 twin diode. The tone-control switch of the b.c. receiver was sacrificed to provide a means of switching the limiter in and out.

Transmitter

The transmitter circuit is shown in Fig. 2. The oscillator is a 14-Mc. v.f.o. which doubles to 28 Mc. in the output circuit. Screen voltage of the 5840 is regulated at about 60 volts by V₃. Except for the small difference in frequency range, the tuned circuit is a duplicate of that used for the h.f. oscillator in the converter. The 5902 buffer stage drives a 6146 final amplifier whose output circuit is a pi network.

Modulator

The screen of the 6146 final amplifier is modulated by the audio section whose diagram appears in Fig. 3. V_{5B} is a cathode follower coupled directly to the screen of the 6146. V_{5A}, also a cathode follower, alters the d.c. bias on the grid of V_{5B} in proportion to the voice level, at a syllabic rate. This causes the average screen voltage to vary, thereby providing a measure of speech control of the carrier level.

S₂ is a separate control for the heaters of the modulator tubes and the 6146 so that these heaters may be turned off independently to conserve power during long listening periods.

Power Supply

Fig. 4 shows the circuit of the low-voltage supply for the converter and transmitter-exciter stages. In the author's installation, high voltage for the final amplifier is obtained from a dynamotor which is actuated by the push-to-talk switch at the microphone and thus operates only when actually transmitting. A second transistor supply would be more efficient, but the author felt that a dynamotor in the junk box was worth two transistor supplies in the catalog.

Change-Over Circuitry

The three relays in Fig. 5 are actuated simultaneously by the p.t.t. switch. With the relays unenergized, K₂ connects 250 volts from the low-voltage supply to the converter, while K₃ connects the antenna to the converter input. The v.f.o. may be turned on for spotting by means of S₃.

In the energized state, K₂ switches the 250-volt supply from the converter to the transmitter exciter stages. K₃ transfers the antenna to the output of the transmitter, while K₄ turns on the 600-volt dynamotor.

Metering

The meter-switching circuit is shown in Fig. 6. The various switch positions are identified and the full-scale meter reading for each switch position is listed. The 100,000-ohm meter shunt R₂, in the field-strength-meter circuit, Fig. 1, provides maximum meter sensitivity. Sensitivity may be reduced, if necessary, by reducing the value of the resistor.

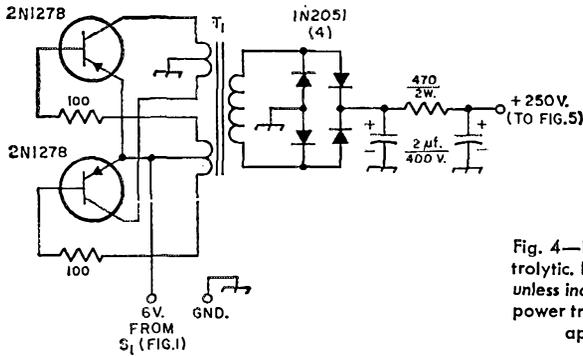


Fig. 4—Low-voltage power supply. Capacitors are electrolytic. Resistances are in ohms, and resistors are 1/2-watt unless indicated otherwise. T_1 is a 6-volt toroidal transistor power transformer delivering approximately 250 volts at approximately 100 ma. (Triad TY99 usable).

Construction

Components are mounted on five aluminum plates, or partitions, measuring approximately 4 by 8 inches. These plates have 1/8-inch lips bent along all four edges so that they may be fastened to side, bottom, and top cover plates which, together with the front and rear partition plates, form the enclosure. These enclosure plates are approximately 10 inches deep. The panel is a sheet of 1/8-inch Plexiglas backed with a sheet of dull-black paper for better visibility of the panel lettering. This panel is fastened against the front partition plate by means of the mounting nuts of various components on the panel.

Two large cutouts in the second partition plate are covered with printed-circuit board on which components for the converter (left) and v.f.o. (right) are mounted. Conventional wiring was used in these sections, the copper coating being used simply for ground connections. Audio components are mounted on the third partition plate.

Components of the driver stage and the pi-network capacitors of the final amplifier are

mounted on the fourth partition plate. The 6146 is mounted horizontally on a small bracket joining the fourth and last partition plates. This section is made available for servicing by removal of the rear plate which carries only a male Cinch-Jones connector for power input, and the fuse for the 600-volt line.

Extension shafts with panel bearings are used, where necessary, to bring the controls to the front panel. Planetary drives were used on the tuning shafts of the v.f.o. and converter.

I_1 and I_2 are used to edge-light the Plexiglas panel. I_1 , which comes on when the converter is turned on, illuminates the left-hand side of the panel. I_2 , which is switched on with the modulator and final-amplifier heaters, illuminates the right-hand side. Metal shields at each end of the panel eliminate the glare from these lamps.

The top and side cover plates were generously perforated to provide ventilation. Some long-term frequency drift has been noted, but it is not serious.

Adjustment

With power applied to the v.f.o., set C_3 at mid position, and adjust the slug of L_7 until the

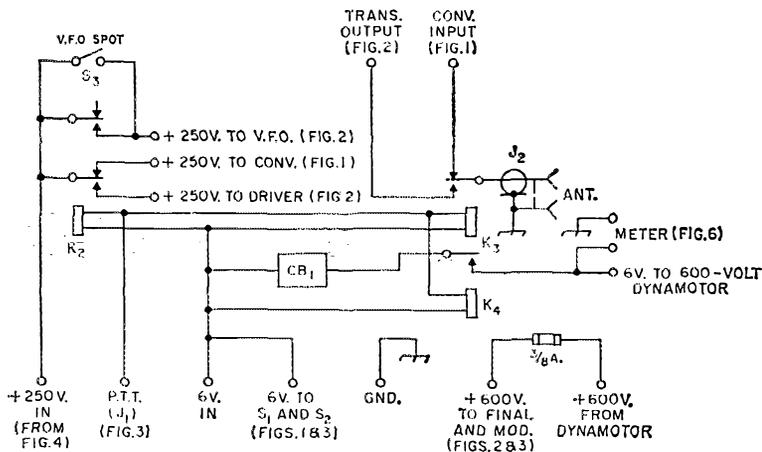


Fig. 5—Power-control circuitry.

CB1—30-ampere circuit breaker.

J2—Chassis-mounting coaxial receptacle.

K2—6-volt d.p.d.t. relay.

K3—6-volt s.p.d.f. relay.

K4—6-volts s.p.s.t. relay, 30-amp. contacts.

S3—S.p.s.t. toggle switch.

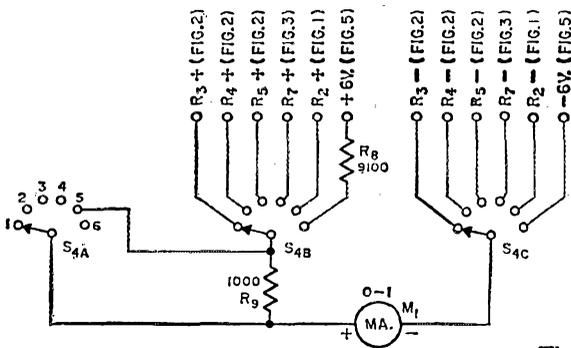


Fig. 6—Meter connections. M_1 is a 0-1-ma. d.c. meter, approximately 50 ohms resistance. R_8 and R_9 (resistances in ohms) are 5-percent resistors. S_1 is a 3-pole, 6-position rotary switch (Mallory 3236J).

- 1- DRIVER PLATE (50 MA.)
- 2- FINAL GRID (10 MA.)
- 3- FINAL PLATE (100MA.)
- 4- MOD. PLATE (100MA.)
- 5- OUTPUT INDICATOR
- 6- BAT. VOLTAGE (10V.)

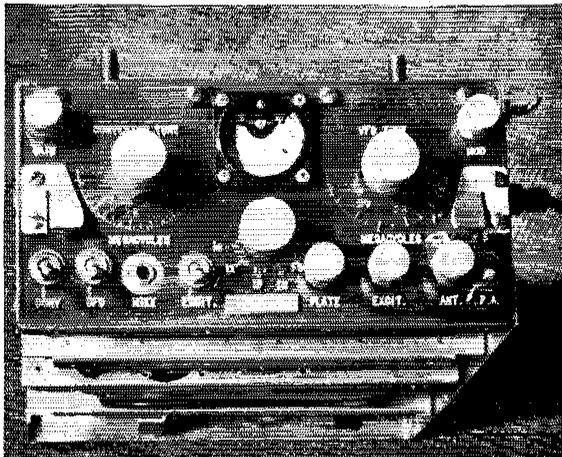
v.f.o. signal is heard on a receiver tuned to 14.0 Mc. Set C_4 at mid position. Apply heater voltage to the 614G, and switch the meter to read grid current. Adjust the slugs of L_8 and L_9 for maximum grid current.

The author has found that approximate adjustments of modulation level and loading of the final amplifier can be achieved with the aid of the field-strength meter. The adjustment should be such that the f.s. meter reads maximum with rapid responsive peaks when modulation is applied. With improper adjustment, response with modulation is sluggish. Accurate adjustment can be made only with the aid of a trapezoid pattern on an oscilloscope. With this modulation system, the plate current of the final will fluctuate widely, of course, because of the variation in average screen voltage with modulation.

Converter Adjustment

To align the converter, it should be connected to the car b.c. receiver. The latter should be set at 1600 kc. Then S_1 should be closed to apply power to the converter, and the v.f.o. spot switch, S_3 , should be closed to apply power to the v.f.o. With C_2 set at mid position, L_5 should be adjusted to bring the v.f.o. signal to zero beat. Then the slugs of L_1 , L_2 , and L_3 should be adjusted for maximum response. Final adjustment of the r.f. and mixer coils can be made on signals picked up on the air.

The unit shown in the photographs has been in regular use for several years. No failures have occurred, and many hours of pleasant QSOing have transpired. About two thirds of the States have been worked, and good contacts have been made with stations in Central America, Canada, and the Carribean. Good voice quality and percentage of modulation are invariably reported. The author anxiously awaits the return of skip conditions to add some real DX to the log of the little car. QST



The converter and v.f.o. tuning controls are to the left and right, respectively, of the meter. Along the bottom of the panel are heater switches and the microphone jack to the left, meter switch at center, and controls for final-amplifier tuning, driver tuning, and antenna loading. Gain controls for the converter r.f. stage and speech amplifier are in the upper corners, left and right, respectively. The metal pieces at each end of the panel are lamp shields.

Strays

When the Amateur Radio First-Day Covers were processed in Anchorage on December 15, 1964, we gambled and had a few extra unaddressed covers prepared, because orders for the first-day covers were still coming in and we didn't want anyone to be disappointed. We still have some of these left.

They are all singles, unaddressed but carrying the stamp and the official first-day cancellation, and they will be mailed to you in an envelope. Prices are 35c each, three for a dollar. Send your orders to ARRL Hq., 225 Main Street, Newington, Conn., 06111.

A Simple TVI Filter For 50 Mc.

BY J. L. COPELAND,* WSSQT

The unit described in this article is simple to construct and adjust. Any amateur radio operator who is plagued by harmonic TVI from 6 meters should be able to build and install this filter without difficulty.

FOR some time, the author has used sections of coaxial cable for resonant and anti-resonant circuits in simple wave traps. It became evident that sections of such cable could be used to replace ordinary coil-capacitor combinations in certain types of filters.

Recently, W5EBU, a local 6-meter operator, was plagued with TVI. After talking with him, I decided to try using coaxial-cable sections, in simple filters, to see how well they would perform. The primary TV channels in this area are 4, 5, 8 and 12. He was having trouble with harmonic interference to Channels 4 and 11. The filter described in the text was designed with these two channels in mind.

Some Advantages

Some of the desirable features realized through the use of coaxial-cable sections as circuit elements, are:

- a) A high s.w.r. is not likely to cause flash-over, since RG-59/U, for example, is rated at 2200 volts, r.m.s.
- b) Resonant lengths of coax can readily be cut to the desired frequency.
- c) Coaxial-cable elements have high Q .
- d) A given length of coax line has more than one resonant frequency.
- e) After the line is cut to the proper length, it can be rolled up and tucked neatly away.

* Box 110, Wolfe City, Texas.

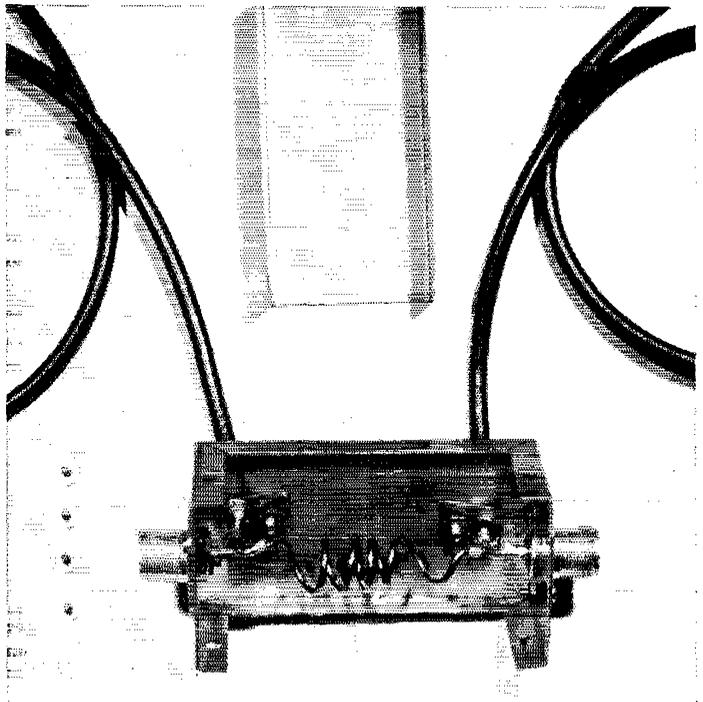
Fig. 1—Interior view of the filter, showing coaxial line sections. Coil L_1 is suspended between the two coax connectors at the ends of the box

About the Filter

One of the most common filter types used is shown in Fig. 2, at A. If the capacitors in the network are replaced with series-resonant circuits, tuned to the frequency of the unwanted signal, we have the circuit illustrated in Fig. 2B. The use of a quarter-wavelength open-ended coaxial cable, cut to the center frequency of Channel 4, permits further evolution of the filter (Fig. 2C). These series-resonant line sections replace capacitors C , shown at Fig. 2A. The coaxial elements will not only be series-resonant at Channel 4, but also at 3, 5, 7 and 9 times the frequency. Note that three times the frequency of Channel 4 falls into Channels 11, 12 and 13. This means that a one-quarter-wavelength coaxial line will aid in harmonic reduction at Channels 4 and 11.

Some relative measurements were made to determine the attenuation level of the two notches in the filter's passband at Channels 4 and 11. The Channel 4 null provided approximately 45 db. attenuation while the Channel 11 notch was down some 75 decibels.

A more elaborate version of the TVI filter is shown schematically in Fig. 3. This is a single T-section unit which has an input impedance of approximately 47 ohms. At the junction of L_1 and L_2 , a coaxial-line trap has been inserted, to reduce harmonic interference at Channels 4 and



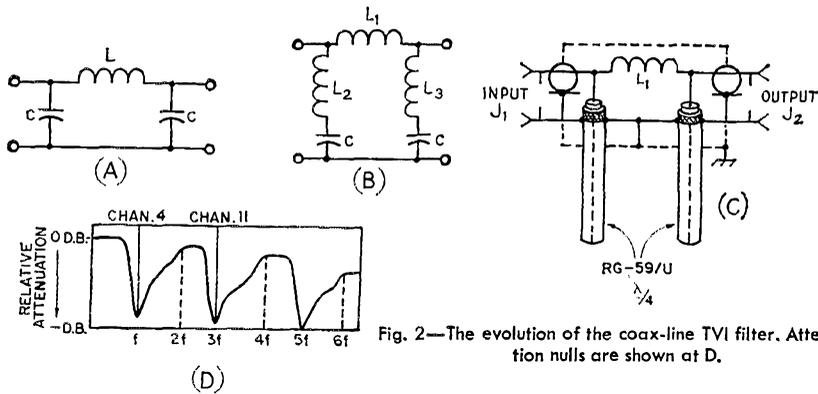


Fig. 2—The evolution of the coax-line TVI filter. Attenuation nulls are shown at D.

11. To effect a proper match to 73-ohm transmission line, quarter-wavelength transformers, made from sections of RG-54/AU, were used at each end of the filter. If 52-ohm feed line is to be used, coaxial connectors could be mounted at the input and output ends of the box and direct connection to the filter could be made with 52-ohm transmission line.

Construction

Fig. 1 shows the interior construction of the filter of Fig. 2C. Small copper or brass tabs can be bolted to the inside of the Minibox, enabling the builder to solder the shield braid of the cable to ground. Standard SO-239 connectors are used at each end of the box. Any of the small-sized Miniboxes will serve as an enclosure for the filter.

It is a good idea to cut one section of the coax cable for the low end of Channel 4 (67 Mc.), and the other section to about 69 Mc. This will slightly stagger the rejection nulls enough to be "on target," without accurate frequency measurement. The length of the RG-59/U cables is 27 5/8 inches, and 28 1/4 inches, respectively, and they are open-ended. The length in inches is computed

$$\text{from: } L \text{ (inches)} = \frac{1950}{\text{Freq. (Mc.)}}$$

The coil, L_1 , is made from 4 turns of No. 12 wire, with a diameter of 1/2 inch. It is suspended between the two coax connectors, mounted on the ends of the box. Be sure to ground the shield braid of the coaxial cable to the box.

Adjustment

Using a grid-dip meter, adjust the coil, L_1 , by compressing or spreading the turns, until the cir-

cuit is resonant at 51 Mc. Additional rejection can be secured by placing two or more of these filters in series. If two sections are used, it is suggested that the coaxial-line traps in the second section be cut to 72 Mc. The line length will then be 26 3/8 inches. The combination of two sections, with the rejection frequencies being slightly staggered, will provide rejection nulls nearly twice as deep. The higher-frequency null will include Channels 11, 12 and 13. The filter can be used with either 50 or 75-ohm line. A suitable earth-ground connection should be made to the case of the filter during installation.

In Conclusion

By employing combinations of 50- and 75-ohm cables, singly or in parallel, many impedance combinations are possible. In TVI filters using coaxial-line shunt arms, one disadvantage is that the response, at frequencies far above the passband of interest, has a series of bandpass filter characteristics. This can be seen in Fig. 2D. In other words, we have a filter with low-pass characteristics, followed by an attenuation peak, and then a bandpass characteristic.

A single T-section filter was built and is now being used in combination with the half-wave filter shown. Either filter alone eliminated TVI in Channels 4 and 11. Both units have been used in series, not because they are needed, but because they were both available.

I wish to thank W5NNI for making the necessary measurements for this article. It is hoped that this article will stimulate some thought connected with the use of coaxial-line sections in filters and wave traps.

□ST□

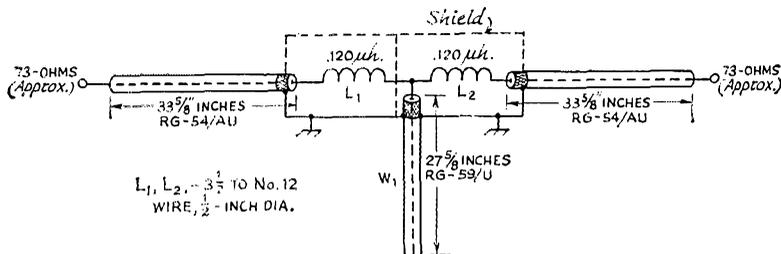


Fig. 3—Circuit of the T-section filter. Note shield divider between the two halves of the filter.

• Technical Correspondence

THE I-177 SURPLUS TUBE TESTER

Technical Editor *QST*:

Those who have updated the I-177 tube tester following suggestions given in *QST* for November 1964, or who contemplate doing so, may be interested in the following observations.

The offsetting of the dial of potentiometer L, as suggested in the original article, may or may not be necessary, depending on a number of variables. In noting different vintages of the I-177 charts, and comparing them with the later-model Hickok charts for that tester and their model 545, I find some differences in the settings of the two potentiometers. Also, in testing the same tube in more than one I-177, different readings may be obtained. A certain amount of deviation is to be expected, of course. The meter, when new, has a tolerance of $2\frac{1}{2}$ per cent of full-scale value. Temperature and aging will further affect its accuracy as well as the accuracy of resistors, which are not of the precision type. Potentiometers have backlash and error in resetting, not to mention the human error in setting the proper point on the scale. All of these may have a bearing on the proper setting of the L potentiometer for G_m measurement. Determination of the amount to offset zero on potentiometer L (if any is necessary) may be determined by the use of an "expensive Hickok tester," as mentioned in the article, but only with understanding and caution. G_m is not constant within a given tube. If the conditions established are identical in both the I-177 and the standard of comparison, then this technique is good. Otherwise, the procedure may cause more trouble than it corrects. A technique that would at least retain the original tolerances of the I-177 before modification would be to test and record the values of several tubes in the junk box before

modification, and then adjust to reestablish these values after modification.

Because of the danger of possible wear on the chart as it passes through the hacksaw slots in the original version, I mounted the chart in a separate compartment. Instead of thumb wheels, I use bevel-gear right-angle drives (worm drives cannot be used) taken from surplus Command-receiver remote controls, one on each drum axle. The drums are of plastic tubing. This arrangement permits more rapid turning of the chart. A separate compartment was used for two reasons: first, the angle drive takes up more space, with consequent cramping of the socket space; second, by leaving the lid free, more room remains for the present socket complement and for future expansion. The separate compartment containing the chart may be clamped to the tester for convenience in storing or carrying.

Of interest to some may be the special adapter that I have made up for the rapid testing of the sections of dual-purpose tubes, or any selected pair of tubes, whether or not they are similar. As shown here in Fig. 1, the adapter contains two sets of switches similar to the set shown in Fig. 2 of the article. I found a pair of multiple-pole multiple-contact switches with concentric control shafts that I used for the purpose, although entirely separate switches may be used, of course. The arms of one set of these switches are connected to one set of contacts on a multiple-pole double-throw switch. The arms of the second set are wired to the other set of contacts on the double-throw switch. The arms of the double-throw switch terminate at socket E.

By setting the upper set of switches for one tube, or section of a dual-purpose tube, and the lower set for a second tube, or the second section of the

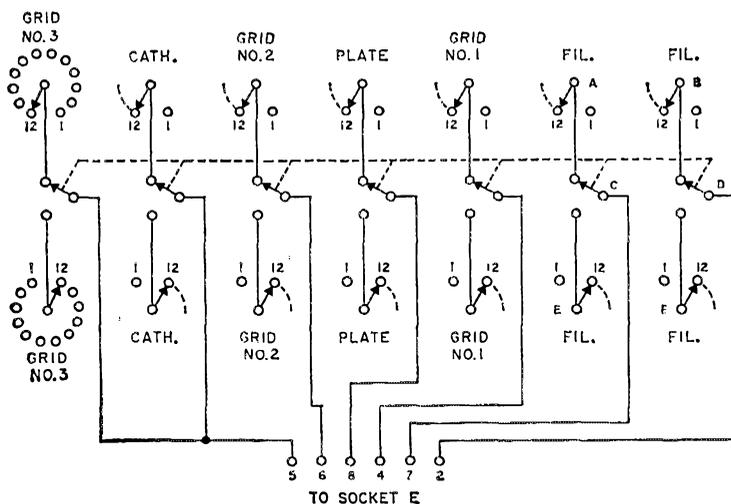


Fig. 1—Switching circuit of the fast-check adapter for the I-177 tube tester. Contacts on the multiple-contact switches go to similarly-numbered pins of the adapter sockets. For checking dual-purpose tubes, contacts of upper switch would be wired to socket terminals appropriate for one section of the tube, while contacts of the lower switch would be wired to appropriate terminals of the second section, on the same socket. The upper set of switches may be the original set, with the arms rewired to the double-throw switch instead of to socket E. For twin tubes only, switch sections A and B may be wired directly to socket E, making sections C, D, E and F unnecessary.

dual-purpose tube, the sections or tubes can be checked in rapid succession by throwing the central double-throw switch. This saves considerable time in checking such tubes as 12AX7s, 12AT7s, 12AY7s, and other dual-purpose tubes, or the tubes in a TV set or hi-fi amplifier where there may be several tubes of the same type.

The concentric-control switches that I used have shaft diameters of $\frac{1}{4}$ and $\frac{1}{8}$ inch. I used standard pointer knobs. The one for the outer $\frac{1}{4}$ -inch shaft was drilled through to allow passage of the $\frac{1}{8}$ -inch inner shaft. A second identical knob was fitted with a sleeve to take the $\frac{1}{8}$ -inch shaft.

To provide a support for the hinged cover when plugging tubes into the tester, the depth of the lid can be increased to make it the same as the depth of the tester case. This will allow the lid to rest against the table or work bench. Alternatively, the lid can be provided with stays, or legs that fold along the sides of the lid. — *Irving Mayer, WSZEB, 572 Wayne Drive, Fairborn, Ohio, 45324.*

PHASED GROUND PLANES

Technical Editor, *QST*:

WIICP's beginner and novice article on page 34 of March 1966 *QST* was excellent, and I'd bet some of the graybeards even looked at it. With due respect to Mr. McCoy, I believe he overlooked a method of getting gain from his 15-meter ground plane.

Proper phasing of two ground planes can give up to 4 db. forward gain while knocking down signals from unwanted directions as much as 30 db. This can be achieved by constructing two ground planes and spacing and feeding them as shown in Fig. 1. Being spaced only 23' 3", the antennas can be mounted on a roof or on the ground. Roof mounting is recommended. At these frequencies, it does not matter much whether standard or polyfoam coax be used; the price and the Novice pocketbook will

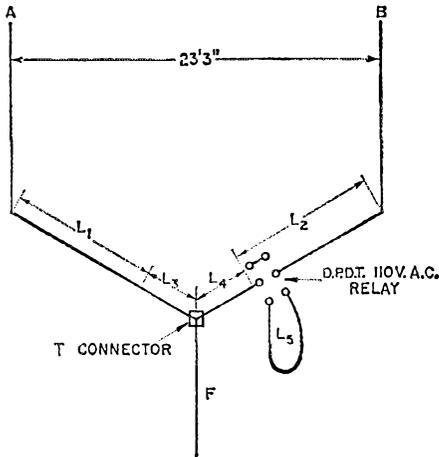


Fig. 1—Phasing harness for two ground-plane antennas (ground planes not shown). Dimensions for 21-Mc. operation are

- L_1, L_2 —Equal lengths of 52-ohm coax; length may be any convenient value.
- L_3, L_4 —7' 8" (standard 75-ohm coax) or 8' 8" (polyfoam 75-ohm coax).
- L_5 —15' 4" (standard 75-ohm coax) or 17' 5" (polyfoam 75-ohm coax).
- F—Any length, 52-ohm coax.

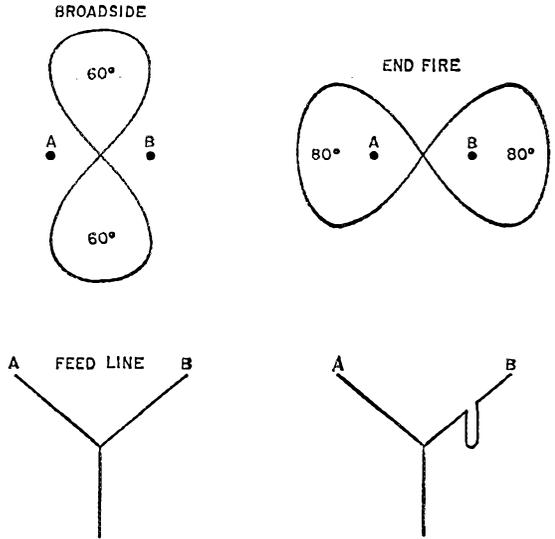


Fig. 2—Approximate directional patterns. Theoretical gain for the broadside arrangement is about 4 db.; for the end-fire arrangement, about 2.5 db.

dictate which. Use standard coax connectors for all joints and wrap well with tape. With a little planning the coax d.p.d.t. switch may be located in the shack to get away from running an a.c. line outside.

By selecting either the half-wave delay line or going straight through, the patterns shown in Fig. 2 will be achieved.

When mounting the antennas and selecting the phase arrangement, consult a great-circle chart for your particular area. This will show you where you want the major lobes oriented for a given switch position.

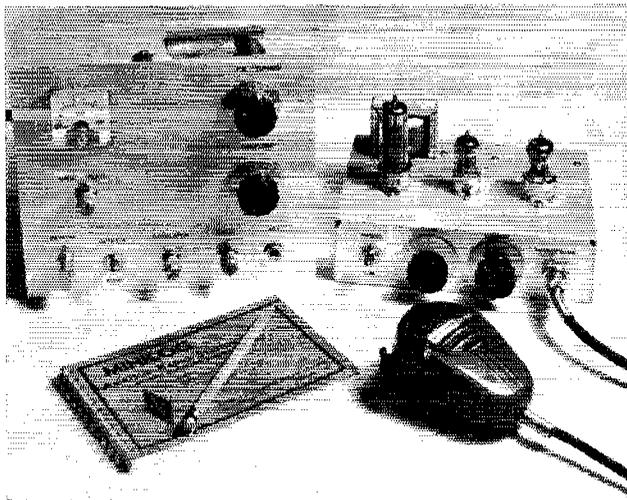
Obviously, the same arrangement may be used for other bands. L_3 and L_4 are a quarter wavelength, and L_5 is a half wavelength. When figuring coax lengths be sure to include the velocity factor — 0.66 for standard coax and 0.75 for polyfoam.

Regardless of what some people say, the ground plane, with its low angle of radiation, is capable of laying down a good signal at a DX point, especially if it is used in a phased system as described. — *Bill Smith, K0CPR, 1301 Churchill Ave., Sioux Falls, South Dakota 57103.*

Fifty Years of ARRL

A bound 152-page reprint of the gold-edged historical articles which appeared in the 1964 issues of *QST* is available from the ARRL for one dollar postpaid. Titled *Fifty Years of ARRL*, the book covers the highlights of ARRL and amateur radio history during the fifty years from 1914 to 1964, and will make a companion piece to the classic *200 Meters and Down*, a reprint of which is also available from the ARRL for one dollar.

"DAS SOFTENBOOMER 160"



A Low-Cost Rig for 160 Meters

BY DOUG DE MAW, WICER*

If you haven't tried 160, you've missed an interesting facet of ham radio. Since high-power operation is not permitted on 160, the little rig described here will hold its own while competing with like-power stations across the country.

The 160-meter band offers the DX man who likes to do things the hard way a proving-ground for his operating skill and perseverance. Ground-wave coverage on 160 is excellent, making it a useful band for ragchewing and mobile work. Signals in the 1.8- to 2.0-Mc. region are not seriously affected by land masses, such as hills and mountains. A few watts of power will do a creditable job of spanning the continent, provided an effective antenna system is used. All of these features contribute to making the band interesting and useful.

"Das Softenboomer 160" will run 50 watts on c.w. and 30 watts on a.m. In areas where higher power levels are permitted¹ it can be used to excite a linear amplifier.

The power supply can be made from salvaged components taken from a junked TV set, making the overall cost of the transmitter a bit more attractive than it would be if new parts were used. Since the balance of the components are readily available from most supply houses, procurement should be no problem to anyone wishing to build the little rig.

* Assistant Technical Editor.

¹ Operating regulations for 160 meters. Send s.a.s.e. to ARRL for Bulletin S-15.

The R. F. Circuit

Two tubes are used in the r.f. section of the transmitter. A 6CL6 serves as the crystal-controlled oscillator and the p.a. stage uses a 6HF5 TV sweep tube. The 6HF5 was chosen because of its high plate-dissipation rating, high perveance, and low screen-voltage requirement. These features make it ideal for operation at low plate voltage where moderate power output is desired.

Constant-carrier screen-grid modulation is used for a.m. operation.² Because the 6HF5 screen grid operates at low voltage, 100-per cent modulation requires but little audio power from the modulator. For a.m. operation the unmodulated screen voltage is about 75 volts. When operating c.w., 150 volts is supplied to the 6HF5 screen circuit.

Output from the oscillator, Fig. 1, is varied by the drive control, R_1 . An r.f. choke, RFC_2 , is used in the plate circuit of the 6CL6. The p.a. grid-circuit hookup, C_1L_1 , makes possible the

² Amplitude Modulation Methods. *The Radio Amateur's Handbook*, Chapter 8.

Here's a straightforward 160-meter transmitter that will make possible many hours of enjoyable hamming, at moderate cost, on the "top band." Why not make that long-promised debut on 160 now?

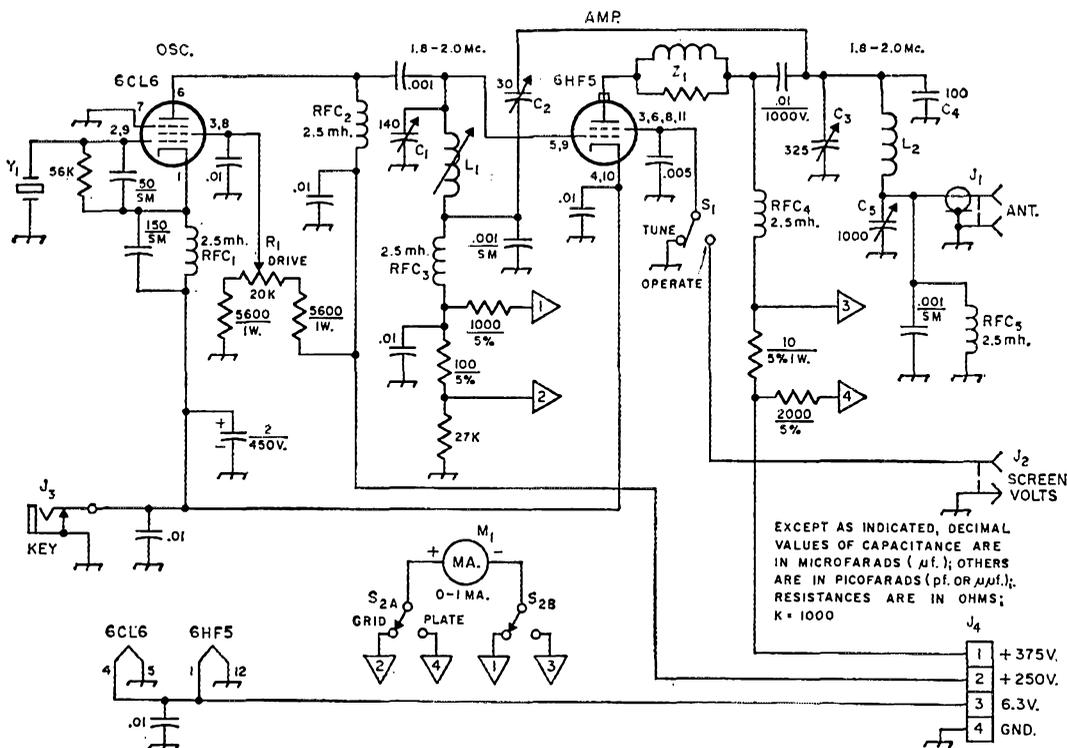


Fig. 1—Schematic diagram of the r.f. unit. Fixed resistors are 1/2-watt composition unless otherwise noted. Capacitors are disk ceramic except those marked SM, which are silver mica. Capacitors bearing polarity marking are electrolytic and are in μf .

- C₁—140-pf. miniature variable (Hammarlund HF-140).
- C₂—30-pf. miniature variable (Hammarlund MAC-30).
- C₃—325-pf. variable (Hammarlund MC-325-M).
- C₄—100-pf. 1000-volt mica.
- C₅—3-section broadcast variable, all sections in parallel (Miller 2113). Remove trimmer capacitors from side.
- J₁—Coax receptacle (Type SO-239).
- J₂—Phono connector.
- J₃—Closed-circuit phone jack.
- J₄—4-pin male chassis connector.
- L₁—27.5–58.0- μh . variable inductor (Miller 42A475CB1).
- L₂—Coil stack, 4 inches long, 1 1/4 inch dia., 16 turns per

- inch (Polycoids 1754, B&W 3019 Air Dux 1016).
- M₁—0–1 milliammeter.
- R₁—20,000-ohm wire-wound control, linear taper, 2 watts.
- RFC₁–RFC₃, inc.—2.5-mh. 125-ma. choke (National R-51).
- RFC₄—2.5-mh. 375-ma. choke (National R-300-ST).
- RFC₅—Same as RFC₁.
- S₁—S.p.s.f. toggle switch.
- S₂—Ceramic rotary, 1 section, 2 poles, 2 positions, non-shorting.
- Y₁—1.8-Mc. crystal.
- Z₁—Parasitic suppressor. 7 turns No. 20 enam. wire wound on 56-ohm 1-watt resistor (coil soldered to resistor pigtailed).

inclusion of C₂, the neutralizing capacitor. Although the transmitter did not show any outward signs of instability without neutralization, considerable r.f. feedthrough was apparent in the p.a. stage when the plate and screen voltages were removed with drive applied. This problem was resolved by the addition of the neutralizing network, C₂, RFC₃, and the 0.001- μf . capacitor at the junction of L₁ and RFC₃.

The output tank, C₃L₂C₅, is a pi network designed to work into a 50-ohm load. There is sufficient flexibility in its tuning range to permit it to match nonreactive loads between 30 and 75 ohms. If other impedances are to be dealt with, a transmatch should be used between J₁ and the load.

Both stages of the transmitter are keyed for c.w. A 2- μf . capacitor is used between the keying bus and ground to provide a shaped keying

characteristic. The c.w. note is clean and chirp-free when active crystals are used at Y₁.

Grid and plate current metering of the amplifier is made possible by measuring the voltage drops across a 100-ohm resistor in the grid circuit and a 10-ohm resistor in the plate supply line. A 1-ma. meter is used for this purpose, and is switched for grid and plate monitoring by a d.p.d.t. switch, S₂. Reasonable accuracy is assured by the use of 5-per-cent resistors. Greater accuracy, at higher cost, would result from the use of 1-per-cent resistors.

Modulator Circuit

Three tubes are used in the screen modulator assembly, Fig. 4. The microphone voltage is amplified by V_{1A}, passed on to V_{1B} for further amplification, and then applied to the speech clipper where the positive and negative peaks

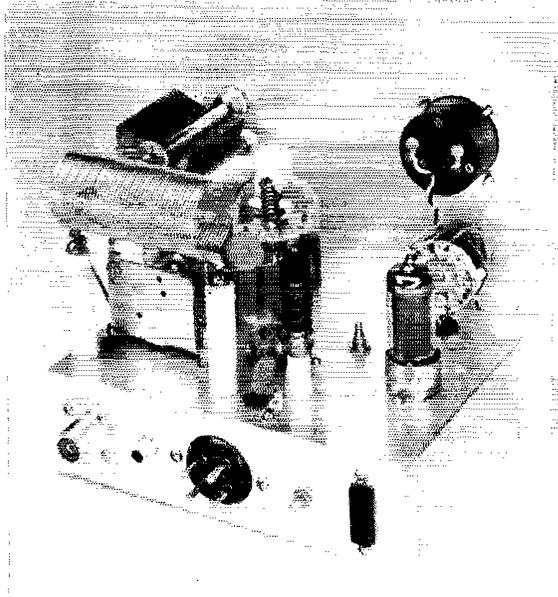


Fig. 2.—Top-rear view of the r.f. assembly. Antenna connector is at left on chassis apron and next to phono connector for screen voltage input. Power receptacle is at center with ground post to the right. The 4-connector socket at the far right is not used and was installed for future experiments with v.f.o. operation.

of the audio signal are clipped by CR_1 and CR_2 . The amount of clipping is determined by the setting of R_3 . Since CR_1 and CR_2 are 3.6-volt Zener diodes, clipping will not take place until the peak audio level reaches 3.6 volts. By connecting the diodes back-to-back, both positive and negative peaks are clipped. The clipper is followed by a filter which prevents high-frequency audio harmonics from being passed on to the last two stages of the modulator. The harmonics are generated in clipping

and would cause the transmitted signal to be broad and distorted were they not filtered out.

Output from the filter goes to R_3 , which serves as the modulator gain control. A 6C4 is used as a third audio amplifier and is necessary to compensate for the insertion loss through the clipper network. A negative feedback network is used between the plate of the 6C4 and the plate of the 6CM6 modulator tube. The feedback voltage is taken from the junction of two 27,000-ohm resistors which are bridged across one half of the primary winding of T_1 . The plate load resistor for the 6C4 is returned to this point to permit part of the audio voltage from the primary of T_1 to be fed back to the grid of the 6CM6. Since the modulator is looking into the nonlinear resistance of the p.a. screen circuit, it is necessary for the internal impedance of the modulator to be low, to minimize distortion. The plate resistance of the 6CM6 is lowered through the use of negative feedback, and the end result is a cleaner a.m. signal.

Transformer T_1 is a push-pull 5-watt output transformer. Connected as shown in Fig. 4, it provides a 1:1 impedance ratio between the modulator and the screen grid of the p.a. stage. The voice coil winding is not used. A 30K resistor is connected between T_1 and the screen grid of the 6HF5 to drop the screen potential to 75 volts during a.m. operation. A 2- μ f. capacitor is in parallel with the resistor to bypass the audio around the resistor.

During c.w. operation, plate voltage to the speech and modulator tubes is turned off by S_3 . The second half of the switch connects the screen to a voltage divider across the 250-volt supply.

Construction

The r.f. and modulator assemblies are built on $2 \times 5 \times 7$ -inch aluminum chassis bases. Separate chassis were used so either unit could

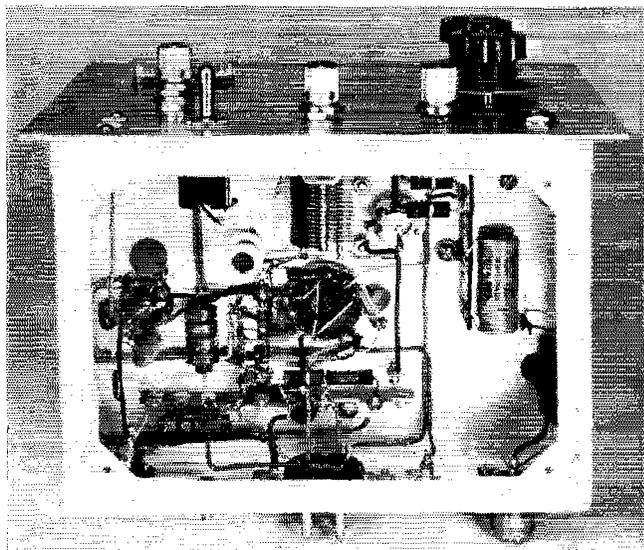


Fig. 3.—Bottom view of the transmitter. Amplifier grid tuning circuit is at the center with the neutralizing capacitor to the right of C_1 . The oscillator section is at the left of the chassis.

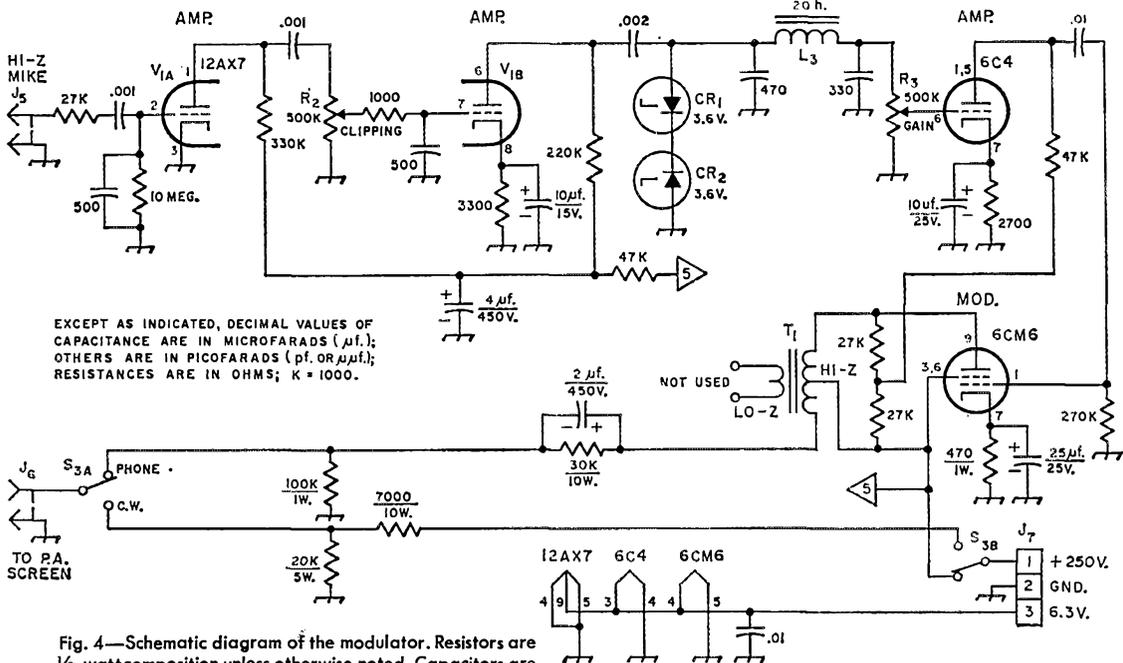


Fig. 4—Schematic diagram of the modulator. Resistors are 1/2-watt composition unless otherwise noted. Capacitors are disk ceramic except those bearing polarity marking which are electrolytic.

- CR₁, CR₂—3.6-volt Zener diodes. (1N747 or equivalent).
- J₅—2-terminal microphone connector.
- J₆—Phono connector.
- J₇—3-terminal connector (Millen E-303).

- L₃—20-h. 15-ma. choke (Stancor C-1515).
- R₂—0.5-megohm audio-taper control.
- R₃—0.5-megohm audio taper control.
- S₃—D.p.d.t. toggle switch.
- T₁—10,000-ohm c.t. output transformer, 5 watts (Stancor A-3831; voice-coil winding not used).

be used independently when experimenting with r.f. units or modulators of different design. There is no reason why the entire transmitter, including the power supply, cannot be built on

a single chassis if one-piece construction is desired.

Shielded audio cable is used in the modulator filament circuit to help reduce hum pickup.

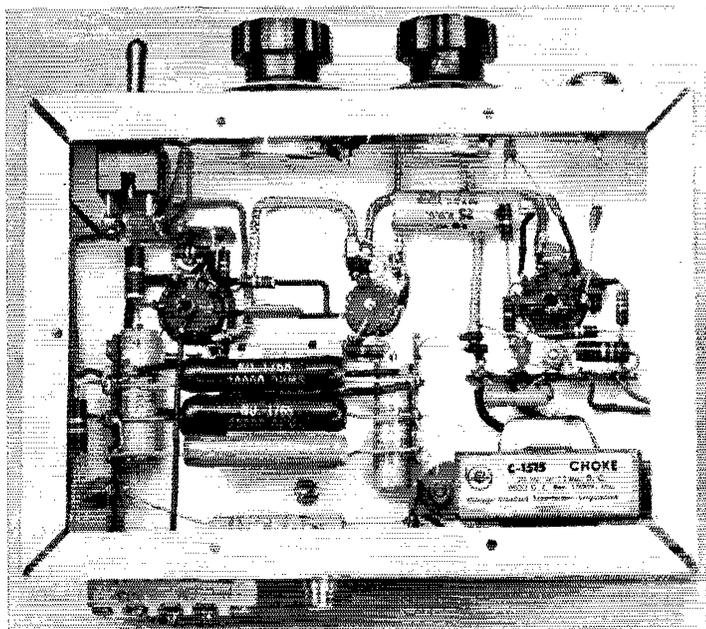


Fig. 5—Under-chassis view of the modulator assembly. The 12AX7 is at the right, the 6C4 is at the center, and the 6CM6 is at the left. Shielded wire is used for the filament circuit.

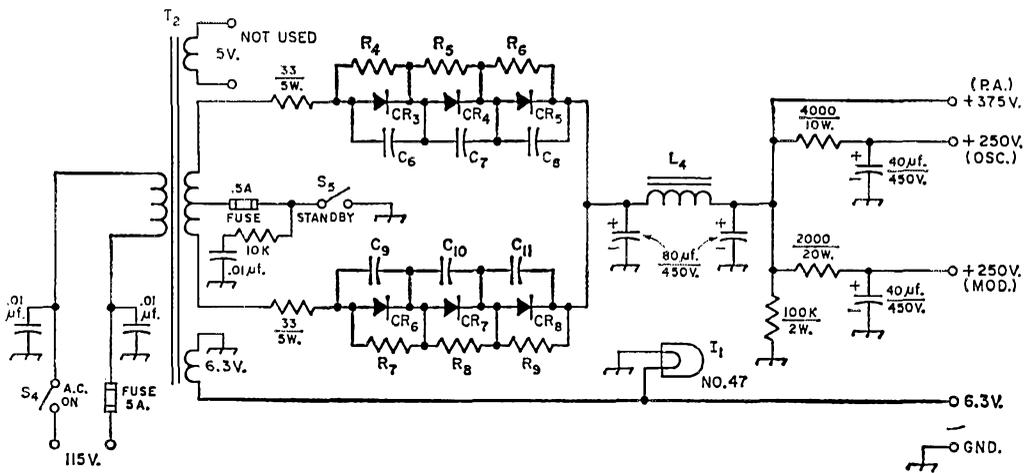


Fig. 6—Power-supply schematic. Capacitors are disk ceramic except those bearing polarity marking, which are electrolytic. Resistors are 1/2-watt composition unless otherwise indicated. Resistance is in ohms. K = 1000.

C₆–C₁₁, inc.—.01-μf. 600-volt disk ceramic.

CR₃–CR₈, inc.—600 p.r.v. 750-ma. silicon diode.

I₁—No. 47 pilot lamp.

L₄—Filter choke from TV chassis, 2 h., 200 ma. (Stancor C-2325 or equivalent).

R₄–R₉, inc.—0.47-megohm, 1/2-watt resistor.

S₄, S₅—S.p.s.t. toggle switch.

T₂—TV power transformer. 350 volts at 250 ma. 6.3 volts at 6 amperes. 5-volt winding not used.

The same method is used in the r.f. chassis to reduce stray coupling between the stages.

The panel for the r.f. unit was made from a piece of 1/16-inch aluminum plate, 7 inches high by 8 inches wide. Each chassis is enclosed by attaching a 5 × 7-inch aluminum bottom plate to it after final checkout. The bottom plates are held in place with No. 6 sheet-metal screws. Each plate is equipped with rubber feet to prevent damaging the surface of the operating table.

The power supply, Fig. 6, is of conventional design and the layout can be anything you please.

Tuning Up

After the interconnecting cables between the units have been attached, connect a 50-ohm dummy load or 60-watt light bulb to *J*₁. Place the transmitter panel switch, *S*₁, in the "tune" position. Apply power and, while observing the grid-current meter, adjust *C*₁ for peak indication. Next, adjust the drive control, *R*₁, for a reading of 3 ma. (full-scale meter deflection in the grid-current position is 10 ma.). The amplifier can now be turned on by throwing *S*₁ to the "operate" position. With *S*₂ in the plate-current position, quickly tune *C*₃ for a dip in plate current. Normal loaded plate current for a.m. operation will be approximately 100 ma. For c.w. use, the p.a. plate current at maximum output will be about 150 ma. at resonance (full-scale deflection in plate current meter position is 200 ma.).

After tuneup is completed, remove the plate and screen voltage from the 6HF5 by unsoldering the plate-supply lead and grounding *S*₁.

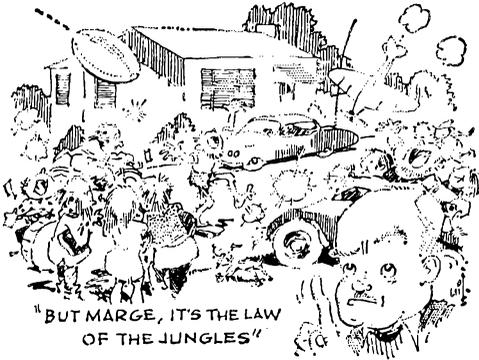
Connect an oscilloscope or diode r.f. indicator³ to the antenna end of *L*₂ through a 50-pf. capacitor. With the dummy load still connected to *J*₁, apply drive to the amplifier and adjust the neutralizing capacitor, *C*₂, for minimum r.f. signal as seen on the diode detector's indicating meter. An insulated screwdriver will be required for adjustment of *C*₂. The null in output will be quite sharp when the proper setting of *C*₂ is reached.

If an oscilloscope is used, leave it connected to the output of the transmitter, place the modulator switch in the phone position, and operate the transmitter into the dummy load. Make certain that the amplifier is loaded to approximately 100 ma. at resonance. Set the clipping control, *R*₂, at midrange and advance the gain control, *R*₃, until 100-per cent modulation is observed on the scope. An audio generator can be connected to *S*₅ for this test, or a sustained whistle can be applied to the microphone in lieu of an audio tone. The output waveform should be free from distortion. Tight coupling to the dummy antenna is important if the waveform is to be clean. The *Handbook* illustrates proper waveforms for a.m. operation in Chapter 11.

The amount of clipping used is a matter of choice. Advancing *R*₂ and lowering the level at *R*₃ will increase the clipping. A compromise can be reached while checking out the rig on the air and getting reports from fellow hams. The more clipping that is used, the greater will be

(Continued on page 130)

³ See *The Radio Amateur's Handbook*, section on amplitude-modulation measurements for methods of using an oscilloscope, and section on r.f. measurements for data on diode r.f. indicators.



"BUT MARGE, IT'S THE LAW OF THE JUNGLES"

DADDY, daddy, there's a car parked across the street with a aerial on it just like yours."

"In front of the vacant house?"

"And he's talking into his radio just like you do."

"Omagosh . . . QRM. He'll ruin me. Whatsa-matter with him? Don't he see my tower and beams and stuff? It ain't legal . . . don't he know the rules? It's unconstitutional for a ham to even look for a house this close to another ham. And I got first prior transmitting rights in this neighborhood. Now how can I get rid of him?"

"I can yell and scare him away like this . . . waaaaaa . . ."

"Ohhh my, that wouldn't help . . . that wouldn't . . . heceyyy! Yeah, let's all make noise . . . the whole family . . . the whole entire blinkin' neighborhood. Junior, go chase up all your buddies. Tell 'em there's a big model airplane flyin' contest on our front lawn . . . and the noisiest engine wins a prize."

"I collect stamps now."

"Today you're a zoomie! Go-go-go . . . and tell 'em to bring their skate boards . . . need noise, more noise . . . where can I find more noise? Ahhhhh, there you are darling daughter . . . where are all them kooky, shaggy friends of yours?"

"Gee, wailin' around. Like how should I know?"

"Like go find 'em quick. Tell 'em there's a big drag race in the street and we're servin' free malts and burgers . . . and french fries for anybody with a motor cycle . . ."

"You just chased um all away for makin' noise."

"I love noise . . . love kids . . . besides I got a crisis . . . and listen, collar them hairy Panthers or whatever ya call 'em . . . the creatures with the electric drums and guitars . . . tell 'em there's a big audition on our front porch . . . and on your way tell your big brother to round up all his lazy, moochin' friends and they can turn up the record player as loud as they want . . . and have the key to the ice box too . . ."

"Daaaaadd . . . ya gotta be kidding!"

"Action! More action . . . gotta be sure he sees me . . . ahhh . . . where's the ladder? Up on the roof and string a few wires. . . Marge

* 45 Laurel Ave., Atherton, Calif.

. . . Maaaaarrnge, where's my bow and arrow?"

"What is going on around here. And what are you doing on the roof?"

"It's all okay, Marge. See that fella in the car across the street? Looookkooooout, Marge . . . comes a jalopy through the flower bed . . . good show Mac . . . rev it up . . . see over there in front of the vacant house . . . that fella in the car with a antenna . . . watch it, Marge . . . them model airplanes is dive bombin' ya . . . ooops . . . oh well, it's only glass . . . I mean the window . . . law."

"Has everybody gone crazy?"

"It's self defense, Marge!! I'm defending my territory. It's a unwritten law and regulation of amateur radio that no amateur will never ever move close in along side of another ham. Oh-hhhhh, think of the QRM . . . clicks . . . hash . . . it's like ahhhh . . . like the law of the jungle. Gotta discourage that fella away from here."

"I can't hear you . . . the noise."

"Yeah, them Panthers bray pretty good . . . turn up the gain fellas . . . Marge, it's like in nature . . . like a squirrel don't let another squirrel move into his little piece of yard, or . . . or . . . a big papa walrus will fight another big papa walrus to keep him outa his territory . . . duck quick . . . football . . . ooops, hurt bad?"

"Well, bare your tusks because big papa walrus is coming across the street."

"Hello up there on the roof. Real friendly neighborhood ya got here. You must be a DXer. I see all your beams."

"Thought you'd never notice."

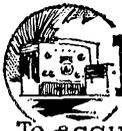
"Sure more kids today than I've ever seen around here before."

"Aw yeah, real noisy bunch . . . rowdy, completely uncontrollable, unreliable . . . just look at them motor cycles zippin' through the roses. I sure wouldn't want to move into this neighborhood if I was you."

(Continued on page 128)

The Nature Lover

BY JOHN G. TROSTER,* W6ISQ

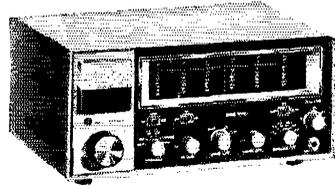


Recent Equipment



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

Hallicrafters HT-46

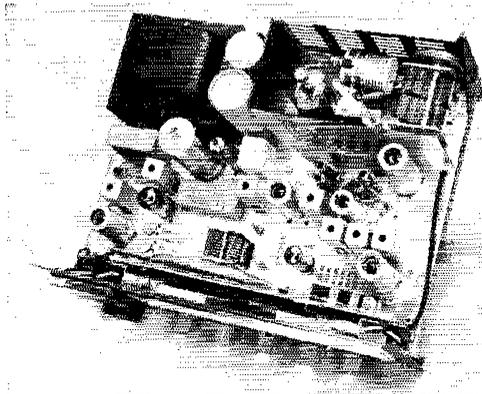


LAATEST in the growing list of coordinated transmitter-receiver combinations is the Hallicrafters HT-46/SX-146 duo.¹ The HT-46 is a complete s.s.b.-c.w. transmitter just as it stands, but has provision for being driven by the v.f.o. in the SX-146 for transceiver operation. A front-panel slide switch effects the transition from one method to the other, so the changeover can be made with practically no effort.

The HT-46 is rated at 175 watts peak-envelope power input on sideband and 150 watts d.c. input on c.w. The output stage uses a 6HF5 sweep tube, and the ratings are of course based on the intermittent operation typical of amateur s.s.b. and c.w. Upper and lower sideband output are both available on all of the five bands — 3.5 through 30 Mc. — covered by the transmitter. In panel appearance, the transmitter is the mirror image of the SX-146, and the overall dimensions are the same.

The circuit layout is shown in block form in Fig. 1. The s.s.b. signal is generated at 9 Mc., using a crystal filter having a nominal bandwidth of 2.1 kc. for sideband separation. The carrier oscillator, V_{2B} , can be switched to either of two

¹ The SX-146 was reviewed in April, 1966, *QST*, page 88.



Top-chassis view of the HT-46. The final stage is at the upper right, enclosed in a separate shield, the cover of which has been taken off for this photograph. The driver tube is immediately in front of this shield, and the remaining space between the shield and panel is occupied by the conversion circuits. The sideband generator is at the left front and the v.f.o. is in the center.

crystals, one above and one below the crystal-filter passband, for selection of either upper or lower sideband. This oscillator output is mixed with audio in a two-diode balanced modulator using the well-known circuit in which the diodes are connected in series across the r.f. source, with audio inserted at the center-tap to switch the diodes alternately into and out of conduction. The suppressed-carrier output goes into the sideband filter through a step-up tuned-circuit arrangement for driving the grid of the 9-Mc. i.f. amplifier, V_{3A} .

The audio circuit has a double triode, V_1 , as a two-stage speech amplifier. A third stage, V_{2A} , also a triode, is a cathode follower for driving the low-impedance balanced modulator. The overall audio gain is sufficient for any communications-type high-impedance microphone.

The 9-Mc. output of the i.f. stage goes to a pentode mixer, V_4 , the output of which is on the desired amateur band. The injection frequency here must either add to or subtract from the 9-Mc. intermediate frequency. Since the v.f.o. covers 5.0 to 5.5 Mc., it can be and is used directly to give the injection frequency for the 3.5 and 14-Mc. bands; the difference frequency is used in the first case and the sum frequency in the second. For the other bands the v.f.o. output, as shown in Fig. 1, is first mixed with the output of a crystal oscillator, V_{3A} of appropriate frequency. This mixing occurs in V_{3B} , which delivers the proper injection frequency on the 7-, 21- and 28-Mc. bands.

In both V_4 and V_{3B} the two signals to be mixed are coupled into the control-grid circuit. V_{3B} is used as a broadly-tuned amplifier for 3.5 and 14 Mc., where the heterodyne crystal oscillator is idle. For these two bands the plate circuit for V_{3B} is a 56- μ h. coil resonated by the circuit capacitance in the 5-Mc. range and shunted by a 3300-ohm resistor. On each of the other bands the plate circuit of this tube is a double-tuned transformer, used as a bandpass circuit to suppress undesired frequencies generated in the conversion process.

Since the v.f.o. tuning range is 500 kc., the 28-Mc. band has to be covered in four steps. The transmitter comes supplied with the heterodyne crystal for the 28.5- to 29-Mc. range; crystals for the other 10-meter ranges can be ordered

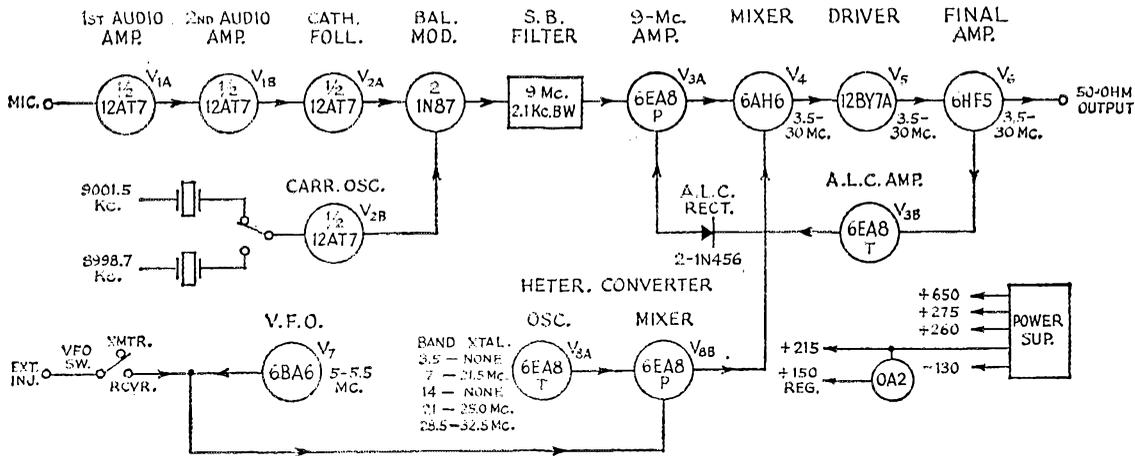


Fig. 1—Block diagram of the HT-46 transmitter.

separately. As in the case of the SX-146, the conversion frequencies are such that the v.f.o. tunes from left to right on the slide-rule dial for 3.5 and 7 Mc., and from right to left on the other bands. The conversion scheme also inverts sidebands on some bands; these are indicated on the panel by using different colors for the control lettering.

This conversion system is duplicated in the SX-146, from which the proper injection frequencies for V_4 can be obtained directly. When the v.f.o. switch in Fig. 1 is thrown to the "receiver" position, injection voltage from the SX-146 is fed to V_{3B} and cut-off bias is applied to V_7 and V_{3A} through an extra pair of contacts on the switch. In the "transmitter" position of the switch this bias is removed, and the circuit from the receiver is opened.

The plate circuit of V_4 is tuned on each band, with capacitive coupling to the grid of the driver, V_5 . A ganged capacitor is used to tune both the mixer and driver stages, the front-panel control being labelled "driver." Coils and padder capacitors are cut in and out by the band switch, which simultaneously connects the proper tuned circuits for all other stages for output in a given band. The plate circuit of the driver, V_5 , is rather complicated looking, because this stage is neutralized by the capacitive bridge method working from the plate tank to the grid—the reverse of the usual arrangement. The band switch connects in a different value of capacitance for the neutralizing circuit for each band, in addition to switching coils and padding capacitors so the tuned circuits will stay in alignment.

The final amplifier also is neutralized, again by the capacitive bridge method—but this time in the more familiar circuit arrangement with the neutralizing capacitor connected from the plate to the "bypass" capacitor at the low end of the driver tank. The amplifier plate tank is a pi network set up for 50-ohm output with no loading adjustment. With a good 50-ohm

dummy antenna the loading is identical in all the phone bands, but we were unable to get quite as much input (and output) at the low-frequency end of 80 meters as at the 4-Mc. end.

The metering circuit in the transmitter reads either final-amplifier cathode current or relative r.f. output. As the recommended idling current for s.s.b. is 40 ma., the current scale starts at 40 ma. instead of zero. This offset is obtained by means of the bridge circuit shown in Fig. 2, which bears a strong resemblance to some S-meter circuits. It allows a somewhat expanded current scale. The current can be adjusted to zero (40 ma.) by means of a bias potentiometer on the rear chassis apron.

The transmitter uses the amplified automatic level control circuit that has been incorporated in Hallicrafters transmitters for several years. As this circuit does not seem to have been reproduced in detail in past equipment reviews, it is shown here in Fig. 3. As do many of the a.l.c. circuits in current s.s.b. transmitters, it makes use of the audio-frequency variations in the small grid current that flows in the amplifier

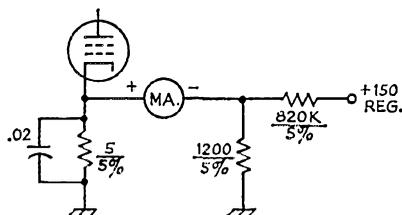


Fig. 2—Bridge circuit for setting the idling cathode current at normal zero on the meter scale. In the HT-46 the scale begins at 40 ma. for zero meter current, the bridge circuit being balanced at this current. Balance is set by means of the control-grid bias on the amplifier tube. The 5-ohm resistor should have a wattage rating sufficient for the amplifier tube used, in applying this circuit. The others can be 1/2 watt, for a 0-1 milliammeter.

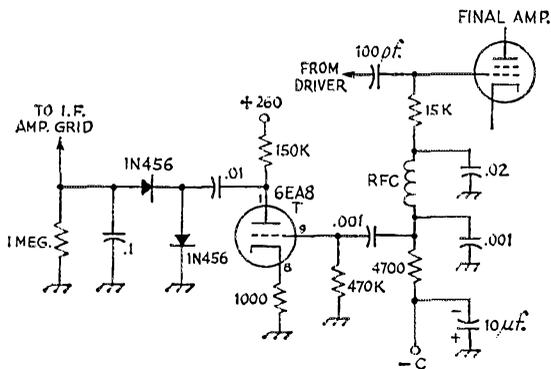
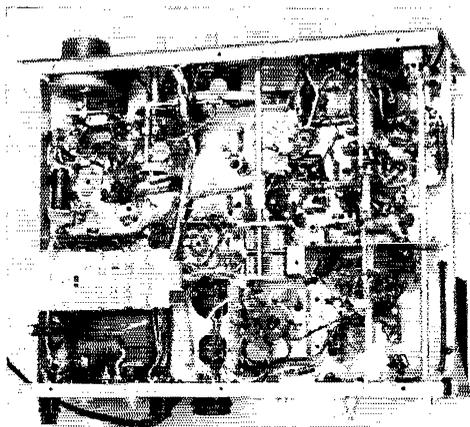


Fig. 3—The amplified a.i.c. circuit used in the HT-46. Capacitances are in μf . except as indicated. Resistors are $\frac{1}{2}$ watt. The 4700-ohm resistor may be made larger or smaller to increase or decrease the d.c. output voltage from the rectifier; the value shown is used with the 6HF5 final amplifier in the HT-46.



Underchassis view, with power supply at the lower left. The capacitor at the center gang-tunes the heterodyne final-mixer and driver tank circuits.

stage just before the flattening point, with the addition of an amplifier to ensure positive action. The control rectifier is a voltage doubler, the negative d.c. developed by it being applied to the control grid of V_{3A} to reduce its gain when the operator tends to be too enthusiastic with the microphone.

For c.w., V_4 and V_5 are keyed by the grid-blocking method. The circuit has RC time con-

stants that nicely eliminate clicks, although not to the extent that the keying becomes soft-sounding.

The HT-46 is set up for push-to-talk operation on s.s.b., but has no built-in provision for voice control. An optional VOX unit, the IIA-16, is available for this purpose. It can be plugged into a socket on the rear of the IIT-46 chassis.

On c.w., manual switching from the "c.w." to "standby" on the "operation" switch is the only means of going from transmitting to receiving, either with or without the extra VOX unit.

The various switching functions necessary for applying proper voltages to the stages for the different types of operation are handled by an internal relay controlled by the "operation" switch. There is also a "calibrate" control which provides a low-level signal for spotting, with the signal amplitude regulated by a "carrier level" control. This latter control also is used for setting the drive level for both s.s.b. and c.w. operation.

The high-voltage power supply uses semi-conductors in a bridge rectifier, with half-voltage output taken from a center tap on the transformer secondary. The three low voltages shown in Fig. 1 come from this tap, being taken off at various points along the resistors used in part of the filter. A separate bias winding with a half-wave rectifier supplies the negative voltage. The control relay is operated from d.c. obtained from a half-wave rectifier and filter capacitor connected to the 12.6-volt heater winding on the transformer.

An 11-pin socket on the rear apron brings out relay contact connections for antenna-relay switching, receiver muting, and the normal control features that go with station operation.

—WIDP

Hallicrafters HT-46, Transmitter

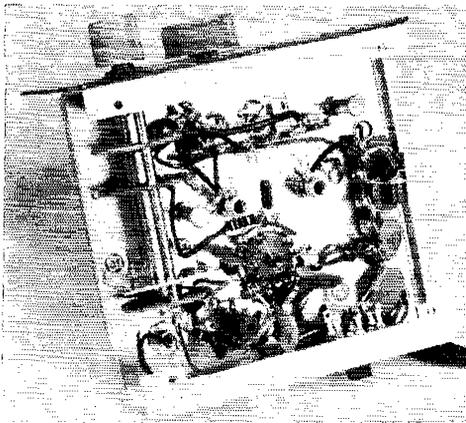
- Height: $5\frac{7}{8}$ inches.
- Width: $13\frac{1}{8}$ inches.
- Depth: 11 inches.
- Weight: 26 pounds.
- Power Requirements: 117 volts a.c., 50/60 cycles, 350 watts.
- Price Class: \$350 less accessories.
- Manufacturer: The Hallicrafters Co., Chicago, Ill.

Hallicrafters HA-26 V.F.O.

UPON plugging the power cord into the v.f.o. socket of the SR-42 or SR-46 transceivers the HA-26 is ready to operate. The HA-26 provides continuous frequency coverage across the entire 6- and 2-meter bands, delivering output

between 24 and 24.666 Mc. during operation on 2 meters. On 6 meters, the v.f.o. output is from 25 to 27 Mc. Because it was designed to function as a companion unit to the SR-42 and SR-46, the cabinet style and color are the same as that of the transceivers. Also, mounting holes

¹ "Recent Equipment", QST, July, 1965, page 85.

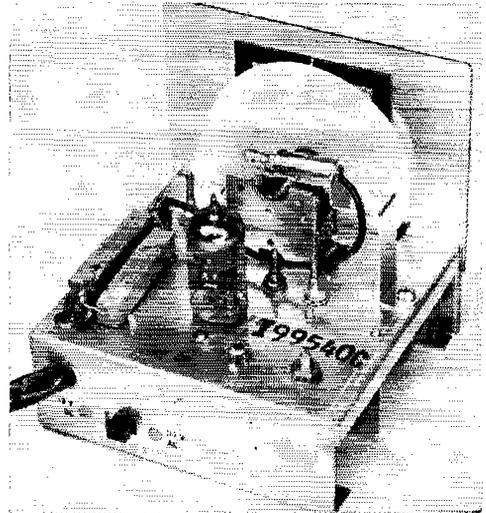


Bottom-chassis view of the v.f.o.

have been drilled in the side of the v.f.o. cabinet, permitting it to be bolted directly to companion transceiver if one-piece installation is desired.

The HA-26 uses a triode oscillator with a tickler coil in the plate circuit of the 6U8A (Fig. 1). The pentode section of the tube functions as a broadly-tuned buffer stage. Band changing is accomplished by switching either of two coils into the grid circuit of V_{1A} with S_{1A} . The tickler windings are switched at the same time in order to assure the correct amount of feedback. Resonance of the output circuit is effected by switching C_4 in parallel with L_3 on 2 meters, and by switching C_4 and C_5 in series across L_3 during 6-meter operation. The HA-26 delivers 3 volts, r.m.s., across a 150-ohm termination. This is the input resistance of the SR-42 and SR-46 units, as seen by the v.f.o.

Temperature-compensating capacitors are used in the oscillator circuit to enhance the frequency stability of the HA-26. Additional stabilization is made possible through the inclusion of CR_1 , a 120-volt zener diode which regulates the plate voltage to V_{1A} . During mobile operation, from 12 volts d.c., the filament voltage to the HA-26 is regulated at 6 volts by CR_2 , also a zener diode. The filament voltage is not regulated when operating the transceiver and v.f.o. from the 115-volt a.c. line. Separate values of resistance are placed in series with the filaments for a.c. and d.c. operation. During 12-volt operation S_2 places R_1 and R_2 in parallel and connects CR_2 to the filament line. When S_2 is set for 115-volt



Top view of the HA-26 chassis.

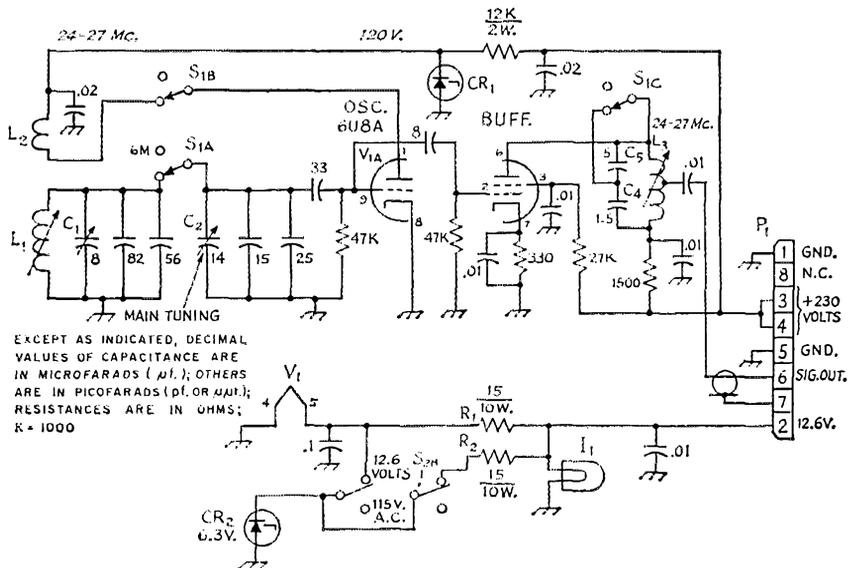


Fig. 1—Partial schematic diagram of the HA-26. The 6-meter grid and tickler coils are not shown but are similar in arrangement to the 2-meter coils shown. Decimal-value capacitors are disk ceramic. Resistors are $\frac{1}{2}$ -watt composition unless otherwise noted. Blank positions of S_{1A} and S_{1B} connect to 6-meter coils and capacitors.

a.c. operation, R_2 is switched out of the circuit and R_1 is used as a filament-dropping resistor.

A trait common to many v.h.f. variable-frequency oscillators is a.c. hum which shows up on the transmitted signal as f.m. The HA-26 designers have gotten around the problem by returning the oscillator cathode directly to ground, thus improving the heater isolation during a.c. operation.

When used with the writer's SR-42 transceiver, the HA-26 exhibited sufficient frequency stability for normal a.m. operation. The manufacturer states that the drift is less than ± 3 kilocycles over a one-hour period after a 20-minute warm up. All indications during actual use seemed to bear this out. There was, however, a slight tendency toward frequency jumping when the line voltage had an abrupt change in level.

The tuning rate of the planetary dial mechanism is on the order of 3:1. No backlash was evident during several hours of operation, a vital consideration to v.h.f. operators. The dial face is illuminated by a 12-volt pilot lamp. It has major calibration marks at 1-megacycle intervals. Calibration marks are also used at every 200-kilocycle point on the dial.

The output from the HA-26 during spotting is quite robust, making it an easy matter to locate the v.f.o. signal. This is particularly helpful when zero beating strong signals on the band.

— WICER

Hallcrafters HA-26 6- and 2-Meter V.F.O.

Height: $5\frac{3}{8}$ inches.

Width: $5\frac{1}{4}$ inches.

Depth: $5\frac{1}{2}$ inches.

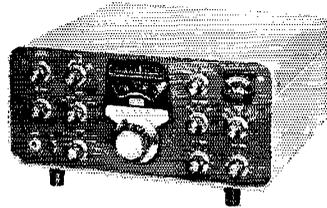
Weight: 3 pounds.

Power: Taken from SR-12 or SR-16.

Price Class: \$50.00.

Manufacturer: The Hallcrafters Co., Chicago, Illinois.

Next Month



Heath SB-100 Tranceiver

Cycles, Cycles Per Second, or Hertz?

RECENTLY there has been a move to use "hertz" for the unit of frequency (cycles per second), to honor the famous radio pioneer, Heinrich Hertz. Opinion on the wisdom of and need for the change is something less than unanimous. A number of the scientific societies support the move, some instrument makers are changing over, and some of the U.S. magazines are substituting "megahertz" for "megacycle" at every opportunity. On the other hand, some government agencies feel an obligation to conform with the requirements in the ITU Radio Regulations, where it is stated that frequencies shall be expressed in kilocycles per second and megacycles per second (and gigacycles per second). For the moment, *QST* is waiting for concerted action by Federal regulatory agencies—or at least until the utility companies change over to 60-hertz power lines.

A letter in the April *R.S.G.B. Bulletin* puts it another way:

Hertz

May I be permitted to pass some observations on the proposed anachronism of substituting "Hertz" for "cycles per second" when denoting frequency.

Generally speaking, the terminology applied to electronic components, or circuit functions, are indicative of their electrical performance, and thus the individual terms are logical. For instance, the terms resistor, capacitor, inductance, valve, amplifier, oscillator, flip-flop, gate, and counter, to name but a few, are meaningful in themselves since the words describe.

Such is not the case with units of measurements, with one exception, and this is the manner in which frequency is at present defined. The term "cycles per second" is meaningful and precise. The *Oxford Dictionary* states that a "cycle" is a "recurrent period of events," and since a.c. is a recurrent phenomena, there would seem no better way to specify frequency than that which finds universal acceptance at the moment.

On the other hand, the proposed term "Hertz" is as meaningless without definition as are Farad, Ampere, Volt and Ohm, and it seems quite illogical to convert from a term which is self-explanatory to one which will require a definition—no matter how simple the definition may be.

I gather that the purpose of the proposed change is to perpetuate the name of Hertz. That Hertz belongs to that elite band worthy of the title of genius is not questioned, and, additionally, it is agreed that he deserves wider recognition. But then so do many more. Jet engines are not known as "Whittles," railway engines as "Stephensons", telephones as "Bells," nor screws as "Archimedean's." If "cycles per second" really are to become "Hertz" for this purpose, then let us at least do the job properly and distribute credit titles all round.

Of course, we will not have to mind putting up with the arguments and confusions which will arise from the mad scramble to get on the band-wagon prompted by a misplaced sense of national pride. We say that Marconi founded radio but, as is fairly common knowledge, our friends in the USSR are equally convinced that Popov fathered the science, whilst recently they have discovered that Baird was a "swizzer" who "nicked" the idea of television from a "comrade."

I rather suspect that the idea for the change originated during a mild dose of electrocution, for, if one gets inadvertently strapped across the public mains supply, one does indeed receive 50/60 Hertz (hurts) per second. On this basis one might be forgiven for assuming that a kiloHertz are a fatal number of Hertz, and a MegaHertz the female of the species.

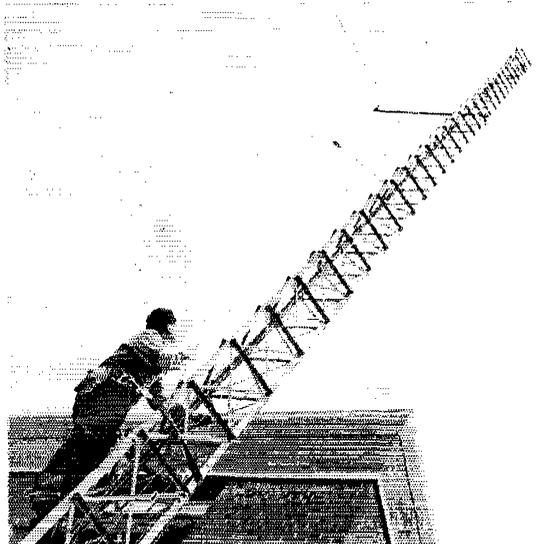
Whilst it will probably prove futile, let us make a determined effort to resist the introduction of a meaningless word in place of a self-descriptive term.

Bognor Regis, Sussex.

PAUL HARRIS, G3GFN

(Reproduced by permission of R.S.G.B.)

One of two 80-foot towers at the Owensboro-Davies County, Ky., Communications Center at the National Guard armory. Between them, the two towers support eight antennas on four bands. That's WA4TTE on the tower.



A Practical Approach

Based on First-Hand Experience

EMERGENCY PREPAREDNESS IN NON-METROPOLITAN AREAS

BY GEORGE S. WILSON,* W4OYI and ALLEN P. HAASE,** W4PFQ

AMATEUR ingenuity has helped pull the public out of many scrapes; but lethargy too frequently lets ingenuity try to do the job that advance planning and experience can and should do. Probably the situation which most needs amateurs' services, and for which amateurs are least prepared, is the one that develops rapidly and is remedied quickly.

During the 1964 flood¹, only ingenuity and the experience of the few who remembered previous experiences permitted us to serve effectively; but most of us recognized that we were operating near the limits of our capability. To find out how effective we really were, the 1964 SET operation² was devised. (One would imagine that an active, "organized" group that had just operated in a true emergency situation could do an effective job in a drill; but when the results were in (it still hurts to admit it), we found that in less than 50% of the cases were the 20 drill situations quickly reported to the c.d. director and his decisions communicated back to the field.

The basic reason for this poor showing was failure to anticipate what data are required for intelligent action in an emergency situation, together with an inadequate conception of just what it takes to handle quickly a large volume of high-priority traffic. The entire communica-

tions system, insufficient in equipment and experience under the heavy load, was reduced to shambles in the first half hour.

In 1965, after a year of soul searching, organization of a 2-meter f.m. net, a civil defense medical drill, and some mass traffic-handling for a two-day Boy Scout canoe race, the 1964 format was tried again with entirely different mock situations. Newly-acquired efficiency allowed but three "errors" (all of them "judgment errors") in over 250 communications. These activities have stimulated the discussions leading to the suggestions presented here.

Preparedness

What, specifically, improved efficiency from 45% to 98.8% in one year? The answer is *preparedness*.

The first step in preparedness is some hard thinking about what to prepare *for*. In the planning approach used here, we tried to picture a specific situation, analyze the communications needs, figure out exactly how to meet them, and then work in enough flexibility to adapt the plan to other situations.

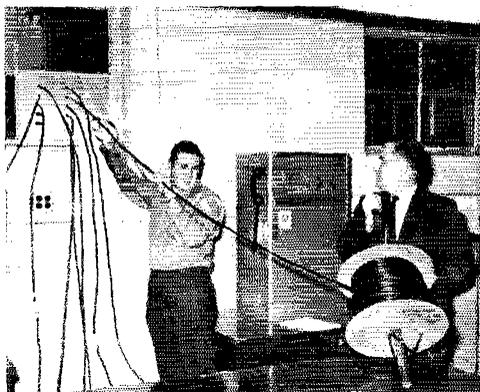
Imagine, as we did, a tornado striking a small, outlying community. Telephones there are out and the switchboard at the nearest hospital is so jammed with inquiries that the staff cannot reach off-duty doctors or obtain additional medical supplies. If amateurs can quickly render adequate assistance under these conditions, their plan is likely to succeed in a flood or even an

* 2114 Robin Rd., Owensboro, Ky.

** 2113 Old Cabin Rd., Owensboro, Ky.

¹ QST, Aug. '61, pp. 84-85.

² McCallum, "Emergency Drill, Deluxe Style," QST, Oct. '65, p. 27.



All antennas are coax-fed. Here's WA4TTE (left) and WA4OYI stringing the feedlines. In the background is the new 100-watt 2-meter f.m. control station.

earthquake. This type of situation requires a plan which features speed in getting into action and is readily adaptable to other circumstances. In such disasters one can expect that normal communications will be obliterated in the most seriously affected area and somewhat disrupted in a broader area due to overload. But in a short time the utility company's crews will have established some lines into the disaster area, and even before then state police and sheriff's deputies will have their own radio links. These decrease the need for operational communications by amateurs.

Too often amateur assistance begins to become effective only at this stage, when the only remaining communications needs are for "health and welfare" and "clean-up" traffic. These are important, but not nearly so vital as the communications needed and probably lacking a few hours before.

A good plan should have "back up" systems so that the entire system is not disrupted if one man or piece of gear should fail. To move quickly, an alerting method is required. In Daviess County we have a telephone-calling net with built-in checks to insure that each person is reached. The telephone calling technique used by our ARPSC contemplates that an actual or threatened need for emergency communications will be reported to either the EC or c.d. radio officer, or in the absence or unavailability of both, to one of the four assistant ECs who, in turn, call not more than four other local amateurs. Some of these call still others, and so forth. If the caller fails to reach any member, he uses someone else at the same calling level to contact those who were to have been reached by the missing individual. Limited calling responsibilities make key men available for action assignments quickly while the "gears" of the system continue to turn. An attempt at diagrammatic portrayal is made in Fig. 1.

If the situation calls for an alert only, reports of personal availability and current equipment status come back up the ladder, while rigs "on the bench" or otherwise out of service

are hastily made operational. "Back-up" alerting (should the local phone system fail) is on specific and well-known 75-, 6- and 2-meter frequencies. Also, upon request of civil authorities, the four local a.m. and f.m. radio stations will interrupt their programs and request radio amateurs to report to preassigned duties. Operators at two of these broadcast stations have equipment on hand to monitor 75- and 2-meter frequencies and can act as temporary net control if necessary.

The Communications Center

The real key to efficiency is the "Communications Center." This is a glorified net control station. It is here that all links come together; it is through here that the "management" (c.d. director, sheriff, county judge or other persons in charge of the overall situation) are reached. We encourage local officials to be present at the Center during emergencies. Experience gained through drills leads them to the realization that they can be only as effective as their communications. When situations or their operational responsibilities make such direct participation unlikely, our Comm Center sets up communications capability with the places where the officials will be. These links are independent of the main operational or control channels. If available, telephone is desirable for one of these links.

Effective Comm Centers may be club stations, they may be supported by c.d. or other public authority, or they may be in someone's home shack adapted for the purpose. Operating from a designated room in an armory, stadium or school building at which antennas have been installed, and into which gear from home shacks can be taken quickly, is far preferable to operating with decentralized control. Our Comm Center is equipped with large-scale maps of the area overlaid with plexiglass. Colored grease pencils keep necessary intelligence up to date and readily understandable.

During operations, each operator is backed up by at least one log-keeper who can copy incoming messages and keep a status board for the operators showing traffic "on the hook" with listed precedences. It has been found highly advisable to have a "controller" at the Comm Center

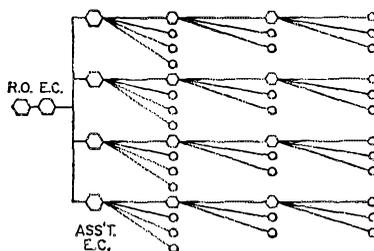


Fig. 1. When the radio officer notifies the EC of the need for amateur assistance, the EC calls his four assistant ECs, each of whom calls four AREC members. If a caller is not located, his responsibility is shifted to someone else at the same level so the chain will not be broken.

who will direct manpower distribution and message routing. This individual doesn't operate himself; he supervises. Because of the astounding rate at which paper work multiplies, the Comm Center can scarcely be overmanned.

We attempt to maintain the ability to communicate area-wide under all propagation conditions. This requires suitable equipment and experienced operators capable of handling NCS responsibilities. In an emergency situation in your own area, you will have operational traffic, so the administrative burden of controlling the long haul net should be handed to an NCS whose operators will recognize the situation in your area and give you appropriate consideration.

Located at the local Kentucky National Guard armory, the Comm Center in our area has a telephone and emergency power. It is capable of communicating with all mobiles on 2 and 6 meters and 80, 75 and 40 meter equipment. Skywires are supported by two 80-foot surplus towers supplied by civil defense. For effective inter-network communications, there are radio links to the state police, city police, county sheriff and state highway department radio systems.

If a truly adequate Comm Center is established, there is little reason to have someone on from his home rig. He may even become a liability because he cannot keep up with the situation and has to be briefed continually, wasting valuable air time.

Field Operations

Mobiles are indispensable. Only they can move rapidly enough to get fast assistance to disaster sites. When thinking about mobiles, remember that four mobiles on four different bands require four base transmitters and receivers to communicate with them. If these base rigs are in different locations, additional equipment is needed to provide direct contact among them. This arrangement renders contact between mobiles subject to the delay and possible inaccuracy of at least two relays; it also loosens the contact between the "management" and the mobiles.

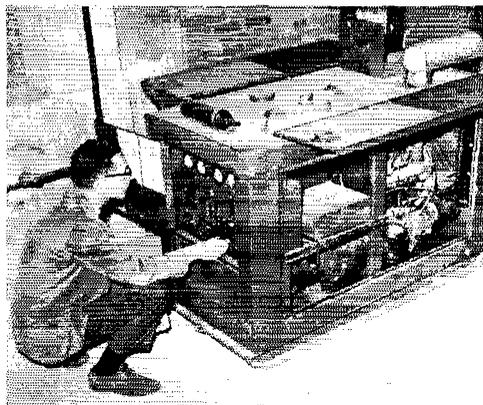
Mobiles in these circumstances lose sight of the overall situation and are thereby denied the ability to take the intelligent, independent action the situation may demand. Try to get groups of mobiles on a single control channel or on pre-designated channels with a control channel on the same band, preferably v.h.f.

It has been found highly advantageous to have another ham "ride shotgun" with the mobile operator. The "shotgun" keeps the log, copies and prepares messages, and is available to leave the car to make contact with the "natives" who are more concerned with their immediate troubles than in coming to the mobile to discuss what help is needed or where to get it. Obviously, a level-headed non-operator could handle this assignment with proper training. Or, a non-operator could merely be the driver if the mobile installation is set up for passenger operation.

Mobiles should be pre-equipped with detailed maps of the area, log forms and a supply of message blanks. It is essential that mobiles be supplied with identification readily recognizable by the police, and arrangements made for police recognition of it. During a recent drill in this area, a key operator was denied entrance to a local hospital for twenty important minutes because an overzealous patrolman was not advised of identification procedures. Our radio link with police headquarters cleared the matter.

Traffic

There is constant discussion, and room for it, on the amount of "formal" traffic that should be required. In our experience, "informals" become garbage once there are more than two mobiles in active operation. The "management" and even the NCS operators simply cannot keep up with the status of numerous, fast-moving



Emergency power is supplied by this surplus generator. That's Ky. SCM WA4KFO making the necessary adjustments.

situations. Mobile operators are likely to resist bitterly, but if you have more than two mobiles in operation nearly all traffic from the mobiles should be formal. More leniency may be permitted in communications to them. Why? Because the "management" and the boys at the Comm Center have to keep up with *all* the situations and the mobile has just his one.

The additional time involved, if any, is more than justified by the additional certainty, accuracy, precedence assignment and ease of directing replies. Careful notations should be made at both ends, of the time and content of any "informals." Note time received and method and time of disposition on all messages. Permissible informal information from mobiles may include location, status of equipment, signal adequacy, route being taken, and the like. Of course *all* third party traffic must be formal. Use local time in local message preambles: chances are the sheriff will not understand GMT.

When reporting a situation, the mobile operator must make the source and reliability of his report clear in the messages itself. The "management" might react entirely differently when

a fire is reported from personal observation than when the report is hearsy originating from an excited refugee.

Drills

Properly conducted drills are of great value. Opportunities should be provided for the operators to switch jobs and become proficient in several capacities. It is best, however, not to change positions while things are "hot," at least not until the new operator has fully acquainted himself with all the details of the operation under way. A licensed log-keeper is in a good position to take over when relief is needed by the assigned operator. Make sure that novices are correctly assigned to operate equipment (and on frequencies) they may use legally.

If drills are repeated too often, they become boring and participants start finding excuses not to show up. For the same reason, drills should not last too long. You'll learn all you're going to in the first couple hours. After that, situations become repetitious and therefore dull. It is helpful to have a serious, critical discussion at the close of the drill—not next week, but right then. A tape recording of the drill (made with the knowledge and consent of the participants) is very interesting for review. Defects in operating techniques can be recognized quickly in this manner and the need for individual improvements are communicated effectively by the tapes.

You cannot build an effective emergency organization over night, so test each part separately, then put the whole "ball of wax" together in one drill only on rare occasions. Does this sound like a tall order? It is indeed, but it

must be realized that the system described here was developed in a series of deliberate steps over a period of more than a year. Build progressively; every improvement brings you that much closer to a disaster communications team of which you can be proud. No system can ever be called complete, much less perfect. New operators need to be worked into the system as old ones fade out. Equipment needs updating and maintenance. Responsible officials change and must be "educated."

The system we have described is still being improved. Extended v.h.f. ranges (via repeater) and increased flexibility (multi-channel exciters for 2-meter f.m. mobile gear) are already under way. Improved antennas and better paper work procedures are being studied. Regular traffic net operation is encouraged to improve operator efficiency. These changes and innovations help keep the group active by providing a wide range of challenging opportunities to which members may apply their interests and skills.

Public Relations

On the public relations side, the effectiveness of drills can be reported through the newspapers on a "readiness to serve" basis. Since "public service" is our middle name, continuing contacts with officials who serve the public are a must. Opportunities to explain the ARPSC function and ability to assist are many in non-metropolitan areas. Local service clubs can always use luncheon speakers, and a portable operation to demonstrate can create interest and realism easily transposed by listeners into relief in emergency situations.

It is not all hard work. Seasoned with imagination, preparedness can be fun! QST

Strays

A 15 minute amateur radio public service program covering news and information for radio amateurs in the southern Texas area is broadcast every Sunday afternoon at 2:45 CST on KWHI, 1280 kc., in Brenham, Texas. The program is entitled "On the Bands" and invites news from area radio clubs. Write to "On the Bands", Radio Station KWHI, P.O. Box 730, Brenham, Texas 77833.

We have had quite a few letters asking who the chap is on the front cover of July QST. In case you are interested it is Stan Israel, WA1FPS, of the ARRL Secretarial Department.

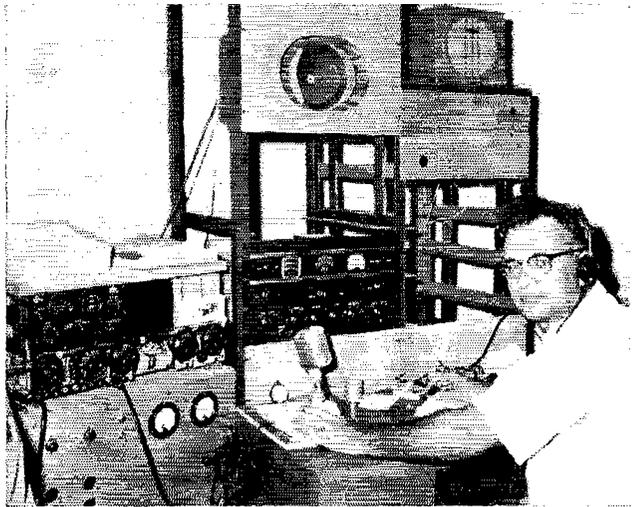
Feedback

In the article "A Transistorless 300-Watt Mobile Power Supply," by Exum and Johnson in QST for May 1966, page 23, the parts list shows K1 as a Potter and Bromfield PR5DY. The relay should be a PR7DY which is the required d.p.s.t. relay.



Mrs. Lee DeForest, widow of the man who invented the vacuum tube, presents the Southwestern Division's Dr. Lee DeForest Award to Bill Welsh, W6DBB/W1SAD, of Burbank, California, at the Southeastern Division's convention at the Disneyland Hotel. Bill has been active in making tapes to aid handicapped persons to learn code and has been personally responsible for helping more than 3000 hams get their licenses. (Hollywood Citizen-News photo by W6YOL)

My Friend, CR6CH



BY JORGE BARBOSA.* CR6AO

Editor's note: It's always interesting to see what hams around the world are doing — and how persevering and downright smart they are. We are printing CR6AO's description exactly as he submitted it. As he said in his accompanying letter, "please excuse all mistakes in the American language." We found this story delightfully fresh just as author Barbosa wrote it, and think you will, too.

My way often takes me to a very beautiful place in the North of Luanda, a small village called Cucuaco. On a very hot and sunny day in 1958 I was also driving there with my little boy. Suddenly we discovered something very strange: to our right, we noticed several odd-looking buildings and quite a few antennas growing up in the middle of the jungle. "What could that be?" the boy asked me. "Well, probably the work of some crazy guy," I decided, "but why not go and have a closer look at it?"

I stopped the car, and we walked slowly towards the "mysterious area." Coming nearer it seemed to us like an astronomical observatory. Soon we discovered a man sitting in the shade and smoking his pipe. Lots of scientific books were scattered around him on the floor. As soon as he saw us he smiled and came to meet us. All the things I noticed around me were absolutely confusing my mind. Having a closer look at our host, I found out that he was the well known newspaper writer, C. Bettencourt Faria. In Angola, he also introduced under water exploration and spear fishing. In addition to that he is the author of several books about astronomy, radio astronomy, and marine biology.

Mr. Bettencourt now invited us to see all his buildings and instruments and for me it was a most fascinating experience. We learned a lot about his work in his electronic laboratories, and also about the chemical and photographic departments. He

then showed to us some of his microscopic works which were very interesting indeed. On our way through the various rooms we passed a number of bookshelves full up with technical literature. Outside he explained to us the various kinds of aerials and the radiotelescope for 108 megacycles. (Later on this was changed to 136 Mc.) A few yards away from here we saw his 10-kw. power station.

To the left we could see his living quarters. In the middle of the "reception room" he sometimes makes scientific speeches or shows scientific movies. Our host suddenly walked toward his piano, sat down and played for us. For 15 minutes he took us with his music to another world, and we forgot all about science and technique.

After a while, Mr. Bettencourt told us a little more about sunspots, moon craters and projects referring to radio astronomy. While we were wandering around looking at the many self-made models and self-built instruments, our friend sat down — and still talking to us about "his world" — he painted some very impressive pictures with water color.

Besides painting with water color, playing the piano, doing under water explorations, he is quite a good shooter, likes bow-and-arrow games, is fond of all kinds of photography, develops and enlarges his own pictures and also makes good movies.

This was the day we became friends. I talked to him about my amateur radio station, CR6AO. So he told us that he had been a ham too in Portugal (CT1UX) and later on as CT2AB on the Azores Islands. At that time he was trying to obtain a CR6 call.

Since Mr. Bettencourt is chief of two technical departments in a local refinery — petroleum refinery — his work in the observatory is all done on spare time. It is not a "hobby" though, but he does very serious work and built up the very first astronomical observatory in all Angola. Astronomy still is a very unexplored field in all Portuguese territories.

When I asked him about the financial problem he told me that most of the expenses go to his own account, but sometimes he gets some help from local firms, and once he was also given \$2,000 by the

(Continued on page 126)

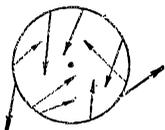
* C.P. 1227-C, Luanda, Angola, Africa.

CONDUCTED BY GEORGE HART,* WINJM

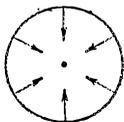
Where Are We Headed?

Amateur Radio Public Service is a concept that everybody favors, like progress, prosperity, and motherhood. Increased attention by ARRL resulting in more emphasis on these pages and in general among the amateur fraternity has brought about many controversial discussions on the subject. Perhaps we should pause and take a look at ourselves—not just at the ARRL-organized efforts, but at *all* public service efforts collectively, to see if we can determine just where all this is headed.

To begin with, are we organized? An organization consists of interdependent parts, each having a special function or relation with respect to the whole. Let's picture the public service aspect of amateur radio as a circle, with the ultimate objective—unity of purpose in the best interests of the nation and general public—as a dot in the center of that circle. Specific organizational lines within the structure follow recommended and generally-accepted precepts converging upon the center. Groups only half-heartedly following recommended lines, although within the circle, miss the center by varying degrees. Still others, which make no attempt to follow, either because their aims are selfish or devoted to a completely different cause, are lines entirely *out* of the circle and going off at tangent from it. Thus, we have a circle with organizational lines which looks like this:



when we should have one which looks like this:



This poses the question: Are we amateurs who set out to justify our existence by rendering public service a single organization working toward a common end, or are we a mass of independent organizations each working toward independent ends? Have we surrounded and are we converging upon our objective, or are we milling around it aimlessly and either missing it or going at tangents?

Consider the number of different amateur groups purporting to operate in the direct public interest. Probably the largest is ARPSC, close

to 50,000 strong, roughly broken down into AREC (30,000), NTS (5,000) and RACES (15,000). Of all known such groups, ARPSC is the only one which sets out to serve all who wish to be served—AREC for general public agency needs, RACES for civil defense, and NTS for long haul.

But there are many others, mostly government. Probably next in point of numbers is MARS, which while not strictly an amateur service and not operating on amateur bands, has many staunch adherents among the amateur fraternity. The MARS mission is primarily military training, but it enters the emergency picture in its general policy of support, on a non-interfering basis, of amateur public service efforts.

The Post Office Department also has a growing amateur radio division which is now engaged in traffic handling throughout the country. While primarily intended to serve the Post Office, it also has extensive general emergency communications capability on a nationwide basis.

Selective Service is trying to set up amateur facilities and has already made some progress to that end. The Weather Bureau has in the past made attempts to set up centralized amateur efforts and there are still a number of very fine weather nets in operation. Red Cross at one time was well along in organizing its own amateur facility, but now depends on ARPSC for all its amateur needs.

This is not a complete list, nor is it intended to be. In addition to sporadic attempts of other agencies, both government and private, to set up amateur facilities for their own purposes, there are a number of independent amateur groups who set out to serve the public in one way or another, not connected with any of the above nor, for the most part, with each other.

We are not mentioning these things for the purpose of decrying them. Maybe this is the way it should be. Separate segments of the amateur fraternity can serve separate specific needs for the above and additional agencies as their needs arise. Each such agency can offer advantages in the form of equipment, facilities, quasi-official status, separate frequencies, certificates, decals, stickers, armbands, helmets, badges, even uniforms. Those amateurs left over, not affiliated with any particular specialized public service group or agency, could take care of whatever miscellaneous requirements might arise. Such a path is certainly the path of least resistance, and who can say that amateur radio does not perform an adequate, perhaps even a maximum, public service in this way?

On the other hand, there is arising some sentiment to the effect that serving piecemeal

* National Emergency Coordinator.

is not the way to accomplish the greatest good, despite the advantages which can be derived. This sentiment points the desirability of setting out to survey the overall requirements for amateur radio public service communications by *everybody*, making a detailed study of them, setting up a drawing-board version of the kind of organization needed to provide them, then going out and getting the amateurs to put the scheme into effect—much in the manner in which NTS was organized. RACES, AREC, MARS, PON — what difference does the name or the initials make? What difference does it make who sponsors it or who gets the credit or what shape or size it assumes, as long as it does the job for both amateur radio and for the general public it ultimately serves?



These two well-known traffic men were among the many who attended the Roanoke Division Convention held on May 28-29. Who are they? Why that's Ken Bay, W4DVT on the left and Tom Jones, W4BZE, on the right. (Photo by W1BGD).

The League has Public Service as its No. 1 objective. But few intelligent leaders that we know of are cocksure that the way they are doing it is the ideal way to do it. Between the two methods mentioned above are many other possibilities, many degrees of specialization and compromise. We are only beginning to explore, and we would much appreciate your assistance in exploring.

Largely, as always, it depends on what you want and how hard you're willing to work for it.

— WINJMI.

National Traffic System

One of the many topics discussed at the recent Eastern Area Staff meeting held at the national convention in Boston was whether or not NTS should be activated and run during the SET without the benefit of previous planning and setting up of schedules on the part of the managers. When both New Jersey Sections and the N.Y.C.-L.I. Section decided to hold another pre-SET exercise, 2RN manager WA2GQZ decided to try an experiment. Over 150 messages destined for areas outside the Region were to be originated by members of Section nets within 2RN, and this was to take place during the pre-SET. The objective was to request an activation of the entire Eastern Area without warning.

At the on-the-air EAS meeting held the week before the pre-SET, WA2GQZ very briefly outlined his plan and the various Region net managers agreed that they would not set up any schedules in advance of the test. Everything was to be done on the fly. The theme of this year's pre-SET was to be "Operation Blackout," simulating the condition that existed last summer when the entire north-

NATIONAL CALLING AND EMERGENCY FREQUENCIES (kc.)

FULL TIME

3550	7100	50,550
3875	29,640	145,350

PART TIME

7250	14,225	21,400
14,050	21,050	28,100

Full time frequencies are for use 24 hours per day but only for emergency and traffic calling purposes. No transmissions for *any* purpose (except calling for emergency help) the first five minutes of each hour.

Part time frequencies are for traffic calling and general amateur use except in an FCC-requested or FCC-declared emergency, at which times they become *full time* frequencies.

This is a voluntary amateur program, designed to show what we can do without FCC regulation. Its success will require us all to work together. Any amateur wishing to assist is invited to use ARRL notification cards to be sent to stations not observing the rules.

east was plunged into darkness for several hours. All net members within the disaster area were to operate using emergency power (if available), with stations outside the disaster area, but still within 2RN, acting as NCS and liaison.

At 1930z, May 14, 2RN was activated. The traffic flow was light at first, but by 2100z it was necessary to activate EAN, with K1WJD assuming the NCS duty, on 7120kc. All Region nets except one were represented at the first session. Since the load for the other two Areas was light, W3EML decided it wouldn't be necessary to schedule extra TCC functions.

All the Region nets held at least one extra session and several operated continuously from 2100z until after the regular EAN session held at 0130z. Within an hour of the first EAN session, replies to the messages originated in the "disaster area" started filtering back into 2RN. This continued far into the night and stretched out into the next few days.

The results of the test will give the members of EAS much food for thought. The biggest question in everyone's mind was, "could we activate part of the system on the fly and have everything working the way it does in normal times?" The indications from this test were that this could be done. Eventually, we may find that this will be tried during a regular SET, but probably not for a while.

Even the most serious test is spiked with a little humor at one point or another, and this test was no exception. At the first EAN session, neither of the regular 8RN receive stations was available because of personal emergencies. WA8MQE just happened to have a schedule on 7120 kc., at 2100z and was very surprised to find EAN on this frequency. After being informed of what was going on, WA8MQE QNI'd as 8RN receive. Evidently, the 8RN manager has taught his men that whenever they come across an EAN session, QNI as receive first and ask questions later.

K1WJD felt that the test was quite successful, although the traffic load wasn't up to the normal SET level. VE3BZE informs us that ECN held seven sessions during the pre-SET and had good representation from most sections. WA2GQZ comments that NTS can be activated if the EAS members will pick a time and frequency to meet in the event of an emergency anywhere in the country. Under real emergency conditions, we would get a later start, but the operators would be willing to operate through the night at all levels.

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Recently, headquarters issued a letter to all NTS managers requesting that they try to align their net meeting times in accordance with the suggested times in the Public Service manual. The managers can change the meeting



Whenever there is a division convention, you are sure to find some big brass floating around. The Roanoke Division Convention was no exception, and W1BGD was able to catch (l. to r.) Barney Dodd, W4BNU, SCM N. C.; Andy Anderson, W4MWH, Dir. Roanoke Div.; and Joe Abernethy, W4AKC, V. Dir. Roanoke Div. while all three had a free moment.

times of the nets, but the members have to be willing to change their particular schedules to fit this schedule. We realize that this may be difficult in some cases, but the net result will be an increase in the overall efficiency of the system in terms of the length of time it takes to get a message from one point to another.

We urge all participants of NTS nets to support their managers in an effort to change the net schedule and make it work. — W1BGD.

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All NTSers everywhere were saddened to hear of the passing of Bob Barrett, W9JQZ. Bob's ubiquitous and powerful signal was always heard, whatever conditions existed, and many a QNB was performed by him above and beyond his regular function. We shall miss him.

May reports:

Net	Sessions	Traffic	Rate	Average	Representation (%)
EAN.....	35	1968	1.164	56.2	96.2
CAN.....	31	1689	1.127	54.4	100
PAN.....	31	1669	1.010	53.7	95.7
1RN.....	62	455	.308	7.6	88.9
2RN.....	66	568	.665	8.6	98.5
3RN.....	62	783	.507	12.6	97.8
4RN.....	60	708	.402	11.8	95.3
RN5.....	62	1002	.424	16.1	92.8
RN6.....	62	1355	.824	21.8	98.6
RN7.....	31	371	.397	12.0	63.5 ¹
SRN.....	64	560	.304	8.8	92.9
9RN.....	31	719	1.142	26.5	98.3 ¹
TEN.....	62	954	.669	15.4	77.0
ECN.....	36	203	.232	5.6	81.5 ⁴
TWN.....	25	395	.406	15.4	60.7 ¹
Sections ²	2079	13,087		6.3	
TCC Eastern ³	124	928			
TCC Central ³	93	973			
TCC Pacific ³	124	1290			
Summary.....	2799	29,677	EAN	9.6	CAN
Records.....	2227	22,882	22.1	1.143	100

¹ Representation based on one or less sessions per day.
² Section/Local nets reporting (66): CN CPN (Conn.); NCN SCN (Cal.); NJN (N.J.); Alta. SBN; ILN (Ill.); EPA WPA PTTM EPAEPTN (Penna.); GBN (Ont.); MTN MEPN (Man.); QFN GN WFPN (Fla.); NCN NCNL (N.C.); GTN GSN (Ga.); CHNN (Colo.); VN VSN VSBNE VSBNTL (Va.); BUN (Utah); QIN BEN (Ind.); MDSD (Md.-D.C.-Del.); SCNS (S.C.); PTN (Me.); AENT AENO AENP AENR AENM AENH AEND AENB (Ala.); TPN TN TRSBN ETPN (Tenn.); WSBN (Wis.); OQN (Ont.-Que.); QMN (D) QMN (S) Wolverine (Mich.); WMN (W. Mass.); NTTN (Tex.); LAN (La.); KTN (Ky.); OZK (Ark.); VTNH (Vt.-N.H.); Iowa 75; Ohio SSB BN (Ohio); PIID (Mo.); MSN MJN (Minn.); RISFN (R.I.); NYCLIPN NLI NLS NYCLIVH (N.Y.C.-L.I.).

³ TCC functions not counted as net sessions.

⁴ ECN extra sessions held during 2RN pre-SET.

Well, another record breaking month in all but two categories. Traffic was way up and so were the number of sessions held, so we guess that the QRN isn't too bad yet. Running down the list, we notice that 10 nets had a 90% or better representation figure. Let's keep this up during the summer months. For you early planners, don't forget that the SET is scheduled for October 8-9.

K1WJD has issued a batch of EAN certificates to: W1NJM, K1s TMK ZND, W2s GKZ MTA ZRC ZVW, K2s RYH SIL, W3s EEB EML NEM, W4DVT, K4E0F, W8RYP, K8NJW, VE2DR and VE3CYR. W9DYG has his fingers crossed in hopes that CAN can hold the 100% representation for two more months. This will make it two years in a row! WB6JUH is pleased with the way things have been on PAN despite a few minor problems that always seem to crop up here and there. WA2GQZ is still having trouble getting net reports. K3MVO comments that representation and averages are down slightly from last month, but 3RN continues to roll along. W4STJ issued a 4RN certificate to WA4SOI. K5IBZ sez the representation has improved slightly thanks to the better turn out from Texas and Miss. Burt is in the process of getting out another RN5 bulletin that should be in circulation by the time you read this. Activity on RN7 dropped in all departments, comments K7JHA, traffic was low and the same old standbys still continue to constitute the backbone of the net. W9QLW is well pleased with the performance of 9RN this month. Traffic was up and so was the rate and average figures. 9RN certificates were issued to W49s NPB POZ. W6LGG reports that condx on 80 are making it very difficult to hear the VE4s without the help of the Dakota boys. The QRN from thunder showers and summer aren't making things any easier, either. ECN has lost its stalwart VE1 rep., and VE3BZB is hopeful that a new replacement will be forthcoming shortly. K7NHL reports that TWN will probably use 7000 kc, during June, July and August.

Transcontinental Corps: W3EML reports that the regular TCC function that was being held on RTTY has been curtailed because the operators are doing some work on their gear. Anyone who has RTTY capabilities and the other necessary qualifications to be a TCC operator should contact W3EML. W4ZJY is on the move again and requests that all reports be sent to him at P.O. Box 1015, Richmond, Indiana. Dave is also a new pappy.

May report:

Area	Functions	% Successful	Traffic	Out-of-Net Traffic
Eastern	124	91.1	2359	928
Central	93	88.2	2110	973
Pacific	124	95.9	2580	1290
Summary	341	92.1	7049	3191

TCC roster: Eastern Area (W3EML, Dir.) — W1s BGD EFW NJM, K1ZND, W2s GVN SEI, W4Z BLY UPC UWA, WB2AEJ, W3s EML PAF, K3s FHR MVO, W4DVT, W2s CHT IBB RYP, K2s RIQ NJW QKY YSO, W6OHL. Central Area (W4ZJY, Dir.) — W4s OGG ZJY, K4DZM, WA4WWT, W5GHP, WA5GOL, W9s CXY DYG JOZ VAY ZYK, W19s BWY NFS, W6s INH HXB/4, K0s AEM GSY.

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Net reports:

Net	Sessions	Traffic	Check-ins
7290	42	796	1246
20 Meter SSB	22	1984	481
North American SSB	26	1102	689
HBN	31	766	467

— . . . —

Diary of the AREC

On March 12, an Army National Guard helicopter was on a training mission when it crashed in a swamp near Savannah, Ga. At the time of the crash, all the swamps in the area were severely flooded, making it almost impossible for a search team to check the area. An air born search was conducted but found nothing. On March 18, the water had receded enough so that 500 men could begin the search. The next day, AREC members from Chatham County, under EC W4KGP, joined the search by providing communication. One fixed station was set up at Travis field, the headquarters for the search, and the local club station

W4HBB, was also activated. Seven mobile units joined the search, two on 75 meters and five on 6 meters. By March 20, the search had broadened both in the area covered and the number of participants, and AREC members were still on the job, providing emergency communication. The search continued through April 3, but since the water had not receded enough to permit rescue parties to check the low lands, nothing was found of the helicopter or its two occupants. It wasn't until the middle of May that the helicopter was found when a man, plowing a field nearby spotted a red light in the swamp. Upon investigation, he found the helicopter and the occupants who, it was determined later, must have died instantly when the crash occurred. Those amateurs known to have participated were: W4s GMA ESP KGP, K4s TZN YSA WMU JAC MIC, W44s VHP EJA OEL SPB HPK EHT YU. — W4DDY, SEC Georgia.

During the medical emergency in Chile (see page 69, June 1966 QST), WA5BNW answered the emergency call from W4CSE/mm and was informed that a special type of blood plasma was needed. A check was made of the various blood banks in Dallas, Texas, and WA5BNW was able to locate six pints of the needed plasma and forwarded the request that they be shipped to Chile. — WA5BNW.

On the night of the Northeast blackout, the Providence Chapter of the American Red Cross was concerned whether it would be necessary to open shelters or take other emergency measures in the area. To attempt a survey, the Disaster Chairman asked that AREC members try to learn the extent of the emergency and its severity.

As soon as emergency power was available, K1JFI, the club station of the Roger Williams VHF Society, went on the air. Approximately 48 stations checked into the emergency net and it was quickly determined that the outage was general. Traffic was handled for Red Cross chapter in Taunton, Fall River, New Bedford and Hyannis. Valuable reports were received via amateur radio as to when power was restored to the various areas.

During April, an eleven-year-old girl and a 6-year-old boy, both from Mexico, had to be flown to Los Angeles for medical treatment. Both had been hospitalized and returned home, but complications had set in and it was necessary to re-hospitalize them. Through the efforts of W6s WRJ ZOM, K6s DIQ EVQ BPI WA6BQZ, WB6NGE and K7RVY, arrangements were made through NE2IL to return the children on Apr. 20 via commercial airlines starting at Hermisillo, Mexico. — W6WRJ.

Amateurs in the Winnipeg-to-Emerson, Man., area were on the alert from April 10-18, when heavy rains caused the flooding of the Red River valley. While commercial communications did not fail, many areas were flooded and had to be evacuated. Extensive measures were taken to prevent flooding in Winnipeg; the flood peak was 3 to 4 feet below the predicted level and serious flooding did not take place. In preparation to take over in case their



The Georgia State Convention draws amateurs from all over the South, and it's possible to come up with some pictures of fellows you're just not likely to find together too often. W4PED got this shot of (l. to r.) W0HXB/4, past TWN Mgr., W4DDY, SEC Ga., and W4BVE, RM E. Fla.

aid was needed, AREC members contacted the Emergency Measures Organization (EMO), nets on 80, 75 and 6 meters were alerted, five portable 75-meter stations were readied along with a 1 kw. emergency power plant. Liaison was made with RACES stations in Grand Forks, N. Dak., on 160 meters and mobile stations were stationed throughout the flood zone. Since no communications emergency developed, the amateurs, although deployed and ready to go, weren't used to any great extent. — VE4OL, SEC Manitoba.

On May 20, the Topeka, Kans., 2 Meter F.M. Net was alerted and placed on standby at 1100 CST for possible heavy thunderstorms, high winds, hail and tornado activity. At 1400 CST, the weather bureau requested the net to go on full alert. W0KKR/0, operated by W0W1Z, was NCS. Mobile units were sent out to keep watch for tornadoes. By 1550 CST, the storm had passed, causing no damage, and the alert was cancelled. — K6JMF.

Well, we've finally had a break in the emergency and alerts, so it's time to dig into the non-emergency reports that have been stacking up.

The spring exercise for the AREC in Calgary, Alta., was held on Apr. 23, VE6FK and VE6MF made the plans with participating members being aware of only the approximate time it was to start. The theme was that a tornado had struck the city, putting out power lines and telephone communications, besides doing extensive damage. From the outset, therefore, it was necessary for the NCS stations to go on emergency power which was accomplished without too much lost time. Mobile units were given sealed instructions (shades of K4URX's plan, page 27, Oct. 1965 QST). Unfortunately, there was a shortage of mobiles so some well laid plans went astray. Those who did take part, many for the first time, received good practice. A dozen scouts assisted at the control station and went along with the mobile operators. Twenty-seven amateurs participated in this exercise. — VE6MF, EC Calgary, Alta.

Forty-eight SEC reports were received for April, representing 19,702 AREC members. This is 7 more SEC reports and 100 less AREC members than last year. Those Sections heard from were: Conn., E. Mass., N.Y.C.-L.I., N.N.J., S.N.J., W.N.Y., E. Pa., W. Pa., Del., Ala., E. Fla., Ga., N.C., Tenn., Va., Ark., La., Miss., N. Mex., Okla., S. Tex., Los A., Orange, S.Bar., S.F., S.V., Hawaii, Mont., Nev., Ore., Utah, Wash., Wyo., Mich., Ohio, W. Va., Colo., Kans., Mo., Nebr., S. Dak., Mar., Que., Ont., Man., Sask., Alta., B.C.

RACES News

When it was reported on May 19, that a boy from Ledyard, Conn., was missing, RO K1MRL was called by the a.s.l. director and, together with K1SRF, proceeded to alert the Ledyard RACES group. Within 20 minutes, six mobiles were at the scene and were assigned to positions around the perimeter of the area in which the boy was assumed to be. Some of the operators proceeded into the search zone equipped with walkie-talkies, while others stayed in their cars and acted as base stations. Within a short time, the boy was found and returned to his home. Those amateurs participating were: W1BZB, K1s MRL SRF LMS, WA1AAQ, WN1FNT and WA5DLS/1. — K1SRF, EC Ledyard, Conn.



On May 25, members of the Tuscola, Ill., RACES were activated in a search for a missing deputy sheriff. The deputy's car had been found the day before where it had been abandoned, north of Tuscola in Douglas Co. There was a bullet hole in the door and blood on the seat, but no sign of the deputy. At 0500 CST, approximately 160 volunteers searched Douglas County. RACES stations furnished the communications. After 8½ hours of searching, the deputy had not been located and the operation was cancelled. Those amateurs known to have participated were: W9UHD, K9s FTJ KNW GTN, WA9s BFF HHR ODI ODJ GJN. — W9UHD, EC/RO Douglas Co., Ill.

QST

Happenings of the Month



ELECTION NOTICE

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

An election is about to be held in each of the above-mentioned divisions to choose both a director and a vice-director for the 1967-1968 terms. These elections constitute an important part of the machinery of self-government of ARRL. They provide the constitutional opportunity for members to put the direction of their association in the hands of representatives of their own choosing. The election procedures are specified in the By-Laws. A copy of the Articles of Association and By-Laws will be mailed to any member upon request.

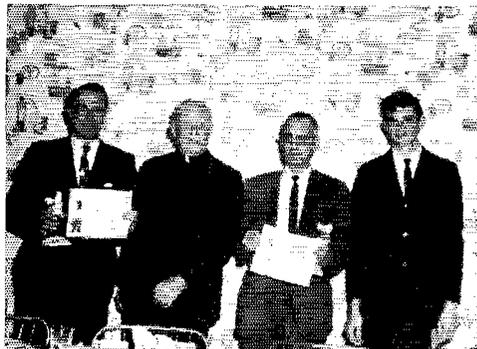
Nomination is by petition, which must reach the Headquarters by noon of September 20. Nominating petitions are hereby solicited. Ten or more Full Members of the League residing in any one of the above-named divisions may join in nominating any eligible Full Member residing in that division as a candidate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

Executive Committee

The American Radio Relay League
Newington, Conn. 06111

We, the undersigned Full Members of the ARRL residing in the.....Division, hereby nominate..... of..... as a candidate for director; and we also nominate..... of..... as a candidate for vice-director; from this division for the 1967-1968 term.
(Name Call City Date)

The signers must be Full Members in good standing. The nominee must be the holder of at least a General Class amateur license, or a Canadian Advanced Amateur Certificate and must have been licensed and a Full Member of the League for a continuous term of at least four years at the time of his election. No person is eligible who is commercially engaged in the manufacture, sale or rental of radio apparatus capable of being used in radio communications, is commercially or governmentally



The Boys Town (Nebraska) Amateur Radio Club presents its Outstanding Service Award to KØGHK, left, and WAØIX, third from left. Monsignor N. Wagner and Club President WAØNCV made the presentation. The two had been instrumental in obtaining new equipment for the Club station at the famous boys' school.

engaged in frequency allocation planning or implementation, or is commercially engaged in the publication of radio literature intended in whole or in part for consumption by radio amateurs.

All such petitions must be filed at the headquarters office of the League in Newington, Conn., by noon EDST of the 20th day of September, 1966. There is no limit to the number of petitions that may be filed on behalf of a given candidate but no member shall append his signature to more than one petition for the office of director and one petition for the office of vice-director. To be valid, a petition must have the signature of at least ten Full Members in good standing; that is to say, ten or more Full Members must join in executing a single document; a candidate is not nominated by one petition bearing six valid signatures and another bearing four. Petitioners are urged to have an ample number of signatures, since nominators are occasionally found not to be Full Members in good standing. It is not necessary that a petition name candidates both for director and for vice-director but members are urged to interest themselves equally in the two offices.

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

Voting by ballots mailed to each Full Member will take place between October 8 and November 20, except that if on September 20 only one eligible candidate has been nominated, he will be declared elected.

Present directors and vice-directors for these divisions are: *Central*: Philip E. Haller, W9HPG and Edmond A. Metzger, W9PRN. *Hudson*: Harry J. Dannals, W2TUK and Stan Zak, K2SJO. *New England*: Robert York Chapman, W1QV, and Bigelow Green, W1EAE. *Northwestern*: Robert B. Thurston, W7PGY and R. Rex Roberts, W7CPY. *Roanoke*: P. Laurier Anderson, Jr., W4MWH, and

Joseph F. Abernethy, W1AKC. *Rocky Mountain*: Carl L. Smith, W0BWJ, and John H. Sampson, Jr., W7OCX. *Southwestern*: Howard F. Shepherd, Jr., W6QJW and John F. Martin, W6ECP. *West Gulf*: Roemer O. Best, W5QKF and Ray K. Bryan, W5UYQ.

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

For the Board of Directors:

July 1, 1966

JOHN HUNTOON
Secretary

ANTI-NOISE BILL CLEARS SENATE

The Senate has passed and sent to the House the FCC-sponsored bill, S-1015, which would give FCC authority to prescribe regulations for the manufacture, sale, offer for sale, shipment and import of devices which cause harmful interference to radio reception. Such devices are presently regulated under FCC Part 15, but only as to the use of such devices.

The text of the bill as reported by the committee follows:

"DEVICES WHICH INTERFERE WITH RADIO RECEPTION"

"SEC. 302. (a) The Commission may, consistent with the public interest, convenience, and necessity, make reasonable regulations governing the interference potential of devices which in their operation are capable of emitting radio frequency energy by radiation, conduction, or other means in sufficient degree to cause harmful interference to radio communications. Such regulations shall be applicable to the manufacture, import, sale, shipment, or use of such devices.

"(b) No person shall manufacture, import, sell, offer for sale, ship, or use devices which fail to comply with regulations promulgated pursuant to this section.

"(c) The provisions of this section shall not be applicable to carriers transporting such devices without trading in them, to devices manufactured solely for export, to the manufacture, assembly, or installation of devices for its own use by a public utility engaged in providing electric service, or to devices for use by the Government of the United States or any agency thereof. Devices for use by the Government of the United States or any agency thereof shall be developed, procured, or otherwise acquired, including offshore procurement, under United States Government criteria, standards, or specifications designed to achieve the common objective of reducing interference to radio reception, taking into account the unique needs of national defense and security."

Because of the benefits it would provide for amateur operation in reducing interference levels, ARRL General Counsel Booth testified in favor of the bill during Senate hearings last year. Proponents of the bill fear that the House may not have the opportunity to take action before adjournment but feel certain that the bill will be reintroduced and passed in the next Congress.

TELEPHONE COMPANY FRAUD BILLS

The Bell System telephone companies throughout the several states are attempting to secure passage of legislation to outlaw use of "black boxes" to defraud automatic toll accounting equipment.

In some instances, the legislation has been so broadly drawn that amateurs fear the application of the new rules to some activities in the amateur service — though the Bell System denies any such intent. In Louisiana the matter arose in the past few months. Local radio clubs, Director Philip Spencer, General Counsel Booth

and several individual amateurs teamed up to secure the addition of the "Oklahoma Amendment" written by a similar amateur team in the Sooner State a year ago. The amendment reads,

"Section 3. Nothing herein shall apply to public service and emergency communications performed by holders of valid Federal Communications Commission radio amateur licenses without charge on the part of such licensees; provided that nothing herein shall excuse any person from compliance with lawful tariffs of any telecommunications company."

In both Oklahoma and Louisiana, the amendment was added to the bill with the full cooperation of telephone company authorities.

Amateurs in state capitols, particularly, or amateurs in a position to follow legislative proposals should keep a lookout for the "black box" bill, immediately notify headquarters and the General Counsel and try to get the Oklahoma Amendment added to it.

MORE AMATEUR RADIO WEEKS

In addition to Amateur Radio Weeks reported in previous QSTs and to those identified with photographs elsewhere in this issue, we are pleased to report that Governor Edward T. Breathitt of Kentucky proclaimed the week



Official Memorandum
By

JOHN CONNALLY
Governor of Texas

AUSTIN, TEXAS

CERITINGS:

The 11,000 licensed amateur radio operators in Texas render outstanding service in the field of emergency communications for civil defense and disaster relief; the military services, and also, non-emergency civic needs.

Licensees in the area have put four satellites in orbit during recent years. All of them contributing to the advancement of radio communications technology.

Texas amateurs, through the Radio Amateur Civil Emergency Service program in the Office of Defense and Disaster Relief of the Texas Department of Public Safety and local governments in the State, participated in the Alaska earthquake recovery, the West Coast typhoon, Sanstrom flood, and Hurricane Helene operations, contributing materially to the fast recovery from these disasters.

Thousands of Texas Amateur Radio Operators are participating in regular Civil Defense Communications Training exercises on a continuing basis, providing technical aid and an operational equipment pool for the State's disaster preparedness program.

The West Gulf Division of the American Radio Relay League, the largest organization of licensed amateur radio operators, is conducting its annual convention at the Ion of the Sea Club in Arlington on July 2-4. Amateur operators from most of the 46 continental states will be in attendance.

WHEREFORE, I, as Governor of Texas, do hereby designate the period May 29-June 4, 1966, as

AMATEUR RADIO WEEK

in Texas.



In official recognition whereof, I hereby affix my signature this 29th day of May, 1966.

John Connally
Governor of Texas

This document declares amateur radio week in Texas, for May 29 through June 4, the last three days of which coincided with the ARRL West Gulf Division Convention at Arlington, West Gulf Director W5QKF, W5GQJ, and W5TQN of the Texas Office of Defense and Disaster Relief, Convention Chairman W5DCH, WA5HPZ, K5ZKS and 4th Army Mars Director R. B. Belk were in on the signing by Governor John Connally.

of June 19-25 as Amateur Radio Week in his state. (The proclamation came, however, on the heels of Governor Breathitt's veto of a call-letter license plate bill.)

Amateur Radio Week was June 20-26 in Meridian, Mississippi and is the first week in August in Winchester, Virginia.

Florida, one of the most consistent states at declaring Amateur Radio Week, again obliged with a proclamation by Governor Haydon Burns setting aside June 19-25 for this purpose. One of its chief cities, Miami, will however celebrate Amateur Radio Week from August 13-21, and will hold a QSL Party in which outsiders working five Miamians can claim a certificate through NOMARC, 776 N. E. 125 Street, North Miami, 33161.

Englewood, N. J. also picked Field Day week, June 19-25, 1966 as its Amateur Radio Week. This city has also been a "regular" in this respect, having declared a Week the past several years.



Governor John Love proclaimed amateur radio week in Colorado June 13-19. Watching the signing are KØZPG, KØWMD (in wheelchair), Rocky Mountain Director WØBWJ and KØUDG.

CB OPERATOR NAILED DESPITE "SKIP CALL"

When the FCC ordered the revocation of CB license KKT-0988, issued to Glenn D. Ward of Houston, Texas, among the violations listed were these: operation as a hobby or diversion, antenna higher than 20 feet, working other stations on intercom channels, discussing technical performance, working skip (more than 150 miles, technically), failure to observe 5-minute silent period, broadcasting, and finally, failure to identify station by its assigned call sign.

The last-named makes it clear that the Commission now has ways to positively identify a station, a tool long needed to catch users of such calls as "Jackrabbit" for illegal operations in the Citizens Radio Service.

The same means of course may be used in prosecuting the occasional bootlegger found on amateur frequencies.

CANADIAN LICENSE FIGURES

Below we present, through the courtesy of Director Eaton, amateur station license figures

by Department of Transport regional offices, as of March 31, 1966, with comparison for earlier years:

Region	1966	1965	1964	1963
Vancouver	1635	1549	1398	1415
Edmonton	1132	1091	1073	986
Winnipeg	1252	1283	1201	1193
Toronto	4313	4149	3907	3742
Montreal	2055	1935	1890	1773
Moncton	1306	1273	1161	1073
Shipboard VEØ	11	8	10	26

TOTALS 11,693 11,280 10,640 10,208

This represents an increase of only 3.66%, a sharp decrease from last year when the increase was approximately 6% and very much less than the "normal" increase of about 8%. The reasons for slowed growth of the amateur service are obscure, particularly in respect to Canada.

CIVIL JUDGMENT AGAINST CB LICENSEE

The United States District Court, Western District of Kentucky, Owensboro, has entered a civil judgment against David P. Killough for failure to pay a forfeiture levied by FCC for rules violation. The judgment calls for payment of \$100 plus interest at 6% on any unpaid principal from date of judgment until paid. The Commission has also issued a Order to Show Cause looking toward revocation of the station license in the Citizens Radio Service for failure to pay the forfeiture and for repeated violation of the rules.

OVERSEAS AND ABSENTEE BALLOTS

As we reported in "League Lines" last month, all ARRL members who are licensed by FCC or DOT but are temporarily resident outside the U.S. or Canada are now eligible for Full Membership. These members overseas who arrange to be listed as Full Members in an appropriate division prior to September 20 will be able to vote this year where elections are being held.

Even within the U.S., Full Members temporarily resident outside the ARRL division they consider home may now notify the Secretary prior to September 20, giving the current QST address and the reason why another division is considered home (e.g., holding an amateur call appropriate to the division). So if your home division is the Central, Hudson, New England, Northwestern, Roanoke, Rocky Mountain, Southwestern or West Gulf, but your QST goes elsewhere because of a different residence, please let the Secretary know, as soon as possible but no later than September 20, so you'll receive a ballot for your home division.

REPORT OF THE MEMBERSHIP AND PUBLICATION COMMITTEE

The Membership and Publications Committee had no assignment concerning publications as none were in the planning at the present time except the operating manual which is soon to be released.

This Committee feels there is much that can and should be done in regard to membership in the League.

Director Spencer and Director Smith as well as other directors have used their vice-directors and SCMs to advantage in getting new members, as well as old members to rejoin. The use of the vice-directors and SCMs under the supervision of the director of the respective division would enhance their value as elected officials and at the same time give each of them a feeling he had a place in the League family of elected officials.

This Committee recommends to the headquarters staff in charge that a system of self-addressed envelopes to the League be used, postage to be paid by the League on receipt, and the data required for membership be printed on the inside portion of the envelopes. This system would require an amateur to only put in his check or money for this League membership. The present system tends to encourage the amateur to set his renewal notice aside or his desire to become a member of the League if and when he finds time to address an envelope, put in his renewal notice and enclose the amount due.

We recommend the proposed membership campaign as proposed by the General Manager and Headquarters staff. This plan calls for an award to be given a club for obtaining new memberships in the League. We feel this plan has merits and should be given as much publicity as possible when it is finished up.

At the Board meeting in 1964 Director Smith moved "that consideration be given to an ARRL field corps, composed of prominent radio amateurs and elected League officials and augmented by the Headquarters staff, for the purpose of maintaining liaison with member and non-member amateur groups, to appear before civic organizations, service clubs and school science groups for the specific purpose of upgrading the public image of amateur radio and increasing the stature of the amateur service and the League in the public interest, convenience and necessity." This was advocated in the report made by the Public Relations Committee and passed unanimously by the Board.

Your Committee feels that more effort should be made by the officers and Headquarters staff to further implement this motion. It could serve well to increase membership in the League.

This Committee also recommends that an application form for membership be inserted in *QST* monthly for a one-year test period. Especially should this be done in the several issues before Christmas whereby League memberships could be given as a Christmas present. Also an order blank for *QST* publications should be published.

It has been a pleasure to serve on this Committee during the past year.

Respectfully submitted,
ROEMER O. BEST, Chairman
HARRY ENGWICHT
PHIL SPENCER

REPORT OF THE OFFICIAL AVAILABILITY COMMITTEE

The Official Availability Committee received a total of 26 names for consideration and investigation of eligibility under the Articles and By-Laws. No

names were recommended for consideration as Vice-President; therefore, all inquiry has been directed to the consideration of a President for ARRL/IARU.

After careful checks of membership continuity and conflict of interest the list of names was further screened for individual willingness to serve as a volunteer League officer in the event of nomination and election.

The names of five members of the present Board of Directors were received by the Committee, as follows: Roemer O. Best, Charles G. Compton, Gilbert L. Crossley, Robert W. Denniston and Wayland M. Groves. Director Best requested that his name be deleted in deference to the candidacy of Mr. Groves and Director Crossley requested that his name be withdrawn from consideration. In addition, Mr. Lloyd Colvin, W6KG, and Mr. Ray Meyers, W6MLZ, were found to be eligible for consideration and have expressed a willingness to accept the office of President of ARRL/IARU if nominated and elected.

The Committee does not recommend one potential candidate over another and presents this final report of availability for your information in the selection of nominees.

Respectfully submitted,
CARL L. SMITH, Chairman
GILBERT CROSSLEY
PHILIP SPENCER

REPORT OF THE PLANNING COMMITTEE

The Board of Directors
American Radio Relay League

The committee was assigned three items by the 1965 Board for study.

Par. 11 of the Minutes, a study of the status of amateurs in the Caribbean and Pacific areas.

The committee is sympathetic to the desires of certain full members, who are temporarily assigned to duties overseas and subject to a satisfactory administrative procedure being evolved, RECOMMENDS, they be granted the rights and privileges of voting in their home divisions.

Par. 56 of the Minutes, a study of the problem of divisional geographical limits and membership proportion therein.



Wish we could give you this picture in Living Color! (Pardon us, RCA.) The Wouff Hong team at the National Convention comprised "His High Potential," W1VRK; "QRM," W1KCO; "The Old Man," W1HKG; "Novice," W1QA (I); "QRN," W1THT and "Crystal," K1LDC.



W1GPZ (r) won the grand award of the ARRL National Convention, a trip for two to KP4. New England Director W1QV makes the presentation.

The committee gave careful consideration to the re-districting of the present League Divisions, with the view to making divisions more nearly equal from the point of view of members therein.

While certain divisions are unusually large and others unusually small, both in number of members and physical size, it could see no way of improving the present boundaries without major changes.

Since the present system is working reasonably well, the committee felt that the present divisional setup was adequate, and no particular advantage would be gained by the re-distribution at this time.

If re-districting is found desirable at a later date, the plan should be submitted to the membership at large in the respective divisions affected for their decisions as to which division they should belong.

Par. 58 of the Minutes, a study of the feasibility of adding ARRL member participants to the Contest Committee.

After careful consideration, the committee recommends that the Contest Committee continue to be composed of Headquarters personnel in order to assure continuance of close coordination, rapid action when necessary, and decision making for the good of all amateur radio.

Respectfully submitted,
 GILBERT L. CROSSLEY, Chairman
 NOEL B. EATON
 ROBERT B. THURSTON
 ROBERT W. DENNISTON

FINANCE COMMITTEE REPORT

During the past year the Finance Committee has corresponded between its members and the Treasurer and has met once — all without expense to the League. The Treasurer has submitted monthly cash balances of the operating fund to the Committee Chairman as has been his custom.

There have been no changes in our portfolio insofar as purchases or sales of equities are concerned. But the committee has considered the make up of our portfolio. For a number of years our security funds have been invested primarily in utilities and bank stocks. This policy has been pursued because of By-Law 29 which states in part that surplus funds of the League shall be invested and reinvested in securities of the variety in which a life insurance company is authorized by law to invest. In a rather strict interpretation this was construed to mean bank and utility stocks.

During the past decade most funds, trusts, etc. have extended their diversification to include industrial issues in their portfolios. As a matter of fact, industrial equities now account for the largest part of most portfolios. In view of this fact, it is apparent that our initial investment policy is out-of-date and needs to be revised to accommodate modern day investment philosophy.

In order to insure adequate and conservative latitude in our portfolio investments in the future, the Finance Committee recommends that the board make possible the inclusion of industrial issues in our portfolio. Specifically, it is recommended that the last seventeen words in By-Law 29 be stricken and substituted therefor be: "... in any bonds, or stocks, or other securities as would be selected by a Trustee with the care of a prudent investor."

Respectfully submitted,
 P. L. ANDERSON, JR., Chairman
 ROBERT YORK CHAPMAN
 HOWARD E. SHEPHERD, JR.

REPORT OF THE PUBLIC RELATIONS COMMITTEE

At the 1965 Board meeting, authorization was provided to engage professional consultation in the field of public relations.

Several firms offering consultation services were reviewed. In September, 1965, the firm of Don Waters and Associates were engaged to perform a pilot survey and report their findings. The results of the initial survey were reviewed and the Executive Committee concurred that the survey be extended to diversified geographical areas of the U. S. In February, 1966, the final report was submitted to the staff and Directors. A summary of the survey was presented to the membership in the May, 1966 QST.

The survey report suggests that a program be undertaken to improve communication with the membership. Mr. Don Waters has had several sessions with staff writers on correspondence techniques and will continue contact in this area as required. The recommended actions should be carefully evaluated and activated at an early date.

(Continued on page 132)



Governor John Volpe presents the Amateur Radio Week in Massachusetts proclamation to W1HKC, co-chairman of the National Convention.

Building Fund Progress



IN MID-JUNE the Midwest Division became the tenth ARRL division to achieve 100% of its assigned quota in the Building Fund Drive. Robert Denniston, W0NWX, Midwest Division director until his recent election to the ARRL presidency, while attending the Rocky Mountain Division Convention in Colorado Springs presented Hq. representative W1IKE with a check summing up the individual contributions of several division amateurs. It was this check which

put Midwest over the top. A concerted drive in recent weeks, engineered by Assistant Director W0MVG, was responsible for contributions from a sizeable number of the Midwest gang.

These divisions are now on the Honor Roll:

Canada	New England
Dakota	Northwestern
Delta	Pacific
Hudson	Roanoke
Midwest	Rocky Mountain

Because of the Milwaukee Plan (see p. 76, June 1966 *QST*) the Central Division has made great progress during the past couple of months, and if it keeps up this pace will make the grade in a short time.

The Houston Plan

The state of Texas, not to be outdone by anyone, has an offer by a group of ARRL-dedicated Houston amateurs to match dollar-for-dollar any future contribution made from the West Gulf division. Because of the matching fund arrangement that already exists, this means that any one dollar contributed by a West Gulf division resident will grow to four dollars when it reaches ARRL Hq. Anyone from the West Gulf division who would like to participate in this matching fund arrangement should make his contribution payable to the ARRL Building Fund, but should send his contribution via Director Best, W5QKF (address on page 8 of this issue of *QST*) for collection and tabulation.

Members Are Saying . . .

Please [find enclosed] check . . . to be applied to the Building Fund, contributed by the members of the Illiana Teleprinter Society . . . We are proud to present it to you with our good wishes. — W9UXW

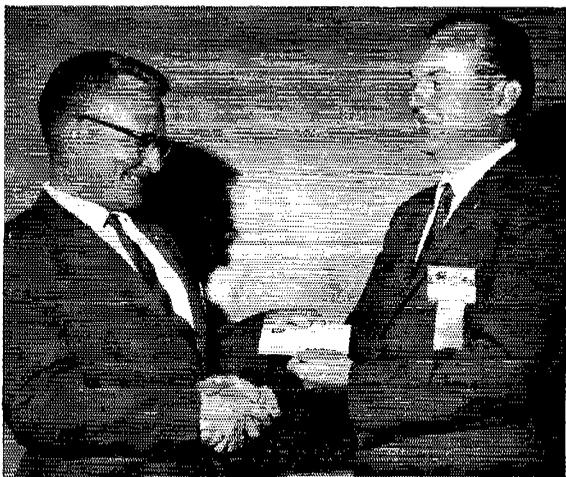
At the regular meeting of our radio club [the Marion Amateur Radio Club], they voted unanimously to make another contribution to your Building Fund. — W4SCUX

On the occasion of my 34th year as a licensed amateur, I am enclosing my second contribution to the Building Fund. My many happy years of amateur radio have been enhanced by *QST*, which I look forward to receiving each month and generally read from cover to cover. Thanks a million for your untiring efforts in behalf of amateur radio and best wishes for continued success. — W6RCV

The Detroit Amateur Radio Association is happy to send the League its second substantial contribution to the League Building Fund . . . — W5MGQ

Enclosed find check for annual dues [and] Building Fund. Yours has indeed been a shining beacon in the darkness of my first year as an amateur operator. — W1N2QQW

A few bucks for the Building Fund. I and my friends are in back of ARRL 100%. — W0LFQ



Here W1IKE receives from W0NWX the check which put the Midwest Division over the top in its Building Fund drive. The presentation took place at the Rocky Mountain Division convention in Colorado Springs on June 19.

I.A.R.U. News



INTERNATIONAL AMATEUR RADIO UNION

REGION I CONFERENCE—OPATIJA

Seventeen national amateur societies were officially represented at the Region I Conference, held at Opatija, Yugoslavia, on May 23-28: Austria, Belgium, Finland, France, Germany, Ghana, Great Britain, Ireland, Italy, Netherlands, Nigeria, Norway, Poland, Sweden, Switzerland, U.S.S.R. and Yugoslavia. Observers were present from Algeria, Czechoslovakia, IARU Headquarters (ARRL) and Region II.



RAEM, president of the Radio Sports Federation (U.S.S.R.) and holder of the Soviet Gold Star, exchanges QSL cards with IARU/ARRL president WØNWX.

The defense of amateur frequencies, and the internal organization of Region I IARU to accomplish this purpose, were major items of discussion in Committee A—Administrative and Operational. There is a continually-growing awareness of the frequency allocation problem, and the need for closer liaison between amateur societies and their respective telecommunications authorities. The conference continued its fund for expenses covering a team of observers at appropriate future ITU conferences. Each Region I society currently seeks competent personnel for the observer team, preferably with some professional background.

It was agreed that the Executive Committee would prepare a comprehensive paper on the benefits of the amateur service, for use at conferences as well as by individual societies in their work with authorities. Headquarters will attempt to provide some background material of its own.

Other subjects receiving considerable attention included continuation of efforts to stimulate growth of amateur radio in "new and developing" countries; increased efforts to search out and file complaints on non-amateur activity in

the amateur bands; a proposal to hire a part-time manager for Region I affairs, the volunteer efforts of the past having been adequate but simply too great a burden on the individuals concerned; dues assessments—it was agreed to raise the per-member amount from 50 to 75 Swiss centimes (equal to approximately 18 cents U.S.); the *Region I Bulletin*; QSL card handling and postage costs; foxhunts (transmitter hunts, a highly popular and strenuous sport in Eastern Europe); contest rules; and several other matters of a primarily internal nature.

SM5ZD was elected Chairman for the next three years; G2BVN was named Vice Chairman; G6CL, Secretary; PA0DD, Treasurer; and DL3NE and YU1AA, additional members of the Executive Committee. It was agreed that the

Qu'est-ce que
L'EMISSION D'AMATEUR ?

EDITE PAR LE RESEAU DES EMETTEURS FRANCAIS

2 P. 42.00 PARIS N. F.

An attractive and informative booklet, "What Is Amateur Radio?" is made available by the *Reseau des Emetteurs Francais* at conventions, fairs, and meetings. Though designed primarily for distribution in France, the booklet is also used to explain amateur radio to French-speaking people in Africa and elsewhere.



Conference Secretary G6CL addresses the delegates. Members of the Executive Committee, l. to r., are DL1XJ, vice-chairman (and newly-elected chairman) SMSZD, host society president YU1AA, honorary conference chairman (and honorary president of the Savez Radioamatera Jugoslavije) YU1A, retiring chairman HB9GA, F9DW.

1969 Region I Conference would be held in Brussels, Belgium.

Aside from the very tangible accomplishments of the conference, observers from Headquarters were again greatly impressed by the ability of dedicated men of so many different backgrounds, interests and languages to cooperate so fully. The overall success of the conference speaks well for the growing strength of IARU in Region I.

The host society, Savez Radioamatera Jugoslavije, is due a word of commendation on the excellent arrangements made for the conference.

INDIA/ISRAEL — U.S. RECIPROCIY

The United States has signed reciprocal operating agreements with India and Israel, effective May 25 and June 15, respectively.

U.S. reciprocal operating agreements currently exist with Australia, Belgium, Bolivia, Canada, Colombia, Costa Rica, the Dominican Republic, Ecuador, France, India, Israel, Luxembourg, Paraguay, Peru, Portugal, Sierra Leone and the United Kingdom. Several other foreign countries grant FCC licenses amateur radio

operating privileges on a courtesy basis; write Headquarters for details concerning a particular place.

1966 IARC CONVENTION—GENEVA

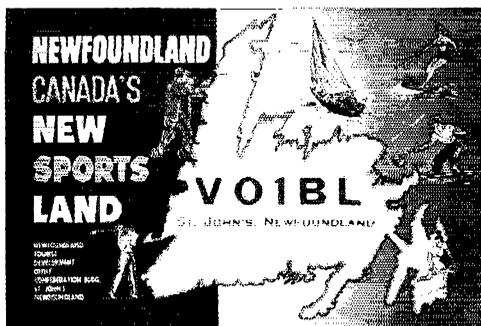
The International Amateur Radio Club (4U1ITU) will hold its annual convention in Geneva, Switzerland, August 26-28. Participants will have the opportunity to discuss various subjects, attend lectures, tour scientific installations and take part in numerous other interesting aspects of the program. Plans have also been made for a reception at ITU headquarters, and a dinner and dance at a Geneva restaurant.

Those interested in attending should contact the International Amateur Radio Club, Box 6, 1211 Geneva 20, Switzerland, for complete information.

— — —

GI3NSM has undertaken a monthly magazine, *Q-FIVE*, with coverage of DX, v.h.f., new equipment reviews and numerous interesting articles, primarily for amateurs in Ireland and Northern Ireland. Those wishing more information should write to *Q-FIVE* Magazine, 54 Orby Road, Belfast 5, Northern Ireland.

QST



The province of Newfoundland and Labrador, in Canada, is currently inviting former residents to revisit Newfoundland and Labrador during 1966. The Society of Newfoundland Radio Amateurs has developed this attractive, multi-colored, double-fold QSL card, now being used by many VO1 and VO2 amateurs, to help publicize the "Come Home Year" celebration.

Strays

If you attended the recent ARRL Southwestern Division Convention in Anaheim, California, you may have heard strange noises coming from the booth area around the Quarter Century Wireless Association display. The Southern California Chapter of QCWA had a booth displaying a couple of dozen telegraph, spark and radio keys from the museum of Louise Moreau, WB6BBO, a 150- to 1000-meter Grebe tuner and a 2-stage audio amplifier belonging to Vance Phillips, W6GH, and a rotary

spark-gap transmitter belonging to Col. Fred Elser, W6FB. The spark-gap transmitter was operated for 30 seconds each hour during the convention as authorized by the FCC. During the convention, Mr. Mack Schaefer, who held the call "US" in 1912 and later W6VI, donated some rare wireless antiques to the Chapter museum. Among the items were the original coherer used by Marconi to receive the letter "S" across the Atlantic, and the first double-plate audion made by Dr. DeForest in 1912.



Correspondence From Members -

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

ELECTRICAL INTERFERENCE

☐ "Electrical Interference" was the best yet on this subject. Shortly after reading the article I had the experience of tuning the 15-meter band and finding it covered. After three days of frustration, with the buzz starting at daybreak and disappearing at sundown, I reread WA6FQG's two-part article. Thus fortified, I began the detective process. Using a neighbor's portable short-wave receiver I exonerated my own house. Within an hour I located the source — an arc type street lamp two blocks away. The light-sensitive switch controlling the light was not opening fully, thereby arcing over but leaving the street light burning during daylight. At sundown the switch closed normally — therefore no interference at night.

One problem not covered by WA6FQG is how one explains to a radio car patrolman at 8 A.M. on a beautiful Sunday morning why one is standing at an intersection, with a portable radio, turning in circles. All ended well, however, when the policeman radioed headquarters, who called the utility company. Within twenty minutes three days of frustration came to a happy ending — no buzz covering the 15-meter DX, thanks to the utility company, and a radio patrolman who drove away with a quizzical expression and muttering something about "the craziest things happen on Sunday mornings." — *Al Dobrof, WA2PNY, Mount Vernon, New York.*

(EDITOR'S NOTE: To further assist in the general problem, Hq. is reprinting the two-part article for distribution to power company officials through their association.)

BEWARE VK1 PIRATES

☐ During the last three years a vast number of QSL cards have arrived and are still arriving at the Canberra Radio Society for stations with VK1 call signs which have never been issued by the licensing authority.

A check of the hundreds of cards received shows no less than 90 (ninety) different illegal call signs have been used. While Pacific area stations have given strong signal reports to some of the illegal transmitters, indicating that they may be operating from Australia, others have received similar S8 or S9 reports from European and U.S. stations. Indications are that a VK1 call sign is popular amongst illicit operators around the world.

The actual number of licensed stations in the Australian Capital Territory is currently 61, of which about only a dozen are active on the h.f. bands with any regularity. It can be seen that there are one and a half times more illegal VK1s than legal operators.

All stations are urged to treat with caution contacts with VK1 stations whose calls do not appear in the latest call book, but allowing for the possibility of newly issued call signs. — *John Weatherlen, VK1QL, Secretary, Canberra Radio Society, Canberra, Australian Capital Territory.*

THE INVISIBLE AUTHOR SPEAKS

☐ As the author of "The Invisible Tower," in April *QST*, I thought readers might be interested in some criticisms received. One is that even though we succeeded in making the tower invisible by means of the special paint, it would still cast a shadow in bright sunlight. This is a valid criticism and must be taken seriously.

Another criticism must also be taken seriously. Suppose we were to choose a paint whose frequency is below the visible portion of the spectrum. If one were to approach a tower painted with this paint in an airplane, or even in a rapidly moving automobile, the Doppler effect would shift the frequency *up* into the visible region and the tower would be visible as long as it was being approached. If the frequency of the paint were above the visible portion of the spectrum, then a person moving away from the tower at considerable speed would see the tower because the Doppler effect would shift the frequency *down* into the visible portion of the spectrum.

A partial solution to the Doppler dilemma suggests itself. As has been noted above, if one selects a paint having a frequency above that of the visible portion of the spectrum, he would see it only while traveling away from the tower. Obviously most forward-looking individuals would not see the tower since it would be in back of them. Since I like to believe that most of my fellow citizens are forward-looking individuals, this may take care of the problem in 99 percent of the cases. I have no solution for the few shifty types who are not forward-looking individuals. — *Ralph H. Turner, W8HXC, Oberlin, Ohio.*

(EDITOR'S NOTE: *Western Paint Review* was intrigued with Turner's April article and is reprinting it for the industry — perhaps we *will* have such a product on the market some day!)

EXTRA HOPE

☐ This is written in hope that it will displace apathy and procrastination with hope in the minds of many amateurs desiring the Extra Class license.

Electronics in the case of the writer is strictly a hobby and after having read recent articles in *QST* pertaining to the Extra Class examination, hope of ever possessing such license seemed remote indeed. Yet with very little preparation I passed the examination on the first try. Sure, there are some real sticky questions that only an engineer could understand, but they are few and far between. Any question that so much as contained a problem involving Ohm's law remained unanswered on the writer's exam paper. Previous articles have gone to great lengths to elaborate on these few sticky questions and have made no mention of the many easy ones. Remember, 74% is a passing grade!

There is one area in which I must agree with what I have read on the subject: you cannot Q & A this examination. An open book test, in itself, would not insure success. It is also understandable that a qualified electrical engineer without amateur

experience would find the exam very difficult. The exam is well written and pertains to problems any active amateur has faced or will face.

. . . I would say that anyone who meets all of the following qualifications has an excellent chance of making a passing grade:

- 1) Can copy code at 20 w.p.m.
- 2) Has been an *active* amateur for several years.
- 3) Is willing to spend an hour or two studying FCC regulations (frequency allocations, third-party traffic, etc.)
- 4) Has built some electronic equipment (not kit form).
- 5) Can draw a schematic diagram of an r.f. amplifier and full-wave rectifier, *without* first looking it up.
- 6) Can draw a block diagram of an s.s.b. exciter and a.m. transmitter *without* looking it up.
- 7) Can list six or more precautions that may be taken in the design of an r.f. amplifier to prevent harmonic radiation and/or TVI.
- 8) Is willing to spend \$4.00.

—George P. Neidhardt, W4MPV, Valley Station, Kentucky.

☞ As a result of the *QNT* article several months ago on the Amateur Extra Class, I finally got up enough steam and courage to take the step. I failed the code the first time, but the next try it was smooth sailing. I recommend this exhilarating experience for all Conditionals and Generals. —J. Bradley Flippin, K6IIPR/4, Falls Church, Va.
P.S.: I never would have made it without WIAW and the *License Manual*.

WANTED: OLD-TIME HAM HUMOR

☞ Back in 1909, I was an amateur radio operator, in Cleveland, Ohio. I used a Ford spark coil for a "transmitter" and a "Mother's Oats" curtain for winding on some wires, complete with a "slider," so I could tune somebody in. Those were the days when they had no licenses or radio inspectors. We hams operated anywhere from 100 to 600 meters, and most of the time we never knew just where we were. We finally got to the advanced point where we threw away our hunk of silicon and discovered galena . . .

. . . I have been collecting all the *humorous* stories I could about old-time amateur radio. I have a project in mind. I think some of the humorous adventures of us old-timers should be preserved for posterity—just why, I wouldn't know . . . I have a fair accumulation of old-time amateur radio stories I believe should be published. Our ARRL has been something that should go down into history.

If some old-timers would write me about any humorous experiences they have had (and I'm sure they all have had them). I will try to assemble them into a book, and give each one of them credit for their contributions. The only thing I request is that they be humorous.

I think even the newest hams would be more than interested in what we guys tried to do in the old days . . . —Haydn P. Roberts, Apt. 106, 1998 Pacific Avenue, San Francisco, California 94109.

THANKS

☞ It is hard to express my thanks for the services you provide. I credit your nightly WIAW code practice as the factor that made the difference between staying a Technician or advancing to the

fun and QRM on the h.f. bands . . . —George Gorsline, Jr., WABSCB, Athens, Ohio.

☞ I have been an ARRL member for almost a year . . . thank you and everyone connected in the sending of WIAW code practice, which I copy every night. Without it, it would have been impossible for me to pass my General examination. I very rarely have a problem in its reception. Keep up the good work! —Roger Coe, WN2TWK, Hicksville, New York.

☞ I would like to express my gratitude for your daily code practice runs. Without them I would not have passed my General. I now have my speed up to 20 words per minute, and intend to go higher.

I have been in the ARRL for only one year, and have already received my dues back many times in information and help . . . —Mark Petruzzi, W1EXA, Waterbury, Connecticut.

☞ . . . Thank you very much for the help you have given me in getting my Novice and later my General Class license. I am now working on starting a club and the information you have given me is most helpful. I hope to write soon for my WAS . . . Richard Goeggel, W1ØNOH, Overland, Missouri.

VK6WS: OLDEST ACTIVE AMATEUR?

☞ It has occurred to me that it would be very interesting to know who is the oldest active licensed amateur in the world. In West Australia we have a candidate for the title in the person of an ex-president and life member of the W.A. division, Wireless Institute of Australia: VK6WS, William Schofield, who is 92 years of age. From the early 1930s to 1962, except for the war years, he was very active on the lower frequencies and was well known in most parts of the world as "Skipper." He became blind and had to cease his activity on the lower frequencies but is still active on 52 Mc., operating daily, entirely by touch . . . W. E. Cowan, VK6AG, Claremont, West Australia.

QZZ?

☞ Due to the crowded band conditions we fight today there should be a new Q-signal added to the list.

When tuning our phone bands for a clear frequency to call CQ, if a CQ is necessary, one has only to zero-beat and ask "Is anyone using this frequency?" This is all well and good on phone but not practical on c.w. For example, after listening to what seems to be a clear frequency on c.w., and upon calling CQ, a mob of stations come back and tell you that you are on the frequency of a DX station who is listening five to ten kilocycles up.

No station wants to willfully cause QRM to another station, so a Q-signal such as "QZZ? DE K9CZV K" could be sent meaning "Is this frequency being used?" If the frequency was in use the station would be informed about it and would then QSY. This should cause much less QRM and would, therefore, allow many more QSOs. —Michael T. Schwartz, K9CZV, Chicago, Illinois.

DXCC COMMENTS

☞ I have heard that some DXers are not very pleased with your change of the DXCC rules. I would like to express my satisfaction with most of your thoughts on page 88, January *QST*.

It is certainly no longer necessary to encourage phone operation. On the contrary, I would like to

(Continued on page 130)



Hints and Kinks

For the Experimenter



SOLDERING AID

AN excellent "third hand" for soldering purposes or for the support of small assemblies or circuit boards may be purchased in most hardware or dime stores for less than a quarter. The soldering aid consists of a large clip of the type used on clipboards, which is fastened to a one-inch-diameter circular magnet. In addition to having a strong spring action and being able to be supported by any heavy ferrous-based tool or object, the clip is an excellent thermal sink for temperature-sensitive components.

— Erling R. Jacobsen, K4OJY/9

WORK LIGHT

WHEN examining complex wiring in ham equipment, especially with a magnifying glass, I find the use of an ordinary 60-watt light bulb in the 5-inch reflector of a floodlight holder to be far superior than any flashlight. Floodlight reflectors come in various sizes from 5 to 12 inches in diameter, but all except the smallest are too cumbersome and always in the way. An integral part of the holder is a swivel mounting clamp which permits the floodlight to be easily positioned and frees one hand for other use. Any photography store should be able to supply the needed parts for the work light.

— Wm. K. Thomas, W3RV

DUAL-VOLTAGE D.C. SUPPLY

RECENTLY I built a linear amplifier requiring a small bias voltage on four 811A's, along with a d.c. supply to operate an antenna relay which evidenced the customary hum in its normal a.c. operation, but which operated quietly on d.c. A back-to-back arrangement of two 6.3-volt filament transformers would not work in the usual configuration. Since the filament transformer supplying the 811A's had its center tap grounded, only 3.15 volts would be available for a half-wave diode rectifier.

My solution is shown in Fig. 1. The secondary of filament transformer T_2 acts as an auto-transformer to give 6.3 volts for the bias rectifier. One end of T_2 's 6.3-volt winding is connected to

the grounded center tap of the 811A transformer, T_1 , and the center tap of T_2 is tied to one end of the secondary of T_1 .

— George H. Goldstone, W8MGQ

POWER FEED FOR ANTENNA-MOUNTED PREAMPLIFIER

AN r.f. amplifier mounted at the antenna is a low-cost way to beat the line-loss problem in u.h.f. reception. Since the overall system noise figure is determined almost entirely by the first r.f. stage, putting this amplifier at the antenna permits use of ordinary coaxial line for the run between the station and the antenna. This is particularly effective for crossband work, as with Oscar IV, where no switching from transmit to receive is required.

Pete Radcliffe, VESBY, solved the problem of feeding voltage up to such an amplifier in a simple manner in his Oscar IV monitoring system. He connected a coaxial T fitting at the station end of the coax, and fed the d.c. for the preamplifier into one end of the fitting through an r.f. choke. The collector circuit of his antenna preamplifier is capacitively coupled to the output terminal. Therefore, the d.c. for the amplifier is taken off through another r.f. choke, connected to the inner conductor of the coaxial fitting.

Much of the time since this preamplifier was installed, the temperature at Yellowknife, N.W.T., was between 40 and 50 degrees below zero, which put Pete's 2N3399 transistor out of business, but on "warmer" days the antenna-mounted preamp helped markedly in reception of Oscar IV.

— WHDQ

CLEANING CRACKLE FINISHES

WHEN crackle finishes need cleaning, try using an art-gum eraser. The eraser doesn't appear to harm the paint and the refinished surface looks like new.

— Ray Tripp, VE3POH

Fig. 1.—W8MGQ's dual-voltage d.c. supply.

- CR₁—50 p.i.v. 500-ma. silicon.
- CR₂—400 p.i.v. 500-ma. silicon.
- K₁—Antenna relay.
- R₁—Value dependent upon relay requirements.
- T₁—6.3 v. at 20 a.
- T₂—6.3 v. at 1 a.

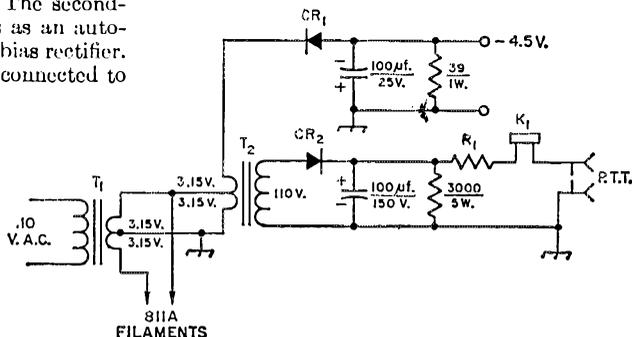
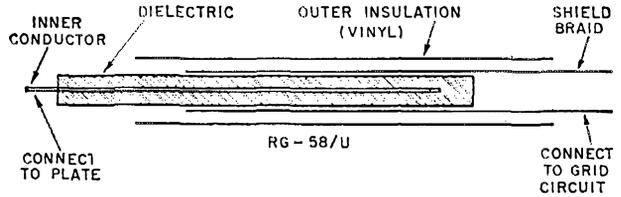


Fig. 2.—Cross-sectional view of RG-58/U coaxial neutralizing capacitor.



COAXIAL NEUTRALIZING CAPACITOR

DURING the construction of my linear amplifier I came up against the familiar problem of obtaining a neutralizing capacitor. I needed a capacitor of 10 to 15 pf. with a voltage rating of 2000 volts. Now RG-58/U has a capacitance of 28.5 pf. per foot and a voltage rating of 1900 volts (r.m.s.), so I figured that six inches of it would do the job.

My procedure for making a coaxial neutralizing capacitor is as follows. First determine the length of coax required to provide sufficient capacitance and add 4 inches. Call this length A. Measure the distance between the plate and grid circuit of the amplifier, taking the route the coax will take. Call this length B. Cut the coax to length A or B, whichever is the greater. Remove $\frac{1}{2}$ inch of vinyl insulation and braid from both ends. Strip the dielectric from one end and pull the inner conductor through the dielectric so that the dielectric protrudes beyond the other end of the inner conductor by about $\frac{1}{2}$ inch. Now slide both center conductor and dielectric through the braid for about 2 inches. Then slide the outer insulation over the braid to expose $\frac{1}{2}$ inch of braid at the other end. Fig. 2 shows the relative positions of the various parts of the coax when the capacitor is ready for installation. Connect the braid to the grid circuit and the center conductor to the plate. The capacitance can be varied by sliding the inner conductor together with the dielectric back and forth inside the braid. In the case where the routing of the coax requires a longer length than calculated, the braid and outer insulation should be trimmed to a length 3 inches greater than that required to provide sufficient capacitance. After the amplifier has been neutralized the inner conductor can be trimmed to suit the lead dress, providing the length inside the braid is not disturbed. Depending on lead placement, stray capacitance between the outside of the coax and the plate circuit may reduce the calculated length of coax by an inch or two.

— Mike P. Hughes, VE3EIH/W5

SHAFT COUPLINGS

IN the "Hints and Kinks" column of *QST* for May 1966, WB6GHB mentioned the unavailability of a commercial $\frac{3}{16}$ -inch to $\frac{1}{4}$ -inch shaft coupler. Since then we have been informed that at least two manufacturers produce couplers that will mate $\frac{3}{16}$ - to $\frac{1}{4}$ -inch shafts. Available from Centralab distributors is their model AK-16. The James Millen Manufacturing Company, Inc., makes

three types that are suitable: models 39004-C and 39005-C, which are brass couplings, and type 39016-A, is an insulated coupling. — WJYDS

TELETYPE-PRINTER NOISE REDUCTION

A problem in revamping an old teletype printer for amateur use occurs in reducing the r.f. noise generated by the d.c. motor and governor. Usually most, if not all, of the noise is generated by the governor, which rapidly interrupts the motor circuit. Bypassing and shielding normally does not entirely eradicate this noise. If one does not wish to spend money on an expensive synchronous motor, there is an effective alternate solution using a power transistor. A unit such as the Texas Instruments TI3031 or any similar transistor can be used in the circuit shown in Fig. 3. As long as the maximum collector-current and emitter-to-collector voltage ratings are at least 3 amperes and 50 volts respectively, the transistor should be suitable in this application. Be sure to disconnect the other wires from the governor contacts and to mount the transistor on a heat sink. — Randolph B. Gold, WA8NNR

(Basically the circuit is effective in reducing noise because the transistor does the heavy switching rather than the governor contacts. As the contacts open and close, they interrupt only the small base current flow of the transistor, causing little arcing. In an unmodified circuit, they would break amperes of current, resulting in much noise. When the governor contacts are closed, the transistor is forward biased and almost all the motor current passes through the transistor. When the contacts are opened, the transistor is unbiased and most of the motor current flows through and is limited by the 200-ohm resistor. — Editor.)

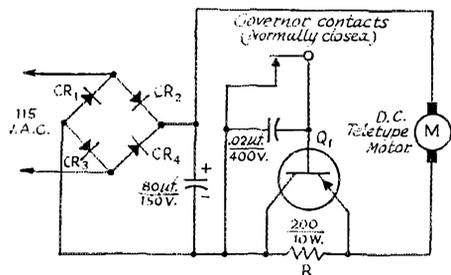


Fig. 3—WA8NNR's system to reduce the r.f. noise generated by the governor contacts of a d.c. motor.

CR₁, CR₂, CR₃, CR₄—200 p.i.v. 2-ampere silicon.
Q₁—Texas Instruments TI3031 or equivalent.



CONDUCTED BY SAM HARRIS,* W1FZJ

50-Mc. F₂ DX Coming?

LAST year predictions for the upcoming sunspot cycle were, to say the least, disheartening. No one saw any likelihood of the m.u.f. reaching 50 Mc. as it has on the last two peaks. This year we have a new group who, with the aid of "orbiting-outside-the-ionosphere" satellite type observatories, is predicting the biggest peak in recorded history. Heretofore predictions as to the size of future sunspot peaks have not been very reliable yardsticks to base your future v.h.f. activities on. As a matter of fact they have been downright unreliable. They also have been uniformly pessimistic. Now someone wants to be optimistic. Obviously he must be a newcomer to the field. Probably hasn't made a thorough study of the last hundred or so cycles and as a result hasn't any preconceived pattern to base his opinions on. So, maybe he's right.

If the new predictions are right we have a year or two to get ready for the big event. The number one project is to find people in other parts of the world who have some portion of the 50-Mc. band available, and convince them that they should be ready to go. The number two project is to find people who do not have the 50-Mc. band but who might be able to get special permission to operate during the peak periods. This means lots of letter writing, lots of DX working and above all lots of salesmanship on your part. After all the band isn't open yet. It's not likely to be open in less than two years, and it may never be open at all.

Sporadic E and the Newcomer

At any given time there is always a fairly large group of active v.h.f.ers who are new to the 50-Mc. band. In the midst of the many band openings in the last few months there has been some confusion concerning sunspots, sporadic-E skip and other DX. Sporadic-E skip yields contacts up to about 1200 miles for single hop and roughly up to twice that for double hop. Sporadic-E occurs, in general, during May, June and July. Every year. With or without sunspots. No one has proven any correlation between sporadic-E and sunspot numbers. Sporadic-E can, of course, occur during any part of the year but extensive openings at times other than spring and early summer are rare.

High sunspot activity produces F₂ skip, usually peaking in the fall and winter months. The last sunspot peak was in 1958. The average peak to peak period for the last few cycles has been

about 10 years. On the last peak the m.u.f. (maximum useable frequency) reached 50 Mc. in 1956. If the current cycle is as big or bigger than the last we could see the m.u.f. approaching 50 Mc. late in 1966. For more details, your attention is directed to *The Radio Amateurs V.H.F. Manual*, Chapter 2.

Oscar IV — Transatlantic

Just to prove that c.w. is faster than international mail we submit the final confirmation of the crossband 144/432-Mc. Oscar IV-satellite contact between K2GUN and UP2ON in Lithuania on December 22, 1965. This is probably

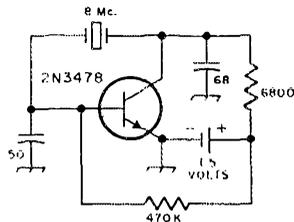
TO RADIO K2GUN
 Confirming our CW: FONE: 2X503 QSO VIA OSCAR IV
 of 22th of Dec 1965 at 144/432 Mc. (2nd cycle)
 on 144/432 Mc. Ur R 2.874 + 9
 Tx 1 KW Input PA 12-14B
 Rx 2000 Mc 55 db Ant. 45' -13.6 db-144
 15-11 432
 Pse. Tnx QSL via P. O. B. 98 Moscow
 Best 73 es fb dx! Valdas Simonis
 K2GUNA, FONE: 65-738

Copy of QSL confirming contact via Oscar IV between UP2ON and K2GUN.

the longest-distance contact made through Oscar IV and is the first v.h.f. exchange between the U.S.A. and U.S.S.R. via any mode. Warren also reported reception of HB9RG and SM7OCQ (?) during later passes.

OES Note of the Month

In search for a very weak signal source at 432 Mc., W4HHK, Collierville, Tenn., tried using a 2N3478 in an untuned oscillator circuit originally described in September '63 *QST*. Using an 8-Mc. crystal, the 54th harmonic on 432 Mc. can be heard when unit is positioned in front of the



Circuit for beacon-signal generator used by OES Paul Wilson, W4HHK.

* P.O. Box 1738, Arecibo, Puerto Rico 09613

dish a short distance away. Antenna on the oscillator is a $\frac{1}{4}$ wave length. D.c. power input to oscillator is 90 microamps at 1.55 volts or .139 milliwatt. Wonder what output is at 432 Mc.? Oscillator unit has been placed in a plastic container and mounted on the two-meter tower near the dish platform, to provide a reference signal for checking the dish system.

It has been brought to our attention that within the past couple of years we have seldom mentioned the OES reports received. Our apologies to the many OESers who have been so faithful about submitting same. The greater part of this section of the v.h.f. column is made up from these reports and if we listed the calls of each and every reporter there would be no room left for the report itself. Those of you who have reported have (mostly) seen your material in print. Those who have noticed the absence of "OES" be assured that the information is coming in and is being used.

144 Mc. and Up

From New England K1YON reports that band conditions on 220 Mc. were quite good on May 18 when he worked W2WOF with good signals both ways. Ted also reports that K1T7D is about ready to go on 220, K2RDX, K3CFA and K4SUM are all working on 432-Mc. antennas, a quad helix at K3CFA and a 32-element colinear extended at K4SUM. Joe, K4SUM noted high activity on 432 and 144 with good conditions on both bands during May. K4LEJQ has completed his 432-Mc. exciter and frequency stability is far better. Bunky operated portable in Virginia recently giving a number of stations their "first" on 144 Mc. He'll be there again soon and is open for skeds on 432 and 144 Mc. W5GAK is working on a 432-Mc. converter and an s.s.b. exciter and crystal filter, and reports that K5HQP and K5SUD are working with 1296-Mc. gear.

A paramp for 1296 Mc. has been completed by WB6ION, who says: "pump frequency is about 10.5 Gc. Diode is a 300-Gc. gallium-arsenide type. Had to increase coupling of diode to signal tank for optimum noise figure. The amplifier improves my T1X 30-24 preamp by a couple of db, when connected in front of it. I tuned it up for maximum pump power with the highest possible antenna coupling. This seems to give best results with respect to noise. Still have some problems with X-band signal getting into the signal tank."

Much building is being done for 432 Mc. and in California W6QJW is working on tracking antennas for 432 and 144 Mc.; WB6CHB/G has completed his two 432-Mc. walkie talkie units and sez that to obtain the freedom to use A2 he replaced the four-contact jack in front panel with a phono jack. WB6HIO is working on a 432-Mc. converter and a quad array of 11-element yagis. A large project undertaken by 17-year-old WA6USU is a 432-Mc. moon-bounce project as a science fair entry. Mike is open to suggestion and help with parts, equipment building and design.

K7ICW and K7NII report from the area: Al, K7ICW, tried wrapping his 432-Mc. converter in cooking foil to eliminate the channel 2 TV interference. Didn't work! He built an r.f.i.-proof copper box, used 57.25-Mc. open stub on the input of his converter, with no discernible improvement. Another project at Al's QTH in Nevada is 1225-Mc. contacts. Rig is an APX-6 with output of 4 watts and a 30-foot dish. Al sez: "A good month for tropo on 144 Mc. Regulars from the southern California area are coming in on s.s.b. rather than c.w. Looks like equipment and antenna improvements are approaching that of 50 Mc." Tom, K7NII, in Arizona is working on a 432-Mc. preamp and a larger antenna for that band.

WB6BOW writes that he never had such a feeling of accomplishment as he did when he made his first 432-Mc. contact. "The distance was only 40 miles but it easily outshines KC4's, FK8's and ZP1's on 20 meters." Rod's rig is a combination of surplus and homebrew with 16-watts input. A 2C39 amplifier is completed and will be plate modulated at the 50-watt level as soon as a suitable modulator is constructed. Antenna is a W6AJF 32-element colinear up 70 feet and the QTH is at the 1800-foot elevation on the northern edge of Los Angeles. Receiver is a Parks converter into an NC-300 receiver. Rod is looking for skeds on 432 Mc. and would like to hear from anyone interested.

There's still more building going on in Michigan (Monroe)

220- and 420 Mc. STANDINGS

220 Mc			420 Mc.					
W1RU	14	5	600	K2UUR	9	3	280	
W1RDQ	12	5	450	W7PUB	2	7	4	500
W1AJR	12	4	480	WA2EUS	7	3	430	
K1JIX	11	4	615	WA2HQE	8	1	280	
K1UCQ	9	3	400	K2HQJ	8	4	250	
K2CBA	16	7	660	K2YCG	6	5	500	
W2AOC	15	5	530	W2YPM	6	3	300	
W28EU	12	5	450	WA2TOV	5	3	140	
W2DZA	12	5	410	K2GGA	4	4	383	
W2NTY	12	5	300	W3MMV	11	5	410	
K2DZM	12	5	400	W3RUE	10	5	470	
W2LWI	12	4	400	K3CLK	9	4	—	
K2KIB	12	4	300	W3FEY	8	4	206	
K2ITP	10	5	265	K3TUV	8	3	310	
K2ITQ	11	5	265	W38ZD	5	4	300	
K2ISA	11	4	300	W3UJG	4	2	350	
K2AXO	9	3	240	W4HHK	9	4	550	
K2JWT	6	2	214	W4TLV	6	2	500	
K2UUC	6	3	210	WA4BYR	6	2	420	
WA2BAH	2	2	200	W4GOO	6	6	415	
K2DJD	4	3	140	W4RFR	5	3	665	
W3FEY	11	5	350	W4TLY	4	3	500	
W3RUE	10	5	480	K4QIF	4	1	285	
K3TUV	10	3	310	W5RCL	16	5	725	
W3LCC	10	3	300	W5AJG	7	3	1010	
W3JYL	8	4	295	W58WV	7	3	525	
W3JZI	4	3	250	W5HTZ	5	3	440	
W4TLC	5	1	315	W5ML	5	1	350	
K4QIF	4	2	500	W5UKQ	3	2	500	
W5AJG	3	2	1050	W6GDO	2	2	385	
K7ICW	4	2	250	W6FZC	1	1	280	
W7AGO	1	1	160	K6GTG	1	1	180	
K8AXU	11	5	1050	W8PPT	11	7	600	
W8PPT	11	5	660	W8YIO	11	6	560	
W9JCS	6	2	340	W8TFY	9	5	580	
VE3BPR	3	3	300	W8YIO	8	5	470	
				W8FWF	6	4	450	
				K8REG	6	4	275	
				W8JLQ	6	3	275	
				W8RQL	6	3	270	
				K8AXU	5	3	660	
				W1AJR	12	4	410	
				W1OOP	11	3	390	
				W1UHE	10	4	430	
				W1HDQ	10	3	250	
				W1QWJ	10	3	230	
				K1JIX	9	3	290	
				W2BLV	13	5	460	
				WA2DTZ	6	3	200	
				K2D M	10	4	370	
				W2RYA	12	4	300	
				K2CBA	9	7	220	
				W2VCG	9	4	280	
				WB2EGZ	9	4	260	
				K9AAJ	9	5	425	
				K9UIF	9	5	390	
				W9GAB	9	4	608	
				WA9HUV	8	5	450	
				WA9AG	8	4	325	
				WA9NKT	7	3	310	
				W9OJI	6	3	330	
				W9IDY	9	5	560	
				K9ITF	3	2	158	
				VE3AIB	5	4	450	
				VE3BQN	5	4	447	
				VE3BFR	4	4	600	

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

where a local group is building preamps (M.A.E.-432-P) to obtain cash for projects at their club station, WA8MTX. Preamps use RCA-40237 transistor, tuned line input and output. If you're interested write to: M.A.E., P.O. Box 586, Monroe, Michigan 48161. W8PT, W8CVQ and K8ZES provide more news from 8 land. W8PT will soon have his 48-element two-meter colinear at 85 feet with a 96-element 432 colinear on back, and two 13-element 220 yagis on a 51-foot tower. Walt, W8CVQ, sez he has finally broken through on 432 Mc. with excellent QSO's with W8PT (35 miles) and W9ZIH (125 miles) with band conditions apparently normal. Frequency at W8CVQ is 432.15 c.w. Two more 17-element 432-Mc. yagis are in the works at K8ZES to be added to the two which are presently up at 100 feet. Sid tells us that he's been copying K4KLM's 432-Mc. signals from Kentucky but John has been unable to copy him although two meters was fair both ways.

In Indiana WA9CJR, WA9CJS, K9OHHY and WA9ABI are all working on 220-Mc. equipment, with transmitters ready to go but receivers still in the works. A long yagi in vertical polarization has been erected at W9PHD for the benefit of the boys in Grand Forks, North Dakota on 144 Mc. Wally sez there are about 15 boys there running low power to vertical beams. W6AIFU/K6HJI is working on a 432-Mc. converter and expects to have his 432 yagi at 60 feet shortly.

W1AZK, K1MTJ, K1OYB, K2HLA, W8PT, W8TBB and WA80L all report Aurora on 144 Mc. during May, with the 31st being the date that most of 'em caught. The boys along the east coast heard mostly 8's, 9's and VE1's and VE3's, with W9BRN being the strongest and most popular; while the 8's were hearing 1's, 2's, 9's and

W's. W9RRN worked two new states, New Hampshire (W1AZK) and Vermont (K1BKK) that night and had two Maine stations, K1MTJ and K1OYB, calling him frantically. Another, but not as good display occurred on May 26 and was followed by good tropo conditions during which time VE1RW and VE1KX stayed up 'till all hours trying to answer all the stations calling them.

Just about all of the 144-Mc. OES reports received mentioned that both conditions and activity are picking up on that band. K3CFA and W8QOH have set up a tightly sked at 0215 GMT to observe propogation conditions on the 250-mile path and to stir up even more activity. If you hear 'em, call 'em. W8QOH runs a kw. on 144.077 and is using two 10-element yagis. K3CFA on 144.011 runs 300 watts to a 24-element colinear. W4AWS reports skip on 144 Mc. on June 6 when he worked W8KAY, W4WNH and W8YTO. K1LXC brings his 144 states up to date with Arkansas being number 30. John still is looking for Tennessee and Vermont to have all states east of the Mississippi on 144 Mc. In Tennessee W1WQZ is working on an s.s.b. rig for 144 so maybe he and K1LXC can get together. W5WAX, W5UGO and WA5IVS, all in Oklahoma, report exceptional conditions on two meters during May. Sam, W5WAX, worked K1LXC on the 4th and W5GYE/4 on the 15th to bring his total up to 13 states worked. He's interested in skeds up to 600 miles and is also looking for M/S skeds. W5UGO had it good on the 21st when Minnesota and Ohio were the two new ones worked. Nothing new worked on the 22nd but eleven states were heard and worked by Larry. A report from WA5IVS tells of the opening of the 22nd when stations in Kansas and Iowa were contacted on two-meters f.m. In Texas K5WXXZ also caught the 21st and 22nd openings during which he worked Nebraska, Iowa and Minnesota. Al also caught several other openings during the month and reiterates strongly that "the big antennas sure pay off." May 15 was the particularly good date for W9JFM on 144 Mc. Gary heard nine states including three new stations from Kentucky whose calls he was unable to copy.

K0MQS and WA0FDY will be operating portable from the extreme southeastern corner of North Dakota during the September V.H.F. QSO Party. They will transmit at 144.210 and receive at 144.145.5 Mc., and will be on the air from 1800 GMT on September 10 until 0400 GMT on September 12. In the event of any kind of tropo conditions stations in 8, 9, and 0 lands should have a good chance of



Bob Vogel, W0UBD (l.) and Jim Froemke, K0MHC, are shown examining thermisters for the Oscar Pulse Code Modulator telemetry unit at the IBM Development Lab. in Rochester, Minn. The 7-channel unit contains 150 transistors and 350 diodes. Future plans are to make use of integrated circuits to reduce the present 5 X 7 X 12-inch size.

2-METER STANDINGS

WIREZ	32	8	1300	K5WXXZ	30	8	1225
W1AZK	29	8	1384	W5DFU	29	9	1300
W1JSM	27	8	1330	K5TOP	26	7	1250
W1AJR	24	7	1130	W5GFX	25	7	1384
W1KGS	24	7	1150	W5UKQ	25	8	1150
W1MEH	24	6	1000	W5SWV	20	5	960
W1MMN	22	8	1200	W5MLL	17	6	700
W1HDD	22	6	1020	W5BEP	16	10	1000
K1ABR	20	6	1140	W5KFTU	15	5	1360
W1AFO	19	6	920	W5WAX	13	5	1010
K1CRQ	19	6	800	W5EJZ	7	4	1375
K1JUG	18	6	1250	W5YYO	7	4	1330
K1AER	17	6	675				
K1MTJ	16	5	1225	W6WSQ	15	5	1300
K1OYB	16	5	1225	W6NLS	12	5	2540
				K6FMS	10	5	1240
W2NLY	37	8	1300	W6TNG	9	5	5250
W2UCY	37	8	1360	W6GDO	6	3	864
W2ORL	37	8	1320	W6AJF	6	3	800
W2BLY	36	8	1020	W6KAP	5	3	1300
K2GQI	35	8	1385	W6MIU	3	2	950
K2LAG	32	6	1710				
W2AZI	29	8	1050	W7JRG	21	6	1275
W7PUA	26	8	1150	K7NTI	19	6	1275
K2CEB	25	8	1200	K7ICV	12	4	1246
W2AMJ	25	5	960	W7LHL	10	4	1170
W2ALB	24	8	1100	K7ZIR	8	5	1130
W2PZE	23	7	1200				
W2LWI	23	7	1050	W8PT	41	9	1260
W2PFG	22	7	1340	W8KAY	39	9	1210
W2E8N	21	6	750	W8FEX	39	8	1225
W2UYH	20	7	880	W8SDJ	37	8	1220
K2HLA	19	6	1005	W8YIO	36	9	1250
W2E8A	19	6	1010	K8AXU	34	9	1275
W2APNW	18	6	1000	W8TAP	24	8	1060
W2LTM	17	7	730	W8AYF	33	9	1155
W2YXS	17	6	720	K8CRQ	31	8	850
K2OEL	16	6	1010	W8NOH	31	8	1090
W2CCO	16	6	750	W8RHW	31	8	860
W2BRAT	16	5	700	W8WNM	25	8	900
K2JVT	16	6	550				
W2JAM	16	5	670	W9WOK	42	9	1170
W2UDT	16	5	556	K9UPF	41	9	1150
				K9SGD	37	9	1100
W3RUE	34	8	1100	K9AAJ	36	9	1200
W3GKP	31	8	1108	W9WDD	35	9	1300
W3TDP	30	8	1125	W9AAG	35	9	1050
W3RYP	30	8	1125	W9GAB	34	9	1075
W3LST	32	6	800	W9CIB	32	8	1060
W3LNA	31	7	720	W9BPB	28	8	820
K3OHL	30	7	930	W9OJI	27	9	910
W3MFT	19	6	600	W9IFA	27	6	1000
K3CFA	17	6	600	W9CUX	24	7	1000
W3HHC	16	6	550				
W4HJO	39	9	1150	W9BFB	43	9	1350
W4HHK	38	9	1280	W9LFE	33	9	1040
W4WNH	35	9	1350	W9BNC	28	7	1250
W4ZNI	34	8	954	W9DQY	27	8	1100
W4MKJ	34	8	1149	W9MOX	23	6	1150
K4QIF	32	8	1000	W9TDY	22	8	1050
W4MNT	31	8	1225	W9ICG	22	7	1360
K4IXC	30	8	1255	W9TPE	21	6	940
W4EJ	28	8	1050	W9JAS	19	7	1130
W4RFR	24	9	820	K9TXL	19	7	750
W4TLV	23	7	1000	K9CER	17	6	1225
W4AWS	22	7	1225				
W4RMH	21	7	1080	KH6UK	2	2	2540
W4OLK	20	6	720				
K4YYJ	20	6	720	VE1CL	8	5	800
K4MHS	20	5	800	VE3DIR	37	9	1300
W4LNG	19	7	1080	VE3AIB	29	8	1340
K4VWH	18	6	590	VE3BFR	24	7	950
				VE3BQI	23	8	1180
W5RCI	39	9	1280	VE3AQG	18	8	1300
W5AJG	33	9	1360	VE3HW	17	7	1350
W5FYZ	33	9	1275	VE6HO	1	1	915
W5JWL	33	7	1150				
W5UGO	30	8	1384	OH1NL	1	1	5250

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

working North Dakota. The boys can usually be found on 7250 s.s.b. between 7 and 9 local time on Sunday mornings if you'd like further information.

RTTY is growing by leaps and bounds on the v.h.f. bands. Reports received this month indicate that the following stations are either "ready to go" or on the verge of it: W200D, WB2TMR, WA3CXZ, K3UTU, K3IHJ, WB2IFG, WB2RSA, K3YVG, WA3DJI, K3GGK, W2UZN/4, WA4NLH, K2UGK, WB6RBH and K9DBR.

Ever wonder how a big rhombic antenna would work on 144 Mc.? K1AGV/4, High Point, N. C., proposes to find out, and asks your help. He will be on 144.095, c.w. at 9 p.m. EST, July 28, 29, and 30, using a large rhombic that favors the Atlantic Seaboard states. It is unterminated, so gives bidirectional pattern. He will be tuning only the first 400 kc. of the band.

220-Mc. Weekend

Results on 220 and 432 achieved by mountain-topping v.h.f. contest stations indicate that an expedition set up

for one of these bands should do very well indeed. Such an expedition is planned for Aug. 27 by WA2BAH/1. Operation will be from Mt. Greylock, highest point in Massachusetts, in the northwest corner of the Hay State. Frequency will be near the low end of the 220-Mc. band, a.m. and c.w.

The Mt. Greylock location is high enough to be clear in every direction, and with a break from tropospheric conditions the operating range could easily include at least 5 U.S. call areas and VE2 and 3. Scheduling will help, and may be arranged by writing Stan Israel, WA1FPS/WA2BAH, ARRL Hq., Newington, Conn. 06111. The station will be on the air from 3 P.M. Saturday until the wee hours of the following morning, Aug. 27-28.



Shown testing the telemetry unit in the IBM lab during an early phase of the Oscar Pulse Code Modulator checkout are (l. to r.) John Champlin, WØZUN, Jeary Vogt, and Don Brouillard. Circuitry in the telemetry unit is built on 20 computer cards. The unit was constructed after working hours during a three-month period.

50 Mc.

Six meters is once again on the rampage for summer skip. Stations from Canada to the Caribbean, from the west coast to the east coast are hearing and working others in most call areas. The most interesting contact we've heard about for this season is one reported by W5WAX in Muskogee, Oklahoma, with KL7FAV in Ketchikan, Alaska. The contact occurred at 0149 GMT on May 27, frequency was 50.090 (c.w.) and the signal was a raspy 4-3-2. Sam feels that this QSO was due to aurora reflection from Alaska to Washington and then E skip on to Oklahoma. As E skip between Washington and Oklahoma is very rare and aurora is seldom heard as far south as Sam's QTH it makes the contact a particularly interesting one. Sam also tells us that on May 26 W5ORH worked JA2CS on c.w. and KR6NIQ on s.s.b. We would like to hear more concerning these contacts, such as, "Is it so?," or "Who's pulling whose leg?"

VE4RE and VE4YW are two of our friends who worked 12 or more states during the first week of June and from their location in Manitoba that isn't easy at any time.

WA2BAH/WA1FPS writes us that during the aurora of May 26 (listening from W1AW and using omnidirectional squelches) 22 s.s.b. stations in 5 call areas were heard, 15 c.w. stations in 5 call areas (including VE3PHU), and 2 stations on a.m. were heard trying to get some a.m. action. K2KDO and WB2RVE report E beginning (for May) about the 9th of the month and continuing with some sort of opening almost every day thereafter, with the 24th producing the best opening. 3's, 4's, 8's, 9's and 0's were worked and 5's, 6's and 7's were heard.

WA4YRM, WA4FJO, WA4FLI, WA4QLZ, K4EJQ and K4KYL all report a "good" month on 50 Mc, with several of the boys hearing all call areas plus VP7 and VE lands. WA4FJO reports the opening of May 21 as the most solid and lasted for 14 hours. K5GBN and W5GAK report good openings into Oklahoma on several days during May when

the band was open to the east, southeast and west. Practically the same story received from California via WB6IZF, K6LDM, WB6MVU, WB6PHO and WA6WKF, who heard and worked stations in 2, 5, 7, 8, 9, and 0 lands. Although California was not blessed with the number of openings already mentioned by reports from the east, those they did have were good ones. K7ICW and K7QXF (Nevada and Oregon) noted E's activity on 11 days during the month with one EE session noted to South Carolina on the 29th by K7ICW. The 26th brought forth a backscatter contact between K7ICW and WØEYE plus an unusual long hop opening and contact between K7ICW and VE6AJY. WA6FPB/6 on Telescope Peak using an HE-45 A3 transceiver gave A1 and S5 report. (The first operation from Death Valley, California on 50 Mc.)

A number of OES reports received from Michigan seem to agree with those already mentioned. The band was open almost every day with May 24th being outstanding for solid QSOs and a long, long opening. WA8FTA sez that during the month all U.S. call areas were heard plus KP4, VP7, VE2, VE3, VE6 and South America. Bruce and Walt (W8CVQ) both mentioned also the aurora sessions of the 26th and 31st when east coast and midwest stations coming through. K8TUT and K8WVZ report from Ohio that openings have been "normal" there too with stations in 1, 3, 4, 5, and 0 lands coming through. On the 9th Mike, K8WVZ heard CO2GS but someone else nabbed him before Mike and then he was gone.

WA9ABI and WA9CJR (Indiana) report a number of good openings with stations heard from Connecticut to Florida, west to Colorado and then north to Minnesota. From Wisconsin W9GJJ, W9HWQ and WA9JFM observed a number of good days with May 24 again being marked as "even better." Jack, W9GJJ, also comments that during the aurora of the 20th all U.S. call areas except 5, 6 and 7 were represented, plus VE3. Jack has a problem! He has in his possession a pair of 4X150C tubes without sockets. Anyone know where he can get some? WAØLDB in Minnesota observed four days of skip during May and heard or worked stations in 7 call areas.

Keep the following in mind during July and August: WØCUC will be portable VE4 at Churchill, Manitoba, 50.1 Mc. codewheel, running 500 watts to 3 elements to the southeast. KØGJX/VE4 at Lynn Lake, Manitoba, 50.400 codewheel, 6N2, 5 elements to the south and southeast. The boys have skeds with VE8BY and some KL7's and will be happy to make more with any other interested parties. Canadian address is Chas. Cravaack, WØCUC/VE4, Officers Mess, Fort Churchill, Manitoba, Canada.

VP7DD, Carter Cay, Bahamas, reports the 50-Mc. band open almost every day in May and June, with excellent double-hop propagation several times. He is up to 43 states, as a result, Scotty passes along information on the big signal occasionally heard at the low edge of the band: "The 'beacon' here at Carter Cay is a reference signal for one of our instrumentation systems, and is on only when the system is in use. It puts 1 kilowatt into an omni-antenna, on 50.0015 Mc. This frequency is accurate to a degree comparable to that of WWV, since it uses a similar standard."

KH6DEM - K7BBO 50-Mc. QSO!

Propagation between the U.S. Mainland and Hawaii has been a 50-Mc. rarity since the F2 DX of the 1950's, so a transpacific QSO is real news these days. On June 16, KH6DEM, Honolulu, was calling W6BFJ on a pre-arranged 50-Mc. s.s.b. sked, when he was heard and called by K7BBO, Tacoma, Wash., at 1936 GMT. The 5-minute QSO that resulted is believed to be the first s.s.b. communication on 50 Mc. across this 2500-mile path.

KH6DEM has a pair of 4CX250Bs driven by a home-built mixer and a 32S1. This feeds a 250-foot V beam. KH6DEM is building a similar transmitting setup and a large Yaqui array. He reports that a Wake Island scatter station on 49.991 and 49.985 Mc. (28-db. array, aimed at Midway) has been heard occasionally in Honolulu, and on the West Coast. Should be a good indicator of Far-East or a Hawaiian opening.

QST

**SWITCH
TO SAFETY!**



YL news and views

CONDUCTED BY JEAN PEACOR,* K1JVV

Life of a Housewife

It has long since been agreed that a housewife should never state — "I'm just a housewife." Too many have proven that housewives deserve far more credit than such a pat statement.

Jerrie Mock, a housewife from Columbus, Ohio, certainly brought much acclaim to this title in the aviation world. She became the first woman pilot to solo around the world, and also made the record-breaking flight from Honolulu to Columbus, Ohio.

Jerrie was not the only housewife involved in the success of the headlining flight. Behind the scenes, a second outstanding housewife had organized complete amateur radio coverage for the Honolulu to Columbus flight. This was another Columbus housewife, Ruth Garrison, WA8FSX. The radio net proved very successful and all ran smoothly despite last minute route changes which were made because of weather conditions.

Ruth, her OM John, W8FGD, and their daughter Nan, WA8BND, are all active radio amateurs. They all operate both c.w. and s.s.b., being very active in traffic nets, AREC, and RACES. Both Ruth and Nan are members of YLRL, Buckeye Belles, and the Columbus Ama-



Sally Ranti, VE2KO.

OMs (bless 'em). Quite often it has been a complete surprise to the YL concerned. Such was the way that news was received about Sally Ranti, VE2KO. Thanks to the thoughtfulness of some kind OM, it is possible to write about another most remarkable YL.

Sally has been an amateur radio operator only two years, first becoming licensed in December 1964 and then passing her Advanced Amateur Certificate in December 1965. Her OM is not licensed, but is an SWL which is how Sally's curiosity in radio was first aroused. Having heard the term megacycle many times, her interest in wanting to learn more led her to the world of amateur radio. What began because she wondered if she could do it, resulted in the addition of a most ardent radio amateur when Sally found that she "could"!

The Montreal Amateur Radio Club (MARC) certainly found a most active member in Sally. She has been editor of the club magazine (*Marcogram*) for the past year, and was elected to the Board of Directors this year. She is also Secretary of the MARC Technical Group and teaches code in the weekly code and theory classes they sponsor.

Sally's activities are many and diversified. She and her husband are both fine musicians. Sally is a professional harpist, and her OM is the principal trumpet player with the Montreal Symphony and plays with CBC for the National Film Board. He also teaches at McGill University.

The Ranti's have two small children, and as a result, Sally has been most interested in a local Cooperative Nursery School for the past four years. Two of the years she has served as president of the group.

When does she find time to get on the air? If it were possible, she'd happily sit and chase DX all day (something we'd all enjoy), but at the moment, evenings provide most of her operating time. Twenty meters c.w. is one of her favorite bands as she's had fine results using her 758-3B, 328-3 feeding an 8B-200, and a TA33 beam up 45 feet. You'll also hear Sally as NCS of the Chicken Junction Net on 80 meters, or sometimes mobile using an SR-160.

The wide range of interests which are shared by so many radio amateurs all add zest to the conversation of every new qso. Sally, and many other interesting hams like her, increase the excitement of amateur radio for us all. Remember the call of VE2KO.

India's YLs

It's a pleasure to report that two more YLs in India are now licensed radio amateurs. The article about the increasing interest among YLs in India which appeared in the November 1965 YL Column can now be enlarged upon.

Miss Ranjanbala R. Desai, VU2LYZ (handle is Ranju), became the fifth and also India's youngest YL ham at



WA8FSX, Ruth, and her daughter, WA8BND, Nan.

tear Radio Assoc. Ruth is Secretary of the latter two groups.

Just as Jerrie Mock added to aviation history, WA8FSX added much to the good will of amateur radio. Congratulations to an amateur radio housewife — Ruth Garrison!

Sally Ranti, VE2KO

Most reports received for the YL Column about the many YLs written up in the past have been submitted by

* YL Editor, *QST*. Please send all news notes to K1JVV's home address; P.O. Box 446, East Orleans, Mass.

eighteen years of age. While a student at Bai Avabai High School of Bulsar, she became interested in hamming through their club station VU2HS (the only high school club in India). Here she learned Morse code and theory but commented — "I found learning Morse code very interesting and easy — but, radio theory was somewhat difficult in the beginning for two reasons: (1) my knowledge of the English language was not too good, and (2) I had very little knowledge of electricity . . ."

Now Itanju is majoring in mathematics and minoring in statistics and physics while studying for her Bachelor of Science degree. Her interest in mathematics led her to become a member of 'Gujarat Ganit Mandal' (Gujarat Mathematical Society). She is also interested in science models and made a Tesla coil for her school. After Runja receives her B.S. degree, she hopes to do post graduate work in science.

Mrs. Lakshmi Durvasula, VU2LD, has become India's sixth YL radio amateur. She holds a Master of Science degree and works as an Assistant Engineer in Bharat Electronics Ltd., a primary electronics industry of India. The first Indian YL ham to go abroad, Mrs. Durvasula recently was on a leave of absence in order to further her studies in electronics in UK land.

Congratulations and best wishes also go to Miss K. R. Shantha, VU2FV, (SIRAN's YL Editor) and Mr. K. Vijayaraghavan who were married on May 22, 1966 in Bangalore, India.



India's fifth YL ham, VU2LYZ.



India's sixth YL ham, VU2LD.



The Floridoras organized at the Orlando Hamfest in 1957 and have an annual birthday party there each year. Their newly elected officers at this year's meeting are (l. to r.): V. Pres., W4WPD, Shirley; Treas., K4TBC, Kay; Secy., K4RHL, Ellie; Pres., WA4FJF, Ellen.



Lily B. Varon, OA4OK, and xyl of OA4BI of Lima, Peru is shown at the rig of W1MD, Sylvester Connolly of Hingham, Mass. Lily is a faithful member of the Intercontinental Traffic Net and helps to keep Lima available for net members. Courtesy of W1MD.

Eastern Ham Now

So many times the FCC unknowingly assigns the perfect call to fit the situation. We've all seen it happen.

Now — Betty Coleman (ex-K6UHD) has W4EUN. Her phonetics? Eastern Ham Now!

YL Club News

Waylarc's new officers installed at their June meeting (also their club's 10th anniversary) are as follows: Pres., W3OLY; V. Pres., W3CDQ; Secy., W3UXU; Treas., W3UTR; Exec. Off., W3RXJ; F.A.R. Trustee, W3CDQ, Alternate, K4LMB.

Laylrc's installed the following new officers in June: Pres., WA6ISY; V. Pres., WA6LWE; Rec. Secy., WA6ZTW; Cor. Secy., W6JCA; Treas., WA6UBU.

QST

JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

Hamfest Calendar

Alabama — The 1966 North Alabama Hamfest will be held August 21 in Decatur, Alabama.

Delaware — The Delaware Hamfest will be held this year at Banning Park near Wilmington on August 14. The rain date is August 21. Swap shop, games, and refreshments. Tickets in advance, Ham and family \$1.50, at gate \$2.00. Information from K3NVV or K3UHU.

Georgia — The Lanierland ARC will sponsor a "Hamnic" August 27 and 28. Headquarters will be the Sportsman's Club on the shores of beautiful Lake Sidney Lanier, Hy. 53, one mile south of Gainesville, Georgia. Saturday at 10:00 A.M. a motorcade will be formed to tour the Blue Ridge Mountains of N. Georgia. Sunday's activities will include the annual meeting of the Georgia Cracker RC followed by a family-style picnic. Bring your own basket. More details from W4RZL.

Illinois — The Big Thunder ARC will hold its Hamfest August 21 at the new fairground in Belvidere, Ill.

Illinois — The 32nd annual Hamfester RC Midwestern Hamfest and picnic will be held near Chicago on August 14 at Santa Fe Park, 91st. and Wolf Rd., Willow Springs, Illinois. This Hamfest is one of the oldest and largest affairs in the Midwest. The Hamfest offers a variety of activities including manufacturer and distributor displays, contests, refreshments, a gigantic swap and shop area, awards, and activities for the entire family. For complete details including a special map of the location write: Gregory Purteck, WA9MRE, 2916 West Marquette Rd., Chicago, Illinois 60629.

Illinois — The Six Meter Club of Chicago will hold its Ninth Annual Picnic & Hamfest on Sunday, August 7, at Picnic Grove on Route 45, one mile north of Route 30, Frankfort, Illinois. Swap section, refreshments, games and races, and a YL special. Advance registration is \$1.50, at gate \$2.00. For more information contact Val Hellwig, K9ZWW, 3420 S. 60th Court, Cicero, Ill. 60650.

Illinois — The Shawnee ARA will hold its SARA "Hamnic" on the first Sunday in August at the Du Quoin State Fairgrounds in Du Quoin, Illinois.

Illinois — The 37th Annual Hamfest of the Egyptian Radio Club, Inc., W9AUU, will be held at the club grounds, Sunday, August 21. Club is located near Granite City, Illinois on the east bank of the Chain of Rocks Canal one block south of U.S. 66. Games, contests, plenty of food and cold drinks. Lots of parking space, admission is free.

Indiana — The 18th Annual Hamfest of the Tri-State AR Society is to be held August 28 at ECCO VALLEY on Highway 460 west of Evansville, Indiana. \$1.50 advance registration, \$2.00 at the gate. Bring the XYL, too. Registration and information from K9QWV, P.O. Box 492, Evansville, Indiana.

Iowa — The Iowa 75-Meter Phone Net Picnic will be held Sunday, August 14, at McHose Park, Boone, Iowa.

Kansas — The Annual Kansas-Nebraska Radio Club convention-type hamfest will be held August 6 and 7 at the air-conditioned American Legion Club Hall, 506 Washington St., Concordia, Kansas. Banquet Saturday night with outstanding speaker from NSA. Advance reservations requested. Covered dish lunch at noon, free coffee and soda pop, games for XYLS and harmonies. Registration at 9:00 A.M. More details from Jerome Johnson, 417 State St., Concordia, Kansas 66901.

Minnesota — The Minneapolis RC picnic will be held August 7 at Lake Nakomis Park in Minneapolis.

Minnesota — St. Cloud RC will hold their picnic August 14 at Wilson Park in St. Cloud.

Missouri — The Suburban Radio Club, Inc. of St. Louis County, Missouri will hold a hamfest on Sunday, Sept. 4 at the Creve Coeur Lake Memorial Park, St. Louis County, Missouri. Registration from 10:00 A.M. until? Admission is free. Swap alley and refreshments. Talk in on 6 and 2 meters.

New Jersey — The Southern Counties ARA of Southern New Jersey will hold its annual outing at beautiful Egg Harbor Lake, Egg Harbor City, New Jersey on Sunday August 28, at 9:00 A.M. Lake bathing, contests, transmitter hunts, swap shop, children's and YL activities. Talk-in on 3.85, 50.55 and 147 Mc. Admission is \$1.00 per person or

\$1.50 for the family. Advance tickets and information from Charles Bengal, W2TUR, 815 Seaside Ave., Absecon, New Jersey 08201.

New York — The 11th Annual Hamfest by Four York County Clubs will be held at Adams County Fair Grounds, 4 miles North of Abbotstown, Penna., Sept. 4, rain or shine. Registration begins at 0900, talk-in on 50.62 Mc. and 145.62 Mc. Plenty of eats, drinks, transmitter hunt, games for XYLS and YLS. For information write K3POR, 170 S. Albemarle St., York, Penna.

North Carolina — The Atlantic Amateur Radio Council Campfest will be held over Labor Day week-end at Beaverbank, near Halifax. The NSARA annual meeting will be held at the Campfest.

Ohio — The Warren ARA Ninth Annual Hamfest will be held August 28 at the Community Center, Newton Falls, Ohio.

Pennsylvania — The Greater Pittsburgh VHF Society will hold a corn roast August 14 in Mercer Grove, South Park.

Pennsylvania — The South Hills Brass Pounders and Modulators, Pittsburgh, Pennsylvania, will hold its 29th Annual Hamfest at St. Clair Beach Pavilion, Route 19, south of Pittsburgh on Sunday, August 7, 1966. Preregistration is \$1.50, at the door is \$2.00. Contact Irwin Tryon, W3WFR, 1500 Tretter Drive, Pittsburgh 27, Pennsylvania.

Pennsylvania — The Puck Rats 11th Annual Family Day and Picnic is Sunday August 14 (rain date August 21) at Fort Washington State Park, Flourtown, Pa. Talk-in frequencies 50.2 and 145.2 Mc. \$2.00 per family payable at the park. Games, prizes, free soda and fun for all. Leave the Pa. Turnpike at the Fort Washington Exit and follow the rat signs to the park. More information from Francis Brick, W3SAO, 821 W. Lindley Ave., Philadelphia, Pennsylvania 19141.

Tennessee — The Seventh Annual Cedars of Lebanon Hamfest will be held August 28 at Cedars of Lebanon State Park, 10 miles South of Lebanon on Route 231-S. Talk-in on 50.25 and 2.980 Mc. Lunch at 1:00 P.M. Information from Tenn. Phone Net. 3.980 Mc. any week day at 6:45 A.M. CST.

Tennessee — The Delta Radio Club, Inc. announces their "Hamfest 66" will be on August 27-28 in Whitehaven, Tenn.

Vermont — The Burlington ARC and the Central Vermont ARC are cosponsoring International Field Day this year on August 13 and 14 at Cliffside Country Club, Burlington, Vermont. Bar-b-q, antenna raising contest, auction and swap shop. Write K1PPW for accommodation. Early bird registration is \$2.50 from W1BRG, 180 Flynn Ave., Burlington, Vermont.

Virginia — The Shenandoah Valley ARC, Inc., Winchester, Virginia, will hold its annual Hamfest on August 6 and 7. August 6, at 7:00 P.M., the steak banquet will be held at the Lee Jackson Restaurant in Winchester (intersections of Routs 522 and 50). An interesting speaker and a dance will follow. Tickets are \$3.00 in advance or \$3.50 at the door. August 7 is the day for the Hamfest complete with swapfest, auction, XYL, YL and children's activities. The Hamfest is at the National Guard Armory, Route 50 east of Winchester. Registration \$1.00. For advance tickets to banquet write P.O. Box 139, Winchester, Va. QST

COMING A.R.R.L. CONVENTIONS

September 16-17 — Ontario Province, Niagara Falls

October 15-16 — Hudson Division, Tarrytown, New York

October 21-22 — Great Lakes Division, Muskegon, Michigan

January 21-22, 1967 — Florida State, Miami

July 1-3, 1967 — ARRL National, Montreal, Quebec

Prospective convention sponsors are urged to check with ARRL Hq. to avoid possible date conflicts.

How's DX?

CONDUCTED BY ROD NEWKIRK,* W9BRD

Why:

THIS CERTIFIES that has this day submitted evidence satisfactory to the American Radio Relay League that his station has conducted two-way communication with other amateur stations in at least one hundred different countries. . . .

That's the meat of your DX Century Club diploma, and the key word *evidence* is the theme of this month's summer rerun. In a 'way-out world it's well to review fundamentals once in a while; basic things we all "know," yet tend to forget, sometimes with ludicrous effect. Like some would-be QSLs and certifications we've been seeing lately that don't quite QSL or certify anything. So, with some abridgment, as we said in "How's" a decade ago —

Certifications (confirmations) of QSOs are commonly known far and wide as QSLs. Obviously, the only person who can so certify communication with a station is that station's operator, or a person in possession of his log or log transcript. QSLs thus can be considered *primary* QSO certifications. Such primary certification is indispensable because it sifts out (1) error in call signs, (2) illegitimate QSOs plus contacts with illicit call-borrowers, and (3) "mental QSOs" claimed through wishful thinking under stress of QRM, QRN and QSB. With no reflection on his honesty, so much of this goes on that a DXer's unconfirmed countries have only personal significance. It clearly follows that the only persons who can certify the accomplishment of, say, Worked All Continents or Worked All States, are those in temporary possession of this evidence, the pertinent primary certifications (QSLs). When primary certifications are so accepted to certify performances on the order of DXCC, WAC, WBE, etc., we derive what can be termed *secondary* QSO certification, the point of this précis.

These "awards" come in all colors, shapes and sizes from near and far corners of the globe. Some are easy to obtain, some are difficult (some indeed impossible), some are costly and some are free. With or without fanfare, new certificates are announced in steady stream. Why so many secondary certifications? Mainly it's a case of groups and societies striving to keep up with the Joneses. Certifications of worldwide availability reflect promotional publicity on their sponsors in proportion to the popularity of the awards. Also it will be noted that most are designed to promote QSOs with stations within the bailiwicks of their sponsors.

Why the unfortunate instability, the output of never-ending rules revisions, among so many DX awards? Well, in the first place, devising such a certification is a truly tricky proposition. Unless the spade-work is done carefully, the initial version of a DX award is likely to be too easy or too difficult. Then, too, developments subsequent to the establishment of an equitable award may necessitate rules changes. This is why "How's" regularly urges you to correspond with the source of any non-ARRL certification to get up-to-date details before you go after it. Otherwise, after knocking yourself out to work, say, six UH8s you may find to your dismay that you really needed only three, or that the requirement has been upped to a dozen, or that the award is no longer available.

This accumulating various DX certifications can be a barrel of fun; much like cashing in white chips for red ones, red for blue, etc. But remember that certificates — any certificates, including U.S. dollar bills — are worth only so much as stands behind them. For fee or free the Podunk Heights Radio Association, membership of two, can certify your QSLs for any feat from Worked All Lids to Heard

Everything Now. Yet if your friends are unfamiliar with PHRA, its authority in such matters, and its administrative rectitude, you can't very well expect them to swoon at sight of the outfit's wallpaper. So wisely ascertain that the certificates you would lose sleep over really are worth your time, effort and IRC's. Then, good huntin'!

A simple closing point is underscored by Waldo Wahlpappen's Law: The value of a secondary certification is inversely proportional to one's reluctance to risk primary certifications therefor. *E.g.*, if you think you'd like to have PHRA's colorful Worked All Clowns sheepskin but you're distressed at the thought of parting with the necessary QSL evidence, forget it. Your slices are worth more than the pie. Hi!

What:

Except for the steady showing of reliable 20, and 15's noteworthy improvement over last summer, the bands are marking time. It's just as well. Even DX men should hang up their headsets and head for the beach now and then. We tuned over twenty last month, so now let's flip the "How's" bandswitch to other frequencies and turn up the gain. . . .

15 phone, enjoyably less saturated than 14 Mc., is the subject of reports from Ws 1DYE 3HNK 4DRK 8PKU 8YGR, Ks 5YPS 8YSO 9CZV, Ws 1DBR 4YDR 5C7D 7BOB 8GGN 8MAT 8MIGD 8OBF 8QJK 8YDR 9HBT 9NXII 9NXP, Wbs 1CAP 6KIL and s.w.l. Kilroy: CEs 2DS (21,940 kc.) 2800 GMT, 3FT* 3GS (420) 21, 3PL (400) 21, 3PR 3RY 4IT, GN8F, CoS 1EG 0, 2QV*, CPs 1AK (378) 21, 1EG 8AU*, CRs 6DX 6PF 6PP 21, 6LAS* (300) 18, 7JN* (220) 17, CTIs BH (355) 20, IW 18, KT (305) 17, CXs 2CO (410) 0, 8AAW (421) 23-0, EAs 6BG* 19, 8AH 14, 8DM* (210) 19, E6AH (372) 18, ELS 2A 6E 19, ET3s FMA (355) 19, RB RC WH (325) 13, FB8WW (350) 11-12, FG7XL (435) 18, FH8CD 12-13, FK8AT 0, FR7ZD (410) 13, FS7RT 20, GP2SM 17 of England, GC2XU (350) 18, GD3RFK (380) 12-13, HCs 1DX (410) 21, 1GK 1JJ 100 1PX* 1RR 1SN 2JF 2JT (380) 21, 2SM (445) 21, 1NQ* (280) 22, HH9DL (418) 23, HIs 6JIL 13, 7AGH 8EAD* (300) 21, SXCC 18, HKS 1XT (350) 19, 3AKQ* 3APC (390) 19, 3AWW (380) 22, 3SO 0A1, HRs 1CP (375) 22, 1JMF (400) 11-16, 1JR 2ABC 17, HZ1AB (400) 19, ITIs TDN GAI, JAs 1RT



* 7862-B West Lawrence Ave., Chicago, Ill. 60656

10ZG*4BK4 5YRW* 2, 60MH 7UJ 9AST* 2, Ks 4ERU/
 KB6 (385) 4, 4MTD/KJ6 (420) 20, 9LUZ/KP4 (410) 20,
 KA7AB 1, KC4USV (448) 21, KG4s AD AU AN BO
 (415) 21, CN, KJ6CF (347) 21, KJs 4CR (402) 16, 6BC
 6BK 6BO 6BR 6BV 19-20, KV4CX (420) 13, KZ5s AG
 CD* DM (420), ED EX* (400) 20, FC* 22, CC* 9, 4W*
 22, LD LT MB AIV* 19, SW 22, LU9s DAIH (380) 21,
 PC, MP4s BBA* (365) 20, TBO (405) 15, OAs 1W, 0,
 4J 4SO (115) 4, 5C (400) 19, 6BL (485) 21, 7Z ST, OD5s
 RZ 14-17, RP (340) 19, OHIONH (485) 22, OYs 6AI
 (377) 13, 8X6* PJs 2AQ (345) 23, 2MT 3AI, 3CD 5BE
 (364) 21, PYs IAICC 2DSC (350) 22, 2CEM 2PE (400)
 23-0, 7MP (370) 14, PZ1BO* 15, SVs IAN (310) 18, 1BH
 (346) 18-19, 1BL 17, 1BN 0WF (400) 18, 0WU (390) 21 on
 Rhodes, TG4TD, TIs 2CHV* 2DL 2IH 2PT 2RO (415) 21,
 2VJ 8RH/2 8LH* 0, TT8A* (240) 21, TU2s AA 20, AF,
 UB5WF (375) 17, UH8AY (455) 17, VEs IAED, YU (332)
 22, SNO, VK8KK 2 3 and other Ausstes, VP4s IRC* 2AP
 (336) 22, 2DA* 21, 2GAW (360) 21, 2KJ (280) 17-22,
 2NS 2, 3AA 3YG (391) 22, 5BP (361) 0, 5RB 7NY 19,
 8CW (401), VR6TC (400) 21-22, VSs 6Fs (344) 13-14,
 9AJC (450) 19, 9AAMD* 9ARV (364) 17, 9PCZ, Ws ANCI/
 KS6 (426) 3, 7HH/YN6 aboard *Hone*, 8TNC/KW6 (400)
 2-3, XEs 1CC 1FFW 1RRW (415) 16, 2DDZ* 21 0, 2MAIM
 2ZZ, XW8s AL (405) 13-14, AZ 11, YAIAY, YN3KAL,
 YO9CN (370) 15, YSIs GA (200) 4, JBE (380) 20, RF
 THM, YV5BPI, ZC4s JU (380) 17, LA* (300) 15, RAI
 (400) 18-22, ZD8s ES SRI (392) 21-23, WZ 15, ZE1AA



VP8HJ, 17-year-old apprentice radiotelegrapher in the Falklands, develops his skills on 15 and 20 c.w. with frequent DX sessions. (Photo via K2MUB)

(295) 18, ZPs 5DH 5KB (350) 22, 9AY (408) 23, many
 ZLs, ZSs 4G 8L (394) 16, 9C* 4U1s ITU (300) 17, SU
 (450) 19, 4X4s GV 19, JU (380) 17, SO (390) 22, UQ (365)
 19, 5A3TV 23, 5H3s JJ JR (431) 10-11, 5J4RCA, 5N2s
 AAW (414) 15-16, AAX AAZ (383) 22, FMI* (300) 18,
 5W1AZ (380) 23, 5Z4s AA (420) 18, ERR (365) 21, IR
 (450) 8-9, JI (404) 23, JQ 22, KW, 6Os 1AU (397) 19,
 6BW (354) 19, 6Y5RA, 7O7s BN (450) 19, PS (435) 16,
 7Xs 3RT (245) 20, 8EP* (320) 15, 9GV (425) 19, 9H1A
 (332) 21, 9J2WR (420) 18, 9L1s JR JW SL (410) 22, 9Ms
 2LO (412) 16, 2OV 6AP (364) 15, 9O5s RP (360) 20, DM
 (345) 19, DO (420) 19, CZ (320), DL (335) 18-19, FG (366)
 20, NAI* (200) 18, PA (420) 19, SG, 2O YL 20, 9U5s BH DP
 (420) 20, LB* (190) 19, 9V1s CN AIK MI MP* (235) 16,
 MX (420) 13, MY (420) 13, NL (480) 14, RS, 9X5VF (425)
 17, 9Y4s TX and VT, the asterisks going for non-s.s.b. sigs.

15 c.w. pays off for Ws 1CNU 1DYE 4DRK 4YOK
 8YGR, Ks 3FOP 5YPS 9CZV, WAs 1DBR 4YDR
 5CTD 7BOA 7BOB 8G6N 8MIGD 8PKG 9NXH 9OZC,
 WBs 2GTA 4CAP and 6KIL to the tune of CEs 1AD 22,
 3OP (36) 21, 3ZK (50) 19, 6EF 0, CMs 1AR (80) 19, 2WS,
 CN8FF (45) 19, CO2s BB BO 23, CO 19, FA (49) 20,
 GPs 2BH 5AQ (70) 16, 5EZ (55) 20, CRs 3KD (60) 0,
 6DX (61) 20, 6GO 20, 6HG (30) 13, 6HV 6JA (70) 18,
 6LAs 7CI (35) 15-16, 7IZ (50) 13, CT1s IT LN, CX1JM
 (30) 17, DM3UE, EA8s ER (63) 18, ET (65) 14, ELs 2A
 2D 2FD 2Y (40) 7, 7A (30) 12, EP2BK (55) 8, F9UC/FG,
 FG7s XT (20) 21, XX (39) 21, FL8s MC (75) 13-14, RA
 (55) 7, FM7WA (35) 20, FR7ZD (40) 12, FS7RT 22,
 GC3AV, HAs 4KYB 5KFR 6HH, HC2SB (20) 18-19,
 HXNAL (41) 11, HKS 3RQ (42) 22, 5CY (26) 21, 6AL
 HM5s BG (40) 14, IL (55) 12, HPHC (15) 21, IS1CXF
 (48) 16, ITIAQ, JAs 1KRU 1, 3EGE 3, 5PU 5TX 2, 6AKW
 6CUC (39) 1, 8CZ 1, 9AIF (20) 11, KA9AK (80) 18,
 KC6AAV (64) 10, KR6KJ (40) 11, KV4CI (33) 19, KZ5s
 FX (40) 22, 6ON (116) 22, NH 0W 16, LAsFG/p (15)
 17-18, MP4s BBA (30) 11-19, BFK (74) 12, BFN BFO
 (90) 10, BEV (60) 16, OAs AO (20) 13, FAI (50) 22, NVE
 (70) 23 0, BF (75) 21, PQ 15, UO, OD5s EJ (115) 12, EL,
 OEs 5NO 6HTZ, GY2H, PJs 2CE 2CJ 2CZ (40) 22 23,
 2MI (110) 15, 3CJ (28) 21, PYs 2BYR 2DUK 5ASN,

PZICE (43) 22, SU1s DL (50) 13, IM (20) 19, SV0WAA,
 TF5TP (422) 15, TIEs CJH 22, DH (409) 29, KR (30) 20,
 TU2AN (5, 60) 17, UAs 9AA (55) 14, 0BZ (65) 6, 0LL 0MX
 (1) 6, UFs 6KAF (30) 14-12, K-AM (50) 14, U8s AIAI (70)
 19, ULZs AD (35) 11, IQ (81) 19, UM8IE, UO5As (41) 14,
 UO2KCT, UT75EL, VE1AED/5U (80) 17, VO1AW,
 VP4s 1LP 2SJ (40) 22, 6AF 8IJ (55), 9BP 9L 9FO (56)
 22, VOs 8BL (40) 14, 9HB (25) 16, VRs 9DK (45) 12, 2EK
 (40) 14, 6TC 21, VNs AAD (30) 14, PCZ, VU2s CC (80)
 14, GW (20) 15, FN JA (35) 15, W1S/KG6 (50) 21-22,
 WAsSDE/VP9 (140) 3, W1Es GAY 1, GCB, WPs
 COW COX CPV (110) 15, W56W3 3, XE1s ER (50) 9,
 OE (5) 17, YNs 1A 3CJD 15-16, 7ZDT, YO2Is YS2OB
 (125) 20-1, YU3s ID YJ, YV4s 4MC 5BH (39) 0, ZB2s A
 (45) 11, AO 17-23, AS (30) 14, ZC4TA (5) 19, ZDs 5M 7IP
 (60) 17, 8AR 19-23, 8J 8WZ, ZEs 1AH 1As (75) 17, 1CK
 8IV, ZP2LS (30) 19, ZSs 3RM 8L (36) 16, 4S7s DA (20)
 15-16, PG (20) 12, 4X4s NZ (75) 4, GA (28) 0, 5A3TX 19,
 5R8CQ (45) 15, 5U9AC (50) 8, 5Z4s BA1 (80) 9-10, IR
 (50) 11, 6O6BW (30) 13, 6W8As BRF (55) 19, DD (60) 18,
 6Y5FB (45) 21, 7G1A (41) 11-12, 7O7FS, 9H1AG, 9J2s
 IE (105) 19, JC (365) 18, WR, 9K2s AB (58) 8, AD (75)
 16-20, AK (65) 14, 9L1TL (10) 15, 9Ms 2OV (75) 14, 6AP
 (65) 16, 9O5s FV JL (45) 11-12, KS (55) 17, PA QR 19,
 9V1s MI (30), MX (40) 17-18, 9X5IS (00) 19 and 9Y4VU
 (50) 23. Another large chunk of code work is found in the

15 Novice range where WNs 1FM2 2UVB 3DQR 3DSQ
 3EGM 6SAZ and 8SQA come up with CO6AH,
 CR6DX, CT1H, CX1JM, Djs 3VG 6LD 7KG 8IK,
 DL3s JR ZI, DM3LDA, DU7SV, EL2NA, Fs 8JA 9EW
 9UD, Gs galore, 11B9K, HCLJQ, HK3KI, H1Z, JAs 1LPZ
 1NST 3CZH 3EGE 3IHL 3KWW 3YCH 4COC 5PU 8TQ,
 KA2DJ, KL7AZ, KZ5OVN, LU8OI, OA4UO, OK1MG,
 ON4QP, PYs 1CKV 1NEW 1RG 21FR 2GDB (105) 21,
 4ANO 4ASJ 4UG 5ASN 5AUC 5WN 5XQ 7NJ, SP1s AW
 LLW, Vks 3XB 4J1 4WO 7SM, VPGJC, WAs 1EAV/VP9,
 8SVU/VP9, WH6GAW, WP4s CPG COW COZ CQR,
 WS6WB, WV4EY, XEs 1CE 1PJE 2CMI 21 3RE,
 YU2RAK, YV4NB, ZD8SK1, 5Z4JX and 9Y4VJ.

40 c.w., far from prostrated by the long hot summer,
 comes through for Ws 1DAL 1VAH 4YOK 8PKU,
 K5JVF, WAs 4YDR 8GGN, WBs 2GTA 2NLH 2UIZ and
 6KIL with CE9AO (5) 10, CM2BL 5, CO2s BB 5, DL, EJ,
 DM3UEA, DU1CL, EA1GJ (37) 2, FG7XF 0, GC2FAIV
 (29) 11, HAs 3GF (12) 3, 9KOB (11) 5, HIs 7NJP 7,
 SXAL 3PC 10, HM0HQ 12-18, HR51B 5-6, ITIAGA,
 JA3EA 15, K4MTD/KJ6 (659) 1-2, KC4AA/mm 7-9,
 KZ5s HO (15) 10, GN TW, LA2B, LU1s 1ZA (10) 6, 8DSF,
 LZ1KDM (2) 2, OA4NVE, OE6HZG (5) 1, PJ5ME 6,
 PY7s ACQ 2, VFN, SP6PJQ, UAs 2A (7) 4, 2CD (3) 4,
 2KAP (2) 3, 9KFF 13, 9RR (14) 8, UB5s SM 1, SV 1, TR
 (3) 2, UP2LP (5) 5, UO2KCR 2, UT7s GY (12) 3, XH (1)
 0, UY5MU (9) 0, Vks a-plenty, VP4s 6AK (5) 10, 7NW,
 VR2DK 8, WA4NXC/VP7 (19) 2, W56WB 11, XEs 1JJJ
 13, 2CN 2FJ, YN3CJD, YOSAGM 1, YS2RC (2) 6, YVs
 1TZ 7, 4NP, ZD8AR 0-1, sundry ZLs, 4U1TU (28) 21,
 6Y5BB, 9Ms 2AV 6DH 10, 6KS 14, 9V1s LP 10 and NN
 ----- Novice-style 7-Mc. DX digging by WNs 3DQR
 3DSQ 7FR and 8SQA bring forth HCL1C (185) 5,
 W6BQOE/VP9 and WL7FOT up among the SWBC
 mushmongers.

40 phone krudgingly gives out with stuff like CN8AW
 (45) 20, CO2HL (a.m.) 5, ET3AC 2, G2PU 6-7,
 GCs 2FAIV (80) 11, 8HT 7, G3CDF, HIBXAL 6, HK3AA
 6-7, KH6HP (218) 18, OA1BL (245) 8, OX3s JV XK (43)
 21, PYs 1CAD 4ND (43) 21, Vks 2AHT 3AC/m 12, 3ATN
 11, 7GK 11, VP6LK, ZB2AJ (45) 21, ZL2WS (95) 8 and
 ZS1JA (45) 21 for WAs 8GGN ORF and tuner P. Kilroy
 ----- Three goodies still holding out on crackly 75
 phone are OX3LP (3790) 0, UW9AF (3785) 23 and ZB2AJ
 (3785) 23.

80 c.w. would draw a blank this month except for
 W8PKU, WBs 2NLH and 6KIL encounters with
 CM2BL, DL2QZ 2, F2PO and VO1HN (7) 5. As for 160—
 well, see you later in the year, fellers, sunspots permitting.
 As we've said before, though, quiet 14-Mc. conditions pre-
 vail in the southern hemisphere. How about some VK/ZL
 breakthroughs up here? Chances for 160-meter DX grow
 slimmer as

10 phone DX interest waxes hotter even in the so-called
 summer slack season. Ws 1DYE 4YOK, WAs 2VFA
 5CTD 7BOB 8G6N 8ORF and G3IDG describe 28-Mc.
 voice work by CEs 3PR 3PT* 3QW* 3RK 17, 3TV* 8AO*
 C8s 4BC* 6AN* 6HG 6JT* 6LAs* 7IX* 9, 7IZ* Cx6
 2AAV (110) 0, 2CN* 4BR* 4VI* 8PS*, EL2s A (583) 18,
 AK 18, 0 R (600) 17-18, 8 (608) 13, V (610) 16, FM7WQ
 (310) 22, FS7RT 16, G16VU 13, HK3s AVK* 4YA*
 HP3MC, 1Is DOR 13, MSG 13, KP4s COW CUN* CS*
 LT* Ks 4CA 20, 6BV (589) 21, KZ5s LC 20, LI, LA1C
 16, LU1s 19AB 19TL (589) 20, 2ACL 2DPC* 3DCU
 4DCK 7OZ 8EPT*, OA1PH, OD5AT* 18, PJ3C*, PYs
 1AGP* 17, 2DSQ*, SV6s WF 17, WU 17, TG9s BM* US*
 T12s Pts TF*, UA3AJ 18-21, UGGABD* UP2s ADZ
 15, NM1P 16, UQ2KWB* 15, Vks 2ADP* 2, 3AHT (571) 0,
 4RH (563) 1, VP1s 1LP 2AC* 2KR (502) 21, 2MW* 2MV*
 6AQ 6HR* 21, 6JC*, XEs 1D9S* LLL* 22, PJE* YN1s
 MAV* RL, YVs 1BZ* 1EN* 3AQ* 5AGM* 5BEF, ZB2AM

(600) 21, ZD8s RD (597) 15, WZ (598) 21, ZEs 2BL 2JA* 10, 4JV, ZLs 1U1 2AQA* 2WO 2WS, ZSs 1BV* 16, 1DM* 16, 1JA* 16, 2OM 40L 17, 6AB 6BKU (149) 15, 9G* 10, 4U1s 1TU 10, SU 10, 4X4IH* EL-18, 5H3s JJ JR (602) 15, 5X5KL 18, 6W8CZ 22-23, 6Y5s BB (599) 23, BP* 7XBAB 22-23, 9I2s BK DT 16, PK WR, 9Q5s 1D* JW* and 9Y4VS* (580) 21, starts blinking for non-s.s.b.

IO c.w. isn't cooling it much, either, if the observations of WA2VFA, WB2UHZ and G3IDG are any indication: CRs 6EL 16, 7IZ 10-16, EL2D, F9VN/FG 11, beacon GB3LER (150) 14, GC3HFE 12, GI3s 1VJ OGR 14, CW3RSP, HASWT, KV4CI 16, KZ5s FX JF, LA1IC 15, LUs 3EX 8DSF, OA4PE, OHs 2JI 17, 3ZD 15-16, 5WF, ON4FX 12, PJ5AL, PYs 2BGL 6ASN 7AKQ 17, SP7HX, UAs 1KCJ 3AZM 3BAZ 3EL 17, 3LI 9AR, UB5s ATX BUU, UC2AQI, UR2IP, VK9CX (12), YO2BV 16, YV4MC, ZC4GB 16, ZDs 7IP (40), 8AR 8J, ZEs 1AS 9, 3JI 15, 3JO 13, ZSs 1AC 6BM 6JK, 4X4NY, 5A3TX, 6W8DD 19, 7G1A, 9H1s AK AL 17, 9Q5s LJ (100) 14-16 and PA 17. Short-skip sessions entertain the lads between spotty hot-weather openings. From our end South America is a cinch much of each day, and September should see a pick-up in east-west paths to Africa and Oceania. Will you be there?

Next month we'll probably check 20's DX pulse again with the help of Ws 1AYK 1CNU 1DYE 1ECH 1VAH 3HNK 1DRK 7RGL 7VRO 8PKU 8YGR, Ks 3KMA 5YPS 8YSO 0DEQ, WAs 4YDR 6JDT 8G1N 8MAT 9IBT 9NXH, WBs 2UFN 2UHZ 6KIL 6MOS and 6MPE on c.w.: Ws 1CKA 1DYE 3HNK 8IBX 8YGR, WAs 4YDR 8G1N 8MAT 80BF 9IBT, WBs 2UFN 6KIL 6MOS and Mr. Kilroy on phone, plus, of course, "How's" Bandwagon jumpers-on before deadline. Climb aboard, OMs!

Where:

HEREABOUTS — W1WPO of ARRL's DXCC Desk is advised of a shakeout in the W2CTN QSL clientele. Jack announces, "My activity as QSL manager for the following stations has been discontinued at my request: CPs 3CN 5EZ, PG7s TC TD XJ, HKs 2YO 3RQ, HPs 1AC 1IE, KV4CI, OAs 4FM 8D 8D/3, OX3UD, PJ2ME, PZ1s AX CM, VPs 2MV 6AK 6AP 6BW 6PJ 7NS 7NW 9BY, ZB2AP, ZSs 2SS 4OF 6GN and 9H1R." QSL these stations direct, *not* via W2CTN. . . . VE1ASJ's July P.E.I. work can be confirmed through W2CTN. "Jack says I'll be the 96th station for which he's handled QSLs." . . . W1DYE has it that post office difficulties may be delaying some shipments of 6Y5BB cards, and XE1EET, with 257 countries worked and 129 confirmed, suspects postal problems down his way. . . . VERON's *DX press* suggests W6KTE as a route to VP2LS QSLs resulting from WA6WTD's visit there late in June. . . . W4MF, in Florida DX Club's *DX Report*, says DX QSLs roll into the Fours ARRL QSL Bureau branch (W4AM) at six or seven thousand per week, about half of 'em bound for Floridians. Bert reports s.a.s.e. output now current but there are about ten kilo-QSLs cluttering up the place. Do you owe your bureau self-addressed stamped envelopes? . . . K7QXG observes, "Accurate records kept for the past four years indicate this response at my location: Canada, 96 per cent; U.S.A., 90; South America, 87; Oceania, 80; U.S.S.R. and Asia, 55 or less. No accurate figure on Europe at this time but it appears to be 70 or 75 per cent." Not too bad, Bob. . . . W9IGW stands by at the home QTH for further QSL inquiries concerning his PJ5MG doings of late April. . . . W6VOE understands that WA8MQE disclaims T19 QSL connections. . . . "Only a fifty-per-cent return on my QSLs," laments YSITHM. So Tom now issues cards only on receipt. . . .

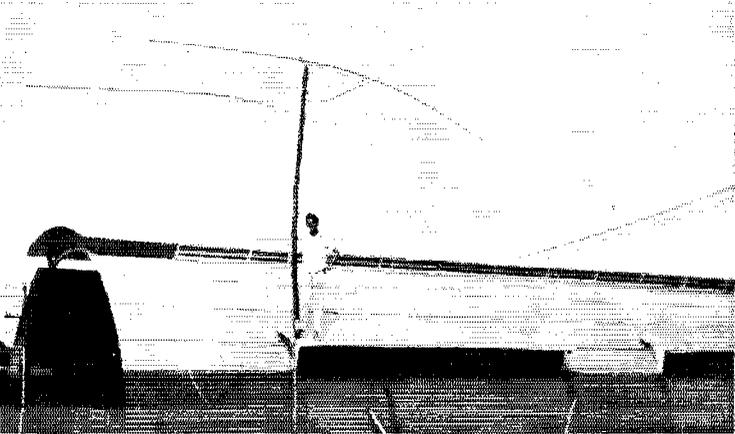
PY7ACQ/p hit the DX gang from Fernando de Noronha island this spring. PY7AKW of CBDX, the Brazil DX Club, describes the action: "Plinio operated a Brasan 202 transceiver made in his own Recife radio factory. He also appears with the 20/15-meter two-element close-spaced beam installed atop a PAA/RCA missile-tracking hut now used by the Brazilian Army." Fernando may become less rare in the future, for PY7ACQ is returning to the island to construct a television relay. (Photos via CBDX)

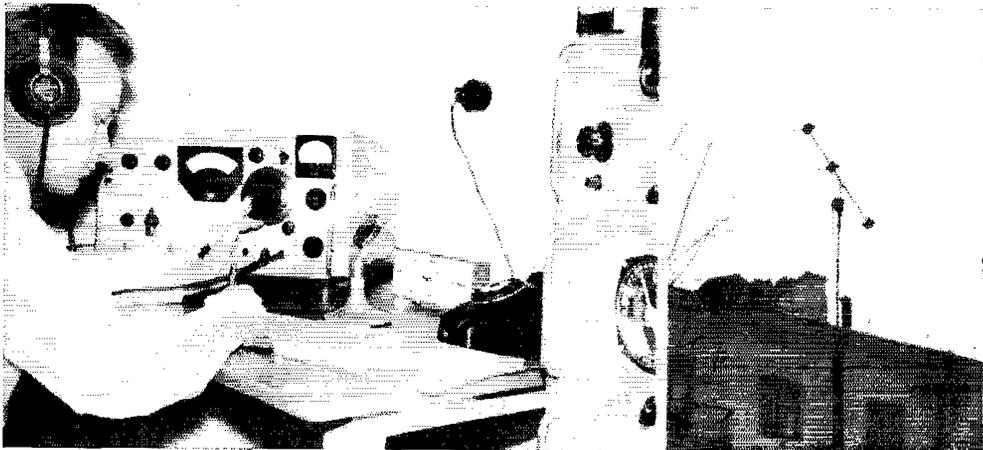
K8YSO is another satisfied user of W2SAW's foreign mint stamp supply. "They sidestep IRCs and really work." . . . WA8OVC has a zero-for-four return from Cuba but others report reliable QSL response from CM/COs. . . . Fine batch of QSLers of the Month: C33FL, CR9AH, CTs 1OI 2BO, DJ7HA, DLs 1BQ 8FQ, EIs 4AZ 8U 9AR, EL2D, FG7TD, F08BJ, FY7YK, GC8HT, GD3BNK, GM3NKR, HA1KSA, HBs 9KC 0ZT, HC9LX, HH9DL, HL9US, HZs 1AB 3TYQ, 1HAMR, IT1AGA, JA8AA, KY7HR, KG6IG, KJ6DA, KR6MM, KX6BQ, MP3s BCC BFU, OA4BI, OE1GWA, OH6NJ, OK2KGW, ON5PM, OZ7GI, PJs 3CD 5ME 5MI, PY7ACQ/p, SM3TW, SP6TG, ST2BSS, SV0VA, UA2AO, UQ2CS, VK9XL, VOLAV, VPs 2AT 2GLE 2AU 3AA, VU2s CK TS, Ws 6IBU/KG6 7MTA STNC/KW6, WH6CGB, XE1JJI, YK1AA, YUs 2RAZ 3BC, ZD7IP, ZF1RD, ZSs 1XR 6JK, 4Xts MZ SO, 5A3TX, 5W1AX and 7G1A, plus QSL tenders Ws 2CTN 3HNK 4ECI 7VRO 7ZAS 9WHM, K5GOT, WAs 4STL and 6OET, all applauded for particularly punctual pastebored production by "How's" reporters Ws 7VRO 8IBX 8YGR, Ks 8YSO 0DEQ 8YFN, WAs 1DBR 1DWE 2HIU 5CTD 5CXT 6MWG 8GGN 8MAT 8PKG 9IBT 9NXH, WB6s KIL and MPE. Anybody we missed saluting here? . . . *Up!* The following italicized chaps seek assistance toward QSLs from holdouts mentioned: W4DRK, MF2AG worked in 1952, VS6CT 56, ZAIAD 50; K8YSO, H18CLU '64, T12P '63; K0BHM, JTICA; W4AYDR, 5N2AA, 6Y5BB; W4BDX4, PY7ADW, 7Q7s EX RM; W2LFFN, 4X4SW and 9Q5GM. Any 'alp? . . . W7VRO, WAs 1APY 1DWE 4KXC 1WHX 8QJK 9IBT and WB2LJX offer their services as QSL reps for overseas DX hunters.

ASIA — "AP stations are not working since May, 1965, due to emergency in the country," confirms AP8B, "I am QSL manager, Lahore Amateur Radio Society, P.O. Box 65, Lahore, W. Pakistan, and can distribute all QSLs addressed to Pakistan stations. We hope to get our privileges back as soon as the emergency is withdrawn." . . .

Reference Japan's upcoming JH prefix, W1TS says the JA1 block is just about filled solid despite *Callbook* indications otherwise. . . . "K2LXP will look after my QSLs for North American contacts only," advises 4X4FV. "Others should send their cards direct or via IARC." K2LXP verifies this arrangement, stating he also tends QSLs for 4X4s AS and YA, the latter his own Israeli call. Larry assures that "Every card will be answered provided s.a.s.e. or IRC is included. Due to a mix-up 4X4AS told some of his contacts to QSL via K2IRK. The latter lives only a short distance from me so we can straighten this out all right." . . . WA6MWG's QSL responsibility to HA2BD begins with '66 QSOs.

AFRICA — "The Seychelles are so isolated that it's extremely difficult to get shipments in, especially radio stuff," details VQ9EF (W0BIC). "The best way is via Mombasa, Kenya, but this route is unpredictable. Not even magazines and catalogs seem to get through. I'm sending log carbons to my wife who will answer QSLs accompanied by s.a.s.e. at my W0BIC address. I'll also answer each QSL sent direct to Mahe with three IRCs." K5QVH adds more on Seychelles matters. "VQ9s BC RH and TC, exchange students from the States, are operating as much as possible. I'm QSL manager for VQ9RH only, but I can relay cards to the other two along with my mail to Bob." . . . W1APU says W2MES of Long Island DX Association may be of assistance toward 5R8CB confirmations. . . . As noted in "IARU News" last month, Box 299, Rabat, Morocco, is the new bureau address for CN QSLs. . . . With more than 200 cards to answer, W2LJX watches for FL8RA logs for QSOs after March 17th. Jim suggests, so far as dealing with QSL airmails is concerned, "On the envelope addressed to the QSL manager (not the s.a.s.e.)





UW4HZ's homespun 26-tube transceiver gives a good account of itself on 20-meter s.s.b. Valery patterned it after KWM-2 and 30L-1 circuitry with literature and components supplied by WA6TFZ who remarks, "Wouldn't want to tackle such a project myself!" That quad is homegrown, too, now a Kuibyshev landmark. (Photos via WA6TFZ)

place your own call, time, date and station worked, on a line just above your return address. This will save much time in handling." W2LJX also points out that most QSL helpers operate at a financial disadvantage, so extra stamps thoughtfully included will help balance the books. "A few operators seem to be aware of this problem and send more than sufficient postage. They should be commended as QSL-Seekers of the Month." W2GHK apprises, "Z99HE's logs are recorded over the air by PY2s PA and PE via their pipeline path to Tristan da Cunha. Eva and Alex in turn retransmit this data on weekly skeds with W3DJZ who mails the tapes to W2GHK. This eliminates the long wait for boat service to the island." Stu says his DXpedition of the Month staff can also help confirm Alan's pre-s.s.b. contacts over the past eighteen months or so. K0DEQ remarks, "I had just worked 7G1A prior to reading 'How's' advice on QSLing to him. I sent my card direct with s.a.e., three IRCs and a couple of U.S. commemorative. By return mail I received Josef's QSL in my envelope which was plastered with collectors' items from Guinea." We nearly lost Bill to philately.

OCEANIA — VS5JC QSLs for QSOs dating on and after June 7, 1966, are available through W5AI-W5VA. Ex-KC6BK awaits QSL inquiries at his new KR6KS address which follows. Stan also has logged DX as DL4JY, KL7CLI and KR6IZ. WA6MWW tells us, "KJ6DA now is QRT after eighteen months of high activity, more than 10,000 c.w. and sideband QSOs. Three thousand QSLs were dispensed by the station's QSL manager, WA6OET. She has logs for all operation. Jessie requests s.a.e. for direct reply; others go back via bureaus." K6KII/KG6 outlines QSL policy for KG6AAJ. Coral Isle A.R.C. station: "S.a.e. is requested from W/Ks seeking direct reply, one IRC each from others. QSL postage must come out of our own pockets. With thousands of QSOs per month, you can see that this could run into money." W7UVR points out that VR1S, though located on Funafuti, gets QSLs via Fiji. "I'm acting as QSL manager for KR6BD, KW6s EL and EM." affirms K6AJ. "I can also help with cards for the latter two's activity as KB6s CB and EPN." VR2ER regrets QSL delays. says W7NRB. "Raj ran out of cards, and a new batch took several months to arrive from New Zealand. QSLs via W7NRB with IRC or loose U.S. postage will get airmail dispatch to and from VR2ER. Others go slow surface mail." ARRL Assistant Secretary W1ECH has the Samoa QSL Bureau address as Clark W. Browne, KS6AX, Communications Officer, Government of American Samoa, Pago Pago, American Samoa, 96920. KS6s BO and BV, however, want their incoming QSLs directed to K4TWF. W1BPY finds VK6MI still yearning for most of the QSLs so blithely promised him by W/Ks. Colin wants to earn WAS before leaving Macquarie. His QSL manager's address appears in the catalog to follow, s.a.e. with IRCs requested.

EUROPE — Jan Mavén's LA6XF/d explains, "We send and receive QSLs via NRRL (Norway) but this may take some time. Mail does not leave the island all winter. As a matter of fact this letter goes with the first ship seen here since last December, along with an enormous amount of QSLs!" OK3s EA and UL tell of OK4CM's shipboard activity, the first OK1 work in years. "I already have Michal's first logs," writes OK3UL, serving as QSL agent in response to s.a.e. with IRC via the address in the roster that follows. K0CYG requests s.a.e. or

s.a.e. plus IRC, with GMT/GMD, for action on QSLs resulting from the June-July Vatican, Monaco and Tunisia work of rover WB6CIY. TF2WJW (WB6OYP/5) guarantees 100-per-cent QSL via manager WA5GLI. W1ECH points out, from RSGB's *Bulletin*, that cards for stations operating in the U.K. under reciprocal-licensing agreements may be sent in care of G3DRN. From K0VFN: "SM13TW says he QSLs via WA6NON except for contest contacts which are handled direct." For planned DX activity K3KMO recommends a look at the Mimeographed operating and QSL specifications issued by G3CHT. Al writes, "Speaking of cards, my final QSL return for MIN was a dazzling 45 per cent. I'm going to send seconds around to see if I can get improved results." K3KMO wants to know how to tell Franz Josef Land UAs from the regular run of Leningrad lads. Accentuating the negative: DL9BL assures WA6MWW he knows nothing about the PX1 bearing his suffix, and WA6OAQ hears from ZC1CI that any 5B4s heard for the past two years or so are fragmentary. That Cyprus prefix is suspended till further notice.

SOUTH AMERICA — "All U.S. civilian Antarctic amateur stations, KC4AA- and CE6ZL/mm, the National Science Foundation's USNS *Ellanor*, our research vessel now working for about two years around Antarctica, should have QSLs mailed to Office of Antarctic Programs, IRES, National Science Foundation, Washington, D. C. 20550." This from Helen Gerasimou under the Foundation's letterhead. Reciprocal licensee HC1TH/K50DZ names WA5IBK his QSL aide, promises 100-per-cent QSLing, and wants no cards via bureaus. W7VRO's stint as PV2BGL QSL charge commences with QSOs on or after June 1, 1966. PV2BGL protests the use of local time designation on many cards arriving direct from W/Ks. "On May 27th, for example, I worked almost 450 U.S. stations. Obviously, GMT is a must. By the way, K9YRA saw my 'How's' request for MP4TBJ QSL data and helped me out." W8WAH, entertaining 9Y4TX in Cleveland, finds Edgar a thorough QSLer. 9Y4TX admits that some 9Ys confirm QSOs most reluctantly. Another unenthusiastic QSLer is said to be FY7YL. W1NIF says nothing works. Lush crop of specific QTH suggestions this month. Remember they're necessarily neither "official", accurate nor complete. Just might work out, though. Help yourself. . .

AP2AR, A. Rahman, 36 Purana Paltan, Dacca, E. Pakistan
 AP8B, E. Elkington, P.O. Box 65, Lahore, W. Pakistan
 CE9AO, F. Romero, Hospital 31, San Felipe, Chile
 DJ6QT/LX (via W2GHK)
 EI0R, T. Deegan, 2 Casement Av., Janesboro, Limerick, Eire
 EL2AT, P.O. Box 659, Monrovia, Liberia
 FB8ZZ (via FR7ZD)
 FL8AU (via VE4OX)
 FR7s GF ZQ (via W6LDA)
 FR7s ZP ZQ (via W4VPD)
 FY7YG, 90 Daramath, Cayenne, Fr. Guiana
 GC5s ACH/W6KG ACI/WB6QEP, Yasma Foundation, P.O. Box 2025, Castro Valley, Calif.
 GD5ACI/WB6QEP, Yasma Foundation, P.O. Box 2025, Castro Valley, Calif.
 GM3NKR (to G3NKR)
 HC1TH/K50DZ, T. Hoke, Box 583, Quito, Ecuador (or via WA5IBK)

YO CONTEST

August 6-7

Amateurs the world over are invited to participate in the annual YO Contest, 1800 GMT Saturday August 6, to 2100 GMT Sunday, August 7. This is a c.w.-only test on 80-10-20-15 and 10 meters. Non-YO stations will try to contact as many YO stations as possible exchanging RST and serial number, starting with 001 (regardless of band). The call of the YO stations will be followed by two letters indicating their own region, as follows: BU, Bucharest City; AG, Arges; BC, Bacău; BT, Banat; BV, Brasov; CJ, Cluj; CR, Crisana; DB, Dobrogea; GL, Galati; HD, Hunedoara; IS, Iasi; MR, Maramures; MS, Mures; OL, Oltenia; PL, Ploiesti; SV, Suceava; RB, Reg. Bucuresti. Each YO region is a multiplier on each band thus the maximum multiplier is 85, 5 bands times 17 regions. Complete contacts are two points, partial ones one point. Final score is the sum of QSO points times the multiplier. Logs must contain date and time in GMT, station worked, serials exchanged, notation of new multipliers and QSO points. A summary must be enclosed with score information, operator's name and address, equipment description and a signed pledge certifying that all rules and regulations have been observed and that the report is a true one. Logs must be postmarked no later than September 1 and addressed to: Central Commission of the Radio Sport, P.O. Box 95, Bucharest, Rumania.

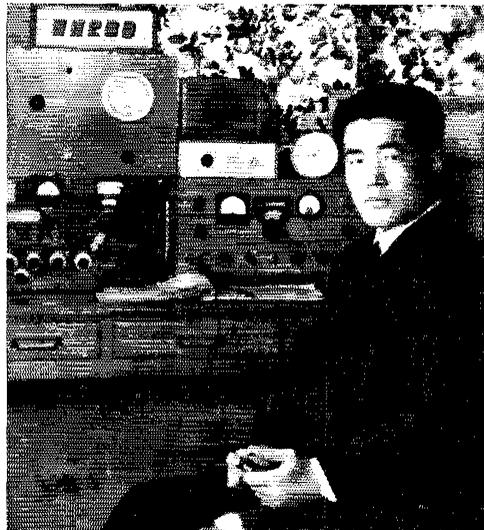
ALL-ASIAN DX CONTEST

August 27-28

JARL invites world-wide participation in the 7th All-Asian DX Contest (a c.w.-only affair) from 1000 GMT August 27 to 1600 GMT, the 28th. Non-Asians will work Asians on 1.8 through 28 Mc., exchanging serials consisting of RST plus the operator's age (YLs are permitted to substitute two zeroes for the latter figure). Final score derives from total contacts multiplied by total band-countries worked. Single-band, multiband, single-op and multi-op categories are available, certificate of meritorious performance will be awarded, and there's a special trophy due the highest scorer on each continent. Entries must arrive at the JARL Contest Committee, P.O. Box 377, Tokyo Central, Japan, no later than December 30, 1966.

H18GTM, G. Toule, 77 Santa Cruz St., Bayman, Puerto Rico
 H18NZT, Box 951, Santo Domingo, D.R.
 H18XMT, % U. S. Embassy, Santo Domingo, D.R.
 HK6BCG, Box 119, Nueva Colombia, Colombia
 HK9AVK (via LCRA)
 HL9TH (via K1ERT)
 HM2BD (via WA6MVG; see preceding text)
 HVMD (via IICNV)
 J11AD, Box 641, Ulan Bator, M.P.R.
 J11AJ (via JT1KAA)
 K4MTD/KJ6, W. Branstetter, P.O. Box 674, Niceville, Fla.
 KB6s CB EPN (via K6JAJ)
 KB6CY (via W2CTN)
 KC4AAD, Box 26, FPO, San Francisco, Calif.
 ex-KC6BK (to KR6SK)
 KG6AAY, Box 110, U.S. NavCommSta, FPO, San Francisco, Calif., 96530
 KG6SB (via W7PHO)
 KW6s EL EM (via K6JAJ)
 LAs 1L/G/p 2IK/p 2JK/p 3P/p 5AJ/p 5ZJ/p 6XF/p 8PG/p (via NRRL; see preceding text)
 LA4FG/p (to LA4PG)
 LA5CI/p (via LA1NG)
 LU7WH, N. Sabio, Box 56, Trelew, Chub., Argentina
 LU9s ECN CN/m, C. Kaufman, P.O. Box 31, San Miguel, Buenos Aires, Argentina
 OK3UL, J. Straka, P.O. Box 44, Malacky, Czechoslovakia
 OK4CM (via OK3UL)
 PJ2AA (via W2CHK)
 PX1BRM (to PA0BRM)
 PX1JQ (via REF)
 PX3RI (via F3RI)
 PY2BGL (via W7VRO; see preceding text)
 PY2BOY, P.O. Box 22, Sao Paulo, SP, Brazil
 PY2GJH, Box 86, Amieso, Formosa, Brazil
 PY7APS, Box 2177, Recife, PE, Brazil
 PY8J, Box 283, Manaus, Amazonas, Brazil
 SM3TW (via WA6NON; see preceding text)
 SM5KV/M1 (via S8A)
 SU1AR (via SU1AM)
 SV6WKK (via K1MVE)
 TF2WJT (via WA3ECU)
 TF2JWJ, 612 Hacker St., New Iberia, Louisiana
 ex-TG9BJ (to EP2RJ)

TG9RN, Box 892, Guatemala City, Guatemala
 UA1KED, % E. Krenkl, RAEM, la Chaplign St., Moscow, U.S.S.R.
 UR2FU, Box 387, Tallinn, Estonian S.S.R., U.S.S.R.
 VE1ASJ (see preceding text)
 VK0MI, % G. Johnston, 3 Inglis St., Newtown, Hobart, Tasmania, Australia
 VP2AP, P.O. Box 93, Antigua, B.W.I.
 VP2KJ, % Flatbush R.C., Box 26, Flatbush Stn., Brooklyn, N. Y., 11226
 VP5BP (via W2CTN)
 VP7NY (via W2CTN)
 VP8IQ, Port Stanley, Falkland Islands via Montevideo, Uruguay
 VQ9RH (via K5QVH)
 VR2ER, Raj Singh, GPO Box 59, Suva, Fiji (or via W7NRB)
 VR1S, P. Dunbar, Box 288, FPO, Suva, Fiji
 VS5JC (via W5A1-W5VA; see preceding text)
 VU2DIA (to VU2D1)
 VU2GW (via W2CTN)
 WA3CBO/KH6, G. Dillman, 5 Johnson Circle, Honolulu 18, Hawaii, 96818
 WA5OTN/mm, J. Jackson, USS Fasp, % FPO, New York, N. Y., 09501
 XW8BD (via K1BFX)
 YN1JLA, Box 189, Managua, Nicaragua
 YN7GJ, G. Jackman, Masaya, Nicaragua
 YO2BW, R. Stuhlmueller, Box 100, Timisoara, Roumania
 YO4s AHE KCA, Box 33, Constanta, Roumania
 YO9KPD, Box 113, Ploesti, Roumania
 YV1ST, Box 791, Maracaibo, Venezuela
 YV5CET (via RCV)
 ZB2AR/mm (to G3TIF)
 ZD9BE (via W2GHK)
 ZI1AFO, D. Rosan, 16 Chequers Av., Glenfield, Auckland N. 5, N.Z.
 ZS6CN (via W2CTN)
 ZS8L, Box 194, Maseru, Basutoland
 4X4s AS YA (via K21XP)
 4X4FV (W/K/VE/VOs via K21XP)
 5H3KF, C. Schneider, P.O. Box 1138, Mwanza, Tanzania
 5N2AAW, P.M.B. 2469, Lagos, Nigeria
 ex-9G1DR (to 5H3KF)



HM2BD, a director of KARL, likes the roll-your-own approach and is finishing up a 1500-watt p.e.p. final at Kyonggido. Sang is active around 14,250 kc. almost daily 0600-0800 and 2100-2200 GMT.

(Photo via WA6MVG)

Great big TNX to donors Ws 1APU 1BPY 1CKA 1GNU 1DYE 1ECH 1UED 1WPO 1YYM 2JBL 4DRK 4VPD 4YOK 6MSM 7NRB 7UVR 8IBX 8YGR, Ks 2AGT 3KMO 6KII 7K6 7QXG 8Y8O 9DPO 9VFN, WAs 4WVK 1YDR 5CXT 8CXP 8PKG 9IBT, WBS 21FFN 6KIL 6AOS, WN41BV, AP8B, LA6XF/p, P. Kilroy, DARC's DX-MB (DLs 1EP 3RK), DX Club of Puerto Rico DX'er (KPIRK), Far East Auxiliary Radio League News (KA2LL), Florida DX Club DX Report (W4MVB), Japan DX'er Radio Club Bulletin (JA1DM), Long Island DX Association DX Bulletin (WA2EIN), Newark News

(Continued on page 134)



Operating News



F. E. HANDY, WIBDI, Communications Mgr.

LILLIAN M. SALTER, WIZJE, Administrative Aide
ROBERT L. WHITE, WIWPO, DXCC Awards
GERALD PINARD, Club Training Aids

GEORGE HART, WINJM, National Emergency Coordinator
ELLEN WHITE, WIYYM, Ass't. Communications Mgr.
PETER CHAMALIAN, WIBGD, Communications Asst.

Achieving the Clean S.s.b. Signal. Any signal that takes excess bandwidth can cause serious interference to operations on adjacent channels. Observers daily note examples of improperly adjusted equipment radiating a poor signal and some signals with effects outside the phone sub-bands. Complaints are loud and long when these side effects interfere unjustifiably with communications on our channel! Let us here detail some voice operating precautions to assure clean signals.

A year or two ago this matter was discussed in the Navy MARS technical information program. Lieutenant Commander Bob Mickle, Chief Navy MARS, and Capt. Paul H. Lee, W3JHR, have generously permitted us to brief some basic operational ideas from their bulletin treatment. After some recent listening, we think it about time to bring up this subject again! S.s.b. signal cleanness can be referred to in terms of r.f. bandwidth, carrier suppression, unwanted sidebands, intermodulation product suppression and audio frequency response over the desired bandwidth.

Many manufactured equipments are reasonably clean, if adjusted and operated properly as recommended in the instructions. How can those of us building our own gear avoid bad signals? What are the things to watch for? First let us look at some causes of unclean signals.

Avoid Too High Settings of Audio Gain. Overdrive is one common cause of unclean signals. Setting the audio gain to high, or the i.f. gain in an s.s.b. exciter, or a faulty a.l.c. circuit or over-dependence on this with a high gain control setting can cause trouble. With overdriving and peak flattening, the signal becomes less readable than a clean signal.

The plate current meter of the final amplifier in an s.s.b. transmitter should swing to no more than 50% of the peak envelope reading as your rig is voice modulated. In addition, read the technical discussion by W1DF which appeared in November '62 *QST* (page 11). Audio compression ahead of the s.s.b. exciter will do more to avoid generating spurious products than a.l.c. This prevents overdriving and gives about 8 db. additional talk power. See also two articles in Nov. 1965 *QST*.

Gain capability should be enough so one can modulate fully with the mike held some distance from the face. One cause of poor audio and poor signals is that of pressing the mouth right on the microphone while talking. Tubes with impaired peak emission capability or having improper bias can cause non-linearity too . . . but the most common trouble is this matter of pushing up the gain and improper mike technique.

Operational Checking of the Voice Signal. How do you detect flat topping? One way, of course, is to use the oscilloscope with its triangular pattern, putting audio

voltage on one set of scope plates and r.f. on the other, to show overall linear performance. It's still possible to have unwanted feedback and spurious products in the output of non-conforming stages. Excellent practice is to use your receiver as a monitor and with the transmitter on a dummy load. With the transmitter on a dummy load that is truly non radiating you can listen even without a two-tone test and by playing hi-fi music into the rig any distortion will be apparent (more so than with voice). If your s.s.b. rig now sounds clean with such a test-on-dummy antenna, the chances of being clean with voice on the air are held to be very good.

Goals. One of the most important things in life is to have a goal. This applies both to individuals and to organizations. Within amateur radio there are, as there ought to be, all kinds of goals. In operational Amateur Radio — there's the code proficiency award, open to everybody, also WAS, DXCC, the BPL, Official Station Appointment (ORS, OPS or OBS for which to qualify), and "net" membership to aim at, to give examples of just a few of the goals. The broader operational goals of the good fist, concise and excellent procedure, true courtesy and assistance to others and the deep satisfactions in public service and fraternal contacts are developed through these many stepping stones, each a goal in itself. In technical fields we have the goal of attaining a fine signal, improving gain or directivity in antennas, arranging flexible break-in (c.w.) or VOX (voice) or an RTTY set up for fast and efficient operating with minimum band-width — just to scratch the surface of listing objectives.



Southern New Jersey SCM W2ZI represents well over a half-century of amateur radio activity and interest. W2ZI has participated in net operations, public service, contests, clubs and is an active wireless historian with over 400 items in his historical wireless museum. When time permits, Ed enjoys swimming, camping, hiking, photography and traveling. W2ZI's station includes a 32V-2, HT-37 driving an SB-200; 75A-4; trap antennas, dipoles and vertical.

Each building project we set ourselves in Amateur Radio can be a technical goal in itself. Its achievement can add much to our personal satisfaction and know-how. There are many ways to reach these goals, once a goal is set. To achieve a goal may take some cost or effort, but this in itself is enriching. Whether by blood and tears, inspiration, plain perspiration or otherwise, the result of the effort is satisfying. A "boughten" goal is much less useful and satisfying to the true amateur than something accomplished by personal striving. As for having goals, there's much in the truism: "Hitch your wagon to a star, keep your seat and there you are."

About c.w. 1D . . . and ID P/M if Using Voice. When identifying, an operator of an amateur station operated as a portable or mobile station using telegraphy shall transmit after the call sign, the fraction-bar character (DN) followed by the number of the amateur call sign area in which the portable or mobile is being operated. *When using telephony* a great many operators for a very long time have mistakenly carried this same practice over. Some have been cited recently by FCC on this account!

When using telephony, section 97.87 of our FCC rules requires use of "this is" or "from" preceding ones call sign, then followed by announcement of the *geographical location* in which the portable (or mobile) station is being operated. You can consult the referenced section in the ARRL *License Manual*. This gives a full example of exactly how this rule is to be followed. Also June '66, *QST*, page 73, gives such text as Example 4. Since we still hear a good many ID's that are incorrect and SCM's even note with their Station Activities reports that FCC citations still are being made, we felt it an obligation to invite attention once again to this FCC requirement.

Handling Q Signals Correctly. Voice operation requires concise expression, use of phonetics only as required and, instead of abbreviations, following the principle of "say it with words." Q Signals are *not* for voice operations! But c.w. operators use and *need* the International Q Code, standard abbreviations adopted internationally "for all services."

The trick is to use these Q Signals correctly! We advise keeping a list of the most-used meanings at hand, and following the *exact* language given. There are too many highly specialized meanings to permit the memorizing at random. To correct some common tendencies to misuse these abbreviations we give you this month a few excerpts from an article by Hugh Gibson, W8DSL, (A-1 Operator Club) in QMN, the Michigan Traffic Nets Bulletin:

"Frequently heard mistakes are the use of QSL in place of R, in direct receipting for Traffic. Some use QSP for the *word* relay, QSO in place of a request to talk to another member, or QRZ in place of QRZ? In general all these signals were devised to shorten c.w. transmissions and give exact phrasology in an abbreviated form.

When used as a question IMI (?) always follows the signal itself. . . . It seems that some incorrect use is brought in from the phone bands. It must be remembered that these signals were not designed for voice use and such voice usage is prohibited by most civilian services and the military. . . . Now for QSL: QSL is *not* a procedure sign and never should be used as such. QSL is used when asking about a *previous* transmission, not a current one. R (roger on voice) is *always* used conveying, *I have received your last transmission, solid or complete.* QSL is proper when discussing a message sent *previously*. If a net message is handled and one station does not receipt for same, it is then correct for a receiving station or the NCS to transmit "QSL

BRASS POUNDERS LEAGUE

Winners of BPL Certificate for May Traffic:

Call	Orig.	Recd.	Rel.	Net.	Total
K6BPL	218	3719	3532	187	7656
W3CUL	201	1108	1027	63	2397
K6BPT	212	785	820	265	1782
W0OMK	108	822	779	12	1721
W4LEW	7	781	752	29	1639
W0LGG	16	800	712	22	1550
W1PEX	61	690	616	52	1419
W3IVH	27	679	612	67	1385
K5TPE	0	689	688	1	1378
W0WPF	83	641	603	38	1365
W7BA	6	611	565	41	1323
W6RSY	188	474	389	78	1129
W6VNO	14	539	534	0	1087
W4ACC	54	522	461	8	1045
W3CUL4	19	512	491	4	1026
W4JGZ	18	491	497	12	1016
W3EML	51	548	417	6	1011
K7TCY	14	444	402	40	900
W6ZJR	22	428	415	13	878
W44TPB	25	433	409	6	873
W7DZX	18	437	368	11	834
W1BBB	39	412	355	24	830
W8UPH	16	408	338	67	829
K0GSY	50	431	344	0	825
W8BJU	20	374	325	49	768
W8GMM	21	67	582	22	692
K9IVG	16	380	265	8	653
W44WTF	19	311	310	3	624
W42UPC	52	392	254	25	623
W43DK/4	108	104	88	16	616
K1BQR	20	300	282	9	611
W1EFW	41	319	201	20	581
K3MYS	15	284	258	21	578
W42GPT	37	266	220	41	564
W448CK	22	257	264	8	532
W0OHJ	4	270	260	10	534
W50BD	11	264	260	0	535
K9KZB	30	252	238	14	534
W40JKT	177	210	177	65	529
W8YYP	14	256	223	9	512
K8LNE	9	247	232	15	503
W4FX	5	254	235	8	502
Late Reports:					
W3IVS (Apr.)	69	1692	1575	117	3453
W3IVS (Mar.)	29	917	878	39	1863
W3IVS (Feb.)	26	824	738	76	1674
W3IVS (Jan.)	19	364	229	35	547

More-Than-One-Operator Station

Call	Orig.	Recd.	Rel.	Net.	Total
W6YDK	4065	64	28	36	4193
K6MCA	682	616	536	80	1914
W81AB	511	385	269	316	1681
K1KBO	187	462	453	9	1411

BPL for 100 or more *originations-plus-delintries*

W44HJM	363	K1EVY	124	W47DNZ	102
W4ARATQ	292	W41LE	123	W8SUF	101
W44BMC	200	W2OE	112	W8JUV	100
W6BQQY	192	W8RBA	108	W44DYI	100
K7CTP	165	K5VBF	107	W8HVR	100
W44AGH	164	W41APY	106	Late Reports:	
W8QND	155	W8F8X	105	W44BMC (Apr.)	228
W4ROQM	138	K6AYU	104	W44PVF (Apr.)	169
K8WMLQ	137	W40GUJ	104	W4CWT (Apr.)	162
W8HVA	130	K6QVN	104	K4EYV (Apr.)	128
W4PQP	127	W49GVW	103	W2OE (Apr.)	107

More-Than-One-Operator Stations

W8LT	118	Late Reports:		WB4BF (Apr.)	140
		WB4BF (Mar.)	237		
		W8RBT (Apr.)	164		

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 of 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.

IMI nr—" If the station has received this message, a proper response *then* is QSL NR . . . AR. Let us receipt for correctly received transmissions with "R"! (When *not* forthcoming, "QSL" becomes the proper inquiry.)

"QSP I AM Detroit is a proper use for this Q signal. In reply the letters QSP constitute a complete affirmative. One does not say "I will QSP your message for you" or "Will you QSP a message to Detroit," if he is an experienced operator. The letters are not synonymous with the word relay.

"Words with W8DSE" is a proper way to request an informal contact with another net member. QSO is *not* appropriate here. Follow the definitions of the various parts of the Q Code for proper usage."

QSO? Can you communicate with . . . direct (or thru . . .)?

QSO I can communicate with . . . direct (or thru . . .)

QSP? Will you relay to . . . ?

QSP I will relay to . . .

QRZ? Who is calling me?

QRZ You are being called by . . .

QSL? Can you give me acknowledgment of receipt?

QSL I give you acknowledgment of receipt.

Ideas that Can Improve Your Net Operations. Every operator reporting on a net regularly needs a tabulation of net stations or a showing of these on a map of his state, or other listing that shows where the regulars report in from, and what stations can relay which traffic where! The NCS may be in a position to furnish this information but NCS duties are sometimes



DX CENTURY CLUB AWARDS



From May 1, through May 31, 1968, DXCC Certificates and Endorsements based on contacts with 100-or-more countries have been issued by the ARRL Communications Department to the Amateurs listed below.

New Members

PY2CQ.....269	YU1NIG....113	W4WGI....105	W3BWZ....103	K8UZK.....101	K2PZF.....100
DL4LF.....205	KR8MM....111	WA8MQE...105	WA9CYV...103	W1AYR....101	K3TRZ....100
ZL3GS.....200	WA7AHH...110	G8HSL....104	WA9DJO...103	W1BUX....101	K3WNL....100
LA5WF.....188	ZS6BFG...110	K1EIN....104	K2CIS....102	W2NZH....101	W3DHO....100
W82JYD...140	8B4PC....108	WB2HVVH..104	K4KZZ....102	WA489P...101	W4DIT....100
DL3VR....131	WB2GMIN..107	HK3AVK...103	KR8DB....102	WA9GNL...101	WA8WT....100
DL9NX....126	K2AGU....106	K6LBV....103	SM7CPL...102	G3JEC....100	W5DZA....100
VE8BB....116	VE5JS....106	K9OSO....103	WA6FOP...102	K1IHK....100	WA6AUD...100
DL9OA....115	WA8NYK...106	VP9EU....103	W9CGG...102	K1SGU....100	W8GOC....100
KZ5AY....115	LZ1KPW...105	WB2JJF...103	WA9KQ9...102	K2MYR....100	W9MG....100
WA5LES...114					

Radiotelephone

ZL3GS.....176	VE3CLV...130	DL1GR....118	WA9PQE...104	K8ZNC....100	WA5GNT...100
LA5WF.....174	VE3FHO...121	W4WBF...111	WA7AIO...103	Q14PI...100	WA6AUD...100
9W1LP...144	W8FLC....120	DJ3HC....107	K3MLR....102	W1FXD...100	W7YBX...100
WA0KDI...135	W9WYB...119	K9TXZ....106	SV0WG...102	W82BBZ...100	WA9CYV...100

Endorsements

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 show only that the participant has reached the endorsement group indicated.

320	W3AFM	240	PY2BKO	W1WLZ	W8NIIJ	W7VRO	120
YK2ADE	W5EZE	K4CEB	VE2BCT	WA2LAW	W9OW	W9IGW	DJ6BW
W1AZY		K6HZP	VE3ACD	W4HKQ	Z5IACD		K1QC
W6CYI	280	K8DYZ	WB2MFX	WA0DXA	9V1LP	140	K4SX
W6UJ	W1EVT	LU8BAJ	W4HOS	W9WNB		DJ4XA	K5KYD
	WA2RLQ	SM1CXE	W8LJC	WA0KDI	160	K8BFX	K9PQG
	WB2FSW	VE3AAZ	W9CAW		K3FGO	PY1BTX	K9PTW
310	W5NUT	W2GHK		180	K8YEK	WA1ABW	ON4NM
YE2BV	W08MV	W4PRO	200	K1SCQ	SP5AEP	WB2FOV	V77NA
W1JNV	Z56LW	W6KTE	DJ2HI	K2AFY	VE2AJV	W3FTJ	W2IWP
W3GRS		W7TDK	DJ2SR	OZ4H	W1EHT	WA4KXC	WB2KTO
W9WYB	260	W9MZP	DL1CR	W21P	W1EOA	WB6KPR	WB2PBI
	DJ4TZ	Z52RM	DL1FZ	W2LW1	W4HD	W9LKJ	W4HHN
300	K4RZK		TN8AF	W4GTS	W4LXX	W9NVJ	W4HIZ
K6JIC	PY7YS	220	VE1AFY	WA4QBX	WB6CFO	WA9JDV	W4WHK
W2JAE	W0QUU	HP1BR	W1MX	W6FB			

Radiotelephone

320	280	240	W2GHK	W1RO	PY2CYK	W9LAA	120
ZL1HY	WB2FSW	W2LEC		W3GRS			CT1LN
	Z56LW	W6KTE	200	W5JWA	160	140	K1SCQ
		W9JT	G4JW	W6TGB	K8GOP	CT1IK	L8JDB
310	260		K0YEF		K0BUR	F2KC	VE3FKL
W1CLX	W1DQJ	220	OE2EGL	180	VE2AJV	IS1VAZ	W8NM
W2BQM	WA2EOQ	K1EIO	OK1MP	DJFTZ	WB2MFX	PY2CTL	WA5TEV
W6BAF	W7QPK	K2ER	VE3ACD	VE1AFY	W5LGG	WA5LOB	W01M
300	PY7YS	VE2BCT				ZL30Y	YU6CB
K4HYL							

unexpectedly rotated, so individual lists are worthwhile. Some operators keep an atlas at hand or post a map for ready reference. Helpful maps can be obtained from the nearest gas station. The ARRL Net Directory, compiled annually and giving frequencies and times of operation is very likely the most effective aid to help correct routing of traffic in a regional and national sense.

A few years ago here in Connecticut, the RM and PAM, Net Managers, also got from the local Telephone Company their concise map-and-city-list defining toll-free and telephone exchange areas for the entire state. This was distributed to all netters, and found invaluable, showing which member-station could readily be responsible for deliveries for areas shown. The Mission Trail Net this season has again made an excellent Routing Guide available to its entire membership. While space doesn't permit "sample" listings here, the major items set down rate emulation by any net managers and editors of bulletin information for nets. MTN is to be commended on its admirable production.

There's (1) a listing of netters *by cities*, and data on each station's operating facilities. (2) a listing of members *by calls* and (3) such a list by counties. There are two other items that we think especially worthwhile: (4) a complete listing of the *liaison stations working to other nets*, also an idea of the coverage by cities, points or areas for such nets, and (5) an alphabetical listing of cities that can be contacted by toll-free telephone service. Following the name of the city are the calls of amateurs in a given area, through whom that particular city can be reached. For every net, we hope the PAM, VHF-PAM, RM, or manager-by-whatever-name, will himself or, with the assistance of a dedicated member, work out helps of this nature to make net operations ever more efficient.

— F. E. H.

OPERATOR OF THE MONTH

During May and June, the following additional amateurs were nominated by their fellow amateurs in recognition of their special operating skills and courtesies:

K1JFQ	K6BPI
W1OER	WA6NLG
K1REW	WB6QMI
K1TXX	WN6QYL
W1VAH	K6RAJ
W1YXB	WN7EDN
WB2BGV	K7NHG
WB2UCU	WA8MCO
WA2VID	WA9CBO
W2YLV	WA9KYE
W3DJZ	WA9ONB
WA3DVO	K9YTT
W3GBB	IJ4VP
K3KJZ	VE2AFZ
K3TJE	VK2NS
WN6OHE	VK9JK
K5OKR	VP2KR



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 or more ARRL full members of the Section concerned, in good standing are required on each petition. No member shall sign more than one petition.

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

Petitions must be received at ARRL on or before 4:30 P.M. on the closing dates specified. In cases where no valid nominating petitions were received in response to previous notices, the closing dates are set ahead to the dates given herewith. The complete name, address, and station call of the candidate should be included with the petition. It is advisable that eight or ten full-member signatures be obtained, since on checking names against Headquarters files, with no time to return invalid petitions for additions, a petition may be found invalid by reasons of expiring memberships, individual signers uncertain or ignorant of their membership status, etc.

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 will please add city and street addresses 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.

— F. E. Handy, Communications Manager

Section	Closing Date	SCM	Present Term Ends
Idaho	Aug. 17, 1966	Raymond V. Evans	Apr. 10, 1965
Maritime	Aug. 17, 1966	D. E. Weeks	June 11, 1966
Western New York	Aug. 17, 1966	Charles T. Hansen	Aug. 10, 1966
Santa Barbara	Aug. 17, 1966	Cecil D. Hinson	Aug. 10, 1966
Iowa	Aug. 17, 1966	Denois Burke	Deceased
Santa Clara Valley	Aug. 17, 1966	Jean A. Gmelin	Oct. 15, 1966
Nevada	Aug. 17, 1966	Leonard M. Norman	Oct. 22, 1966
New Hampshire	Aug. 17, 1966	Robert Mitchell	Oct. 26, 1966
San Francisco	Sept. 9, 1966	Hugh Cassidy	Nov. 19, 1966
Maryland-D.C.	Oct. 10, 1966	Bruce Boyd	Dec. 10, 1966
Southern Texas	Oct. 10, 1966	G. D. Jerry Sears	Dec. 10, 1966
Delaware	Oct. 10, 1966	Roy A. Belair	Dec. 10, 1966
Mississippi	Oct. 10, 1966	S. H. Hairston	Dec. 15, 1966
Alabama	Oct. 10, 1966	William S. Crafts	Dec. 26, 1966

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.

Saskatchewan	Mel Mills, VE5QC	Apr 11, 1966
Utah	Gerald F. Warner, W7VSS	July 15, 1966
Western Pennsylvania	Robert E. Gawryla, W3NEM	Aug. 7, 1966

SUGGESTED OPERATING FREQUENCIES

RTTY 3620, 7040, 14,000, 21,000 kc.
WIDE-BAND F.M. 52.525 146.94 Mc.

GMT CONVERSION

To convert to local times subtract the following hours:

ADST -3, AST -4, EDST -4, EST -5, CDST -5,
CST -6, MDST -6, MST -7, PDST -7, PST -8,
Hawaiian -10, Central Alaska -10,

CODE PROFICIENCY PROGRAM

A.R.R.L. ACTIVITIES CALENDAR

(Dates are shown in GMT)

- Aug. 5: CP Qualifying Run — W6OWP
- Aug. 18: CP Qualifying Run — W1AW
- Sept. 8: Frequency Measuring Test
- Sept. 9: CP Qualifying Run — W6OWP
- Sept. 10-11: V.H.F. QSO Party
- Sept. 16: CP Qualifying Run — W1AW
- Oct. 7: CP Qualifying Run — W6OWP
- Oct. 8-9: Simulated Emergency Test
- Oct. 15: CP Qualifying Run — W1AW
- Nov. 12-14: Sweepstakes Contest, phone
- Nov. 19-21: Sweepstakes Contest, c.w.

OTHER ACTIVITIES

The following lists date, name, sponsor, and page reference of QST issue in which more details appear.

- Aug. 6-7: Ill. QSO Party (p. 91, this issue).
- Aug. 6-7: YO Contest, Central Commission of Radio Sport (p. 83, this issue).
- Aug. 13, Sept. 10: WAE DX Contest, DARC (p. 131, this issue).
- Aug. 13-14: S. C. QSO Party, Low Country ARC (p. 108, this issue).
- Aug. 13-15: Indiana QSO Party, Michigan City ARC (p. 92, this issue).
- Aug. 20-21: N. J. QSO Party, Englewood Amateur Radio Assn. (p. 90, this issue).
- Aug. 27-28: All-Asian DX Test, JARL (p. 83, this issue).
- Sept. 10-11: Pan Americano Peru 1966 Contest, RCP (next issue).
- Sept. 17-19: Washington State QSO Party, Boeing Employees' Amateur Radio Society (next issue).
- Sept. 17, 24: Scandinavian Activity Contest, EDR (next issue).
- Oct. 1-2: WADM Contest (next issue).

Twice each month special transmissions are made to enable you to qualify for the ARRL Code Proficiency Certificate. The next qualifying run from W1AW will be made Aug. 18 at 0130 GMT. Identical tests will be sent simultaneously by transmitters on c.w. listed frequencies. The next qualifying run from W6OWP only will be transmitted Aug. 5, at 0400 (Greenwich Mean Time on 3500 and 7129 kc. **CAUTION!** Note that since the dates are given in 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 Aug. 18 becomes 2130 EDST Aug. 17.

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.

Daily tape-sect code practice transmissions are available on an expanded basis this season. These start at 2330 and 0130 GMT and are sent simultaneously on all c.w.-listed W1AW frequencies, with about 10 minutes practice given at each speed: 5 7½ 10 13 20 and 25 w.p.m. on Sun, Mon, Wed, Fri, from 0130 to 0235; 15 20 25 30 35 w.p.m. on Tues, Thurs, Sat, from 0130 to 0220; 10 13 and 15 w.p.m. daily from 2330 to 2400 GMT. [All days are in GMT.]

To make the practice more beneficial the order of words in each line of the text is sometimes sent reversed. The 0130 to 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 fist by sending in step with W1AW and to allow checking strict accuracy of your copy on certain tapes note the GMT dates and texts to be sent in the 0130 to 0220 GMT practice on those dates.

- Date Subject of Practice Text from June QST
- Aug. 1: *It Seems to Us*, p. 9
- Aug. 4: *An S.S.B. Transmitter for Transceiver Operation*, p. 11
- Aug. 9: *How To Substitute Components*, p. 24
- Aug. 17: *Breaking the 5650-Mc. Record*, p. 82
- Date Subject of Practice Text from *Understanding Amateur Radio*, First Edition
- Aug. 26: *Receiver Controls*, p. 50.
- Aug. 29: *Selectivity*, p. 51

W1AW SCHEDULE, AUGUST 1966

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					
0020-0100 ⁴	3.555 ⁵	14.1	14.1	7.08 ⁶	14.1
0100	Phone-OBS ²					
0105-0130 ⁴	145.6	3.945	115.6	50.7	1.82	21.41
0130	Code Practice Daily ¹ 15-35 w.p.m. TThSat., 5-25 w.p.m. MWFSun.						
0230-0300 ⁴	3.555	7.08	1.805	7.08	3.555
0300	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				
0335-0400 ⁴	7.255	3.945	7.255	3.945	7.255
0400	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 ⁵				
1900-2000	14.23	7.255	14.28	7.255	14.28
2000-2100	14.1	14.28	14.095	21/28 ⁵	7.08
2200-2300	21/28 ⁵	21.075 ⁵	14.1	7.255	14.28
2330	Code Practice Daily 10, 13 and 15 w.p.m.						

¹ CW, 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, 14.23, 21.41, 50.7 and 145.6 Mc.
³ RTTY OBS (bulletins) on 3.625, 7.045 and 14.095 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 29.7 Mc.
⁶ W1AW will listen in the novice segments for novices on band indicated before looking for other contacts.

Station Staff: W1QIS W1WPR W1NPG, *All times/days in GMT, general operating frequencies are approximate.



Strays



WWV Relocation

It is now expected that WWV will start operating from its new site at Fort Collins, Colo., about December 1 (see June *QST*, page 39).

Technical information about the services of stations WWV, WWVH (Maui, Hawaii), WWVB and WWVL can be obtained from NBS Miscellaneous Publication 236, Standard Frequency and Times Services of the National Bureau of Standards. The 1966 edition is available from the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402, at a cost of 15 cents per copy. Occasional changes in these services are announced in the NBS Technical News Bulletin, published monthly and also available from the Superintendent of Documents at a cost of 15 cents an issue, or \$1.50 a year.

Amateurs in the Hudson Division take notice! Send in your nomination for Miss Amateur Radio who will reign over the Hudson Amateur Radio Council's Convention at the Hilton Inn, Tarrytown, N. Y. on October 15 and 16. Qualifications are simple. She must be a licensed radio amateur, reside within the Hudson District, and be entered by a HARC member club. Miss Amateur Radio will receive free transportation to and accommodations at the Convention along with an engraved plaque, flowers, and \$100 towards a wardrobe. Officers of HARC will choose the final winner. Nominations must include her photograph, name and address, age and class of license. They should be sent to Stan Zak, Convention Chairman, 13 Jennifer Lane,

Port Chester, New York before the closing date of September 15, 1966.

The 5th annual QRP QSO Part will be held from 0200Z August 27 to 2300Z August 28. Frequencies: 3.540, 7.040, 14.065 and 21.040 Mc. Logs should be postmarked no later than September 30, 1966 and include QSO number, call, his section (or country) and QRP No., and should be sent to K8TBR, 817 Springdale Dr. Charleston 2, West Virginia. Additional details from James Perry, W5NSE, 5608 St. Bernard Ave., New Orleans, La. 70122.

The photo of the attractive young lady on page 97 of July *QST* obviously caused more editorial enthusiasm than accuracy on our part—it was a Michigan State Convention, not a division affair. The Great Lakes ARRL Division Convention will be held in Muskegon on October 21-22 this year, sponsored by the Muskegon Area Amateur Radio Council.

Feedback

In the article "A Low-Noise Transistor Converter for 432 Mc.," *QST*, June 1966, the length of the oscillator coil, L_1 , should read $\frac{3}{8}$ inch, not $\frac{5}{8}$ inch.

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.



August 1941.

... In his editorial, K. B. Warner discusses, for the first time, a device credited with winning the first Battle of Britain. This is, of course, the "Radio Locator" as the British have called it. We know it by the name RADAR, a word not then coined. Not too much in the way of technical information is given, since we are limited, for publication purposes, to information already published. He does see a great opportunity for experimentation by hams in the field of microwaves.

... It seems that there were two "Fritzes," one of whom was discussed two months ago. The second and "real" one was apprehended in New England as the result of full cooperation by a number of amateurs who kept him busy while the FCC closed in on him.

... The Signal Corps Radio School at Fort Monmouth, N. J. is the subject of an interesting article. Judging by the pictures, there were a lot of fellows attending. Our old friend Gen. Bill Hamlin, W4WH became commanding officer of the post.

... For ten dollars you can put together a 112-Mc. m.o.p.a. rig, according to William A. John-

son, W2KPB. This job uses linear tank circuits and winds up with an 815 amplifier. The closed-circuit jacks for the meters are hot, so be careful! He has worked 100 miles over not particularly favorable terrain with this outfit.

... A nice discussion of e.c.o.s is presented by W. J. Stiles, W2MBS and G. S. Blair who decided that a 6G6G was best suited for their project, giving the best frequency stability. They point out that the plate-voltage regulation is probably the least important of the factors which cause drift. More important is filament heating.

... Vernon Chambers, W1JEQ who described a 56-Mc. exciter in the June issue, now completes the job for this rig by presenting the dope on a modulator and power supply for the same. The construction of these units matches the exciter so that a nice appearing rig results.

... Five-meter DX is the broad subject of an article by Melvin S. Wilson, W1DEI. The piece discusses refraction and reflection from various types of "layers," etc. This is real good reading and more will come in the second part of the essay, to be in next month's issue.

... For the junior constructor there is an article by Don Mix, W1TS on improvements in his previously described "fool-proof" rig. It is now expanded to embrace push-pull in the final.

... W1AIY, Waterbury, Conn. is active on 227 Mc. and has had pretty good results using an HK24 in ultraudion circuit over difficult paths. He uses a square-corner reflector in his attic. — W1ANA

• 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—SCM, Roy A. Belair, W3IYE—RM: W3EEB. SEC: K3NYG.

Renewals: K3NYG as SEC, K3OBU as OES, K3NHL as OPS, K3OBU resigned as V.H.F. PAM because of a heavy college load, WA2CUB has been appointed Navy MARS Area coordinator for S.N.J.—Del. Direct inquiries about Navy MARS to this station. Delaware amateurs placed an exhibit in the Wilmington Hobby Show. 75 messages were handled via NTS and MARS to U.S. and Viet Nam. About 20 hams from local clubs and nets combined efforts "in the public interest." WA3DYG has a new 400-watt linear on c.w. WA3FAV and WA3FAX use new Delaware husband-and-wife hams. Traffic: (May) W3FEB 187, K3YHR 16, K3ZMI 10, WA3CDV 4. (Apr.) W3EEB 237, WA3DYG 20, K3ZMI 7, K3KAJ 2, K3NYG 2.

EASTERN PENNSYLVANIA—SCM, Allen R. Breiner, W3ZRQ—SEC: W3ELI. RMs: W3EML, K3YVG, K3MVO. PAMs: W3FGQ, W3SAO. The EPA C.W. Net had 398 QNI, 449 QTC; PTTN 369 QNI, 294 QTC; EPA Emergency Phone & Traffic Net QNI 625, 308 QTC. WA3BSV is now ORS: WA3BKP is OES. K3RZE, an active ORS in the PTTN Net, has been transferred to Altoona, Pa. WA3CFU is operating from Harvey's Lake during the summer. WA3AFI, a new OBS, also is Radio Officer for Chester County. The new editor of North Penn RC's paper, *Static*, is K3HLN. K3FSV claims to be the youngest member of the NTS, age 15 years, 7 months. Any challengers? W3CUL and W3VR have returned to Morton after a hectic Florida vacation. W3EU is QRL planting the summer crops. WA3BJQ has started collecting antique lamp fixtures. K3UWH has moved to Maryland. Penn Wireless Assn. is looking for more willing workers. WA3DBC, Lancaster County EC, appointed K3OGY and W3FEY Asst. FCs. New Gear Dept.: K3HTZ built a two-element quad: K3FLT. Milton ARC, erected a TA-33 beam; WA3BBI has a 6-meter mobile; WA3BSV a Turner 355 mike; W3KJJ an SB-300; K3MVO, a Johnson s.s.b. adapter. K3WEU and W3ELI spent a few weeks in Maine at Camp Modin. K3MDG, an ardent OES, has been adding current-limiting circuits to all his power supplies. K3QCQ is entering the U.S. Air Force. "Did you know the AREC membership in this section is well over 1000? If you are not yet a member ask your EC for an application. If you are an active amateur in one of the following counties you may be interested in being the EC: Adams, Berks, Bucks, Chester, Columbia, Dauphin, Lebanon, Luzern, Monroe, Montour, Northampton, Northumberland, Perry, Pike, Schuylkill, Snyder, Juniata, Sullivan, Tioga, Wayne, York and Wyoming. All section appointees should note that monthly reports or a minimum of 5 reports per year are required for annual endorsement. Traffic: (May) W3CUL 2397, W3IVS 1385, W3EML 1011, K3MYS 578, WA3ATQ 486, W3VR 412, K3MVO 370, WA3AJT 362, W3AEQ 304, K3PIE 269, W3TKX 209, K3FSV 188, W3FAF 176, K3YVG 140, WA3BLZ 105, W3ZRQ 97, W3MPX 93, K3TNL 82, K3HLN 81, W3KJJ 81, WA3BYH 79, W3FGQ 77, W3VAP 77, WA3BFR 58, WA3AFI 53, W3CPH 51, K3WEU 50, K3KTH 48, W3RV 46, WA3CKA 41, WA3CFU 39, K3ZSK 39, WA3BSV 31, W3ELI 24, WA3CCG 22, WA3BBI 21, WA3DBC 18, K3RZE 17, K3VAJ 13, K3MDG 10, W3OY 8, WA3DJV 7, K3HNP 6, W3OAL 6, W3KCM 3, WA3DE 2, W3RFF 2, WA3BJQ 2, K3NYX 2. (Apr.) W3IVS 3453. (Mar.) W3IVS 1863. (Feb.) W3IVS 1674. (Jan.) W3IVS 547.

MARYLAND-DISTRICT OF COLUMBIA—SCM Bruce Boyd, W3QA—SEC: W3CVE. RMs: K3JYZ, W3PRC, W3QCW, W3UE, W3ZNW. PAMs: W3JZY, K3LFD.

The coming of warmer weather is evidenced by fewer station activity reports and more interest in v.h.f. K3LLR and K3EJF found a number of good 6-meter "openings." W3MSR again is on 2 meters and is working on gear for 1266 Mc. WN3EOP is trying hard to keep the Cumberland Valley 2-Meter Traffic Net active and publishes the *Net Bulletin*. Congratulations to K3OAE who graduated from the Massachusetts Institute of Technology in June. WN3EOP will start college next fall and WA3BTA is continuing his college work instead of joining the Peace Corps. W3JZY operated at NSS on Armed Forces Day. W3TN vacationed in Florida. W3QA attended the El Paso ARC's Swap Fiesta while K3LFD handled the SCM job for the month. W3CRA was off the air in May because of school. QRAM. WA3CFK also reported that school QRAM cut his traffic total but he managed 122. MDD leader K3JYZ switched modes and was on mobile s.s.b. during June in upper New York State. W3MCG is busy keeping the grass cut on his antenna farm. W3CDQ is planning a new antenna so she can get back on the air. W3LBC will be QRT all summer. *Announcements:* MDD Picnic July 24 (thanks to K3JYZ). MEPN Picnic Aug. 8 (thanks to WA3BNL). Traffic: (May) K3JYZ 170, WA3CFK 122, WA3BTA 115, W3LBC 115, W3TN 86, K3LFD 84, W3EOV 80, K3GZK 74, K3UXY 51, W3PRC 36, K3QDD 35, W3ZNW 33, K3OAE 20, K3EJF 12, W3MCG 10, W3QCW 8, WA3BNL 5. (Apr.) W3LBC 121, WA3CRA 34, W3MCG 31, W3CQS 14.

SOUTHERN. NEW JERSEY—SCM, Edward G. Raser, W2ZI—SEC: W2BZJ. RM: WA2BLV. PAM: W2ZI. W2BZJ has been appointed SEC for S.N.J. He is endeavoring to reorganize the section's AREC facilities. We need EC appointees in all counties. WB2AEJ, NJN Mgr., has printed an excellent history of this net entitled "A Guide to NJN," which explains the net in detail. The new NJPN Net Roster with map has been mailed to all members, thanks to WB2YO and son. The 7th N.J. QSO Party will be held Aug. 20 and 21 beginning 2300Z on all hands. The Southern Counties Amateur

SEVENTH NEW JERSEY QSO PARTY

August 20-21 1966

The Englewood Amateur Radio Association, Inc., invites all amateurs the world over to take part in the Seventh New Jersey QSO Party.

Rules: 1) The time of the contest is from 2300 GMT August 20 to 2300 GMT August 21. 2) Phone and c.w. are considered the same contest. A station may be contacted once on each band. Phone and c.w. are considered separate bands. New Jersey stations may work other New Jersey stations. 3) General call is "CQ New Jersey" or "CO NJ". New Jersey stations are requested to identify themselves by signing "DE NJ" on c.w. and "New Jersey calling" on phone. Suggested frequencies are: 1810 3530 3900 7030 2750 14075 14275 21100 21300 28800 kc., 50-51 and 144-146 Mc. 4) Exchanges consist of QSO number, RS(T), and QTH (ARRL Section or country). N.J. stations will send county for their QTH. 5) Scoring: Out-of-state stations multiply number of complete contacts times the number of New Jersey counties worked (maximum of 21). New Jersey stations multiply number of complete contacts times the number of ARRL sections and countries worked. 6) Certificates will be awarded to the first place station in each N.J. county, ARRL section, and country. In addition, a second place certificate will be awarded when four or more logs are received. Novice and Technician certificates will also be awarded. 7) Logs must also show GMT date and time, band, and emission, and be received not later than September 17, 1966. Logs and comments should be sent to Englewood Amateur Radio Association, Inc., 303 Tenafly Road, Englewood, New Jersey 07631. 8) Stations planning active participation in New Jersey are requested to advise the EARA by August 6th of your intentions so that we may plan for full coverage from all counties.

Radio Assn. will hold its Annual Club Outing at Egg Harbor Lake, Egg Harbor, N.J., Aug. 28. The Traffic Seminar, held at South Amboy last month, was a big success with more than 70 traffickers attending in conjunction with the Pre-SET, W1BGG, from ARRL HQ, addressed the meeting along with W2ZL and K2FZL. NJN reports 31 sessions with a total of 350 messages. NJPN reports 31 sessions, QNI 633 traffic 242. WB2RVE submits his monthly OES reports. WB2OAI has gone mobile. The SCARA Net continues to grow in popularity on 28.6 Mc. K2SHE has a new Telrex beam. WA2UPC has been appointed EC for Mercer Co. K2MBW is the new liaison to the E. Pa. Net from NJPN. W2EWR has new SB-100 transceiver. K2JJC was in "dry dock" for a time but is feeling much better now. W2BEI had equipment damage by lightning! Congrats to WA2UPC, who made the BPL this month. Traffic: (May) WA2UPC 623, K2MBW 103, W2RG 100, WA2BLY 65, W2ET 43, K2SITE 25, W2ORS 19, W2GJW 15, W2YPZ 10, W2BSBD 8, W2BEI 5, W2EWR 5, WA2KAP 5. (Apr.) K2SHE 11, W2ORS 9.

WESTERN NEW YORK—SCM, Charles T. Hansen, K2HUK—SEC: W2RUF, PAM: W2PVI. RMs: W2RUF, W2EBZ and W2FEB. NYS C.W. Net meets on 3670 kc. at 1900, ESS on 3590 kc. at 1800. NYSPTEN 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 1000 and 3670 kc. at 1700 Sat. Please note that Clara, W2RUF, is now the SEC for the W.N.Y. section. W2ZRC was forced to resign because his new job takes him on frequent trips out of town. W2RUF is well known and beloved by all who know her. W2ZRC did a fine job and I'm sure he will remain active in other capacities. W2RUF is back on the air and can be contacted on the NYS C.W. or NYS County Net. For the 12 years I have known her she has been easily the most dedicated and hardest-working ham I know. We are proud to announce her appointment as SEC. The W.N.Y. Hamfest, sponsored by the Rochester ARA, was the best yet with more than 900 hams attending. The May meeting of RAGS was visited by K2HUK. This fine group elected W2SEI, pres.; K2KTK, 1st vice-pres.; W2MUF, 2nd vice-pres.; WA2RBF, secy.; W2PGD, treas. RAGS again will furnish communications for the 1000 Islands Speed Boat Races, furnishing position data, etc., for race officials and the local radio station. 146.94-Mc. f.m. is the frequency and the repeater will be located in the middle of the 1000 Island International Bridge. W2FXA is the fourth member of the NFDXA to make the honor roll. K2LWR now has a kilowatt amplifier on each of five bands. K2LGI is looking for skeds on 1296 Mc. W2SSC has made WAS. The FCC made an official inspection of the Buffalo Repeater on 146.94. This mode of operation is relatively new on the ham bands although Syracuse, Utica, Binghamton and Toronto all have repeaters on v.h.f. Certain changes in the method of control and operation were suggested and the Buffalo group appreciate the interest and cooperation extended by the "RI." We are sorry to report that W2SCU has joined the Silent Keys. K2AMI had a 100% perfect year on the NYS CN and 90% for 2½ years. WB2OYE has received NYS Net CP. The CVARA is losing one of club founders, WA2RBN, to W3-Land. Congratulations to BPLR W2OE. Traffic: (May) W2OE 311, W2SEI 293, WB2GAL 212, W2LIF 102, W2RUF 93, K2JBX 67, W2FEB 37, W2RF 63, WA2ANE 28, W2FCG 22, W2NYM 17, W2MTA 16, WB2OYE 15, K2DNN 14, W2PVI 10, W2PNW 8, WA2PZD 5, W2OYE 3, WA2GLA 2, W2EMW 1. (Apr.) W2OE 142.

WESTERN PENNSYLVANIA—SCM, John F. Wojtkiewicz, W3GJY—Asst. SCM: Robert E. Gawryla, W3NEM. SEC: K3KMO. PAM: K3VPI (v.h.f.). RMs: W3KUN, W3MFB, K3SOH, W3UHN. Traffic nets: WPA, 3585 kc. 0000 GMT Mon. through Sun. Bob Gawryla, W3NEM, 1463 N. Allen St., State College, Pa. 16801, has been elected as SCM for the next 2-year term. Congratulations. I want to thank all my appointees and club secretaries who offered their support in the past. It was great. Please send future reports to your new SCM. WN3FVX joined the Erna Radio club, K3KTP, in Iran, signs EP2RJ. The Greater Pittsburgh V.H.F. Society will hold a corn roast Aug. 14 in Mercer Grove, South Park. W3RUE tries for 2-meter WAS. K3WFN would like to contact anyone interested in experiments on 1215 Mc. K3NNW, K3PLQ, K3OUK and K3SCK are in the military services. WN3FTS is a new Novice in Conneville. K3GGK works 2-meter RTTY. K3SBT is recovering after hospitalization. K3FKQ and NYL WA3BAH are now "Generals." K3JFB majors in electrical engineering and NASA development at the U. of Michigan. The ARPSC needs the support of all amateurs. How about contacting your EC or SEC K3KMO and joining in the emergency program. ECs still are

needed in many states. Emergency preparedness is of the prime essence and needs your support. New gear: NW3EVP, HA-350 and DX-60A; W3TTV, 312B4, 516FL-2, 32S3 and 30L-1; WN3FVX, DX-60A; WN3FLN, DX-60A. Check the expiration date of your license. It may be later than you think. K3CFA rebuilt his 24-element colinear antenna, damaged by a wind storm. K3POG partakes of hamming endeavors after a two-year layoff. ORS, OPS, OBS and especially OO appointments are available. If interested, send your request to the SCM and it will be promptly handled. New appointments during May: WA3CHY, Indiana County EC, K3WFN OES, Endorsements; K3VYY and W3LJN as EC. W3BLH as OO-ORS. K3PQK as OBS. Traffic: W3KUN 237, W3SMV 116, W3BLZ 111, K3PYS 101, W3LOS 77, WA3AKB 70, WA3AKH 45, WA3AD 44, K3SOH 39, W3MFB 36, WA3EPQ 30, W3OEO 23, W3GJY 10, K3SBM 10, K3EDO 6, W3LOD 6, W3ELZ 4, W3YA 4, W3RUL 2, W3UHN 2, WA3BGE 1.

CENTRAL DIVISION

ILLINOIS—SCM, Edmond A. Metzger, W9PRN—SEC: W9RYU. RM: WA9GUL. PAMs: W9VWJ, WA9CCP and W9KLB (v.h.f.). Cook County EC: W9LPG. W9WYB, K9WMP, W9BVV, W9IUV, K9OSO, W9QKE and WN9QXT participated in the League's recent Frequency Measuring Test. This column extends sympathy to the family and friends of George T. Schreiber, W9YLX, who was the SCM of this section from 1953-1957. George's death was a sad blow to many of the traffic nets and traffic men with whom he was associated for so long a time. W9JOZ, another traffic man of long standing, also joined the ranks of the Silent Keys. K9RHU, formerly of Quincy, is now in New Mexico, teaching mathematics. A new Novice heard was WN9RSP. WA9MLX has a new eight-element 6-meter beam in operation. New officers of the RAMS (Radioamateur Megacycle Society) are K9OBB, W9GFF, WA9KHR and K9DQU. WA9MLZ has moved to Palatine from Milwaukee. WA9POZ is running a newly-acquired Apache. K9CYZ has a Model 15 on RTTY. W9LNQ won the 1965 VE/W Contest. WA9NGB is the new trustee of K9CFC, the Evergreen Park High School Radio Club. Section Net certificates went to K9RFTI, WA9LGT and WA9POZ. The AREC gang was active after the tornado hit Astoria on May 23, according to EC W9MUL. New appointees include WA9LGT as ORS and WA9PDI as OES and OBS. The Morton West High School Amateur Radio Club has been voted ARRL affiliation by the League's Executive Committee. K9RAS has graduated from IIT with a BSEE degree and has taken a position with Motorola. WA9CCP, K9KZB and WA9GVW are recipients of the BPL award. Traffic: (May) WA9CCP 1045, K9KZB 534, W9EJV 372, WA9CNU 338, WA9GUT 238, WA9GVW 231, WA9XR 149, W9FXV 111, K9AVQ 104, K9CVZ 97, W9DOQ 97, W9NXG 77, WA9LGT 66, K9WMP 60, W9ELL 53, WA9JJE 52, K9BTE 46, K9RPU 41, W9HOT 36, W9TDY 29, W9UHD 28, K9HSK 18, WA9AJF 12, W9HJM 10, W9LNQ 8, WA9MRU 8, W9PRN 8, K9RAS 8, WA9FH 4, WA9PDI 3, W9GFF 1. (Apr.) WA9GVW 160, WA9LGT 50, WA9JJE 7, W9MITO 3.

ILLINOIS QSO PARTY

August 6-7

All amateurs are invited to participate in the Fourth Annual Illinois QSO Party, information as forwarded by the Illinois SCM. The contest starts at 1600 GMT August 6 and ends at 2200 GMT August 7. The same station may be worked once on phone and once on c.w. Suggested frequencies are 3600 3900 7040 7220 14,080 14,300 21,100 21,300 28,100 and 28,700 kc. Exchange QSO number, report and county (in Illinois) or state, province or country. Illinois stations multiply total QSO points by the number of different states, provinces and countries worked. All others use the number of different Illinois counties for multiplier. In Illinois, single and multiple-operator stations will compete for 1st, 2nd and 3rd place certificates. Outside Illinois, a certificate will go to the high scoring station in each state, province and country. Logs must show dates, times, stations, exchanges, band, mode and score claimed. Illinois stations must show whether single or multiop. Postmark logs no later than Sept. 1, 1966 and send to Illinois QSO Party c/o Cliff Corne, K9EAB, 711 West McClure Avenue, Peoria, Illinois, 61604, U.S.A.

INDIANA—SCM, M. Roberta Kroulik, K9IVG—Asst. SCM: Ernest Nichhols, W9YXX. SEC: K9WET. K9GLL, PAM of the Hoosier v.h.f. nets, reports May traffic of 111. K9EFY, mgr. of PON, reports May traffic of 36. W9QLW, RM of 9RN reports Indiana was represented 100% in May. WA9IZR, mgr. c.w. of RFN, reports May traffic of 99. W9PMT, NCS of phone RFN, reports May traffic of 15. BPL certificates went to W9JOZ and K9IVG, QLN Honor Roll: K9HYV 25, W9ZYK 24, K9VHY 23, K9WVJ 21, W9QLW 18, W9HRY 18, WA9BHWY 18, W9HRE 17. New officers of the Martinsville ARC are WA9LLE, pres.; WA9QQH, vice-pres.; W9DUD, secy.-treas. The name of RFN has been changed to Indiana Weather Net. W9FQN is enjoying a summer vacation in Mexico and using the call NE1PNE. K9JCU's step-daughter, Elaine Richards, is Miss Indiana for 1966 and second runner-up in the Miss U.S.A. Contest. Congratulations to WA9QVV on receiving his General Class ticket. W9LBE is dabbling in ham TV. K9BSL's signal has greatly improved since he built the Eico 753. W9JYF is enjoying a new linear. The Michigan City ARC is sponsoring an Indiana QSO Party Aug. 13-15. The new Bartholomew Co. AREC Net meets Tues. and Sat. at 0130Z on 50.250. *Amateur radio exists because of the service it renders.* Traffic: (May) W9JOZ 1018, K9IVG 667, W9QLW 296, W9ZYK 253, WA9BHWY 231, K9HYV 188, WA9IZR 153, W9HRY 138, K9CRS 134, W9HRB 104, K9FZX 96, WA9JHH 89, WA9OYI 85, W9AM 73, K9VHY 70, K9FUJ 48, WA9LGG 48, WA9FDQ 41, W9GFS 41, W9PMT 36, WA9KAG 33, K9RWQ 31, K9EFY 28, W9CC 26, WA9CJR 26, W9RUB 19, WA9LUG 19, WA9BWT 18, W9YXX 18, K9ZLB 16, WA9BGI 15, WA9CFW 14, K9IFK 12, WA9KVP 12, W9RTH 12, WA9CHY 11, K9JYJ 11, K9RFL 11, W9DZC 10, W9FWH 10, K9GBR 10, WA9GJZ 9, K9GLL 9, W9RZI 8, W9DOK 8, W9BDP 6, K9RSL 5, WA9JWL 5, WA9NGN 3, WA9QW 2 (Apr.) K9HYV 185, W9UOZ 5.

WISCONSIN—SCM, Kenneth A. Ebnetter, K9GSC—SEC: K9ZPP. RM: WA9MIO. PAMs: K9HJS, K9IMR and W9NRP. A net certificate went to WA9QKP for WBSN. New appointments: W9YT, W9EWC and WA9QMP as OESs, W9HQT as ORS, K9OSC as OO, WA9MIO as RM. Appointments renewed: W9IBM and W9RTP as ORSs, K9DTK as OPS, FMT results: K9GSC 6.5, W9KCR 126.0 and K9GDF 142.0 p.p.m. error. New officers of W9YT are K9ZAS, pres.; K9FWP, vice-pres.; K9KGA, secy.; WA9CRO, chief engineer. BPL in May was made by W9SUG and WA9GJU. W9EWC is looking for someone else on TV on 443 Mc. W9AYK and W9HQT report new

DX antennas. WA9NDV got his General. WA9NPB is manager of the local 2-meter net. K9GDF led the Oos with 24 notices sent. WA9NBU now is running four 811As for a kw. New hams in Appleton are WN9RYD and WN9RXH. Traffic: WA9MIO 315, WA9NPB 281, W9DYG 250, W9CXY 240, WA9GJU 168, K9IMR 126, W9SUF 125, WA9NFG 76, W9KQB 58, K9HJS 56, WA9LWJ 50, K9GSC 41, WA9NDV 39, W9NRP 36, WA9NBU 35, WA9QKP 35, W9CBE 34, W9DND 28, W9AYK 27, W9HWQ 18, WA9GJH 17, K9PHI 16, WA9EDZ 12, K9RCK 12, W9BLQ 10, W9HQT 6, W9RTP 6, W9HPC 4, W9GGN 2, WA9OMO 2, W9OTL 2.

DAKOTA DIVISION

MINNESOTA—SCM, Herman R. Kopischke, Jr., W0TCK—SEC: WA0BZG. RMs: WO1SJ, WA0EPX. PAMs: KQ0BI, WA0JKT, W0HEN, WA0DWM. MSN meets daily on 3595 kc. at 0300Z. MJN meets M-S on 3595 kc. at 0100Z. Noon MSN meets M-S on 3820 kc. at 1805Z and Sun. at 1500Z. Evening MSPN meets daily on 3820 kc. at 2400Z. MS7N meets M-F on 50.4 mc. at 0430Z, Sat. at 0200Z. The Co. Hunters WX Net meets Sat. on 3820 kc. at 1500Z. The PO Net meets Sun. on 3812 kc. at 1830Z. During DST nets meet one hour earlier by GMT. Same local time. WA0EPX will be MJN RM this next year. WA0EDN renewed his OPS appointment. Aug. picnic reminder: Minneapolis at Lake Naconis, Aug. 7 and St. Cloud at Wilson Park, Aug. 14. A large number of amateurs and their families enjoyed the Worthington ARC Picnic June 5. WA0AAM, accompanied by WA0FSK, W0ATO and K0ZRD, drove to Des Plaines, Ill. to attend the Annual Midwest YL Convention May 13, 14, and 15. The gals report they had a real good time. A new operator in Minnesota is Rick Whiting, K6IYF and WA0MIOX of Los Angeles, who will work for Honeywell. Rick runs an HT-32A driving a pair of 813s and receiving with a 75A-4 on 75 and 40. He mobiles with a Swan 350. WA0LOB is studying engineering science at Texas A&M U. this summer. WA0LVG will operate portable from S.D. during the summer. Mike's new receiver is an SR-160, not an SR-100, as reported earlier. More than 50 amateurs took part in operating some 20 mobiles and 4 NCS stations and the MSA-1 CD trailer in a PICONet communications drill covering Steel, Rice, LeSueur and Waseca Cos. on May 15. Messages between Co. ed. directors and officials in each township and municipality in the 4 Co. area were handled. A BPL certificate was awarded WA0JKT. Traffic: (May) WA0JKT 529, WA0EPX 146, K0JGJ 124, WA0KQU 102, WA0LOB 96, K0PZ 73, WO1SJ 58, WA0IKP 54, WA0MIP 53, WA0LVG 42, K0IGZ 34, K0ZRD 34, K0QBI 27, WA0ILX 26, WA0DFT 20, W0UMI 17, WA0IUJ 16, K0HJC 14, W0TCK 14, K0ORC 13, WA0LOH 12, WA0LUT 11, K0FLT 10, WA0EDN 9, WA0JPR 9, WA0KJF 9, W0KLG 9, W0BUO 8, WA0IJJ 8, WA0MAV 6, W0NGO 5, W0ATO 4, WA0LVK 4, W0FKC 1, W0SZJ 1. (Apr.) WA0FUR 22, K0ZRC 8, WA0IKP 7.

NORTH DAKOTA—SCM, Harold L. Sheets, W0DM —SEC: W0AYL. The NDSU Hamfest was a decided success with 170 hams and families attending. The NDSU Amateur Radio Society elected WA0NJJ, pres.; Jim Whitney, vice-pres.; WA0ENS, secy.-pres.; WA0GJM, research director; Bruce Bushey, public relations officer. K0PZK reports that the N.D. Post Office Net had 111 check-ins for the month of May and 18 pieces of traffic. This net meets at 3845 kc. Sun. at 0900 and 1730 CST. A new Novice call in Grand Forks is W00VW with an Apache and vertical antenna. W0OAT expects to move to Bismarck during the summer. W0DNE has a new Tri-bander going on the high frequencies; also he received his WAS and OTC awards. W0KZL is on with a new SB-100 and a TO-1 keyer. W0DM is on vacation now and expects to get in some portable work with the SR-150 and make up for lost time on 15 and 10 meters this summer. A trip to Iowa is in the offing. W0YRD has a new linear and has been going after the openings on 6 meters. RACES: 21 sessions, 718 check-ins, 105 messages. Have a good summer, fellow, and thanks for the help. Traffic: K0TTP 47, W0DM 12, W0KZL 6.

SOUTH DAKOTA—SCM, Seward P. Holt, K0TXW —SEC: W0SCT, W0LHP, of Ridgeview, made his first AREC report and promises more. WA0NYS, of Spearfish, got on the air with an HT-46 and an SX-146 in transceive. Spearfish and Belle Fourche held Field Day at the center of the nation. W0LGG is back at network operation following his recent operation. Network activity is slow because of vacations and National Guard obligations. WA0DEAI's report for the S.S.B. Net for May is: total QNI 1001, total QTC 233. The Mitchell Amateur Radio Club's recently-published So. Dak. directory is proving to be in great demand. Traffic: K0G8Y 825, WA0AOY 83, W0SCT 58, K0VYV 53, WA0LLG 38, WA0LYO 18, WA0BWJ 2, WA0BZD 2, WA0LHP 2, K0LKH 2, K0YGV 2.

INDIANA QSO PARTY

August 13-15

All amateurs are invited to participate in the 1st Annual Indiana QSO Party, sponsored by the Michigan City Amateur Radio Club.

Rules: 1) Time, 2200 GMT Saturday August 13 to 0000 GMT Monday August 15. 2) All emissions and h.f.-v.h.f. bands may be used. A station may be contacted on c.w. and phone on each band. 3) General call, "CQ Ind" and Indiana stations identify by signing "De Ind. (call) K." 4) Exchange QSO Number, RS(T), and county, country, state, or province. 5) Scoring: Count each completed contact as 5 points. Additional multiplier of 2 for contacts made above 50 Mc. For final score, Indiana stations multiply QSO points by the total number of different states or provinces. Ind-to-Ind contacts count for QSO points and the Indiana multiplier. Outside stations multiply QSO points by different Indiana counties. 6) Awards: Certificates to the highest scoring station on v.h.f. and in each state, province, country, and Indiana county. Second and third place awards issued if in the opinion of the contest committee, the number of entries warrants it. A plaque to the highest scoring station. 7) Suggested frequencies: 35 Kc. up from the bottom of each c.w. and phone band. 8) Logs should show dates, times, stations worked, exchanges, frequency bands, type emission, and a signed statement that all contest rules have been observed. A list of all winners will be sent to all participants. Contest logs postmarked no later than September 15, 1966, and should be sent to: MCARC, c/o Steve Malott, WA9IZR, 522 Miller St., Michigan City, Ind., 46360.

DELTA DIVISION

ARKANSAS—SCM, Don W. Whitney, K5GKN—With the advent of hot weather station activities seem to have slowed down a bit but our SEC sure hasn't slowed down. WA5KTX, our fireball SEC, lists six new EC's and the EC recruiting program is gaining momentum. If you are in a county that does not have an EC and you would be willing to serve, contact Don Corley, WA5KTX, Arkansas Baptist Medical Center, Little Rock, Ark. May net reports—1966.

Net	Freq.	Time	Day	Sess.	QTC	QNI	Time
RN	3815 kc.	0001Z	Daily	?	?	?	?
AFN	3685 kc.	1200Z	Mon.-Sat.	26	24	942	1675 min
OZK	3790 kc.	0100Z	Daily	?	?	?	?
APON	3825 kc.	2130Z	Mon.-Fri.	21	69	309	600 min.

The following net report for April was received too late for last month's QST:

OZK	3790 kc.	0100Z	Daily	29	64	220	592 min
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Traffic: (May) W5OBD 535, W5NND 197, W5MJO 140, K5VBF 108, WA5KUD 4, K5GKN 3. (Apr.) WA5IIS 79, K5TYA 40.

LOUISIANA—SCM, J. Allen Swanson, Jr., W5PM—SEC: K5KQG, RM: W5CEZ, V.H.F. PAM: W5UQR, WA5KHE and WA5KIV are moving to Dallas. As I write this column our two state nets, LAN on 3615 and Delta 75 on 3900, are preparing themselves for the first disturbance of the hurricane season. The Gulf Coast Hurricane Net on 3845 is showing an increase in attendance. W5TAV has been elected alderman for his town. W5NQR, our new DX advocate, has 71 countries confirmed. W5NPOD and W5NPLH are new Novices in the Lafayette area. WA5PMC passed the General Class exam. The Lafayette High School RC calls itself the Kajun Kay Kliekers! K5ARH and his XYL are moving to a new QTH. WA5KPV is sending code practice live nights per week on 28.38. The Ozone ARC V.H.F. Emergency Net meets Wed. on 50.55 Mc. at 9130. WA5CKJ has a new neighbor—K5MOQ! W5UBK has a new quad in operation and is hot after DX. W5BY and his missus spent a vacation in Arkansas. WA5ENB, W5TAV, K5VYN and W5PPT are new ECs. W5GHP is the Delta 75 Fone Net representative on RN5. WA5MLF recently demonstrated his completely homebrew RX and TX tor 9000 Mc. By the way, the "Rare Ones" meet nightly at 0300 GMT on 7260. They offer a certificate to anyone who works all members. Contact W5NUH for information. The CLARC had a special QSL for its hamfest at Alex. W5UQR reports fewer openings on 2 so far this year as compared to last. WA5KLF has an FB vertical now. W5CEZ spent seven weeks at Boy Scout camp with the call W5QEG/5. Alice, K5OKR, reports that W5NPMIE is a new Novice in Jackson. WA5LED says Extra or bust! WA5DRP reports that BRARC was active on FD. W5ZBC is back on s.s.b. The Jefferson ARC had a bang-up picnic, says W5MXQ. Yes, it's true I have gone mobile with a Swan 350! Traffic: K5OKR 104, W5MXQ 51, W5CEZ 40, W5MBC 34, WA5ORQ 10, WA5DXA 8, W5EA 8, WA5JVL 8, WA5KLF 7, K5FYI 6, W5CXL 2.

MISSISSIPPI—SCM, S. H. Hairston, W5EMM—SEC: W5JDF. The Gulf Coast Sideband Net had a fine dinner in Mississippi City May 14, celebrating Net Manager W5JHS's birthday. K4UBR/5, acting as the new Miss C.W. Net manager, is running a new SB-400TX now. The Miss. Sideband Net welcomes WA5AWO, WA5OKI and W5EHZ as new NCSs. Miss C.W. Net NCS W5BW is doing a fine job on Wed. W5JDF/5 hopes to be back in business soon in Columbia. WA5JWD is really participating in net activity. New appointment: W5EVY as EC in Jackson. W5WMQ is noted for effervescent cordiality and W5EHZ is cool, calm and collected. W5JHS continues his faithful work as net manager. W5LJW is one of our most active mobiles. We all hate to lose K5UYP to Louisiana. WA5PAD and W5CUU built a fine compact linear for Field Day use. Check into our nets: Gulf Coast Sideband Net, 1730 CST on 3925 kc. daily; Miss. Sideband Net, 1815 CST on 3883 kc. daily; Miss. C.W. Net, 1845 CST on 3647 kc. daily. Traffic: K4UBR/5 297, W5JDF 65, W5BW 9, WA5JWD 9.

TENNESSEE—SCM, William A. Scott, W4IUP—RM: K4UWH, SEC: K4RCT, PAMs: W4PFP, WA4EWW. Our thanks to Gov. Clements for proclaiming FD week, Tennessee Amateur Week. Each of us should write him. Tennessee Ham needs club write-ups for publication by the 20th of the month. Send them to W4WHN. Congrats to WA4DBG and K4WUJ, both of Jonesboro, on election as pres. and vice-pres. of the Va. Tech Radio Club. The Hardin AR Club has K4BXV, pres.; WA4-

VTD, vice-pres.; WA4WHN, secy. The Memphis V.H.F. Club has a nice hamfest with W4HKK giving a talk on Moonbounce. W4ZBQ didn't allow weather satellite picture reception to prevent Class 1 OO qualification in the May FMT. W4WRK and W4VRD also scored high. EC reports should go to K4RCT by the 5th of month. W4HKK, W4WQZ and K4EJQ report various 432-Mc. progress. Traffic: W4FX 502, W4OQG 344, W4RUW 211, W4PQP 170, K4UWH 127, WA4IBZ 88, WA4UCF 75, K4WVW 72, W4SQE 58, W4CXY 40, W44NUJ 35, W4TZB 35, W4PFP 31, WA4GLS 26, K4UMW 24, WA4CGK 23, WA1AFP/1 20, WA4EWW 17, W4TZJ 13, W4UVP 13, WA4NEC 12, WA4YEM 12, K4SXD 5, W4VTS 5.

GREAT LAKES DIVISION

KENTUCKY—SCM, Lawrence F. Jeffrey, WA4KFO—SEC: W4OYI, Appointments: SEC: W4OYI, PAM: WA4AGH, OPS: WA4WWT, Endorsements: ORS: W4CDA, EC: W4NOA. K4URX, our SEC for the past two years, has been forced to resign. Let's all give W4OYI our full cooperation in his SEC post. K4YZU resigned as PAM of KTN because of work and school. WA4AGH is the new PAM. Our thanks to Governor Breathitt for proclaiming June 19-25 as "Amateur Radio Week" in Kentucky. K4PWP has RTTY going. WA4TJS has emergency nets in Districts 16 and 17 on 145.494 Mc. and 3942 kc. WA4UAZ is Acting PAM for MKPN during the summer. WA4BAZ is boosting c.w. and KYN for traffic by getting to as many clubs and hamfests as possible. WB4ACQ is active on the traffic nets. K4TXJ handles traffic on 10-15-20. WA4TPB now is on 6 meters. WA4GHQ keeps Lexington v.h.f. nets going in his PAM job. V.H.F. activity keeps W4WNH, W4IOMH and K4PWP busy. St. Mary's College Amateur Radio Club now is an ARRL Affiliate. K4ZRA leaves St. Mary's. W4BTA is working on RACES data. Members of the Lexington-Blue Grass Amateur Radio Club, WA4NZZ, WA4GHQ, WA4EKZ, W4TRO, WA4ELK, WA4SBG, WA4OMH, WA4QZV, W4TPB, WA4GQO and W4HEA, staffed four ham radio stations to send messages from Lexington relatives to their kin in Viet Nam. Traffic: (May) WA4TPB 873, WA4WWT 643, WA3DEJ/4 616, WA4DYL 449, WA4HJM 438, WA4AGH 366, W4BAZ 334, W4H4IN 224, WA4KPO 187, WA4VUE 155, K4MAN 72, WA4VCN 66, WA4TTE 62, W4CDA 57, W4YOQ/4, 46, WA4GMA 39, WA4UAZ 35, WA4GCL 29, WA4IBG 29, W4OYI 29, K4QIO 29, WA4DXA/4 21, W4KJP 21, W4NBZ 19, K4VDO 19, WA4TJS 14, WA4BZS 12, K4PWP 12, W4BTA 10, WB4ACQ 6, WA4GHQ 5, W4UJ 4, W4ZKF 3, K4HOE 2. (Apr.) WB4ABF 164, K4PWP 7. (Mar.) WB4ABF 269, (Feb.) WB4ABF 106, (Jan.) WB4ABF 57.

MICHIGAN—SCM, Ralph P. Thetman, W8FX—SEC: K8GOU, RMs: W8ELW, K8QKY, W8EU, K8KMQ PAMs: W8CQU, K8LQA, K8JFD, V.H.F. PAMs: W8CVO, W8YAN, Appointments: W8NDM as EC: W8DQL, WA8KME as ORS; K8VDA as OPS; WA8DZP, W8FZ as OBSs; K8AQA, W8AKRH, WA8OLD as OESs. BPLers: K8LNE, K8KMQ, Silent Key: W8PDF, Rudy was Isabella County EC for 12 years. New officers: Milford ARC—W8WUD, pres.; WA8BSA, vice-pres.; WA8IGN, secy.; WA8OHL, treas. High-Noon ARC (Grand Rapids)—K8DVO, pres.; WA8PAU, vice-pres.; WA8FXR, secy.-treas. The Amateur V.H.F. Assn.—WA8FGK, pres.; K8BMC, vice-pres.; W8KOX, secy.; W8VRU, treas.; W8JXU, editor. Ford ARL—K8SSZ, pres.; K8LIB, vice-pres.; WA8ORI, rec. secy.; K8TKK, corr. secy.; W8OVM, treas.; WA8NLL, WA8FCL, act. mgrs. WA8IML finished a TO Keyer. W8IWF is spark-plugging the Michigan Council of Clubs. WA8KME has joined the CAP. WA8RZY and WA8FJK made General. W8IBB is hot on 2. WA8HGE left for the Air Force. W8SWF finds that 10 is starting to open up. W8WPD says the AREC gang is hot for transmitter hunts. W8AAM has the 75-meter vertical working well. K8YEK made WAC/9-s.s.b. and the RTTY DX award for 25 countries. K9RHU/8 left for New Mexico to teach math. W8ROJ has a new Heath SB-400. The W8ZDFs celebrated their 25th wedding anniversary. 144 Mc. now is active in the Soo Area. The U.P. Hamfest will be held Aug. 7 at Marquette. W8PJH/MI has a new SB-100 on a freighter. K8ZNU has moved to Lansing. K8IFH has moved to the Detroit area. W8KBI has the new Collins line and W8FEW has moved to a new QTH with a 120-ft. tower. K8NTE has a new Collins 7583B. The SEMARA provided communications for the Freedom Festival Road Rally July 2-3. K8PBA had a rough time getting help mounting the 5-kw. generator in the HVARA's new trailer. The High-Noon ARC sponsors a round-up net on 50.418 Mc. at 12 noon to 1 p.m. Most of the 90 ft. mobile units sold in the Grand Rapids-Muskegon area will be on 52.525 Mc. Officers of the CMARG are W8FSZ, pres.; WA8LAY, vice-pres.; W8TJL, secy.; K8SHZ, treas. Traffic: (May) K8LNE 503, K8KMQ 398, K8QKY 323, WA8PIM 210, W8IUC 175, W8EIV 150, WA8IML 136.

W8UFS 123, W8EU 114, W8A0GR 103, W8AMCQ 86, K8JED 80, K8JJC 70, W8IWF 64, W8ALXY 64, W8MIQT 63, W8AKME 58, W8ATAN 55, W8ALRC 49, W8FX 43, K8GOU 43, W8YAN 43, W8RTN 40, W8IBB 36, W8BEZ 33, W8FWQ 33, W8CQB 30, K8VDA 29, W8ZIB 21, W8PFI 20, W8HGE 17, W8AUD 16, W8AR0J 16, W8SWF 16, W8ABQK 15, W8EJR 12, W8WVL 11, W8MPD 10, W8TRP 10, K8QA 6, K8QLL 5, W8DSE 4, W8AAM 2. (Apr.) W8YAN 29.

OHIO—SCM, Wilson E. Weckel, W8AL—Asst. SCM: J. C. Erickson, W8DAE, SEC: W8HNP. RMs: W8BZX, W8DAE and K8LGB. PAMs: W8VZ and K8UBK.

OSSBN	56 Sess.	QNI 1523	QTC 804	14.3%
BN	31 "	"	284	9.5

WA8SFH is a new ham in Columbus. WA8JVJ had its call changed to W8ZPF. WA8QJ attended the ARRL Convention and QCWA luncheon there. WA8QPU received his General Class license and has an HR-10 and a DX-60. K8HDO sent in five top scores in the 1966 Ohio Intra-state Contest and they are W8NBK, 7293, WA8FKD 4455, WA8HTR 3680, WA8CWU 2660 and K8DIU 2190. Those who have received the Worked All Ohio Counties Award are, in order received, W8EQN, W8HUX, W8AJW, W8CTZ, W8WZ, W8HJZ, W8IBX, K9ECE, W8JHI, W8AL, W8RSE, W2QHH, W8UMR, W8HFX, W8BQV, W8HWF, W8YGR, K8QAD, K8CEN, WA8XNS, K8SGK and K8JZW. Miamisburg Wireless Association's *The Spectrum* tells us the club heard a talk on cubical quads by W8FYR. W8PGF has a new Drake 2B. WA8PRA has a new SBE-34 and W8MFX has joined the OOTC. According to Columbus ARA's *Carascope* Jerrie Mock spoke to the club about her record-breaking flights and the Franklin County AREC held a get-together and picnic lunch. Westpark Radiop's *The Radiops Log* tells us the club held an auction and heard W8DAE discuss the National Traffic System and WA8JOY is using a new Heath HW-32. Mt. Vernon ARC's *K8EEN Newsletter* reports W8NS TKH, TKL, TKL, TKM, TKP and TKQ are new Novices and WA8TOZ received his General Class license and will be a missionary in Tanzania soon. WN8THD has a new tower. K8ONA reports that W8LJS received the Apricot Net's trophy for his outstanding efforts as TVI chairman for Cuyahoga County. Springfield ARC's *The Qser* says W8LAB is in the hospital, and ex-W8EQN is now K4GU in Florida. Parma RC's *P.R.C. Bulletin* tells us the club held a dinner with Rev. Henry Birkenhauer speaking on Life in Antarctica. From Toledo's *Ham Shack Gossip* we learn that K8MGJ joined the Silent Keys, WA8TLY, WA8TLZ, WN8THI, WN8THP, WN8THA, WN8TLK and WN8TLM are new members. K8PMI was home on leave from Viet Nam, ex-K8SZE is now W0KZL in Colorado. W8WM is back at Put-in-Bay. WA8JWU was in the hospital and Lucas County AREC set up communications during a strong northeastern wind storm whipping from Lake Erie flooding the area of northwestern Ohio with W8BHL, W8BIQ, W8FPU, W8H5W, W8HYE, W8HIM, W8IQC, W8ITT, W8KIX, W8KPJ, W8MTU, W8NXN, W8PCS, W8QKR, W8RZM, W8RZN, W8RZQ, W8TKS, W8TSD, W8UPH, W8UFL, W8VDR, W8WDZ, W8YAT, W8ZJX, K8BAT, K8DPE, K8HNI, K8ISE, K8JDS, K8LFI, K8LUE, K8KYB, K8MYN, K8NPK, K8OMB, K8QPW, K8RKG, K8SQE, K8TVX, K8UJQ, K8UJT, K8VPX, K8VMI, K8VTE, K8YWW, K8ZCS, K8ZTZ, WA8COO, WA8CTN, WA8FPG, WA8GLR, WA8IDV, WA8JWU, WA8JTB, WA8TB, WA8MJP, WA8MNR, WA8MTX, WN8SAE, WA8SOR and WA8TLY participating. Canton Chapter of QCWA held a dinner at Atwood Dam with 50 present and W8HVR, W8OE, W8TV and K8CHL as visitors. W8NBK won the national QCWA Contest. W8UPH, W8YRP, WA8FSX and W8LT made the RFL in May. According to Kettering ARC's A-4 the club held a presentation of MARS on Six Meters by WA8PQI. V.H.F. High Banders *The Log* reports K8ZES has a new baby boy. *The Buckeye Net Bulletin* says K8DIU was home on leave from Ft. Knox before transfer to Ft. Monmouth and ex-W8DSX is living in Jamaica. Ex-W8DSX is now K9KB. W8BMS is now VPDR. Greater Cincinnati ARA's *The Mike & Key* reports W8HKR/W9NTV, who has been with the Voice of America, will discuss propagation for long distance shortwave coverage. Inter-City RC's *IRC News Bulletin* tells us the club elected officers, a home-brew contest was held and 22 passed the Novice code test. Traffic: (May) W8TPE 829, W8RYP 512, W8CHT 384, WA8FSX 294, WA8PMN 262, WA8CFJ 234, K8LGA 196, W8LIT 172, W8BZX 169, W8FAE 169, K8HKB 168, W8ACXY 83, W8QCU 82, K8FYR 71, W8ERD 68, W8DQD 67, W8MGE 64, WA8FZS 60, W8AUX 51, W8LAM 43, W8FGD 39, WA8IFI 37, W8LAG 37, W8OE 37, WA8BTE 36, W8TV 35, K8VAI 34, K8BNL 32, WA8FKD 32, W8IPQ 32, WA8MHO 29, WA8AJZ 27, W8LZE 18, W8HTI 15, W8RWK 13, K8LGB 10, WA8KPN 9, W8WEG 5, W8COE 4, K8RND 4. (Apr.) WA8HVR 302, K8YSO 77, K8HKB 52, W8LTD 14, WA8AJZ 12. (Mar.) WA8HVR 124,

EASTERN NEW YORK—SCM, George W. Tracy, W2EFU—SEC: W2KGC. RM: WA2VYS. PAM: W2JVG. 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. Endorsements: WA2VYS as ORS, OPS and RM. The Mt. Vernon H.S. Club, K2-VSU, visited Newington in May as reported by Secy. WB2PUX. Two ARRL films on "Amateur Radio Public Relations" were shown at the Westchester Club. The club's technical net on 28.68 Mc. (Wed. at 2000 hours local) is expanding. A "Fall Tale Night," unlikely but true, was the feature at the Albany Club. Both the Radio Officer and Civil Defense Director were featured speakers at the New Rochelle Club. Five mobiles and two base stations were used on 2 meters to handle the Memorial Day Parade in New Rochelle. This was sponsored by the Westchester County ARPSAC. May was "Homebrew Nite" at the Schenectady Club and prizes were judged by K2DLD, W2MEK and WA2WQL. Technical presentations on induction measurements and v.s.w.r. were given by WB2TN and K2SPD. WA2SPL is operating in Korea under HL0US on 14-Mc. s.s.b. WA2OJD has been keeping intruder watches regularly in the hands. New officers of the Schenectady Club include W2LDC, pres.; W2MEK, vice-pres.; WA2VWJ, secy.; WA2BLD, treas.; WA2CGD, W2BHO, K2DLD and WA2SFP, dir. Traffic: W2BKN 230, WB2HZY 154, WA2VYS 149, W2THE 144, K2S2N 76, WB2JVY 74, W2URP 29, WA2JWL 26, W2BXP 22, W2UC 21, W2ANV 16, WA2OJD 10, W2ARTZ 10, WB2UHZ 10, W2PKY 7, WB2QYZ 6, K2AJA 3.

NEW YORK CITY AND LONG ISLAND—SCM, Blaine S. Johnson, K2IDB—Asst. SCM: Fred J. Brunjes, K2DGI. SEC: K2OVN. NYC-LI AREC Nets: See Dec. 1965 column for schedules. W2GKZ ambled off to FP8-Land in June to see how the QRM is on the other side of the fence. WB2-QBR is off to JA-Land for a few months, and expects to pick up a transceiver made in Japan. K2ORA is shipping out to the West Coast for about 2 years on a salt mine assignment. W2EHA is heading to upstate N. Y. for the duration. We are going to miss him and his OBS reports on the AREC 28.720 Net. Keep in touch with us, Lee! W2PC has tickled his driver coil in the linear, and is really zapping out the soup on 10, 15 and 20 now! Our SCM has rebuilt his radio shack in fine fashion. All he has to do now is to rebuild his bakery cord rhombic and he will be in strong contention again. The NASTAR group at Nassau College has moved its operations to a new building on the college campus, with all kinds of room for equipment and antennas. The group is working on a solid communications link with Oscar headquarters on the West Coast and with JUIIU operations in Geneva, is planning some wild things for the future involving satellites and lunar equipment and is looking for dedicated amateurs in the area to help with design and construction of equipment. For information contact Nick, W6O/O/2, at 516 MI 3-5122, or Bill Belcher at 516 681-9525. It sounds like a real interesting project and opportunity for some devoted fellows. How about giving Nick or Bill a call if you can give your time and talents. In future columns, the SCM's office will publish a list of OBSs and their schedules. We find this to be a desirable venture. Also we will publish a list of OOs so they may be contacted if you have need for their very excellent services. We would like to have your opinions on these ideas, and any other suggestions or information you may have. Remember, this column is for you and about your activities, so drop us a line if you have any newsworthy item for the consumption of our section amateurs. Most of our information comes through our radio clubs and League appointees; so let us know what the rest of the 2000 amateurs in our section are doing. We want to hear from everybody—a new antenna, transmitter, QTH, etc., anything you have. Let us hear about it so we can tell the rest of the gang. We would like to hear from our radio clubs. We get quite a few inquiries from new, old, and up-and-coming hams as to radio clubs in their areas and the availability of "ham" code and theory classes. We have little information in this field and would appreciate some word in this category, so drop us a line. We hope you all have an enjoyable summer and have recuperated from Field Day—K2IDB and K2DGI. Traffic: (May) WA2GPT 564, WA2UWA 470, WB2RBA 333, K2UEG 268, WB2SRN 215, W2EIV 182, WB2DXM 164, WB2FAJ 123, WB2EUF 103, WB2MHT 79, WB2RQF 56, WB2SIZ 55, W2GKZ 54, WB2TNY 54, WB2TCS 51, WB2MBU 31, WA2DTY 30, WB2AEK 22, W2DRQ 22, W2EC 14, WA2QJU 12, WA2PAW 8, W2PF 7, K2UFT 7, WB2MCT 6, WB2IUV 6.

NORTHERN NEW JERSEY—SCM, Edward F. Erickson, W2CVV—Asst. SCM: Louis J. Amoroso, W2-LQP. SEC: K2ZFI.

NJN 3695 kc. 7:00 P.M. Daily WB2AEJ—RM
 NJ Phone 3900 kc. 6:00 P.M. Ex.Sun. W2PEV —PAM
 NJ Phone 3900 kc. 9:00 A.M. Sun. W2ZI —PAM
 NJ Six 51,150 kc. 11:00 P.M. M.W.Sat. K2VNL —PAM
 NJ Two 146,700 kc. 10:00 P.M. Tue.St. K2VNL —PAM

AREC Net schedules are available from SEC K2ZFI. Congratulations to K2KDQ, a new OES and to WB2-FUW and W2VDE, new OPSs. The following ECs participated in the Pre-SET Exercise May 14: W4DMJ, W2-COT, K2KDQ, W2SED, WA2NJB, K2VNL, WB2DXW, K2ZFI and WB2BCS. The NTS did a very good job of passing AREC traffic as part of the exercise. Knight Raiders V.H.F. Awards have been issued to WA2SEI and WB2JF. New officers of the Irvington RAC are WB2-SRY, pres.; WB2VUY, vice-pres.; WB2QFZ, secy.; WA2PWZ, treas.; K2UGF, trustee. Congratulations to WB2SSZ on the receipt of his General Class license. WB2SEZ has discovered the world of traffic. WB2IYO has done a fine job of publishing a N.J. Phone Net Directory and Map. WB2AEJ spent a month making repairs and can now operate all bands, phone and c.w. WA2TEK is running Official Bulletins on RTTY, 3625 kc. at 4:45 P.M. local time daily. He is looking for contacts at 5 P.M. in order to start a net. K2KDQ has joined Navy MARS. WB2BCS has been experiencing QRM on his RTTY net on 2 meters. WB2FUW is going to Burkell U. WB2BXX worked W. Va. on 2-meter aurora. WB2UGE has entered the Air Force. WB2GFY is in Spain for the summer. W2VAIX is becoming an expert in precision crystal-etching! K2UCY is confining his OBS transmission and other activities to 2 meters because of his XYL's health. WA2UCP has made RCC and will operate 11 from Vi. this summer. W2JDH reports that P.S. cleared up its QRN by grounding the high tension towers at the base, as well as the static wires at top. The Union County Area meets at the Washington St. School, Roselle at 8 P.M. the 2nd and 4th Fri. Technical meetings are held the 1st and 3rd Fri. WB2MXZ wants to know what happened to the old regulars on 2 meters. K2RDX is driving a 4X150A with a varactor multiplier on 432 Mc. K2SCD is adding an optical tracker to his moonbounce antenna. WA2EWG is back on 2 with a Seneca. WB2TFK is another newcomer to traffic on the Eastern Area Slow Net, 3748 kc. at 6 P.M. local time daily. WB2SSZ has a new tri-bander atop a 35-ft. tower. OO reports: (May) W2TPI 34, K2-AGZ 8, W2VMX 3, K2UCY 1, (Apr.) W2BVE 17. Traffic: (May) K2VNL 338, WB2AEJ 301, WA2TFK 160, WB2JWB 159, K2ZFI 118, WB2OHK 96, WA2GQZ 88, K2KDQ 66, WB2QLF 60, WB2FIT 55, W2QNL 50, K2-1FEL 36, WB2IYO 35, WB2BCS 31, W2TJZ 22, WB2-FUW 18, W2PEV 15, K2FQP 13, WB2KTO 11, K2UCY 11, WA2CCF 10, WB2BXX 9, WA2TAF 9, W2DRV 7, WB2TFK 7, WB2VHG 7, WB2GFY 6, K2MFX 6, W2-BWZ 5, W2CFB 4, WB2ICH 3, (Apr.) WA2SRQ 15.

MIDWEST DIVISION

IOWA—Acting SCM, Verlin Rowley, K0BRE—SEC: K0BRE. Because of the problems involved in transfer of records, information and reports in a situation where a serious illness and death is involved some traffic reports, RPLs, appointments, etc., may have been delayed. However, if the Iowa gang will bear with me, I hope to get everything caught up so that I can do the job at least partially as well as Denny has done.

75 M	QNI	1302	QTC	183	Sess. 26
Talcom	QNI	91	QTC	9	Sess. 23

Traffic: W0LGG 1550, WA0DYV 34, K0BRE 24, W0-NGS 16, W0BKR 10, WA0IYH 10, WA0GBD 9, WA0-JOA 3, WA0DAG 1.

KANSAS—SCM, Robert M. Summers, K0BXF—SEC: K0EMB, RM: WA0JIL, PAM: K0JMF, V.H.F. PAM: W0HAJ. Congrats to W0NWX from Kansas! Disaster has hit again—are we all prepared? There will be a report on the Topeka disaster later. Now is the time for all good hams to review their capabilities! Know your emergency frequencies, know your state level frequencies, learn how to handle traffic, know your EC and make him be active. This is a must to prevent a disaster within a disaster. Volunteer. Don't wait to be asked. New ECs: W0QNI, Topeka Zone 3; W0VRZ, Pretty Prairie Zone 10; K0MZZ, Salina Zone 14. Retired: W0BMW, Wichita Zone 9. New OPS: WA0EMQ. New OES: WA0HMZ, WA0ARL. New OBS: WA0-HMZ. More OO, ORS, EC, OPS, OES and OBS appointments are needed. OESs report a number of openings on 6 and 2 few on 2, 6- and 2-meter repeaters are being planned for the 450 tower of KCMB-FM in Wichita. Both units will be t.m. The JARS, in Wyandotte Co.,

signed its 100th club member May 19. Twenty-five persons passed the c.w. test at the JARS code class May 11. K0EVAI instructor comments, "This has been the most energetic and determined class in our memory." Members of the BHRG, Dodge City, participated in a c.d. Fallout shelter test May 14 and 15. Apr. net reports:

Net	Freq.	Day	Time CST	QNI	QTC
QKS	3610	Daily	1900	215	65
		Sun.	0800		
KPN	3920	M-W-F	0645	265	82
KSBN	3920	Daily	1830	357	100
KWN	3920	Daily	1800	433	6
Kans EC Net	3920	Sun.	1300	37	1
Zone 11 AREC Sessions	5 EC	K0JDD		114	

June QST listed K0GZD as having a traffic total. This was an error, K0GZP was the culprit. Traffic: W0OHJ 64, WA0MLE 332, W0INH 226, K0GZP 108, K0HGI 67, K0JMF 67, K0GHI 52, K0BKF 45, W0RUC 40, WA0CCW 39, W0VRZ 37, K0KED 33, K0UVH 17, K0LPE 9, K0MRI 7, W0BAW 6, W0FDJ 4, WA0-IPC 3.

MISSOURI—SCM, Alfred E. Schwaneke, W0TPK —SEC: WBUL, K0JPL was appointed EC for the St. Louis area replacing W0HTO, who resigned for lack of time. K0VXU is a new ORS and OPS. Appointments renewed: W0AIM as EC, W0OUD as RM, K0YIP as OPS, K0AEM as ORS, WA0FLL as OES, K0GSV as OO, W0TPK as ORS-OPS, WA0FKD as ORS-OPS. K0YIP participated in the May PMT. MoSSB Net certificates went to W0EZI, K0IOG, K0UWV, W0-LPE, WA5BSS, O and WA0JEG. I regret to report that W0ZK, one of the first hams west of the Mississippi, is now a Silent Key. WNOQU and WNOOSH are new operators at W0ZLN, WN0MHP, the son of WA0MGV, passed the Gen. Cl. exam, and WN0MDH passed the Tech. exam. W0OUD reports MNN (7063 kc.) will go on daylight time. WA0LJ has moved to Nevada, Mo. WA0FKD visited W0RTO and WA0FMD. W0TDR visited W0OUD, W0TPK and K0ONK. W0AIM has a 2.5-kw. emergency generator. WA0AMD/O worked XE1-PY on 6 meters. WNBVV/O is a new Novice in Independence. OO reports were received from K0YIP and K0GSV: OES from K0JWN and W0JTD, Male Taylor, W0EXQ/A0EXQ, MARS Dir., St. Louis, Mo., representing 5th Army MARS, cordially invites member inquiries and applications from Missouri hams, especially S.W., So. Central and N.E. areas. The MSN (Slowped Net) meets nightly at 10 P.M. CDST on 3715 kc. Net reports for May:

Net	Freq.	Time	Days	Sess.	QNI	QTC	Mjr.
MEN	3885	2330Z	M-W-F	13	183	12	W0BUL
MON	3580	0100Z	Daily	31	180	150	W0WYJ
SMN	3580	0100Z	Daily	19	38	22	K0AEM
QMO	3580	2200Z	Sun.	5	17	12	WA0FKD
MSN	3715	0300Z	Daily	31	40	3	K0ONK
MNN	7063	1800Z	M-Sat.	26	54	18	W0OUD
MoSSB	3963	2400Z	M-Sat.	25	506	145	K0TCR
MoPON	3810	2100Z	M-F	20	253	117	W0HVJ
MTTN	3940	2300Z	M-F	20	177	45	WA0ELM
PHD	50.4	0130Z	Tue.(GMT)	5	146	8	WA0FLL
MON (Apr.)				30	200	190	W0WYJ

Traffic: K0ONK 1721, WA0FKD 259, W0TDR 259, K0-AEM 140, W0HVJ 121, W0OUD 91, WA0FMD 82, K0-YGR 75, W0EEE 64, K0HNE 64, W0ZLN 55, W0RTO 23, W0TPK 23, WA0LYE 22, K0JPS 17, WA0ELM 13, K0TCR 13, W0BUL 10, WA0KNW 9, WA0CHH 8, WA0GH 8, K0LGZ 8, K0PFC 7, WA0HQR 6, W0-GQR 5, K0YIP 5, WA0FLL 4, WA0BGU 3, W0JBK 3, W0BVL 2.

NEBRASKA—SCM, Frank Allen, W0GGP—SEC: K0JXN. Appointment: WA0KGD as PAM. Net reports: Nebraska AREC C.W. Net, WA0EEI, QNI 12. Nebr. Storm Net, WA0KGD, 1st session, 0030Z QNI 1063, QTC 48, 2nd session 0130Z, QNI 721, QTC 25. Nebr. Morning Phone Net, K0UWK, QNI 859, QTC 56. Nebr. AREC Net, W0IRZ, QNI 169, QTC 3. Dead End Net, WA0MCX, QNI 52, QTC 13. West Nebr. Phone Net, W0NIK, QNI 476, QTC 35. Nebr. Emergency Phone Net, WA0GHZ, QNI 1386, QTC 133. Nebr. C.W. Net, WA0GHZ, QNI 85, QTC 35. Nebraska Centennial cards are being sent at a fast pace. If you don't have yours, make contact with a Nebraska station now. Traffic: K0QVN 108, W0LOD 98, WA0KGD 44, W0FQB 27, W0LFX 22, W0BVF 20, WA0BOK 19, K0JFN 18, W0GGP 15, WA0LQ 15, WA0KHE 14, K0DGW 10, WA0IBB 8, WA0LOY 8, K0FJT 7, K0UWK 7, WA0-EEI 6, W0VPR 6, W0WPK 6, W0EOG 5, W0OGVJ 5, WA0JAV 5, W0NJK 5, W0PQP 5, W0CXH 4, K0HNT 4, WA0JUF 4, WA0LRQ 4, WA0DFS 2, W0HOP 1, W0VEA 1.

NEW ENGLAND DIVISION

CONNECTICUT—SCM, John J. McNassor, W1GVT
—SEC: W1PRT. RM: W1ZFM. PAM: W1YBH. Net reports for May:

Net	Freq.	Days	Time	Sess.	QNI	QTC
CN	3640	Daily	1845	31	281	304
CPN	3880	M-S	1800	31	545	191

CN high QNI: W1EFW and W1RFJ. CPN high QNI: WAIDEM 27, WAIDWF 26, WA1EEJ 26, W1GVT 26, K1OJZ 24, K1SRF 24, W1LUB 22, W1YBH 22, K1EJC 21, K1EYY 19, W1NQO 19. SEC W1PRT was guest speaker at the Eastern Conn. ARA in Danielson and the Shoreline ARC in Essex during May. K1SRF is doing a fine job with other AREC members demonstrating the value of Amateur Public Service in emergency communication work. BPL for May traffic was made by W1EFW and W1A1PY. The Conn. V.H.F. Post Office Net operates Mon. through Fri. at 2100 on 145.98 Mc. with W1ULZ as State Manager. It also operates on 50.6 Mc. K1YON reports May band conditions were good on 220 Mc. He worked W2WOF on L.I. K1TZD also is active on 220 Mc. W1QV, New England Division Director, has been very busy with ARRL Board Meeting and associated business but still found time to be active on the traffic nets. K1IIF is starting a travel agency. W1OPZ is QCWA No. 4827 plus Worked All Maine and Worked All R.I. K1TRS and K1TBA are building a repeater system for Bloomfield RACES/AREC 2-meter mobiles. WA1DWJ is promoting the AREC in Simsbury. K1UTV is attending Lehigh University. I am honored to be the new SCM for the Connecticut section. My sincere thanks and appreciation for the many congratulations and offers of assistance. I will do my best to maintain the high standards previously established. Your suggestions and constructive criticisms are always welcome. Traffic: (May) W1EFW 581, W1A1PY 448, K1EYY 140, K1LQG 93, W1BDT 77, K1E1R 74, K1E1C 73, WAIDEM 54, W1YBH 47, K1LMS 33, K1SRF 31, W1GVT 20, W1OPZ 18, WAIDWF 17, W1BWB 12, W1CUB 12, W1QV 12, K1NTR 10, W1OBR 8, W1BNN 6, WA1EZW 3. (Apr.) W1OBR 4, WAIDWF 3. (Mar.) W1OBR 17.

EASTERN MASSACHUSETTS—SCM, Frank L. Baker, Jr., W1ALP—W1OAG, our SEC, received reports from Wis LVK, EHT, STX and K1PNB. New appointments: K1NLQ Ipswich, WA1BZJ Dartmouth as ECs; K1FPR, K9APQ/I Acton as OESs. Appointments endorsed: Wis HNW, EHT, LVK as ECs; Wis RST, ZQQ, K1WJD as OOs; Wis DGM, HIL as OPSs; K1KUY as OES. Sorry to report that W1OIR is a Silent Key. W1EAE now is in So. Acton. The EM2MN reports 23 sessions, 217 QNIs, 273 traffic. K4NS sends a card from Denmark. W1NF is busy on Intruder Watch. The Bedford Radio Club now has the call W1SS, W1OD, Framingham, has his old call back. K1AUP is now an Asst. Director to W1QV. W1AAI is on 2. W1RST has Extra Class. The South Shore Club held a meeting. W1HIL has an Ameco 6 & 2 transmitter and has a sked with W1GAG away up North. KV4CI visited W1RBP, who is now on 10. K1BUF is on 15-meter phone. W1VAH is DXing on 20- and 15-meter c.w. W1BGW joined the Antique Wireless Assn. The T-9 Club met at W1BFP's. WA1EOT has his General and needs Utah for WAS. K1DZG is communications chairman of the Red Cross. W1TGV is on many bands. K1FPR got rid of the ignition noise from his Volkswagen. WA1FFY has stacked holes for 2.35 ft. up. W1JLI worked some DX on 2. K1BTF worked aeronautical mobiles on Armed Forces Day. W1SZB and NSS, W1EKU Vt, VE1s KX and RW. The Yankee RC's new officers are WA1DTI, pres.; W1OFP, vice-pres.; K1SMP, treas.; W1WXF, secy.; Wis ONW, KYT, KYR, WA1CTS, directors; W1AAT, ham tamer. The Roxbury Y Radio Club, WA1FRI, is now an affiliated club. New officers of the Norfolk County RA are W1ALK, pres.; W1HTR, vice-pres.; W1KBL, treas.; K1EPL, secy. The 6-Meter Crossband Net reports 19 sessions, 292 QNIs, 19 traffic. K1PAM is pres.; K8ZHR, vice-pres. and station manager; K1SGY, secy., treas. of the Harvard Wireless Club, W1AF, which has a KWAI-2 and will be on many bands. W1AWZ gave a talk on antennas at the Quannapowitt RA. The Cape-way RC met at K1HGT's. A new award: Worked Scallop Capitol by Scallop City ARS. Write to K1INO for information. W1PEX and K1KBO made the BPL. K1CLM has his BPL medallion. W1NEUU is working DX on 80. WA1DIT was busy with final exams. Heard on 75: W1BPK, WA1DSZ, K1QVW is on 6. WA1BRL is on several bands. The Yankee Club held its Annual Banquet at the Hawthorne Hotel, Salem. New Novices: W1s GHX, GHT, GHU, GGW, GGX, GGZ, GHA.

GHB, GHC, GHN, GHO, GHP, GHQ, CHR, GFT, GGB, GGF, GGG, GGH, GGI, GJK, GKF, GFM, GBI, GBK, GBN, GBQ, GBT, GHU. New Wais: GGB, GCD, GCH, GCI, GCJ, GFA, GFN, GGP, GGR, GGS, GGU, GHJ, GHL, GID. Let's hear from all of you. Traffic: (May) W1PEX 1419, K1KBO 1411, K1LCM 396, W1OFK 310, W1OJM 220, K1ESG 170, WA1EYY 143, K1VOK 130, W1ZSS 122, WIEMG 94, WA1EAT 73, W1DOM 59, W1UIR 50, K1VPJ 44, W1CTR 38, W1AOG 30, WA1DED 26, W1NEUU 25, K1RCD 22, WA1ED 12, K1EYM 18, W1SIV 16, WA1DIT 13, K1BKG 12, K1OKE 11, K1GTX 8, WA1CBG 7, WA1DZM 7, K1YUB 2. (Apr.) K1BKG 8, K1YKT 1.

MAINE—SCM, Herbert A. Davis, K1DYG—SEC: K1QIG. PAMs: K1WQJ, K1ZVN. RM: K1TJH. V.H.F. PAM: K1OYB. Traffic nets: Sea Gulf Net, 1700 to 1800 and 2000 to 2100 on 3940 kc. Mon. through Sat.; Pine Tree Net daily at 1900 on 3596 kc. c.w. A meeting was held in Belfast with AREC groups, interested amateurs and others. There was a discussion followed by a question-and-answer period with K1TJH, WA1ATX, WA1DEQ, K1FQE, K1SGA, WA1DZT, W1H1T, W1LDF, WA1BNP, WA1EDZ, W1YVB, K1SBA, K1EBG and others at the c.d. room. K1MTJ and K1OYB still are keeping the state on the map in the v.h.f. band and doing a nice job. Some new ORSs now are W1GU, WA1DOW and WA1AXZ. Nice work, fellows. Traffic: K1YUJ 208, K1ZVN 182, K1WQJ 78, WA1DOW 44, W1NND 21.

NEW HAMPSHIRE—SCM, Robert C. Mitchell, W1SWX/K1DSA—SEC: WA1LE/W1TNO. PAM: K1APQ. RM: W1DYE. The GSPN meets on 3842 kc. Mon. through Fri. at 2300Z and Sun. at 1330Z. The VTNH Net meets on 3685 kc. Mon. through Fri. at 2230Z. W1DYE received the USA CA award. K1PQV is active on the VTNH with traffic. K1APQ reports 689 check-ins and 108 traffic for May. N.H. is making DX news; W1FZ is now on the DXCC Honor Roll. We believe Jim to be the first and only N.H. station to ever appear on this list. W1DYE is now a DXCC member with 101 countries. W1SWX just sent his in with 100 countries on 3.5 Mc. only. Anyone else DXing? K1YSD is awaiting the Ford Museum certificate and also other certificates from Armed Forces Day. W1UXS has been active in the nets. W1KOC was heard recently on a.m. K1MOZ is home from school for the summer. K1ERE and his XYL are back from Florida. K1LNU has a fine mobile signal on the nets. K1BCS is active on GSPN. Traffic: K1BCS 150, WA1LE 42, W1DYE 32, K1YSD 26, W1MHX 17, K1AEG 6, W1SWX 6.

RHODE ISLAND—SCM, John E. Johnson, K1AAV—SEC: W1YNE. PAM: W1TXL. RM: W1BTV. V.H.F. PAM: K1TPK. New appointment: K1JVN as OI. R1SPN reports 31 sessions, 515 QNI, 123 traffic. The W1AQ Club of Rumford issued the following WRI certificates: No. 75 to W1EIO, No. 76 to K1YSV, No. 77 to W1DYE and No. 78 to W5NSE. K2KMF/1 and K1PWC were elected to membership. Judging from the activity on the bands for Rhode Island Amateur Week, the affair was a huge success. A station set up on Kennedy Plaza in Providence using the call K1RI offered a special QSL card for all stations contacting it. As the SCM I would like to thank all clubs and individuals who worked together to make this a huge success. During the summer we seem to have a lower traffic count than usual and I urge you to check into the Rhode Island State Phone Net at 1830 EDST on 50.6 Mc. This will assist the net managers in handling the traffic during the summer months. Traffic: K1TPK 91, K1YVC 67, K1YEV 40, W1TXL 38, WA1EEJ 36, K1SXY 29, WA1CSO 23.

VERMONT—SCM, E. Reginald Murray, K1MPN—SEC: W1VSA. RM: K1UZG. May net reports:

Net	Freq.	Time	Days	QNI	QTC	NCS
Gr. Mt.	3855	2130Z	Dy x S	706	58	W1VMC
Vt. Fone	3855	1300Z	Sun.	187	0	W1UCL
VtNH	3685	2230Z	M-F	91	35	K1UZG
VTCD	3900 1/2	1400Z	Sun.	24	7	W1AD
VTSB	3009	2230Z	M-S	533	28	W1CBW
		1330Z	Sun.			

K1YAM has been hospitalized. Don't forget International Field Day Aug. 14 at Cliffside Country Club in Burlington. W1HRG, 333 Dorset St., S. Burlington has all the details. It should be the best ever with a bar-b-q, antenna-raising contest, auction, swap shop, etc. Write K1PPW for accommodations. Write Jim Vele, W1BRG, 180 Flynn Ave., Burlington, for early bird registration (\$2.50). Traffic: K1BQB 611, K1UZG 24, K1MPN 17, W1KJG 8, W1HRG 2.

WHILE the all solid-state HRO-500 communications receiver (with 37 transistors and 21 diodes) isn't exactly a midget transistor radio, it is available in a portable configuration (designated HRO-500P) for battery operation independent from sources of A.C. power.

THE HRO-500P consists of the HRO-500 receiver mounted in a special cabinet which contains a built-in speaker and a rechargeable nickel-cadmium battery. The receiver in its special cabinet is then mounted in a waterproof luggage-styled carrying case for safe and easy transit to remote locations.

THE rechargeable nickel-cad battery will provide over eight hours of continuous operation at 50 milliwatt audio output if the receiver's dial lamps are extinguished by means of the front-panel switch provided for that purpose — as you may know, the dial lamps actually draw more current than does the rest of the receiver! The battery and charging unit are both removable from the receiver case, so that a spare battery may be charged while the other one is in use. Needless to say, the HRO-500P, like the standard HRO-500, may, in addition, be operated from an external 12 VDC source or from 117/234 VAC sources.

THE waterproof carrying case is constructed of high-impact ABS plastic and fiberglass — a “tongue-in-groove” extrusion and rubber seal between the base of the carrying case and its cover provides watertight integrity. The cover may be removed completely, if desired, for table-top operation.

WHILE the HRO-500P may give you ideas about battery-operation multipliers for next year's Field Day, the “P” configuration is really intended for use in portable or field applications barred to conventional vacuum tube equipment. On-the-spot communications, intercept work, measurement, quick-transit instrumentation — all are possible with greater performance than is available with fixed-station installations using conventional competitive receivers. Total field set-up consists of connecting an antenna, and there is even room inside the carrying case for a tape dipole (or similar) antenna.

FOR owners of standard HRO-500 receivers, a special CK-5 conversion kit is available which consists of the special cabinet with built-in loudspeaker and removable nickel-cad battery with charger, and the waterproof carrying case.

IF you'd like more information on the HRO-500P we'll be happy to send you the six-page data sheet which covers this unit as well as other specifications of the HRO-500 — the most advanced amateur and commercial receiver available today.

MIKE FERBER, W1GKX



National Radio Company, Inc.

WESTERN MASSACHUSETTS—SCM, Percy C. Noble, W1BVR—SEC: K1IJU, C.W. RM: K1IJV. W1-HDQ and W1BVR, with their XYLs, were guests of the Hampden County Radio Association at its annual banquet attended by approximately 110. At the business session the following officers were elected: K1PMK, pres.; W1ALL, vice-pres.; K1LTD, secy.; W1LRE, treas. W1UFP brought back a Galaxy V and PS from the National Convention. EC K1SSH is looking for recruits for the AREC in the Worcester area. Two films from ARRL, "Transistors" and "RTTY," were shown at the April meeting of the Valley Amateur Radio Club. C.W. RM K1IJV reports that WMN handled 94 messages during the month with the following in attendance (in order of activity): K1WZY, K1IJV, W1ZPB, K1SSH, K1BVR, W1DWW, W1MNG, W1AFNX/1, K1LBB, W1-AJX, W1YK, and W1ZL. K1WZY spoke on "The Distaff Side of Hamming" at the May meeting of the Berkshire County ARA. She also had a nice picture and write-up in the *North Adams Transcript*. Ex-K1GET is now W4EHP. We received a letter recently from WA1DVE informing us that he is secretary of Hamrad, a radio club in Pittsfield that has been in existence for the past three years. Golly, how some of these guys hide their lights under a bushel! The club call is WA1ASV and meetings are held every Fri. at 7:30 p.m. at 48 Bank Row, Pittsfield. An open invitation is extended and I, for one, intend to take advantage of that. Officers of the club are W1DUQ, pres.; K1NWO, vice-pres.; K1TNB, treas.; WA1DVE, secy. Incidentally, the club gets out a nice bulletin. Please keep it coming. Traffic: K1IJV 78, K1SSH 78, W1-ZPB 70, W1BVR 68, K1WZY 49, W1DWW 11.

NORTHWESTERN DIVISION

MONTANA—SCM, Joseph A. D'Arcy, W7TYN—

Montana S.S.B. Net	3910 kc.	1800 MST	M-F
Montana PON	3885 kc.	0815 MST	Sun.
Montana RACES	3896.5 kc.	0900 MST	1-3 Sun.
Missoula Area Emerg. Net	3895 kc.	0900 MST	Sun.

Endorsements: K7SVR as OPS and OO. W7NML is back on 75 meters with a new Cliff Dweller antenna. The Hi Line Amateur Radio Club is back in business. WA7-AEX is pres.; K7GAH, vice-pres.; W7ROE, secy.-treas. The club is using a building at the county fairgrounds for meetings and the site for the club station. WA7-FOB is a new call in Butte. W7C9N has his super 2-meter mobile on the air and is doing fine. From W7-NPV comes news of the Bozeman gang. Seven hams have earned degrees from Montana State University. They are K7DNV, K7RAU, WA7BRY, K7BXZ, K7DVA, K7HOS and K9MV. WA7BRY is going to work for the Collins Radio Co., K7DYA for the AEC at Arco. K7-EGE has gotten married. WA7EHD has his new 753 on. From Missoula comes word that WA7AFC has won the American Science Foundation Award. WA7DAF is moving to Oregon. W7VLY is the new General Manager for Interstate Communications, Inc., at Billings. Traffic: (May) K7LDZ 14, K7CGJ 13, K7DCH 11, W7FL 7. (Apr.) K7CGJ 18.

OREGON—SCM Everett H. France, W7AJN—SEC: W7AJN, RM: W7ZFH, W7AZD. AREC net mgr., reports sessions 31, total attendance 440, traffic 22, QNT 1, maximum contacts 13, contacts 61. K7QWU reports the Vernonia Amateur Radio Club was organized during May with 24 members, 4 of whom are licensed—W7WWO and W7ZKJ are on 75 a.m., W7QEI has a Swan 350 and K7QWU also an s.s.b. The club meets Tue. at 7:30 p.m. at Anderson Park club house and has code and theory classes with 7 members ready for their Novice tickets. For Novices in Oregon who operate on 40 meters, the Northwest Novice Net on 7170 kc. at 7 p.m. PDT welcomes your participation. If you are interested in getting experience in traffic-handling and network procedures, contact WA7CSK, 2943 N.E. 178th St., Seattle, Wash. 98155. W7DEM reports for the Grants Pass area. W7-CGW now is WA7CGW. K7CMV is a new mobile with an NCX-5. W7NPHX is a new Novice. The Southern Oregon Radio Club handled election returns from 24 of the 56 precincts using two frequencies on 2 meters without any interference. The club, using s.s.b., handled communications for the Memorial Day "Boatnik" boat race. Traffic: (May) K7IWD 286, W7ZFH 53, W7GUH 39, K7-DVK 30, W7DEM 5. (Apr.) K7IWD 246.

WASHINGTON—SCM Everett E. Young, W7HMQ—SEC: W7UWT, RM: W7OEB. PAM: W7LEC. V.H.F. PAM: W7PGY. NTS Nets:

WSN	3535	Daily	0200Z	QNI	373	QTC	275	Sess.	31
NTN	3970	Daily	1930Z	QNI	941	QTC	153	Sess.	31
WARTS	3970	Ex-Sun.	0130Z	QNI	789	QTC	87	Sess.	26

Four Roses to K7JHA, W7LEC and WA7BDD—Bill for his Tech. Net Sun., Pete for his code practice net daily 3700 kc. 10 A.M., Joan for her N8N transformation.

W7UO now is in the Philippines. OBS K7CHH/7 has a new 40 inverted and reports it is FB. W7NICW, RO Kit-sap County is busy with RACES on 6 and 10 meters and sends in a nice WARTS report. All league members are urged to apply for OPS appointment. Contact W7LEC, RM W7OEB wants all qualified members of WSN as ORSS. K7QOM is awaiting an SB-100 kit. Rich-land ARC code practice is going great. Benton County will have a new e.d. director. W7COG has accepted appointment as coordinator for S.E. Washington Navy MARS. W7PI and W7KZ now are liaison to PAN for RN7. Washington is tops on RN7 with 100 per cent representation. W7JEY now is home in Quilcene. ORS/OBS W7AMC has a new receiver. The 20th Annual Walla Walla Hamfest will be held Sept. 25. ORS WA1B spent a vacation in Nevada. W7RXH, ORS-OPS, is going sideband. W7AXT is a new ORS. Pierce County RACES now is QRL for the summer but will be back in Sept. on 29.510-50.6—145.65 Mc. Director W7PGY's letter of May 26 was highly commended. Washington section ARRL members join in saying "Thanks Bob, nice job." The Tacoma AREC Net meets the 1st, 3rd and 5th Wed. of each month at 0330Z. W7KLV visited the RC of Tacoma. K7GPK found generators need brushes and now is back mobile. W7UWT, our SEC, is now planning the fall AREC program and asks that all ECs get the activities going in their areas. The Director, SCM, RM and PAMs will work closely with UWT to effect our very highest emergency communications potential. Our sympathy to K7CZM on the loss of his wife, K7CZT on the loss of his mother, W7EUV on the loss of a brother.

NWSSP	Slo-speed	3700	Daily	QNI	300	QTC	123	Sess.	29
NWSSB		3945	Daily	QNI	1324	QTC	97	Sess.	31

Traffic: (May) W7BA 1223, K7TCY 900, W7DZX 834, K7-CTP 263, W7PI 247, K7JHA 123, W7JEY 103, W7APS 97, W7GYF 80, W7OEB 75, W7BTB 59, W7HMQ 53, K7VNB 51, W7KZ 42, W7AMC 27, W7VG 21, WA1B 10, W7-RXH 9, W7EUV 3, W7AXT 2. (Apr.) K7VNB 38.

PACIFIC DIVISION

EAST BAY—SCM, Richard Wilson, K6LRN—K6-PMG, in Newark, and K6PIV/6, in Alameda, are new QNI's to NCN. W6LNK and W6HOF gave a fine talk and demonstration on the construction and operation of the W6CX repeater. The amazing part is that this repeater is built around the link 1905-2240 and incorporates features not found in many supposedly more sophisticated amateur repeater installations. W6JWV is telephone relaying with his SB-100. W6IDY earned his A-1 Operator certificate. W6TYM is back on the air after blowing the power transformer in the 32S-3. WA6WNG's 4-250A final blew up so he is now trying to get a pair of GG 818s on. K6GZJ moved to Walnut Creek from Richmond. WA6RRH, mgr. of the Bay Area Net, needs help on the net. Net controls lousous and just plain QNIs. Drop a card to WA6RRH, 48244 Cottonwood Dr., Fremont, for information or you may find him on BAN every night on 146.7 Mc. at 0145/1845 PDST. The net is staying with PST and will switch back to 0245Z/1845 PST in Oct. Among those in attendance at the Fresno Hamfest were WA6AIF, W6LGW, W6TYM, W6NBL, WA6WNG, W6BSE, W6ACN, WA6-JCS, K6CFY, W6BIA, W6BHZ, W6R8W, WA6ANE, K6ZBG, W6BCTB, WA6YAL, W6PIR and K6LRN. WA6WNG attended the Northwestern Division Convention with W6TYM and W6NBL. K6SPP is driving a shiny new (to him) red T bird. Help wanted dept. We need an SEC and several Emergency Coordinators to assist the two we have at present. The duties are not at all hard. Refer to articles in past QSTs for EC information.

BAN	0145Z	146.7	Daily
NCN	0300Z	3.635	Daily

Traffic: (May) K6LRN 404, W6IDY 325, WA6WNG 158, W6TYM 126, K6PIV/6 72, W6BREQ 33, WA6RRH 29, WA6FBS 11. (Apr.) W6TYM 282, W6YKS 15.

HAWAII—SCM, Lee R. Wical, KH6BZF—Asst. SCM/SEC: Ernie J. Kurlansky, KH6CCL. PAM: WOPAN/KH6. RM: Vacant—taking offers. V.H.F. PAM: KH6-EEM.

Net	Freq. Mc.	Time	Days
Friendly	7.290	2030Z	M-F
50th Stat.	3.895	0500Z	Tue.-Sat.
NO KA OI	7.290	2230Z	Sat.
Makuli	14.250	0700Z	Nightly (When no DX coming in)

KH6G/G coordinates the following:

RACES 40	7.225	1930Z	2 & 4 Sun.
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PARTIAL SB-110 SPECIFICATIONS—RECEIVER SECTION: Sensitivity: 0.1 uv for 10 db signal-plus-noise to noise ratio. Selectivity: 2.1 kc @ 6 db down, 5 kc max. @ 60 db down. Image rejection: 50 db or better. IF rejection: 50 db or better. Audio output power: 1 watt. AGC characteristics: Audio output level varies less than 12 db for 50 db change of input signal level (0.5 uv to 150 uv). **TRANSMITTER SECTION:** DC power input: SSB, 180 watts PEP, CW, 150 watts. RF power output: SSB, 100 watts PEP, CW, 90 watts (50 ohm non-reactive load). Output impedance: 50 ohm nominal with not more than 2:1 SWR. Carrier suppression: 55 db down from rated output. Unwanted sideband suppression: 55 db down from rated output @ 1000 cps & higher. Distortion products: 30 db down from rated PEP output. Hum & noise: 40 db or better below rated carrier. Keying characteristics: VOX operated from keyed tone using grid-block keying. **GENERAL:** Frequency coverage: 49.5 to 54.0 mc in 500 kc segments (50.0 to 52.0 mc with crystals supplied). Frequency selection: Built-in LMO or crystal control. Frequency stability: Less than 100 cps drift per hour after 20 minutes warmup under normal ambient conditions. Less than 100 cps drift for ±10% supply voltage variations. Dial Accuracy: Electrical, within 400 cps on all band segments, after calibration at nearest 100 kc point. Visual, within 200 cps. Dial backlash: No more than 50 cps. Calibration: Every 100 kc. Power requirements: High voltage, +700 v. DC @ 250 ma with 1% max. ripple. Low voltage, +250 v. DC @ 100 ma with .05% max. ripple. Bias voltage, -115 v. DC @ 10 ma with .5% max. ripple. Filament voltage, 12.6 v. AC/DC @ 4.355 amps. Dimensions: 14 7/8" W x 6 1/2" H x 13 3/4" D.

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RACES 6	50,252	1930Z	2 & 4 Sun.
RACES 2	147,000	1930Z	2 & 4 Sun.

KH6AX tied the knot—he now has a new NYL. W6IFO and K4ERU/KB6 were recent visitors in our islands and at the Honolulu ARC meeting. KH6DRN has joined the Honolulu ARC. KH6ETG reports that the 40-meter s.s.b. mobile gang is mobilizing to faraway places. KH6EDG QSY'd to JA-Land while KH6EDH went the other way and is located on the West Coast. W6PAN/KH6 and KH6FRO are neighbors. Your SCM would like to keep in touch with locals who are on 160 meters. Let your SCM know your needs today. See page 6 for his address. Send in your reports today. Request Form 1 report cards from your SCM or ARRL Hq.

NEVADA—SCM, Leonard M. Norman, W7PBV—SEC: WATBEU/W6EBS. W7LUV is a Silent Key. W7PEW gave an interesting talk on antennas to the NARA group. W7AAP is back at his old trade repairing aeronautical radios. W7AKE and the 2-meter f.m. group have a new site picked out for their repeater which receives on 146.94 Mc. and transmits on 145.5 Mc. K7RKH demonstrated his v.h.f. and u.h.f. IIB gear to SNARC members. K7ADD is back in Las Vegas for the summer. K7ZAU is doing a good job as editor/publisher of the WCAR *Sentinel*. K7ICW was issued WAS certificate No. 16,871. K7ALG and W6TQZ/7 report good DX on 6 meters. K7OHX is mobile. Southern Nevada amateurs provided communications for the Clark County Sheriff and Nellis AFB in searching for a lost six-year-old child in Lee Canyon. The following were among those taking part: W7FJN, K7VUI, W7VYC, W7AEMP, K7VHS, W7AKE and W7ERR. Traffic: K7OHX 12, W7PBV 2.

SACRAMENTO VALLEY—SCM, John E. Minke, III, WA6JDT—SEC: WB6BWB, ECs: WB6MXD, K6RHW, W6SMU, WA6TQJ, RM, W6CMA, PAM; WA6YYK, ORSs: WB6HAW, W6LNZ, OPSs: WB6EAG, K6IKY, WB6MAE, WB6RCR, W6TQJ, OBSs: W6AF, WB6PHQ, WA6SLU, WA6TQJ, WA6YYK, OOS: W6ECE, W6GDO, W6WLI, W6GJW, OESS: WA6CXB, WA6FWU, W6GDO, WB2OV6/6.

Net	Freq.	Time	Days
SVN	3800 kc.	0230Z	Daily
	146.28 Mc.	0330Z	TThS
NCN	3635 kc.	0300Z	Daily
YCCD	146.94 Mc.	0200Z	Wed.
SCEN	146.28 Mc.	0400Z	Wed.

The Seardey Radio Club had an RTTY display at Mather AFB for Armed Forces Day using the call W6SIG/6 with WA6VVR as operator. WB6AQR and WA6JDT received the traffic. WA6SLU took traffic from the USS *Swathmore Victory* as it roamed around S.E. Asia. WB6MAE was in the newspaper regarding his traffic-handling. W6GDO has been keeping schedules with K6HCP in San Jose on 1296 MHz. W6WLI is adding radials to his vertical antenna so he won't get burned from his grounded(!) TTY machine. WA6FWU is vacationing in Florida. W6AF built a 60-watt 7-Mc. rig for Field Day. The GEARS, normally found on 160 meters also meets Fri. on 145.26 MHz at 7 p.m. The Yolo Co. CD-AREC Net participated in an SET conducted by the Yolo Co. Disaster Office. Participating members were W6CEI, WA6VVR, WA6PKD, W6MNM, WB6BWB, WA6DDO, WN6SAT, WA6TQJ, W6WBT, WB6GOV and WB6MLM. Traffic: WB6HAW 316, W6LNZ 41, WB6MAE 41, WB6SIG/6 38, WA6JDT 36, K6YBV 29, WA6VVR 26, WB6BWB 23, WA6SLU 18, WB6EAG 10, K6IKY 9, WA6CXB 6, WB6OYI 6, WA6TQJ 6.

SAN FRANCISCO—SCM, Hugh Cassidy, WA6AUD—SEC W6KZF would like ECs to report every month. K6OJO is General Chairman of the Greater Bay Area Hamfest to be held in Oakland Oct. 22-23. W6LQW is home after a visit to the local hospital. W6JVA, whose call appeared occasionally in the newspaper cartoon "Bobby Sox" became a Silent Key in May. The San Francisco, Marin, Tamalpais, Sonoma, Humboldt and HAIS Radio Clubs were all active on FD. W6EAJ still is the most active one in the section on 160 meters and reports that his 400-ft. antenna helps. W6HSA made the Southwest Division Convention at Disneyland. W6RMM and WA6AUD got their DXCC certificates. WA6IVM has a new Class I and II OO appointment. Ray had an article in the June *Section Courier* on his frequency measurement techniques. WB6GLD has been transferred to Calexico by the Immigration Service. WA6MGG has a Model 15 RTTY operating and reports that one of his first contacts was with VK2KF. W6GQA worked all four of the Armed Forces stations during the May activity. In the Feb. FMT test W6GQA had an average error of 3.4 parts per million and W6SPB had an average

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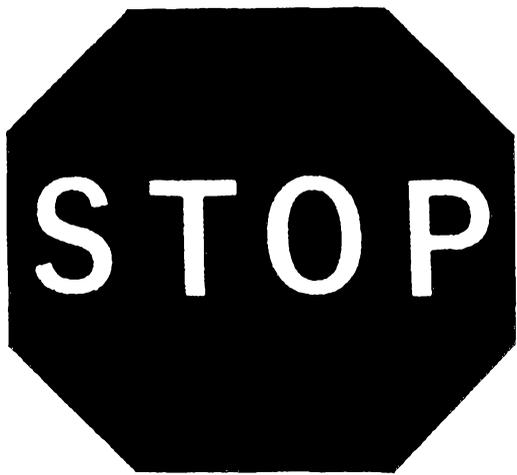
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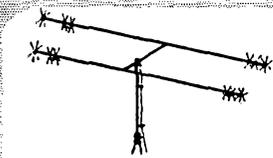
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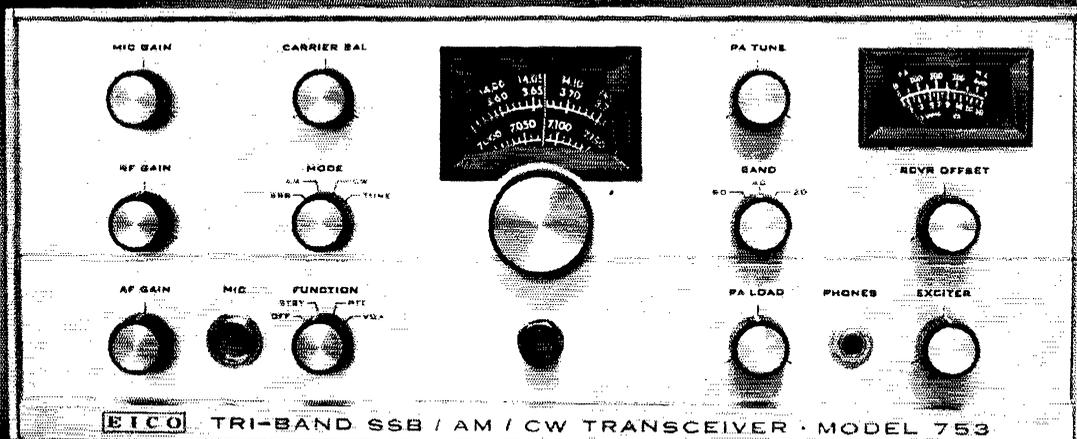
• LEADERS IN COMPACT ANTENNAS •

of 2 parts per million. The Humboldt High School Radio Club made a trip to TV station KVIQ. WB6JOX has been filling in as NC on the San Francisco Section Net with a strong signal Mon. and Fri., 3900 kc, at 6:30 P.M. local time. The San Francisco Radio Club held its May meeting at the Burgermeister Brewery. WB6-PZH was section winner in the January V.I.F. Sweepstakes and in the VE/IV Contest last year. W6MSM and W6WLV were the high scorers. W6DZQ spoke at the June meeting of the Marin Club on the trials and tribulations of achieving an Amateur Extra Class license. W6RLY reports traffic is being handled on the 6-meter net in the Humboldt County area. W6CYO has a new TH4B net replacing the vertical in his DX activity. WB6AIS continues to recover from major surgery. WB6-CKT reports many new repeaters in the western states. The Tamalpais Radio Club handled parade communications at the Loyalty Day activity in Sonoma in May. Latest to sign up in AREC is W6KKF, in Petaluma. W6IWO operated portable from KH0-Land during May. K6TZN has erected a Hi-Tower HT-18 at his Weott QTH. W6ARE is a new EC in Sonoma County. Fourteen members of the Tamalpais Club made the Fresno Hamfest. W6BDGJ and W6PPB did fine on the 6-meter openings during May. W6AEY is delighted with his SB-100 project. Traffic: (May) W6RQV 236, W6NL 114, W66-GLD 39, W6GVI 34, K6SAA 31, W6AUD 22, W66-IMO 17, W6CYO 12, W6RQY 12, K6TZW 12, W6BNOL 8, W6MGG 6, W6BIP 4, W6OPL 4, W61VM 3, W66JOX 2, W6RLY 2, K6TZN 2. (Apr.) W6GVI 14.

SAN JOAQUIN VALLEY—SCM, Ralph Saroyan, W6-IPU—The 24th Annual Fresno Amateur Radio Club Hamfest was held at the Hacienda Motel with about 350 in attendance, with WB6ETQ, as hamfest chairman, doing a line job. In order to use his new Galaxy V in his car, W6OWL is going to have to reverse the polarity of his English car! W66KIG won the Swan 350, W6NTK is mobile with a TR-3. Among those seen at the hamfest were WB6ETQ, W6OWL, W6GJG, W6HKV, W6FCR, W6SMS, W6GML, W66BUY, W6QON, W6NTK, W66-LCM, W6KSV, K6OPE, W6PPP, K6LJK, K6BKZ, W6FKQ, W6PFP, W6AUA, W6RRN and K6AXV. W6GJG has an SB-100. K6LJK is on 2 meters from Oakhurst. W6AUA is on 80-10 with an SB-100. W6OIP is on 40-multiphone with a homemade rig using 6BQ tubes. W6MIUY was the Delta Amateur Radio Club's Field Day chairman. W66NMQ is now General Class. W6FBL still is teaching code and is turning out Novices. W66NCJ has a Vanguard 2-meter converter. W6-ADB, who never misses sending in his monthly report, says nothing new this month. W66PCQ has a 75A-4 and a 20-A exciter. W66TDW is a new Novice in Fresno. The Fresno Amateur Radio Club held its FD exercises at Kearney Park. I still can use some news from Bakersfield. Please send in those reports, it doesn't take long. Traffic: W66HYA 297, W6ADB 198, W66PCQ 73, W66NCJ 9.

SANTA CLARA VALLEY—SCM, Jean A. Gmelin, W6ZRJ—Asst. SCM, Ed Turner, W6NVO. SEC: W6-HVN. RM: W6QMO. W66ZF reports activity for King City: W66RMV is working mobile 2 meters and W1-PYM/6 has 87 countries confirmed for the year. W6OII is using a new Swan 350 and having good success on MTN. W6BVB works NCN. K6YKG reports activity for Armed Forces Day and has received a QSL from NPG. W6AUC is active as OO. W6ZRJ was the featured speaker at the NPEC May meeting and spoke on the problems of club organization. W66NXX, ORS in Sunnyvale, is active on NCN and taking area traffic. W6SAW is very busy with Navy MARS Viet Nam traffic but finds time for OO/OBS activity. W6QIE is also very QRL with the Navy MARS traffic operations. W6HC is busy with his Director work but holds down a TCC slot. W6DEF made a trip to Boston in late June. K6DYX is QRT for the summer and will be fishing in Michigan for a month. Smitty reports that RTTY is fine for bulletins but is not so good for traffic. W6YBV is busy on NCN and works RN6. W66CVU works NCN, RN6 and PAN from Cupertino and is doing a fine job of clearing area traffic as well as relay. W6RSY made the HPL. W66EF reports that W6ZLL has been awarded a Naval Reserve Officer's scholarship. Phil was graduated from Serra High School in San Mateo this year. Hal also reports that W6HSR has had a heart attack but is recuperating nicely. W6UMI is active as OO and gave a talk to the SCCARA on DX. Members of the King City Explorer Post 1 operated a station at the Salinas Valley Fair in King City May 17-22 using the call W66SBL. Operation was on several bands and the station contacted 25 states and several countries. W6DEF was scheduled to talk on "electronics in jet airliners" at the June meeting of the PAARA. The May meeting of the club was on trade fairs behind the iron curtain. The May meeting of the Santa Cruz County Amateur Radio Club featured an auction. The April meeting of the SCARS featured a

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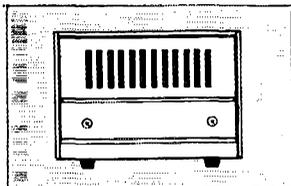
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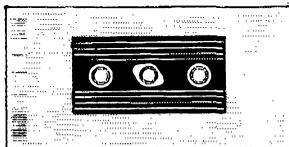
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261 VHF VFO	32V-2 Xmtr	149	A-54H Xmtr (AS-IS)	AF-67 Xmtr	45	Comm II 6m	SR-34 Xcvr	199	T-50 Xmtr	24
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5100 Xmtr	30L-1 Linear	390	PS-2V AC Supply	PS-2V AC Supply	29	900A 2m Xcvr	HAMMARLUND		T-150 Xmtr	59
5100B Xmtr	312B-4 Console	149	PMR-7 Receiver	PMR-7 Receiver	45	902A DC Supply	HQ-100 Receiver	99	V-4 VFO (AS-IS)	59
6100 Xmtr	KWS-1 Xmtr (#389)	695	PMR-8 Receiver	PMR-8 Receiver	95	G-50 Xcvr	HQ-110A Receiver	119	X-10 Calibrator	5
515B SSB Gen	KWM-1 (1000-up)	275	PSR-612 DC Supply	PSR-612 DC Supply	19	901A AC Supply	HQ-110AC Rec	159	NATIONAL	
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10B Exciter	KWM-2 Waters Rej.	775	Scout 680A Xmtr	Scout 680A Xmtr	39	913A 6m Linear	HQ-170C Receiver	199	NC-68 Receiver	69
20A Exciter (table)	Q-Multiplier	775	Chief Deluxe	Chief Deluxe	59	GR-212 Receiver	HQ-170A Receiver	265	NC-98 Receiver	39
QT-1 Anti-rfp	KWM-2A blanker	875	Chief 90A CW Xmtr	Chief Deluxe Xmtr	39	G-66 Receiver	HQ-170AC Rec	275	NC-105 Receiver	75
BC-458 VFO	516E-1 12VDC Sup	59	King 500A Xmtr	King 500A Xmtr	225	G-66B Receiver	HQ-170AC VHF	249	NC-109 Receiver	75
200V Xmtr	516F-1 AC Supply	75	King 500B Xmtr	King 500B Xmtr	249	3-Way Supply	HQ-180AC Receiver	299	NC-121 Receiver	79
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Thor 6 (RF only)			DC Supply	DC Supply	75	GSB-100 Xmtr		175	NC-300 Receiver	149
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Ihor 6 AC Supply			2000 Linear Sup	2000 Linear Sup	275	Superceiver (AS-IS)	HR-10 Receiver	\$ 39	2m Converter	29
Zeus Xmtr			Deluxe Console	Deluxe Console	69	Super 6 (AS-IS)	HR-20 Receiver	89	220Mc Converter	24
Venus Xmtr			Calibrator	Calibrator	12	Super 12	MT-1 Xmtr	45	Converter Cabinet	17
Venus AC Supply			VOX	VOX	14	HALLICRAFTERS	MR-1 Receiver	49	XCU-27 Calibrator	15
SS1R Receiver			755 VFO	755 VFO	25	SX-24 Rec (AS-IS)	RX-1 Receiver	149	XCU-300 Calibrator	12
COLLINS			755A VFO	755A VFO	29	S-38E Receiver	X-6 Converter	29	NTS-1 Speaker	9
75A-1 Receiver			752 VFO	752 VFO	49	S-40B Receiver	QF-1 O-Multiplier	4	NTS-2 Speaker	12
75A-2 Receiver			730 Modulator	730 Modulator	39	S-43 Receiver	DX-20 Xmtr	24	NTS-3 Speaker	14
75A-3 Receiver			752 VFO	752 VFO	49	S-53 Receiver	DX-35 Xmtr	29	NCX-3 Xcvr	199
74A-4 (0-1000)			751 AC Supply	751 AC Supply	59	S-53A Receiver	DX-40 Xmtr	34	NCXA Supply	75
75A-4 (1000-2000)			752 DC Supply	752 DC Supply	59	S-56 Receiver	DX-60 Xmtr	59	NCXD Supply	75
270G Speaker						SX-62 Receiver	DX-100 Xmtr	75	NCX-2000 Linear	425
75S-1 Receiver						SX-71 Receiver	DX-100B Xmtr	99	P & H	
75S-2 Receiver						S-77 Rec AC DC	TX-1 Xmtr	125	LA-400 Linear	\$ 75
75S-3 Receiver						S-85 Receiver	SB-10 SSB Adaptor	69	LA-400B Linear	85
						SX-96 Receiver	HX-10 Xmtr	199	LA-400C Linear	99
						SX-99 Receiver	HX-20 Xmtr	149	6-150 6m SSB Conv	99
						SX-100 Receiver	HW-12 75m Xcvr	99	POLYTRONICS	
						SX-101 Receiver	HW-72 40m Xcvr	99	PC-6 Xcvr	\$195
						SX-101 Mk III	HW-32 20m Xcvr	99	PC-62B	125
						SX-101 Mk IIIA	SB-300 Receiver	225	RME	
						SX-101A Receiver	VF-1 VFO	17	4300 Receiver	\$ 75
						S-106 6m Receiver	HG-10 VFO	29	4301 SSB Adaptor	39
						SX-110 Receiver	Six'er	34	4302 Speaker	9
						SX-111 Receiver	Two'er	39	4350 Receiver	99
						SX-115 Receiver	HW-10 Shawnee	169	4350A Receiver	109
						SX-117 Receiver	HX-30 6m Xmtr	175	6900 Receiver	145
						S-118 Receiver	VHF-1 Seneca	159	VHF-152A Conv	34
						S-119 Receiver	HP-13 DC Supply	35	SBE	
						S-120 Receiver	HP-20 AC Supply	25	SB-33 Xcvr	\$175
						SX-122 Receiver	HP-23 AC Supply	35	SB-34 Xcvr	275
						SX-140 Receiver	MP-1 DC Supply	25	SB2-DCP Inverter	35
						CRX-1 Receiver	UT-1 AC Supply	19	SB3-DCP KW Inv.	125
						CRX-3 Receiver	HO-13 Ham Scan	49	SB2-LA Linear	149
						R-46 Speaker	JOHNSON		SINGER	
						R-46B Speaker	Adventurer	\$ 25	PR-1 Panadaptor	\$ 99
						R-47 Speaker	Challenger	59	SONAR	
						HT-17 Xmtr(AS-IS)	Viking I	49	20M Monobander	\$125
						HT-30 Xmtr	Viking II	75	AC-10 AC Supply	75
						HT-31 Linear	I22 VFO	95	DC-10 DC Supply	75
						HT-32 Xmtr	Ranger I	175	MW-4 Mariner(AS-IS)	25
						HT-32A Xmtr	Valiant I	145	SWAN	
						HT-32B Xmtr	Valiant II	249	SW-120 Xcvr	\$125
						HT-33 Linear	SSB Adaptor	149	SW-140 Xcvr	125
						HT-33A (conv to B)	500 (4-400A)	375	SW-117 AC Supply	65
						HT-37 Xmtr	Pacemaker	149	SW-12 DC Supply	75
						HT-40 Xmtr	Invader 2000	549	SW-240 Xcvr	199
						HT-41 Linear	Courier Linear	139	SW-117C AC Supply	65
						HT-44 Xcvr	6N 2 Conv (14-18)	29	SW-117B AC Supply	65
						MR-150 Rack	6N 2 Xmtr	89	SW-12A DC Supply	75
						P-26 Supply	6N 2 VFO	29	SW-350 Xcvr	295
						P-150AC Supply	Mobile VFO(AS-IS)	25	SW-117C AC Supply	69
						P-150DC Supply	Mobile VFO(AS-IS)	15	SW-117XC AC Sup	75
						SR-150 Xcvr	KNIGHT		TECRAFT	
						SR-160 Xcvr	R-55 Receiver	\$ 39	TR20-50 6m Xmtr	\$ 34
						HA-1 Keyer	R-55A Receiver	44		
						HA-2 Transverter				
						HA-5 VFO				

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EIMAC

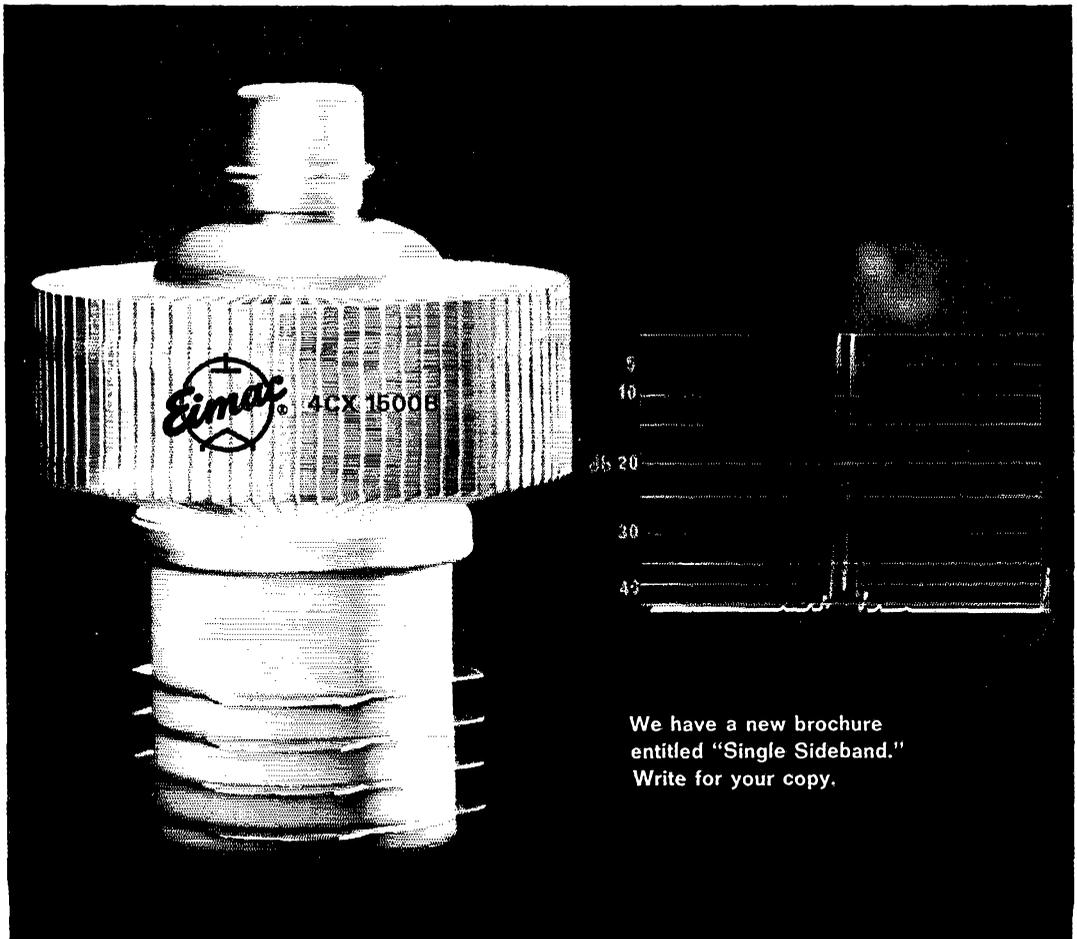
offers new 1 kW PEP
tetrode for SSB with
highest linearity—at least
-40 db in typical operation

EIMAC's new 4CX1500B power tetrode is the most linear tube on the market; intermodulation distortion characteristics under typical operating conditions are at least -40db at all drive power levels from zero to maximum. The new tube is ideal for advanced single sideband transmitters demanding high linearity to avoid channel-to-channel interference. The 4CX1500B is the product of a four-year development study which included optimization of internal tube geometry by computer techniques. Rated maximum plate dissipation of this radial beam tetrode is 1500 watts, and control grid dissipation rating is 1 watt maximum. Because the 4CX1500B has very low grid interception (typically less than 1.5 mA grid current), it is possible to drive the grid positive without adverse effects upon the distortion level; the tube is therefore recommended for Class AB₂ linear amplifier service. For further information, write Product Manager, Power Grid Tubes, or contact your nearest EIMAC distributor.

TYPICAL OPERATION (Frequencies Below 30 MHz)

DC Plate Voltage	2500	2750	2900 volts
DC Screen Voltage	225	225	225 volts
DC Grid Voltage	-34	-34	-34 volts
Zero-Signal DC Plate Current	300	300	300 mA
Single-Tone DC Plate Current	720	755	710 mA
Two-Tone DC Plate Current	530	555	542 mA
Driving Power	1.5	1.5	1.5 watts
Useful Output Power	900	1100	1100 watts
Intermodulation Distortion Products			
3rd Order	-38	-40	-40 db
5th Order	-47	-48	-48 db

EIMAC
Division of Varian
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We have a new brochure
entitled "Single Sideband."
Write for your copy.

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W-51

FREE STANDING TOWER.

SUPPORTS 9 SQ. FT. OF ANTENNA.

Shown with internal Ham M rotator and 2" mast.

INCLUDES

- FREE: RIGID BASE MOUNT
- PRE-DRILLED TOP PLATE — For TB-2 thrust bearing.
- HIGH STRENGTH STEEL TUBING LEGS. Solid rod, "W" bracing.
- EASY MAINTENANCE — No guys or house brackets needed.
- RISES TO 51 FT. — Nests down to 21 ft.
- HOT DIPPED GALVANIZED AFTER FABRICATION! All welding by certified welders.

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Iri-Ex TOWER CORPORATION

7182 RASMUSSEN AVE., VISALIA, CALIF.

Bingo Night with W6CTH running the show. The SC-CARA May meeting featured a talk on solid state transceivers and power supplies. Clubs active on Field Day included NPEC, San Mateo Radio Club, SCARS, PAARA, Santa Cruz Radio Club, SCCARA, Santa Clara County RACES and King City. The West Valley Radio Club held its Annual Pancake Breakfast in June. Traffic: (May) W6RSY 1120, W6CVU 359, W6YBV 298, K6DYX 233, W6DEF 127, W6HC 66, W6SAW 50, WB6NXX 26, W6QMO 25, W6ZRJ 22, W6AUC 15, K6-YKG 12, W6BVB 11, W6OII 10. (Apr.) W6JXK 182.

ROANOKE DIVISION

NORTH CAROLINA—SCM, Barnett S. Dodd, W4-BNU—Asst. SCM; Robert B. Coons, W4FDV. SEC: W4AIFK. RMs: W44ANH and K4CWZ. PAMs: W4AJT and W44LWE. V.H.F. PAM: W4HJZ. K4IEX has moved to Florida and is working for the Martin Company in Orlando. The THEN held its spring picnic at Lake Norman and about 40 members and their XYLs enjoyed a three-hour cruise on the lake aboard the replica of the river-boat, the *Robert B. Lee*. The Cherry Point MCAS station, K4BUJ, has been reactivated by W6-UGG/4. W4UFQ got a mobile mike at the Roanoke Division Convention. W4KWC has been experimenting with an inverted vee and very low power on 20 meters and says, "get good reports until they find out I'm QRP with a simple antenna." W4LEV is on the air with RTTY and expects to have more complete skeds now. W44VLJ, W44VLL, W4WJZ and W4ZZC are on 2 meters nightly and are looking for contacts.

Net	Freq.	Time	Days	QTC	Mgr.
NCN(F)	3573 kc.	23:30Z	Daily	247	K4CWZ
NCN(L)	3573 kc.	03:00Z	Daily	126	W44ANH
THEN	3865 kc.	00:30Z	Daily	114	K4ODX
SSBN	3938 kc.	00:30Z	Daily	94	W44LWE

Traffic: W4LEV 1639, K4BUJ 370, W4EVN 310, W4LWZ 277, W6GXQ/4 134, WB4HGL 119, W4IRE 113, K4CWZ 91, K4EOP 66, W44UFQ 66, W4UWS 62, K4EO 47, W44-FJA1 36, W4BNU 24, W44ANH 23, W44UVH 22, K4TTN 18, W44NUO 14, W44CFN 13, W4BAW 10, K4CVJ 6, K4ZKQ 4, W44ICU 3, W44KWC 3, K4IEX 2.

SOUTH CAROLINA—SCM, Clark M. Hubbard, K4-LNJ—SEC: W44ECJ. Asst. SECs: W4WQM, W44EFP. RM: K4LND. PAM: W44RUB.

SCN	3795 kc.	Daily	0000Z-0300Z	May Tfc.: 110
SCSBN	3915 kc.	M-F	0100Z, S-S 0000Z	May Tfc.:
SCSN	3795 kc.	Daily	2:00Z	May Tfc.: 15

New net officers of the SCSBN are W44RUB, mgr.; W44EFP, 1st asst. mgr.; W44QKQ, 2nd asst. mgr. Sidebander of the Year award went to K4BAM at the sideband dinner in Greenville. Other honors awards went to W4CE, K4PJE and W4FMG. K4WOI is being transferred to Germany after a long assignment in Rock Hill. Look for Al on 20. K4YYL also is departing S.C. for Florida. Don't forget the S.C. QSO Party Aug. 13 and 14. The N. Augusta Club will operate portable from Edgefield and McCormick Counties during the party. Traffic: W4SOD 276, K4LND 203, W44AMN 73, W44SOL 66, K4LNJ 58, W4WQM 53, K4OCU 42, W4NTO 38, W4-PED 34, W4JA 31.

VIRGINIA—SCM, H. J. Hopkins, W4SHJ—PAM: K4SCL. RMs: W4SHJ, W44EUL, K4LJK. It is my painful duty to report the passing of W4OXG in early June. Over-the-air and personally, Ralph was known to us as a first-class operator, gentleman and loyal friend. We deeply mourn his passing. W44SSG reports the officers of the Huguenot High School ARC (Richmond) are W44CGA, pres.; W44SSG, vice-pres.; W44LPQ, secy.; W44CZK, treas. All who attended the division convention had a good time; W44EUL and W4SHJ used the trip as a shakedown for new mobile rigs. W4OWE and W44YSE are trying to improve antennas and W44QOC is satisfied with a new beam. Black cats don't bother K5ELPR/4, who passed his Extra Class exam on Friday the 13th! W44UMX was a finalist in the International Science Fair. W4OKN has been holding the 0300Z sideband net for two years. We all owe him thanks and more support with more check-ins. K4LMB's Area 4 group held a very fine "Little SET." As some of you may know W4MWH, who has served us devotedly for 14 years as Roanoke Division Director, will not be a candidate for reelection this fall. All members are urged to cast their ballots for a responsible candidate; at least one member from Virginia will be among those nominated. Traffic: (May) W44OHZ 374, W44RHA 207, W44SZT 187, W4DVT 186, W44EUL 170, W4OWE 163, W44NLC 141, K4KNP 123, W44YSE 100, K6HPR/4 87, W44UMX 74, W4BWP 73, K4ITY 72, W44DAI 62, K4FSS 62, W4OKN 59, K4SCL



BIG-K

1000 watt (p.e.p.) mobile antenna at a mini-power price! Quick-connect high power inductors for 160*-80-40-20-15-10 meters have exceptional figure of merit—"Q"—that measures approximately 230 on 80, rises to 350 on 15 meters. Webster invites comparison of this sky power antenna particularly its high efficiency space-wound coils, suspended—not molded—inside a protective all-white tenite housing. Compare also the precision machined hinged column assembly that releases coil/whip for right-angle laydown—forward or to the rear. Lockup into operating position is equally fast. Install BIG-K—give your mobile signal a real sendoff. Two column sizes for bumper and deck mounting with overall lengths, respectively, of 93" and 77". And use the money you save to buy a fine Webster mount.

*160-meter coil 300W p.e.p.



Band-spanner

Want a fully streamlined car antenna that will handle 500W p.e.p.? Buy Band-spanner as thousands have over the past sixteen years. One clean-cut antenna—nowhere

over 1 1/8" in diameter—that delivers big sky power on 80-40-20-15-10 meters plus MARS. Band-change in seconds too just by raising or lowering the top whip (which contacts a section of any of the internally exposed inductor turns) and exact resonance on any in-band frequency. Band-spanner—truly streamlined—de-emphasizes the appearance of a fair size antenna on a new car. It has a two-tone fiberglass column and an attractive, epoxy-sealed loading section that blends both with car and surroundings. Two column lengths: Model ABB, 117" overall extended, 63" telescoped and Model ABD, 93" overall extended, and 60" telescoped.



Model THMD, de luxe 3-hole mobile mount.



Model BCM, bumper chain mount. (spring not supplied)



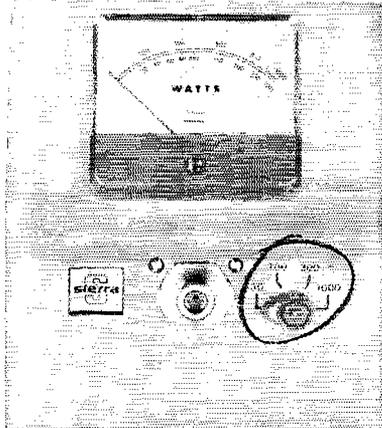
Model SHM, single hole de luxe mobile mount.

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You'll find it on the front of every Sierra 401A Series Termination Wattmeter. By controlling selection of power ranges, it helps you read 2-watt systems between 2 and 1000 MHz with unprecedented speed.

Expanded scale on left-hand side of the instrument meter lets you read low-power ranges as easily as high. For example, you can read 2 watts on the 1000-watt model. With one wattmeter, you can measure output of both low-power portable and base transmitters.

Sealed aluminum housings (no bellows, no air vents) preclude coolant leakage. Dielectric is long-life, non-carbonizing, silicone fluid. All four models use Sierra "Twist-Off" Connectors for quick field changes.

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56. K4LJK 55. WA4QOC 44. WA4URN 42. W4SHJ 41. WA4JW 37. K4ASU 29. K4YCH 24. K4MLC 20. W4JFJ 18. WA4PBG 18. K4VCY 15. W4WRG 15. W4TE 13. W4BZE 11. K4SDS 11. W4ZAU 11. W4ZMT 11. W4ALK 10. W4ZM 10. W4KFC 9. WA4FFY 8. K4LMB 8. K4PIK 7. W4LK 4. W4PTR 4. W4JXD 3. W4WG 3. (Apr.) W5VZO/4 110. W4WRG 14. WA4ONG 11.

WEST VIRGINIA—SCM, Donald B. Morris, W8JM —SEC: W8SSA, RMs: K8TPF, W8LAF, PAMs: K8CHW, W8IYD, C.W. Net Mgr.: WA8GRE. Nets meet on 3570, 3890, 3903 and 3905 kc. WA8JYR has an eleven-element beam on 6. W8IZA visited W8CJT, discussing 8RN. WA8QND made the BPL again. WA8PXF's traffic was reduced by studies at Ohio U. WA8KAZ, WA8LJY and WA8CKN were active during forest fires in Monongalia County. K8SDH received the Worked All Countries W. Va. certificate No. 43. K8CHW reports for WVN Phone, 21 sessions, 482 stations and 112 messages. Communications between the bridge and airport for Memorial Day services, Weirton area, were provided by W8ERR, K8AKN, K8VWB, K8VBH and K8QEW. K8ZPR added Illinois and Indiana on 14 Mc. WA8MAT will be operating portable from W.V.U., starting in Sept. K8CSG and W8TVO are in Louisiana trying 40-meter RTTY. W8IYD and the Northern Panhandle ARC boosted 29.6 operation by their time program at the State Convention. W8RXC now W6CWY in California, works 20, 15 and 10. K8WNC is now WA8WKM on 40 in Florida. K8TPF reports for WYPON, 13 sessions, 180 stations, 36 messages. Congratulations to Gen. Chairman K8BIT and all his helpers on a fine State ARRL Convention. Traffic: WA8QND 197, WA8POS 123, K8TPF 91, W8HZA 72, WA8PXF 53, K8BIT 36, W8CKX 23, WA8MAT 14, W8AY 16, K8CUZ 16, WA8BUM 14, W8GUL 11, WA8NDY 13, K8MQB 10, WA8KAN 6, K8CHW 5, W8JAI 5, WA8CKN 3, K8SOR 3, K8CFT 2, WA8IMY 2, WA8RQB 2, W8CZT 1, WA8XJ 1, WA8GI 1, W8QAC 1, K8QY 1, WA8TAN 1, K8WVW 1, K8ZGZ 1.

SOUTH CAROLINA QSO PARTY

August 13-14, 1966

All amateurs are invited to participate in the first South Carolina QSO Party, sponsored by the Low Country Amateur Radio Club, Inc. of North Charleston, S. C.

Rules: 1) Contacts will be made during the periods from 2000 GMT to 0500 GMT and 1400 GMT to 0500 GMT on August 13 and 14. Full or part time operation is permitted. 2) All bands, all modes and the same station may be worked on different bands and different modes for extra points. 3) The general call will be CQ SC. 4) Exchange QSO number, report and state, province or country. South Carolina stations give county for QTH. 5) Score one point for each contact and multiply by the number of different S. C. counties worked. S. C. stations multiply by states, provinces or countries. 6) Certificates will go to the first place winner in each state, province or country and the first three winners in S. C. 7) Suggested frequencies, plus or minus 15 kcs, of 1820 3550 3950 7040 7240 14070 14240 21070 and 21270. 8) Logs showing date, time, band, mode, and location of station worked, with claimed score, to be mailed no later than August 31, 1966 and sent to: Contest Chairman, LCARC Inc., P. O. Box 5026, N. Charleston, S. C. 29405.

ROCKY MOUNTAIN DIVISION

COLORADO—SCM, Donald Ray Crumpton, K0TTB —Asst. SCM: A. E. Hankinson, WA0NQL. SEC: W0SIN. This report was written by WA0NQL. Information from the section has been difficult to obtain. It would be appreciated if you would send information care WA0NQL, 6642 South Pearl, Littleton, Colo. 80120. Englewood-Littleton AREC is picking up steam with ARC-1 conversions on 2. The regular net meets at 7:30 local time every Mon. on 145.5 and 29.53 with an eyeball get-together the first Mon. at Englewood City Hall. Are there any groups involved in Project Oscar? If so, how about a card outlining activities? Reports from clubs/individuals in Boulder, Colorado Springs and the Western Slope are needed. Traffic activity continues strong. Columbine/High Noon/Colorado Nets are maintaining daily sessions. Will all net managers please forward current information concerning their net for publication in a future report. Power line noise problems continue to plague the Greater Denver area. With the rash of noise articles

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IN PERFORMANCE, VALUE, QUALITY, PRICE, AVAILABILITY

ALL-BAND VERTICALS

QUALITY MATERIAL

Brand new mill stock aluminum alloy tubing with Aluminite finish for protection against corrosion. Loading coils made by Barker & Williamson.

ALL-BAND OPERATION

Loading coil not required on 6, 10, 15 and 20 meters. For 40, 80, and 160 meters, loading coil taps are changed manually except if a wide-range pi-network output or an antenna tuner is used; in this case band changing can be done from the shack.

EASY ASSEMBLY

Less than two minutes is all you need to put your vertical together. No special tools or electronic equipment required. Full instructions given.

SIMPLE INSTALLATION

Goes almost anywhere. On the ground, on the roof, or outside your window.

AMAZING PERFORMANCE

Hundreds of reports of exceptional DX operation on both low and high power. You will work wonders with a Gotham vertical.

"All band vertical?" asked one skeptic. "Twenty meters is murder these days. Let's see you make a contact on twenty meter phone with low power!" So K4KXR switched to twenty, using a V80 antenna and 35 watts AM. Here is a small portion of the stations he worked: VE3FAZ, T12FGS, W5KYJ, W1WOZ, W2ODH, WA3DJT, WB2FCB, W2YHH, VE3FOB, WA8CZE, K1SYB, K2RDJ, K1MVV, K8HGY, K3UTI, W8QJC, WA2LVE, YS1MAM, WA8ATS, K2PGS, W2QJP, W4JWJ, K2PSK, WA8CGA, WB2KWY, W2IWJ, VE3KT. Moral: It's the antenna that counts!

FLASH! Switched to 15 c.w. and worked KZ5IKN, KZ5OWN, HC1LC, PY5ASN, FG7XT, XE2I, KP4AOL, SM5BGK, G2AOB, YV5CLK, OZ4H, and over a thousand other stations!

V40 vertical for 40, 20, 15, 10, 6 meters \$14.95

V80 vertical for 80, 75, 40, 20, 15, 10, 6 meters \$16.95

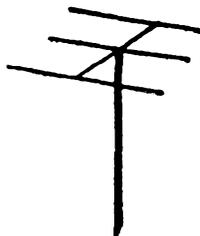
V160 vertical for 160, 80, 75, 40, 20, 15, 10, 6 meters . . . \$18.95

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BEAMS

Compare the performance, value, and price of the following beams and you will see that this offer is unprecedented in radio history! Each beam is brand new; full size (36" of tubing for each 20 meter element, for instance); absolutely complete including a boom and all hardware; uses a single 52 or 72 ohm coaxial feedline; the SWR is 1:1; easily handles 5 KW; 7/8" and 1" aluminum alloy tubing is employed for maximum strength and low wind loading; all beams are adjustable to any frequency in the band.



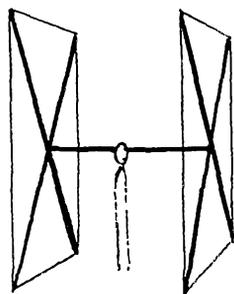
2 E1 20	\$16	7 E1 10	\$32*
3 E1 20	22*	8 E1 10	36*
4 E1 20	32*	4 E1 6	15
2 E1 15	12	5 E1 6	20*
3 E1 15	16	6 E1 6	24*
5 E1 15	25*	7 E1 6	26*
4 E1 15	28*	8 E1 6	28*
4 E1 10	18	9 E1 6	30*
5 E1 10	24*	10 E1 6	32*
6 E1 10	28*		

* 20' boom

QUADS

NEW! NEW! NEW! CUBICAL QUAD ANTENNAS

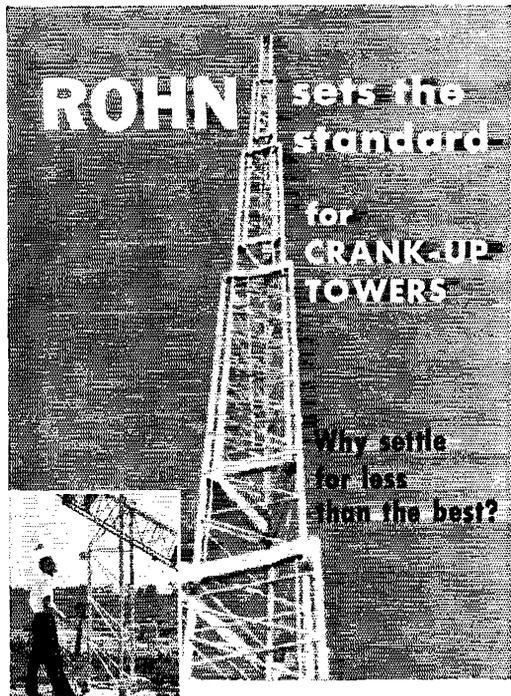
— these two element beams have a full wavelength driven element and a reflector; the gain is equal to that of a three element beam and the directivity appears to us to be exceptional! ALL METAL (except the insulators) — absolutely no bamboo. Complete with boom, aluminum alloy spreaders; sturdy, universal-type beam mount; uses single 52 ohm coaxial feed; no stubs or matching devices needed; full instruction for the simple one-man assembly and installation are included; this is a fool-proof beam that always works with exceptional results. The cubical quad is the antenna used by the DX champs, and it will do a wonderful job for you! Now check these startling prices — note that they are much lower than even the bamboo-type:



TWENTY METER CUBICAL QUAD	\$25.00
FIFTEEN METER CUBICAL QUAD	24.00
10-15-20 CUBICAL QUAD	35.60
10-15 CUBICAL QUAD	30.00
15-20 CUBICAL QUAD	32.00

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GOTHAM, 1805 Purdy Ave, Miami Beach, Fla. 33139



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in national publications, it looks as though we are not alone. The Hausters V.H.F./U.H.F., now affiliated with ARRL, meets the 1st Sun. of each month. Contact W0HEP for further information. High Noon report: QNT 546, QTC 168. Traffic: KOZSQ 125, KOFDH 79, KODCW 64.

NEW MEXICO—SCM, Bill Farley, WA5FLG—Alamogordo was pounded by 55-m.p.h. winds and had to call on the Las Cruces fellows to aid with emergency communications. They did a superb job. Those helping out were WA5IND, WA5LLD, WA5NZK, WA5MCC, WA5OMY, W5RPF, W5PEJ, W5ZLX, WA5MAU and Harlow Longmore. Many thanks to the Mesilla Valley Radio Club. WA5PFL has been portable in Oklahoma City and really has put a signal back to New Mexico. The Alamogordo hams who managed to get on with emergency antennas during the disaster were EC W5UBW, W5KDB from Red Cross Hq. and SCM WA5FLG. Anyone needing good press releases should see Rose Stewart, Marge Lutz and Ken Mills. They have the press job over in Las Cruces for the club. Traffic: WA5DUH 248, K5VXJ 26, K5ONE 23, WA5FLG 15, W5ROH 7.

UTAH—SCM, Marvin C. Zitting, W7MWR/W7OAD—Asst. SCM: Richard E. Carman, W7APY. SEC: W7WKF. Section nets: BUN meets daily on 7272 kc. at 1930Z. UARN meets each Sat. and Sun. on 3987.5 kc. at 1500Z. The Utah Amateur Radio Club has obtained space for an exhibit in the Utah State Fair, Sept. 9-18, 1966. Any amateurs who have suggestions or would like to help are urged to contact W7LQE or K7SOT. W7WKF has his antenna up at his new QTH and is working all sorts of DX. The Utah Repeater Club's repeater continues to give extended 2-meter coverage over a large part of the state for both mobiles and fixed stations. The new SCM for Utah is Gerry Warner, W7VSS. Gerry has been very active in many fields of amateur radio and is well qualified for this job. Let's all give him our support! Traffic: W7OCX 152, WA7RME 126, W7MWR 7.

WYOMING—SCM, Wayne M. Moore, W7CQL—SEC: W7YWE, RM: W7BHH, PAMs: W7TZK, K7SLM, OBSs: W7TZK, K7SLM, K7ZHT and WA7DNZ. Nets: Pony Express, Sun. at 0800 on 3920; YO Mon., Wed., Fri. at 1830 on 3610; Jackalope, Mon. through Sat. at 1215 on 3920. New appointments: W7HLA as ORS and WA7DNZ as OBS. The Sheridan Club will begin code and theory classes Sept. 15, each Thurs. at 7 p.m. K7HDY is now in Redondo Beach, Calif., and is on 40 and 15 meters. Ex-W7LLP is now W5BTZ in Oklahoma City. WA7DNP is working in Yellowstone Park for the summer and operating portable. We have a 12-year-old ham in the state, W7JFK. He is active on 40 meters. K7ZNF is now serving a hitch in the Navy. I want to thank all the Wyoming members for their vote of confidence recently. I started my second term as SCM in June. Traffic: WA7CLF 172, WA7DNZ 107, W7DXV 52, W7BHH 20, K7ITH 14, W7GSQ 12, K7OWT 8, WA7DNP 6, K7AHO 4, K7BTE 4, K7POX 4, W7BKI 2, W7CQP 2, W7NKR 2.

SOUTHEASTERN DIVISION

ALABAMA—SCM, William S. Craits, K4KJD—Asst. SCM/SEC: William C. Gann, W4NAT, RM: W4EXA, PAM: K4WHV. The N. Ala. Hamfest will be held at Decatur Aug. 21. CU there. Novices, please check in AEND. Sorry to see W4ZJY leave Ala. May net reports (times GMT):

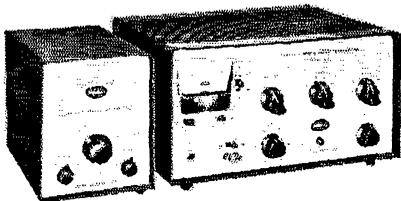
Net	Freq.	Time	Days	Sess.	Ave. Tfc.	Ave. QNT
AENB	3575	0100	Daily	30	3.5	5
AEND	3725	2400	Daily	29	1.9	6.1
AENH	50.7	0200	Sun./Tue.	9	.55	21.3
AENM	3965	0030	Daily	31	3.44	10.58
AENO	50.55	0115	T/T/Sat.	12	2.2	17
AENP	3955	1230	Mon.-Sat.	26	1.43	14.2
AENR	50.55	0115	Wed./Fri.	8	0	25.75
AENT	3970	2230	Daily	28	1.5	6.7

Sorry that K4GHX had to resign as NAI AENM. WB4APL is a new General. Eight new stations are on 6 in the tri-cities. WB4BMO has an Apache. Traffic: (May) W0HXB/4 315, WA4TID 220, WA4EXA 163, W4ZJY 96, WB4BAIO 88, K4AOZ 82, WA4JXC 71, K4KJD 58, K4NUW 50, K4BSK 49, W4NAT 34, WA4RES 25, K4WOP 25, WA4EEC 16, K4NSU 16, WB4APL/4 12, K4WHV 12, WA4OCL 10, K4PZQ 9, K4CZZ 7, W4HON 5, W4DGH 4, WA4AKA 3, WA4WLD 3, W4DS 2, K4OQY 2, K4UUC 2, W4YRM 2. (Apr.) W0HXB/4 197, WA4TID 147, K4HJX 103, K4CZZ 6.

CANAL ZONE—SCM, Mrs. Lillian C. Smith, KZ5-TT—SEC: KZ5MIV. The Canal Zone Amateur Radio Association, Army MARS and Air Force MARS were all

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 Solid state power supply.
 Mike/key jack and crystal socket on front panel. Push-to-talk mike jack.
 Potentiometer type drive control. Audio gain control.
 Additional connections in rear for key and relay.
Model TX-62 Wired and Tested only \$149.95

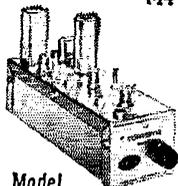
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NUVISTOR CONVERTERS FOR 50, 144 AND 220 MC. HIGH GAIN, LOW NOISE



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CN-220K in kit form. (specify IF.) \$34.95

Has 3 Nuvistors (2 RF stages & mixer) and 6J6 osc. Available in any IF output and do NOT become obsolete as their IF is easily changed to match any receiver. Average gain — 45 db. Noise figure — 2.5 db. at 50 Mc., 3.0 db. at 144 Mc., 4.0 db. at 220 Mc. Power required 100-150V, at 30 ma., 6.3V. at .84A. See PS-1 Power Supply. Model CN-50W, CN-144W or CN-220W wired. (specify IF.) \$49.95. Model CN-50K, CN-144K or CN-220K in kit form. (specify IF.) \$34.95

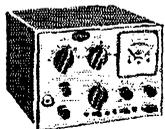
ALL BAND NUVISTOR. PREAMP 6 THRU 160 METERS



MODEL PCL, Wired, \$24.95
 MODEL PCLP, with built-in power-supply, wired, \$32.95

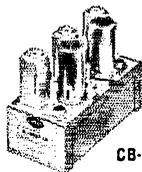
2 Nuvistors in cascade give noise figures of 1.5 to 3.4 db. depending on band. Weak signal performance, image and spurious rejection on all receivers are greatly improved. PCL's overall gain in excess of 20 db. Panel contains bandswitch, tuning capacitor and 3 position switch which puts unit into "OFF," "Standby" or "ON," and transfers antenna directly to receiver or through Preamp. Power required — 120 V. at 7 ma. and 6.3 V. at .27 A. — can be taken from receiver or Ameco PS-1 supply. Size: 3 1/2"x5"x3 1/2".

COMPACT 6 THRU 80 METER TRANSMITTER



Model TX-86

Handles 90 watts phone and CW on 6 thru 80 meters. Final 6146 operates straight thru on all bands. Size — only 5" x 7" x 7" — ideal mobile or fixed. Can take crystal or VFO. Model TX-86 Kit \$89.95 — Wired Model TX-86W. \$119.95. Model PS-3 Wired \$44.95. Model W612A Mobile Supply wired \$54.95.



CB-6

CB-6K — 6 meter kit, 6ES8-rf Amp., 6U8-mix./osc. \$19.95
 CB 6W — wired & tested ... \$27.50
 CB-2K — 2 meter kit, 6ES8 1st rf amp., 6U8 — 2nd rf amp./mix, 6J6 osc. \$23.95
 CB-2W — wired and tested, ... \$33.95
 Model PS-1 — Matching Power Supply — plugs directly into CB-6, CE-2 and CN units. PS-1K — Kit ... \$10.50
 PS-1W — Wired \$11.50

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 EL 3 1.75 EL 4 1.25
 Amateur Log Book50
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active on Field Day. The Crossroads Amateur Radio Club has suspended meetings for the summer, with pres. KZ5SS having been heard as portable HR, TI, XE, etc., on his drive up the Pan-American Highway. KZ50A, operating as WB4BEN/MM from the SS *Cristobal*, was a popular gal on the air. KZ5IO left the Isthmas permanently June 30 and will be operating as WA4QXI. KZ5DR is on TTY. Two new General Class licensees are KZ5RJ and KZ5GN, with WTS recently licensed as KZ5HT. Traffic: KZ5JC 143, KZ5TT 108, KZ5LT 84, KZ5AG 27.

EASTERN FLORIDA—SCM, Albert L. Hamel, K4-SJH—SEC: W4IYT, RM C.W.; W4LUV, RAJ, RTTY: W4RWL, PAM S.S.B.; W4OGX, P.A.Ms: W4SDR, W4-TUR, V.H.F. P.A.M: WA4BMC, K4BNE now is writing a column called "The Ham Shack" for a St. Petersburg daily paper, K4YQO. Tampa, expects to be operational RTTY real soon. This SCM expects to do the same but how soon? By the time this reaches print "Alma" will be history. Sincere thanks to W4MLE and W4IYT and all of those who have put forth much time and effort toward preparedness such as we have. This office notes that the average number of traffic reports is about 85 but did you know that we could be getting at least 150 reports if all those handling traffic on the nets alone sent in their reports? You need not be an ARRL member to report. You not only help to keep Eastern Florida on top but you also are doing your share to show that "in the public interest" is more than mere words. Won't you get into the habit? Traffic: (May) W3CUL/4 1026, WA4SCK 552, W4TUB 490, WA4NEV 489, W4DFI/4 431, W4FPC 284, WA4BMC 279, WB4IUV 241, WA4DEL 218, W4TLE 203, K4EYV 190, WA4KB 156, K4BNE 125, W3VR/4 122, W4LUV 114, WA4KDL 96, K4SJK 93, W4FP 82, W4SDR 78, WA4HDH 62, K4KDN 60, WA4JH 59, W4VDC 58, K4ILB 54, K4YQO 52, W4SMK 51, W4MVB 49, K4BY 48, W4ARQR 46, K4DAN 37, W4AFGH 33, W4EHW 30, W4ACIQ 29, W4NUH 27, WB4CAP 24, W4DVO 22, W4VAP 22, W4AWZZ 22, W4BNE 21, W4ABGW 20, W4AWNE 17, W4TJM 16, W4QBY 12, WA4SHJ 12, W4VPO 12, WA4WEB 11, W4BKC 10, W4NGR 10, W4BAV 9, K4OER 9, W4GDK 8, K4ENW 7, W4KRC 6, (Apr.) W4FPC 397, WA4BMC 304, W4CWI 254, K4EYV 251, W4DFU 243, W4APWF 194, W4DVO 135, WA4JH 126, W4LUV 118, K4YQO 90, W4BKC 45, W4AWZD 36, W4MVB 27, WA4VZD 26, W4BNE 20, W4FEI 18, W4VAF 18, W4SCY 15, WA4LBS 14, K4FNW 12, W4GJU 12, K4OER 12, WB4CAP 6, WA4QLZ 6, W4LVV 2, W4-VYJ 1.

GEORGIA—SCM, Howard L. Schonher, W4RZL—Asst. SCM: James W. Parker, Sr., W4KGP. SEC: W4-DDY, RM: W4CZN, P.A.Ms: K4PKK, WA4JSU, WA4-GAY, W4KR, The Lanierland Hamnic and Annual Meeting of the Georgia Cracker Radio Club will be held at the Sportsman Club on Lake Lanier Aug. 27/28. K4UUM lost a potential ham gear purchase to an expensive auto repair. WA4BYD hopes to be active again soon. W4LRR has a new 20-meter antenna. W4TFC spent a vacation in YE4-Land. W4HYW participated in the Georgia and Kansas QSO Parties. W4FQX is a new OPS.

Net	Freq.	Time (GMT)	Sess.	QNI	QTC
GSN	3595	0000 & 0300 Dy.	60	558	182
GSSN	3975	0100 Dy.	30	953	170
GTN	3718	2300 Dy.			
G Teen Net	3855	1600 Sat. 2130 Wed.	8	63	25
Cobb, Co. AREC Net	145.8				
NEGEN	52.250	1730 Sun.			

All stations are urged to prepare for the National SET. Follow information as announced in QST and through local bulletins. Our section rates low in the national standings, not because of our lack of potential but our lack of participation and failure to report activity. Traffic: W4PIM 193, W4FOE 148, WB4BDG 127, W4CZN 100, W4DDY 89, WA4WQJ 88, K4NFP 59, WA4-JSU 57, W4RZL 37, K4BAI 29, WA4GAY 29, WA4OV'S 28, W4TFC 26, W4HYW 25, WA4LLI 18, WA4UYT 17, W4FQX 10, WA4WKZ 10, K4UUM 8, WA4FUN 5, W2-TPV/4 4, K4SES 1.

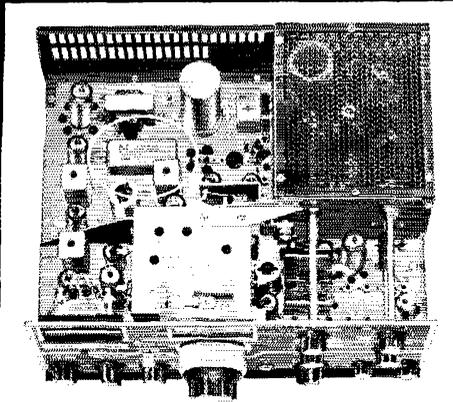
WEST INDIES—SCM, Albert R. Crumley, Jr., KP4-DV—The Puerto Rico Amateur Radio Club voted unanimously to relinquish its call KP4ID to the American Red Cross Chapter, San Juan, Puerto Rico, and at the same time agreed to petition FCC for the call KP4KD in honor of former SCM "Ev" Mayer, who died several years ago. KP4KD will be called the "Mayer Memorial Station" of the PRARC. KP4CK/CT is doing an excellent job steering the PRARC with both monthly Board meetings and general membership meetings. KP4RA and his XYL keep Arceibo on the map. KP4BJD and KP4BJU have returned from Stateside colleges for summer vacations. KP4BJU joined the Civil Air Patrol.

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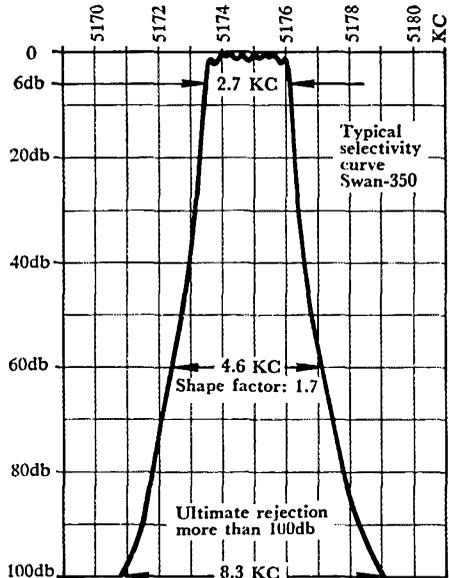


One of the reasons why the Swan-350 is the top selling transceiver today is its exceptional selectivity provided by a new crystal filter which we began installing in all production units a few months ago. This amazing little gem is made exclusively for Swan by C-F Networks. The selectivity it provides for voice communication is as good or better than the selectivity provided in any other sideband equipment, regardless of price.

There are 3 important factors about a filter which determine what the overall selectivity will be. One of these is its *bandwidth* at the 6 db points, and here we have carefully selected 2.7 KC in order to give you good channel separation, and still retain the smooth, natural audio for which Swan transceivers are so well known.

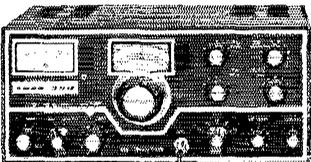
The next consideration is *shape factor*, or the ratio between bandwidths at 6 and 60 db. In this respect the Swan filter gives you a "shape factor" of 1.7 to 1. This is substantially better than the 2 to 1 ratio of the mechanical filter, or 3 to 1 of the average 9 mc crystal filter. Best shape factors are achieved right around 5 mc, and this is one of the main reasons for selecting 5175 KC for the Swan I.F. (This choice of I.F. also permits single conversion design which results in fewer images and spurious signals. The only thing better than single conversion is no conversion at all.)

The third important factor, but by no means the least, is the measure of *ultimate rejection*, or how far the skirts fall before flaring out. Take a look at the graph and you'll see that this is better than 100 db with the Swan filter! Ultimate rejection determines how well your receiver attenuates those strong adjacent channel



signals, especially the guy down the street with the big linear. In this respect, the Swan filter is superior to others being used in amateur sideband gear.

In Swan transceivers, the filter is also used when transmitting, of course, and in this mode the shape factor determines what your unwanted sideband suppression will be. We have been advertising 40 db, but this is a conservative figure, since it is really better than 50 db. Also, we've been advertising only 400 watts PEP input to the 350, but actually the average production unit peaks over 500 watts before flat-topping, which is why the 350 gets out so well, and sounds so good. Compare these features with any other sideband transceiver, and they all sell for more money! 73 Herb Johnson W6QKI



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KP4WT is the only reporting station this month. KP4-RK regularly and efficiently edits his bulletin, the *Puerto Rican DXer*, which has a large subscription list. KV4-BV, of Saint Thomas, V.I., advises starting efforts for an ARRL-affiliated club in Virgin Islands. Traffic: KP4WT 303.

WESTERN FLORIDA—SCM, Frank M. Butler, Jr., W4RKH—SEC: W4MLE. PAM: WA4FIJ. RM: W4BVE. Section net reports:

Net	Freq.	Time	Days	Sess.	QNI	QTC
WFPN	3950 kc.	2300Z	Daily	31	593	186
QFN	3651 kc.	2330/0300Z	"	62	—	—

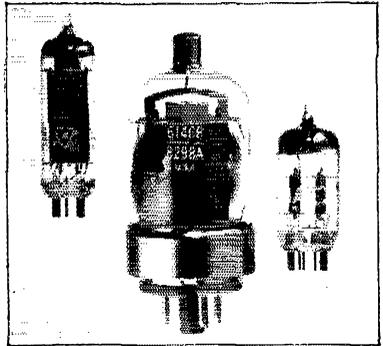
Florida LOs and ARRL appointees now meet on the air every Thurs. at 8:00 p.m. EST. Beginning c.w. traffic men are invited to QNI the Ala. Training Net, meeting nightly on 3725 kc. at 0001Z, then become a regular on QFN. Pensacola: K4SOI has an SB-200. W4AXP is having receiver troubles. Milton: WB4CZT and WB4-CZU received Tech. Class tickets. K4NMZ completed the s.s.b. mobile rig. Crestview: WA1BBB/4 and W4OXR are working on 2-meter gear. Fort Walton/Eglin AFB: WN4CNX, W4KWX, W4RKH, W2ZRX and K5BEJ took part in the CAP SARC.A.P. WA6EDE, aided by WA4-FQZ and K4YMZ, made this year's EARS AF Day exhibit the best ever. WA7ABH, WA5OIF and WA3APO are stirring up activity on 10 meters. Panama City: WA4FIJ is now PAM and WFPN mgr. K2SBV/4 has an APX-6 on the air. WA4NRP installed a new 80-ft. tower for the 2-meter beam. Chipley: A new ham is WA4TUO. Tallahassee: W4EQO finally got the HW-12 working. Leon County needs an EC. Traffic: (May) K4NMZ 77, W4BVE 68, WA4EQO 61, K4VND 46, WA4-FIJ 45, WA4JIM 15, WA4NRP 1. (Apr.) WA4FIJ 34.

SOUTHWESTERN DIVISION

ARIZONA—SCM, Floyd C. Colyar, W7FKK—SEC: K7NIY. PAM: W7CAF. RMs: K7NHL, K7TNW. The Arizona Eye Bank, Inc., presented the Lions International Award of Merit to K7CEH and K7UJV for their work in handling traffic in the Phoenix area of the Eye Bank Net. Thank you, Bill and Helen, for a fine job. W7AYY has a new 60-watt linear amplifier on 50 Mc. K7OIX, K7RUR, W7FQW and K7UTF participated in the Feb. FMT. K7UTF has a low average of 0 parts per million, hitting all frequencies on the nose. Appointments endorsed: K7NIY as SEC, W4TECA as OES, K7HQJ is experimenting with low power on 40-meter c.w. W7BBW is building a new house in Tempe. K7NII is experimenting with preamps and antenna for 432 Mc. Congratulations DX Corner: W7AH, 324 worked, 314 confirmed; W7SDU, 237/212; W7ZMD, 218/206; W7FKK, 172/146; W4BOB, 149/112; W47BOA, 138/89, W7YWF, 130/102. K7NHL, K7RWI, K7MTZ, K4VVE/7 and K7-UXB still are faithfully pounding away on TWN. K7-NHL invites all stations interested in traffic-handling to join with them on TWN. K7LKV has been awarded the Worked All Arizona Counties certificate. Traffic: K7NHL 383, K7RWI 157, K7MTZ 138, K4VVE/7 121, K7RUR 39, W7FKK 23, K7PLO 6.

LOS ANGELES—SCM, H. G. Garman, W8BHG—Asst. SCM/SEC: Wallace R. Calkins, W1KUX/6 RMs: W8BHG, W8BRBO, W6QAE. PAMs: K8MDD, W6MLZ, W6ORS. BPLers this month are K8AYU, K6EPT, W8-WPF, W8BBO and W8QXY. WA6TIM has received his commercial ticket. K6IOV and W8QXY spent a total of 117 hours on net schedules in May. K8IWW's OM, K6YDJ, still is under the doctor's care. K8AYU believes more traffic should be fed into SOS. W6GYH's planned itinerary is W5NNA Big Fork Ark., Florida, Connecticut and home. W8QMIF is having surprising success bending an 80-meter dipole to accommodate his 30-ft. roof. K8GIL operated a rotary spark transmitter at the QCWA demonstration at the Convention. W8-MILZ has a nice tape on Gov. Egan of Alaska commending amateurs if anyone needs it. W8AM's emergency station can run c.w. or s.s.b. on any of 5 amateur bands as long as the gasoline holds out at 600 watts into the Swan 400 at 1150 volts, using 3 V.F.O.s W1KUX/6-WA6UCR is busy with SEC and Astronet activities. W8KIL made DXCC. W8IOM is moving to a new location in Los Angeles. W8MEP is busy with 2-meter repeaters. W8AMQF is back on the air with the friendly help of W8OLD. W6SRE is in a new QTH, Lake View Terrace, Calif. W6YUZ, most interested in DX from mobile, has worked ZL, JA, KW6, KP4, KV4, KR6, KL7 and KH6 call districts with a Swan 240. The LERC Amateur Radio Club is to be commended on its fine bulletin for June. The Harmonies 6-Meter YL Club elected K6AYU, pres.; W8GZY, vice-pres.; W8ODU, secy.-treas. W8FKD now is living in Arizona. W8-ODW presented a 9-lb 3-oz boy harmonic to W8ODU.

Tough tubes for mobile communications



In mobile communications service, the tubes really take a beating, regardless of whether they're put to service in commercial, military or amateur equipment.

And no wonder. Power and receiving tubes alike used in any type of vehicle have to withstand high impact shock, almost continuous vibration, wide variations in temperature and humidity, frequent on/off cycling and even abnormal variations in operating voltages. Conventional tubes aren't necessarily designed to meet these conditions.

If you've had trouble with tubes in commercial or amateur mobile service, so have the manufacturers. And that's why Sylvania has worked hard and long to develop rugged types just for mobile service. Our engineers were successful because they made a clinical study of the weak points in mobile tube design, and found ways to eliminate them in overall design.

For instance, we found that Rhenium-Tungsten heater wire virtually eliminates catastrophic failure of the heater-cathode assembly because of heater embrittlement. Result: the new type tubes can take up to 140% above rated heater voltage for 15,000 cycles.

The next breakthrough came through our development of the powdered metal cathode with the addition of controlled amounts of trace materials. The advantages are threefold. Long life and excellent emission at very low voltages; reduction of interelectrode leakage paths; and a minimum of contaminants which build up interface resistance layers during standby operation.

Finally, the tubes were ruggedized by using double mica insulation, U-bolt locked mounts, and controlled-atmosphere welds. With this construction, the tubes can take impact shocks up to 350-g and long-term testing at 2.5-g.

Sylvania has incorporated these and other features into 24 types for 6- and 12-volt mobile service. All of them are available from authorized Sylvania distributors. And you'll find a type to replace virtually every tube in the equipment you use or service...the "6000" series, such as the 6660/6BA6, for 6-volt batteries; and the "7000" series, such as the 7055/12BA6 for 12-volt batteries. Plus Sylvania's superior 6146B and 7054.

If you've had tube trouble in mobile equipment, it's time to "go Sylvania." See your Sylvania distributor for full information on these tubes, or write the Sylvania Electronic Components Group, Sylvania Electric Products Inc., 1100 Main Street, Buffalo, New York 14209. They'll send you a list of the types and their standard equivalents.

73,

Bob Lynch

K2RMM

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WARNING!



With that attention-getting word, the town clerks of New England traditionally called to the voter's mind the impending Annual Town Meeting, cornerstone of the democratic process for nearly two centuries.

The League, too, is a democratically-run organization, though its government must be representative in nature (like Congress) rather than direct (as in the Town Meeting) because our 80,000-plus voters are spread out over seven million square miles of territory.

Representation in the League starts with nomination, and League voters in the Central, Hudson, New England, Northwestern, Roanoke, Rocky Mountain, Southwestern and West Gulf divisions are hereby warned that nominations for director and vice director of those divisions are now open. Any ten members can join in the nomination of a member, as is explained more fully in "Happenings of the Month," with petitions due at headquarters before noon of September 20.

The membership roster, for election purposes, also closes on September 20. Get your amateur friends signed up now, using the membership blank to be found elsewhere in this issue, or an approximate copy of it.

QST and ARRL membership \$5, \$5.25 in Canada, \$6 elsewhere. Additional family members at the same U.S. or Canadian address, \$1.

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NEWINGTON, CONNECTICUT 06111

Attention all holders of Novice, Technician or Conditional Class licenses: "FCC Article 97.35 Additional examination for holders of Novice, Technician or Conditional Class operator licenses. (a) The Commission may require a licensee holding a Novice, Technician or Conditional Class of operator license to appear for a Commission-supervised license examination at a location designated by the Commission. If the licensee fails to appear for this examination when directed to do so, or fails to pass such examination, the Novice, Technician or Conditional Class operator license previously issued shall be subject to cancellation, and upon cancellation, a new license will not be issued for the same class operator license as that cancelled." Reference to the article in last month's column regarding amateurs operating "portable or mobile" the FCC Article 97.37 Transmission of Call Signs appears on pages 72 and 73 June QST, under the title "Identify in English". The Eight Ball Net (EBN) meets Mon. through Fri. at 1615Z and Tue. through Sat. at 0230Z on 50.500 kc. The Southern California Net (SCN) meets daily at 0300Z on 3600 kc. Traffic: (May) K6EPT 1782, W6WPF 1365, WB6BBO 830, WB6QNY 445, W6MLF 382, W6QAE 336, K6IOV 277, K6MDD 262, WB6CGL 200, WB6KVA 174, K6IYW 154, K6AYU 114, W6GYH 97, W6DF 88, WA6WKF 84, WB6QMF 77, K6ASK 75, K6LDM 69, K6GIL 62, W6BMZ/6 55, W6BHG 46, W6LVQ 42, WB6KKG 41, W6TXJ 38, WB6BBH 34, W6YRA 26, WB6AEL 21, W6NAA 23, W6MLZ 21, WA6TWS 21, WA6KZI 20, W6PCP 18, W6NKR 14, K6CWD 13, WB6GXI 13, K6TMY 11, W6AM 10, W6USY 10, K6HV 8, WA6UCR 8, W6QJW 7, WB6KIL 5, W6DGH 4, W6ND 4, W6HUJ 3, W6OI 2, WA6WJT 2. (Apr.) K6IYW 203, W6SRE 6, WA6WJT 4, W6VUZ 2. (Mar.) W6VUZ 2.

ORANGE—SCM, Roy R. Maxson, W6DEY—S.W. Div. Convention Notes: WA6ROF advises the NTS station both handled 50 messages with 10 operators participating. K6MJU, K6JBG, WB6EOK, WB6GRK, WA6IYN, W6RDB, WA6GAZ, WB6CDY, W6DTR, WA6OOR, K6-ATK and WB6IDJ were some of the operators on the four rigs set up in the RACES Com Van, thanks to WB6IFV OC Radio Officer. At the convention W6FB earned a 60-W.P.M. certificate, also Fred schedules W6NMC/AM from Palm Springs on the way to Europe/Africa. W6DFY is the new EC for the San Bernardino Desert Area. WA6TAG, for Riverside County Desert Area EC, reports 4 new AREC members. WB6MDN, WA6WFW and WA6GQJ also are new AREC members. FB OES reports were received from W6AHU/K6HIJ, WB6ODU, WB6PHO and WB6MYU. WA6OQM has a new G-50 Communicator and is active on 6. WB6CLO and WB6NGE were active on 7 Mc. from Utah while on vacation. W6PQA is a new ORS. Traffic: (May) K6MCA 1914, W6ZJB 878, WA6ROF 257, WB6JFO 222, WA6OQM 188, K6IAE 52, WB6ODU 52, WB6MYU 25, K6YVN/6 25, W6WRJ 24, WB6NGE 23, WA6ROF/6 21, K6GMA 6, W6PQA 6, WB6LCO 5, W6FB 2, WA6TAG. (Apr.) WB6ODU 23.

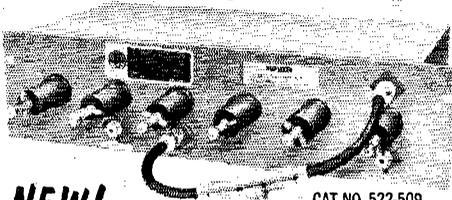
SAN DIEGO—SCM, Don Stansifer, W6LRU—W6NZX worked 13 different states and VP7DD during a recent good 6-meter opening. W6JZK earned his 30-w.p.m. Code Proficiency sticker. The San Diego V.H.F. Club operated from Tecate Mountain during the V.H.F. QSO Party. RM W6BGF spent one month with a FCC sked before leaving on a six-week field trip. WA6UO won a trophy at the convention for 2nd place in the 75-meter transmitter hunt. WLICP spoke at the San Diego V.H.F. and SOBARS meetings in June. The following nets, all meeting on local time, Sun. only, are listed for area hams who may wish to participate. They are listed by name, frequency, mode, time and net control station. ARPSC (s.s.b.), 3925, LSB, 0900, W6FWU NCS; SDSN (c.w.), 3795 kc., c.w., 0830, W6BGF NCS; Morning After, 50.250-Mc., a.m., 1100, W6EAX NCS; 2-Meter ARPSC, 145.500-Mc., a.m., 0900, WB6BCZ NCS and San Diego 2-meter f.m., 146.840-Mc., f.m., 2000, WA6-OSB NCS. All nets welcome visitors, usually after roll call. The San Diego Council needs your club's support. Is your club represented? If not, why not? Traffic: K6BPI 7656, W6YDK 4193, W6IAB 1681, W6VNO 1087, WB6JUI 768, WB6GMM 692, W6EOT 454, W6BGF 376, WB6NMT 44, W6LRU 26, W6JZK 20.

SANTA BARBARA—SCM, Cecil D. Hinson, WA6-OKN/W6CUB—SEC, WB6NDP, RM: W7WST/6. K6-AAK has returned from his mobilizing vacation to northern California and W6BJM is departing on his vacation to Florida but his Sting-ray is sans mobile equipment. K6DW, K6GV, WA6OKN and WB6BII, of Ventura County, were seen at the recent S.W. Division Convention at Disneyland. The Simi Valley ARC used Pine Mountain as its Field Day site and operated on 6 meters. WA6OJM reports he worked 200 stations during a recent contest on 15 meters, using a new NCX-5 and a TA-33 Jr. WB6BII has a new Mosely Tri-handler on

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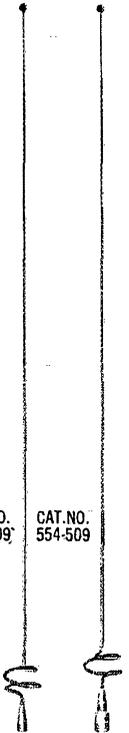
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total number of mobile radios there are in this country. What's your total? 100,000? 300,000? A half-million? Wrong! Close to 900,000 transmitters have actually been authorized for two-way voice communication between two stations, at least one of which is mobile!

As an amateur friend of mine put it: "If you haven't discovered the joys of working a rig that's foot-loose and fancy-free—man, you haven't lived!"

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Ward J. Hinkle, Owner

order to place atop his 60-ft. tower. K6GV again has trouble with transistors in his SBE-34. WB6PI1 has gone mobile with the HW-12. W8AB, the Satellite ARC, reports that they used Orcutt Hill for Field Day.

WEST GULF DIVISION

NORTHERN TEXAS—SCM, L. L. Harbin, W5BNG—Asst. SCM: E. C. Pool, W5NFO; SEC: W5PYI, PAM: W5BOO, RM: W5LJK. The Irving ARC held its monthly dinner meeting June 2 with an attendance of 80 hungry hams. Doc, Best, W5QKF, made a report on the Board Meeting. Frank Corlett, our first West Gulf Division Director, Doc, Chinkscales and your SCM also were present. This was the first time I have been able to meet with this FB club, which has about 40 members with an average attendance of 30. If anyone has the idea that 6 meters is a useless band, WA5HDT has logged 10,250 contacts on 6 in the past two years. I don't know if that is a record but it sounds impressive to me. The Arlington ARC, host for the West Gulf Convention, did a commendable job. I have not been able to confirm the number registered but the Arlington newspaper reported 900, which I think is near a record. Mr. Tuska, W1ZP, was the main speaker at this very fine convention. My hat is off to a very fine convention official team. I am wondering who will be the host for 1967. No one bid on it. Are we losing interest in the annual convention? Traffic: WA5ALB 36, W5LR 15, K2-EIU/5 4, W5MSG 2.

OKLAHOMA—SCM, Daniel B. Prater, K5CAY—Asst. SCM: Sam Whitley, W5WAX. SEC: K5DLP, RM: W5QMJ. PAM-75: WA5BTQ.

Net	Freq.	Time	Days	RM-PAM	QNI	QTC
OPEN	3850	0800 CST	Sun.	W5PML	220	21
STFCN	3850	1745 CST	M-Sat.	WA5BTQ	327	55
OLZ	3682.5	1900 CST	M-Fri.	W5QMJ	65	90
SSZ	3682.5	2145 CST	M-Fri.	W5QMJ	49	80

Our thanks to W5NML for taking over as net manager of SSZ. The Lawton-Port Sill Amateur Radio Club's new officers are WA5LBD, pres.; W5HIM, vice-pres.; W4RCM/5, secy.; W5RDK, treas.; W5FEC, trustee. WA5MCN, W5PBL and K5MBK are leaving soon for overseas assignments. WA5CUI, NCS STFCN, is on the air with a new Duo-Bander s.s.b. unit. K5CBG received his WAS certificate. W5PML has joined the 2-meter group with a TDQ and a live-element beam up 50 feet. We are sorry to report that K5GLB and W5BZH have joined the Silent Keys. WA5CNU is vice-pres. of the Oklahoma Central V.H.F. Amateur Radio Club. The Oklahoma county RACES Net has several new participants joining each month. W5LVO is now Canadian County EC. K5MJY, of Oklahoma City, has been doing a fine job of operating the 2-meter station on 145.1 Mc. at the Weather Bureau Radar Site. Tulsa amateurs had a very successful operation at the International Petroleum Exposition from their booth. Traffic: (May) K5TEY 1378, W5NBI 275, W5QMJ 77, K5MBK 58, W5MFX 49, K5LAIG 33, W5NNTI 20, K5-DLP 17, W5FRL 17, WA5MDN 10, K5OUC 8, K5CBA 7, W5EHC 4. (Apr.) K5CBA 16.

SOUTHERN TEXAS—SCM, G. D. Jerry Sears, W5-AIR—SEC: K5QQG, PAM: W5ZPD, RM: K5ANS. EC W5FBI reports new officers of the Golden Crescent Radio Club are K5HUA, pres.; W5NLL, vice-pres.; W5DUQ, secy. PAM W5ZPD says W5YCK happened on an accident and called police from mobile before the car stopped rolling. W5MRY will be visiting in W1-Land for the summer. WA5GLG is spending the summer in Europe. There is standing room only at the Houston Amateur Radio Club theory classes conducted by W5-VCE. WA5AUZ is starting a campaign to get more stations on the TEX Traffic Net daily at 1900S and 2200S Texas time on 3770 kc. Come on, you fellows, get your keys dusted off and join the TEX Traffic Net. It's the best place in the world to keep your code speed going up. K5HZR, Bexar County EC, and manager of the 7200 Traffic Net, advises of odd band conditions on 40 meters. However, the net operations have been near normal. W5HWY, 40-meter PAM, reports K5TEY is very busy with Viet Nam traffic. WA5FXR, the Texas A. & I. Club station, is off the air for the summer. K5LQJ will be back at Texas A. & M. for the summer. Look for him from W5AC. He expects to be back in Houston in Sept. W5VPQ gave a most interesting talk on activities of the Texas V.H.F.-F.M. Society. Any amateurs interested in v.h.f.-f.m., contact W5VPQ, 11314 Janet Lee Dr., San Antonio, Tex. 78230. These boys are on the ball and deserve credit for excellent work in this area. W5KWU, in the Red Cross radio room, now has a new Henry kw. linear in operation. During tests excellent reports have been received from the Texas area as well as many states bordering and

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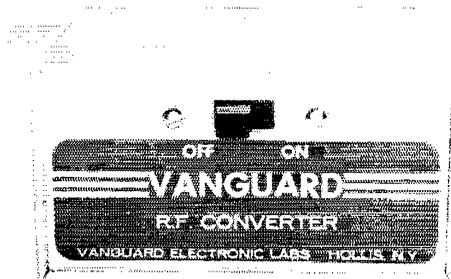
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	301-E2	145-146	.6-1.6
	301-F	144-146	28-30
	301-Q	144-148	14-18
	301-R	144-148	7-11
	301-S	143.5-148.5	30-35
6M	301-B1	50-51	.6-1.6
	301-B2	51-52	.6-1.6
	301-C1	50-54	7-11
	301-C2	50-54	14-18
	301-J	50-52	28-30
20M	301-G	13.6-14.6	.6-1.6
CB	301-A1	26.5-27.5	.6-1.6
	301-A2	26.8-27.3	3.5-4.0
40M	301-K	7-8	.6-1.6
CHU WWV	301-L	3.35	1.0
	301-H	5.0	1.0
Int'l. Marine	301-I1	9-10	.6-1.6
	301-I2	15-16	.6-1.6
	301-M	2-3	.6-1.6
Aircraft	301-N1	118-119	.6-1.6
	301-N2	119-120	.6-1.6
	301-N3	120-121	.6-1.6
	301-N4	121-122	.6-1.6
	301-N5	122-123	.6-1.6
	301-N6	123-124	.6-1.6
Fire Police VHF Ma- rine etc.	301-P1	154-155	.6-1.6
	301-P2	155-156	.6-1.6
	301-P3	154-158	7-11
	301-P4	154-158	104-108
	301-P5	156.3-157.3	.6-1.6
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	301-W3	162.55	107.0

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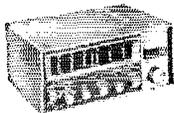
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beyond. During emergencies W5KWU should get through if any signal will. Traffic: WA5AUZ 214, W5BGE 204, K5HZR 180, K5LQJ 58, W5ABQ 38, W5AIR 23, W5HWY 15, W5ACQB 10.

CANADIAN DIVISION

ALBERTA—SCM, Harry Harrold, VE6TG—SEC: VE6FK, PAM APN; VE6ADS, PAM ISBN; VE6ALQ, ECs: VE6SA, VE6SS, VE6AFJ, VE6IB, VE6ALL, VE6XO, VE6XC, ORS: VE6BR, OPSS: VE6HM, VE6SS, VE6BA, VE6ADS, OOS: VE6HM, VE6NX, VE6TY, VE6AKV, OBS: VE6HM, OES: VE6DB. It is with regret that we cannot give you any reports of the new DX club of Edmonton as it is a secret and the members don't give out any information. By all reports AREC and EMO tests turned out very successful. VE6SS is now sporting a new Swan 350. VE6CO sold his monster and Gonset. We should have two new hams on from Foremost soon. Any time any of you hear of a ham passing away, please let me know. VE6SA and his XYL are taking a holiday in England and we hope that they enjoy it. Calgary still is looking for contacts to give away more Stampede certificates. Time is not too far away and thoughts of electing your SCM should be considered. Traffic: VE6HM 131, VE6FK 95, VE6XC 23, VE6BR 32, VE6ADK 16, VE6AOO 8, VE6SKV 8, VE6SS 7, VE6FV 6, VE6ALQ 5, VE6PZ 4, VE6KS 2.

BRITISH COLUMBIA—SCM, H. E. Savage, VE7FB—VE7BLO is the first winner of the Penticon ARC Centennial certificate. VE7BHH and VE7ASU both have purchased new equipment, yes s.s.b. transceivers. VE7BDR passed the exam and is Class A. VE7BDR is EC for Nanaimo and VE7HI is EC for the Fraser River North Side. North and West ARC meets the 1st Mon. and 3rd Wed. at c.d. hq. For ten years or more the North and West has been meeting on 28.5 at 1630 GMT every Sun. VE7BQN is NCS. VE7RR has a new floor; sure hope it helps our North and West EC. Burnaby ARC conducts code and theory classes each Fri. night except the 3rd Fri. on which general meetings are held. Write Box 83, Burnaby 1. Chilliwack ARC hosted the Burnaby ARC, East Kootenay ARC elected VETASE, pres.; VE7BGN, vice-pres.; VE7BKW, secy. For the Centennial Year award by the Penticon C.D. ARC and the Okanagan International Hamtest Association (Can. Division) work 10 VE7s including two Penticon Club members during the Apr. 1, 1968 to Dec. 31, 1967—B.C. amateurs work 20 VE7s and two Penticon Club members. No band/mode endorsement. Seal endorsement for 3 eye-ball QSOs with club members. Send GCR list and 50 cents or 5 IRC to custodian, Norm Taylor, VE7BNT, Box 580, Summerland B.C., Canada. VE7TF is now a Silent Key. Some years ago when Trunk Line 1 was in operation he was one operator who was always there. Traffic: (May) VE7ASY 192, VE7BBB 88, VE7BHH 46, VE7BLO 39, VE7SE 20, VE7BOQ 15, VE7AC 10, (Apr.) VE7BHH 38.

MANITOBA—SCM, John Thomas Stacey, VE4JT—VE4RE has a 32-element collinear built for 432-Mc. and is completing work on a transmitter for that band. VE4TM has erected a 60-ft. tower and beam with an eye on DL-Land. VE4LG has his CP-25 and is working on a 1/2-kw. VE4EI received a TEN certificate and CP-25. VE4E has his Advanced Class license. VE4CF and VE4FW have moved to the east. VE4XQ is heard on the DX bands signing ON8XE. VE4MK is getting set up for some RTTY work. Sorry to report that VE4QD is hospitalized. VE4QX, our RM, is looking for some new recruits for the c.w. net. VE4XN moved to a new QTH in Brandon. VE4JF has returned to Brandon. VE4GV is active on 6 and VE4YW is taking advantage of the Es to add to his 6-meter records. Net reports: Evening Phone, QNI 380, traffic 12. C.W. MTN, QNI 163, traffic 127. The AREC participated in the Trans-Canada Net during the KLM exercise. Sincere thanks to VE4EX for his fine job as recorder for the phone net. VE4JP is in the process of moving out of the Province. VE4GN is on from Winnipeg. VE4FW is mobiling with his Swan. Correction (Mar.): VE4QX was listed as VE4QZ in the traffic column. Traffic: VE4JT 160, VE4LG 104, VE4QX 62, VE4EI 60, VE4NE 42, VE4GN 13, VE6JA 8, VE4OL 5, VE4JC 2, VE4JQ 2, VE4TM 1.

MARITIME—SCM, D. F. Weeks, VE1WB—Asst. SCMs: A.E.W. Street, VE1EK, and R. P. Thorne, VO1EI. SEC: VE1HI. The Atlantic Amateur Radio Council advises that a campfest will be held over the Labor Day week end at Beaverbank, near Halifax. The NSARA Annual Meeting will be held at the campfest. NSARA members are reminded that the weekly meeting is now held at 0900 Sun. on 3740 kc. VE1RB (ex-



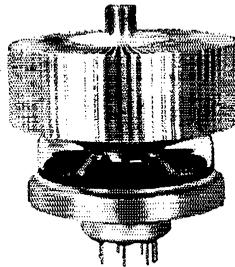
PENTA Beam Pentodes for Amateur Radio



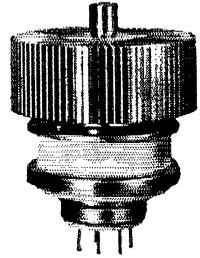
PL-175A



PL-177A



PL-8295/172



PL-8432

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PL-175A	5.0	14.5	400	—	—	445W	570W	680W
PL-177A	6.0	3.3	75	96W	140W	210W	—	—
PL-8295/172	6.0	7.8	1000	—	—	1020W	1280W	1540W
PL-8432	6.0	7.8	1000	—	—	1020W	1280W	1540W

*Actual power output delivered to load from typical amplifier.

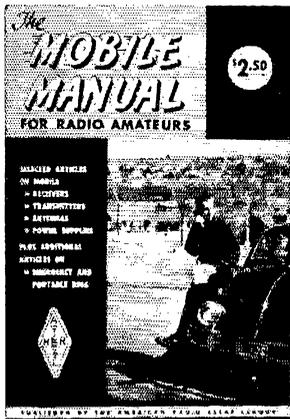
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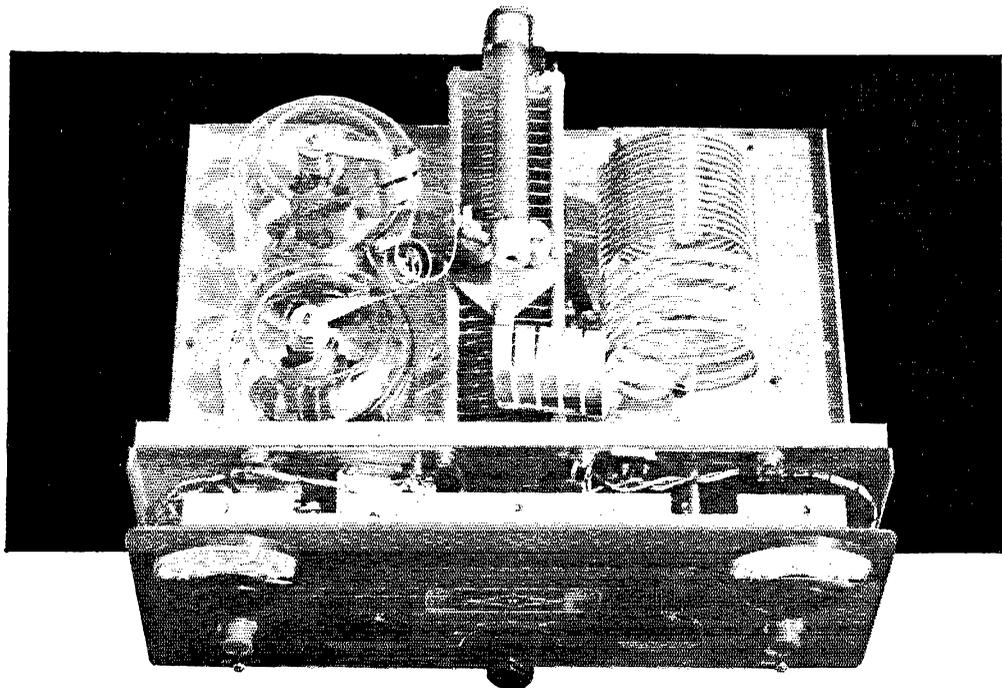
VE2YA) has returned to the VE2 call area. VE1SP has been transferred to St. John's, Newfoundland, and soon will have a new VO1 call. VE1UB and his XYL have returned from a vacation trip in the British Isles. VE1ARY has been operating from his motor cruiser under the call VEOMF. New VO1 calls include IR, IS, IT, IU (ex-AI) and IV. Ex-VOICK is now VE2-BEU. Congratulations to VO1FX and his XYL on the arrival of a new jr. operator. The new call of the Lakehead ARC is VO1GF. VO1HN and VO1CF have a 4H Club radio project on the go. It is believed to be the first such project in Canada. It is understood that amateurs employed by the CBC in the Halifax area have formed a club of their own with VE1UB as pres. Traffic: VE1OM 13, VO1FX 12.

ONTARIO—SCM, Richard W. Roberts, VE3NG—With deep regret I have to report to you the passing of VE3KA. Rusty was an officer of the RSO. Our sincere condolences to Dottie and daughter. We also record the passing of VE3AOJ and VE3AVX. To their families we send our sympathy. The Northumberland-Durham County AREC has a net going. Wed. at 9 p.m. on 144 Mc. with VE3BHQ as controller. The York V.H.F. Society had G5TH from England as a guest recently. Syd Cole, Metro Toronto EC, has resigned because of the pressure of business. The Scarborough ARC now has over 100 members, making it one of the large member clubs in Ontario. VE3CFR is back to work after a lengthy stay in the hospital. For the information of those of you who worked 9A18EB in southeast Asia, he is now in London with the call VE3EMF. Welcome home, Ed and Sheila, VE3HW, Toronto EC and PAM for 144, is doing very well after his recent operation and will return to the v.h.f. nets soon. VE3EZZ visited Tobago. The Skywide club elected VE3UR, pres.; VE3EUK, secy.; VE3PYF, vice-pres.; VE3EVV, treas. We welcome the Amateur Radio Club of Cooksville as an ARRL affiliated club. The Niagara Club is in top gear for the Ontario Division Convention. Reserve early or you may lose out. The Lakehead Club elected VE3FSE, pres.; VE3ARN, vice-pres.; VE3EFO, secy.-treas. Traffic: (May) VE3CYR 154, VE3BZB 137, VE3TPO 110, VE3-DVE 90, VE3BTY 86, VE3BII 81, VE3TT 74, VE3FGV 70, VE3FHV 64, VE3DBG 58, VE3DAU 54, VE3GI 50, VE3ATI 43, VE3BLZ 43, VE3AWB 36, VE3CGE 33, VE3-EBC 33, VE3EAM 31, VE3NO 26, VE3DU 24, VE3AUU 20, VE3BUR 20, VE3VD 13, VE3BWM 7, VE3HW 7. (Apr.) VE3BII 219, VE3BTV 137, VE3EPH 104, VE3-NO 57, VE3FGV 50.

QUEBEC—SCM, C. W. Skarstedt, VE2DR—During May a large simulated emergency was held in connection with the KLM Airline. The 20-meter Trans-Canada Net frequency was used and stations in all major cities from coast to coast took part. As traffic was picked up via the Net Control Station, VE2XT, or by others, it was dispatched to 2-meter mobiles for speedy delivery. VE2ANH and VE2BSQ have picked up some additional 2-meter transceivers. If interested, contact them. VE2WM, at Mont Joli, reports formation of the new Bas de St. Laurent Net to overcome poor summer conditions. It will operate on approximately 3780 kc. at 2330Z. VE2AZF is leaving Montreal for Ontario. He did a fine job as Montreal and District EC. VE2ANH is the new appointee. Sorry to report that VE2BE and VE2SF have been under the weather. VE2MO held elections and the new slate is VE2AOL, pres.; VE2BUK, vice-pres.; VE2AJD, treas.; VE2AGI, VE2BJG and VE2ASK, directors. Welcome to VE2BKA, a newcomer at Shawinigan. VE2AFU built his own power plant at summer camp with dam and a turbine alternator, 550 v.a.c. VE2BZH operated portable on 6 and 2 meters from Mt. Rigaud with excellent results. After 9 years I am now bowing out as your SCM. My successor, VE2-OJ, is an excellent choice and I trust that you will give him the same hearty cooperation which I have received. I have noted with pleasure the fine growth of our section, particularly in connection with the AREC, participation in nets, the growth of h.f. activity, etc. Thanks —Merci beaucoup. Traffic: VE2DR 121, VE2BRD 81, VE2OJ 77, VE2WM 38, VE2BZH 31, VE2EC 29, VE2-AE 28, VE2CP 25, VE2BVY 19, VE2BRT 11, VE2NT 7.

SASKATCHEWAN—SCM, Mel W. Mills, VE5QC—Congratulations to the AREC boys for the successful liaison exercise with the Saskatchewan private pilot's civil defense exercise. A job well done. Another job well done was the Regina crew on the Saskatchewan Hamfest the July 1st week end. Thanks for the hospitality, fellows. Don't forget to allow those breaks for the mobiles. Now is the time to start thinking of those new antenna installations before the bad weather sets in. Traffic: VE5HP 85, VE5LAI 18, VE5BO 16, VE5IR 9, VE5IQ 5, VE5LG 3, VE5FX 2, VE5GX 2, VE5PZ 1.

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Silent Keys

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

- KIIPA, George A. DiCarlo, Revere, Mass.
 WIMCS, Garald W. Silsby, Littleton, N. H.
 W1OIR, Martha S. Ridley, Winthrop, Mass.
 K1OYL, Edward Ingenlath, III, Danbury, Conn.
 WB2AJX, Homer G. Whitson, Farmingdale, N. Y.
 W2AT, Robert H. Butler, Bronx, N. Y.
 W2DUR, Louis F. Munzer, Port Jefferson, N. Y.
 W2GNQ, Joseph A. Anderten, Upper Saddle River, N. J.
 W2SCU, Charles S. Robbins, Johnstown, N. Y.
 W2TDI, Roland R. Fife, Queens Village, N. Y.
 ex-W2XX, Robert P. Gowen, Ossining, N. Y.
 W3CKS, Robert M. Hillyer, Troy, Penn.
 W3EAT, Charles S. Perkins, Reading, Penn.
 W3MJK, Merle E. Coughenour, Berlin, Penn.
 W4CDQ, Clifford L. Shiflet, Gastonia, N. C.
 WN4CRM, Robert C. Mitchell, Sarasota, Fla.
 W4EGL, James M. McLean, Bowling Green, Fla.
 K4EI, Thomas Neal McGown, Bowling Green, Fla.
 W44FVP, Louis P. Herberger, Venice, Fla.
 W4PGP, Frank A. Pierson, Sr., Winter Haven, Fla.
 K4PLF, Jefferson L. Cribb, Kingston, N. C.
 W44TYT, Frank D. Torrey, Memphis, Tenn.
 W4UAE, Irving Tauber, Miami Beach, Fla.
 W4WCE, A. Eugene Stringer, Memphis, Tenn.
 WN4ZMD, Ray Cobb, West Palm Beach, Fla.
 W51ZX, Juanita F. Brown, Denison, Texas
 W5RZB, James S. Brown, El Paso, Texas
 K5VGF, Billy N. Marlow, Ruleville, Miss.
 W6DNF, Nelson O. Pfister, Burbank, Calif.
 W6ETT, John N. Reiser, Redding, Calif.
 W6FWW, Ray Moore, Manhattan Beach, Calif.
 W6IBW, II, Lay Snyder, Palo Alto, Calif.
 K6INA, Harvey T. Stentz, Los Angeles, Calif.
 WB6JWG, William C. Brown, Los Angeles, Calif.
 W6JXF, Clifford S. Pugh, San Pedro, Calif.
 W6JYA, Alexander L. Arguello, San Francisco, Calif.
 WB6KCX, Ernest V. Baxter, Seaside, Calif.
 K6KQX, Meredith Ellars, Fontana, Calif.
 W6MOY, Griffin W. Mossbarker, Livermore, Calif.
 K6ONR, Dudley C. Ablf, Mountain View, Calif.
 W6QWT, Perry O. Trisler, Fullerton, Calif.
 W6RCM, George C. Jackson, Monrovia, Calif.
 W6UDK, Paul Bisel, Fullerton, Calif.
 W7LUV, Bertrand H. Havens, Henderson, Nebr.
 W7WJ, Hal C. McCracken, Portland, Ore.
 ex-K8ATR, Lawrence R. Marion, Marlette, Mich.
 K8MGG, George W. Barnes, Toledo, Ohio
 W8MZZ, Jene P. Streitenberger, St. Marys, W. Va.
 W8OGP, James S. Dyer, Lansing, Mich.
 K8QQQ, Joseph W. Manser, Jackson, Mich.
 ex-W8TMN, Bernard D. Fellows, Ferndale, Mich.
 W9CCI, Rex Kundiger, Oshkosh, Wisc.
 W9JOZ, Robert A. Barrett, Knox, Ind.
 W9KEU, Clarence J. Burke, Milwaukee, Wisc.
 W9QHZ, Walter A. Gardner, Elburn, Ill.
 K9RDV, Vincent D. Olroyd, Hillsboro, Ill.
 W9YIX, George T. Schreiber, Oak Park, Ill.
 W0APM/W4FZJ, Newell D. McCombs, Des Moines, Iowa
 W0CQX, Edward Gutmann, Omaha, Nebr.
 W0GUV, Hans G. Bloch, Kirkwood, Mo.
 WA8LAB, John N. Temple, Independence, Mo.
 W0ZK, Carl W. Klenk, Kirkwood, Mo.
 KL7AEP, Paul L. Ingraham, Fairbanks, Alaska
 PA0XZZ, Ben A. Lubbers, Amsterdam, Holland
 VE3A0J, John Scullion, Hanover, Ont.
 VE3AVX, A. E. Draves, Matheson, Ont.
 VE3KA, W. F. Brennan, Toronto, Ont.
 VU2PP, Pran Nath Perti, Kanpur, India

Because of the need for accuracy in our "Silent Keys" listing, please send all notices to the ARRL and include both name and call of the deceased.

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340B.....47	ERR BRIDGE & mtr.....17	F01.....139	HICKOK 820vtvm tube, trans, cker.....37
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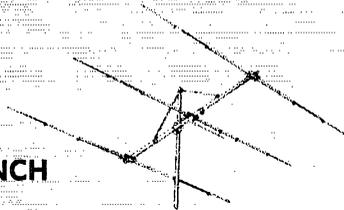


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The TR-2 Transceiver

(Continued from page 15)

factory, set the receiver on a signal near 144.5 Mc. and peak up the antenna trimmer capacitor. The dial calibration may now be painted on or decals can be used.

Transmitter Tuning

Remove the final and connect a v.t.v.m. to the junction of RFC_1 and the 47,000-ohm resistor. Adjust the slug in L_1 for maximum reading on the v.t.v.m. Check the oscillator with a wavemeter or receiver to make sure it is oscillating on 24 Mc. Connect a dummy load (a 47- to 75-ohm, 2-watt carbon resistor will do) to the antenna jack and insert the final tube. Connect the v.t.v.m. to the junction of RFC_2 and the 27,000-ohm resistor. Tune L_2 for maximum reading on the v.t.v.m., then quickly adjust C_1 and C_2 for maximum reading on the output meter. Check each stage with a wavemeter to make sure it is tuned to the proper frequency. Repeak each stage for maximum output. Listen to the signal on a receiver and see if the oscillator starts easily. Plug in the microphone and check the modulator.

Performance

During temperature inversions which usually occur in spring and fall, the author has worked eight states using an 8-element beam 50 feet high. Massachusetts has been heard twice. The TR-2 was used in a recent v.h.f. contest to work 62 stations in 6½ hours. Our location a few miles east of Philadelphia puts us in the heart of one of the most active v.h.f. areas. The fact that repeats were necessary on only two of these QSO's is an indication of the adequateness of the TR-2's selectivity. QST

My Friend, CR6CH

(Continued from page 55)

Government. So little by little he is realizing his program, and spending all his money on the observatory.

Finally we had to part again, but I promised to come back soon. So time passed by, and I could see the observatory grow slowly but steadily. One day in December 1960 he told me that he had exchanged his underwater camera for a Collins ART-13 transmitter. He had passed the examination as amateur radio operator and his new call was CR6CH.

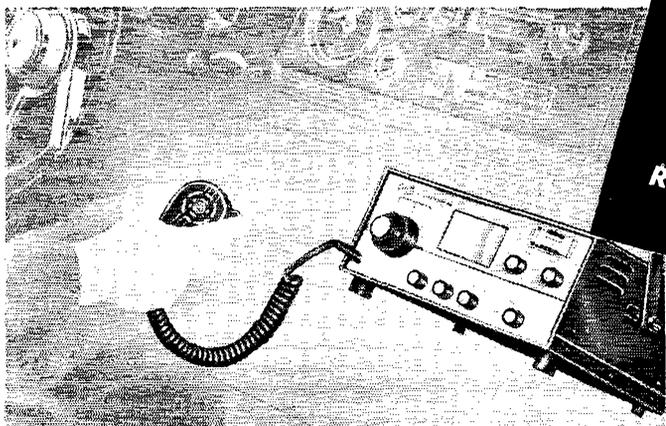
Soon new problems and difficulties occurred. He needed several radio parts — connectors, resistors, transistors, etc., etc. — and he seemed a little disappointed. I suggested to ask some American amateurs for help, since nearly all of them are very friendly and always willing to help and cooperate.

Well, he tuned his transmitter to 14 Mc., connected a key to it and soon had contact with American amateurs. Luckily he found someone who could be of great help to him and the next day he told me

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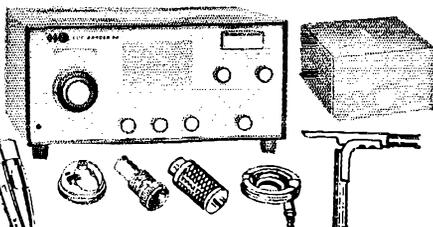
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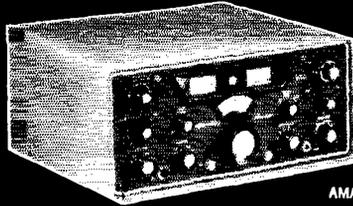
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on the telephone that one amateur had promised to send the needed crystal for his converter in order that he could receive signals from American satellites.

Now CR6CH is erecting a radiotelescope of about 66 feet in diameter. With that he wants to receive signals from the center of our galaxy. I am convinced that he will find them. He also is preparing a lot of technical equipment in order to track American satellites. Full of enthusiasm he talked about this to CR6CW who in January 1963 was able to listen to signals of American satellites on 136 Mc. for the first time.

Lately my friend had another problem. A 200-pound heavy piece of equipment had to be installed into the focus of his large zenithal radiotelescope. Just making a joke I said: "Why don't you use a helicopter?" Well, he did not laugh at all, but three days later he told me that a helicopter of the Portuguese Air Forces was engaged to do the job. After getting to know my friend better and better I honestly think that nothing seems "impossible" to him. To those amateurs who contact CR6CH and cooperate with him: Please remember that you aid in a very wonderful and fantastic enterprise, one of the most interesting ones I know in this world.

QST

The Nature Lover

(Continued from page 48)

"That's funny. It always looked pretty nice. I've sold lots of houses around here."

"Been wantin' to move away from here for years . . . ahhhh . . . you say you sold houses around here?"

"Yes, I'm a real estate man. I just stopped to take a look at that vacant house for sale. And I like to do a little mobiling when I'm driving around. Guess you saw my car antenna."

"What car? What antenna? Ohhhh . . . your car antenna . . . hadn't really noticed your antenna . . . lotsa mobyles around these days . . . ahhh . . . you say you're *not* movin' into my territory . . . errr . . . into the vacant house?"

"Noooo, no. I live right near the top of that hill over there . . . the highest one. The DXers tell me it's the best QTH in the county for DX. But I wouldn't know since I'm a VIIIF man myself. Saaaaay, you said you had been wanting to move . . . maybe I could show you some of the houses we have for sale."

"Well, you *know* I'd move away from here in a minute, but the NYL and the kids . . . they get kinda attached to a place and . . ."

"Wait now . . . I just remembered we got a new listing today . . . and being a DXer, you'd be veeerrrry interested because it's the house up the hill from me."

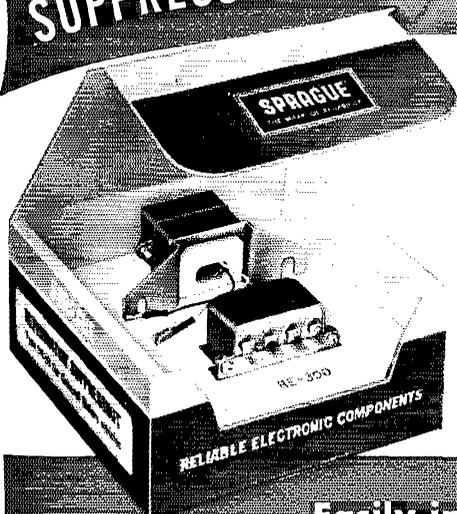
"Oh me . . . oh my . . . Marge . . . Maaarrrrge . . . I'll be right back old man, don't go away . . . Marge, listen, the walrus . . . ahhh, real estate fella's got a house for sale right smack on top of the highest hill . . ."

"Yes, I heard him. But I believe he also said it was on his hill . . ."

"Well, it's two whole houses away and higher up . . . very top . . . beautiful view, just like you always wanted . . . dear."

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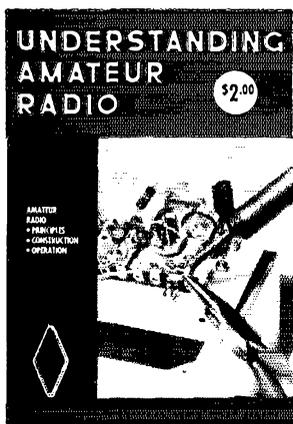


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"But Marge, this walrus is a VIIFer and I'm a DXspecialist . . . so, no problem."

"Then you gave me a lecture on natural history. The law of the jungle, you said. Squirrels snarling and snapping and walrussi battling over their own private territories . . ."

"But Marge, this situation is *completely* different! Why, any nature lover will tell ya that a squirrel and a walrus gets along real good."

QST

Das Softenboamer 160

(Continued from page 42)

the audio punch. The increased talk power will make the audio less pleasant to listen to, but the intelligibility will remain good. If an oscilloscope is not available, the rig can be tuned up for best audio quality by advancing the audio level until a slight flicker is evident in the p.a. plate current. Once this point is reached, back off on the audio gain control until the plate current flickers only on occasional voice peaks. Make certain that the output tank is tightly coupled to the load when operating a.m., to prevent flat-topping on voice peaks.

Some Final Thoughts

In areas where the maximum input power is limited to 25 watts, it will be necessary to reduce the screen voltage to the 6JF5 stage so that tight coupling to the load can be maintained during a.m. operation. In such cases as this, the screen voltage can be reduced by increasing the resistance between T_1 and the screen. The 30K resistor can be replaced by one of higher value. It is not satisfactory to reduce the input power by loosening the coupling of the pi network to the load, because this procedure would result in a distorted a.m. signal and would cause splatter.

On c.w. it is helpful to detune the p.a. grid tank slightly from resonance. This will lessen oscillator pulling and aid in preventing chirps.

Where antennas are concerned, 160 meters is the same as other bands — the proof of the pudding lies in the effectiveness of the skywire. Complete data on antennas for 160 meters is contained in the *A.R.R.L. Antenna Book*, Chapter 7.

If you're looking for a little rig with a big signal, "Das Softenboomer 160" will fill the bill.

QST

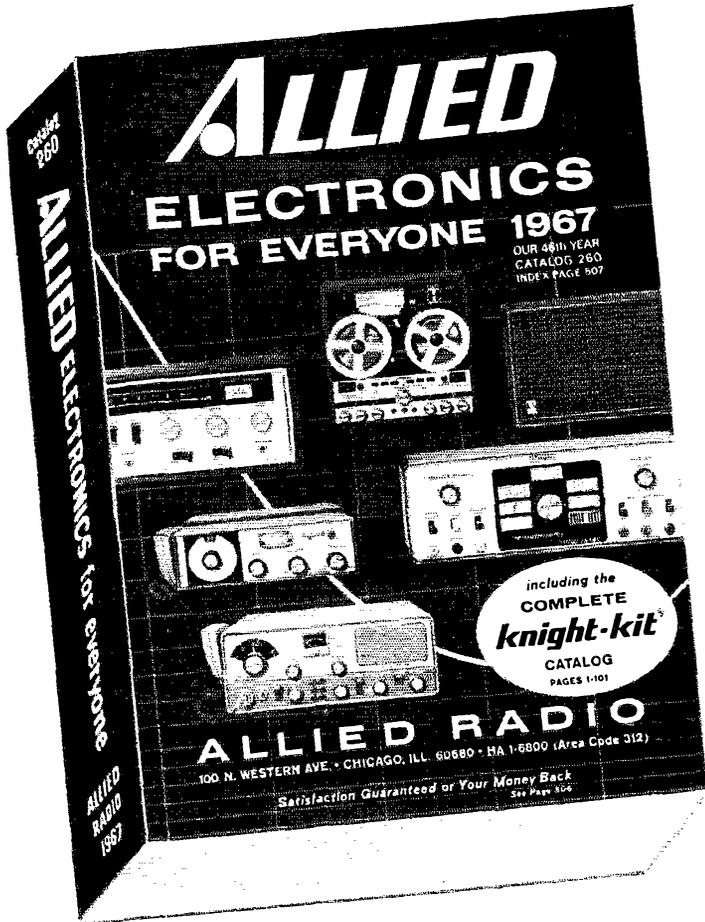
Correspondence From Members

(Continued from page 67)

see you encourage more c.w. work. I hope your new rules will save us from the "Please listen for my phone" type of operation. If we now could also avoid the special s.s.b. awards, DXpeditions should be able to work a lot more stations, instead of working the same "big wheels" over and over again on various modes/bands . . . — *Ragnar Otterstad, L15UE, Oslo, Norway.*

(Continued on next page)

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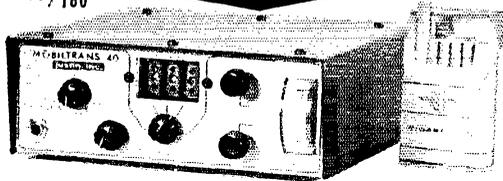
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☛ I recently was bitten by the DX bug . . . I was amazed at the number of "Hello-Goodbye" contacts between American hams and foreign stations. It has always been my belief that amateur radio is supposed to foster good will between different countries. How can this goal be reached when you offer the DXCC award? I think a new award, or modification of DXCC, is in order.

How can a foreign amateur learn about the average American if all he gets is a signal report, QTH, and name? If DXCC contained an endorsement for rag chews with 100 countries, amateur radio could fulfill its goal of fostering good will. In effect, this DX-RCC award would just be a combination of the present DXCC and RCC awards. This should begin to eliminate the "Hello-Goodbye" type of contact and turn working DX into a pleasure rather than the ratrace it is now.
— Dave Denstow, W1A0SG, Western Springs, Illinois.

AARL

☛ I would like to see the name of our organization changed to the "American Amateur Radio League." After fifty years, the original title of our group needs to be changed to reflect the almost complete absence of need for the word "relay" in our present work. I feel also that a gesture towards unifying the various factors in ham radio ought to be made by the Board of Directors.

I feel this simple device would go a long way toward removing the opinion of many that this is a c.w. man's organization. The ARRL, or as I would prefer to call it, the AARL, represents all of ham radio, not merely the c.w. enthusiast. While I may reminisce about "the good old days," and in many ways agree with the traditionalists, I think it is time for a change . . . — Herbert W. Gordon, W1BY, Harvard, Massachusetts. QST

Happenings of The Month

(Continued from page 62)

The Oscar IV shot was given excellent coverage and the League was prominently mentioned in stories of the event. Hurricane Betsy in the Southern states provided editorial coverage of the amateurs in action. Several other magazines and house organs paid tribute to amateurs and their public service. Very valuable and good publicity resulted from the many newspaper articles in various parts of the Country as a result of the handling of traffic to Viet Nam.

The Committee recommends the following areas of activity be undertaken to further the League interests.

1. Directors, headquarters staff and League Officials undertake a more vigorous campaign in public and club contact to acquaint the membership with the League's function, activities, publications, and government contact.
2. In the areas of policy decision, statement of the League's position on government proposals for rulemaking, that the staff, Executive Committee and Directors give careful review to the public relations aspect of our positions.

3. Request the staff to investigate the availability of programs of the Department of Health, Education and Welfare or National Science Foundation for recognition and participation of amateur radio extracurricular activity in secondary schools.

4. ARRL publicity for amateurs is needed. A "two-level" publicity program is recommended: First, aimed at national radio, TV, and newspapers.

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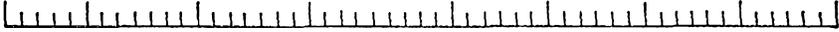
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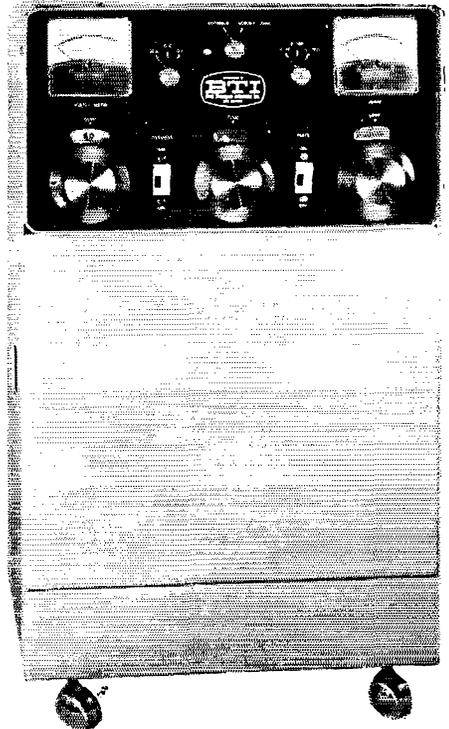
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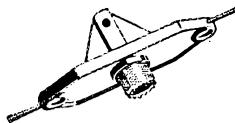
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Second, via Division, Section and clubs to the local news and other media levels. Thought should be given to an idea raised several years ago to create an office of Public Relations Manager for each Section. This office would be responsible for supplying liaison with newspapers, radio and other news media. Clubs could actively participate in the program by working closely with the Public Relations Manager. The PRM would supply locally prepared releases or material supplied by the League.

Respectfully submitted,
CHARLES G. COMPTON, Chairman
HARRY J. DANNALE
PHILIP E. HALLER
DANA E. CARTWRIGHT (Alternate)

How's DX?

(Continued from page 82)

Radio Club Bulletin (L. Waite, 39 Hannum St., Ballston Spa, N. Y.), North Eastern DX Association DX Bulletin (K1IMP), Northern California DX Club DX'er (Box 608, Menlo Park, Calif.) and VERON's DXpress (PA0s FX LOU TO VDV WWP). Come again!

Whence:

EUROPE -- DARC (Germany) invites amateurs throughout the world to participate in its WAE DX Contest, No. 12 in the series, scheduled for c.w. from zero GMT, August 13th, to 2400 the 14th, and phone on September 10th-11th, same times. Non-Europeans will trade RST001, RST002, etc. (no "T" on voice, naturally) with Europeans once per band at one point per QSO. Additional points are yours by sending "QTC" (QSO reports) to European stations at one point per QTC. Each QTC consists of (1) time in GMT, (2) station call, and (3) QSO number of any previous WAE Test contact. For example, W9GCV raises DJ9YL and earns a contact point thereby; W9GCV previously worked G2KID at 207 GMT for G2KID's 96th Test QSO. So, besides the QSO point for his serial swap with DJ9YL, another point goes to W9GCV if he successfully sends "1207/G2KID/096" to DJ9YL. W9GCV can work DJ9YL later on the same band only for transmitting additional QTC. Over the entire Test period each QTC can be sent to Europe by W9GCV but once, and DJ9YL can accept no more than 10 QTC per band from W9GCV. It thus figures that the more Test QSOs accumulated, the more QTC are available to parlay into additional points. Scoring: Multiply combined QSO and QTC points collected on all bands by the combined numbers of multipliers collected on all bands, the latter deriving from DARC's Worked-All-Europe Countries list -- CT1 CT2, Germany, Spain, EA6 ET F FC G GC GD GI GM, Shetlands, GW HA, Switzerland, Liechtenstein, HV I IS IT, Norway, Pear isle, Jan Mayen, Spitzbergen, LX LZ, San Marino, OE OH OI OK ON OY OZ, Holland, PX, Sweden, SF, Greece, Rhodes, Crete, European Turkey, TF UA/UV/UW1-6 UB/UT/UY5 ZC TIN UO UP UQ UR, Franz Josef Land, YO YU ZA ZB2 3A2 and 9H1. Entries go to Dr. H.-G. Todd, DL7EN, Chlodwitzstr. 5, 1 Berlin 42, Germany, postmarked no later than September 15, 1966 (c.w.) or October 15, 1966 (phone). Top Test performances in many regions will be rewarded with testimonials of merit. G'luck! ... Other European DX contests looming up: The 8th Scandinavian Activity Contest, September 17th-18th (c.w.) and 24th-25th (phone); East Germany's c.w.-only WADM Test, October 1st-2nd; and the International OK DX Contest, also c.w. only, scheduled for November 17th. We'll have details on the first two next QST. ... LA6X/p lists seven fellow Jan Mayen DXers (see "Where") and informs, "We are also active from our club station, LA3P/p, mostly on 14 Mc. We use 7 and 21 Mc., too, but 3.5-Mc. work is almost impossible now due to local loran interference." ... Banks still help Icelanders dispense TF contacts. TF2WJT (WA3ECU) has an agile 100-wattor on 20 c.w., and TF2WJV (WB0OYP) likes code around 14,055 kc., sideband near 14,225 kc. TF2WJU, with the American Red Cross, tells K3KMO his usual 20-meter hours are 2000-2200 GMT. ... OK4CM (OK3CM) operates afloat in the Black, Aegean, Adriatic and Mediterranean Seas aboard MS Boj-



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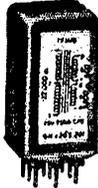
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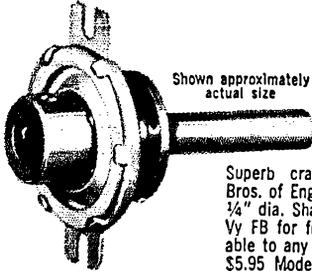
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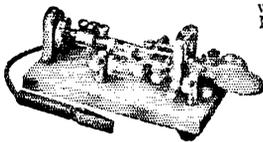
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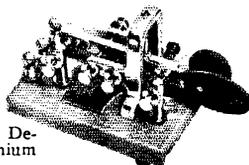
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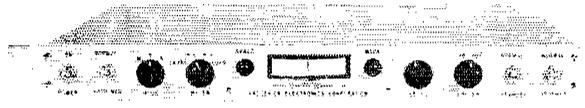
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nice K3KMO notes UA1BT in pursuit of a WAS-clinching S. Dak. QSO near 14,040 kc. at 0300 GMT. K7QXG says UP2KPN and DL6WV need Nev. for the same reason, both near 14,050 at 0530-0730 8V0WKK, who prefers 20 s.s.b. and c.w. from Greece, signs K1NWF when back home in Mass. Old ten-meter hound G3IDG says G3HCU already has 25 countries on the band this year, including CX and VP6. "I'm more or less just listening on 28 Mc. at present but I'll soon be there with my mighty 55 watts feeding a 150-ft. wire bent into a 'W' to fit our minigarden." W1CNU says UA1KFT helps UA1EK produce F.J.L. contacts near 14,020 kc. Check with Falun R.C., P.O. Box 12, Falun 12, Sweden, for specs on a certification based on QSOs with Falun SM-Is. Another target for award hunters is IMD, International Mobile Diploma, wallpaper calling for 100 QSOs with mobiles on land, sea or air; DJ8OT of DARC's Nordrhein branch can supply data Continental cullings via club newshawks: The roaming Colvins followed Man Isle DX fun with G5SACI/WB6QEP and G5SACI/W6KG Jersey sport in June. U5ARTEK is old U5ARTEK, still a school station in the Ukraine. PA0s BRM and DX teamed up for July jollity as PX1BRM. International A.R.C.'s 4U1TU gang schedules an August 26th-28th convention in Geneva.

ASIA — "Hams wondering how their 14-Mc. s.s.b. signals are getting into Vietnam should watch for WA2PQX/mm and K5ZZL/am," suggests W7AZG. "Ray operates from an Army LARC launch in Quin Nhon harbor with a KWM-2 and whip, while Jack QSOs from an Air Force C-130 making trips out of Da Nang. Frustrating, though — neither counts for DXCC." "A thrill to catch VU2CK of New Delhi on 20 sideband," recounts WA8PKG. "I was there in WW-II over twenty years ago. "Thoroughly enjoyed this year's ARRL DX Test," exclaims 4X1FV. "Sent some suggestions for rules changes along with my log." W3INK finds Bill's neighbor, 1X4UH, doing rush biz on 14,060-kc. c.w. from 2200 to 0100 GMT. "HL9TH remains very active on 20," notes K1ERT. "14,040-kc. c.w. and 14,220-14,320-kc. single-sideband." "UA6OM is looking for Idaho, Nevada, Utah and Wyoming near twenty's low c.w. edge," reports W2JBL. K3RQV's brother-in-law, K3KTP, signs P2RJ with USAID. "Bob's teaching a second two-year hitch in Tehran after signing TG9BJ for three years. EP2RJ likes 10, 15 and 20 meters." Announcement of PEARL's July Field Day DXercise arrived too late for "How's" announcement. The KAs were out in force, favoring separate station entries this year. K2LLI, PEARL News editor, reminds us that Worked Five KA Stations, Worked 25 KA Stations and Worked All KA Districts diplomas are very available. Two Asian items from the clubs press: Andamander VU2DLA likes daily 14,031-kc. c.w. sessions, 0000-0200 GMT, and has been heard below the Yank phone band on a.m. at 1030-1130. V9SARV may be of assistance toward QSOs with MP3s TBO and TBV. Ray and Aden associates still intend VS0HRV Kuria Maria action.

AFRICA — "There are now at least five VQ9s active," tallies VQ9EP (W9BIO). "BC EF HB RH and TC. I'll be here for at least another year." There goes another rare country, same thing happening to Seychelles that befell Ascension Isle. "VQ9BC has received his rig, VQ9TC owns an NCX-3 and has access to a KWM-2 at his work site. I erected a simple vertical, used CTC's rig and worked about 200 W/Ks." K5QVII adds, "VQ9s BC RH and TC are adding a beam to their NCX-3 and E-4 combo. They expect to be active through September." VQ9BC (K1KZE) writes to say he hopes to stay in Seychelles for several years. He formerly signed VP7BG and ZD8BC. WA4YDR reports fine 15-meter phone signals from the TR-3 and beam of freshly-licensed 5N2AAX, Lagos. W2GHIK's DXpedition of the Month release gives ZD9BE's 1A schedule. "Alan is very active almost every day, 1900-2100 GMT, transmitting on 14,211 kc. and listening on 14,250 kc. or as announced. W4VPO lists tentative 1A Xpedition stops by CR7GF and ZD8II as Glorieuses (FR7ZO), Comoros (FR7CF), Aldabra (VQ9FV), Tromelin (FR7ZP), then Juan de Nova or Europa or Bassa da India (FR7ZQ). African notes via clubs memo: ZS1ANT of Antarctica skeds ZS6UR on a.m. near 14,150 kc., 1500-1530 GMT. ZS8I does brisk DX trade on 14,105-kc. sideband at 1800-2000 GMT. Igxypt is quite workable lately with 8U1 AR on 15 c.w., DL and IM using code on 14 and 21 Mc., and 4U1SU lurking on 20 s.s.b.

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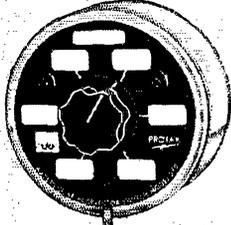
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OCEANIA — K6KIL/KG6 peeps things up at Coral Isle A.R.C.'s KG6AAV. "We're on a program to build new gear and operating positions for the club station so that we can keep Guam on the air in a big way. By fall we should be on 160 through 6 meters with fat signals on every band. In contests we'll have three operating positions with a kw. at each, and five antennas." Those California guys never do things halfway . . . "The Bendix boys of KJ6DA are now reassigned elsewhere, closing the station," says WA6NIWG. "Stan, Del and Dick, the most active ops, have returned to the mainland." . . . WA8CQN gives the cast for that springtime contest splurge of 5W1AX: K80s BO (W1WIV), BR, BQ (KB6CP), BT (W7WGG) and BV (W4ZKS). The lads also hold the calls 5W1s AM AR AL AX and AE, respectively . . . According to WA3CBQ/KH6, KH6FQX plans a rare stop or two while cruising aboard USS *Lissianki* in Pacific waters this month and next. Laysan and Lisianski islands may feel the brunt of Bob's Galaxy and 14-AVQ near 14,260 kc. . . . WIBBY says VK0MI is averaging 500 contacts monthly, not bad for a supposedly non-DX type. Colin's QSL manager may soon join the DX chase as VK7KJ. . . . QRL is the word for VE2ER. W7NRB discloses, "Raj was recently married and is in process of getting a new quad assembled to beat the one blown away in a hurricane." . . . VK9WE, Port Moresby, is searching for Maine to no avail." remarks K7QXG. . . . WN4DBV finds ex-WB6IKS enjoying the DX scene on 15 and 20 as KH6GAJ. . . . Reminder: NZART (New Zealand) offers the annual VK/ZL/Oceania DX Contest on October 1st-2nd (phone) and 8th-9th (c.w.). More info next "How's" . . . Papuan patter per L1DXA's organ: VK9s CJ luts 20 around 1000 GMT, DJ is on 14-Mc. sideband, PL warms up for more s.s.b. on 15, TB and WE employ 20 and 40 c.w.

SOUTH AMERICA — RCP (Peru) will sponsor the Pan-American Peru 1966 Contest, a voice-only affair, on the 10th-12th of next month. This one, as indicated, is for DX men and ladies in North and South America — details next month. Announcement of the RCV phone-only Venezuelan Independence Contest, July 1st-2nd, reached ARRL too late for a full June "How's" announcement. For proper QST handling, news of upcoming operating events should reach us at least six weeks before the month of magazine issue. ARRL Assistant Communications Manager WIYMM will be glad to help coordinate plans along such lines . . . LU9ECN sports a Drake s.s.b. line-up effectively from his new Buenos Aires location, 10, 15 and 20 meters. On wheels Carlos is LU9CN/m . . . The whopping 14-Mc. c.w. signal of PY2BGL stems from 500 watts and a 3-element whirler. "Loudest station I worked in the ARRL DX Contest," testifies W7VRO. Arch receives on a 75A-1 . . . W8WAH says, "QY4TX appreciates a good rag-chew. Edgar can be found most Sundays on 14.303 kc. around 1200 GMT." . . . Onset of the summer storm season suspends rarer HK6 plans of HK6AI and mainland HKs . . . LU1ZG, S. Orkneys, sneaks in c.w. QSOs 'way up on 21.251 kc. around 1700 GMT. S. Shetlands neighbor LU1ZC goes for code on 20's low edge but will tune for s.s.b.ers.

HEREABOUTS — "How about setting aside a band segment for stations in rare states to congregate?" W1AXK of Vermont puts the question and then answers it, suggesting 14,030-14,040 kc. "W, Ks in this slot could add their states to their calls for ease in identifying." . . . K3KMO of MIM renown, newly appointed SEC, spends DX lulls in the worthy AREC cause; or is it the other way around? Anyway, Al is rigging a new 10/15-meter beam and plans to shunt-feed his tower for next season's 80-meter DX . . . W8IBX reports unique activity by WA50TN/mm aboard carrier *Wasp*, prime recovery ship for Project Gemini doings.

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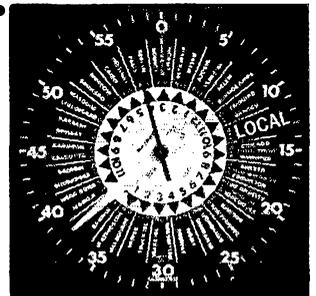
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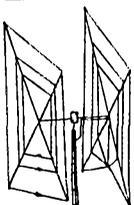
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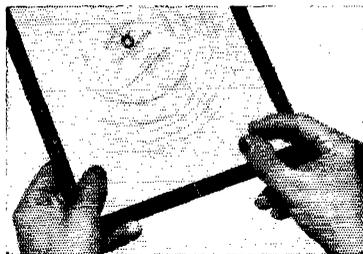
A new first in Quad spreaders at a price everyone can afford. HEAVY DUTY VINYL JACKETED selected bamboo, needs no treating, complete spreader is weather resistant, salt-spray proof. HEAVY VINYL coating of spreader is brown in color to resist sun rays.

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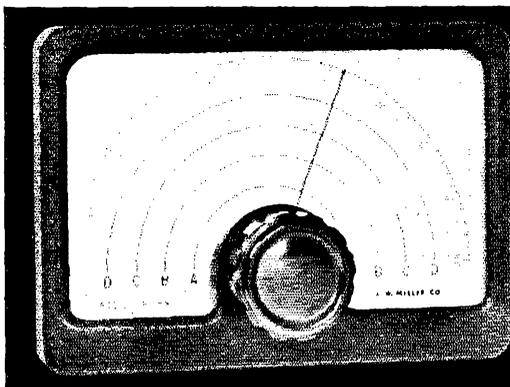
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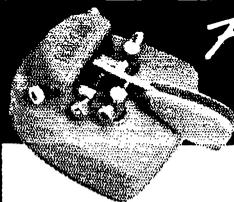
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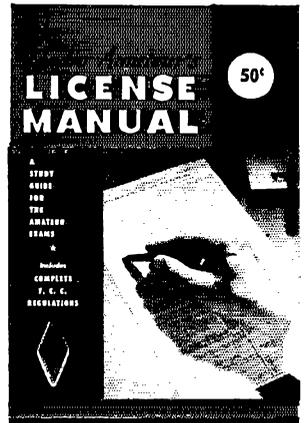
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Q. When may third-party messages be handled between amateur stations of different countries?

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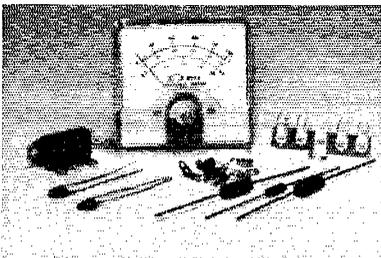
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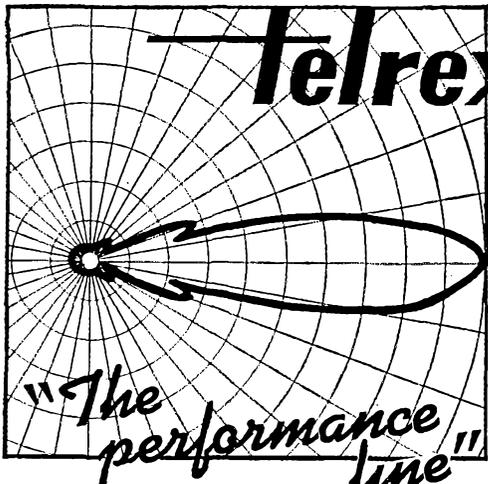
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I can give you personal service on helping you select better gear per dollar for your operating pleasure. Over 30 years' experience. Big trades, easy terms. Used bargains.
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My name Call.....
Street
City State..... Zip.....

(Please see the other side of this page for a list of available League publications.)

THE AMERICAN RADIO RELAY LEAGUE, INC., NEWINGTON, CONN. 06111
QS-866

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50mc • 144mc • 220mc • 432mc

On V.H.F., the antenna is half the battle of getting out. Get the story on J Beams—number of elements, boom lengths, feed impedance, db gain. These features are what make better beams.

RAY STAIR W9CEJ recently purchased a Skybeam. When asked how it worked, he said, "I used to hear THEM, now they hear ME!"

50 MC New 4-6-8-10 element beams. Add elements without discarding old beam. Inverted (Pat.) balun assures full coverage with very low SWR.

144 MC "Skeleton Slot" antennas. Skybeams with taper element positioning. Hottest Yagi manufactured. Moonbouncers. 4 polarizations.

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432 MC "Skeleton Slots", high gain easily stacked. 10 element Skybeam. 14 and 24 element "Long Johns" with multiple reflectors. New! . . . 28 element cross Yagi Moon-bouncer.

We can supply 300 ohm impedances . . . king sized hardware for the big arrays. Matching harness for any band. Also Rohn towers, CD rotators, cable, flat line, etc. • Write and ask for pamphlet on "Stacking" . . . free. Let us prove why the J Beam is better.

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CSL NR 1 & NR 2 (1 tape) for the prospective Novice, Technician, General or Amateur Extra First. 3 to 25 wpm.

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Magnetic tape, 7" reel, dual track, 2 hours. Immediate delivery. Send check or money order. (Specify which tape.) \$6.95 each.

Both tapes on one order, only \$13.50.

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3 thumb tacks, or 6" scotch tape and \$1.00 will frame and display 60 QSLs in plastic. Each holder has 20 compartments. Tried, proven, and accepted as the modern successor to all previous methods of displaying and protecting QSLs. 8 holders, \$1.00, or 10 for \$5.00 PPD and Guaranteed

Free sample available to dealers or clubs

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SPACE ELECTRONICS, 4178 Park Ave., Bronx, N.Y. 10457
(212) CY 9-0300

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Ship to this address:

NAME CALL

STREET

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- ARRL HANDBOOK** \$4.00
The standard comprehensive manual of amateur radiocommunication
- UNDERSTANDING AMATEUR RADIO** \$2.00
Written for the beginner—theory and how-to-build it.
- VHF MANUAL** \$2.00
A new and thorough treatment of the amateur v.h.f. field
- LICENSE MANUAL** 50¢
Complete text of amateur regs, plus Q&A for amateur exams
- HOW TO BECOME A RADIO AMATEUR** \$1.00
All about amateur radio and how to get started

- A COURSE IN RADIO FUNDAMENTALS** \$1.00
Use this in conjunction with the Handbook
- ANTENNA BOOK** \$2.00
Theory and construction of antennas
- SINGLE SIDEBAND FOR THE RADIO AMATEUR** \$2.50
The best s.s.b. articles from QST
- THE MOBILE MANUAL** \$2.50
The best mobile articles from QST
- HINTS AND KINKS** \$1.00
300 practical ideas for your hamshack

(Please see the other side of this page for an application for membership in ARRL and 12 issues of QST)

THE AMERICAN RADIO RELAY LEAGUE, INC., NEWINGTON, CONN. 06111

HAM-ADS

(1) Advertising shall pertain to products and services which are related to amateur radio.

(2) No display of any character will be accepted, nor can any special typographical arrangement, such as all or part capital letters be used which would tend to make one advertisement stand out from the others. No Box Reply Service can be maintained in these columns nor may commercial type copy be signed solely with amateur call letters. Ham-ads signed only with a box number without identifying signature cannot be accepted.

(3) The Ham-Ad rate is 35¢ per word, except as noted in paragraph (6) below.

(4) Remittance in full must accompany copy, since Ham-Ads are not carried on our books. No cash or contract discount or agency commission will be allowed.

(5) Closing date for Ham-Ads is the 20th of the second month preceding publication date.

(6) A special rate of 10¢ per word will apply to advertising which, in our judgment, is obviously non-commercial in nature. Thus, advertising of bona fide surplus equipment owned, used and for sale by an individual or apparatus offered for exchange or advertising inquiring for special equipment, takes the 10¢ rate. Address and signature are charged for. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and all advertising so classified takes the 35¢ rate. Provisions of paragraphs (1), (2) and (5), apply to all advertising in this column regardless of which rate may apply.

(7) Because error is more easily avoided, it is requested copy, signature and address be printed plainly on one side of paper only. Typewritten copy preferred but handwritten signature must accompany all authorized insertions. 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.

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.

PEORIA Hamfest September 18, Peoria, Illinois. For details see Sept. QST Hamfest Calendar, Advance Registration \$1.50. Write: Ferret Lytle, W9DHE, 419 Stonegate Rd., Peoria, Ill. 61614.

THE 37TH Annual Hamfest of the Egyptian Radio Club, Inc., W9AU, will be held at the club grounds, Sunday, August 21, 1966, Club grounds at local near Granite City, Illinois, on the east bank of the Chain of Rocks Canal, one block south of U.S. 66. Games, contests, plenty of food and cold drinks. Plenty of parking room and admission is free. Turner, W9YZE, Treas., 1718 Worden Ave., Alton, Ill. 62002.

LOUISVILLE Ham Convention, Oct. 15, 1966. Technical forums, exhibits, banquet, Giant indoor Trade-O-Rama (bring your goodies), Ladies Program (Advance Registration only). Details P.O. Box 20094, Louisville, Ky. 40220.

HAMFESTERS Radio Club, Chicago, Illinois, proudly announces its 2nd Annual Midwest Hamfest, Sunday, August 14th at Sante Fe Park, 91st Wolf Road near Chicago. The Hamfest features manufacturer and distributor exhibits, swappers row, contests, awards and a variety of activities for all. Clowns and games for the children, activities for the YXL while you enjoy amateur radio with friends and acquaintances. The Hamfest climaxes Illinois' Amateur Radio Week August 8-14th, by proclamation of Governor Otto Kerner. For complete details and a map of the location, write: Grocory Purbeck, WA9MRE, 2916 West Marquette Road, Chicago, Illinois 60629.

MOTOROLA used FM communication equipment bought and sold. W8BCO, Ralph Hicks, Box 6097, Tulsa, Okla.

WANT Callbooks, catalogs, magazines, pre-1920 for historical library. W4AA Wayne Nelson, Concord, N.C. 28025.

WANTED: all types of aircraft or ground radios. 17L 618F or S388, 390, GRC, PRC, 51 JRVX, Collins linear amplifier, Type 294; Especially any item made by Collins Radio, ham or commercial. Also large type tubes and test equipment in general. For fast cash action contact Ted Dames W2KUW, 308 Hickory, Arlington, N.Y.

SELL, swap and buy ancient radio set and parts magazines. Lavery, 118 N. Wycomb, Landsdowne, Penna.

WANTED: Military and commercial laboratory test equipment. Electroncraft, Box 13, Binghamton, N.Y. 13902.

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 u want at the price u want to pay.

WANTED: 2 to 12 304TL tubes. Callanan, W9AU, 118 S. Canton, Chicago 6, Ill.

WANTED For personal collection: WE 1A mike mounting case with or without 38" carbon mike. Also WE 618-A dynamic, Gardner, W0JID, 223 Welch, Ames, Iowa 50510.

TOPPING All offers 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.

TUBES Wanted. All types, highest prices paid. Write or phone Cucco Communications, 120 west 18th St., N.Y. 11 N.Y. Tel: 242-7359.

WANTED: For personal collection: QST, May 1916, WICUT, 18 Mohawk Dr., Unionville, Conn.

INTERESTING Offers galore! Ham's trading paper. Next 12 big issues, \$1. Sample copy free. "Equipment Exchange—Ham Trader", Sycamore, Ill.

QSLs? Made-to-order! Largest variety samples 25¢, DeLuxe, 35¢ (refunded). Sakkers, W8DED, Box 218, Holland, Michigan, SINCE 1937. QSLs by W1LMS, Sheehan Press, 23 West Street, Stoneham, Mass. 02180. Samples 10¢. Catalog, 25¢.

QSLs. 18 samples, 10¢. Filmmcrafters, Box 304, Martins Ferry, Ohio.

QSLs, samples 20¢. QSL Press Box 281, Oak Park, Illinois 60303.

QSLs "Brownie" W3CJI, 3111 Lehigh, Allentown, Penna. Samples 10¢. Catalog 25¢.

C. FRITZ For better QSLs! Bringing hams greater returns for over a quarter-century. Samples 25¢ deductible. Box 1684, Scottsdale, Arizona 85252 (formerly Joliet, Ill.)

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QSLs: Movers Printing, 846 Rising Sun, Telford, Penna. Samples, stamped envelope.

QSLs-SMS. Samples 10¢. Malgo Press, Box 373 M.O., Toledo 1, Ohio 43601.

DELUXE QSLs Pett, W2HAZ, P.O. Box 5237, Trenton, N.J. 08638. Samples, 10¢.

QSLs. See our new "Eye-Binder" cards. Extra high visibility. Samples, 5¢. Dick, W8VXK, 1994 N. M-18, Gladwin, Mich.

10¢ Brings free samples. Simc Advertising Service, 32227 Missouri Ave., St. Louis, Mo. 63118.

DON'T Buy QSL cards until you see my free samples. Bolles, W5OWC, Box 9363, Austin, Texas.

QSL Specialists. Distinctive Samples, 15¢. DRJ Studios, 2114 N. Laverne Ave., Chicago, Illinois 60639.

SUPERIOR QSLs, samples 10¢. Hamsco, Box 773, Hobbs, New Mexico.

QSLs, SWLs, XYL-OMS (sample assortment approximately 9¢) covering designing, planning, printing, arranging, mailing, eye-catching, comic, sedate, fabulous, DX-attracting, prototypal, snazy, unparagoned cards (Wow!) Rogers K8AAB, 961 Arcade St., St. Paul 6, Minn.

3-D QSL cards add prestige with spectacularly different glittering colors and raised designs. Samples 25¢ (refundable). 3-D QSL Co., Monson 2, Mass.

QSL, SWLs, WPE. Samples 10¢ in adv. Nicholas & Son Printery, P.O. Box 11184, Phoenix 17, Ariz.

QSLs 300 for \$4.35. Samples 10¢. W9SKR, George Vesely, Rte. #1, 100 Wilson Road, Ingleside, Ill. 60041.

QSL 3-color glossy, 100, \$4.50. Rutgers Vari-Typing Service. Free samples. Thomas St., Riegel Ridge, Milford, N.J.

QSLs Kromekote 2 & 3 colors attractive, distinctive, different. Free ball point pen with order. Samples 15¢. Agent for Call-D-Call deals K2VOB Press, 31 Argyve Terrace, Irvington, 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.

DAZZLING QSLs Samples 10¢ (ex-W2QCC) Ted Besesparis, WA4WVK, Box 1275, Lake Worth, Fla.

QSLs. Finest YLRS, OM's, samples 10¢. W2DJH Press, Warrensburg, N.Y. 12885.

QUALITY Rubber stamps; Complete QSL 3"x5" \$5.00. Call, name, address \$1.50 "Wes's," W1FP, RFD No. 1, Amesbury, Mass. 01913.

QSLs Stamp and call brings samples. Eddie Scott, W3CSX, Fairplay, Md.

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RUBBER Stamps \$1.00. Call and address. Clint's Radio W2UD0, 32 Cumberland Ave., Verona, N.J.

QSLs—Free samples. Attractive designs. Quick Service, W7IIZ Press, Box 183, Springdale, Ore.

ORIGINAL EZ-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 of clubs. Tepabco, John K4MNT, Box 198T, Gallatin, Tenn. 37066.

SMART Ham operators buy their QSL cards from the Ham Wholesale Card Club. See 1/2 p. ad (p. 141) in this magazine.

QSL Cards. Quality printing. Samples 15¢. Sargent Press, 19 Glenn Ave., Lynn, Mass.

QSLs. 18 samples, 10¢. Filmmcrafters, Box 304, Martins Ferry, Ohio.

QSLs, Radio Press, Box 17112, San Diego, California 92117.

QSLs, SWLs, 3 and 4 colors. 100, \$2.00. Samples dime. Bob Garra, Leighton, Penna.

QSL's K2HVN, 860 Atlantic St., Lindenhurst, N.Y. Samples 25¢ (refunded). Maps, flags, space arc, rainbows, W. L. Jansen, K2HVN, 860 Atlantic St., Lindenhurst, N.Y. 11757.

HUNDRED QSLs, \$1.00. Samples, dime. Holland, R. 3, Box 649, Duluth 3, Minn.

COLORFUL QSLs. Very artistic—very different. Samples 10¢ or SASE. Colorful QSLs, M. A. Barnett, 833 Crowden Dr., Cincinnati, Ohio 45224.

RUBBER Stamps made-to-order. Write: J. P. Maguire Co., 448 Proctor Ave., Revere, Mass. 02151.

CANADIAN Ontario Section ARRL Convention, Sheraton-Brook Hotel, Niagara Falls, Ontario, September 16 and 17. Displays, good exhibits. Special advance registration package: OM, \$8.00, XYL, \$6.00. For those who wish to attend forums, etc., only, not including banquet: \$3.50 at door. D. G. Hall, VE3TB, P.O. Box 692, St. Catharines, Ont., Canada.

OLD Old Timers Club now over 600 members with verified 2-way contacts before 1925. Life membership, \$15 Bi-monthly "Spark-Gap Times", \$2.50 annually; also available to non-members, \$3.00. Write Secretary W1MPP, Lovell, Maine 04051.

MANUALS for surplus electronics. List, 10¢. S. Consalvo, 4905 Roanne Drive, Washington, D.C. 20021.

MOBIOCK! Incomparable theft protection exclusively for KWM-2 owners. Stop worrying! Write Transisticks Co., 4452 N. 20th Rd., Arlington, Va.

WANTED: Teletype equipment, R-388, R-390A, Cash or trade for new amateur equipment. Alltronics-Howard Co., Box 19, Boston, Mass. 02101. Tel: (617-742-0048).

MICHIGAN Ham's Amateur supplies, standard brands. Store hours 0830 to 1730 Monday through Saturday. Roy J. Purchase, W8RP. Purchase Radio Supply, 37 E. Hoover St., Ann Arbor, Michigan. Tel. NORMANDY 8-8262.

TOOCOBES: 6146B, \$4.00; 6CW4, \$1.40; 417A, \$3.95; 6360, \$3.45; 6146, \$2.55; 5894, \$1.50. All new, boxed guaranteed. No pulls, seconds or A.N. Catalog of many other types, free. Vanbar Distrib., Box 4442, Stirling, N.J. 07980.

RTTY Gear for sale. List issued monthly, 88 or 44 myh toroids, five for \$1.75 postpaid. Elliott Buchanan, W6VPC, 10677 Mancana Blvd., Oakland, Calif. 94610.

TELETYPEs, parts. Fast service. Schmidt, W4NYF.

HAM Paradise for sale on beautiful Maine lake. Fully equipped station with Telrex Xmas Tree, 300 ft. lake frontage, 10 acres, boating, fishing, swimming. WIAUR, H. G. Riley, Fayette, Maine.

FM Equipment Schematic Digest: A comprehensive collection of Motorola schematic diagrams covering low-band, high band and 450 Mc equipment, manufactured between 1949 and 1954. Crystal formulas, alignment instructions and a wealth of technical data included in 92 pages. Price, \$3.95, post. Two-Way Engineers, Inc., 1100 Tremont St., Roxbury 20, Mass.

WANTED: Collins Parts, BC-610, GRC-2, Antodyne, Bethpage, L.I., N.Y.

WE Buy all types of tubes for cash, especially Eimac, subject to our test. Maritime International Co., Box 16, Hempstead, N.Y.

ACT Now! Barry pays cash for tubes (unused) and equipment. Barry Electronics, 512 Broadway, NYC 12. Call 212-Walker-5-000.

WANTED: Tubes, all types, write or phone W2ONV, Bill Salermo, 243 Harrison Avenue, Garfield, N.J., Tel GARfield Area code 201-471-2020.

NOVICE Crystal 80-40M, \$1.05 each. Also other freqs. Free list Nat Stinnette, W4AYU, Umatilla, Fla. 32784.

CERTIFICATE Hunters: Work five members, get free award. The-Born Radio Club, Inc. W2BMW, 104-19 127 St., Richmond Hill, N.Y. 11419.

HAM Discount House. Latest amateur equipment. Factory sealed cartons. Send self-addressed stamped envelope for lowest quotation on your needs. H D H Sales Co., 107 Lockwood Av., Stamford, Conn. 06902.

AMATEUR Paradise Vacation: Livingstone Lodge, Mascoma Lake, Enfield, N.H. Cosy cabin for two weekly, \$50.00. Swimming, Fishing, Boats, Sports, Ham Radio, Dartmouth Golf, Tennis, Hot Showers, Fireplaces, light housekeeping, children half. Lake Shore Camp Cities, literature. Al. O. Livingstone, W2OPN (Quarters, Pennies, Nickels).

RTTY Channel Filters, octal mounted, 2125/2975 cps, \$5.95 pair, 88 myh toroids, uncased, 5 for \$2.50. Herman Zachry, WA6IGL, 3232 Selby Ave., Los Angeles, Calif. 90034.

BRAND New: SR-160 with MC PW supply. Hustler ant. with 30-40-75 sections. Rubber hand mike, \$329.00. Lisy for over \$500. Used DX-100B, perf. condx, \$120.00. HQ-110C with spkr, \$125.00 and both for \$210.00. John Harlin, 944 E. Normal, Springfield, Ohio.

FOR Sale: NCX-5 Mark II transceiver, CXU-27 xtal calibrator, NCX-A power supply/speaker console, all 6 months old, original cartons \$530.00, 40 ft. Rohm tower, 3-element Hy-Gain Tribander TH3MK2, TR-44 rotor and desk-control, \$135.00. Less than one year old. Monks. No shipping on antenna installation, you take down and away. Certified check or m.o. Alan Kogerup, 25 W. Soffel, Northlake, Illinois. Tel: (312)-562-1575.

NCX-3, NCX-A, perfect, \$295.00; Warrior Linear, runs 1000 watts P.E.F. from 100 watt exciter, \$145.00. K3WNS, Box 4, Forest Hill, Maryland.

SACRIFICE Versatile HT-37, 75S-1, antennas and 3 bedroom furnished residence on lovely and private 3/4 acre near Daytona Beach. Tel: 904-6-480 or HUNtsville 205-536-2524.

NCL-2000, like new, \$400.00; Hallcrafters FR-274, SX-73, \$150.00; 50 ft. Rohm #25 tower and Ham-M rotor, \$150.00. SBE-34, like new, \$300.00. W7WRS, Lyons, 1708 Valley View, Las Vegas, Nev.

WANTED: Extra heavy-duty prop pitch rotor or similar. K5JZV, 5847 South Pittsburg, Tulsa, Okla.

WANTED: Junk R-105A/ARR-15 receivers; send band dial and other parts. David Woerner, #23 Azalea, Houston, Tex.

SELL: Eimac 4X250B tubes. Guaranteed gud condx, \$6.50 each, \$10.00 pair prepacked in U.S.A. Send check or m.o. Everett Stridham, Jr., W5JLQ, 722 So. 30th, Muskogee, Okla.

4000 Ham words German-English, \$1.25 bill, stamps or 11 IRCs. Christian Zangerl, OE9CZ1, Dornbirn, Austria.

BIG Bargain: For sale; Gonset GSB-101 linear 1200 watt P.E.P. input, perfect condx. Tremendous signal, \$175.00. Dan Safran, 57-36 Cloverdale Blvd., Bayside, L.I., N.Y.

SWAN 350 12V supply, Model 14-117. Unused, \$95.00. W6NCT, 243 Rametto Road, Santa Barbara, Calif.

WANTED: 30S-1 linear. Will pay cash. W6DMK, John Kaylor, 818 Rideout Way, Fullerton, Calif. Tel: 714-871-0731.

EXCELLENT condition QST 1939 to 1960, CO 1947 to 1960 (complete runs, \$3.00 year, or will trade for Heath SB-10 high power tetodes or what have you. W3WVF.

ONE Close shave was enough. New TR-4 Drake transceiver with unused Drake 12-volt DC-3 supply, \$575. Heath HP-13 DC supply with spare transistors, \$35.00. WA2LIM, tel: 212-461-1779.

GONSET GSB-100 exciter, excellent, book, first \$125.00; Eico 5-inch scope mod. 450, \$25.00; 800 ml. 15 hy. 35 ohm, H. E. Co. choke, \$15.00, 30 pounds. Express collect. W2ZK, 46 Monmouth Blvd., Oceanport, N. J.

TPS-6P, tripod mount for RBS-40, \$69.00. K3MNNJ.

FOR Sale: Collins 62-S1. Serial 11479, \$575; 30S-1, Serial 482, \$750.00; 516-F power supply, \$75.00; National HRO-500, Serial 75-1303, \$875.00; low frequency converter L.F.-10, Serial 92-0362, \$225.00; Concertone Berlant tape recorder, Model 93-2 rack mounting, \$450.00; Sencore FS-124 VHF-UHF field strength meter, \$125.00; Electro-Voice Model 667 microphone, transler or preamplifier, Serial 154, \$100. All perfect condx, no modifications. R. C. Littler, 640 Snowhill, Springfield, Ohio 45504. Tel: 513-322-8722.

WANTED: 3CX2500, 3CX10,000/8159 or equivalent high power transmitting tubes used TV and other commercial pull-outs acceptable; price must be realistic. State price and condition in your first letter. Bill Smitherman, WA4YFI, Rte. 2 East Bend, N. C.

INTERESTING Offers galore! Ham's trading paper. Next 12 big issues, \$1. Sample copy free. "Equipment Exchange—Ham Trader", Sycamore, Ill.

GLOBE King 500-B, 540 watts of AM & CW, exclnt condition. Asking \$150.00. David G. Steffens, K8YWS, 656 Cascade Road, Cincinnati, Ohio 45240. Phone 825-8333.

NEW IP69/ALA2 30 Mc. Panadaptor, converted; perfect RME 6900, 6400, or SB-33-34. Compaco 813 linear (80-10). Iwant Heath OM-1, \$265. Cheston M. Benson, W9IFB, 732 South 14th St., Richmond, Indiana 47374.

SALE: HQ-140X, \$95.00; GSB-100, \$165.00; Navigator, \$75.00; Knight T-60, \$33.00. HT-18 VFO, \$30. All items excellent and f.o.b. Wanted: Pre-war RCA rcvrs. ACR 136, 111, 175, 155, need not be in working order. W3NXC, 1005 Wyoming, Allentown, Penna.

SELL: Hallcrafters HT-40, \$55.00; HA-5 VFO, \$45.00. WAS, WAC, 70 countries. WB2JGD, 16-10 Berdan Ave., Fair Lawn, N.J.

SELL: Hallcrafters SR-500 transceiver with AC supply and speaker and calibrator. Cost \$523.15 three months ago. Sell for \$385.00. Also \$500DC supply, cost \$149.95. Sell for \$80.00. All guaranteed. Jack Yeoman, W8VHY, R #4, Washington Court House, Ohio.

SALE: Complete 2 mtr. antenna. Skeleton Slot, CDR rotor, 50 ft. mast. Best offer takes it. Bob Barrett, 1510 Kiva Ln, Vista, Calif. 92083.

SELL: Brand new Eico 753-SSB transceiver, wired, tested. Works perfectly, in exclnt condx, \$169.95. WA4TKK, Shannon Griffin, Rte. #1, Box 427, Williamson, N.C.

COLLINS 75A-4, in mint condx, \$400; Hallcrafters SR-46, \$135.00, K1EUS, 80 Stonecrest Drive, Bristol, Conn. 06011. Tel: 582-0236 after 6 P.M.

WANTED: Link Power amplifier type 1908. Advise tubes, rice, condition. W8ACR, 960 West Milton, Alliance, Ohio.

HAVE HQ-160, PMR-7. Would like to swap for linear amplifier. Warrior, GSB-101, SB-200, etc. or what have you? John Winward, 12711 Medford Road, Philadelphia, Penna. 19154. Tel: 215-NE7-4619.

QST: Sell: Ranser II xmt, in vy gd condx: \$200.00. Heath FT-111 Novice xmt. In exclnt condx, \$40.00. R. B. Hardine, 2490 16th Ave., San Francisco, California 94116.

HW-37, w/HP-22, power supply and matching microphone, \$160.00; Knight SVR Bridge, \$100.00; Knight audio compressor, \$100.00; AR-22 rotor, \$22.00. All in exclnt condition. Larry Reader, 1575 Queen St., N. Bellmore, N.Y. 11712. Tel: SU-1-1484.

COMPLETE SSB station, GSB-100, pair 4-400's final; HQ-170C, TA-33, tower, rotor, 80m vertical, freq. meter, SWR bridge, electronic T-R switch, 3" scope, 24-hr clock, etc. \$700. WASAME, 230-53rd St. W., Albuquerque, N.M. 87105.

WANTED: Johnson Matchbox 250-23, \$30.00 cash. I will pay shipping. K. R. Rietman, 1719 8th St., Elk River, Minn.

SELL: Instructograph, 110 VAC, 20 tapes, headphones, key. In exclnt condx, \$30.00; Heath CR-21 FM rcvr, factory-aligned, new condx, \$30.00; RME DP-23 Preselector w/12 new 616 WA tubes for sale, \$10.00. Will ship any or all items. Remit by postal-money-order only. K. S. Crowell, 242-B Eglin Parkway, Fort Walton Beach, Florida 32548.

WANTED: KWM II, 30L1/30S1, 312B4/5 on terms. AAA1 credit. Fone collect (413) 647-6096. Miller, 1225 Sandringham, Birmingham, Michigan.

COLLINS: 75S-3, \$425.00; 32S-3, with 516F2, \$575; Hunter Bandit 2000A, \$375; Heath Monitor scope HO-10, \$45.00; Johnson Matchbox, \$25.00. Like new. Dr. Perciful, 3326 Noe Way, Louisville, Ky. Tel: 502-452-2116.

FOR Sale: SB-100, SB-200, SB-300. Wanted: Any kit to wire and repair, preferably Heathkit. Most Heathkits in stock. Business ref. on request. Lan Richter, 131 Florence Dr., Harrisburg, Penna. 17112.

SALE: B&W 51SB, complete with spare parts. Instruction book in gud condx. K5KKV, Bay City, Texas.

EICO 753 transceiver, 751 power supply. Tested but never used, \$300. DX-60, good, \$60.00. Instructograph with tapes, very good, \$40.00. Ameco CN-144 converter, never used, \$35.00. Other items. SASE for list. J. A. Huckabay, 8025 Tonto, El Paso, Texas.

WANTED: Collins Filter, 455Y3.1. Advise condition and price. K8OXI, John Watzke, 24131 St. Marys Court, Farmington, Michigan 48024.

SELLING: Eico 753 kit, on-the-air tested, \$220.00. Tom Chesworth, RFD #1, State College, Penna.

11th ANNUAL Hamfest: by Four York County Clubs again sponsored at Adams County Fair Grounds, 4 miles North of Abbottstown, Penna., Sept. 4, 1966, rain or shine. Registration begins at 0900 hrs. Talk ins 50-62 and 145.62 Mc for the mobiles. Plenty of eats, drinks, transmitter hunt, games for XYL and ladies, Auction, etc. For info, write K3POR, LeRoy Frey, 170 S. Albarmer St., York, Penna. Keystone VHF Club.

SELL: 200w. HB xmt, rcvr, excess test equipment, tubes, parts, etc. Send SASE for list. John R. Yurick, K2EMF, 510 Conklin Place, Linden, N.J. 07036.

SELL: QST, Radio CO from 1940, \$12.00 per year, or your best offer. W4JGO, Box 26, Salem, Virginia 24153.

FOR Sale: SX-117 revr, excellent in appearance and operating condition, \$275.00. F.o.b. Will ship. WAI/AKL 49 Pondview Drive, Chicopee Falls, Mass. 01020. Tel: 593-6631.

HT-37, used little, excellent condition, no scratches, clean manual, original owner. \$225.00. Upon receipt your certified check will ship express prepaid insured, original carton, continental USA. W. F. Koepf, KSDMO, 9750 Parkford Dr., Dallas, Texas 75238.

CO and QST. CO 1948 to 1960. 118 issues; QST 1953 to 1960. 64 issues. Either or both to highest bidder. KSDZM, 112 Belaire, Grapevine, Texas.

FOR Sale: Heathkit mobile, Cheyenne MT-1 xmt, Comanche MR-1 revr, transk. pwr. supply, H-2-10 speaker, mic, MT rack, etc. Total assembly \$175.00. Johnson Viking Valiant xmt, \$185.00. Home brew 6 meter xmt, \$50. All with operating manuals. All in excellent condition. Mrs. Barbara Greco, Box 79, Brant Lake, N.Y. 12815. Tel: Chesterton 2270.

ONE of the last Collins 75A-4 receivers made. S/N 5733. Reduction tuning, dial lock, 500 cycle and SBB filters. Like new, with manual, in original carton, \$425.00. Gonset GSB-100 transmitter, excellent condition, \$175.00. Will ship. WSOXS, 2028 Rock Creek, Arlington, Texas. Tel: 817-CR4-0538.

SELL: A-1 DX-20, \$25. QF-1 O multiplier, \$5.00. Robert Yoder, KJUCO, Box 369, Kalona, Iowa.

SELL: HQ-180-AX receiver, Ranger II F.W. Both used ten hours, mint condition, with manuals and cartons. First best offer. P. O. Briton, \$31.00. New Rochelle, New York 10801.

COLLINS 75S-1, \$30.00. Firm! Frank Darke, 13C Hampton Arms, Hightstown, N.J. Tel: 609-448-0414.

COLLEGE: Must sell, T150A xmt and HE-30 revr. George Moore, 6230 Dove Rd., Smiths Creek, Mich.

4CX250 R's or 4CX250 B's with air sockets and chimneys, \$5.00. Dioded, 500-ma 600-psi, 106 Model 26 teletype page printer, \$40.00 or will take for RTTY tape gear. Wants: 75 mm gears for Model 15 teletype, and 100 kc. xtal. I have a few other goodies for sale. Send for list. Del Thomas, WB2NBY, 15 Creek Bend Rd., Poughkeepsie, N.Y. 12603. Tel: 462-0415.

WILL Swap 3-band quad, 2-element for 18AVQ vertical or keyer. Write for information to Kaftan, 65 E. 32nd St., Brooklyn, N.Y.

GONE Sideband. Sell: DX-100, SX-16, both in gud working order with manuals; SW-3, McMurdo-Silver Model 701 xmt, BC-654, 522 xmt, 6 meter beam Western Electric amplifier 7A, UX-199 and other tubes. Priced to sell. D. R. Abraham, Tyler Hill, Penna.

TRADE: S53 Matchbox 250 2-1 and cash. Want: SB200 kit or assembled. Dr. Rob Baxter, W4YKX, Union City, Tenn.

FOR Sale: Recently reconditioned NC-181D, in vy gud condx, \$100 and vy gud 120, \$25.00. Wanted: 10B or 20A. Ted Hogan, K4VAA, Box 182, Graham, N.C. 27253.

GROUNDLED Grid filament chokes, ferrite core, 10 amp., \$2.95; 30 amp., \$3.65, on cont. U.S.A. W. Deane, 8831 Sovereign Rd., San Diego, Calif.

WANT: Kilowatt Matchbox, Virgil Talbott, W6GTE, 1175 Longhill Way, Monterey Park, Calif. 91754. Tel: AN-88868.

RCA 7735A Vidicon, good picture, \$15.00; 15.75 kc xtal, \$15.00; Vidicon socket, \$2.00; 150 ft. Andrews H-O heliax cable, Heath VTVM and RF signal generator, WB2GKF, Stan Nazimek, 506 Mt. Prospect Ave., Clifton, N.J. 07012.

SELL: New MARS Mobile xmt. Power supply, relay, mike, xtals. Regency ATC-1 conv., \$70.00. K9QZX, LaVern Smith, 3104 Catherwood, Indianapolis, Ind. 46226.

SELL: HW-12 and HW-32. Both in very gud condition. \$105.00 each, plus postage. K3JML, Kollar, 142 South St., Nanticoke, Penna.

COLLINS KWS-1, 75A-4 SWR meter, plus extra 4X250B's; Telrex 6-el. 20 mtr. beam, 60 ft. tower Telrex rotor. Complete station ready to go. K4OHF, Milan R. Burger, 12 E. Peachdilly St., Wynchester, Virginia. Tel: 703-662-8232. No reasonable offer refused.

RTTY Gear for sale, Model 19 and 28 parts and service. Price list issued monthly. Mazer Enterprises, 17740 Bay Circle, Fountain Valley, Calif. Phone (714)-962-4970.

SELL: Telrex beams; excellent. 10 mtr. 3-el., \$40.00; 20 mtr. Supermin, 2-el., \$40.00. Motor/Generator PE-103, excellent, \$15.00. F.o.b. Jackson, N.H., Mack Beal, W1PNR.

POI YCOMM 62B, \$165.00; DX-20, \$20.00; Wheatstone Bridge, \$20.00. AS1 meters, E. A. Vey, WB2IPV, 6 Baker St., Poughkeepsie, N.Y. 12603. Tel: 914-454-2544.

NCX-3-NCXA, complete transceiver, 1 yr. old, new condition with books, \$250.00, firm complete. Ship your expense. W1OHB, 25 Woodlawn Ave., Holbrook, Mass.

WANTED: Military, Commercial, Surplus, Airborne, Ground, Transmitters, Receivers, Test-sets, accessories, Especially Collins. We pay cash and freight. Ritco, P.O. Box 156, Annandale, Virginia (703)-560-5480. Collect.

COLLINS KWM-2, 516F-2, 30L-1, 31ZB-4, serials above 13,000, SM-1, new condition, less than 10 hours on air, package deal only, \$1200. Request offer following package: Communicator IV, 6 mtrs., Gonset VFO, Ham-M rotator, 4 el. 6 mtr. Hy-Gain, 2-el. Tribander Hy-Gain, clock, bug, mike, Closing station, W41H, 6619 Skyline Ct., Alexandria, Va. 22307.

WANTED: Reasonable, 40 ft. crank-up, fold-over ground post tower for Sarasota QTH, W8IQ.

COLLINS 75A4, Serial #5173, 3.1 and .5 kc filters, \$425.00. Don't need 2. W9GIL.

B&W Transmitter #100B excellent, \$150.00. W3KI, 50 Shelburne Rd., Springfield, Penna. 19064.

GUARANTEED A-1 reconditioned equipment on trial approval at very attractive prices. Terms: Collins 75S-1, 75S-3, 75S-3B, 32S-1, 32S-3, 30L-1, Drake 2-A, 2-B, R-4, T-4X, TR-3, TR-4; Gonset GSB-100; GSB-201, G-50, Hallicrafters SX-111, SX-101A, SX-117, SX-115, HT-37; Hammarlund HQ-110, HQ-170, HQ-180; National NC-190, NC-300, NCX-3, NCX-5, NC1-2000. Much other equipment. Write for lists. Henry Radio Company, Butler, Mo.

NEW (GPR-90) revr and companion PAL 350, 350 W output linear amp and pwr. supply. Both units used less than 10 hours. Complete with manuals, \$250.00 each or both for \$450.00 cash & carry only. Need a 10 1/2 inch reel tape deck, mono or stereo. A. Bruno, 185 Hall St., Brooklyn, N.Y.

COLLINS. Complete 500-watt mobile station, KWM-2 with 1A6B-2 noise blanker; 351D-2 mobile mount; 516F-1 DC supply; 516F-2 AC supply; Master Mobile K-73 500-watt linear; Leucec-20 Neville 60-amp. alternator; Hustler antennas 10-80; spec. al. 20 meter whip; Electro-Voice 600D mike; extra tubes \$1200 cash and carry. W1KWP, Merle M. Sanborn, 128 Davis Ave., Brookline, Mass.

SELL Heath HW-32, HP-13, GH-12. Hustler with body mount, cables, ignition, suppressors, manuals. All in excnt condx, \$185.00. W3CPF 1728 Wheatland Ave., Lancaster, Penna.

SAVE: New factory carton Ham-M, \$100.00; TR-44, \$55.00; SB-34, \$345.00; Eico 753, factory w/red, \$249.95. Hy-Gain Tri-lander 1H-3MK2 and 204BA, \$88.00 each. 7115 Mt. Vernon Rd., Evansville, Ind. Tel: 812-422-0215.

TEL-REX Optimum spaced 3-el. 20 mtr. beam. Will not ship. Best offer. See anyone. Warren Cann, 112 "11" St., Hampton Beach, N.H. W1HSC.

PLATE Transformer, Thordarson Type T19P68, 115V, primary, secondary 6000-3900 VCT, 1/2 amp. Best offer. John Zia, 1623 Starngro, New Orleans, La. 70115.

SELL: 100 Navy transmitter converted to 2 meters. Manual included. \$100. K8CVL 114 East Main, Norwalk, Ohio.

HO-160 with speaker, \$160.00; Viking 500 with power supply, \$250.00. K4IOK, 14406 Greendale, Detroit, Mich.

SALE: Zenith transoceanic and Fairbanks-Morse shortwave revrs. Wanted around \$50.00 each. Gregory Ickes, Box 23, Fairview, Penna.

DRAKE 2B, speaker, calibrator, \$200. Johnson Adventurer, \$25.00. W3OAO, A. Hadian D. Focis, Postville, Iowa 52162.

75A3 for sale, in excellent condition, \$235.00. W6KEV, 3088 Greenoak, San Mateo, Calif.

SX-101, McMill receiver, \$150.00; DX-60 and HG-10, \$75.00. Write: WB2PPO, Gregory Smith, 47 W. Hanover Ave., Morris Plains, N.J.

COLLINS KWM-2, 312B5, 516F2, MP-1 condition excellent. Sell as unit, only \$950.00. Also 30S1, \$950. Macomber, 4 Yorktown Rd., Setauket, N.Y. Tel: (516)-251-1507.

TWO-Meter Tecrat TR20-144 transmitter, \$35.00. Tom Henewicz, WA2OBT, 11 Montrose, Allendale, N.J. 07401.

FOR Sale: Parts for 813 linear. List available. Hy-Gain 2BDO antenna, New, \$15.00. W1OER, 135 Barbara Rd., Waltham, Mass.

RADAR Burglar Detector: clean condition, operates at 400 Mcs. by doppler effect. Can be used with existing w/red systems, or by itself without wires. Excellent for home, camp, office, factory or warehouse. Simple installation (5 minutes). Originally cost \$325.00. Will sell for \$75.00. Have 3 units left, with schematics and instruction booklet, 10-Day Money-back guarantee. S.J. Gogel, 1096 Laux Place, No. Hellmore, N.Y. Tel: 516-SU 1-0568.

COLLINS 136B-2, noise blanker, like new. Will ship, \$60.00. R. Simon, 102-36 64th Ave., Forest Hill, Forest Hills, L.I., N.Y. 11375. Phone (212)-897-9650.

WRL's Bluebook saves you money! Take these prices without trades! KWM-2, \$675.00; 30L1, \$341.00; G50, \$197.10; HT-37, \$342.10; SX-99, \$89.10; SX-101A, \$188.10; SR-150, \$341.10; HW-12, \$107.10; AF67, \$44.95; King 500A, \$233.10; HQ-110, \$120.60; R4, \$269.10; Galaxy 300, \$161.10. Hundreds more. Free list. WRL, Box 919, Council Bluffs, Iowa 51501.

KW-DC input amp, for 6 m. Uses 3 4X250B's or 150's, tubes included. Power supply for KW, variable plate, bias regulated screen, relay voltage. Fully metered, all cable harnesses and Dow-Key 60-2B. Best offer over \$500. WB2QQZ, 154-28 19th Ave., Whitestone, L.I., N.Y. 11357.

WANT: 40 ft. E-Z Way tilt-over tower. Clean, reasonable, cash. W9KWC, Jesse Warren, 2311 Buckingham, Westchester, Ill. 60153.

HT-33B. In excellent condx. Tube practically new. Asking \$425.00. H. J. Nadley, W3INH, 307 Woods Road, Glenside, Penna. 19038. Day phone: 215-103-5579.

SELL: HRO-Senior, Ser. D-37 A.B.C.D coils. Manual and HRO-50 A.A. B.C. D coils. Make offer. WA4VNE Rt. 7, Box 482, Raleigh, N.C. 27609.

FOR Sale: BC-610E; BC-614 speech amplf.; KWS-1; 32 V-1, ART-13, R388 revr. W2ZOL.

MOTOROLA and G-E FM equipment for all bands. Clean and guaranteed operating. Also test equipment, parts, accessories. Send for large list. Ray Newsome, K8TJP, 2670 Pinetree, Trenton, Mich. 48183.

NCX-3, NCX-A, Turner 252 mike still in original cartons: \$275.00. R. L. Wand, WA9HVA, 10316 Ronald Court, Indianapolis, Ind.

SWAN 350, 117 C supply, VX-1 VOX unit, spare pair 6HF5 finals, PR-100 xtal calibrator. Purchased new in May 1965 and used very little, \$430.00. Cash or HW-12 and cash. Cliff Hill, W81CY, 639 Lake Ave., Ironwood, Mich.

SELL: SX-111 with matching speaker in excnt condx, \$125.00. Little use due to college. K4SOS, 2722 Emery Drive, Nashville, Tenn.

DX-60, VFO, like new, \$90.00; PMR-7, \$70. S-53A, \$40; Morrow MB-565 75 w. mobile AM/CW/VFO transmitter, \$50. HC-455 converted, \$10. ARC-49 2-meter transmitter, \$15.00. 3B2B's, \$1.00. All in good operating condition. Reasonable offers considered. F.o.b. W9GBD/7, 456 N. Matlock, Mesa, Arizona.

6 Meters-Lafayette HE-45B transceiver, HE61A VFO-Turner 254C mike, 3-ring Halo, Robert Jehu, USN, K1GLL, 21 Bay-side Ave., Newport, R.I.

SELL: Heath Marauder, HX-10, Eico A753 (with transistor VFO), both excellent, unmodified \$160.00 each. Robert W. Curry, W9UYM, 5227 East 21st St., Indianapolis, Ind. 46218.

EXCELLENT Condition: Viking Valiant, \$145. Lafayette HE-45A, transceiver, \$60.00 or best offer. Herb Reed, W2E0G, 109 Stonybrook Rd., Somerville, N.J.

WANTED: Cabling harness for KWS-1. Max Reas, 395 Pleasant St., Truro, Nova Scotia, Canada.

PORTABLE-Mobile G-12-115 volts AM-CW VFO xmttr Gonset G77A, \$69. Gonset Super Six converter, \$9.00 Coil-whip mount, \$19. Richard Shideler, 2812 Tenth Ave., Arcadia, Calif. 91006

SX-117 Hallicrafters receiver with HA-10 low freq. tuner and 7 crystals. Also new \$25 SR-15 Hallicrafters transceiver with AC P/S, \$350.00. HT-45 Hallicrafters Loudspeaker amplifier, all like new. \$290.00. K1PNL. Tel: 203-583-5433.

IT'S Here, now! The biggest price break-thru in the linear business! The ever-famous power-packed Hunter Bandit 2000B is available now for \$249.95 (less tubes) in easy-to-build kit form. Send your order to assure early shipment to: Hunter Sales, Inc. P.O. Box 1128, Des Moines, Iowa. 50311.

R-100A Knight rec. immaculate condx. \$70.00. Ron Trostel, 1419 Cayuga St., Philadelphia, Penna. 1914-. Tel: 215-GL5-2060.

DX-35, excellent condition. \$35.00 plus postage. Elmac PMR-6A, dual-conversion receiver, with P/S, \$40.00 and postage. V-F-1, lousy but free (plus postage) Pete Rogers, WB2OSR, 30 Mason St., Rochester, N.Y.

CLEGG Interceptor, \$265.00; Northern Radio variable Master Oscillator, R-32 Mc, \$45.00; 200 watt Multi-match modulation transformer, \$10.00; Harvey regulated metered, B+ power supply, \$15.00; NC-638-A frequency meter, \$15.00; RCA AR-88LF receiver, \$90.00; Harvey-Wells R-264/GND, 100-160 Mc., receiver with power supply, \$50.00. Components, all kinds, 65% or more off net. Write for list. WA6YZG, Traver, 59A Burroughs Ave., China Lake, Calif.

COLLINS 32S-1 with power supply and 75S-1 with 455K-15 filter with modifications to rec. and trans. RTTY, \$620.00; 30S-1, \$800.00; RTTY Mod. 15 with converter and pwr. \$100. All A-One condx. Come after the entire package for \$1500 and receiver Heath scope and many other goodies free. C. A. (Doc) Traverse, 515 Collese, Alva, Okla. 73717. Tel: FA7-1151. NC-300, \$155; SB-400, \$260.00; HM-11 SWR bridge, \$12.00; Vibrox Original, \$14.00; BC-342, \$45.00; AR-22 rotorator with wire, \$23.00. Mostley TA-32R, \$25.00. Terry Miller, WB2-LMH, 76 Woodland Ave., Summit, N.J. 07901.

SWAN 350 with AC speaker, original boxes, 6-element 6-meter beam, like new. 2 FM GE mobile units, 1 base with AC supply on \$2.525 P.M. excellent condx. Harold Medley, R #1, Cambridge City, Ind.

CALIFORNIANS! Ham Directories of San Francisco, Los Angeles, Oakland, Long Beach \$1.00 each. Los Angeles, \$1.50. Directories ready for distribution July 25th. Gary Schwartz, 3171 Walker, Rossmoor, California 90720.

SIX Months old: Challenger and Lafayette HA-90 VFO, \$112.00; Lafayette HA-225 rcvr, \$93.00. All for \$195.00. W2-HKE, Howard Kass, 601 Bristwater Court, Brooklyn, N.Y. 11235.

RANGER, \$95.00; RME 6900 \$240.00. Mike Bellinger, 129 1/2 Main, Ames, Iowa.

NOVICES! SX-140, \$70. Perfect condition. Ken Wratten, 76 Spring St., Adams, N.Y.

NEW McCoy 32-B1, \$22.00; Used Knight R-100A, \$75.00; T-60 w/xals, Drake lo-pass, \$38.00; P-2, \$10.00; Heathkit AR-3, \$22.00; HD-11, \$8.00; Dow-Key DK-60-G2C, Blitz-Bug, \$10.00; 800V Supply, \$25.00. Handbook 6m Nuvistor Converter, \$25.00; H-Gain 6SB, \$6.00; \$7.50, \$5.00. Everything for \$200. Chuck Sauer, W0HHG, 1635 Highridge, Columbia, Missouri.

HEATHKIT HW-22 transceiver, \$100. Also SB-10 SSB adapter, \$80.00, both in exlnt condx. John, K4OAC, 1948 Shelton Rd., Jacksonville, Fla. 32211.

HT-32B, \$275.00; Thunderbolt, \$250.00; SR-500 with A/C supply, \$290.00. All in perfect condx. Local or pick-up deal only. John D. Voss, Voss Radio & Appliances, 3008 South Laramie Ave., Cicero 50, Ill.

A Real gem! Panoramic Adapter BC-1031C; three inch scope with 100 KC on each side! Looks and operates like new. First certified check for \$125.00 takes it. Will ship collect: 75A4, looks and operates like new! Still the best receiver for SSB. Best offer over \$375. HT-32B, less than 25 hours of use on this SSB transmitter. Purchased new and treated with tender loving care! Best offer over \$400. Prefer local deal but will ship collect. TH-4 Thunderbird beam, complete with rotator, indicator, coax, and hard-to-find collapsible steel mast (Signal Corps). \$125.00. Sry, will not ship. Prefer local sale on this item. W1ULR, 16 Edgell Road, Swampscott, Mass. Stan Cokas.

CRYSTALS Airmated: MARS, Marine SSB, Nets, Novice, Custom finished, any frequency, 01% FT, \$43. \$50.00 to \$190. \$1.90. (Five or more same or mixed frequencies \$1.70) (Net crystals ten or more same frequency \$1.35). 1700-3499 and 8601-20,000 \$2.50. Overtones supplied above 10,000. Add 50¢ each for .005% into 32pf. Inquire regarding other frequencies and crystal kits including SSB Package, IMP, DCS-500, and many other ARRL Crystal Kits. Send for price-order-information sheet. Custom order closes 1/31/81. Crystals since 1933. C-W Crystals Route 2, Box 22-B, Marshfield, Missouri 65706.

FREE Copy of totally new ham publication. Send OSI or postcard today. Nothing like it before! Ham's Market Newspaper, Box 13934, Atlanta 9, Ga.

Elmac Vacuum variable capacitor VVC60-20, new, \$30.00; Elmac 4-1000A, new, \$50. Postal m.v.c. only. Dick Mitchell, R. 1, B59, Winnebago, Ill.

WANTED: KWM-2, 516F-2, K3JFV, 18 W. Front St., Media, Penna. Tel: 215-LO6-0934.

HOUSECLEANING: Ham gear. Send postcard for list. W8-YHU, 921 South Woodside, North Canton, Ohio 44720.

DRAKE R4, T4X, M54, AC3, in original cartons with manuals and cables. In mint condx, no time to use. Package price, \$735.00, no trades. New parts for 4-1000A rig, including

punched panel, chassis, solid-state power, etc. SASE for list, will sell or trade for hi-fi gear, Bill Moore, K5HTF, Box 53444, Oklahoma City, Okla. Tel: AC 405-292-2337.

SACRIFICE: Gonset G-50 mint, mike, rotobrake, new Telrex beam and rotator, cost \$525.00. Sell: \$215.00. K6BTH, 123 Forbes Ave., San Rafael, Calif.

VALIANT II, Mint condition, factory-wired. Will pay shipping. \$250.00 or your best offer. K1EZA, Stable, 8 Flanders Lane, Wakefield, Mass. 01880.

KNIGHT R-100A receiver with xtal calibrator, \$85.00. Eico 723 transmitter, \$35.00. Jim Buck, 4860 West Richfield Rd., West Richfield, Ohio 44286.

WANTED: Unit 11B of 0-153/URT synthesizer; Ferris 16C generator; Triplet 221-PL DC meters 1-100 volts and 0-1 amp or 0-1000 Ma.; Weston 155 or 433 0-150 volts AC; H-P 410C voltmeter; exciter section from Collins 32V series; CV253/ALR tuning unit; TMC VOX VFO. Robert Ireland, Pleasant Valley, N.Y. 12569.

SELL: NCX-5 and NCX-A in mint condition in original boxes with book, \$495.00 cash. George Lasaly, Rte. 3, Box 79C, Oklahoma City, Okla. 73127.

FOR Sale: SX-101A, \$180.00; Valiant I xmttr, \$170.00. Both are in perfect condition. W1OER, 135 Barbara Rd., Waltham, Mass. 02154. Tel: 617-854-1039.

SB-33 Sideband transceiver and SB1LA linear, both for \$375.00. SB-33 alone, \$145.00. Hallicrafters HT-40, \$40.00. Philip Schwebler, Jr., W9GCG, 4536 N 50th St., Milwaukee, Wis. 53218.

HEATH Warrior, 1 kw linear amp, in exlnt condx. \$140.00; Twoer, \$35.00. Sorry, no shipping on amp, W2MVR, James Geras, 108-12 227th St., Queens Village, L.I., N.Y. Tel: 212-HO-48777.

HQ-180 AC, matching speaker, used less than 50 hours, immaculate condition, serial No. 7043, in original carton, \$325.00. New, sealed. Johnson 275 Matchbox and coupler indicator, \$7.00. W. G. Bourgeois, RD 1, Box 265, Katonah, Westchester Co., N.Y. 10593.

SELL: Hallicrafters HT-37 transmitter, \$210.00; HA-5 VFO, \$40.00. Both in absolutely mint condition with manuals, cartons, and accessories. Inspection invited. All inquiries will be answered. Donald Cook, WB2DUJ, 62 Bay Ridge Parkway, Brooklyn, New York 11209. Tel: 212-745-4566.

HT-32, \$260.00. You pick up, I will deliver within 150 miles for \$15.00 additional. In exlnt condx. W1RUU, Robert Strid, 302 Oak St., Raynham, Mass. 02767. Tel: 617-823-1923.

TRANSMITTER, 1000W Hallicrafters BC-610D with coils for 10, 15, 20, 40 and 80 M. Extra tubes and instruction book. Asking \$350.00. Receiver, Hammarlund HQ-100C, with clock. Asking \$120.00. Dr. M. L. Turf, 36 Timber Mill Rd., Stamford, Conn.

SELL: Ranger with P.T.T., \$110.00. Bud 66 inch cabinet with cover, \$150. Lafayette 60 watt PA, amplifier \$30.00. Nikko, KE-250 mm telephoto zoom lens with case, new, \$375.00. W2-PQG, Stan Sears, 188 Concord Drive, Paramus, N.J. Tel: 201-261-4760.

SELL: Hy-Gain 18 HT all-band vertical antenna, like new. Will help dismantle. Furnish set-up instructions. Come and get it for \$75.00. W8LEZ, Harold Collins, 225 N. Jackson, Lowell, Mich.

SX-101A, R-47, latest model. Spinner knob, \$200. No. 20 teletype, polar relay, table, \$50. Central Electronics MM-2 scope, \$50. Will ship. Wanted: NCX-3, NCX-A, Kramer, 8691 148th St, Jamaica, L.I., N.Y. Tel: 212-SP-6-8163.

CLEANEST Globe King 400-B in existence. All bands, phone gear w/ half-aton, Spares and manuals, \$125.00 or offer. K6-ILM, 835 Valencia St., San Francisco, Calif. Tel: 415-282-3200.

DX ANTENNA System: 70 ft. Rohn tower with stacked 20M beam, 15M beam, 10M groundplane attached to 3-bedroom deluxe QTH between two lakes, \$19,500. Details and photos on request. Also excellent HQ-170 receiver, \$170.00. K41IF, HX 205, Winter Haven, Fla.

COLLEGE Bound: Mavarder, \$250.00. SX-101A, \$210.00. SR-160 and DC supply, \$300. Ron Buswell, WA8GEM, Gateway Motel, Houghton, Mich.

TR-4, \$495.00; AC-4, \$83.00; DC-3, \$123.00; RY-4, \$68.00. Factory sealed boxes. Warranty, naturally. Will sell separately. Mel Palmer, K4LGR, Box 10021, Greensboro, N.C. 27404.

KNIPT V-44 VFO. In exlnt condx. \$19.00. WA6ZMR, David Fisher, 243 Cimmaron, Glendora, Calif. 91740.

VIKING II and VFO, \$99.00; Courier 506 watt linear, \$129.00; C18P100, \$175.00; Collins 32V-1, \$99.00; 75A-1, \$125.00; HX20, \$119.00; SW240, \$219.00; SW-350, \$319.00; 75A4, \$329.00; SX-111, \$129.00; 2A, \$149.00; NC-200, \$149.00; AF67-S, \$35.00; Free list. Howard Radio, Box 1269, Abilene, Texas 79604.

OFFERING \$600 for mint KWM-2 and 516-F2. I'm not cheap. Must consider family, hI KL7EPI, Box 192, Rte. 1, Myrtle Creek, Oregon.

VALIANT, \$175.00. FW, working. Looks new. WA0FVJ, 4825 W20, Topeka, Kans. 66604.

TR-4, MS-4, AC-3, \$550.00. Eico 723, \$40.00. ART-13, in working order, \$30.00. Write to K8LNL, 833 Crowden Dr., Cincinnati, Ohio 45224.

GALAXY V, with AC supply, in perfect condition. Manuals and cartons. Wonderful transceiver. Reason for selling: going into army. One price: \$395.00. H. Webb, K2GKH, 140 Ocean Ave., Jersey City, N.J.

COMPLETE Station: Hallicrafters, SX-111, Globe Chief 90, T-R switch, xtals, key, \$149.00. Craig Scoughton, 423 4th St., S.E., Watertown, South Dakota.

SX-71, drifts, \$25.00. Heath calibrator, \$5.00; Signal Sentry, \$5.00. National regenerative rcvr, all coils, 80/10 p/s. Almost complete parts kit RA06 rcvr. Shipping charges extra. K1CUD, Roda, 26B Conwell, Provincetown, Mass. 02657.

ADVENTURER and Heathkit GR-64 for sale, \$30.00 each, both for \$50.00. Good condition. W9NQT, 461 King Lane, Des Plaines, Ill. 60016.

COLLINS Complete station; \$1100.00; 75S-1 with Waters Q-multiplier/notch filter, matching speaker, \$325.00. 32S-1 with 516F-2 power supply, \$450.00; 30L-1 linear, \$450.00. Purchased new. Kept in air-conditioned quarters. Absolutely perfect mint condition. Will bear most scrupulous inspection. Used very little. Will consider trade on new Avionics radio gear, K9MDG, Perry Mowery, 21 Waibel Rd., Bartonville, Ill. Tel: 697-6597.

UTAH Amateur Directory. Over 1250 stations. Cross-indexed by towns. Up to date. \$1.25 ppd. UARC, 2218 Wilmington Circle, Salt Lake City, Utah 84109.

COMPLETE Novice General station: T-150A xmttr, HQ-100A rcvr, key, xials, antenna and coax. All in xcint condx. \$210.00. Antique tubes and gear. WB2RPO, 3 Sedgewood Dr., Morris Plains, N.J.

COLLINS 30L-1, \$330.00. Delivered within 150 miles. K2OGA, Robert J. Miller, 245 Scudder Avenue, Northport, L.I., N.Y.

71 Ft. Tristao self-supporting tower, with electric winch and tilt-over base, \$900. Collins 62S-1, in sud condx. \$550.00. WA6IUM, Box 153, Ft. Jones, Calif. Tel: (916)-468-5126.

FOR Sale: Hammarlund HX-50, late model, like new. \$225.00. Waters 359 com-preamp, \$20.00. W0CKC, 1024A Claytonia Terrace, St. Louis, Mo. 63117.

TOROIDs, 88 mh uncased, \$7.52.50. Postpaid, Humphrey, WA6FKN, Box 34, Dixon, Calif.

COLLINS VFO's: 70E-23 for KWS-1, new \$399; 70E-12 for 75A-3, new \$39.00; 70E-1A for 32V, new \$29.00; 70E-1 for KWM-1, new \$29.00; 70E1B for R-392, new \$49.00; 70H12 for R390A, new \$49.00. Richard E. Mann, 430 Wilmot Road, Deerfield, Ill.

AUGUST Specials: Hy-Gain 20% off. New SB-34, \$335.00. SB2-LA, \$220. Swan or Galaxy W/AC, \$435.00. TR-4, \$515.00. Swan Mark I, \$470.00. W/T Ham-M, \$100.00. Save at Evansville Amateur Radio Supply, 1306 E. Division St., Evansville, Indiana. Tel: (812)-422-4551.

SELL: HW-12, \$90.00; DX-60, \$50.00; R-100A with S-Meter, \$60.00. Kit Schellens, Westbrook Rd., Essex, Conn.

NC-155, all ham band receiver, perf. condx. \$125.00 or best offer. Hamley, 604 East Rockwell, Arlington Heights, Ill. Tel: 259-4806.

NCX-3, best offer over \$200.00. Consider trade for SB-33 or SB-200. W8DRV, 6890 Parma Park, Cleveland, Ohio 44130.

FOR Sale: Collins 32S-3, 75S-3B with 200 cy and 4 kc filters; 30L-1, 312B-4, and 516F-2 without cabinet. Excellent condition. Best offer over \$1,650.00. Jim Taylor, W8EEC, 23874 Oak Lane, North Olmsted, Ohio.

FOR Sale: Collins 30L-1 linear amplifier—new, in original case, contact: Commander Aviation, P.O. Box 639, Pontiac, Michigan.

QSTs, Fairly complete run going back to 1928. Issues are unbound, but they are clean crisp copies, not clipped, cut, or damaged in any way. We have most you need. Will sell singly or lot. Make offer. Mrs. W. K. Carroll, 229 East Oak St., Redwood Falls, Minn.

FOR Sale: HT-37 SSB Xmttr and Drake 2B rcvr. Best offer for cash. Or will trade for what have you. H. Wassser, 9 Butternut Drive, Blauvelt, N.Y., or call DA3J-0860.

SSB KW Mobile. SBE equip. SB-33 trnsrvr. SB-1LA linear, VOX acc., mic, brackets, SB2 and SB3 inverters, Webster KW "Topsider" whip (20M and 40M coils), Complete; \$600 ppd. KODTO, Jerry Nielsen, P.O. Box 1217, Blytheville AFB, Arks.

FOR Sale. Excellent condition, best offer: DX-35 Heath, DX-100 Heath; Heath VFO 160 to 111 meters. H. Mancino, K2ZDS, 1330 Mamaroneck Ave., Mamaroneck, N.Y.

SELL: Johnson Challenger (xmttr) 80-6 meters; Globe Deluxe VFO 160-6 mtrs; 14 AVO antenna; T-R switch, 6 mtr. (5-cl) beam; Ameco 6 mtr. Converter (Nuvistor) and power supply; 500 and 59 U coil; cable; transceiver; WB2FOJ, Helmut Michitsch, 7448 64th Place, Glendale, N.Y. Tel: (212)-GL6-5761 or JU-6-5000 Ext. 2573.

SALE: Heath Apache transmitter with sideband adapter and Chippewa kilowatt linear, including power supply. Hardly used. Make offer. K1ACY, 246 Soundview Ave., Shelton, Conn.

SACRIFICE: Collins 32S-2, cost \$746, price: \$465; 75S-2, cost \$600, price \$365. Both cost \$1,346. Price \$255. HP AC sup, \$39.00. Orig. owner, in mint condx, used very little. No time to operate. Drake TR-3, clean, cost \$550. Price: \$365. AC-3 Sun, \$59.00; freq. mtrs, TS/174 or TS/175, \$75. Tooobes: new, factory sealed cartons. PL 172, \$75; 4-400, \$18.50. Used: excellent 4-1000A, \$45; 450 TL, \$24.50; 250THs, \$8.00; 813s, \$8.00; new (2) 304 TLs, \$24.50 ea. 810s, \$12.50; Collins KWM-1 mobile mount, excellent, \$25.00; certified check or m.o. S.A.S.E. Additional list. W4PLP, P.O. Box 3667, Fayetteville, NC. Tel: 919-484-6456 after 5 PM.

HAMMARLUND HQ-180C; excellent, as new, w/matching speaker, \$315.00. D. A. Keller, 4011 Soutter Ave., S.E., Cedar Rapids, Iowa 52403.

DON'T Struggle with the code! The Codemaster system is a planned program of code learning on magnetic tape which brings you from scratch to 15 WPM. Thousands have learned by this method. Two-hour tape, \$5.95 postpaid. Brochure free. Codemaster, Box 29, Portsmouth, R.I. 02871.

EXCELLENT NC-300 receiver. Factory modifications, alignment. Best offer U. S. coins or cash. Godsey, 525 N. Ninth, Arkansas City, Kans.

COLLINS 75S-3, 32S-3, 516F-2 and 312B-4. Perfect appearance any condition, \$1100. R. F. Farmer, W8EPN, 5229 Woodmont Dr., Kalamazoo, Mich.

COMPLETE Station, Apache, Mohawk, SB-10. Cables, manuals. \$425.00. Dumortier, 1754, \$250.00. Will deliver within 200 miles. K4DNY, 240 Pendleton Rd., Clemson, S.C. 29631.

WANTED: Telrex TC-99, any series. W1OUZ, Ernest Hrosselman, 210 South Rd., Farmington, Conn. Tel: (203) 521-3617 after 5 PM.

IS My Elmac rix worth anything to anybody? Chrome plated A-7, FMR-7, M1070, 5 strips, and mount. Must sell. Will take best offer over \$100. K8DQC, 6815 Oakes Rd., Brecksville, Ohio 44141.

FOR Sale: One RCA AVR11 radio receiver 150 kc-550Kc, 550 Kc thru 22 Mc. One RCA AR88 radio receiver with meter same as new; one Westinghouse TCE-1 transmitter less power supply, with all plug-in units. Best cash offer. W2YXW, 904 Morgan Ave., Palmyra, New Jersey (609)-829-3027.

EXCESS Gear and parts: VAC variables, variable coils, tubes, meters, transformer, 2 VV linear, diodes (HV), etc. Stamp for complete list. W6MCS, Rte 1, Box 666, Arroyo Grande, Calif.

DX-100 xmttr (Heath) 1 SX-101 rcvr (Hallic), and accessories: \$400. Write S. M. Leman, 821 Albaric, Wyckoff, N.J. 07481 or call (201) TW1-0676.

SELL: DX-35 with ARC5 VFO, speaker, SX28-A, \$60.00. Ideal Novice c.w. station. WASMYG, 108 Albany, Victoria, Texas.

NCX-5 transceiver; NCX-2 power supply, perfect, used only 20 hours; \$425.00. WA4GYA, 2207 Harvard, Ft. Myers, Fla. 33901. Tel WE-6-1726.

DRAKE 2B. In excellent condx. 2BQ speaker and calibrator: \$200. Bert Simons, K4YLP, 8413 Zell Lane, Richmond, Va.

FOR Sale: Hunter Bandit 2000B linear, less tubes. New unused, in factory carton: \$325.00. K0GVB, RR #2, West Branch, Iowa. Tel: 319-643-2287 evenings.

SELLING: AR-22 rotor and/or Finco 6 & 2 meter beam. Best offer. Schwartz, 1129 Astor Ave., Bronx, N.Y. 10469.

FOR Sale: BC-610 xmttr (on wheels) with all channels, including speech amplifier and antenna tuner, \$300.00. ART-13 xmttr, \$400.00; BC-100A receiver and supply (HC-779 with BC band), \$75.00. K6VYV, Box 214195, Sacramento, Calif.

"HOSS-TRADER" Ed Moory offers for cash demonstrator floor models with factory warranty: first certified check received has purchase priority. SB-34, \$329.00; Swan 350, \$349.00; Galaxy SB-33, \$399.00; 75A-3, \$499.00; Ham-M rotor, \$89.95; NCX-5, \$449.00; NCT-2000, \$499.00; Rd-4, \$329.00; New Mosley TA-13 beam and demo Ham-M rotor, \$159.00; New Mosley TA-13 on used gear: HT-37, \$239.00; 2-B, \$189.00; SX-11, \$129.00; SX-101, \$139.00; 75A-4, new \$449.00; SB-33, \$189.00; Heath HW-22, 40 meter transceiver, \$109.00; KWM-2, \$696.00; 32S-1, \$389.00; 75S-3, \$399.00; Thunderbolt, \$239.00; 600-L, \$149.00; SB-1 linear, \$149.00; T-4, \$319.00; TR-4, \$429.00; TR-3, \$389.00; HT-37 (needs repairing), \$189.00. Terms: cash. Ed Moory Wholesale Radio, Box 506, DeWitt, Arkansas. Phone 946-2820.

SELL: National NC-270, \$150.00; Johnson Viking II, \$90.00; Lafayette HA-90 VFO, \$25.00. Skip Watts, WB2SNR, R.D. #2, Middle Road, Hudson, N.Y.

SALE: Central Electronics 100V, \$299.00; WA1GGQ, 182-B School St., South Acton, Mass. 01771. Tel: 263-4468.

SB-33, late (Series SF-1) with DC supply and mount, \$200.00. Clean HT-31 linear, \$100.00 (prices hold only if I don't have to contact). W. Thiele, 215 E. Main, Somerville, New Jersey 08876.

MINT HO-129X, \$85.00; Amplydne C-61 6M Nuvistor converter and power supply, \$25.00; Tecraft 6M transmitter, \$30.00. Will trade for 99'er or Gonsat Communicator III. Steve Schwartz, WA2YDN, 340 West 86th St., New York, N.Y. Tel: 313-SU-7-8951.

SELL: HT-37, \$225.00; Heathkit HO-10 monitor scope, \$45.00; Veroplex Original, \$5.00; Turner 254C mike, \$7.00. All f.o.b. K5SPM, 11415 Critten Way, Houston, Texas 77024.

SELL Invader 200, \$250 or your best offer; 2B, 2BQ, 2AC, xtals, \$225.00; I-60, \$35.00; T-4, VFO, \$25.00; T-3E, \$35.00; Two cr, \$40.00. R. Nevers, 2438 Stanley St., New Britain, Conn. 06058.

HEATH HP-14 kw compact mobile supply kit in carton opened for inspection only. Will ship to first offer over \$70.00. Also, Heath HO-10 signal monitor, completely new, and in perfect operating condition. Cabinet in A-1 shape. Will ship to first offer over \$60.00. Send check or money-order to Pete Chamney, WIBGD, 111 Buena Vista Road, West Hartford, Conn. 06107. Shipping Continental U.S. and Canada only.

DRAKE R-4 Receiver. Original packing, manual, guarantee card. As new. Bargain! W61EJ, 2890 San Francisco Ave., Long Beach, California 90806. Phone GA-7-8203.

CLEGG Zeus with PS/Mod unit, \$400. Art. WA9IQP, 811 Franklin, River Forest, Ill. 60305.

NC-300 with xtal calibrator and speaker; 2nd conversion osc. Xtal controlled with switchable xtals for USB/LSB; coil compartment heater; excellent condition, \$160.00. R. Markel, W2VLS, 1435 Lexington Ave., New York 10028.

ESTATE. Must sell. One owner. mint. HT-32A, SX-101A, Heath linear, extras: \$800.00. Ameco TX-86, \$75.00. B. R. Bausch, 382 Norfield Blvd., Elmont, N.Y.

WANTED: Collins 51S1 receiver, excellent condition, right price. W9MJJ, 3700 Van Buren St., Gary, Indiana 46408.

FOR Sale: By original owner, HT-37, HT-41, HO-160 plus all accessories such as T-O keyer, Waters comp-preamp., etc. All in excellent condition. Prices reasonable. All replies answered immediately. Write: P. A. Larro, 44 Washinton Ave., River Edge, N.J.

HALLICRAFTERS SR-42, new Xmas 1965, perfect, original carton, practically unused due to shortage of time: three crystals, Turner mike with coil cord, real nice 2-meter station, ready to go, \$100.00. E. P. Simon, M.D., W2KOY, 850 Richmond Road, East Meadow, N.Y. 11554.

WANT: Johnson Thunderbolt Linear Amp, for 6 & 2 meters. Info on condx and price to Dr. Coy Byrd, WA4HAV, 118 E. 9th, Charlotte, N.C. 28202.

COLLINS 32S-1 transmitter; 75S-1 receiver with 500 cycle mechanical filter; 516F-2 AC power supply, \$75.00. In mint condx. Hy-Gain 40-20 beam, \$75.00. WA8LNQ, Bob Winters, 5392 Antoinette Dr., Flint, Michigan 48507. Tel: (313) 694-6777.

FILTER Condensers, oil-filled 6,000 VTFI mfd. Westinghouse, \$5.00 each; UTC CG310 high power broadcast plate transformer, \$75.00. Dick Mitchell, R 1, B59, Winnebago, Illinois 61088.

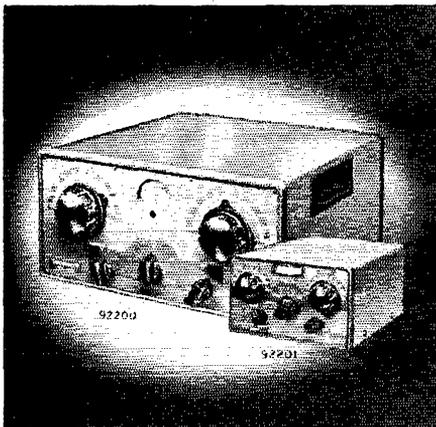
RTTY Channel filters, octal mounted in plastic case. Standard 2125/2975 cps, \$5.00 pr. Any other frequency, \$3.25 each. Test data enclosed for each filter. Jim Cooper, W2BVE, 834 Palmer, Maxwood, N.J. 07607.

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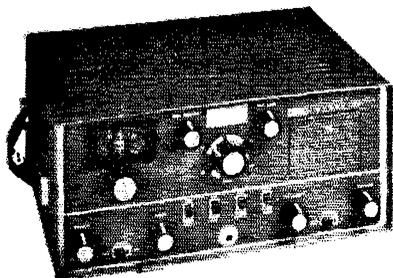
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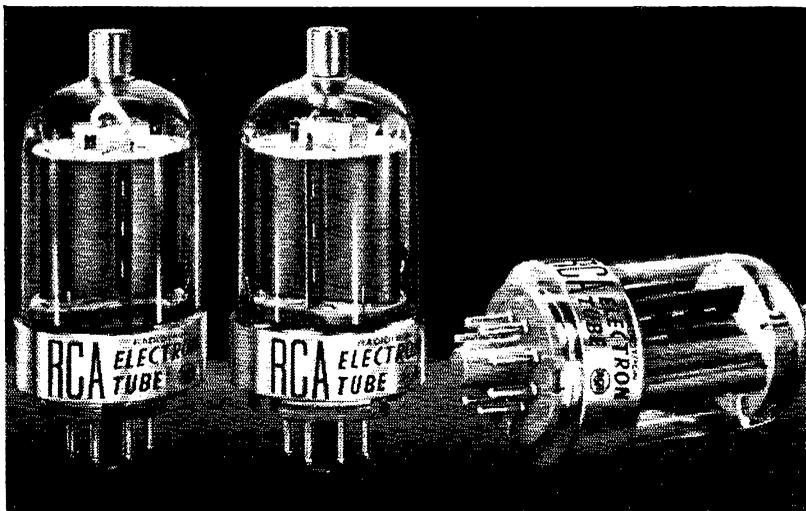
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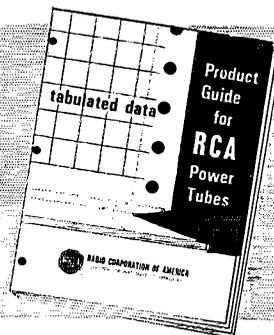
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