QST

amateur radio

November 1963

50 Cents

55c in Canada

PUBLISHED BY THE AMERICAN RADIO RELAY LEAGUE

In case you figured we had plans for a transmitter that would transceive with the ***SX-117*** . .

SX-117 SPECIFICATIONS

Exceptionally versatile and compact triple-conversion, superheterodyne communication-type receiver. **Transmitter-type V.F.O.** can be used as crystal locked oscillator; **Selectivity:** Variable in 3 steps, 500-5,000 cycles. Crystal-controlled 1st and 3rd oscillators. Selectable sidebands, constant tuning rate. **Sensitivity:** less than 1 mv. on AM, less than ½ mv. on SSB/CW. **T-notch** for up to 50 db. attenuation to unwanted heterodyne in I. F. pass band. I. F. type noise limiter. Audio inverse feedback. Crystals provided for 3.5—4.0, 7.0—7.5, 14.0—14.5, 21.0—21.5, 28.5—29 mc. Four addt'l. crystal pos. for 500 kc. segments between 85 kc. and 30 mc. Size: 15″ x 17⅛″ x 13″. Net wt. 18 lb. Amateur net price: $379.95.

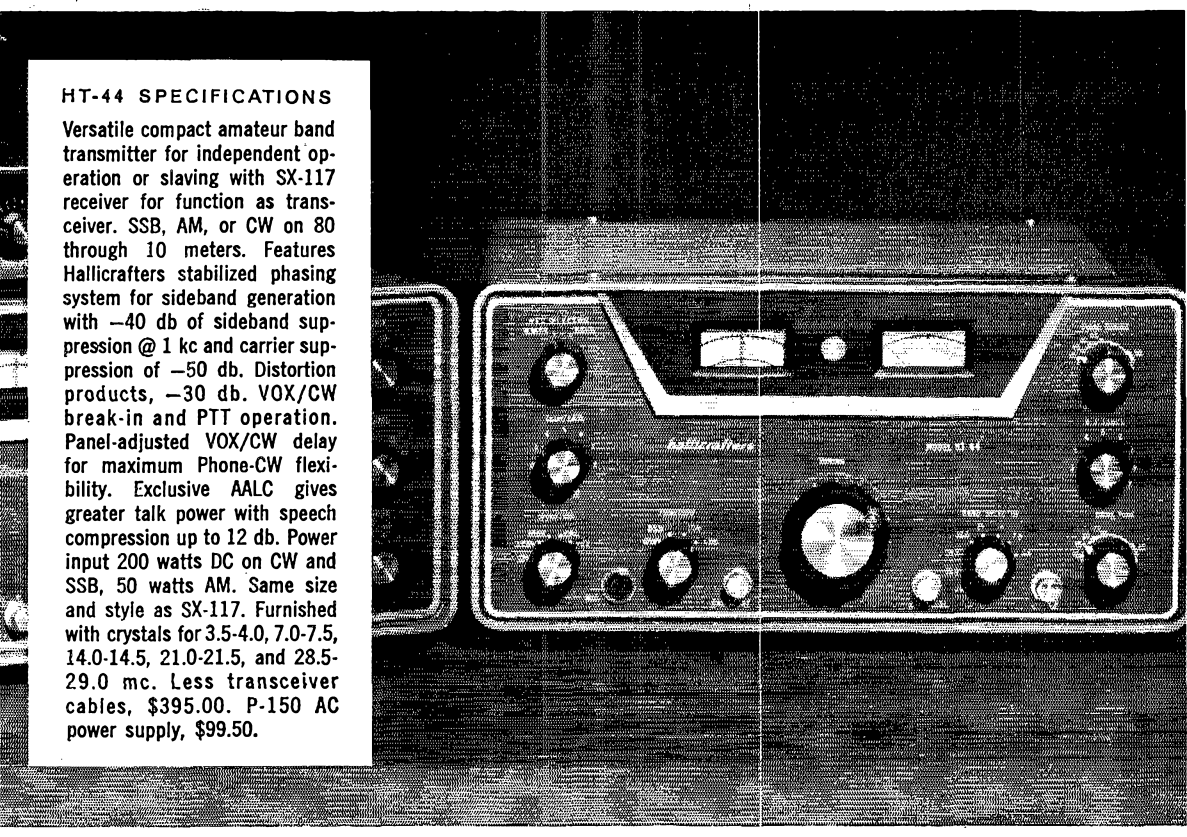
HA-10 Low freq. tuner adapts SX-117 for 85 kc.—3 mc. $24.95

No other receiver in its class has proven so versatile and reliable as the SX-117. Part of the story is its frequency coverage capability . . . variable selectivity . . . crystal-controlled H.F. oscillators and other high-performance features. Now comes the sequel — Hallicrafters' new SSB/AM/CW HT-44 transmitter. On its own, the HT-44 gives you 200 watts DC input, SSB and CW . . . break-in CW

The unit that stacks up best alongside the ***SX-117*** *is* .

the new ideas in communications
are born at . . . ***hallicrafters***

you were right



HT-44 SPECIFICATIONS

Versatile compact amateur band transmitter for independent operation or slaving with SX-117 receiver for function as transceiver. SSB, AM, or CW on 80 through 10 meters. Features Hallicrafters stabilized phasing system for sideband generation with −40 db of sideband suppression @ 1 kc and carrier suppression of −50 db. Distortion products, −30 db. VOX/CW break-in and PTT operation. Panel-adjusted VOX/CW delay for maximum Phone-CW flexibility. Exclusive AALC gives greater talk power with speech compression up to 12 db. Power input 200 watts DC on CW and SSB, 50 watts AM. Same size and style as SX-117. Furnished with crystals for 3.5-4.0, 7.0-7.5, 14.0-14.5, 21.0-21.5, and 28.5-29.0 mc. Less transceiver cables, $395.00. P-150 AC power supply, $99.50.

operation . . . Hallicrafters' exclusive stabilized phasing system and Amplified Automatic Level Control (AALC) . . . VOX/PTT and a dozen other solid value features. Interconnected, this great new Hallicrafters pair gives you independent or transceive operation at the flip of a switch—and a whole new world of flexibility. Your distributor will give you a convincing demonstration today.

the NEW HT-44 Transmitter by hallicrafters

Fifth & Kostner Aves., Chicago 24, Ill.

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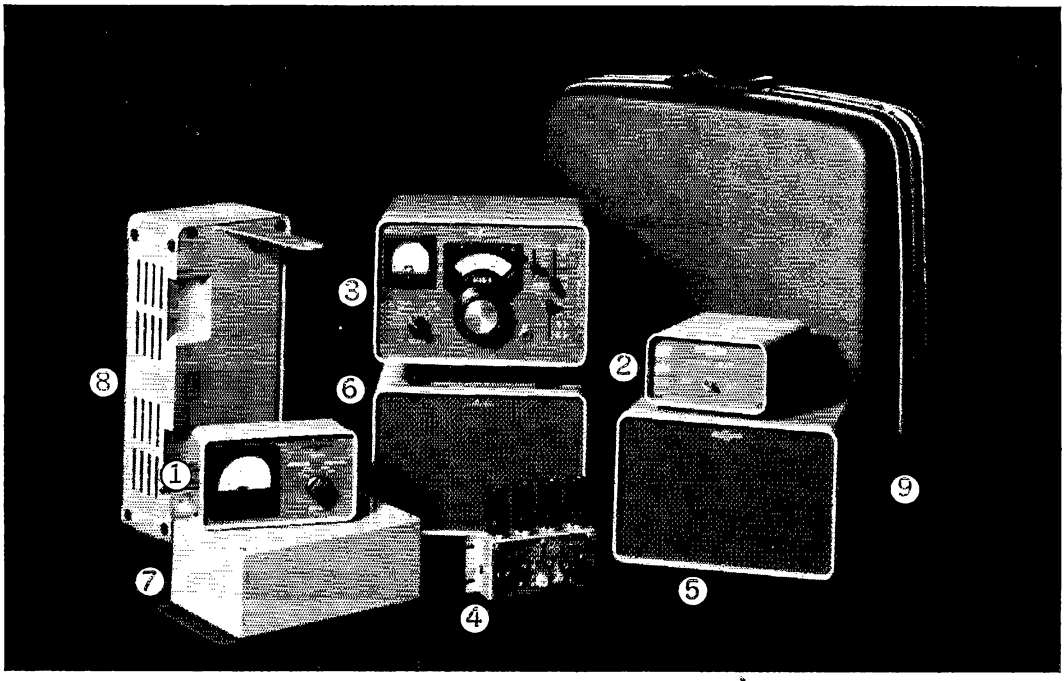
Improve your rig with these Collins accessories



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

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

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

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

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

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

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

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

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

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

Do your Christmas shopping early.
See your Collins distributor today.

COLLINS

QST

NOVEMBER 1963

VOLUME XLVII • NUMBER 11

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—CONTENTS—

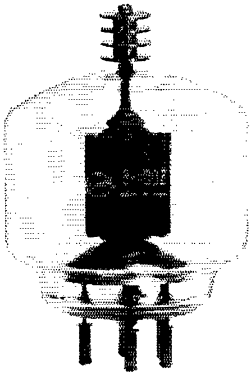
Eimac zero bias triodes offer economy, simplicity, low distortion

by William I. Orr, W6SAI

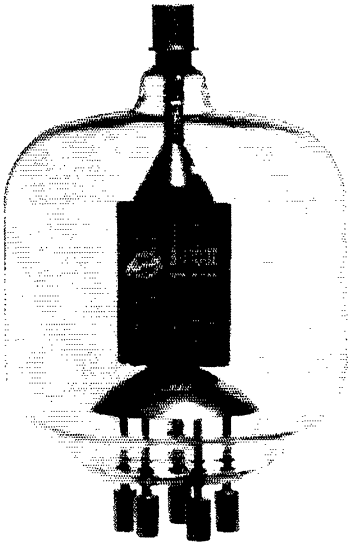
The Eimac 3-400Z and 3-1000Z are zero bias triodes especially suited for single sideband operation in the amateur service. Costly and bulky screen and bias supplies are not required. The tubes are small and rugged and are designed to fit into modern, compact transmitter design. Best of all, they provide improved linearity and a reduction of bothersome intermodulation products when operated in an approved circuit.

The 3-400Z is rated to 1000 watts p.e.p. input and the 3-1000Z is rated to 2000 watts p.e.p. input. These ratings are established at moderate plate potentials and result in third- and higher-order product distortion figures better than -35 db below maximum output. These ratings are for continuous, key down service!

For a zero bias package including complete details and application information write me today c/o Amateur Service Dept., Eitel-McCullough, Inc., San Carlos, California.



3-400Z



3-1000Z

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Section Communications Managers of the ARRL Communications Department

Reports Invited. All amateurs, especially League members, are invited to report station activities on the first of each month (for preceding month) direct to the SCM, the administrative ARRL official elected by members in each Section. Radio club reports are also desired by SCMs for inclusion in *QST*. **ARRL Field Organization station appointments** are available in areas shown to qualified League members holding Canadian or FCC amateur license, General or Conditional Class or above. These include ORS, OES, OPS, OO and OBS. SCMs desire applications for SEC, EC, RM and PAM where vacancies exist. OES, v.h.f. bands appointment, is available to Technicians and Novice, as well as to full-privilege amateur licensees.

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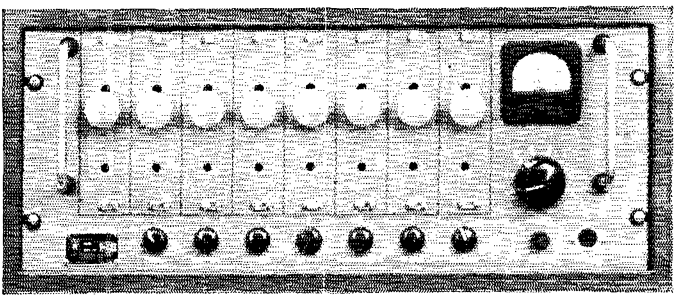
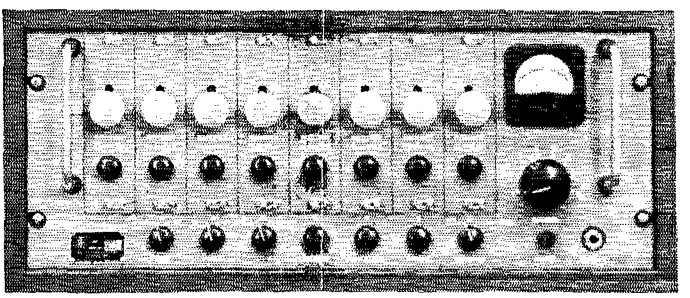
A COMPLETE SOLID STATE SSB EXCITER SME-I

and...



A COMPLETE SOLID STATE SSB RECEIVER SMR-I

providing



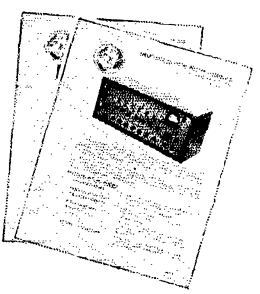
INSTANT SELECTION

OF ANY ONE OF 8 PRE-SET CHANNELS

OVER THE 2-32 MC FREQUENCY RANGES

MODEL SMR-1
REQUEST
TB 3010

MODEL SME-1
REQUEST
TB 2030



- SSB (USB LSB), AM EQUIVALENT, CW, MCW
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THE AMERICAN RADIO RELAY LEAGUE, INC.,

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

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

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

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

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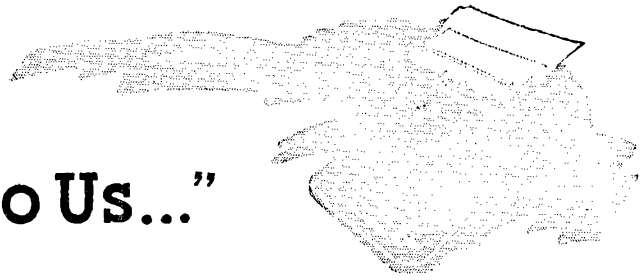


"It Seems to Us..."

League Acts to Strengthen License Structure

IN ACCORDANCE with instructions of our Board of Directors, the Executive Committee of the American Radio Relay League has acted to file a petition with the Federal Communications Commission for reinstatement of the Advanced Class license. It also has proposed that an Advanced Class or Amateur Extra Class license should be required for voice operation on certain of our amateur bands. The purpose is to provide additional self-training goals, and thus to strengthen the position of the amateur radio service in both domestic and international affairs. This is all part of a broad program, adopted by the Board at its annual meeting last May, to upgrade the amateur service.

The formal petition which has been filed with the Federal Communications Commission is printed beginning on page 66 of this issue.

QST has carried many pages of material on this general subject during 1963, discussing the status of and trends in amateur radio, and expressing the concern of the Board — and that of many amateurs and clubs as well — as to how adequately we are fulfilling the purposes and objectives of the amateur service. Failure to continue achieving these purposes and objectives might well result in an eventual loss of frequencies. Such a situation would be disastrous to us all. The problem is particularly well stated in the October *QST* article, "Two Plus Two Equals Four," by WØDCA, which we commend to your careful re-reading.

The League believes that a reinstatement of the higher-class license with associated incentives will provide a needed goal which can and will be achieved by a large majority of amateurs. Its purpose is to attain a substantially higher average technical level and thus improve the stature of the amateur service.

The League petition requests the Commission to act as promptly as possible to reactivate the Advanced Class license by making it again available to new applicants. The League proposes that eligibility requirements be reinstated as before — *i.e.*, the holding for a period of one year or more a valid General or Conditional Class operator license. The League proposes that no additional code test be required of applicants who have already passed 13 w.p.m. under supervision of an FCC engineer, and that a new written examination be prepared for the Advanced Class applicant, to cover advanced radio theory and operation as applicable to modern amateur techniques. It is contemplated that the test would be of a level somewhere between the present General and Amateur Extra class examinations. The emphasis would be on practical rather than purely theoretical matters.

The League proposes that, to allow adequate time for existing amateurs to qualify for the new class of license, and to provide minimum impact on present operating habits and practices, the requirement of an Advanced or Amateur Extra class license for voice operation on certain of our bands should be on a progressive schedule as follows:

Effective July 1, 1965 — 20-meter phone band.

Effective July 1, 1966 — 40- and 15-meter phone bands.

Effective July 1, 1967 — 75-meter phone band.

The 75-meter voice band was put last on the schedule in recognition of the fact that this band houses a considerable portion of our organized traffic and emergency networks. Thus it will provide minimum disruption to public service activities and allow this group of amateurs maximum time to achieve the new class of license.

There is no need for any serious, determined amateur to lose privileges under the League's proposal. It will require additional effort, most certainly, on the part of many of our number. The League is convinced, however, that its action is essential for the long-term health and growth of the amateur body by improving our proficiency and thus our stature and image, and accordingly our chances for continued justification of assignment of operating frequencies. The alternative — doing nothing

— avoids immediate inconvenience; but it risks eventual and severe setbacks in our frequency assignments.

The next move is up to FCC. The Commission might issue a notice of proposed rule-making embodying the suggested changes, or it might modify them as its judgment dictates. Before any substantive changes are made final, of course, administrative procedure requires that all interested parties be given an opportunity to express their views.

Are you in favor of a proposal which perhaps will make you put forth some extra effort now, but which will in the long run increase the stature of amateur radio and thus help preserve its status for you and thousands of other hams? Or would you rather sit back with the status quo and face the chance that amateur radio may eventually run into serious difficulties both at home and abroad?

The League feels there is only one answer — the action it has taken. QST

OUR COVER

Who says there's a sunspot minimum? Well, while it is true that conditions have been a bit spotty the past few months, the DX *is* there and *can* be worked. Our cover bears proof of this. These are QSLs for contacts made largely during the past year by W1TS. Don runs 250 watts into a ground-plane antenna.

COMING ARRL CONVENTIONS

November 29-30 and December 1 — Delta Division, Lafayette, Louisiana
January 18-19, 1964 — Florida State, Miami
April 3-5, 1964 — Great Lakes Division, Detroit, Michigan
May 9-10, 1964 — New England Division, Swampscott, Massachusetts
June 12-14, 1964 — West Gulf Division, Brownwood, Texas
August 21-23, 1964 — ARRL National, New York City

DELTA DIVISION CONVENTION

Lafayette, Louisiana — November 30 and December 1

The ARRL Delta Division Convention will be held on Saturday and Sunday, November 30 and December 1, at the Municipal Auditorium in Lafayette, Louisiana. Talk-in stations for mobiles are planned, operating under the call W5DDL/5; frequencies to watch are 3905 kc. s.s.b., 3860 kc and 50.4 Mc. a.m.

There will be an early-arrival fish fry on Friday evening, November 29, although Convention activities don't officially start until 10 A.M. on Saturday. There will be a buffet lunch at noon on Saturday. The afternoon program will include meetings and talks, as well as displays of the latest in amateur equipment. The annual Lafayette Amateur Radio Club banquet will take place that evening, followed by a dance and an initiation ceremony for the Royal Order of the Wouff Hong at midnight. The final Convention session will finish by noon on Sunday, to allow those traveling long distances plenty of time.

Convention registration fee and LARC banquet fee are $5.00 each, or the combined tickets can be obtained for $10. After November 15, the fee goes up to $6.25 for each part or $12.50 for the combination. For further details, write to: Lafayette Amateur Radio Club, P.O. Box 3564, Lafayette.

November 1938

The brilliant career of *QST* and *Handbook* Editor Ross Hull had been ended by electrocution and *QST* lamented his death. His death dramatically alerted hams around the world to the dangers of their own rigs, and a concerted safety campaign resulted in nearly every ham home of the day.

. . . Clinton DeSoto wrote of amateur rescue and communication service during the September hurricane-tidal wave-flood disaster in southern New England and Long Island.

. . . On the technical side, James Dickert described "A New Automatic Noise Limiter," W1LJI said "Let's Settle those Antenna Questions," W2AOE wrote about "Variable Frequency Control For Transmitters," W1TS contributed "A Transmitter of General Utility" and W1IBY showed off his all-band, low-power, crystal-controlled transmitter.

. . . Sweeping new FCC regulations were announced, among them a ban on music and new emergency operating rules. QST

Missouri — The St. Louis ARC will name the recipient of the first annual St. Louis Amateur of the Year award at a ham meeting and rally Friday, November 15, at the Mosley Electronics Auditorium, 4610 N. Lindbergh, St. Louis County. Contact KØKJX at 645 Marshall Ave., Webster Groves, Missouri 63119, for details. Nominations for Amateur of the Year must be in by November 1. A talk by ARRL Midwest Division Director Denniston, WØNWX, will highlight the meet.

Pennsylvania — The Mobile Sixers Radio Club will hold its sixth annual banquet and hamfest at the Falcon House Restaurant, 525 West Chester Pike, Havertown, Pennsylvania, on November 2. Banquet chairman is Harold Unruh, W3TXO.

Texas — Free coffee all day and Texas-size bargains team up November 10 at the new Armory in Brownsfield. It's the annual Terry County ARC swapfest. Contact W5NFO.

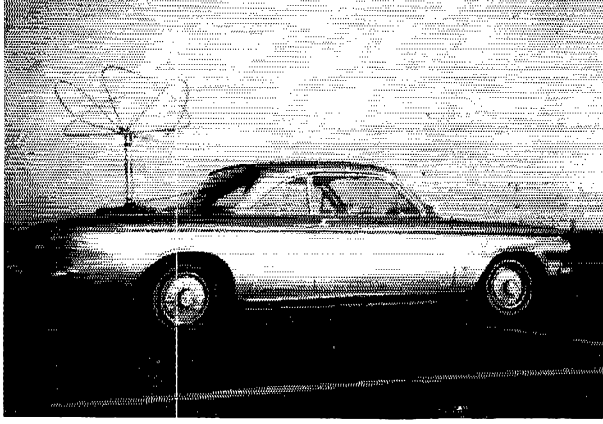


Fig. 1—The Skewed-Planar Wheel for 144 Mc. makes an imposing sight on the rear deck of the W1FVY Corvair. Each of the four elements is skewed at an angle of 45 degrees, resulting in nearly uniform response to signals of any polarization.

The Skew-Planar Wheel Antenna

An Omnidirectional V.H.F. Antenna with Universal Polarization

BY ROBERT H. MELLEN,* W1IJD, AND CARL T. MILNER,* W1FVY

While the Big Wheel antenna (*QST*, September and October, 1961) was under development, it became evident that the polarization could be changed from horizontal to circular by simply skewing the planes of the elements 45 degrees to the horizontal. Several 2-meter models were constructed and tested, both on the antenna range and under actual operating conditions, with excellent results. While circular polarization *per se* may be of limited interest to amateurs, there are a number of applications for an omnidirectional v.h.f. antenna which will work with any plane of polarization; for example, in areas where both vertical and horizontal are used, in a base station working mobiles and fixed stations, and for tracking a tumbling satellite.

The original Big Wheel is a circular coplanar antenna consisting, in effect, of three half-waves-in-phase, with end feed. Each element is a full wavelength, bent to form a half-wave circumferential radiating segment with quarter-wave radial feeders. One feeder goes to the center common ground point, the other to the common hot point, fed by the center conductor of a coaxial line. The radiation pattern is omnidirectional in the horizontal plane and the polarization is horizontal.

The Skew-Planar Wheel has four elements similarly configured but the plane of each element makes a 45-degree angle with the horizontal plane. This results in a radiation pattern which is again omnidirectional, but the polarization is now essentially circular instead of horizontal. The operation of the antenna can be visualized by considering that the horizontal component comes from the projection of the elements on the circle, while the vertical component comes from the projection on the axis. Since the radius of the circle is a quarter wavelength, the vertical radiation component lags the horizontal by a 90-degree space phase angle in an outward direction. Thus the outgoing wave is omnipolarized.

The sense of the polarization may be either left-handed or right-handed, depending on the direction of rotation of the field. The sense of the Skewed Wheel can be easily determined by com-

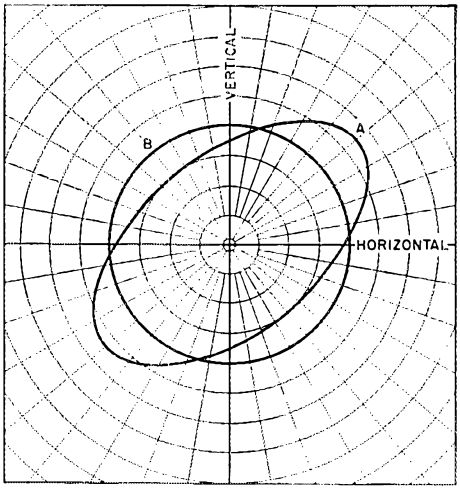


Fig. 2—Polarization pattern of the Skewed Wheel array, A, showing its variation from perfect circularity, B. Though this difference looms large in a visual presentation, it is only about plus-or-minus 2 db., hardly noticeable in normal communication with stations using horizontal and vertical antennas.[1]

* U.S. Navy Underwater Sound Laboratory, New London, Conn.

[1] The Skewed Wheel shown in the photographs was tested on the antenna range at the K1HMU moonbounce station, where it showed maximum radiation in the vertical plane and minimum in the horizontal, with the total difference in the order of 1.8 db. Checks were made with the notch lined up toward the test dipole, and with the midpoint of an element toward it, without appreciable difference in readings. — *Editor*

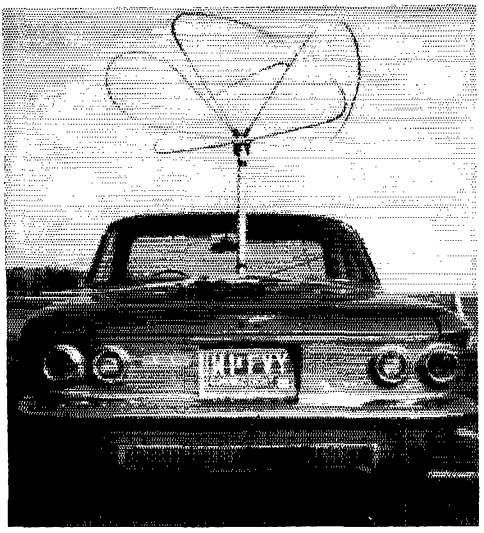


Fig. 3—Rear view of the temporary mobile installation of W1FVY. "Jiffy mount" on the rear deck is quickly and easily removed, in case passengers object to the adornment. Giving almost uniform response to signals of any polarization, the Skewed-Planar Wheel is very effective in reduction of the mobile flutter commonly observed in 2-meter mobile work. By the same token, it is ideal for base stations that work largely with mobiles, which may be using whips or halos.

paring the plane of the elements to the blades of a propeller. Turning the propeller on its axis to cause it to "advance" along the axis determines whether it is a right- or left-handed screw. This also turns out to be the sense of the electric polarization. Antennas shown here are left-handed.

The polarization pattern is tested by observing the response of a field-strength-meter dipole set at various polarization angles. With perfect circularity, the response would be the same for all angles. Thus the field of a perfect circularly polarized antenna should produce equal response with not only horizontal and vertical antennas but any angle in between. Fig. 2 shows, however, that the Skewed Wheel has a maximum response

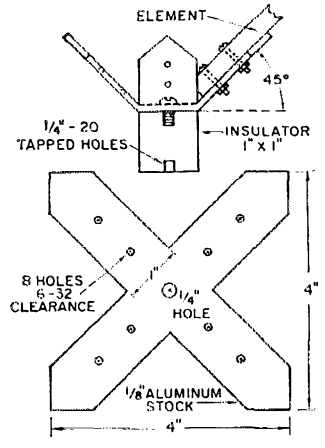


Fig. 4—Construction of the Skewed Wheel is similar to the previously-described Big Wheel, except for the top support, and the use of four elements instead of three. A square plate of 1/8-inch aluminum is cut and drilled as shown, and the projections bent up to a 45-degree angle. Dimensions are not critical, so long as holes in the elements and the support match up.

45 degrees from the vertical, which is approximately 3 db. more than the minimum at right angles to it. The ratio of maximum to minimum response determines the degree of ellipticity of the polarization. The 45-degree inclination is somewhat of a mystery, but the degree of ellipticity is not enough to be serious.[1]

In the original Big Wheel, the radiation resistance turned out to be about 12 ohms. Matching to a 52-ohm line was achieved by means of a parallel stub. The Skewed Wheel impedance is somewhat greater than 40 ohms, so a stub is necessary only when a perfect match is required.

Both antennas have the same broad-band properties. On two meters, the s.w.r. is less than 1.5 over the entire band. Because of their low Q, both are relatively immune to detuning by nearby objects. While the Big Wheel mounted a quarter wavelength above a metal car roof requires some stub adjustment for a perfect match, the Skewed Wheel can be half that height without significant effects. However, because of the vertical component, the Skewed Wheel must be mounted at the very top of the mast. Extension of the mast or feed lines above the base causes antenna-to-mast coupling which can degrade both the s.w.r. and pattern. For the same reason, the Skewed Wheels cannot be readily stacked on a mast.

Several models of the Skewed Wheel have been tried, ranging from a 12-foot king-size 6-meter version to a one-foot model for 430 Mc. Most of the experience, however, has been on 2 meters, where the antenna has been used extensively for mobile operation. Although ignition noise is somewhat increased due to the presence of the vertical component, performance with signals of either vertical or horizontal polarization has been generally excellent. The uniform response of the antenna to all planes of polarization was clearly demonstrated when tracking the Oscar II satellite at the two Arctic Drift Stations.[2] The signal could be acquired and held just as long as with an accurately-pointed high-gain Yagi, and the usual polarization fading due to tumbling was completely absent.

Apparently there is no amateur convention for either right- or left-handed circular polarization, and either sense may be used. For communications with another station using either horizontal or vertical polarization, this is not important, but when both are circularly polarized, the same sense must be used to prevent cross-polarization losses.

[2] Orr, "Oscar I: A Summary of the World's First Radio-Amateur Satellite," *QST*, September, 1962; Orr, "Oscar II: A Summation," *QST*, April, 1963.

Construction Details

The same basic components for the Big Wheel are used to assemble the new Skewed Wheel. Only the center terminal assembly is new. The 2-meter version uses four 80-inch elements of ⅜-inch tubing. The upper center terminal plate is fashioned of ⅛-inch plate, as shown in Fig. 4. The element mounting tabs are bent upward at a 45-degree angle to match the upper radial angles. The element mounting holes on the base plate must be arranged in the form of a cross to accommodate the lower radial elements.

We have found that the use of nylon, Teflon, or other plastic material for the center insulator is preferable to the ceramic standoff used originally. The working of the screws in the ceramic tends to destroy its threads.

We have arbitrarily used a left-hand sense in the antennas we have constructed. That is, we have assembled the elements in such a fashion that the elements leave the top center terminal and go in a counterclockwise direction back to the base. The resulting propeller-like structure has a left-hand thread pitch.

Element lengths for other frequencies may be readily determined in inches by dividing 11,800 by the desired center frequency in megacycles. The radius of the large bend is about 30 per cent of this length and the radials are about 25 per cent of the element length. The angle between the radials of each element is about 100 degrees. The plane of each of the elements is at an angle of 45 degrees from the horizontal plane.

The 6-meter model was constructed of ½-inch tubing elements each 232 inches long. A bridle of crossed nylon lines was connected across the tops of the elements to help stiffen the structure and the resulting antenna has withstood 50- to 60-mile-an-hour winds without damage, atop a 30-foot unguyed steel mast. It was just a little too large for practical mobile use on W1FVY's Corvair, but has given excellent results as a home station 6-meter omnidirectional antenna for general band monitoring.

The "jiffy mount" visible in the pictures may be of interest for others needing a convenient quickly-removable mount for their Big Wheel or Skewed Wheel antennas. It consists simply of a vertical pipe mounted on a plywood base to the bottom of which a piece of plastic foam (from the dime store) and a pair of rain-gutter replacement car-top carrier straps are attached. The foam protects the car's finish and prevents the mount from sliding about. Installation and removal is accomplished in just a jiffy and may help pacify the XYL who may not fully appreciate the functional beauty of the antenna's structure atop "her" automobile.

The forming of the bends in the elements can be accomplished best by first constructing a simple wooden bending jig, as shown in Fig. 5.

QST

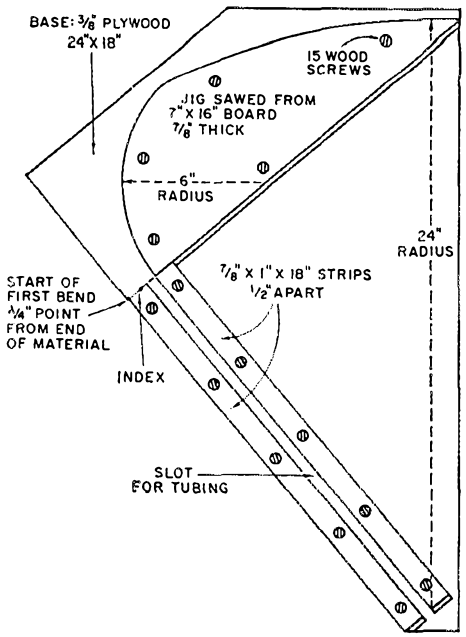


Fig. 5—Details of a bending jig for Big Wheel elements. Groups planning construction of appreciable numbers of the antennas may find this jig worth making. Dimensions are the same for either the skewed or planar versions of the array.

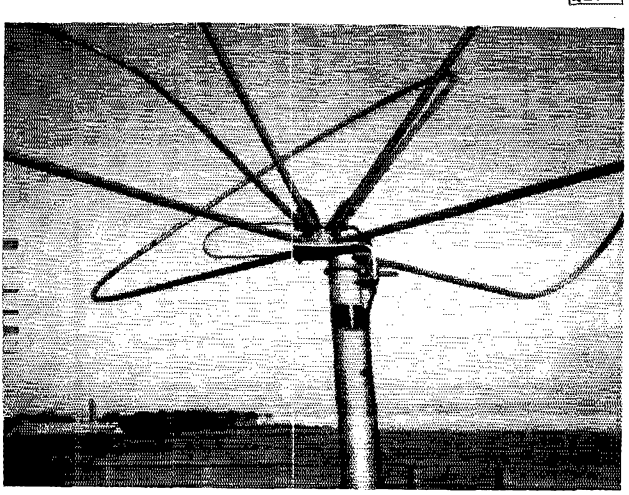
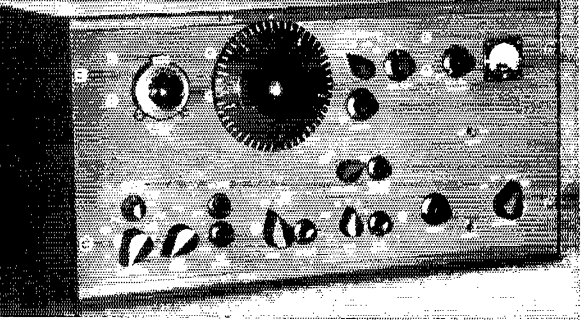


Fig. 6—Close-up view of the mounting of the Skewed Wheel. Each element connects from the upper support to the lower, as in the original model of the antenna. Lower mounting plate is grounded to the support, and connected to the outer conductor of the coaxial feed line.



This is the second of two articles. The first, appearing in the October issue, described the input r.f. amplifier and the dual conversion system. The remainder of the receiver is covered in this article.

The TDCS Communications Receiver

An All-Transistor Unit Covering the Amateur H.F. Bands

Part II

BY T. L. THOMAS *

THE 455-kc. i.f. amplifier circuits are shown in Fig. 3. A three-stage 455-kc. amplifier follows the second mixer. An additional stage is switched in along with the mechanical filter to compensate for the insertion loss of the filter. The maximum gain available in the i.f. strip is more than adequate, and was limited without appreciable deterioration of selectivity by the use of a smaller-than-normal emitter bypass capacitor in the second stage. Gain of the strip may be controlled manually by R_9.

The 4-kc. filter is a little wide for s.s.b., but it is excellent for QRM-beset a.m. However, the main reason for not using a sharper filter was that this one was available at half price at the time this portion of the receiver was being built. Nevertheless, when this filter is combined with additional filtering in the audio section, all but the worst QRM can be pretty well eliminated, including heterodynes above about 2 kc. A Q multiplier was tried, but it worked very poorly and was discarded.

A shunt i.f. noise limiter is used across the last i.f. amplifier output. The time-constant control, R_3, does not have too much effect on the operation and probably could be dispensed with. This limiter is not as effective as some on a.m., but it works on all modes of reception and is quite good for such types as ignition noise. J_5 was installed for possible connection to an f.m. adapter.

The detector operates as a product detector on s.s.b. and c.w., and as a power detector on a.m. An emitter follower is used for b.f.o. isolation and a carbon potentiometer, R_4, in the emitter circuit of this stage makes a very effective b.f.o. injection control for the detector. The control has no noticeable effect on b.f.o. frequency.

The attenuator controlled by S_6 is used to set the general output signal level depending on whether headphones or speaker are in use. Because of the position of the headphones in the audio circuit, more gain will usually be required when headphones are in use. The attenuator will also be found useful in compensating for insertion loss in the sharpest audio filters.

* 17 Candlewood Drive, Pittsford, New York.

A.G.C. System

The a.g.c. design, shown in Fig. 4, is basically similar to that used in the receiver described by W2TGP.[2] It was extensively modified, however, to provide variable time constant (0.25, 0.5, 1.5 and 5 seconds), fast-attack and slow-decay characteristics, and a high-impedance input to avoid loading the detector stage. It was felt that an a.g.c. system with a large voltage swing would be required for satisfactory operation of a squelch system. A 60-db. rise in signal strength causes a rise of less than 4 db. in audio output. The two longer time constants are excellent for s.s.b. and for all but very slow code.

The emitter follower fed by the last i.f. stage provides the desired high-impedance input. The follower feeds an additional 455-kc. amplifier whose rectified output feeds a d.c. amplifier. The time constant is controlled by S_7, which switches to manual control in its last position.

Audio and Squelch

The circuit of the audio system is shown in Fig. 5. Audio from the detector is fed to a two-stage preamplifier, the first stage of which is basically an electronic switch, or gate, controlled by the a.g.c. voltage when R_6 is suitably adjusted. The stage cuts off quite sharply at the level for which R_6 is set, and causes no noticeable distortion when turning on or off. Although this stage was designed primarily for its squelch function, it does have an incidental gain of about 10 db.

Any one of three selective audio filters may be inserted between the preamplifier and headphones plugged into J_6, or the driver stage when

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

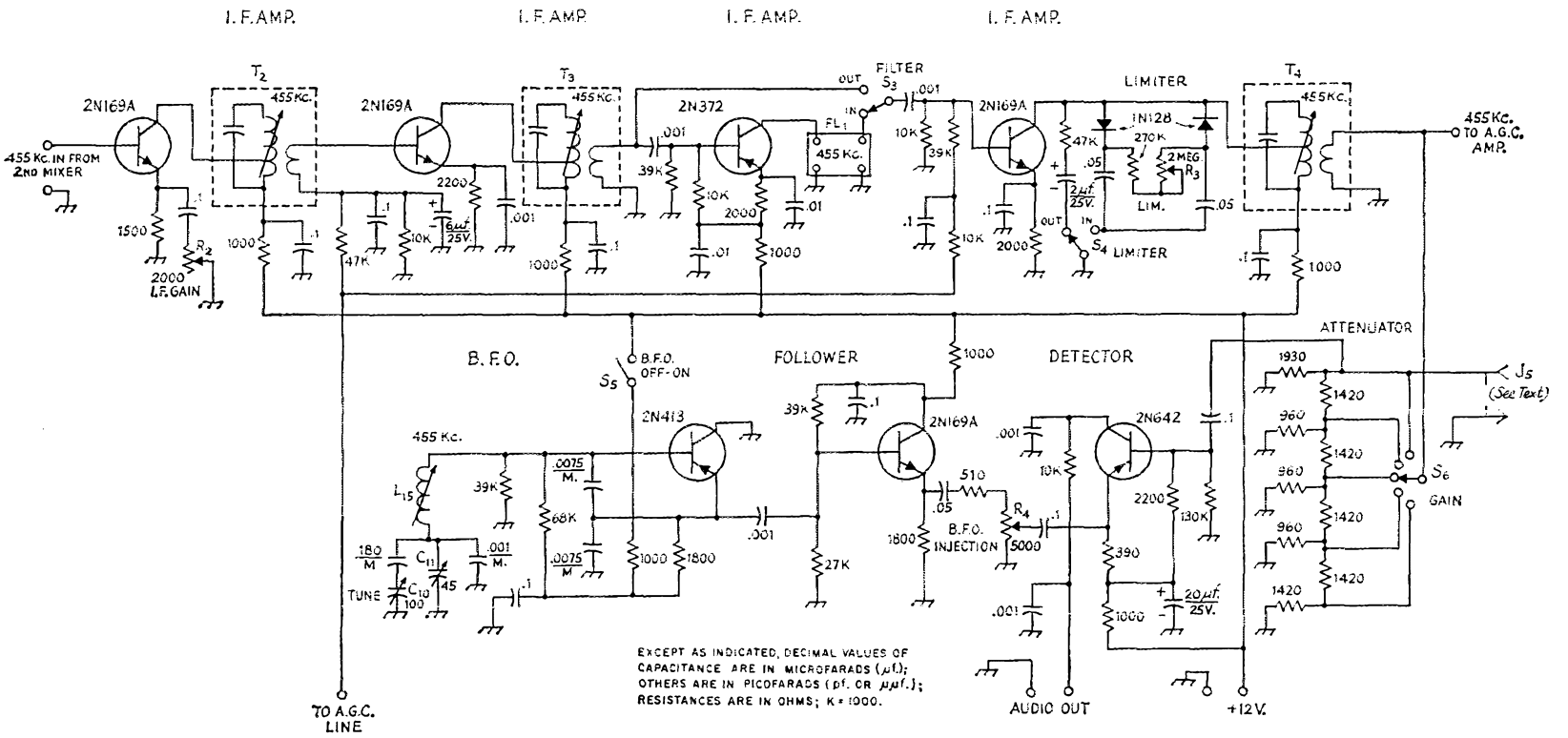


Fig. 3—Second i.f., detector and b.f.o. circuits. Fixed resistors are ½ watt; nonstandard values are made up of series or parallel combinations. Fixed capacitors of decimal value are disk ceramic or mylar, except M indicates mica; others are mica or NP0 ceramic, except those marked with polarity, which are electrolytic.

C_{10}—Air trimmer (Hammarlund APC-100-B or MAPC-100-B.

C_{11}—Ceramic trimmer.

FL_1—4-kc. mechanical filter (Collins F455-Y40).

J_5—Subminiature r.f. jack.

L_{15}–110—187 μh., slug-tuned (Miller 41A154CB1 or North Hills 1000J).

R_2, R_3, R_4—Linear control.

S_3, S_4—Ceramic s.p.d.t. rotary switch.

S_5—S.p.s.t. switch (attached to R_4).

S_6—Ceramic single-section single-pole five-position rotary switch.

T_2, T_3—Transistor 455-kc. i.f. transformer, 25,000 to 600 ohms (Lafayette MS-268A).

T_4—Transistor 455-kc. i.f. transformer, 25,000 to 1000 ohms (Lafayette MS-269A).

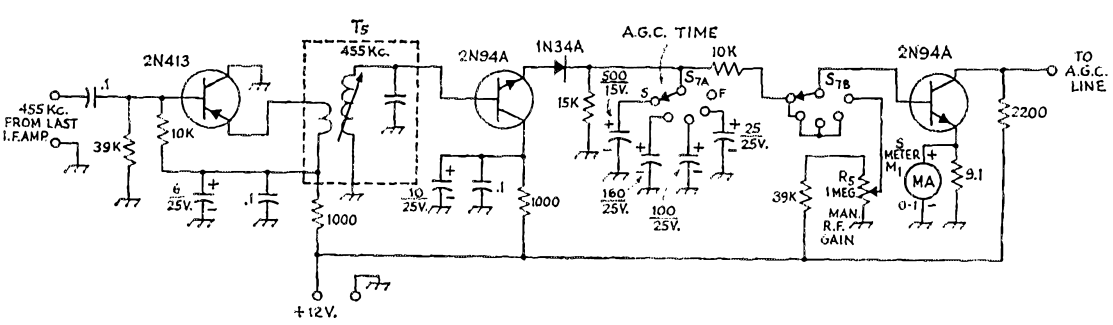


Fig. 4—Circuit of the a.g.c. system. Capacitances are in μf., and resistances are in ohms. Capacitors of decimal value are paper or mylar; others are electrolytic. Fixed resistors are ½ watt.

M_1—0–1-d.c. milliammeter, 1½-inch square (Micronta).
R_5—Linear control.
S_7—Phenolic single-section double-pole five-position rotary switch.
T_5—Transistor 455-kc. i.f. transformer, 600 to 25,000 ohms (Lafayette MS-268A).

the headphone plug is removed. The selection of filters is made by S_8. In the first switch position, filters B and C are in series, and an additional amplifier stage is added to compensate for insertion loss. The frequency response is approximately 950 to 1100 cycles.

In the second position of S_8, only filter B is inserted, and the frequency response is approximately 200 to 2000 cycles. The third switch position inserts filter A with a frequency response of about 200 to 3600 cycles. The last switch position bypasses all filter circuits, leaving the normal response of approximately 200 to 7000 cycles. The speaker output stage is a 5-watt Class B amplifier.

Audio volume is controlled by the T pad, AT_1, in the preamplifier stage, in conjunction with the i.f. attenuator controlled by S_6 in Fig. 5. The setting of S_6 depends primarily upon whether headphones or speaker is in use, the headphones requiring more gain than the speaker. With AT_1 set for minimum attenuation, S_6 is adjusted to give maximum desired audio output, then volume is thereafter controlled by the T pad.

Crystal Calibrator

The circuit of the crystal calibrator is shown in Fig. 6. The oscillator circuit is a Pierce with tuned collector circuit, emitter-coupled to an untuned amplifier. S_9 offers a choice of 100- or 1000-kc. crystals, and has a spare position for a third which may be plugged in externally at J_8. The output signal is fed from J_9 to J_2 in Fig. 1.

Power Supply

Fig. 7 shows the circuit of a dual power supply for the receiver. All output voltages are regulated. One supplies the required positive voltage while the other section has separate negative output voltages for the audio output stage and low-level stages. S_{11} permits switching to battery power for portable or mobile operation. Initially, a separate regulated tap was brought out for the v.f.o., but this was subsequently found to be unnecessary.

Construction

The construction is divided principally into three chassis made of Seezak components. One chassis (5 by 13 by 4 inches deep) is devoted principally to the band-switched high-frequency circuits, one (6 by 13 by 4 inches deep) to the i.f., detector, a.g.c. and squelch circuits, while the third (5 by 13 by 5 inches deep) contains the power supply and audio circuits. Much of the circuitry of the latter two chassis is in the form of printed-circuit boards,[3] using Lafayette MS-150 series copper-clad formica sheets. The "wiring" was drawn with acid-resistant paint (Lafayette MS-728, which comes in a ball-point dispensing tube). Large conducting areas were masked with plastic electrical tape. The exposed copper was then etched away with dilute (about 25 per cent) nitric acid. About one or two minutes is usually needed to remove the exposed copper. CAUTION: Nitric acid is very corrosive; rubber gloves and eyeglasses should be used when handling this material. Concentrated acid may be purchased either through a chemical supply house or, at a much higher price, from a drugstore, and diluted with water. The boards should be thoroughly cleansed as soon as the etching is complete. As an alternative, conventional wiring may be used on the copper-clad boards, using the copper coating for ground connections, and cutting away the copper where insulation is necessary. Perforated boards may also be used. Interconnections between chassis are made through a series of jacks, using subminiature r.f. jacks for the r.f. connections and pin jacks for the d.c. connections.

The v.f.o. is a separate subassembly consisting of two shielded enclosures. The v.f.o. circuit board, which contains the fixed components, is mounted over a cutout toward one end of a ⅛ × 3 × 9-inch aluminum plate. The d.c. input and the r.f. output connectors and the slug-tuned coil are mounted on a 2-inch-high bracket fas-

[3] The author is willing to supply line drawings of the printed-circuit boards at $1.25 for a set of three sheets.

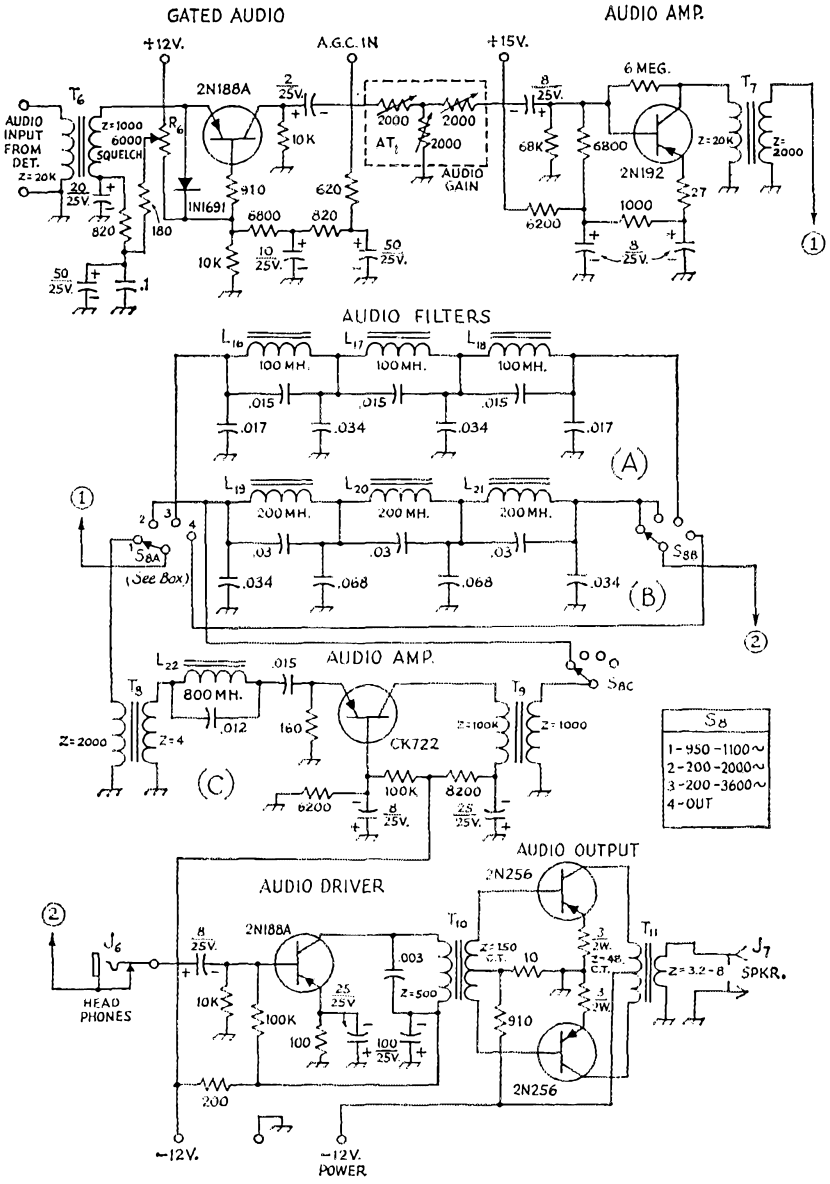


Fig. 5—Audio circuits. Capacitances are in μf. and resistances are in ohms. Capacitances of decimal value are mylar; others are electrolytic. Nonstandard values are made up of parallel combinations. Fixed resistors are ½ watt unless indicated otherwise.

AT_1—T-pad attenuator (Mallory T-2000 or similar).

J_6—Closed-circuit headphone jack.

J_7—Phono jack.

L_{16}–L_{22}, inc.—Toroid inductor (Chicago type TM).

R_6—Linear control.

S_8—Phenolic single-section three-pole four-position rotary switch (CRL PA-2006).

T_6—Transistor audio driver transformer; 20,000 to 1000 ohms (Argonne AR-104).

T_7—Transistor audio driver transformer; 20,000 to 2000 ohms (Argonne AR-103).

T_8—Transistor audio output transformer; 2000 to 4 ohms (Stancor TA-10).

T_9—Transistor audio input transformer; 100,000 to 1000 ohms (Lafayette TR-97).

T_{10}—Transistor audio output transformer; 500 ohms to 150 ohms, c.t. (Argonne AR-163).

T_{11}—6-watt audio output transformer; 48 ohms, c.t., to 3.2 ohms (Argonne AR-503).

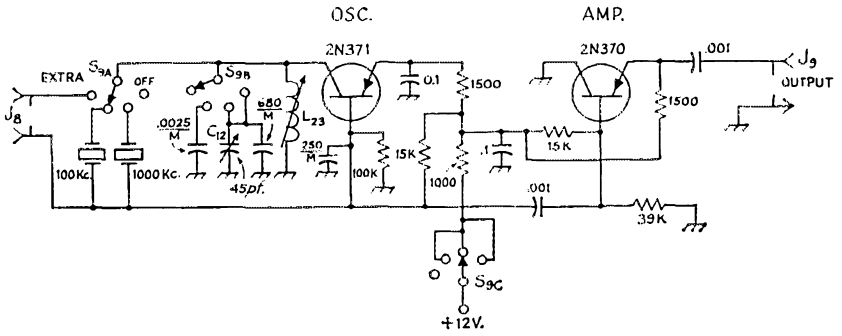


Fig. 6—Circuit of the crystal calibrator. Decimal values of capacitance are in μf., others are in pf. Fixed capacitors are paper or mylar, except M indicates mica. Resistances are in ohms and resistors are ½ watt.

C_{12}—Ceramic trimmer.
J_8—Crystal socket.
J_9—Phono jack.
L_{23}—2 mh., slug-tuned (North Hills 120-K or Miller 4414).
S_9—Ceramic single section three-pole four-position rotary switch (CRL PA-2006).

tened to this end of the plate. The tuning capacitor is mounted at the other end of the plate, its shaft lined up with the main tuning dial, a National NPW-0. Trimmer capacitor C_9 is mounted in a 5¼ × 3 × 2⅛-inch Bud minibox fastened to the panel, and is controlled by a 1½-inch vernier dial (Lafayette F-348). The rear of this box has a cutout corresponding to the one in the v.f.o. plate. The plate is fastened over the opening in the box, and the v.f.o. enclosure is completed using Seezaks components. The v.f.o. assembly is further braced by a bracket between the v.f.o. box and the central main chassis.

The crystal calibrator and the b.f.o. are enclosed in Miniboxes. The crystal-calibrator is mounted at the rear of the central chassis, its switch shaft being extended to the panel control. The b.f.o. unit is fastened to the panel, just to the left of the S meter.

When completed, the three subchassis are mounted inside an inverted 14 × 17 × 3-inch chassis which serves as a bottom cover. The complete assembly fits an 8¾ × 19 × 14-inch cabinet.

Adjustment

It is advisable, although not absolutely necessary, to align the i.f. strip and a.g.c. transformer with a 455-kc. signal. None of the transformers used in the receiver was found to be far off frequency, but some improvement was noted on touching up the alignment.

For proper alignment of the r.f. and first i.f. sections, and the 5-mc. input rejection filter, a sweep generator and scope are all but necessities. This, unfortunately, is one of the problems encountered when using band-pass circuitry. A straight signal generator and v.t.v.m. can be used for the alignment, but this method is much more time consuming and does not do as good a job as the sweep generator. To align the 5-Mc. amplifier, the band switch should be turned to the 5-Mc. position to disable the crystal oscillator. A piece of paper should be inserted between the contacts of S_{2E} to disconnect the r.f. amplifier

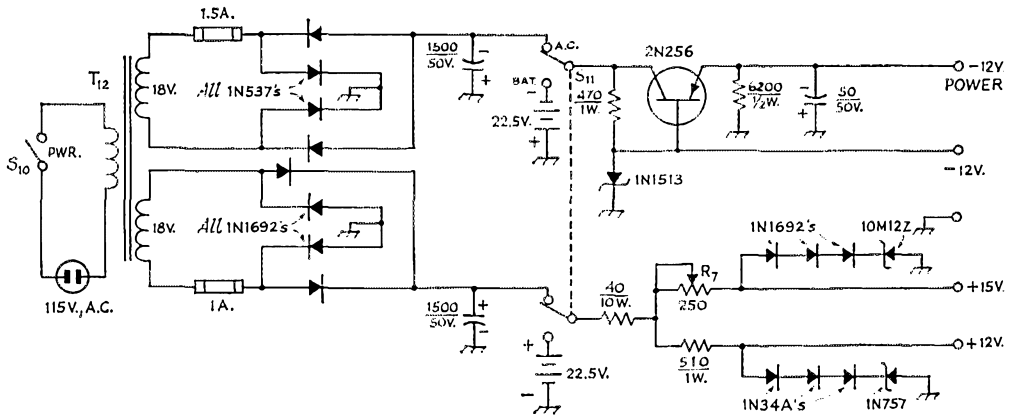
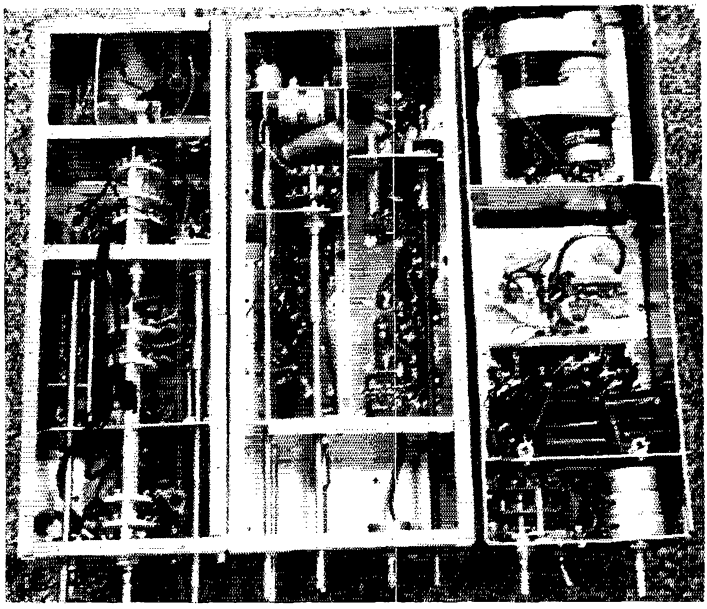


Fig. 7—Circuit of the power supply. Capacitances are in μf., and capacitors are electrolytic; resistances are in ohms.

R_7—Wire-wound control.
S_{10}—S.p.s.t. toggle switch.
S_{11}—D.p.d.t. toggle switch.
T_{12}—Transistor power transformer; two 18-volt 900-ma. secondaries (Stancor TP-1).



Bottom view of the TDCS receiver.

from the mixer. The sweep generator is then connected from J_3 to ground. A resistance of 500 ohms should be connected across J_4, and the scope input connected across this resistor through a detector probe. Then L_9 and L_{10} are adjusted to give the desired pass band of 5 to 5.5 Mc.

The adjustment of the low-pass filter is not critical. The coils were simply set to the specified inductance and wired into the circuit.

The coils in the 5-Mc. input filter were adjusted to resonate at 5 Mc. with their associated capacitances.

The 100-kc. section of the crystal calibrator may be set on exact frequency by adjustment of the coil. The 1000-kc. section may then be brought onto frequency by means of the trimmer capacitor. If this is found to be impossible, try another value of fixed capacitance.

Receiver sensitivity appears to be better than 1 μv. on all bands. Image rejection varies from a low of 45 to 50 db. to a high of more than 70 db. Noise figures checked with a temperature-limited diode noise generator are as follows:

3.5 Mc. — 16 db.	21 Mc. — 4.5 db.
5 Mc. — 12 db.	28 Mc. — 8.4 db.
7 Mc. — 9.9 db.	28.5 Mc. — 9.9 db.
14 Mc. — 6.2 db.	29 Mc. — 8.4 db.

I would like to thank Sam Baker of Sarnia, Ont. and Ray Ruby of Rensselaer, N.Y. for the helpful comments and suggestions they made during the design and construction of this receiver. QST

Strays

Communications for the annual Alhambra (Calif.) Hi Neighbor Parade were handled this year by the radio clubs of Alhambra, Ramona, and Monterey Park. The truck was on loan from a local car dealer and 2-meter rigs were borrowed from local DC authorities. The result was top-notch parade announcing and coordination, wide spreads in area newspapers and televised publicity. Pictured, left to right, are WA6GDF, WA6YUF, WA6ISQ, and K6SUJ, kneeling. Other operators included W6MVY, WA6NHY, K6TVC, WA6VHX, WA6WPX, WA6YDU, WA6YRS, WA6DMS, and WV6ZVN.

The ARRL's Official Observers

Who They Are and What They Do

BY F. E. HANDY,* W1BDI

Although ARRL sponsors many membership-service programs, ranging from W1AW's code practice sessions to providing anti-TVI pamphlets, one of the most important in improving the state of the amateur art is the Official Observer system. OOs provide friendly, voluntary reports of sour signals, distortion, harmonics and more and help keep brother hams out of FCC and DOT (Canada) hot water.

Our bands are congested; interference is bad enough without poor signals. ARRL Observers have been asked to do their part in the crusade to improve operating conditions in our bands. For three consecutive years the Observer program has done the biggest job in League history, sending each year about 24,000 cooperative mail-notices. The continuing growth of the amateur body requires an expansion of this program — more observers, adequately experienced; and full cooperation by the recipients of notices through accepting them as friendly advice, within our own family, and promptly looking into the difficulty.

Even s.w.l.s are asking what it's all about — Who are the OOs? What do they do? "How can *I* help?"

Only licensed amateurs can be Observers. Briefly, OOs are experienced fellow amateurs who keep a watch on signal quality in our amateur bands, and provide a helping hand for hams with something wrong. They watch all modes and all bands. Reports are sent for such varied symptoms as s.s.b. splatter and flattopping, c.w. chirps and thumps, harmonics, excessive tune-ups, failure to identify, and operation outside the band-edge.

They issue notices like the sample Form 10 on page 21, and similar forms keyed to special difficulties such as harmonics. The card clearly says that the OO report "is simply a friendly notice from one amateur to another, calling attention to a condition observed that appears to violate an FCC (or DOT, Canada) regulation" and that "this is not a citation or a 'bawling out in any sense." Hams who have tried to put faith in standard RST reports on the air know that these don't guarantee that the signal is clean. Who sends "T8" anymore? OOs, that's who!

Official Observers as a rule have several years' experience as an amateur. If you receive an OO card, chances are you were listened to, then measured carefully on advanced frequency metering or other equipment. If the OO says "T6" or "T8," you can be sure it was.

How do amateurs receive OO advisories? Bagsful of responses show that the vast majority are grateful for the careful OO report. Disagreement or resentment are very rare indeed.

The Start of the OO Program

The post of Official Observer came into being long ago. An observers' program is as old as the problems of off-frequency transmission. Here's a quotation from *QST* for October, 1925: ". . . Newcomers have entered our ranks. Reports have it that they are operating off wave length using long, drawn-out calls and signing at infrequent intervals . . .

"One of the most powerful agents in improving individual operating is individual, friendly, and constructive criticism. Because it is manifestly impossible to write a long helpful letter to every station owner every time it becomes necessary, we have to find other means productive of the desired results. The American Radio Relay League stands for lawful operating, and for good operating; and that organization is expected to represent amateurs to its government in asking for continued privileges in using the valuable shorter wavelengths. . . . A form postal card has been devised [and sent to members of the Field Organization] with instructions that the ADMs [now SCMs] appoint Official Observers. Only common faults can be listed on the form . . . but a place for additional improper practices and comment is provided. Observers are instructed to use the postals conscientiously and

* Communications Manager, ARRL.

RECIPIENTS SAY:

"I had left the top and back off my v.f.o. for access. Discovered my problem was due to r.f. feeding back into the oscillator from the transmitter with a resultant change in frequency. With the cabinet fully assembled, the note is clean and stable." — *W1* - - -

"Thanks for the notice. Off frequency was due to the bandswitch being at '40' instead of '80.' Next time I'll triple check!" — *WN8* - - -

"Since receiving your Form 11, I replaced the filters in the [v.f.o.] supply, which was causing the trouble. Have about 250 actives on 6 meters here, but no locals mentioned the trouble." — *K4* - - -

"Thanx for the report of the 40-meter harmonic at a time I was operating 75-meter phone. The antenna was 250 feet long, fed at one end *without an antenna tuner*. I am no longer using the end-fed antenna." — *W2* - - - (Emphasis supplied).

"Thanks a million for the report . . . I never gave the sidebands a thought." — *WA2* - - -

"RECIP UNSTABLE SIGNAL REPORT FROM WA2PMW ON FORM 10. FOUND LOOSE WIRE TO GRID OF 6146 FINAL. CHECKS OUT OK. 73." — *W8* - - -

"Your report and a similar card from W3NNC have convinced us that a wave meter is a very useful piece of FD equipment." — *K1* - - -

"Tnx for the OO card. I had the MARS crystal rather than the v.f.o. When I discovered this I was sure of either an OO card or an FCC 'pink slip'." — *K7* - - -

"That spurious signal must have been there for some time. Thank you for calling it to my attention. Your job is a thankless one 99 per cent of the time. In the same spirit the card was sent, a sincere 'thanks' to you." — *W8* - - -

"Spoiled a perfect record, but much appreciate having it called to my attention. There is no better way to prevent a recurrence." — *W6* - - -

"In regards to chirps and clicks on my 14-Mc. signal, many thanks for friendly tip and rest assured I will take corrective measures immediately." — *W9* - - -

"After getting your report I ceased operating lest I get a report from the Friendly Communications Commission. Have built half-wave filters per *QST* May '60. The rig is now clean and has been checked by local hams." — *WN4* - - -

"Was monitoring with the receiver and realized it was chirpy. Was not sure whether it was the transmitter or the monitor. I appreciate your notice. Will fix. 73." — *W3* - - -

"Installed a separate power supply for the v.f.o. It cleared up the trouble. Thanks." — *KØ* - - -

"My heartfelt thanks . . . I found out that with 80-meter drive applied to it, my linear has two points where it resonates, one doubling to 40. It *was* doubling, the resultant signal way out of the band. Chances are I would have heard from the FCC before I would have noticed it myself, so I am very grateful for your report. Thank you again." — *W2* - - -

"I had asked several contacts if they noticed a chirp but the reports were that I had a very slight indication of chirp. I am wondering if many persons really don't know how to check for chirp. Too many of them don't tune off to the side . . ." — *K5* - - -

"If you hadn't told me about the parasitic, I'd probably still be generating it. Had left out a choke in the set-up. A new choke and all's well. Thanks." — *W1* - - -

A.R.R.L. OFFICIAL OBSERVER'S COOPERATIVE REPORT

Dear.....Your signals were.....at.....M.....ST.....
calling
when you working.....You were using a frequency of.....kc.
Your signal was .....

This report is *not* a citation or a "bawling out" in any sense. It is simply a friendly notice from one amateur to another, calling attention to a condition observed that appears to violate an FCC regulation. The ARRL Observer program is designed to help amateurs help each other, keep our bands clean, and assist all amateurs to avoid FCC citation, with potential risks to amateur operating privileges. In this your cooperation is requested.

Details above may suggest a special check by yourself, or with a nearby amateur to try to duplicate conditions reported, in order to initiate corrective measures. Chapter 23 of The Radio Amateur's Handbook, as well as several *QST* articles may be of aid to you. Let's fix the signal today, OM. 73.

Sincerely,

Address

ARRL Official Observer, Class.....

Form 10 Printed in U. S. A.

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make observations carefully. In concluding, we ask members of the League to help. May we have your cooperation, OM?"

How to Become an Official Observer

The ARRL welcomes applications for OO posts. To qualify, the applicant must have at least four years' licensed experience, a General or higher-class license, and receiving equipment with top stability, sensitivity, calibration and accuracy. Ability to measure frequency within preset tolerances must be demonstrated before a frequency-observing appointment will be made. (The ARRL regularly holds Frequency Measuring Tests for this purpose.) The Official Observer application form poses typical questions of policy that help show the applicant's background. Although SCMs welcome applicants, they may accept only those best qualified.

Successful candidates are issued prestamped mailing forms and full instructions. They are asked to file monthly reports with ARRL Headquarters. An OO position requires tact and continuing activity in mailing notices.

To apply for an OO appointment, write Headquarters and request application form OO-45. Mention also the booklet *Operating an Amateur Radio Station*, which describes OO and other appointed positions. It's free. When you file your application with your SCM (see page 6 in this issue of *QST* for his address) indicate your favorite ham activity and the extent to which you would propose to be active, should you be appointed an OO. SCMs make appointments on all bands and all modes — he may have an opening right down your alley. Section Managers have

been asked to double the present number of Observers and to arrange additional coverage of v.h.f. as well as all h.f. bands and modes. Only if the section has strong workers and lots of them on a certain band, or if you fail to measure up to standards, will he decline to open a new Observer's slot.

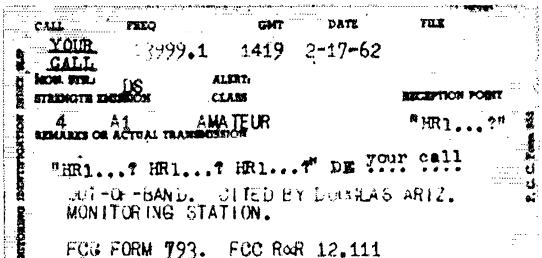
The Observer's Job Responsibility

The OO's job is done when he has mailed his advisory note. Before that form is sent however, he has been very careful to make an accurate form and identify the station he monitored. If he has any doubt, the form does not go.

Once it's mailed, he has done all he was asked to — to notify a fellow ham that he may have technical or operating troubles which may be adjusted. His job is ended and it is up to the licensee to correct any problems. If the latter elects not to, it's his own business — his and the FCC's. Most often by far, the recipient of an OO notice responds with a grateful "thank you for helping."

Typical responses from recipients of OO cards point up two main facts of amateur life: that locals and friends either do not notice or do not report awry conditions and that a guy can go for months getting nothing but the standard T9 reports, when all the while he has a buzzsaw note to his signal. It takes an OO, many amateurs say, to give an honest report. One important advantage that often goes unsaid but is deeply appreciated is that the OO noticed the trouble before the FCC did! Excerpts from typical notes of thanks to observers appeared on page 21.

As for the FCC's stand on the subject, much can be said. And FCC Field Engineering Bureau Chief George Turner says it quite well above.


CALL: YOUR CALL | FREQ: 3999.1 | GMT: 1419 | DATE: 2-17-62 | FILE:
MON. STA.: DS | ALERT: | STRENGTH RECEPTION | CLASS: A1 AMATEUR | RECEPTION POINT: "HR1...?"
REMARKS OR ACTUAL TRANSMISSION:
"HR1...? HR1...? HR1...?" DE .... your call
OUT-OF-BAND. CITED BY DOUGLAS ARIZ. MONITORING STATION.
FCC FORM 793. FCC R&R 12.111
LOCATION: | BY: JK

"Numerous problems are encountered in the regulation of the amateur service. They concern allocations and special rules for foreign as well as domestic work. Fortunately, *serious* violations are few in number. This stems generally from the fact that *amateurs take pride in monitoring their own service.* The Commission notes that the number of amateur stations licensed continues to rise year after year. There were about 240,000 at the end of the last fiscal year. We sincerely hope that the program of amateur observing work will keep pace with the growth of the service. FCC believes all amateurs should take note of the crowding of frequencies. A better distribution of the stations in the bands to use both the lower and higher frequencies available would in effect widen the bands. Likewise, limitation of power to the minimum required for contacts, and more strict compliance with the rules for signal quality will likewise make for more efficient contact for everybody.

"We hope the fraternity may continue the generally close cooperation with FCC in, as well, the close individual attention to the reports of ARRL observers. We hope likewise that skilled and experienced amateurs may continue to step forward and participate in this ARRL program which keeps signal conditions on the track and so reduces the necessary burden of FCC citations that we must send out. This inevitably helps the over-all record of your service . . .

"Our men at the field offices and FCC monitoring stations know the Official Observer service as one quite independent of our government obligation, but one which has kept many an amateur out of trouble. Our appreciation and good wishes for the selfless and conscientious efforts of the Official Observers. They continue to justify the ARRL claim that you amateurs are a self-regulating body."

— GEORGE S. TURNER, *Chief Field Engineering Monitoring Bureau, FCC.*

Conclusion

All ARRL publications have sections which can help you to curtail key clicks, harmonic and spurious radiation, flattopping s.s.b., and the other common faults. If every amateur keeps abreast of the state of the art, troubles will be limited to equipment failure and accidents. Even then, with luck, a friendly, cooperative note from an Official Observer will quickly help clear up the trouble.

The League's Board has requested an expansion of the Official Observer system, to make it more effective by providing greater self-policing coverage. This is another link in the League program to increase the stature of the amateur service. And it is an ideal opportunity for the individual amateur to contribute usefully to public service.

Perhaps you'd like to be an OO. Think you can qualify? Then write League headquarters or direct to your SCM for more information. QST

Neon Bulbs and Dial Lamps

Making Inexpensive Test Instruments and Other Devices

BY LEWIS G. McCOY,* W1ICP

WHEN a beginner buys or builds his first station he usually finds that some test gear would be a very handy thing to have in addition to the regular receiver-transmitter combination. By the time the transmitter-receiver combination is acquired he also finds that the funds are getting low. However, there are several pieces of test equipment that can be made for practically pennies if neon bulbs or dial lamps are used as indicators instead of the more expensive meters. This article will discuss the use of neon bulbs and dial lamps and will show you how to build some handy devices, including a simple voltmeter.

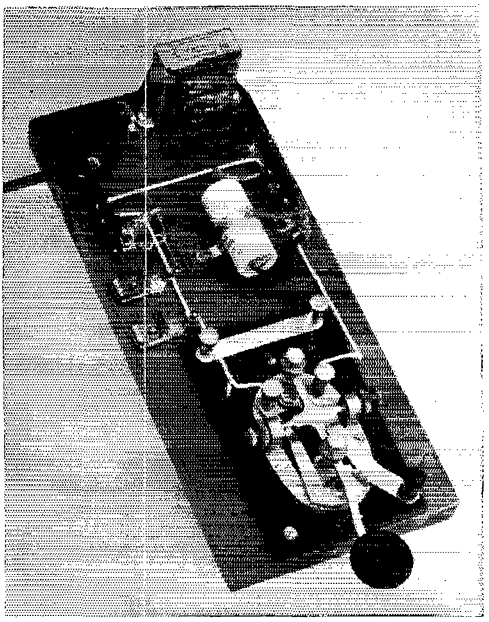
Let's treat neon bulbs first. There are many uses for neon bulbs and gaseous regulators in ham radio, too many in fact to list in one article. What we will do here is show some of the more popular uses.

The type of neon bulb used in most of the devices described here is the NE-2 and sells for 10 cents. It has two electrodes surrounded by a glass envelope which is filled with neon gas. When a voltage of sufficient magnitude is applied to the electrodes the neon gas will "fire," igniting the bulb with an orange glow. The amount of voltage necessary to fire the bulb is called the "starting" voltage. In the case of the NE-2 it is about 65 volts for a.c. and 90 volts for d.c. One of the features of neon bulbs and voltage regulator tubes (VR tubes) is that the voltage drop across such a tube is constant regardless of current through it, a feature that is extremely useful where a regulated voltage is needed. The power-supply chapter of the *Radio Amateur's Handbook* gives details on using regulator tubes.

Testing For The Presence of R.F.

One very handy feature of a neon bulb is that if it is brought into close proximity with an r.f. field the bulb will glow. It isn't necessary for the neon bulb to be actually connected to an r.f. source for it to glow. If the field is strong enough the bulb can be held nearby and it will light. For example (and this is a valuable thing to know), if the bulb is held near or on antenna feeders of the open-wire or Twin-Lead type, you can quickly determine whether r.f. is actually flowing on the line. With only the plate current meter of your amplifier to guide you, how many times have you wondered if power is actually going to the antenna? Particularly after making many calls and getting no answers. You can quickly see what a gem the neon bulb can be.

Suppose you wanted to check for the presence of r.f. in the various stages of a transmitter. You could start at the oscillator, holding the neon bulb to the plate circuit of the stage, and see if r.f. is being generated. It is a simple matter to proceed through the circuit checking at all the places where r.f. should be to see if it actually is there. You can quickly tell if a stage is working or not. In doing any checking where there is any danger of getting a shock, be very careful. You can hold the neon bulb by the tip of the glass bulb and touch one of the electrode leads to the point being checked.



This photograph shows the completed code practice oscillator. The terminal strip at the left rear is used for mounting the oscillator components. At the right rear is the strip holding the power supply parts. Note the tape on the top of the strips to avoid electrical shocks from accidental contact.

* Technical Assistant, ARRL.

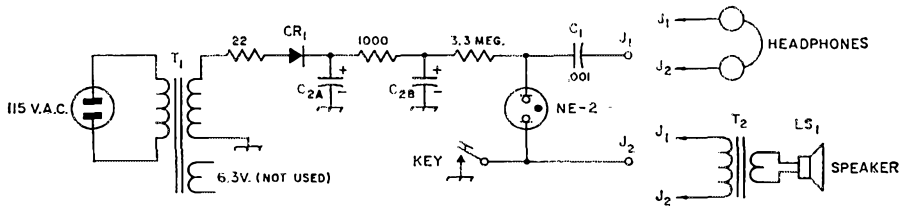


Fig. 1—Circuit diagram of the neon-bulb code practice oscillator. Resistances are in ohms; resistors are ½ watt.

C_1—0.001 μf. ceramic or paper.
C_2—Dual 20-μf. electrolytic, 150 volts.
CR_1—Miniature selenium or silicon rectifier, 400 volts p.i.v., 130 volts r.m.s. or more.
J_1, J_2—Fahnestock clips.
LS_1—4- to 8-ohm speaker.
T_1—Power transformer, 125 volts, 15 ma. (Stancor PS-8415, Knight 61-G-410).
T_2—Output transformer, 5000-ohm primary, 4-ohm secondary (Knight 61-G-403).

A Neon Bulb Code Practice Oscillator

A very simple code practice oscillator using a neon bulb as the oscillator is shown in Fig. 1. The oscillator circuit consists of an NE-2 bulb, a 0.001-μf. capacitor, and a 3.3-megohm resistor. We have included a power supply to power the oscillator but the unit can be run by a 90-volt battery. However, the supply is almost as cheap as the battery and, what is more important, after you've used the oscillator, this same supply will find many other uses around the station. Incidentally, the smallest size batteries available can be used for unit as the current flow in the circuit is less than 0.1 ma., so the batteries will last almost as long as their normal shelf life.

The unit shown in the photograph uses a piece of wood 1 × 4½ × 11 inches as a chassis. The key is mounted forward and the oscillator and power supply components at the rear. Terminal strips were tacked to the board and all necesssary connections are made to the strips. In order to avoid any accidental shocks, the terminal strips were covered with electrician's tape.

If you find the pitch of the note too high or low to suit you it can be changed by reducing or increasing the value of C_1. For a higher pitch use 470 pf., and for a lower note make the value 0.002 μf. The unit can also be used as a keying monitor by using a relay to key the transmitter and code oscillator at the same time.

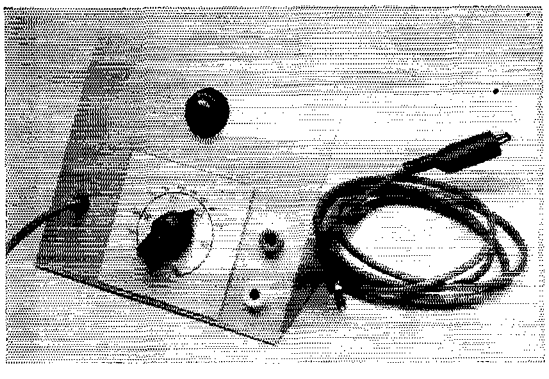
The oscillator can be used with headphones or a speaker. If a speaker is used an output transformer is needed. The audio level with a speaker won't blast your eardrums but it is plenty loud enough when used in a quiet place.

A Simple Voltmeter

One important item that finds considerable use in the ham shack is a voltmeter. Many times an amateur will wish to check voltages. The unit described here, while quite simple, will do a very good job. The voltmeter shown in the photographs and Fig. 2 is useful for checking d.c. voltages between 100 and 1000 volts and for a.c. from 100 to 900 volts. The theory of operation is quite simple. Whenever the voltage drop across R_3 reaches the starting voltage of the NE-17, the bulb will ignite. The amount of voltage drop across R_3 depends on the amount of current flowing through the resistor. This current flow is controlled by the variable resistor R_2 and of course any other resistance that may be in series with the circuit. The NE-17 was chosen because it has a lower ignition voltage than other types.

To make it easy for the builder, we have provided a drawing of a dial scale which can be cut out and used as the scale for your unit. Using the scale eliminates the problem of trying to calibrate your own unit. We tried several NE-17 bulbs and they all showed the same starting voltage so the dial calibrations should be the same for any units constructed according to Fig. 2. Be sure to use the same type control as specified in Fig. 2, the Mallory U-50.

The voltmeter was mounted on a piece of aluminum 4½ × 9 inches which was bent to



Here is a shot of the completed voltmeter. The dial was mounted on a piece of cardboard which in turn is held in place by the mounting nut of the control. Note the insulated cover on the clip lead which provides an additional safety factor when testing "hot" circuits.

form an angle. The panel is 4½ × 4½ inches; see the photograph. If a piece of metal isn't available the voltmeter can be mounted in a small cigar box or any other suitable container. The NE-17 is held in place by a ½-inch diameter rubber grommet mounted just above the dial. The negative lead is permanently wired into the unit and two pin jacks are used for the two positive terminals. In the low voltage setup the range is 100 to 500 volts d.c. When the positive lead is connected to the other pin jack, 500 volts should be added to any reading.

The base of the NE-17 should be wired so that when a positive voltage is applied to the positive terminals the neon glow will appear around the outer electrode of the bulb. If the glow appears around the inner electrode first, the calibration scale of the unit will not hold true. All you need do if the glow is around the wrong electrode is reverse the wires to the base of the NE-17.

Using The Voltmeter

Whenever you check an unknown voltage, or for that matter any voltage, always set R_2 at

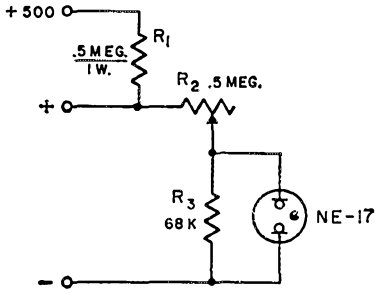


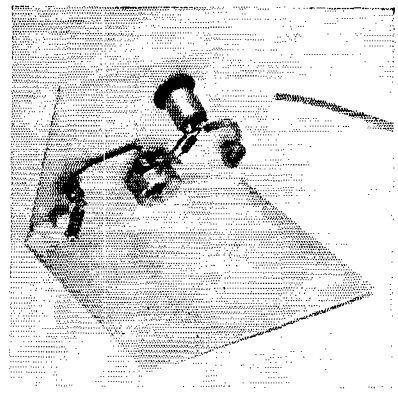
Fig. 2—Circuit diagram of neon-bulb voltmeter. Resistances are in ohms; resistors are ½ watt unless otherwise specified.

R_1—0.5 megohm, 1 watt.
R_2—0.5-megohm control (Mallory U-50).
R_3—68,000 ohms, ½ watt.

maximum resistance to start. Use insulated leads to connect the voltmeter to the voltage being checked and as we said before, always use caution when working around "live" circuits. Turn the knob on R_2 slowly toward minimum to the point where the neon bulb fires. At the point where this happens the voltage can be read from the scale. *Don't* turn the control any more than necessary to get the bulb to light. If you go too far toward minimum there is a danger of burning out the neon bulb from excessive current flowing through the bulb. It is good practice to always start at the highest range and then work down until the lamp lights, particularly when checking an unknown voltage. When you buy a voltmeter with a meter in it you would follow the same practice of always using the highest range first in order to protect the meter.

Neon Bulbs For Checking Parasitics

One characteristic of neon bulbs is that the glow has a different color at different frequencies.



The wiring of the voltmeter is quite simple. No terminal strips are required as the wiring can be made directly to the test jacks, control and neon bulb.

Below 50 Mc. the color is orange to red. Above 50 Mc. the color becomes violet or purple. This characteristic is handy if you want to check for parasitics, particularly v.h.f. parasitics. Most of the tubes used in r.f. amplifiers these days, pentodes and tetrodes, are very likely to have v.h.f. parasitics. In fact, unless something is done to suppress parasitics you can almost be certain that such an amplifier will have them. If a neon bulb is held near the plate circuit of an r.f. amplifier and it glows with a violet or purple glow, you know you have a v.h.f. parasitic. Be sure that you are using a neon bulb for such checks. There is another type of glow lamp that is filled with argon gas which has a purplish glow. These bulbs carry the "AR" designation.

Dial Lamps As Indicators

Another good indicator for r.f. power is the common dial lamp. A good example of this is a simple device called a tune-up loop. This consists of a dial lamp connected in series with a loop of wire. When the loop of wire is coupled to the coil of a tuned circuit, and that circuit is resonated, power is coupled to the loop of wire causing current to flow in the loop. The lamp will light, giv-

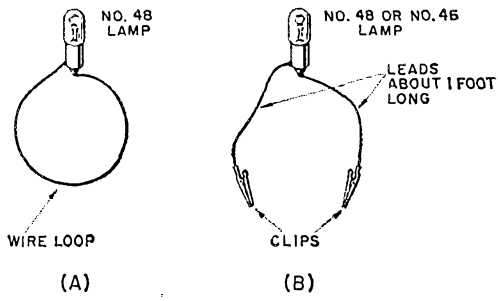


Fig. 3—Two dial-lamp test units. The diameter of the wire loop at A should be the same or slightly larger than the coils of the circuits being checked. The leads of the loop are soldered directly to the base tip and the metal shell of the lamp. At B is a sketch of the indicator for checking power in feed lines.

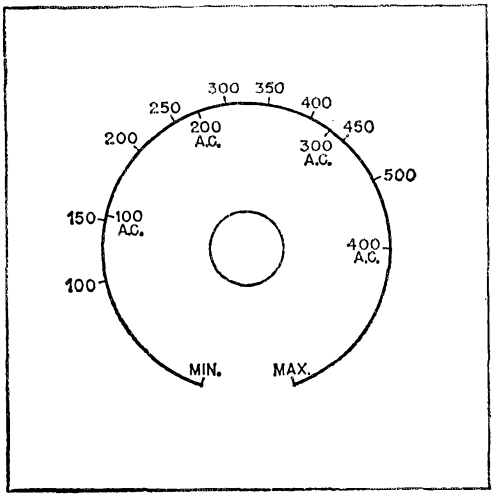


Fig. 4—This drawing can be cut out and used for the dial of the neon voltmeter. Mount the knob on R_2 so that the pointer is at "MIN." when the least amount of resistance is in the circuit. You can double-check the dial accuracy against any known voltage, such as the regulated voltage from a VR tube.

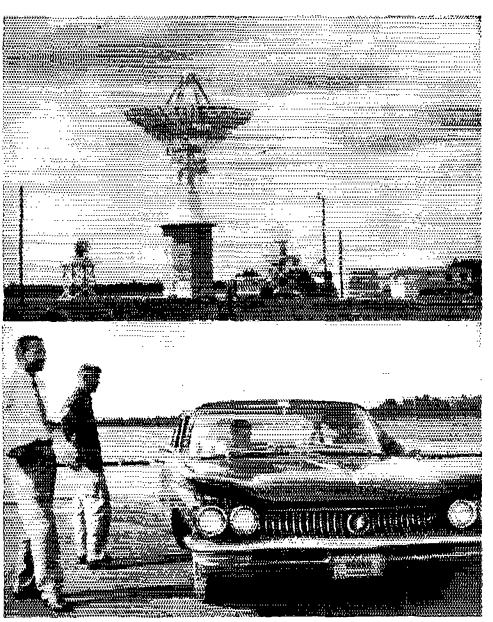
ing a visual indication that the circuit is actually tuning. Depending on the type of dial lamp used this can be an extremely sensitive device. For example, a No. 48 lamp, which is rated at 2 volts at 0.060 amp., when used in a tune-up loop will light up on a tuned circuit that has only a fraction of a watt of power in it. Many of the v.h.f. gang find this extremely helpful in checking low-power stages in a transmitter to make sure the circuits are actually tuning. Fig. 3A is a drawing of this device.

As we mentioned earlier, a neon bulb can be held to the feed line of an antenna to determine if r.f. is flowing to the antenna. However, under some conditions the neon bulb won't light if the point on the line happens to be a voltage minimum spot. A sure-fire method of checking power in the line is with a dial lamp.

The simplest method is to connect two leads about a foot long to a dial lamp (see Fig. 3B). The leads are clipped to one of the feeders and some of the current flowing in the line will be shunted through the lamp, causing it to light. Depending on the power from the transmitter you can use the sensitive No. 48 lamp or a less sensitive one, the No. 46, which is 6 volts at 0.25 amp. If you are using open-wire feeders check to see if the wire is insulated with enamel or other material. Be sure to scrape off the covering so you get a good connection. With poly-covered Twin-Lead remove some of the poly to get at the bare wire.

These are just a few of the uses for dial lamps and neon bulbs. You'll probably discover many more by yourself. If you come up with what you think is a good idea, send it along for our Hints and Kinks Department. QST

Strays



When the land lines break down, call the hams! The Air Force made good use of that axiom during a recent EXOS rocket test at Eglin Air Force Base, Florida.

GE and AF project engineers got the touchy telemetry and tracking instruments working A-OK, but a heavy lightning storm disrupted what was probably the simplest of all their circuits: the telephone line. The rocketeers decided to ask local hams to provide a communications net. That way the launch wouldn't have to be delayed until the break, deep in the nearby woods, could be found and repaired.

Project members W1IYX, K2OUX/W1MVV, and W2YXS put through the plea to local mobileers and W4RKH/mobile and WA4BOZ and K4YVQ responded. A fixed station was set up at the launch site in surprisingly short time. W4RKH/mobile operated from the tracking station about fifteen miles away.

The test took five hours. At its end, the Air Force called it a complete success and gave grateful credit to all the hams involved. Shown are the ground tracking station and (below) the crew who helped. That's W4RKH bending over frontwards to do a good job for the Air Force.

"AA"

BY JOHN G. TROSTER,* W6ISQ

TUNG-a-ling-a-ling — "My gosh, forgot to take the phone off the hook. Sweepstakes not two hours old and interrupted already. Not enough I get rid of Marge and the kids for the weekend . . . Hello."

"Is your radio number W6ISQ?"

"Yes . . . ahh . . . lady. But I have my own TV set going and have a perfect picture. It must be your set. My station has been approved by the FC . . ."

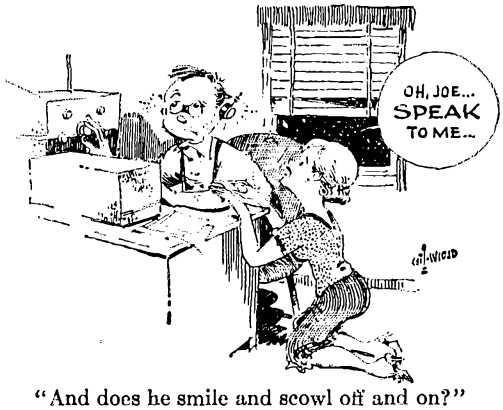
"No, no. I'm calling about my husband. He's a radio bug and his number is WA6TGY. There's something wrong with him."

"Ohhhh, Joe. That's right. You just got married a few weeks . . . I mean . . . well . . . ahhh . . . what's wrong with him?"

"I don't know. He won't talk to me, and all he does is just sit in front of a lot of radios and turn the knobs. He hasn't spoken a word in two hours. He won't come to supper. Just stares and turn knobs. Finally pleaded with him to say something . . . anything . . . and he said, 'call this fella.' And he gave me a card with your phone number on it."

"Ohhh, I see. Now, Mrs. TGY, every once in a while does Joe kinda jump a little, grab a dial and then you hear little clicks and snaps?"

"Yes, yes. For two hours now."



"And does he smile and scowl off and on?"

"Yes."

"And maybe a couple of hours ago he was normal — talked calmly . . . well, maybe a little nervous, a twitch maybe . . . walked around the house, looked up at his aerials?"

"Yes, yeeeesss."

"And did he say something about no company, and staying home this weekend?"

"Yesss."

"Mrs. TGY, I think I know what is wrong with Joe."

"Is it bad? Contagious?"

"I'd guess Joe's got a pretty bad attack. But don't worry, you may never get it."

"Please, it's all right to tell me. You know, I'll take care of him. After all, I did promise to . . ."

"No, now don't worry. Only certain people are afflicted."

"Well, can you tell me what it is? What's wrong?"

"Madam, he's been bitten by, ahhh . . . a rare, rather harmless most of the time . . . well, he's been bitten by an AM . . . Anopheles Marconii. Joe's got what we call the WF . . . ahhh . . . Weekend Fever."

"Oh my, it sounds horrible. What can I . . . err . . . we do? Is there any hope?"

"As a matter of fact, there's quite a bad outbreak of the WF . . . ahh . . . Fever this weekend? Thousands are suffering all over the country. And some weekends there are horrendous outbreaks all over the world. AM . . . Anopheles Marconii has many victims . . . worldwide. But it just so happens I might be able to relieve Joe's suffering a little."

"Oh please, come over quickly. Joe is in very poor condition. I can tell."

"Oh, I won't need to go over. I can give him a treatment from right here. Right now."

"Is it something like mental telep . . . ahhh . . . ESP . . . one of those?"

"Nooo. This is a positive treatment. Now watch Joe's face. (He's on this band . . . heard him a few minutes ago. There he is CQing away . . . 'WA6TGY de W6ISQ')."

"(W6ISQ de WA6TGY nr 79 WA6TGY . . . etc. etc.)"

"(WA6TGY de W6ISQ. This is an AA call, Joe. Ur XYL talking to me on fone. Says ur sick. Smile at her . . .)"

"Mrs. TGY, does Joe seem any better?"

"Why yes, he smiled. What did you do?"

"Well I administered a little EBT . . . ahh . . . Electromagnetic Balm Therapy. Now keep your eye on him . . . (Hr Joe nr 81 W6ISQ . . .)."

"Mrs. TGY, did Joe frown, scowl or something?"

"Oh my. He broke his pencil and said something. Very ugly humor."

"I thought so. Now tell me what he does — watch closely — (. . . dit dit dit dit . . . sri Joe hr *only* nr 61 61 61 W6ISQ . . .)."

"Oh, now he's smiling again. Happy. Picked up the biggest part of the pencil."

"Well now Mrs. TGY, don't worry about Joe I just gave him a short treatment and I'll keep an eye . . . ahh . . . ear on him. His fever is pretty bad though and he won't sleep much for the next 48 hours. You might feed him every

(*Continued on page 142*)

* 45 Laurel Avenue, Atherton, Calif.

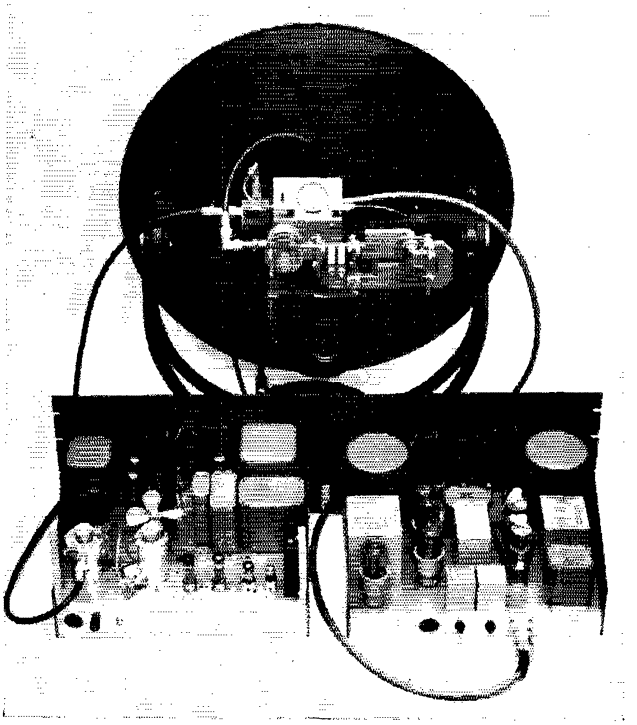


Fig. 1—One of the two 10,000-Mc. crystal-controlled transmitters built by W7JIP and W7LHL. Rack assemblies are the exciter, left, delivering output on 2000 Mc., and the power supply and modulator, right. The klystron multiplier, double-stub tuners and directional couplers are mounted on the back of the parabolic reflector. Output is about one watt on 10,000 Mc., with a high order of stability.

Crystal Control on 10,000 Megacycles

Applying Narrow-band Techniques to Amateur Microwave Communication

BY LEONARD F. GARRETT,* W7JIP AND ERNEST P. MANLY,** W7LHL.

The authors of this article have demonstrated that even on 10,000 Mc., the next-to-the-highest amateur frequency assignment, interesting propagation effects and DX beyond line of sight can be observed on occasion. The equipment described briefly here was developed over a period of years in the hope that it will permit exploitation of weak-signal propagation modes known to exist in this frequency range, and thus make microwave DX possible from other than mountaintop locations. While few amateurs may be capable of building a complete station of this caliber, the information includes several items of value to the u.h.f. experimenter. Perhaps more important, it shows the ends that dedicated amateurs will go to in order to pursue their hobby.

FOLLOWING successful efforts with simpler equipment which resulted in a 265-mile contact over an obstructed path, the writers often discussed the possibility of using narrowband crystal-controlled equipment on 10-kMc. These experiments used reflex klystron oscillators and wideband receiving systems, leaving much to be desired in the way of sensitivity and power output. It was felt that if suitable crystal-controlled equipment could be built, the reliable communications range could be extended markedly.

The most important consideration in planning and building such advanced gear would be the availability of a 10-kMc. multiplier which would give reasonable power output and still be obtainable at a price we could afford. After scanning possible choices, the Varian V-45 klystron multi-

* 625 West 17th Street, McMinnville, Oregon.
** 429 Tenth Avenue West, Kirkland, Washington.
[1] "The World Above 50 Mc.," October, 1960, *QST*, p. 79.

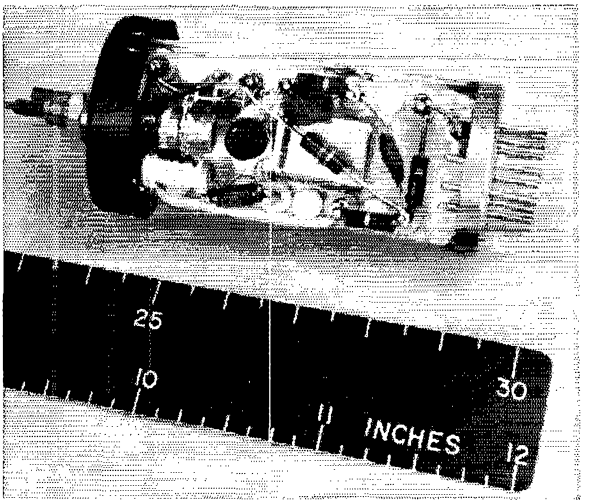


Fig. 2—Crystal-oscillator assembly of the 10,000-Mc. station. The buffer stage, which also uses a transistor, is on the opposite side of the mounting board.

plier looked like the best bet for the purpose, and it could be obtained on the surplus market at a price compatible with our resources.

For such a system to be practical at this frequency, the problem of frequency stability had to be given serious thought. After due consideration, we decided that the entire crystal oscillator and buffer assembly should be temperature stabilized and, because of the size of typical component ovens, transistors were decided on for these stages.

Exciter Design

An important factor in the stability of a transistor crystal oscillator is the phase stability of the transistor used. This is associated with the diffusion of minority carriers through the base region of the transistor. Frequency instability

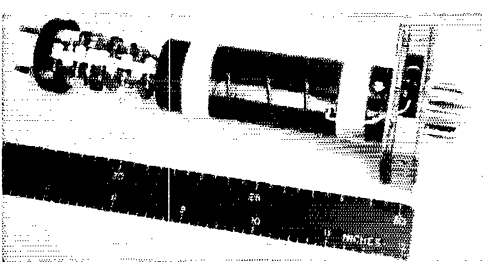


Fig. 3—The complete crystal oscillator and buffer assembly, partially inserted into its oven. High stability is assured by regulation of the operating temperature at 70° C, plus or minus 0.08.°

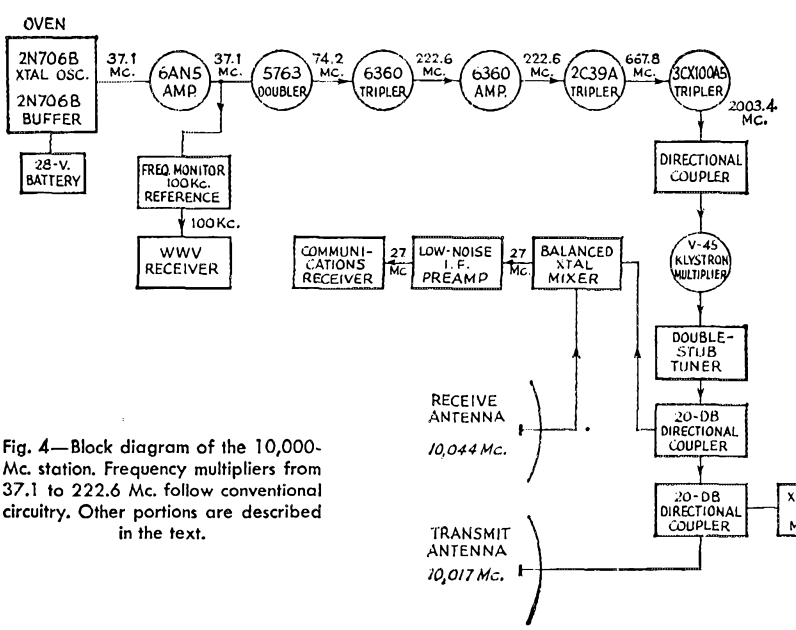


Fig. 4—Block diagram of the 10,000-Mc. station. Frequency multipliers from 37.1 to 222.6 Mc. follow conventional circuitry. Other portions are described in the text.

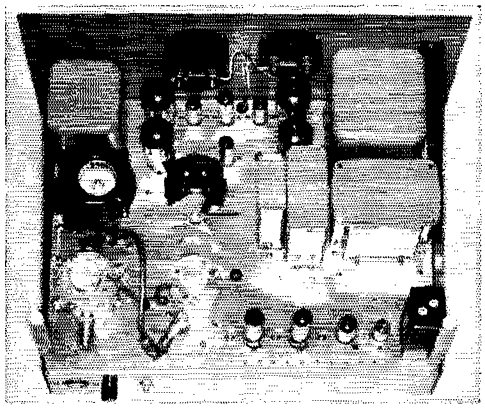


Fig. 5—Top view of the 2000-Mc. exciter. The oven containing the oscillator and buffer stages is at the lower right, with multiplier stages on the left. Near the panel are the electronically-regulated supplies for the low-level and 2C39 stages, which are in the lower left portion of the chassis.

can be minimized by using a transistor with a high-frequency cutoff several times the crystal frequency, and by temperature stabilization.

The choice of crystal frequencies was motivated by the desire to have them at multiples of 100 kc., for checking with WWV and a secondary frequency standard, while at the same time

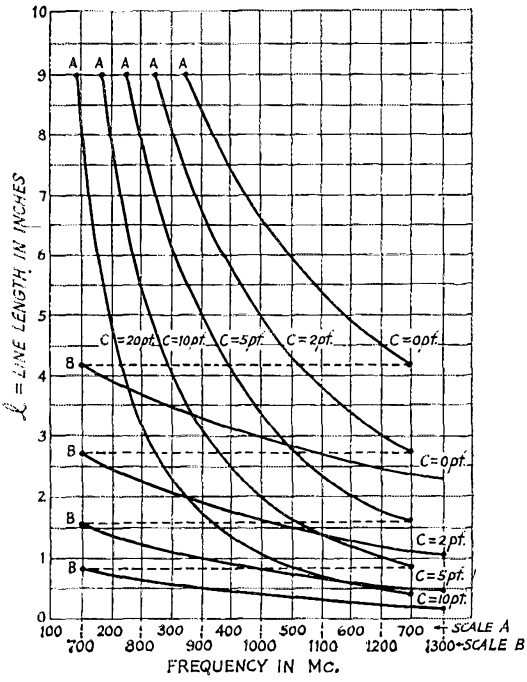


Fig. 6—Graph for determining the length of a capacity-loaded quarter-wave coaxial line of 71 ohms impedance, for frequencies from 150 to 1300 Mc. The value C includes tube output and tuning capacitances. From Brayley, May, 1951, QST.

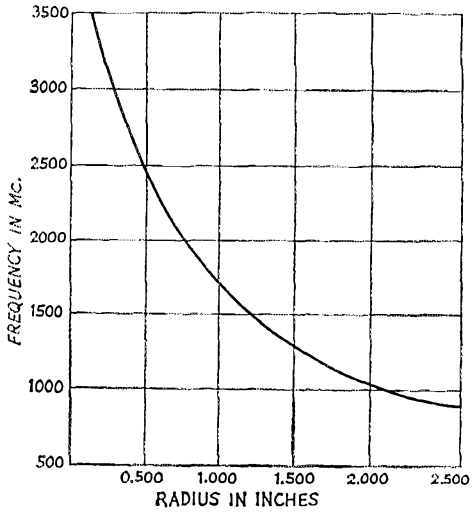


Fig. 7—Radius of a cylindrical cavity for a type 2C39 tube, for frequencies from 500 to 3500 Mc., with a cavity height of 0.78 inch. From Ramo and Whinnery, *Fields and Waves in Modern Radio*, pp. 398, 399.

providing a 27-Mc. frequency difference between stations. The crystal oscillator and buffer assembly is shown in Figs. 2 and 3. Fig. 4 is a block diagram of the complete station.

Following the oscillator and buffer are several stages of conventional frequency multiplication similar to those found in chapter 17 of the *Radio Amateur's Handbook*. Then follow two multiplier stages using 2C39-type tubes. The output circuit of the 2C39 tripler to 667 Mc. is a quarter-wave coaxial line similar to that shown for 420 Mc. by Brayley, in May, 1951, *QST*.[2] The graph of Fig. 6 makes it a simple matter to select the proper line length for a 71-ohm coaxial tank circuit of this kind, when the total terminating capacitance of the circuit is known. This includes the tube output capacitance and the tuning capacitance.

The tripler to 2000 Mc. uses a 3CX100A5, which is the ceramic version of the 2C39. It was chosen for this stage because of its superior performance in the radial-line type of cavity required for this frequency. Fig. 7 shows the radial-cavity radius for a tube of this kind in a cavity having a cylinder height of 0.78 inches, over a frequency range that will be useful for microwave experimenters.

The input circuit of this tripler stage uses a three-quarter-wave coaxial line. This type of circuit could have been used for the output, but the radial cavity is more compact and probably more effective. It will be seen that up to this point, the transmitter design is relatively simple and it can be built without too great an expense, if one is willing to shop the surplus market for the necessary tubes. The mathematical part, which may scare off some experimenters, is taken care of in Figs. 6 and 7.

[2] Brayley, "A Coaxial-Tank Amplifier for 220 and 420 Mc.," May, 1951, *QST*, p. 39.

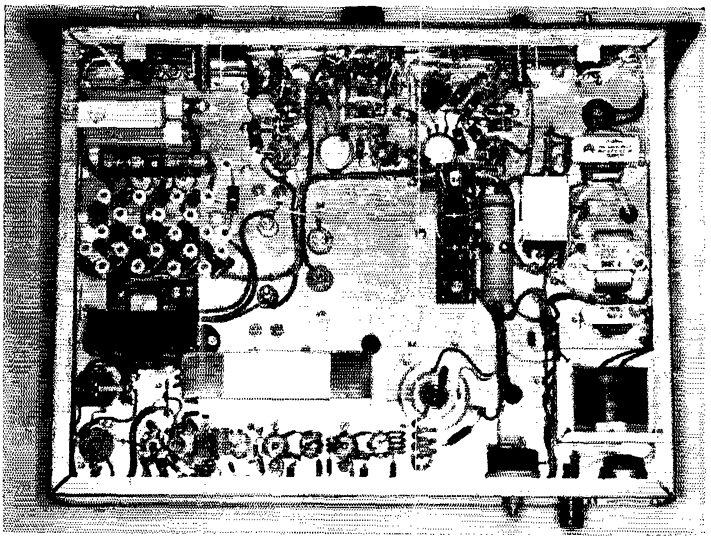


Fig. 8—Bottom view of the 2000-Mc. exciter. Provision is made for monitoring plate voltage and grid and plate currents of all stages. The r.f. circuits are visible at the bottom of the picture, with the series-tuned input to the 2C39 stage at the right end of the string.

The Klystron Multiplier

The last and most important stage, the V-45 klystron multiplier, provides about one watt output on 10,000 Mc. when driven on 2000 Mc. and working into a properly-matched load. Approximately 80 per cent amplitude modulation is possible through proper adjustment of beam voltage and r.f. drive.

Klystrons of the V-45 type are generally provided with a fixed output coupling aperture and it is necessary to use additional external matching if maximum power output is to be obtained over the entire frequency range. A double-stub tuner is used for this purpose in our installations, as indicated in Fig. 4. The waveguide section between the V-45 klystron and the antenna also contains two 20-db. directional couplers. One of these is for power-output monitoring and the other for feeding a portion of the transmitted energy to the balanced mixer in the receiver, to provide the local oscillator injection. In order to keep losses at a minimum, this local oscillator energy is piped from the transmitter unit to the receiver through 6 feet of flexible waveguide.

The Receiver

The receiving system uses a balanced mixer in a short-slot hybrid mount, followed by a low-noise i.f. preamplifier. Because the crystal mixer has no gain, the noise figure of the i.f. amplifier is important. In order to secure the lowest possible noise figure, the i.f. preamplifier was designed around the Amperex 7788, which has an equivalent noise resistance of 60 ohms when triode-connected. Two of these tubes are used in a conventional cascode circuit, with a 6CW4 cathode follower for coupling into the NC-300 communications receiver at 27 Mc.

Power supplies for all multiplier stages are electronically regulated and the transistor stages are powered by a 28-volt mercury battery.

Using narrow-band techniques and the best possible receivers should result in a 20-db. improvement at each station, compared to the simpler equipment used heretofore in work at 10 kMc. This means a 40-db. system improvement with two stations, to cope with path losses. It should thus be possible to cover much greater distances, and to work over paths far below line of sight. QST

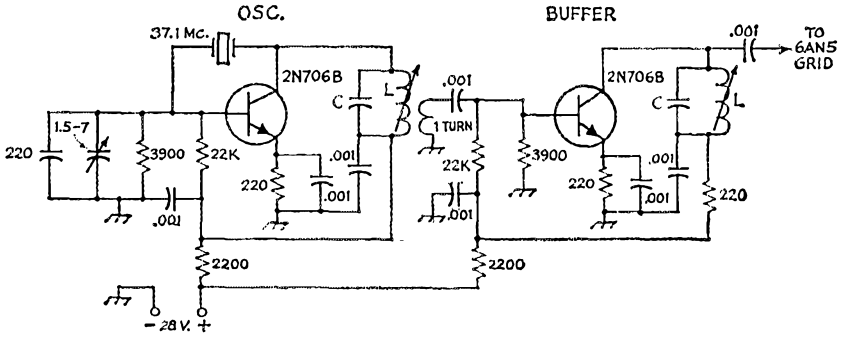
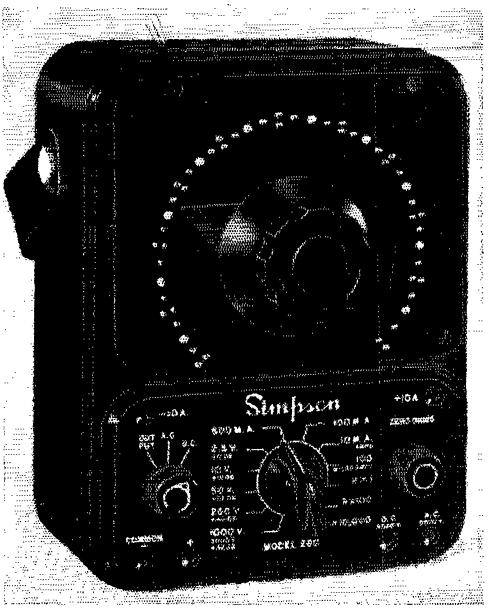


Fig. 9—Circuit diagram of the 37.1-Mc. crystal oscillator and buffer. Both stages are inside the oven unit of Fig. 3. The two LC circuits resonate at the crystal frequency.



Transistor Auditory Meter for the Blind

BY J. C. SWAIL,* VE3KF

A standard v.o.m. is converted to Braille for sightless amateurs, by substituting a transistor comparator and audio amplifier for the microammeter normally supplied with such an instrument.

In recent years many blind persons have entered the field of electronics either as a hobby or a vocation. There are numerous blind radio amateurs, radio and high-fidelity service technicians, and electronic assembly-line workers. One of the major difficulties confronting these persons is obtaining suitable measuring instruments.

The most widely used technique for instruments requiring precise readings is shown in Fig. 1. In this system, the voltage drop across the visual meter, or a resistance of the same value as the meter substituted in the circuit, is balanced against the voltage developed between the arm and one end of a linear-calibrated potentiometer. This potentiometer is fed by a known stable voltage source such as a mercury cell. The detector is a mechanical chopper whose contacts are in series with a pair of headphones across the circuit. The potentiometer is adjusted for a null in the phones, at which point the voltage drop across the meter and that across the potentiometer are equal. The value is then read from a raised scale associated with the potentiometer.

Although this system permits the blind user to make very accurate measurements, it has the disadvantage that such mechanical choppers are both mechanically and electrically noisy, and they are also rather large and power-hungry. This generally restricts their use to non-portable bench equipment. For this reason the author sought a solution in transistor circuitry.

Fig. 2 shows the circuit of a transistor chopper and audio amplifier designed to adapt the Simpson Model 260 circuit analyzer for use by the blind. The total current drawn by this circuit is about 6 ma. from a 9-volt battery. With the exception of the calibrated potentiometer, speaker and batteries, the unit is contained on two small circuit boards as shown in Fig. 3.

The visual meter is removed from the instrument and its space occupied by the calibrated potentiometer and associated raised scale. The meter is electrically replaced by a resistor of the same value as its internal resistance (2050 ohms in this case). The one-inch loudspeaker and the power switch are mounted on the upper end of the case and small holes are drilled in the case to form a speaker grill. The raised scale is made by installing small drive screws in a piece of $\frac{3}{16}$-inch bakelite. The pointer is made of a piece of thin aluminum cemented to the underside of a knob. The completed instrument is shown in the picture above.

* National Research Council, Ottawa, Canada.

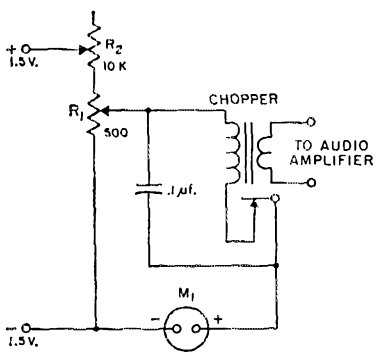


Fig. 1—Chopper circuit for voltage comparison.
R_1—Precision 500-ohm potentiometer with pointer and Braille scale.
R_2—Calibrating resistor, 10,000-ohm control.
M_1—Moving-coil meter to be read.

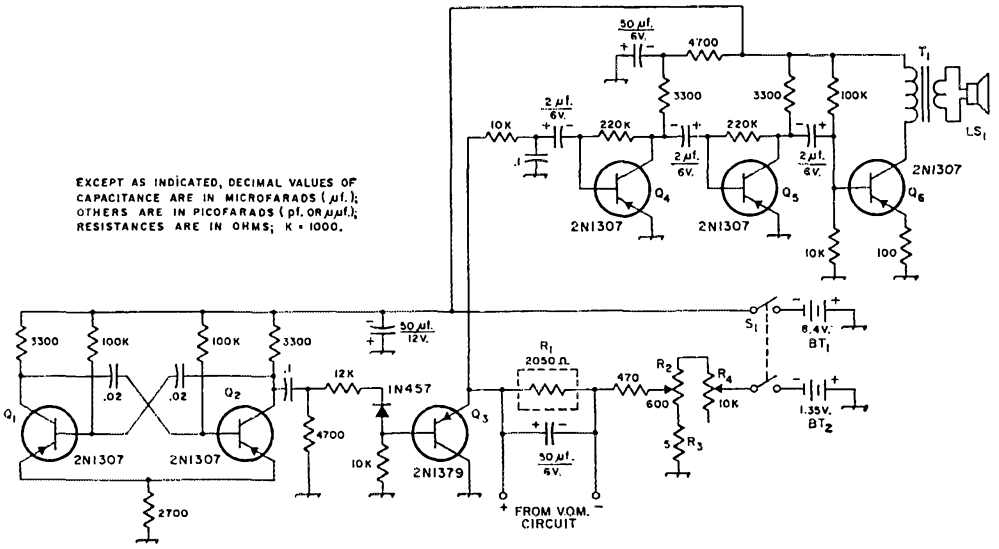


Fig. 2—Transistor auditory-meter circuit. Fixed resistors are ½ watt; capacitors with polarity indicated are electrolytic, others are low-voltage ceramic.

BT_1, BT_2—Mercury transistor batteries.
LS_1—1-inch loudspeaker.
R_1—Substitute for meter internal resistance.
R_2—600-ohm precision potentiometer.
R_3—5 ohms.
R_4—10,000-ohm linear control (calibrating adjustment).
S_1—D.p.s.t. toggle.
T_1—Transistor output, 1200 to 3.2 ohms, 250 mw. (Hammond 142T or equivalent).

Circuit

Q_1 and Q_2 form a 200-c.p.s. multivibrator whose output is coupled to the base of chopper transistor Q_3 through appropriate limiting resistors and a diode which permits only negative pulses to reach Q_3's base. When a measurement is being made, the positive voltage developed across the meter replacement resistor, R_1, is balanced against a negative voltage developed across the calibrated potentiometer, R_2. A small value of negative bias is permanently applied to this potentiometer by the 5-ohm fixed resistor, R_3, in series with it, to balance out the contact potential of the chopper transistor. R_4 is used to set the correct voltage across the potentiometer. Q_4, Q_5, and Q_6 constitute a simple audio amplifier to drive the speaker.

In use, the operator simply adjusts the calibrated potentiometer so that a null is heard in the speaker, and then reads the correct value from the raised scale.

A number of these instruments have been in use for some time in ham shacks, laboratories, and schools for the blind. With precision components and a little care, accuracies of about two per cent are attainable. This chopper has been applied to many other instruments, the only requirement being that the appropriate value of meter-replacement resistor be selected. In many cases the meter is simply left in the circuit and the chopper connected across it so that the instrument may be used by both blind and sighted persons. QST

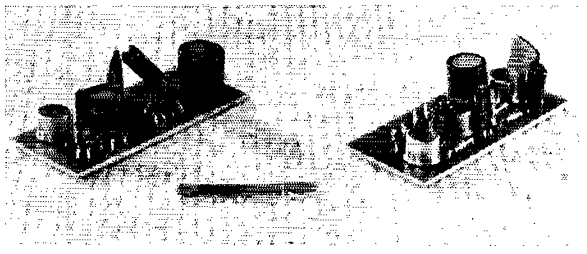


Fig. 3—The paper match gives a good idea of the size of the two phenolic boards on which the circuit components are mounted. Layout is not critical because only audio frequencies are involved.

Strays

Officials of a California race track recently asked the FCC to investigate when they heard numbers being transmitted on their Citizens Band channel at the start of each race. FCC discovered that messages were being sent from a man in the grandstand to his accomplice near the betting window below. The electronic aid was not very profitable, though. Their last bet was $100 on a horse that also ran.

Rus Sakkers, WSDED, is compiling a directory of members of the Christian Ham Fellowship, a group formed to promote interest in a missionary ham network. Copies of the directory will be made available to anyone interested.

—···—

The Post Office Department promises faster mail service with the new Zip codes. Use yours when you write League Headquarters.

Announcing the 30th ARRL Sweepstakes

November 9-11 and 16-18

CONTEST PERIODS

Starts	*Ends*
Saturday Nov. 9 **2300 GMT**	Monday Nov. 11 **0801 GMT**
Saturday Nov. 16 **2300 GMT**	Monday Nov. 18 **0801 GMT**

THREE decades of SSing will be celebrated this November when the 30th ARRL Sweepstakes gets under way. The SS has been a favorite operating activity for many amateurs in the Field Organization and this year should prove no exception.

In general the rules remain the same as last year. A few interesting preamble changes, however, should spice things up considerably! In place of the RS(T) report for the message check, you'll be sending the last two digits of the year you were first licensed. No more stereotyped

59(9) reports fellas', just 30 for the check if you received your first license in 1930, etc. The other change replaces the SS date with the month and day (*not year*) of birth, *i.e.*, Nov. 1 if you were born on Nov. 1. No more "date" or *dit-dit dit-dit;* copying what is *sent* will be the rule of the day. How will this affect you if operating another station? You'll still send the above information as it refers to *you alone;* the same for each opr. in a multi-op. station.

The contest will run over two consecutive week ends with a maximum allowable operating time of 40 hours out of the possible 66 for each entry (phone or c.w.). You may operate both modes, but please file separate logs. For contest purposes Yukon-N.W.T. (VE8) counts as a separate multiplier in addition to the 73 ARRL sections. Newfoundland and Labrador (VO) count as Maritime.

Certificates will be awarded to the highest scoring single-operator in each section (plus Yukon-N.W.T.). A certificate also goes to the top Novice, Technician, and multiple-operator entry for those sections with sufficient entries, see the rules for award details. Within a club, single operator entries can complete for the club certificate given to the top c.w. and phone scorers with *an engraved cocobolo gavel going to the* club with the highest aggregate score. Mark your logs accordingly if participating for your club award.

HOW TO SCORE

Each preamble sent and acknowledged counts one point.

Each preamble received counts one point.

Only two points can be earned by contacting any one station, regardless of the frequency band used.

For final score: Multiply totaled points by the number of *different* ARRL sections worked; that is, the number in which at least one bona fide SS point has been made. Multiply c.w. scores by 1.25 and phone scores by 1.5 if you used 150-watts-or-less transmitter input *at all times* during the contest.

Please read and follow the contest rules carefully. To avoid duplicating QSOs, we suggest the use of ARRL *Operating Aid No. 6*, a check list of stations worked. This and convenient log reporting forms are available for the asking. Please request them today from the ARRL Communications Dept. 225 Main Street, Newington, Connecticut 06111. Logs must be postmarked by Dec. 18, 1963, to be eligible for score listing and awards.

Rules

1) *Eligibility:* The contest is open to all radio amateurs in (or officially attached to) sections listed on page 6 of this issue of *QST*.

EXPLANATION OF "SS" CONTEST EXCHANGES

Send Like a Standard Msg. Preamble, the.....NR		*Call*	*CK*	*Place*	*Time*	*Date*
Exchanges	Contest serial numbers, 1, 2, 3, etc., for each station worked	Send your own call	CK (Last two digits of year first licensed)	Your ARRL section	Send GMT time of transmitting	Send month and day of birth (not year)
Sample	NR 1	W1NJM	30	CONN	2301	NOV 1

2) *Time:* All contacts must be made during the contest periods indicated elsewhere in this announcement and between amateurs in (or officially attached to) the 73 sections. Yukon-N.W.T. (VE8) counts as a separate multiplier. Time may be divided between week ends as desired, but a total of 40 hours must not be exceeded for each entry. Time spent in listening counts as operating time.

3) *QSO:* Contacts must include certain information sent in the form of a standard message preamble, as shown in the example. C.w. stations work only c.w. stations and phone stations only other phones. Valid points can be scored by contacting stations not working in the contest, upon acceptance of your preamble and/or receipt of a preamble.

4) *Scoring:* Each preamble sent and acknowledged counts one point. Each preamble received counts one point. Only two points can be earned by contacting any one station, regardless of the frequency band. The total number of ARRL sections (see p. 6) worked during the contest is the "section multiplier." It is not necessary for preambles to be sent both ways before a contact may count, but one must be received, or sent and acknowledged, before credit is claimed for either point(s) or multiplier. Apply a "power multiplier" of 1.25 to c.w. entries and 1.5 to phone entries if the input power to the transmitter output stage is 150 watts or less at all times during contest operation.

The final score equals the total "points" × the "sections multiplier" × the "power multiplier."

(Continued on page 140)

SUMMARY OF EXCHANGES ARRL NOVEMBER SWEEPSTAKES

CALL USED...W1NJM..... CW OR PHONE....C.W..... SECTION....CONN.....

	SENT (1 point)								RECEIVED (1 point)							
BAND	TIME ON OFF AIR	NR	STN	CK	SECTION	TIME	DATE	NR	STN	CK	SECTION	TIME	DATE	NR. DIFF SEC.	PTS
3.5	2301 NOV.9	1	W1 NJM	30	Conn	2302	NOV 1	1	W3AA	12	DeL.	2303	MAY 1	1	2
		2				2304		3	W4QQQ	50	VA	2306	JAN 4	2	2
		3				2310			W1WPO						1
		4				2315		8	K2PPP	60	NLI	2317	APR 20	3	2
	2325					2320		15	W1WPO	38	CONN	2321	NOV. 5	4	1
14	1900 NOV.10	5				1903		200	K6SS	20	SBAR	1905	OCT. 15	5	2
	1915	6	↓	↓	↓	1910	↓	99	WØSLL	57	Colo	1912	AUG 17	6	2

Enter summary below on last sheet used

SCORING: ....12.....points X ....6...sections X 1.25.power Mult.* = ...90....CLAIMED SCORE

*power multiplier: C.W. -- 1.25, phone -- 1.5 for 150 watts, or less, at all time.

Nr. different stns. wkd...6....., nr. diff sections wkd.6...., input.75.watts, hr. op..1...

Type transmitter (tube line up if home built).....

Receiver..... Antennas.....

CHECK ONE: Single Operator Station [✓] Multioperator Station [ ]

If multioperator, please show calls of all operators.....

Participating for award in the following club.....

I have observed all competition rules as well as all regulations established for amateur radio in my country. My report is correct and true to the best of my knowledge.

.....

Signature Call Mailing Address

(Please don't forget to enclose your comments for soapbox, photos, etc., and mail promptly to ARRL Communications Department, 225 Main Street, Newington, Connecticut, 06111.)

Basics for Beginners

Antennas and Feeders

Part II — Antenna Impedance; Directivity

BY GEORGE GRAMMER,* W1DF

THE way in which current and voltage are distributed along a wire, discussed in Part I,[1] may be in itself an interesting electrical phenomenon, but it is not merely that. It has important practical effects, too, in the workings of antennas and transmission lines. In antennas, the distribution exerts control over the radiation — taken up later in this Part — and establishes the conditions that must be met when r.f. power is fed to the antenna. The latter point can be summed up by saying that, as a result of the r.f. current and voltage distribution, the antenna has an *impedance* that must be considered when power is applied. In this respect the antenna is just like any other load in which energy is to be used up. Until we know the impedance of the load we don't know where to start in settling on the right way to feed it.

Antenna Impedance

Impedance, as it was defined in the earlier series,[2] is equal to voltage divided by current. When the current and voltage both change as we move along the antenna, as they do in Fig. 3, Part I, the impedance also is different everywhere along the antenna. Therefore, if we want to talk about antenna impedance we have to specify the point at which it is measured.

The customary place to measure the impedance of a simple antenna is at the center of the wire. In Fig. 1 an r.f. generator, *G*, is inserted in series with the antenna at its center. The voltage from the generator will cause a current, *I*, to flow; this current has the same value on both sides of the terminals. The antenna behaves like a circuit having resistance, inductance and capacitance in series. At the resonant frequency of such a circuit the inductive and capacitive reactances cancel each other,[2] leaving only the resistance. This is also true of the antenna. Thus at its resonant frequency the antenna "looks like" a simple resistance, and it is at this frequency that the current is largest. A half-wave antenna has a resistive impedance, measured at this point, in the neighborhood of 70 ohms. It is rarely exactly 70 ohms in any practical case, because the actual resistance depends on the same factors that affect the resonant frequency.

If the frequency is moved off resonance the impedance rises, just as it does in a series *LC* circuit. It also becomes complex — there is reactance, now, along with the resistance.

Now suppose the r.f. generator to be connected to one end of the antenna, as in Fig. 1B, with one ammeter at the end and the other at the center. As the frequency is varied, the current I_2 will reach its highest value at resonance, where the antenna is a half wavelength long. But the current I_1 at the terminal where the generator is connected will be *smallest* at this frequency. As seen by the generator, the antenna is just like a parallel *LC* circuit. That is, at resonance its impedance is maximum, and is a simple resistance. As the frequency is moved away from resonance the current I_1 increases; the impedance becomes smaller and is again complex, containing both reactance and resistance.

Impedance Values

Although it is possible to feed at any point along the wire, antennas are usually fed with r.f. power either at the center or the end. Thus the two cases illustrated by Fig. 1 have some practical importance. The resonant impedance at the end is much more dependent on the thickness of the antenna conductor and other such factors than is the impedance at the center. Values can range from a few hundred to several thousand ohms. The thicker the conductor the lower the resistance as viewed from the end. At the center, the

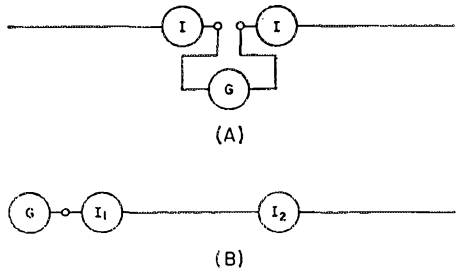


Fig. 1 — A half-wave wire driven at the center behaves like a series-resonant circuit. One driven at the end acts like a parallel-resonant circuit.

* Technical Director, ARRL.

[1] "Antennas and Feeders," Part I, *QST*, October, 1963.

[2] "A.C. in Radio Circuits," Part II, *QST*, April, 1963.

effect of conductor thickness on the resistance, at resonance, is relatively minor.

The impedance of a grounded antenna usually is measured between the earth and the bottom of the antenna. Like the center-fed antenna with free ends, the grounded antenna acts like a circuit having L, C and R in series. As the antenna is only half as long, for the same resonant frequency, the resistance is only half as great. That is, it is in the neighborhood of 35 ohms, for an antenna a quarter wavelength long. This assumes a "perfect" ground — one that has extremely low losses at the operating frequency. Ordinary ground is far from perfect, and the earth connection usually adds quite a considerable amount of resistance to the system — often as much as 25 ohms. The ground resistance can be reduced by burying a large number of wires, having a length of about a half wavelength, going out from the base of the antenna like the spokes of a wheel. To be effective, though, a really large number of them — several dozen — has to be used.

The Nature of Antenna Resistance

Resistance, defined in broad terms, is something in which power is used up — usefully or otherwise. The resistance of an antenna divides into two parts, one useful and one not. The useful part is called **radiation resistance.** The power used up in this resistance is the power actually radiated into space from the antenna. The nonuseful part of the resistance is represented by losses, partly in the conductor (because of its ordinary resistance at the operating frequency), partly in insulation associated with the wire, and partly in conductors and dielectrics close enough to the antenna to be in a strong electromagnetic field. These are lumped together and often called the **ohmic** resistance. Power dissipated in ohmic resistance is turned into heat.

Since only the power used up in the radiation resistance is useful, we want the radiation resistance to be much larger than the ohmic resistance. It is the *ratio* of the former to the latter, rather than the actual values in ohms, that is of interest. We may measure different values of total resistance at different points along a given antenna, but the ratio of the two components of the resistance does not change. In other words, it does not matter where power is introduced into the antenna; the same proportion will be radiated, and the same fraction lost, in every case.

Why Impedance is Important

Since it is only the *ratio* of radiation resistance to ohmic resistance that counts, you would be justified in concluding that the actual value of resistance is unimportant. This is so in the antenna itself. But another factor must be taken into account. Somehow, r.f. power must be put into the antenna before there can be any radiation. In feeding power to the antenna the actual antenna resistance — or impedance — *is* important.

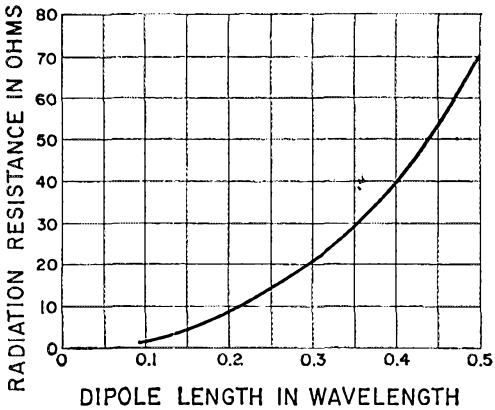


Fig. 2—Radiation resistance measured at the center of an antenna as the length of the wire is varied. Lengths here are in terms of free-space wavelength.

R.f. circuits using practical components work at best efficiency when the impedance level is between perhaps 25 and 2000 ohms. These are not exact limits by any means, but do indicate the general range. If the impedance is only an ohm or two, or is many thousands of ohms, the losses in the circuits themselves may be far greater than the power that can be delivered through them to a load. And between the plate of the transmitter's final-amplifier tube and the antenna itself there must be circuits — often several of them. Each exacts its toll of power.

The resistance of a half-wave antenna is about 70 ohms, as we have mentioned. This value is well within the optimum range for minimizing the losses in any circuits we may use to match the antenna to the final amplifier. Furthermore, it is nearly all radiation resistance. Ohmic resistance amounts to only a few per cent of the total if the antenna is mounted in a clear spot. However, the radiation resistance decreases if the antenna is shortened. For example, if a dipole is a quarter wavelength long its radiation resistance as measured at the center is only about 14 ohms, as shown in Fig. 2. If the length is shortened to one-eighth wavelength the resistance drops to around 4 ohms.

Coupling Losses

If the same power can be put into all these values of resistance, all of the power will be

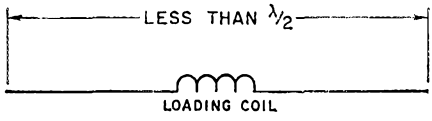


Fig. 3—Inductive "loading" of a short antenna to make it resonant. The shorter the antenna the greater the inductance required. The term loading, as used in this connection, dates from early radio times, and refers to tuning a circuit —usually by adding inductance—to a lower frequency than the one to which it is naturally resonant. The natural resonance in this case would be that of the wire without the coil.

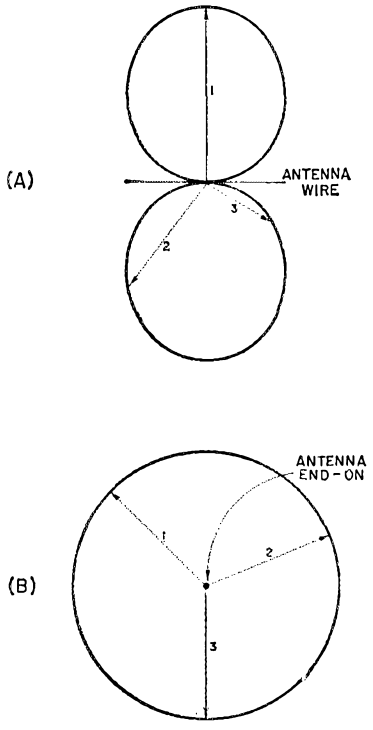


Fig. 4—Cross-sections of directional pattern of a half-wave antenna. A—in the plane in which the wire lies; B—in a plane cutting through the center of the wire at right angles to it.

radiated. However, the "if" is a big one. The half-wave antenna is resonant, and so needs no tuning. The shorter antennas are not resonant; their impedances have large amounts of reactance along with resistance. In order to put power into a short antenna the reactance has to be "tuned out," by adding the same value of reactance, but of the opposite kind, at the antenna terminals. A short antenna has capacitive reactance, so inductive reactance has to be added to cancel it, as in Fig. 3. But coils inherently have resistance, and a coil of the size needed for tuning a ⅛-wave antenna, for instance, will have more resistance than the radiation resistance of the antenna itself. As a result, more power is used up in heating the coil than is radiated by the antenna.

Aside from considerations such as these, there is nothing sacred about the resonant length. The antenna will radiate just as well whether or not it is resonant. However, it will not *get* all the power output of the transmitter if it is so far off resonance that the tuning apparatus uses up an appreciable portion of the power.

Beginners often take antenna resonance far more seriously than it warrants. A small departure from the resonant length is of little consequence. The resistance and reactance change rather slowly around the resonant point, so there is no observable increase in loss if the antenna isn't exactly resonant. As a matter of fact, an antenna can't be resonant at more than one single frequency. Yet it isn't by any means necessary to use different antennas for each frequency within an amateur band.

Directivity

Offhand you might think that the strength of the signal radiated from an antenna would be the same in all directions—up, down, and to all sides. It isn't. The radiation is stronger in some directions than in others. This comes about because the ends of the antenna always have opposite polarity, and because the antenna is not just a point but has a length that isn't small compared with the wavelength.

You can think of it as a case of timing, or phase. The electromagnetic field from one part of the antenna doesn't reach a distant point at the same time as the field from another part. In an extreme case, the fields reaching such a distant point may even get there with the same amplitude but *opposite* polarity. Then they add up to zero; there is no radiation in that direction. Or, in another direction, the fields may reach the distant point with the same amplitude and the *same* polarity. Being "in phase," they add together to give the strongest field the antenna is capable of producing. In still other directions, neither of these conditions is met completely, so

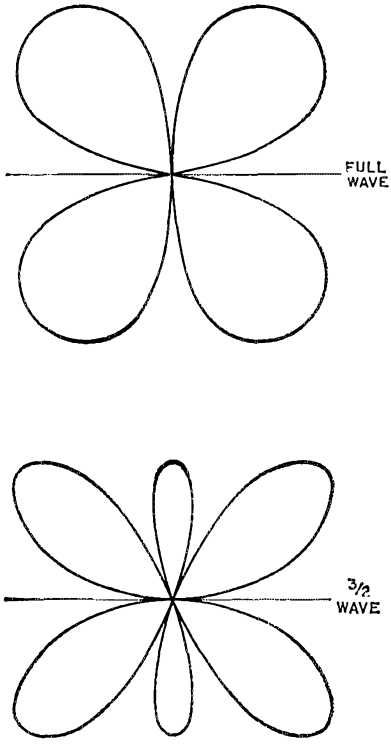


Fig. 5—Cross-sections of directional patterns of (A) a full-wave antenna and (B) one having a length of 1½ wavelengths. The cross-sections correspond to the one in Fig. 4A, in relationship to the antenna wire.

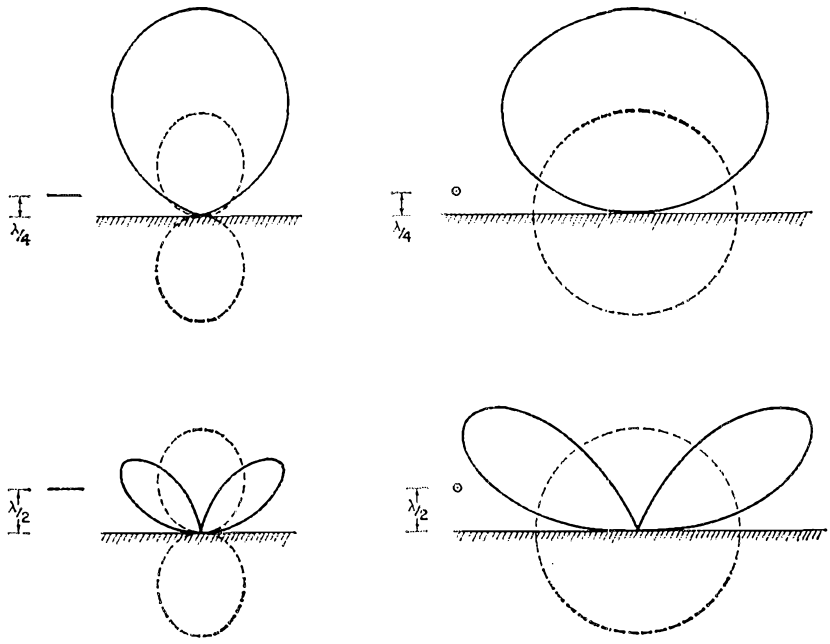


Fig. 6—Effect of the ground on the radiation from a horizontal half-wave antenna, for heights of one-fourth and one-half wavelength. Dashed lines show what the pattern would be if there were no reflection from the ground. Orientation of the antenna is shown to the left of each pattern.

the strength of the signal has an intermediate value.

Directive Patterns

This rather complex operation is summed up in what is called the **directive pattern** of the antenna. The pattern is a graph showing the relative strength of the radiation in all directions. We can't show a pattern completely on a sheet of paper, since the paper has only two dimensions, while the antenna actually radiates into all the space surrounding it. Antenna patterns usually are a "slice" or cross section of the full pattern.

Fig. 4A shows typical cross-sectional patterns for a half-wave dipole. The arrows marked 1, 2 and 3 show, by their length and direction, the relative strength of the radiated field. Don't forget that this drawing is a slice; in order to visualize the complete pattern you would have to imagine that the pattern rotates around the antenna wire, in and out of the paper, to form a doughnut with a point, not a hole, in the middle. Then when you turn the antenna on end, as in B, a slice at right angles would give you just a circle, as shown.

Taking these two patterns together, you can see that a *horizontal* half-wave antenna will radiate best directly upward and downward (if you are looking at the antenna from the side) and won't radiate at all directly off the ends. If you imagine yourself *over* the antenna in A, it radiates best at right angles to the direction of which the wire runs. On the other hand, if you are looking directly down on a *vertical* antenna, as in B, the antenna is radiating equally well in all directions. These last directions, of course, are along the ground, going around the compass.

If the antenna is shorter than a half wavelength the patterns will still have much the same shape. However, if the length is two or more half wavelengths there are rather drastic changes. Figs. 5A and 5B show, respectively, the patterns for the "full-wave" and "three half-wave" antennas whose current and voltage distribution are shown in Fig. 4, Part I. The maximum radiation is no longer broadside to the wire but goes off at an angle, as you can see by comparing these drawings with Fig. 4A. These, too, are cross-sections of a solid pattern that you can visualize by imagining the cross-section drawing to be rotating around the antenna.

The Earth's Part

Since the antenna radiates in all directions, some of the energy must go toward the ground. The earth acts more-or-less like a huge reflector for radio waves. The rays hitting it bounce off much like light rays from a mirror. These reflected rays combine with the direct rays from the antenna at a distance. The result is that the directive pattern of the antenna is modified by the presence of the earth "mirror." Just what the mirror does depends on the height of the antenna above it, and whether the antenna is horizontal or vertical.

Fig. 6 shows a couple of typical cases for a half-wave antenna. The patterns at the left show the relative radiation when you view the antenna from the side; those at the right show the radiation pattern you would "see" when you

Fig. 7—Effect of the ground on radiation from a half-wave vertical antenna. In the absence of the ground, the pattern would be like the dashed line

look at the end of the antenna. Changing the height from one-fourth to one-half wavelength makes quite a difference in the upward radiation — that is, the radiation at high angles. The **radiation angle** is measured from the ground up.

Fig. 7 shows what happens to the pattern of a vertical half-wave antenna sitting on the ground. Here the maximum radiation is along the ground.

Lest you take these pictures too seriously, we have to warn you that the ground isn't like the mirror on your wall. It's pretty foggy, as a matter of fact. In other words, it isn't by any means the perfect reflector that these pictures assume it to be. The fogginess is principally the result of energy losses; a fairly husky proportion of the wave energy striking the ground is used up in the ground resistance. The principal effect of this is that you don't get the radiation at very low angles that Fig. 7 would lead you to expect. Practically, there isn't a great deal of difference between horizontal and vertical antennas in this respect, if the horizontal is a half wavelength or more above the earth. QST

Strays

Most fields have their historians and collectors. There are antique car fans, early railroad "buffs" and now amateur radio historians. Such a group met recently for the first time, sponsored by the Antique Wireless Association, at Holcomb, New York. Representatives of many pioneer organizations attended. Among them were R. B. Bourne, W1ANA, Curator of the ARRL Museum; Frank Davis, Curator of the Ford Science Museum; James Jones of VWOA; W2ZI, Historian of the OOTC; W4ZM of the QCWA; W1NTE, Curator of the New England Wireless Museum; W2ONE, Historian, the Morse Telegraph Club; and Radio Club of America President Ralph Batcher, who delivered the meeting's keynote address. Our picture shows W1ANA addressing the group. The museum room is seen to the rear.

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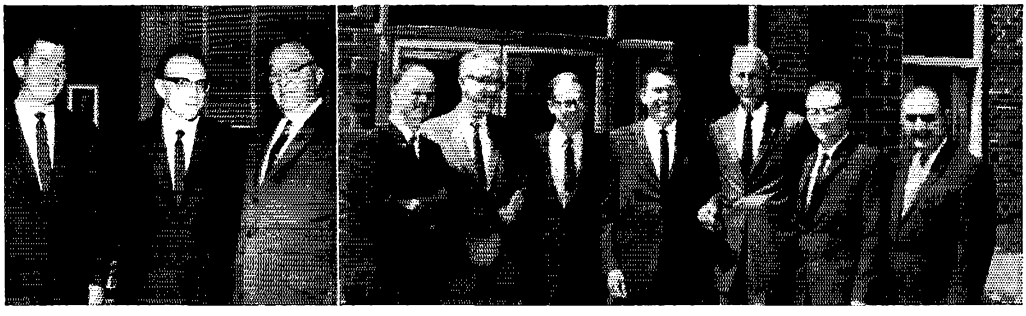


Domenico Petti, HV1CN, recently made a whirlwind week-long jaunt through the eastern U. S. He made stops at Chicago, where he was feted at the Hamfesters Radio Club picnic and the Hallicrafters labs and factory; in Detroit, where he visited the Ford Museum and an automobile assembly line; in New York; and at ARRL headquarters. Among the firsts that Dom tallied during his visit were subways, hot dogs, and mobile hamming (mobiling is not permitted in Italy). An engineer with Vatican Radio, Dom was guided through radio and TV studios of WGN in Chicago and NBC, New York.

The picture on the left shows HV1CN (center) and his Hallicrafters hosts K9EBE (left) and W9AC. The other picture was taken at ARRL's front door. Left to right are W1WPO of DXCC; W1BDI, ARRL Communications Manager; W1LVQ, ARRL General Manager; K9EBE; W1VG, QST Advertising Manager; HV1CN; and K1JMN, Dom's traveling companion and interpreter.

R.F. Chokes for the V.H.F. Bands

How to "Roll Your Own" for Optimum Results

BY EDWARD P. TILTON, W1HDQ*

Often it is more convenient and economical to buy r.f. chokes ready-made than to go to the trouble of winding them yourself, but lots of hams still like to make their own. More power to them — there are good reasons for this, not all having to do with economics. You may be able to make a better choke than you can buy, for applications where choke efficiency is important, and where it isn't a few turns of wire wound on a resistor or self-supported may be a simple and inexpensive answer to the choke question. The main thing is to understand the requirements. You can make the right choke for the job once these are known, and it will be more effective than some all-purpose item you have to hunt for in a catalog.

Jobs for R.F. Chokes

Their name is descriptive enough so that almost everyone knows in a general way what r.f. chokes are supposed to do, but a look through *OST* or the *Handbook* may turn up applications that are not easily understood. Furthermore, other circuits seemingly alike may use resistors in places where chokes might be expected to appear. Some of the more common uses for r.f. chokes are described below.

Receiving: Power leads to various stages may have to be isolated to prevent feedback between output and input circuits. The more stages and the higher the amplifier gain, the more likely this is to be necessary. R.f. chokes are often connected to the ends of the circuits involved, to provide such isolation and decoupling. A bypass capacitor is usually connected at the same point. Where current in the circuit in question is low, resistors may be used in place of chokes, as shown in Fig. 1, R_1 and R_2 in both circuits. Current in the heater circuits is too high for resistors to be used for decoupling, so r.f. chokes RFC_1 and RFC_2 are connected in the heater leads.

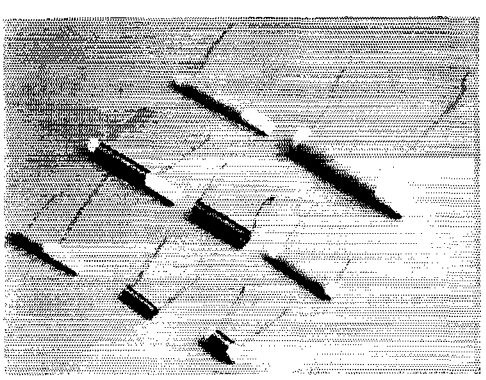
The circuit at the left is the popular cascode. At the right is a two-stage grounded-grid amplifier. Both are widely used in v.h.f. receiving applications. In the grounded-grid amplifier the signal is fed directly to the cathode of the r.f. amplifier tube, with or without a tuned circuit at this point. When no tuned circuit is used, as in our diagram, an r.f. choke is inserted between the cathode and its bias resistor. RFC_3 and RFC_4 prevent loss of signal through the low value of bias resistor needed with most tubes. The heater leads will be decoupled with r.f. chokes in these stages too, as for the cascode circuit.

Transmitting: R.f. chokes are often used in transmitters in much the same way as in receivers, but other factors come into play. A transmitting application may involve high temperatures, high r.f. and d.c. voltages, and greater current-carrying capacity. Chokes in the low-powered stages of a v.h.f. transmitter may not differ greatly from those used in a receiver, but something special is called for in high-power circuits.

The grid circuit of the 50-Mc. amplifier of Fig. 2 presents no great problems. A choke suitable for receiving applications will probably do well enough for RFC_5. The shunt-feed choke in the plate lead of our pi-network circuit is something else again. Here the choke RFC_6 is effectively *across* the plate circuit. It may be in a strong r.f. field, carrying nearly half an ampere d.c. at times, and it will be subjected to very severe voltage-breakdown strain. Shunt feed has much to recommend it, but the job takes a real choke. The full r.f. voltage of the tank is across it so if it is not the best you can get RFC_6 will burn to a crisp in short order. There may be doubt as to whether other chokes are all that they might be, but this one will let you know — in a hurry!

Things are not so bad for RFC_7. At this point the impedance has been stepped down to something around 50 ohms by the pi-network tank circuit, and the r.f. voltage will never be very high. The main purpose of this choke is safety, in case the blocking capacitor C_1 should break down. We hope that your plate milliammeter is fused, for the high voltage is going to be grounded through it in the unlikely event that C_1 does short out. You won't electrocute any unsuspecting person who touches your antenna, in any

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



Typical handmade v.h.f. chokes. At the rear are close-wound and spacewound chokes for 50 Mc., wound on ¼-inch and ½-inch Teflon rod. The latter is drilled and tapped for end-mounting. Three 144-Mc. chokes are seen in the center row, the two at the left being excellent for high-current applications. Similar types to these, but for the 220-Mc. band, are in front.

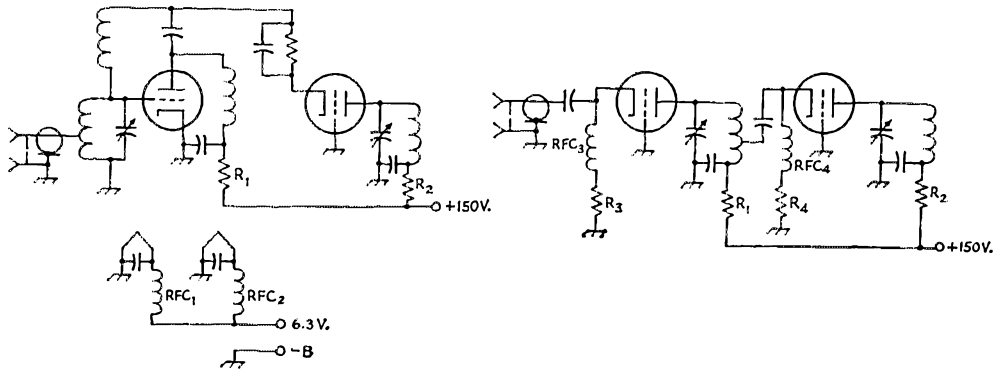


Fig. 1—Typical r.f. amplifier circuits for v.h.f. receivers or converters. Resistors R_1 and R_2 are used for decoupling of the power leads. R.f. chokes could replace them, but resistors do the job well enough. In the heater circuit the current is too high for resistors so simple r.f. chokes, RFC_1 and RFC_2, must be used. In the grounded-grid amplifier, right, chokes RFC_3 and RFC_4 are inserted in the cathode leads, to prevent signal loss to ground. Heater circuit chokes are the same as for the cascode circuit at the left. The quality of the chokes is not particularly critical in either application.

case, so RFC_7 is cheap insurance. It doesn't have to be the world's best r.f. choke, however.

Designing for the Job

The best r.f. choke for most v.h.f. applications is the shortest length of wire that can be wound into a coil that will be self-resonant at a frequency just below that of the circuit in which it is to be used. As a rule of thumb for v.h.f. purposes we can cut off a quarter wavelength of wire, or slightly more, and wind it onto any small-diameter form. This will give a suitable value of inductance, but a choke of optimum design requires a bit more thought.

Current-carrying capacity may be important. The *Handbook* wire table is helpful here. It has been in every edition for at least 30 years, but only recent ones show anything other than ratings for transformer applications. The value given in the column labelled *700 c.m. per amp* can be multiplied by about four for single-layer r.f. choke design. Still, the largest convenient size is best, if the application is a critical one. No. 22 is as big as we'll need to go, unless the circuit is going to carry transmitting tube filament current. Sizes down to No. 28 or 30 should be adequate for most purposes except filament and heater circuits.

Shape factor is important. The r.f. field around a choke should be small, so we want a small diameter — not more than ½ inch for 50-Mc. chokes and ¼ inch for all higher bands. The winding should not be unduly long, either. Length/diameter ratios between 3 and 6 are about right.

A really topnotch choke must have low distributed capacitance. This means space-winding, and a minimum of lacquer and cement. Wire heavy enough so that the winding form can be removed and the choke supported by its leads is fine in this respect. The self-supporting choke is usually the best kind for use at 220 Mc. and higher, where only a very short piece of wire is needed for winding.

Now Let's Make Some

First lay in a stock of "makin's." We'll need several sizes of wire: No. 22 enamel (Nylclad or Formvar types are good), No. 28 enamel, silk or cotton-covered, and No. 30 of any similar insulation. Silk-covered wire takes cement nicely, but enamel or cotton insulation will make equally good chokes. Enamelled wire is most readily available, ordinarily.

For winding forms we can use high-value resistors, one megohm or more. By using fine wire we can wind chokes for 144 Mc. and higher frequencies on ½-watt resistors, though one-watt types are easier to handle. For 50 Mc. two-watt resistors are desirable. About the only merit in using resistors for choke forms is that they provide ready-made leads. Notching the end of the

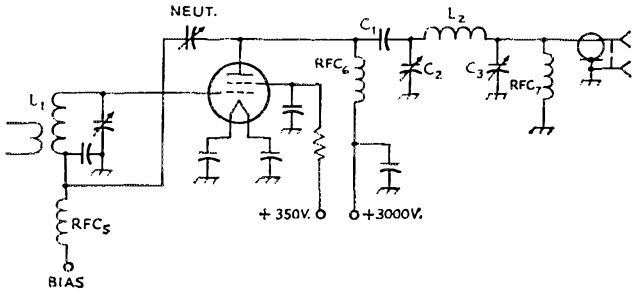


Fig. 2—Transmitter applications for r.f. chokes vary markedly in regard to the quality of choke needed. In the grid circuit, RFC_5 has no very difficult job to do, and any choke suitable for low-power use is suitable. The shunt-feed choke, RFC_6, must meet severe requirements, especially in high-powered amplifiers. It is effectively across the transmitter tank circuit, and is subjected to high temperature, current and voltage. The output choke, RFC_7, is mainly a safety device and it operates under much less stringent circumstances.

Table I

R.f. Chokes for 50, 144 and 220 Mc. service.

Frequency	*Inductance*	*Description*
50 Mc.	7.8 to 9.5 μh.	B & W Miniductor No. 3004, 1⅜ to 1⅝ inch long.*
50 Mc.	8.3 μh.	No. 28 d.s.c., spacewound on ½-inch Teflon rod. Winding 1¾ inch long.
50 Mc.	7.2 μh.	No. 28 d.s.c., closewound on ¼-inch Teflon rod. Winding 1⅞ inch long.
144 Mc.	2.15 μh.	No. 22 Nyclad, closewound 1⅜ inch on ¼-inch Teflon rod.
144 Mc.	1.42 μh.	31 turns No. 28 d.s.c., spacewound on ¼-inch Teflon rod. Winding 1⅛ inch long.
144 Mc.	1.3 μh.	29 turns No. 22 Nyclad 1⅛ inch long, ¼ inch diam. self-supporting.
(Above 144-Mc. chokes work well on 220 Mc.)		
220 Mc.	0.6 μh.	13 turns No. 22 Nyclad on ¼-inch Teflon rod.
220 Mc.	0.75 μh.	17 turns No. 28 d.s.c. spacewound on ¼-inch Teflon rod. Winding ⅝ inch long.
220 Mc.	0.52 μh.	22 turns No. 22 Nyclad closewound on No. 24 drill, self-supporting.

* Excellent for use except where high temperatures are involved.

resistor with a small file or saw blade will make a starting point for the winding. No. 30 wire closewound on a resistor makes a fair choke.

Rod stock of material having good r.f. insulating qualities is much better for r.f. choke forms where high choke efficiency is important, and it affords a means of drilling and tapping of one end for screw mounting, where this is a useful feature. We found Teflon rod in all sizes readily available by consulting the Yellow Pages, and ¼-inch stock was under 50 cents per foot. At this rate a dollar will provide material for a pile of chokes, and it's the best there is. Polystyrene and other low-loss clear-plastic rod was less than 10 cents per foot, in the ¼-inch size. It's fine for choke use, except where high temperatures may be involved. Larger diameters are proportionately higher priced.

A very small drill will be needed for making holes through the rod for threading leads. We used a No. 60 (0.04 inch diameter) set deep in the chuck to prevent bending or breakage. Small brads with their points filed sharp are good small-drill substitutes. A small tube of quick-drying polystyrene cement completes our inventory.

Table I gives typical sizes for use on the v.h.f. bands. The smaller sizes of prepared coil stock can be used with excellent results in any application where they can stand the heat. Space-winding of chokes is easy. First drill through the rod at spacings indicated under *winding length*. Now measure off slightly more than a *half* wavelength of wire. Double it back on itself and feed the end through one of the holes in the rod. Now wind the coil as if it were to be bifilar. If you clamp the other end of the double wire in a vise, or tie it down firmly otherwise, this can be done easily. Keep the wires under tension, and be sure that they are not twisted at any point. Wind tightly and then feed the end through the other rod hole.

Now remove one of the wires by unwinding carefully, keeping it under tension throughout. The remaining wire will be space-wound as neatly as if done by machine. Apply a thin coating of polystyrene cement, using a bit more around the lead holes, and your choke is done. It will be dry and ready for use in a few minutes. If having all those wire scraps left over runs against your Scotch instincts, make chokes for the lower end of the range first. The pieces unwound will be useful for higher-frequency production later.

Self-supporting chokes of excellent quality can be made by winding No. 22 or 24 wire tightly on various drill sizes, and then slipping the drill or other winding form out. If wound under tension the coil will hold its shape when slipped off the form. Turns can be spaced by running a thin knife blade between then. You can't make a better choke than this.

Using the Chokes

How and where you mount a choke may have much to do with how well it works. We burned up one of our best handmade ones by mounting it so that it was coupled tightly to the transmitter tank circuit. The amplifier in question is a high-efficiency two-meter kilowatt we hope to describe soon. The r.f. choke was positioned inside the "U" formed by the shorted end of the plate line, as shown at the left of Fig. 3. With the amplifier delivering nearly 800 watts to a dummy load, the choke flashed over between turns in a terrifying manner. A similar choke mounted outside the loop, as shown at the right in Fig. 3, runs as cool as the proverbial cucumber.

A companion kilowatt amplifier for 50 Mc. posed a choke problem already discussed in connection with Fig. 2. The ½-inch diameter choke in the table was made originally for this application. If there is an r.f. choke on the market that is good enough for this job we have not seen it.

(Continued on page 146)

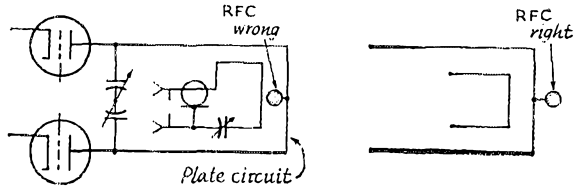


Fig. 3—How a choke is positioned with respect to other circuits may be important. The choke at the left is coupled to the plate line of the transmitter tuned circuit. Outside the loop, as at the right, makes the choke far less subject to r.f. breakdown.

Sweepstakes from the Sidelines

BY NORMA SISSON *

NOVEMBER, to the average American family, means burning leaves, the onset of cold weather, turkey, and Thanksgiving — but not to the Sweepstakes Nut and his XYL! To him, November holds the magic of Christmas — to her, the misery of taxes. That dread word, "Sweepstakes", brings a cold shudder to the sorority of suffering XYLs.

I guess there are no words to prepare a new XYL for her "Baptism of Fire," but I firmly believe in women's rights (even XYLs'), and I claim the right to do my part to warn all XYLs and prospective XYLs who have thus far been spared to man their battle stations before it's too late.

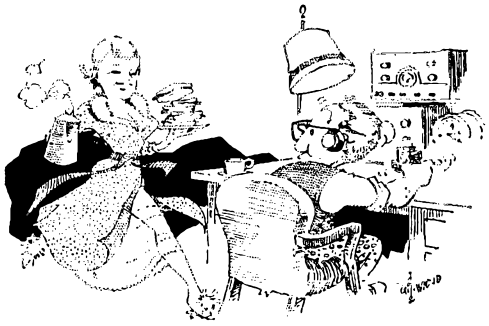
My first November approached with no foreboding. Sweepstakes sounded like an interesting little game, and my OM was going to operate phone so his new bride could enjoy the action. This was the one pitfall Mother missed in our long talk before the wedding.

Thursday night before the contest, the OM started tightening up. He kept muttering about low power, lousy antennas, multipliers, and last year's winner. At 2:00 A.M. his mind was made up — he wasn't going to enter. He wasn't competitive. He hadn't had enough time to get ready in the new QTH (we'd moved to Colorado in August). By 3:00 A.M. he was in a frenzy. By 4:00 A.M., I had convinced my handsome new groom that he couldn't lose. He was wonderful. His equipment was fine. He should compete with everything he had. I felt like the perfect wife. What a dope I was! I should have said "Yipee!" at 2 o'clock and gone to sleep!

At 8:00 in the morning I called his office. I told them my husband was sick and he couldn't possibly come to work. And was he sick! He'd gone right out of his everloving mind like he has every November since.

At 3:45 Saturday afternoon we were in the shack. I was perched on the desk with a big smile of encouragement while he sat biting his nails for the countdown. 4:00 P.M. — HAVOC! The sudden din of 'CQ Contest' knocked me right off my perch. He was off. And I do mean off!

By evening everything was fine, except for my headache. I'd prepared a lovely candlelight dinner for two so that my adoring spouse could relax and take a few hours off. After the fifth time I called him, I went into the shack to tell the OM the lobster was getting cold. I think he said, "Your number 115 — thanks — Colorado — out here — 0300 GMT". Not being able to decipher that, I stood there patiently waiting. The next recognition I got was, ". . . Colorado — where's dinner? — 0305 GMT". I gathered that he wasn't coming to the table, so I handed him a peanut butter sandwich



and went back to the cold lobster and warm wine.

By 2:00 A.M., I couldn't decide whether I was madder or lonelier. Loneliness won out. After all, I was a new bride. So I put on my best face, my best perfume and my very best negligee. I slinked into the shack and sat right on top of number 194, making sure that just enough knee peeped out. The man who promised to love, cherish, etc., elbowed me off number 194 in double time while he asked for a coke and recorded number 195. The only thing I remember about the rest of those two hideous weekends was that I got laryngitis trying to sob delicately from my bed loud enough to be heard over the din. I didn't make it.

By the time the last log sheet was checked and the whole mess was bundled off to ARRL, we were very close to the divorce courts. I would have gone home to Mother, but she was 900 miles away and we'd spent all our sugarbowl money on a beam before the contest.

Two weekends later, I awoke to "CQ DX." With a deadly calm, I walked into the shack. My OM looked up, grinning.

"What — are — you — doing?" I wanted to know.

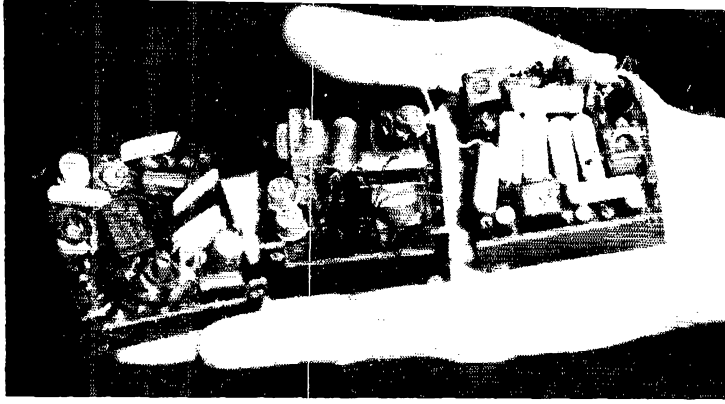
"Well, Honey, there's an interesting little contest . . ."

It was like waving red at a bull. I exploded! I ranted! I raved! I cried! He didn't love me! He married me under false pretenses! All hams were off their rockers, and he wasn't going to drive me off mine. What followed is too painful to relate. Suffice to say that after three days of "the silent treatment", and two modern chairs with a blanket thrown over them, my contrite spouse came to me with a thing-a-ma-bob, without which the radio wouldn't go. He promised never to mention ham radio. It was a day of glory. I had my husband back. I'd given that "thing" the knockout punch, and ham radio was down for the count.

As the saying goes, little did I know that you can take the ham out of the shack, but you can't take the shack out of the ham. For a week, I

(Continued on page 140)

* XYL of W4WZC (ex-W5ONL, W8FFL, K0HEM, WA2GWF) 304 Laurel Street, Signal Mountain, Tennessee.



The often-heard expression, "only a handful of parts," can be used without exaggeration in describing the three decks of the 7-Mc. handi-talkie shown here. The transmitter section (which also contains the receiver h.f.o.) is to the left, the superhet receiver is to the right, and the audio section is in the center.

Handi-Talkie for 7 Mc.

A 200-mw. Unit Using Nine Transistors

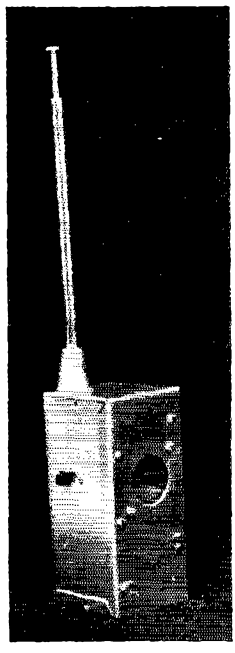
BY TIMOTHY HULICK,* W9MIJ

Complete with self-contained power supply, this transmitter-receiver unit measures only 2¼ by 2¼ by 5 inches. With an unloaded 3-foot whip, distances up to 4 miles between units have been covered.

SECOND only to amateur radio, my fondest interest is in trout fishing in the streams of western Wisconsin. Having decided to combine the two hobbies, it occurred to me to build a station small enough that it could fit into the pouch of a pair of fishing waders and still not be of any inconvenience. After using a pair of old BC-611 surplus handi-talkies for one summer, they were discarded because of their bulkiness and cumbersome batteries. It was at this time that the thought of a pair of very small transistor units as much better substitutes occurred to me.

After a week or so of bread-boarding circuits and drawing a few sketches, construction was started, and two units were completed in about a week of spare time last summer. Unfortunately, I wasn't able to get much use out of them while at home on leave, so I took them with me to Pensacola and Jacksonville, Florida and, with the aid of W4NEK, gave them some trial distance tests at the naval air station where I was undergoing my introduction to naval aviation. The results were surprising in that the same set of batteries lasted much longer than the summer, and the maximum distance obtained was about 4 miles over flat terrain.

Needless to say, I was quite satisfied with the way these units performed. They would be excellent for emergency communication, or for just plain local hamming around town. After correcting the values of a few bias resistors in the audio circuit, excellent modulation was obtained with better than expected results. The final amplifier operates at an input of slightly over 200 mw.



The container for this hand-portable transmitter-receiver is a standard aluminum box measuring only 5 inches by 2¼ inches square. The 2-inch dynamic speaker serves also as the microphone.

Circuit

The circuit of the unit is shown in Fig. 1. The receiver is a superheterodyne with Q_1 as the mixer, Q_2 the h.f. oscillator, Q_3 and Q_4 i.f. amplifiers, and CR_1 as the detector. The high-frequency oscillator is crystal-controlled to insure unfailing receiver stability on the transmitting frequency. The i.f. strip is of the conventional 455-kc. type used in most transistor broadcast receivers. The a.g.c. circuit is simple and requires a minimum of parts.

With the change-over switch S_1 in the receive position, the detector feeds the audio section consisting of the driver Q_9, and push-pull output stage Q_7Q_8. With S_1 in the transmit position, the audio amplifier becomes the transmitter modulator, the speaker serving as a dynamic microphone. The output transformer T_4 has a 500-ohm

* Midshipman, U.S.N., Bancroft Hall, U. S. Naval Academy, Annapolis, Md.

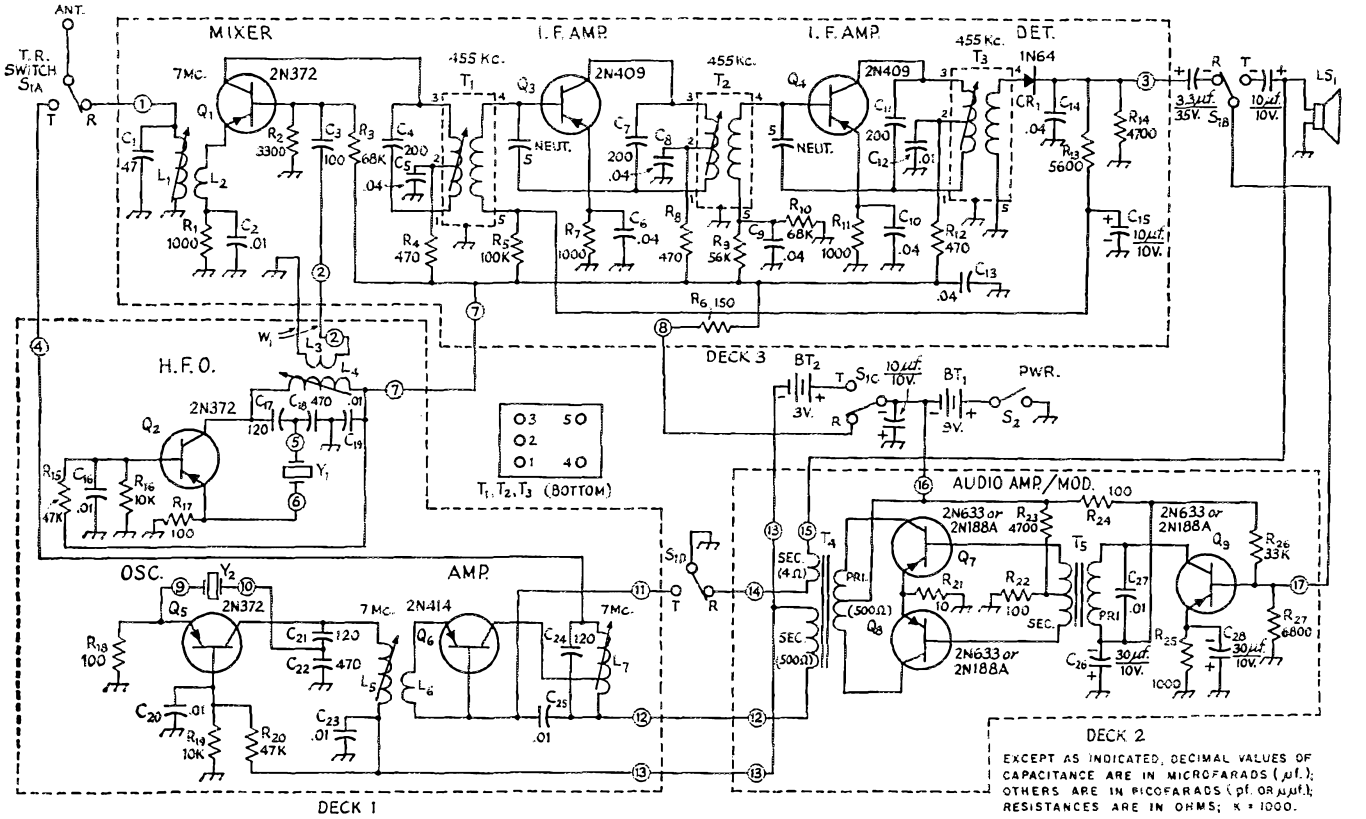


Fig. 1—Circuit of the 40-meter hand portable. Capacitors are disk ceramic, except those marked with polarity which are subminiature electrolytic. Resistors are ½-watt composition. Labels on components not listed below are for text-reference purposes. Ground symbols indicate connections to common ground bus wire.

BT_1—9-volt battery (Eveready E146 or equivalent).
BT_2—3-volt battery (two penlight cells).
C_4, C_7, C_{11}—See text.
CR_1—1N64, 1N34 or equivalent.
L_1—30 turns.
L_2—5 turns over L_1.
L_3—3 turns over L_4.
L_4, L_5—22 turns.
L_6—9 to 15 turns over L_5 (see text).
L_7—20 turns, tapped at 7 turns from antenna end.
Above coils are wound with No. 32 to No. 40 enameled wire, and mounted with associated slugs as described in the text.
LS_1—1½-inch speaker (Burstein-Applebee 17B543).
Q_1, Q_2, Q_3—2N372 (RCA).
Q_3, Q_4—2N409 (RCA).
Q_6—2N414 (Tungsol and others).
Q_7, Q_8, Q_9—2N633 (Raytheon) or 2N188A (G.E.).
S_1—Four-pole double throw spring-return switch (Lafayette SW-92, or see text).
S_2—S.p.s.t. slide switch.
T_1—Transistor 455-kc. input i.f. transformer (Burstein-Applebee 17A27).
T_2, T_3—Same as T_1, output (B-A 17A28).
T_4—See text.
T_5—Miniature 150-mw. interstage transformer, 5000-ohm primary, 7500-ohm c.t. secondary (Stancor TA-30, primary c.t. not used).
W_1—Twisted pair of No. 32 or 34 enameled wire.
Y_1—Same as Y_2, but 455 kc. lower in frequency (see text).
Y_2—7.2-7.3-Mc. crystal (FT-243 surplus).

secondary for modulation, and a 4-ohm secondary for the speaker.

The transmitter consists of Q_5 as a crystal oscillator and Q_6 as the output amplifier. While a single oscillator might have been used for both transmitting and receiving, the required switch would have been physically larger than the separate oscillator. The final amplifier uses a grounded-base configuration. This is similar to a grounded-grid tube circuit in that the input impedance is low.

The antenna used for hand-portable operation is an unloaded whip approximately 3 feet long which represents a high impedance (capacitive-reactive) load. To achieve the necessary impedance step-up, the antenna is connected to the "hot" end of the output tank coil, while the collector of the final amplifier is tapped down on the coil.

The change-over switch, S_1, has four poles. S_{1A} switches the antenna between transmitter and receiver, S_{1B} and S_{1D} connect the speaker to either the output or input of the audio amplifier. S_{1D} also grounds the base of the final amplifier in the transmit position. S_{1C} switches the 9-volt battery between transmitter and receiver.

It will be noticed that the supply voltage for the receiver and audio sections is 9, while the transmitter operates at 12 volts. The additional voltage for the transmitter is provided by a separate 3-volt battery, BT_2, inserted in series with the common 9-volt battery, BT_1. It was found that this increase in transmitter voltage extended the range about a mile over flat terrain. However, a similar increase in receiver voltage accomplished little more than to increase the noise level.

The two oscillator circuits are identical except as to frequency. To have the receiver tuned to the transmitter frequency, the receiver oscillator must operate 455 kc. (the receiver i.f. frequency) higher or lower than the transmitter frequency. It was noticed that the efficiency of the oscillator transistors used dropped off as the frequency was increased. For this reason, it was possible to obtain the same output from the receiver oscillator at lower battery drain by operating it on the low-frequency side of the received signal.

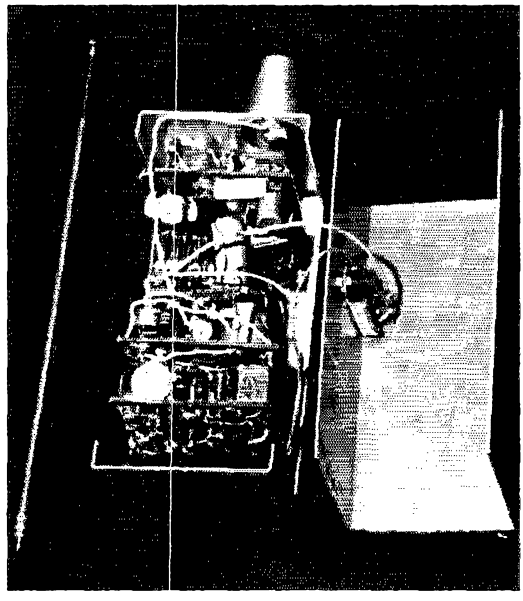
Construction

The entire circuit is mounted on three strips of black cloth-base fiberboard, each measuring 2 by 2⅛ inches. This type of board can be purchased very cheaply from almost any plastics supplier, and can often be found as samples used by salesmen in the tile, linoleum or lumber trades. It can be cut with a hacksaw or tin shears and will cut straight following the grain of the material. As can be seen from the photos, strips of the same material are cemented to each subchassis to act as mounting brackets. Epoxy 220 cement gave the strongest bond. These brackets can be made by the individual builder as one of the last operations, because some trimming may have to be done here and there to fit the subassemblies to the contour of the aluminum box in which the three decks are mounted. The holes for mounting the decks can be drilled at the most appropriate points to be determined after the subassemblies are complete, since it is impossible to locate these points exactly until the builder can fit the three decks into the box and see for himself.

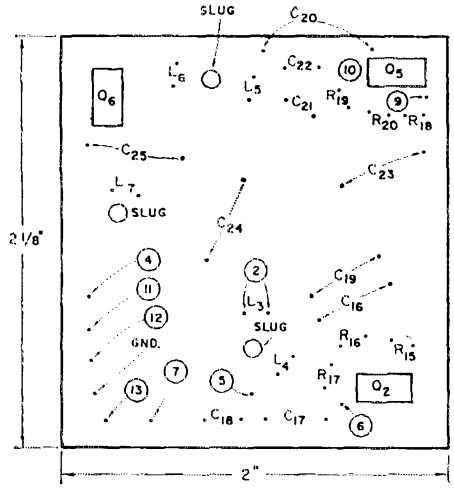
Fig. 2 shows the physical layout of components on each of the three decks. The drawings are actual size and may be used as templates. I cannot emphasize too strongly how important it is to follow closely the arrangement of components indicated if all are to fit within the available space. A wire nail was found to be the best drill bit when making the holes for mounting such things as resistors and capacitors.

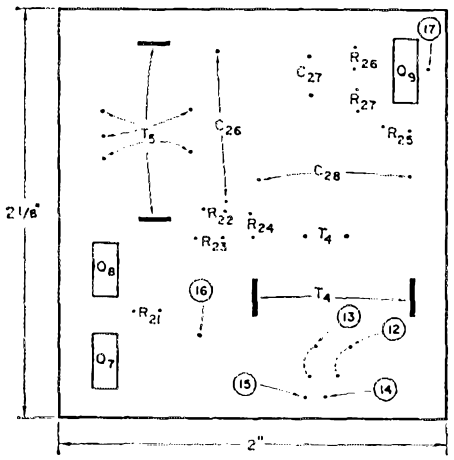
The circled numbers in Fig. 2 indicate points in the layouts corresponding to similarly-numbered points in the circuit diagram of Fig. 1. These represent points at which connections external to each deck are made. Terminals for these connections are formed by putting a little hook in the end of the wire protruding through the hole at one of these points, and placing a drop of solder on the hook. To avoid confusion, soldering should be done as each part is mounted, rather than to mount all components first and then try to sort out the maze of wires sticking out from the undersides of the decks.

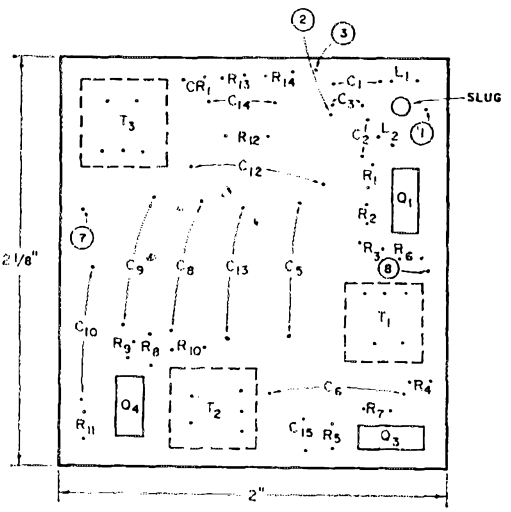
Sockets were provided for the transistors, instead of soldering them in, to facilitate their removal. During initial adjustment with a g.d.o., the transistors must be out of the circuit. Holes for the sockets can be easily made with a ⅛-inch drill and a small triangular file.



The construction is divided into three sub-assemblies comprising essentially transmitter (top), receiver (bottom), and audio section (center). The latter is used for both transmitting and receiving.







Coils

All of the coils are wound with very small enameled magnet wire. Sizes 32 to 40 are recommended. The size is not critical from electrical considerations, but the diameter must be quite small so that the coils will not take up too much room on the decks. All coils are identical except for the number of turns. In winding the coils, use a common ¼-inch round pencil, or something equivalent, as a form. Place about four or five 4-inch strands of sewing thread longitudinally on the pencil, spacing the strands evenly around the form and holding them in place with bits of Scotch tape. Scramble-wind the coil over the pencil, about midway between the ends of the strands. Twist the ends of the coil together while tying the ends of each strand tightly together, and simply slip the completed form off the pencil. It is best to wind the coil as close to one end of the form as possible so that it doesn't have to be slid too far in removing it. A little coil dope can be applied to the finished coil so that it will not lose its shape.

The slugs (approximately ⅛-inch diameter) for the coils were obtained from old miniature i.f. transformers. These slugs are about ⅜-inch long. They are threaded their entire length and have a screwdriver slot at one end. A small hole to take the screw can be drilled in the center of each area where a coil is to be mounted, and the hole threaded with an equivalent brass or iron bolt. Carefully center the coil over the hole and cement it in place. Screw the slug into the threaded hole, and the coil is complete except for initial tuning with a grid-dip oscillator, and final tuning under actual operating conditions. An iron slug will lower the frequency when the slug is driven farther into the coil center. If it should be found necessary to raise the frequency instead of lowering it, a small brass bolt may be substituted for the slug. Which type of slug to use can be determined only after the coil has been mounted and connected into the circuit and checked with the g.d.o. When making these checks make sure that the associated transistor or transistors are out of their sockets. Final adjustment with the transistors in place will be made later when the complete circuit is functioning.

Modulation Transformer

Transformer T_2 in the modulator was purchased from Burstein-Applebee in Kansas City, Missouri, for 89 cents. However, it had to be modified. Carefully dismantle the metal mounting strap on the transformer and, one by one, remove the laminations and set them in a pile. These laminations can be pried loose quite easily using a small knife or a pair of tweezers. Next, unwrap the paper covering the wire and unsolder the leads from the top winding (secondary). As

« « «

Fig. 2—Actual-size template layouts of the three decks. The circled numbers identify the locations of deck terminals corresponding to similarly-numbered points in Fig. 1. These terminals are formed as described in the text.

the turns are unwound, string the wire around some object in the room, such as the back of a chair or the legs of a table. Note carefully where the center tap comes off, because this winding will be cut in two later on, and the center tap is the mid point. The primary is unwound and the wire discarded, since it will not be used in rewinding the transformer.

Now wind half of the secondary wire (up to the center tap) back onto the bare core. This becomes the new 500-ohm secondary. Stretch the remaining half of the wire out in a straight line. Find the mid point and hairpin the wire by bringing the two ends together and stretching out the double strand. Begin winding the double strand over the new secondary, starting with the hairpinned end, and leaving about 2 inches of this end outside the winding so that it can be soldered to when the modification is complete. Leave about 2 inches per strand at the final end for making a soldered connection. If the wire breaks at any time, just solder the broken ends together and keep on winding.

Next, wind about 40 turns of the wire used for making the r.f. coils over the preceding winding. This is the 4-ohm speaker secondary. Make the terminal leads about 4 inches long.

Now, cut open the hairpin loop of the starting end of the primary, and connect one of the hairpin ends to the outer end of the opposite half of the winding. This is the primary center tap. The remaining primary leads go to the collectors of Q_7 and Q_8.

Cut the primary and 500-ohm secondary terminal leads rather short, and solder the original colored leads to them to preserve the original color coding. Wrap the paper back onto the outside and, one by one, slip the laminations back into place, and the modification is complete.

The impedances of the original transformer were: primary 10,000 ohms, secondary 2000 ohms center-tapped. The new impedances are: primary 500 ohms center-tapped, secondaries 500 ohms and 4 ohms.

The speaker used was also obtained from B-A for only $1.49. It serves both as an excellent microphone and speaker, with amazing quality for its 1½-inch cone and one inch of depth. Of course, any speaker of equivalent size with a 4-to-8-ohm voice coil will work, but this one is quite inexpensive.

I.F. Transformers

If the i.f. transformers are bought from B-A, some of them may have the 200-pf. capacitors (C_4, C_7 and C_{11}) built in while others may not. If they are built in, they will be visible from the bottom of the can through a small slit in the bakelite. In such a case, the external capacitors C_4, C_7 and C_{11} shown in Fig. 1 should be omitted.

T.R. Switch

A switch of the "intercom" type may be used for S_1. However, to get the smallest dimensions, I made a switch using miniature-relay contacts found on some surplus relays in the junk box. The relays were dismantled and the contacts stacked in the necessary arrangement. Miniature relay contacts may be purchased in pieces from most radio-parts supply houses. The contacts can be mounted on a narrow strip of copper with two bolts, and then the strip of copper can be soldered to the side of the speaker.

Crystals

Type FT-243 surplus crystals were used, principally because they are relatively inexpensive. Sufficient space for crystals of this size is available between the first deck and the top of the aluminum enclosure. Naturally, any other type of crystal may be used. The frequency of the receiver crystal need not be exactly 455 kc. lower than the transmitting frequency, but it should be somewhere within 20 kc. of this value. The difference can be made up by simply retuning the i.f. amplifier. In other words, the receiving frequency can be changed by about 35 kc. using the same receiving crystal by adjusting the i.f. strip.

The Enclosure

The three decks are mounted in a 5 × 2¼ × 2¼-inch aluminum box (Bud Minibox CU-

(*Continued on page 162*)

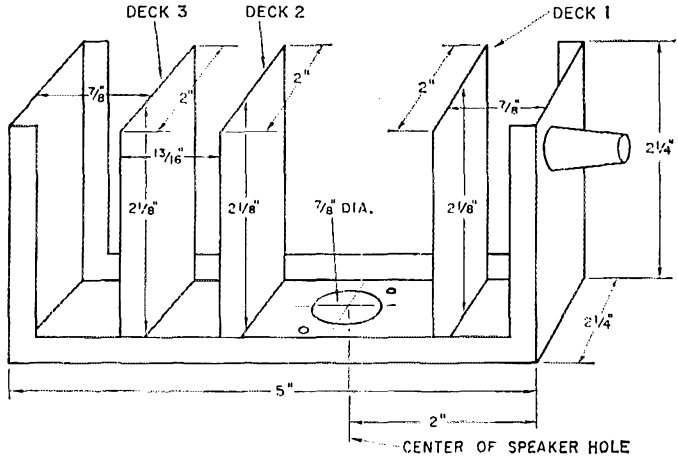


Fig. 3—Sketch showing the arrangement of decks in the aluminum enclosure.

Baked Ham

BY J. T. MARTIN,* K4RVG

THE large pearly gate swung open and John Q. Ham was ushered into the presence of Saint Peter.

Saint Peter sat behind a huge desk and peered down at the log book which lay open before him. Suddenly he looked up and spoke in a booming voice. "What's your handle, son?"

"I'm John Q. Ham, sir, and . . ."

"Yes," St. Peter broke in, "we've been expecting you for some time, John. What happened? Fall off that new tower?"

"No," said John, "the XYL climbed the tower and put the beam up. You see, there was this exposed wire from the high-voltage power supply and . . ."

"Tsk, tsk," tsked St. Peter, "been getting quite a few of you boys lately. Not quite as many as we did in the home-brew days though. Seems like the commercial rigs are not so dangerous. Well, so much for how you got here. Let's take a look at your record! !"

Saint Peter leaned back in his overstuffed swivel chair and studied the report which the H. O. (Heavenly Observer) had just brought in.

After reading for a few minutes, his brow wrinkled in a wry frown, and he again turned his attention to John Q.

"According to this report, John, you received your Novice ticket in 1957. Is that correct?"

"Correct OM, er, I mean, sir," said John, visibly shaken at the mere mention of his Novice days.

"Hmmm, it seems you made several contacts that year, most of them verified by OO stations or Frank Charlie Charlie. You also held the record for the longest CQ without a listening period. That's not a very good report even for a Novice, John!"

John looked down at the gold-paved floor and shuffled about nervously, then spoke in a voice which sounded very much like his first phone contact.

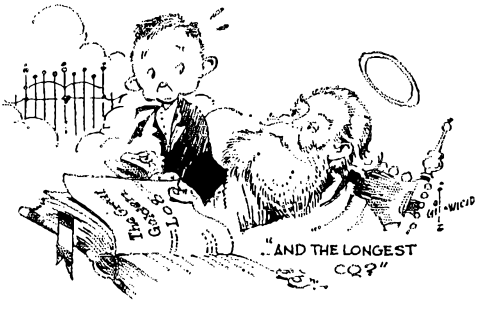
"Your honor . . . Pete . . . sir," John Q. stammered "you see it was like this. This transmitter I was using would dip at two different points, and besides I didn't think the harmonics were strong enough to get out of the shack, and the QRM on 40 was always murder . . ."

St. Peter raised his hand and motioned John to silence. Then he spoke in an almost kindly voice.

"I realize your problems with your rig and the QRM, John, but there are certain rules, you know. Now let's get on with this report.

"Let's see now; got your Conditional in 1958, receive three citations for off-frequency operation, accused of QRMing traffic nets, almost victimized by TVI lynch mob. What about these things, John?"

John became very furious at the accusations. "In the first place," he fumed, "how was I to know those lids I went back to were off the edge of the band? As for QRMing those net boys, I don't see how they get that way, because I was only on when the weaker stations were transmitting and I could hardly read them. When the big boys came back on, naturally I would QRT. Now as for those TVI people, they were just a bunch of soreheads with obsolete TV sets . . ."



At this point St. Peter decided to terminate the interview. He raised his hand in a gesture which had come to mean silence to John, and nodded to the two burly guards who flanked the luckless ham on either side.

The guards seized John Q. rather roughly and escorted him from the room. St. Peter flipped the switch on his intercom and spoke into it.

"Are you there, CB?"

"That's 10-4, Peter, go ahead."

"I'm sending you down another one."

"That's 10-4."

QST

*Beaver Dam, Kentucky

Important Notice—Changes of Address

Important changes in handling second-class mail matter are now in effect. Please advise us *direct* of any changes in address. When notifying, please give old as well as new address. Thanks.

WWVB–WWVL

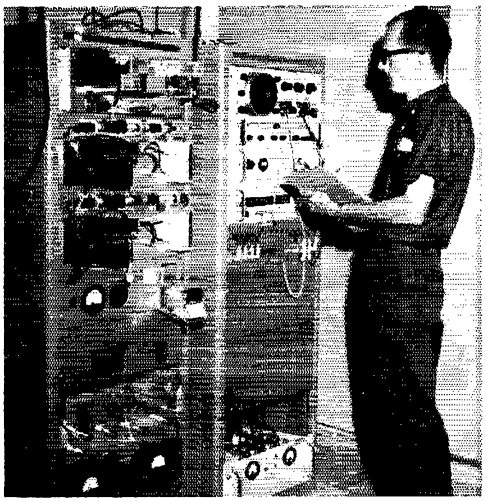
The National Bureau of Standards Dedicates its new Colorado Frequency Standards

ALTHOUGH WWV and WWVH will remain the time and frequency standards for amateur radio, new National Bureau of Standards stations WWVL and WWVB have been put on the air with greater-than-ever accuracy. These new stations, near Fort Collins, Colorado, will become the standard signals for many important satellite and missile programs and for basic research on atmospheric and ionospheric phenomena.

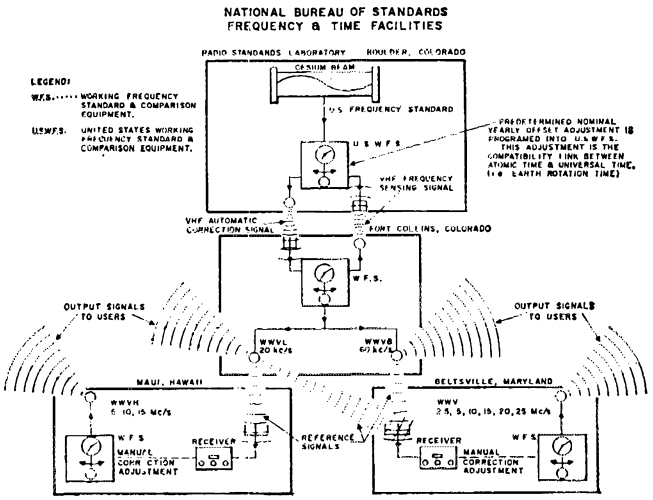
Until recently, WWVB and WWVL have been transmitting experimentally on 60 kc. and 20 kc. respectively, but both stations have now been made permanent parts of the National Bureau of Standards services.

The improvement in accuracy results from the very low frequencies employed. At 60 and 20 kilocycles, signals from WWVB and WWVL will not suffer the slight time delay over long distances which sometimes limit the accuracy of measurements from WWV and WWVH. Both stations are broadcasting only frequency markers. Time signals will be added later. The new markers are considered so important to the U. S. space effort that NASA helped underwrite the construction of WWVL.

The antenna array for each new station consists of four guyed steel towers arranged in a diamond 1900 feet long and 750 wide. Counterbalances at the inside and base of each tower maintain proper tension at the tower tops and compensate for high winds which sweep down from the nearby Rocky Mountains. QST



(Above, left) the signals transmitted by WWVB and WWVL are regulated from the U. S. Working Frequency Standard in Boulder, Colorado, through a servo loop. Here John B. Milton monitors the oscilloscope which indicates the condition of the phase-lock equipment. Power output of WWVB is five kw., that of WWVL, one kw.



On the right is a drawing depicting the relationship between the cesium-beam frequency standard and the U. S. Working Frequency Standard at NBS Boulder, and the standard frequency and time broadcasts from WWV, WWVB, WWVH, and WWVL. For more information, write the NBS Office of Technical Information, Washington 25, D. C.

» » »

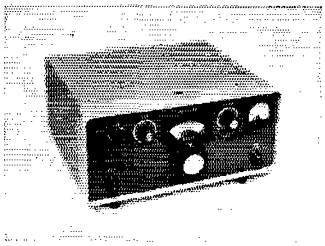
The National Bureau of Standards has dedicated major facilities near Fort Collins, Colorado for stations WWVB and WWVL. These stations provide frequency standards at 60 and 20 kilocycles, respectively. Time signals will be added later. As with WWV and WWVH, frequency accuracy is within 2 parts in 100 billion at the transmitter.

This is the view from halfway up one 400-foot tower.

• Recent Equipment —

Collins 62S-1

V.H.F. Converter



THE 62S-1 is a device intended to put owners of the other items of the Collins S-Line equipment on the 6- and 2-meter bands with sideband, c.w. and a.m. Design and operation are well matched to the companion units for the bands from 3.5 through 29 Mc., and the v.h.f. conversion is likely to be of interest primarily to owners of such gear. Presumably, though, the 62S-1 could be adapted for use with any s.s.b. transceiver or transmitter and receiver capable of tuning 14.0 to 14.2 Mc. This is the only frequency coverage necessary on the h.f. gear in order to cover the entire 50- and 144-Mc. bands with the 62S-1.

All operational tuning is done with the h.f. equipment. The window dial on the 62S-1 converter is attached to a selector switch with 23 positions, each representing a 200-kc. segment of the v.h.f. band in use. For example, the dial on the 62S-1 in our first photograph (though the reader very likely cannot see the numbers) is set for the segments that begin at 50.2 and 144.2 Mc. Actual coverage, with crystals as supplied, is 50.0 to 54.0 and 144.0 to 148.0 Mc. This can be extended down to 49.6 and 143.6, and up to 54.2 and 148.2 Mc. by the addition of three additional crystals, supplied on order. This accounts for the 23-position selector switch.

Circuit Details

All this is accomplished in a quite elementary manner, as seen from the block diagram, Fig. 1. What happens is much more readily apparent from this than from scanning the full circuit diagram. Energy is taken at low level from the 14-Mc. signal source and fed to the transmitting mixer, V_1, a 6ER5. An oscillator-multiplier-amplifier system, V_6, V_9, V_{10}, furnishes injection on the necessary frequencies to heterodyne the 14-Mc. signal to 50 or 144 Mc. Three low-level amplifier stages using a 6BZ6, V_2, and two 7558s, V_3 and V_4, build this up to drive a 7034/4X150A final amplifier, V_5.

The injection system also serves for the receiving end of the converter, so only two r.f. tubes are required in the receiving converter. These are 6ER5s, an r.f. amplifier, V_7, and a mixer, V_8. Output frequency is, of course, always 14.0 to 14.2 Mc., the tuning range of the h.f. receiver. Most of the circuit complexity is thus in the oscillator-multiplier system.

The crystal oscillator responsible for 50-Mc. conversion is V_6, a 12AT7 Butler oscillator. This is on 35.6 to 40.0 Mc. in 200-kc. jumps, depending on the position of the selector switch. Plate coils pretuned for each channel are also selected by the switch. To provide injection for 144-Mc. operation the output of V_6 is heterodyned 94 Mc. higher by another overtone oscillator, V_9, a 6U8. The pentode portion of this tube is an amplifier in 50-Mc. service and a mixer in 144-Mc. service. Output in the latter case is at 129.6 to 134.0 Mc. The injection signal then passes to V_{10}, an amplifier for both frequency ranges, feeding both

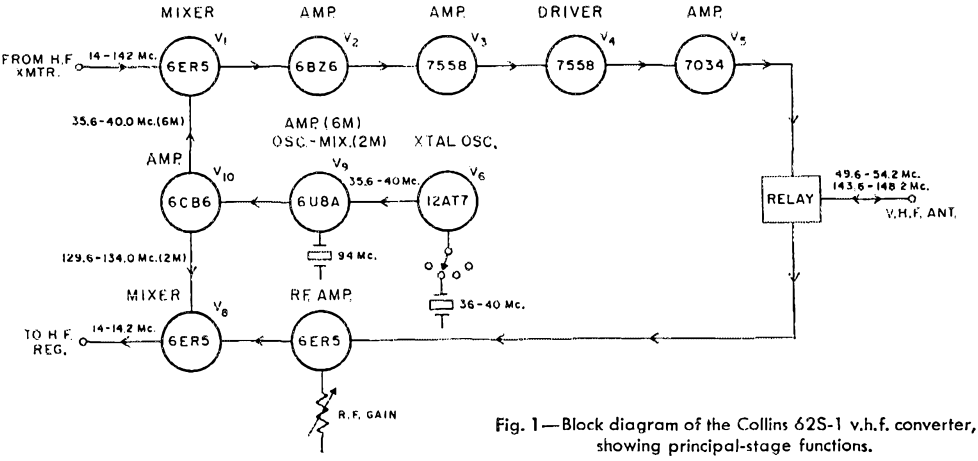
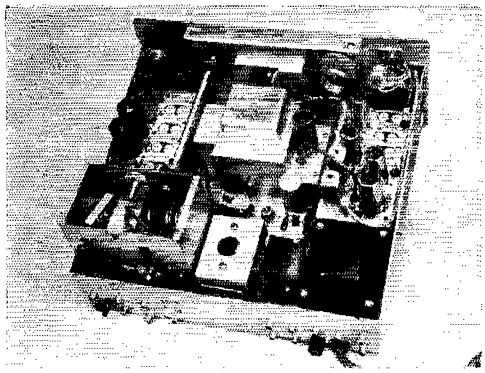
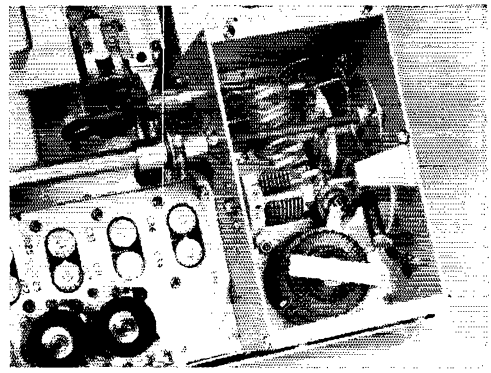


Fig. 1—Block diagram of the Collins 62S-1 v.h.f. converter, showing principal-stage functions.





(left) Interior of the Collins 62S-1 v.h.f. converter. Transmitting portion is at the left side, with the final amplifier stage at the lower left. Receiving stages are at the upper right. Crystal oscillator and switching turret are in the center. (right) Close-up view of the final amplifier stage, showing the two-band circuits described in the text. Note also the safety device on the rear wall of the amplifier compartment. When the cover is removed the spring bracket rises to short the d.c. high-voltage terminal to ground.

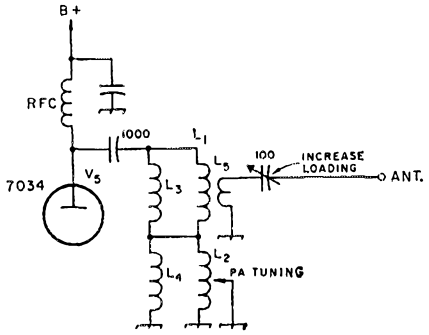
transmitting and receiving mixers. It will be seen that all these operations take place at very low power levels — a key factor in attaining high stability and freedom from spurious heterodyning products.

There is another basic consideration that might well be kept in mind by those who contemplate heterodyne-type exciters for v.h.f. work. Note that only 200 kc. per switch position is provided. One sure way to run into unwanted products in heterodyne exciter design is to try to use tunable oscillators to cover wide frequency ranges. Lots of crystals and bandswitch positions, and a single small tunable frequency range, provide a much better answer. Even with the extensive precautions taken in the 62S-1, some unwanted products appear in the 2-meter tuning range. The instruction book warns you to expect them at 144.0, 144.2, 145.0, 145.8, 146.0 and 148.0 Mc. Those at 144.0 and 148.0 are strongest, serving as reminders of the band edges they mark.

The Two-Band Tuned Circuits

Most well-designed commercial equipment incorporates ideas worth filing away for future reference whether you ever intend to buy the product in question or not. The circuit-wise ham will find plenty of these in the 62S-1. One is the means by which good tuned circuits are achieved throughout the outfit, in all two-band stages. This is shown basically in Fig. 2, eliminating the switching circuits to clarify circuit functions. The lower portion is the 50-Mc. basic circuit, wherein L_1 and L_2 comprise the 50-Mc. inductance, tuned by C_1, an adjustable padder. The front-panel tuning control is a shorting wiper on L_2, enabling the operator to select the exact amount of inductance needed to resonate the circuit at the operating frequency.

An example of this is seen in the close-up view of the final amplifier tank circuits in one of our photographs. Here we see the single turn coil, L_2, and its shorting arm, at the edge of the compartment. The switch wafer adjacent to it converts the circuit to that shown in the upper portion of Fig. 2, when the bandswitch is placed in the 144-Mc. position. This puts L_3 in parallel with L_1 and L_4 in parallel with L_2, the combined inductances in each case then tuning to the desired portion of the 144-Mc. band. The coils



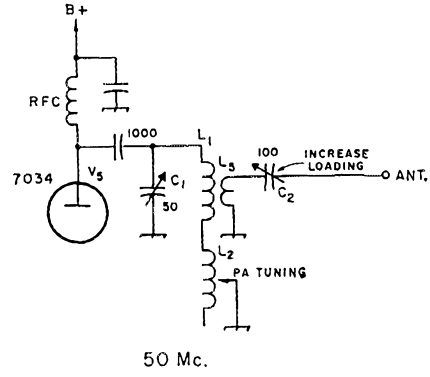
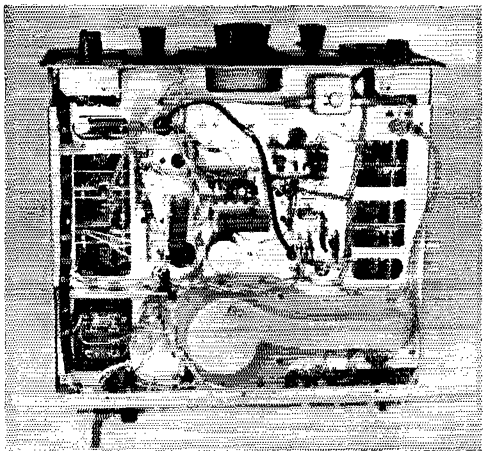


Fig. 2—Basic circuits used in the r.f. stages for both transmitting and receiving. Paralleled inductances, upper diagram, are used on 144 Mc., substituting for the tuning capacitor, C_1, used in 50-Mc. service. Coupling link L_5 and its series capacitor, C_2, work for both bands. Tuning of all circuits is by means of a shorting wiper on a single-turn loop, L_2. Designations are not those employed in the instruction book.



Bottom of the 64S-1. Receiving circuits are at the left.

we call L_1 through L_5 are visible in this view, L_1, L_3, L_4 and L_5 being on the opposite side of the switch wafer from L_2. L_5 is permanently coupled to L_1, and the position C_2, the series capacitor, determines the coupling to the antenna. The 50-Mc. tuning capacitor, C_1, is switched out of the circuit on 144 Mc. and the two coils L_3 and L_4 go in its place.

This circuitry is employed throughout, in both receiving and transmitting. Only the final-amplifier plate circuit can be seen in the photographs, but ganged circuits of similar design on a smaller scale are used in all other r.f. stages. Two sub-units, one for receiving and one for transmitting, are involved. The shorting wiper action in each stage is controlled by the main switch, which also selects the appropriate crystal for each 200-kc. interval. Thus the tuned circuits are tuned and tracked precisely at 200-kc. points. No broadband circuits are needed, receiving or transmitting — a great aid in reducing spurious responses in transmitting and overloading by unwanted signals in the receiver section.

Installation and Use

The 62S-1 contains a low-voltage supply that furnishes bias, relay and low-power tube voltages. Other power requirements, 800 volts at 220 ma. for the amplifier plate and 275 volts at 20 ma. for the screen, are taken from the associated equipment or from separate external source. Use of the equipment with the various Collins items, including the KWM and S-Line gear, and associated amplifiers, is covered in full detail in the instruction book. Very comprehensive explanations of circuit functions and complete servicing procedure are also included.

Output is stated to be 65 watts p.e.p., minimum, on both bands, working into a 50-ohm load. Receiving noise figure is given as approximately 4 db. — *E.P.T.*

COLLINS 62S-1 V.H.F. CONVERTER

Height: 6½ inches.
Width: 13 inches.
Depth: 14¾ inches.
Weight: 25 pounds.
Power Requirements: 800 volts d.c. at 220 ma., 275 volts d.c. at 20 ma., and 115 volts a.c. at 75 watts.
Price Class: $900
Manufacturer: Collins Radio Company, Cedar Rapids, Iowa.

Strays

When W6WY and W1AE QSOed recently, it was their first contact since both were with the A.E.F. in France in WW I — 45 years ago!

— • • • —

WB2ALF tells about the local TV announcer who dropped his microphone, then tested it by calling a short CQ.

— • • • —

When the Navy held its largest Naval Reserve training cruise out of Seattle this summer, five hams did yeoman's duty to keep in touch with home. Aboard the USS *Brannon* was K7YMO. K7TIP, aboard the USS *Whitehurst*, was operated by K7s TIP and TIQ. At the Seattle end were two operators of K7UWT.

— • • • —

"A Complete Two-Band Station for the V.H.F. Beginner" is still available from the ARRL, 225 Main Street, Newington 11, Conn. The fifty-cent price includes a reprint of four articles from July-October, 1961 *QST*s as well as the drilling templates.

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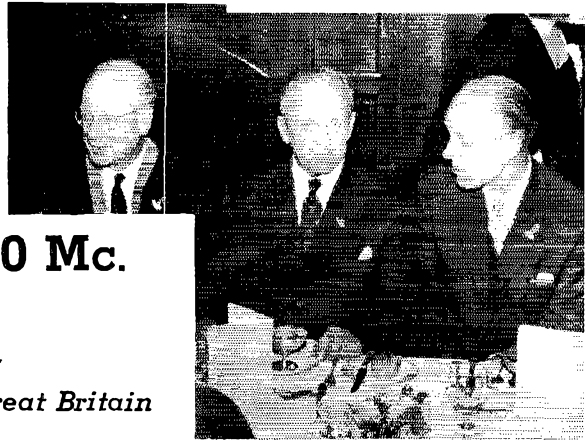
Here's KN3ZIM explaining a new rig to Assistant Technical Editor W1DX during a recent visit to ARRL headquarters. Maurice Baker is the youngest ham ever—he just turned six. He learned the code at age 4, with an assist from a ham at his local Naval Reserve Training Center.



One side of the head table at the 9th International V.H.F.-U.H.F. Convention held in London, May 18. From left to right, Norman Caws, G3BVG, President, RSGB; Dr. R. L. Smith-Rose, widely-known propagation authority and former president of RSGB; and P. Thorogood, G4KD, President of the London U.H.F. Group. (Photo courtesy of *Electronics Weekly*.)

The World Above 70 Mc.

A Brief Look at V.H.F. and U.H.F. Activity in Great Britain

BY EDWARD P. TILTON,* W1HDQ

THE 9th Annual International V.H.F.-U.H.F. Convention, held in London in May under the sponsorship of the Radio Society of Great Britain, provided a special incentive for your v.h.f. editor to make a long-deferred trip to G-land. Some observations during our 10-day visit may be of interest to v.h.f. enthusiasts on this side of the Atlantic.

Enthusiasm and activity on 144 Mc. and up are at higher levels than most Americans might imagine. There is no 50-Mc. band in Europe. They once had assignments like our prewar ones, but they lost the 56-Mc. band to television, instead of it being moved to 50 Mc., as ours was. Special authorizations for use of 50 Mc. on a noninterfering basis have been issued in various European countries during sunspot maxima, but with increasing use of this frequency range for television this may not happen again. There is also no 220-Mc. band, so interest is concentrated on 144 and 420 Mc., a sort of "ill wind" that blows some good in an area where the total number of hams is considerably lower than in this country. Great Britain and some of the countries on the Continent have an assignment at 70 Mc., but it does not have the occupancy that the higher bands enjoy. A fair amount of sporadic-*E* skip is worked on the 70-Mc. band, however, during the early summer months.

The 2-Meter Scene

In terms of the percentage of amateurs using 144 and higher bands, v.h.f. men of the British Isles do better than we. The band is 144 to 146 Mc., and use of it is apportioned geographically according to a "2-Metre Band Plan," whereby only a small segment is used in any one area. Examples: Cornwall, Devon and Somerset counties use 144 to 144.1 Mc.; Kent, Surrey and Sussex use 144.5 to 144.7; Scotland, Northern Ireland and some British counties 145.8 to 146 Mc.; and so on. Thus you know where to look for your DX, and probing 360 degrees to peak up weak signals is largely eliminated. This plan was born of a need to avoid certain frequencies *in the band* that are used for military purposes, and while it cramps the operator's style in some ways it also has its good points. The portion of the 420-Mc. band most used for DX (432 to 434 Mc.) is similarly apportioned.

Equipment in stations we visited showed a high level of technical competence on the part of the owners. The average British v.h.f. enthusiast is a make-do artist of no mean ability, and much of the gear we saw was not only highly effective, but beautiful to look at, as well. We hasten to add that we also saw plenty of typical haywire, in the good ham tradition of this approach.

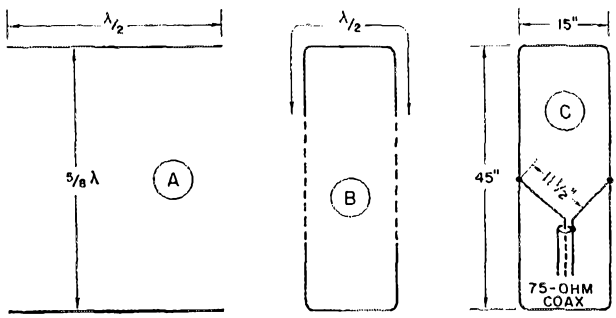


Fig. 1—Details of the driven-element portion of the "skeleton slot" array, widely used by British v.h.f. enthusiasts. The system is derived from two horizontal dipoles stacked approximately ⅝-wavelength apart, as at A. These are then bent up and down at the ends, and connected by means of a high-impedance line, as shown at B. The completed loop, C, is fed through a fanned-out Y section, and 75-ohm coax. In a typical slot array, a reflector and four directors are added in line with the top and bottom portions of the driven element, using conventional Yagi dimensions, to make up a 6-over-6 array having a center frequency of 145 Mc., and good broadband characteristics. (Information courtesy of the RSGB Handbook and J-Beam Aerials, Ltd.)

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

Portable and mobile work are popular, and the v.h.f. Field Day is a fixture of the contest calendar. During a weekend with the Northwest V.H.F. Group of the Manchester area, we were given a tour of favorite portable-working sites in the hills south of the city. Some impressive distances were covered while mobiling en route with G3AOS. From one of the higher spots in England, an 1800-foot elevation having a typically-British name, Meriton Low, good contacts were made out to 100 miles or more, even with other mobiles. All-transistor receivers are fairly common in 2-meter mobile installations, and the halo is popular for in-motion work. The knocked-down portable beam, for quick assembly at a desirable site, is also widely used. The "farthest out" mobile we saw was that of G2HCJ, of Liverpool. Ralph has a 4-element Yagi, complete with rotator, mounted atop a tiny Morris station wagon. Following behind him in another car, and watching the head-turning by pedestrians along the route, is an experience not soon forgotten.

Sideband is doing well on 144 Mc. in the Manchester area. We saw fine homebuilt layouts at G8SB and G3EGK. G8SB (the right call for a sideband enthusiast) uses a home-made crystal-lattice filter setup, while G3EGK has a McCoy filter, brought back from a recent visit to this country.

There is almost complete standardization on one type of antenna for home-station work, the "skeleton slot," an array just coming to the attention of American v.h.f. men. We asked John Rouse, G2AHL, editor of the excellent *Amateur Radio Handbook* published by RSGB, for permission to use information on the slot from that book. The design is by B. Sykes, G2HCG, and the array is sold by his company, J-Beams, Ltd., on both sides of the Atlantic. Except for small single Yagis used for portable work, we saw nothing but various combinations of these slots on 144 or 432 Mc. G3HRH, RSGB V.H.F. Manager, has two 8-over-8 slots in phase, though smaller systems are more often seen.

Transmitter power on 144 is usually around the 100-watt input level or lower, a popular final amplifier being the Mullard version of the tube known here as the 5894. External-anode tubes (4X150, 250, etc.) are seen occasionally, though high cost of these and sockets for same keep them from universal use. Fellows I talked with seemed surprised to learn that not everyone in the States uses a pair of 4CX250Bs or better, and a minimum of 64 elements.

The surplus store is a popular source of components for the v.h.f. enthusiast. There were at least six of these within easy walking distance of the Kingsley Hotel in London, where the Convention was held, and we poked around several of them. All offered a bewildering array (and often disarray) of stuff for sale. Not much of it was familiar to U. S. eyes, other than an occasional 522, ARC-5 or military versions of well-known American communications receivers. These items were apparently bringing prices well above what we would expect to pay for them here. Most of the buying seemed to be for parts-salvage purposes, and we gather that this is the standard way of accumulating the wherewithal to build v.h.f. gear, for the average ham.

Convention Highlights

The Convention, attended by nearly 200 v.h.f. enthusiasts, set a new record. Hams were present from The Netherlands, France, Germany, and from all over the U. K. Five excellent technical talks followed the writer's opening remarks at the afternoon session, each including a short question period. The keen character of the latter boded ill for a speaker who might not be well-grounded in his subject. The territory covered was impressive. Titles: Receiver R. F. Stages, Parametric Amplifiers, V.H.F. Aerials and Feedlines, Transistors at V.H.F. and V.H.F. Transmitter Design. It was as stimulating a technical period as this writer has enjoyed in many a day.

A homebuilt-gear competition is always a feature of these affairs, and this one had about thirty pieces of equipment, representing every level of sophistication. The writer shared with Dr. R. L. Smith-Rose the considerable task of judging and selecting three winners. It was far from easy, but the final nod was given to a beautifully-built complete 2-meter transmitter-receiver. Second award went to a sectionalized 2-meter f.m. and c.w. transmitter. Third was a fine portable transmitter for 432 and 1296 Mc. There were several all-transistor converters for all bands up through 1250 Mc., a neat TV final amplifier using a 4X150A, some interesting test equipment, and one of the most beautiful pieces of amateur gear we've ever seen, a complete communicationr receiver of all solid-state design, for 432 and 1296 Mc. This work of art, described in the May, 1963 issue of the *RSGB Bulletin* by its builder, G3HBW, was a previous award winner. Every item showed evidence of meticulous care in construction, as well as familiarity with the fine points of circuit design. All would make fine *QST* construction articles.

The Higher Bands

We have known for some years that European hams are ahead of us in occupancy of the 420-Mc. band, and, in general, the distances covered on this frequency. This is a natural result of high population density, freedom from the power limit that long held American 420-Mc. interest down, and the experimenter interest that seems to characterize the European approach to the hobby. The possibility of working a sizeable number of countries may not do any harm, either. Quite a few Gs have more countries worked on 432 than some of us have states.

Work with television is fairly widespread. This is fostered by the British Amateur Television Club, formed in 1949, and operated for some years now under RSGB affiliation. Membership in the BATC is open to anyone interested in amateur TV, and the cost, $2.00 yearly, payable on Jan. 1, includes the club's magazine, *CQ-TV*. Interested parties may address the Hon. Secre-

tary, BATC, 21 Silverdale, Sydenham, London, S.E. 26. BATC membership is around 600, of which perhaps 50 are actually on the air with TV signals. The current TV DX record for European amateurs is 200 miles.

There is appreciable interest in 1250-Mc. work (the band in U. K. is 1250 to 1300 Mc.) with most of it directed toward crystal-controlled gear on or near 1296 Mc. One reason for our trip was to discuss the question of channels for future world-wide use in the v.h.f. and u.h.f. bands, in view of the ever-increasing pressure for frequencies in this part of the spectrum, and the likelihood of international communication through the use of satellites. Our use of 432 Mc. as a "low end" for narrow-band DX work, fits well into the European picture, though the agreed-upon segment in IARU Region I is 430 to 434 Mc. This takes into account the fact that the band is 430 to 440 Mc. in some European countries (Britain has 420 to 450, as we do) and the desirability of one 6-Mc. segment for intercountry TV work. This would be 434 to 440 Mc., in this case.

The segment for narrow-band work in the 1250-Mc. band is 1296 to 1298 Mc. No specific band segments have been discussed for the higher bands, it being felt that where narrowband techniques might be used above 2000 Mc. it would be no great problem to adjust to any desirable band segment. Harmonic relationship might not be as important above 2000 Mc. as on lower bands. Thus far there is little uniformity between countries in the matter of frequency assignments for amateurs in the microwave region, nor much activity in such bands as are assigned. Experimental interest in the 1250-Mc. band is generally high, however, with both simple gear and advanced techniques receiving attention.

Organized Activities

As anyone who has read British magazines will know, the radio club plays an important part in the life of most British hams. Contests, rallies and field days go over big, and group effort pays dividends in many ways, as it does here. Moonbounce and other esoteric projects are being promoted by a recently-formed Space Communications Group, first suggested by Bill Sykes, G2HCG. Ralph Taylor, G2HCJ (the man with the far-out mobile) is bearing down on the 2-meter moonbounce problem, and is particularly interested in the possibilities of synchronous detection. He would be glad to hear from anyone seriously working on 2-meter moonbounce. No merely-curious pen-pals, please.

Contests are popular and frequent. The *RSGB Bulletin* carries a "Contest Diary" in each issue. This lists 31 contests of all kinds for 1963, including major h.f. activities of worldwide scope. There are 9 affairs for 144 Mc. and higher: a 144-Mc. c.w. contest, two 144-Mc. open and listeners' contests, two 420-Mc. contests, two 144-Mc. portable contests, and separate events for 70 and 1250 Mc. These activities are well coordinated throughout Europe by the IARU Region I V.H.F. Committee. Scoring on the basis of distance for each contact, and categories for various power levels, results in contest complexity that would drive American v.h.f. enthusiasts mad. Checking by volunteer committees in the various countries slows down reporting of final results to a point where the 1961 Region I V.H.F. Contest was the last for which complete results were available in print as of the end of May, 1963. This one had about 550 entries from 18 countries. Classified by amateur definition of "countries" the number would be several higher. A 420-Mc. contest in 1962 brought 50 entries.

We had the pleasure of sitting in on a meeting of the RSGB V.H.F. Committee, during which contest forms, duration and coordination were under discussion. Much of the talk had a very familiar ring, and it seems that they are hashing over many of the same problems that have bedeviled ARRL contest administrators for years. Theirs are made all the worse by the multi-nation nature of the v.h.f. scene in Europe.

Being on opposite sides of the Atlantic does not keep hams from being hams, and despite surface differences we found that British v.h.f. enthusiasts have a lot in common with their brothers in America. We found them keen to learn more of American v.h.f. ways, and it was our distinct impression that only good could come of closer relations between us. If this trip did a little to bring better liaison in v.h.f. and u.h.f. matters into being, it will have served its purpose well. With the Space Age upon us, we're going to need it.

QST

Strays

The daily 34-minute silent period (at 1900 Universal Time) was discontinued by WWVH, Maui, Hawaii, after October 1. The silent periods at 15 to 19 minutes past every hour are being continued. WWVH operating frequencies are 5, 10, and 15 Mc.

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The address of W3KT and the W3 QSL Bureau was changed October 15. See the complete list of bureau addresses on page 168, this issue.

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Stolen equipment — The following equipment was among the gear stolen in September from W2NXZ's garage. If you know of the whereabouts of any of it, notify W2NXZ at Box 186, Brightwaters, Long Island, N. Y. Swan transceiver SW-175, serial number 108712; Electro-Voice microphone model 714SR; a Topaz power supply; and a New-Tronics antenna and mobile mount.

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One of the speakers at the fall meeting of the URSI (International Scientific Radio Union) will be *QST* author W1OUN. He'll speak on "Doppler Measurement Techniques in Planetary Radar" in Seattle in December.

Transistor Switches in Transmitter Keying

With Particular Reference to Grid-Block Systems

BY JOHN E. CORBETT,* K1IZZ

Two recent articles[1] in *QST* concerning transistorized keyers have aroused my interest in their capability to reliably control blocked-grid keying systems. In such systems, the open-circuit voltage at the key is invariably in excess of 100 volts, and can be expected to be in the range of 120 to 150 volts d.c. One saving grace, however, is that it is usually transient-free.

With these characteristics in mind, a circuit configuration was worked up, component values calculated, and quite a few evaluations made to verify the circuit. The results are passed on in this article to serve as information in the application of switching "high" voltage, rather than as a treatise on construction.

Transistor Ratings

The inverse breakdown voltage of semiconductors is given on data sheets as maximum collector-to-emitter, collector-to-base, and base-to-emitter. This is analogous to inverse peak plate-to-cathode rating on vacuum rectifier tubes. However, general practice with semiconductors is to operate them well below their maximum ratings. On the other hand there is a loophole, advantage of which is often taken. Semiconductor damage is caused by energy dissipated during breakdown. If the duration is short, and/or the current flow at breakdown limited, no apparent damage occurs. The author has been associated with transistor pulse amplifiers driving transformers in the collector that experience collector-to-emitter inverse voltage breakdown at every pulse, and no failures can be traced to this in a three-year period. However, the duration of breakdown has been very small compared to pulse-repetition rate. Therefore, the criteria for the blocked-grid keyer should be that under steady state, V_{CE} will not exceed maximum rated and, preferably, be maintained at 75 per cent or less of maximum; transients in excess of rated should have minimum duration and limited energy dissipation.

Protective Measures

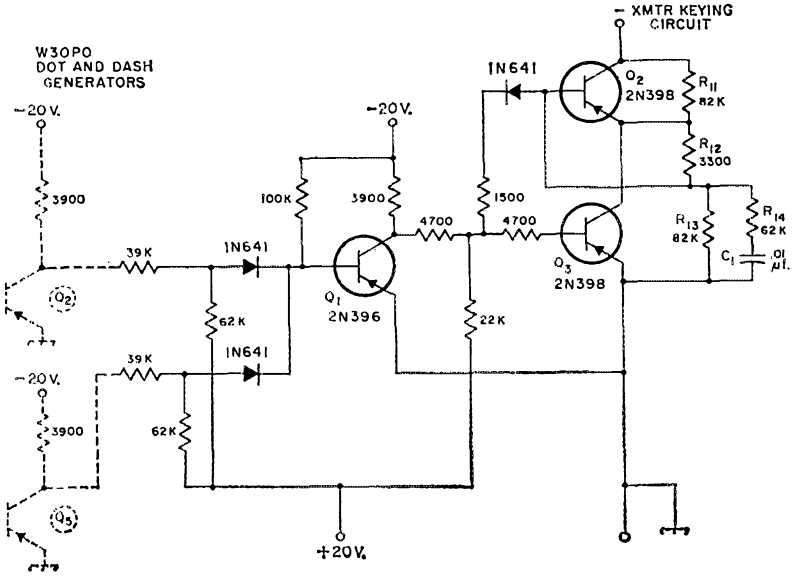
The circuit of Fig. 1 was finally devised. It was driven by W3OPO's keyer, with the OR gates and all subsequent circuitry of Fig. 1 replacing W3OPO's. The monitor oscillator is omitted.

Q_1 shunt-feeds Q_2 and Q_3 whose outputs are in series. Q_2 and Q_3 are 2N398s, rated at a maximum V_{CE} of −105 volts. The circuit is similar to that of K5UIJ in his Fig. 1, except for the resistance-capacitor net around Q_2 and Q_3 collectors and emitters. Although R_{11}, R_{12}, R_{13} in series ground the transmitter keying lead, the high resistance value should be no detriment in most transmitters where the resistance between the

* 107 Somerset Avenue, Pittsfield, Mass.

[1] MacFarlane, "A Monitored Electronic Key & Keyer," *QST*, Dec. 1962; Lyon, "An All-Transistor Keyer and C.W. Control Unit," *QST*, July, 1962.

Fig. 1—Modifications in the W3OPO transistor gridblock keyer. Resistances are in ohms and resistors are ¼-watt. Component labels are for text-reference purposes. All voltages indicated are in respect to the ground terminal.



negative and key jack is low compared to $R_{11}+R_{12}+R_{13}$. It showed no effect on the Heath Apache keying characteristics where the source resistance is 47,000 ohms. These resistors clamp the V_{CE} on Q_2 and Q_3, so that if any leakage occurs in either, the other won't hog the voltage.

R_{12} provides cutoff bias to Q_2. This is a more positive method of insuring cutoff than merely tying base to emitter through a resistor when Q_2 is off. C_1 and R_{14} give a time delay to hold Q_2 base negative, with respect to Q_2 emitter, if Q_3 should turn on first, to aid Q_2 turn-on. It works the opposite way if Q_3 should turn off first; it holds Q_2 base-positive with respect to Q_2 emitter, aiding Q_2 turn-off.

Checking the Keyer

For evaluation, a voltage of 230 volts d.c. with 40,000-ohm source resistance was used, giving 100 volts steady-state V_{CE} at Q_2 and Q_3. This is not recommended for continual application; however, 12 hours of continuous dot transmission at 35 w.p.m. into this dummy load had no ill effects.

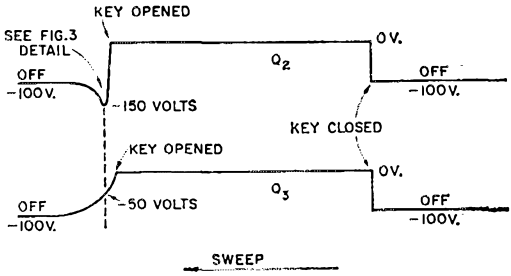


Fig. 2—Graphs taken from oscilloscope patterns showing the switching characteristics of Q_2 and Q_3 in Fig. 1. The curves represent individual collector-to-emitter voltages of the two series transistors during a keying cycle. A spike of voltage appears across Q_2 (but not Q_3) at the instant of opening the key. A detail of the spike is shown in Fig. 3.

Fig. 2 shows graphs of V_{CE} at Q_2 and Q_3 as taken on an oscilloscope. It shows a definite spike of voltage at Q_2 as it hogs the voltage at turn-off. This spike exceeds the rated 105 volts for approximately 1 millisecond with a peak amplitude of 150 volts, or 75 per cent of total voltage from Q_2 collector to Q_3 emitter under steady-state "off" conditions. This is significant in that this ratio held for all values of source voltage. Thus, if it were desired never to exceed the rated 105 V_{CE} for the 2N398, the source voltage would have to be limited to 140 volts at a 40,000-ohm source. This probably meets the requirements imposed

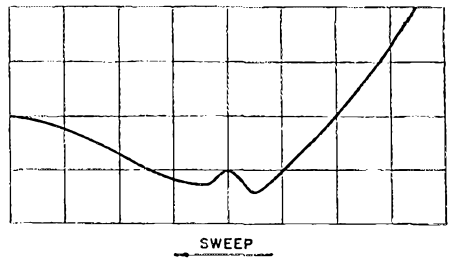


Fig. 3—Close-up detail of the spike in Fig. 2. The positive-going bump in the valley indicates breakdown.

by most grid-block transmitters.

A detailed magnification of the "nose" of the spike is shown in Fig. 3. The positive-going pip down in the valley indicates breakdown. The duration of the breakdown undoubtedly exceeds the duration of the pip, but is probably of a destructive nature for no more than 100 to 200 microseconds. Since the repetition rate period is approximately 50 milliseconds, breakdown covers only a small portion of the duty cycle.

Fig. 2 shows no voltage-hogging at turn-on. An expanded scope reading, similar to Fig. 3, verified this.

The circuit was made up on a perforated flea-clip board. The accompanying photo shows it prior to cutting down to size for insertion into the keyer unit.

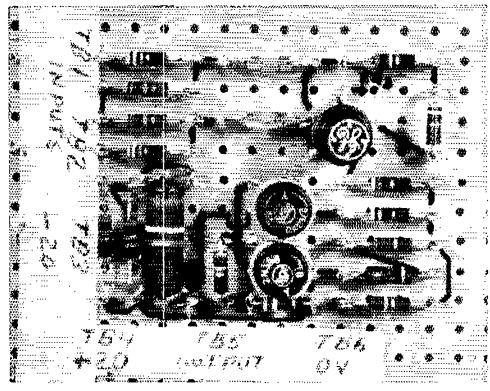


Fig. 4—Physical layout of components using the circuit of Fig. 1.

My indebtedness is extended to G. Manarchik and M. Melchiori who volunteered their efforts in aiding my meager, but hopefully useful, attempt to span the gap between our transistorized and vacuum-tube gear. QST

Strays

"For meritorious service. To Señor Leroy S. Harris in honor of your distinguished actions in the rescue . . . in the Pichincha Mountains" reads the certificate in part. It was sent to WA4JSU after he recently helped arrange the rescue of five students lost in Ecuador's highlands.

W9YSZ gets credit for proving that electricity is worth a hundred times its weight in gold. Look at it this way: in a 115-volt circuit, at a power-company rate of 2 cents per kwh., electricity costs $51,000 dollars per pound . . . and that's 100 times as much as an equal weight of gold!

Control Towers, Contests—and Traffic Nets

BY GEORGE HIPPISLEY,* K1WJD/K2KIR

Not long ago I visited the control tower of one of the east coast's larger airports. After two hours of avidly watching the four-man team coordinate the activities of all aircraft in the vicinity of the airport, I came away convinced that any one of these men would have little trouble becoming a top contest operator or net control station. The principles of each are very similar, and proficiency in either of the latter two will move you well along the road to proficiency in the other.

For instance, let's look at a decision which might have to be made by a control tower operator (CTO). Assume a small private plane about five miles out and a commercial jetliner ten miles away are coming into the airport from different directions. The CTO will have to consider the relative speeds of the two vehicles and then decide whether or not the commercial plane can be given landing clearance before the small plane. Assuming the speed difference is great enough, and landing flight patterns permitting, he will be able to land the commercial plane first without delaying the other plane at all.

Now let's look at a contest operator and a somewhat analogous decision. He calls CQ and gets two replies, one with a good signal but slow and sending what looks like is going to develop into a 4 by 4 call, and the other weak but sending a quick 1 by 1. To answer the quick one and perhaps lose him in the QRM, or wait for the slower one — which? If our operator is at all "hep," he'll go for the quickie. Why? Well, if the contest is the type with a short exchange, such as CD parties, he may finish the contact before station #2 has finished calling him. Even if he doesn't, the quicker station is probably more impatient and less apt to wait around for our operator to finish a QSO than the plodder. One disadvantage: if the quick station is weak, he may lose the QSO entirely due to QRM. All things considered, the odds are better that he'll have his cake and eat it too if he takes the quick guy first.

In a traffic net the job of the net control station is simply stated: he must expedite the best and fastest routing of all traffic entered into the net, often within an allotted time limit. Simple? Well, it depends on the material he has available to work with. Unfortunately, too many members of a net fail to heed one of the rules of traffic handling: participation in a net implies that you agree to abide by the decisions of the NCS. It does not mean you're there to help him out, unless he asks you to. If you are more competent than he is, he needs the practice more than you do. If you are *as* competent, your turn will come later to show your own skill. If you are less competent, he's better off without your help. So let him alone. Speak to the NCS only when he directs you to do so — as though he were your elder.

Let's observe a session of the Eastern Area Net (EAN), a high-level net in the National Traffic System. Its job is to clear the traffic reported in by representatives from the 1st, 2nd, 3rd, 4th, 8th, and Eastern Canada region nets. Let us suppose that W2EZB is net control for the evening in question. When EZB starts the session, stations from the region nets will check in with traffic for other region or area nets. The simplest solution for EZB is to dispatch pairs of stations off-frequency at random to clear their traffic. Unfortunately, this technique, while requiring a minimum of brain-work, tends to leave large numbers of stations sitting on frequency, cooling their heels while waiting for appropriate stations to return. In terms of the control tower analogy, think what would happen if the tower operator fixed his attention on the small plane and guided it onto the landing strip while leaving six or seven commercial airliners sitting up on cloud 9 waiting. A rather inefficient procedure.

So EZB, being a thinking man, attempts to maximize the number of stations he can send off frequency at one time. This automatically maximizes the number of messages being handled per minute, which is one of his primary concerns. Now, believe me, it is not easy to do this while the pressure is on; and what is maximum for the moment may result in an "idle" condition five minutes later.

As far as I know, there are very few set rules for this procedure, but one that almost always benefits the net is to handle the smaller traffic lists first. For example: suppose W1NJM checks in with 1 2RN, 2 4RN, and 32 8RN messages.

* 68 Jarvis Circle, Needham, Mass.

EZB's first impulse might be to send NJM off with K8TIG, 8RN representative for the evening, and get the 32 out of the way. Chances are, however, that it's going to take at least a half hour to clear those 32 alone. If they're cleared first, a whole flock of other stations may have to wait around for NJM and TIG to return before they can "clear the hook" and quit for the evening. So instead, EZB sends NJM off with W2FEB, the 2RN rep. If W4PTR (4RN) is available at the right time, he'll send PTR off to the NJM/FEB frequency to get NJM and the 4RN traffic when NJM finishes with FEB. This obviously has to be done before NJM and FEB are apt to be finished, or they will return to the net frequency and PTR will be off looking for them in vain.

Returning to the small plane and the jetliners, the above technique corresponds to jockeying *all* planes into a pattern, so that they can touch down one by one in a very efficient spacing. It is merely a case of having to make decisions affecting a lot of planes (or stations) at the same time.

What I've just described is applicable to optimum conditions. But the real mark of a good net control (or control tower) operator is how he reacts in non-perfect situations, caused mainly by two things — poor operators and lousy band conditions.

Sometimes two stations will try to check in simultaneously. If neither is using break-in, a "double" transmission will occur. With any sort of luck, one of them will be slightly off frequency and a sharp NCS, using his built-in "sampling" device, may be able to get the calls and traffic lists of both at the same time. This is done by alternately listening to each just long enough to "sample" each bit of information being sent. A further stroke of luck may occur if the two stations are sending at greatly different speeds. In any case, the object remains the same: to save time, and avoid retransmissions.

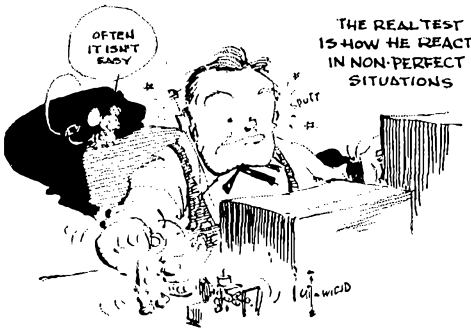
Or take the problem of poor band conditions. Quite often these days half the net members can't hear the other half. W1s, W4s and W8s may be able to work each other as if they were talking to their next door neighbors, but they won't be able to hear the 2s or 3s. Aside from hoping for a blown fuse (real or otherwise), the hapless NCS must grin and bear it. Sometimes band conditions will change during the course of the net; in that case, the NCS merely prays that he gets all 1RN/4RN traffic exchanges cleared before the skip changes to a good 1RN/2RN path. In other cases, the NCS will be blessed by the presence of other "savvy" guys on frequency who have no traffic and will help relay information and traffic whenever requested to do so. In extremely bad cases, one section of the net's members may not hear the NCS start the net and will start their own session. Talk about Confusion!

In short, running a net session is not a dull, tailor-made job. The NCS must be constantly using his head and altering his strategies to fit the operators, band conditions, and traffic loads.

Assuming you've never been an NCS before, let's start you off on a somewhat less critical but still fairly ambitious beginning, namely a section net. Probably you'll have no warning that you are to be an NCS. The regular control for the evening may not show up, and someone may say "GA TAKE IT." (That's what happened to me. I was scared to death!)

Your first flight as an NCS will probably be an unforgettable experience. You tremble, you twitch, you sweat, you hope for a blown fuse. But you start the net: CQ NYS DE K2KIR (New York State C.W. Net) QND QNZ QNI K. You may get a K2KIR, or BK in return. You may get two dits; don't ignore them as being somebody slightly trigger happy on the bug — send them back a couple of dits, and see what happens.

Or, you may get nothing. In this case, you might check your final B-plus, antenna connection, or even your v.f.o. dial setting — I've been



known to miss the net frequency by 100 kc! Anyway, assuming that you get a bite, let him proceed: DE W2FEB QNI QTC 1 SYR 1 THRU AR. So Keith has 1 each for Syracuse and the region net. Oh goody — now what? Well, you can't do much with only one station in the net, so acknowledge him and hold tight: W2FEB GE R AS.

At this point you may be frightened by another station checking in; after all, you didn't even send CQ NYS again. Don't panic, let him in, too: K2KIR BE K255X QNS QMC 3 V 2 2RD AR.

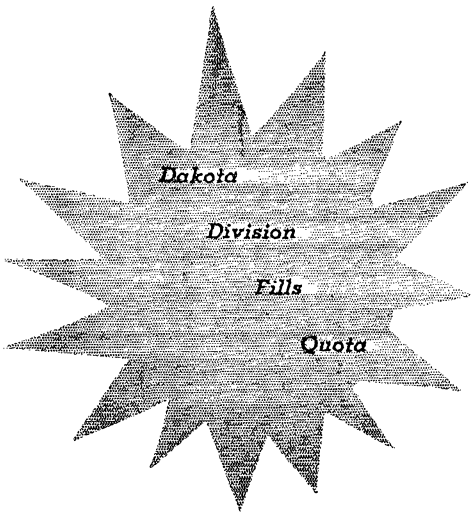
Look like Greek? Or course it does; but since you remember K2SSX mentioning getting a new keyer the other day, you can assume he meant: K2KIR DE K2SSX QNI QTC 3 U 2 2RN AR. Three messages for you and two for the 2RN rep. Writing everything down is a must in traffic nets. If the guy is sloppy, looking at what he actually sent sometimes helps you figure out what he meant to send. (Apologies to SSX — he's a fine operator, but I'm bigger than he is, so I can use him for my bad examples.)

Now you have a swingin' net. The next move is obvious:

K2SSX (he goes "dit" at you to show that he hears you OK)
W2FEB (dit)
UP TEN SYR (Go up ten kc. and pass the Syracuse traffic from W2FEB to K2SSX.)

Easy, wasn't it? Now you're all alone. But

(Continued on page 144)



Building Fund Progress

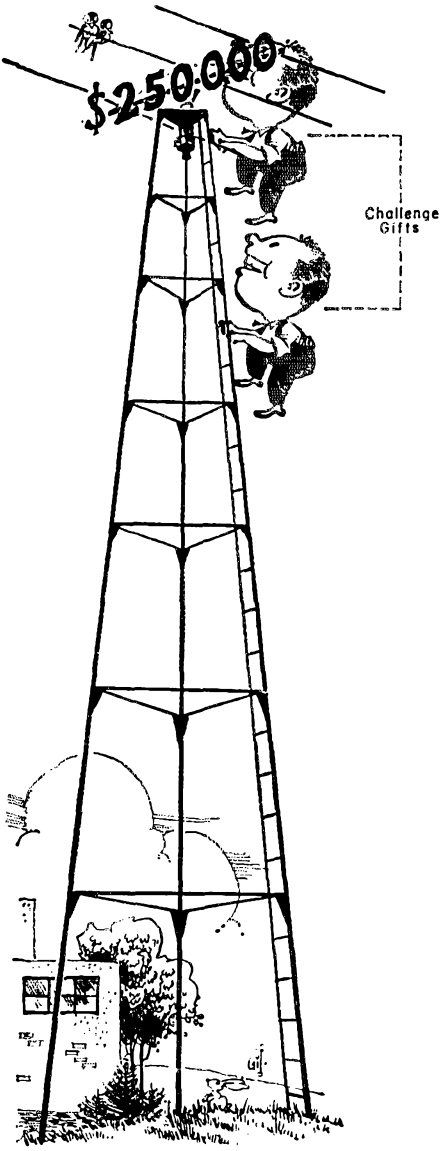
Hearty congratulations to League members in the Dakota Division — the first to reach its quota in the ARRL Building Fund drive!

At each meeting this year, the Minneapolis Radio Club passed around a container — with the League emblem on top — to collect contributions to the fund. Submitted to Hq. in late September, the substantial donation — doubled by matching funds — put the Dakota Division over the top. The ARRL Executive Committee adopted a resolution of appreciation to Director Compton and members of his division for their fine support of the drive.

New England is running a close second, and may well have achieved its quota by the time you read this. Several other divisions are close behind, however, and may reach their goals first:

Dakota	**100.0%**	Canadian	54.3%
New England	95.6	Central	53.6
Hudson	81.8	Atlantic	53.0
Northwestern	75.3	Rocky Mt.	50.4
Southwestern	71.9	Delta	47.4
Midwest	66.1	West Gulf	44.1
Pacific	61.2	Great Lakes	42.1
Roanoke	61.1	Southeastern	39.7

Nearly 11,000 members have made individual contributions to the Building Fund. Are you among them? QST



Members Are Saying . . .

My first membership was in 1932. I've been in and out of ham radio since then. I know the fine work your organization has done for ham radio. In fact, there would be no ham radio today without the hard work of ARRL. — *W3SBL.*

Enclosed is a contribution for which I would like a brick or two put into the new building. — *VE3SD.*

As the outstanding ham in the U.S. (in my opinion) K7UGA, Barry Goldwater, says, "We have to pay the rent in return for our stay on earth", so I believe we hams had ought to "pay the rent" for all that the League has done for us. My contribution backs up my belief. — *K5PXV.*

Here is the contribution I promised for the building fund; sorry it isn't more. Please add my name to the list of all the nice things that have been said about the ARRL and amateur radio. — *K7SRU.*

Please accept this donation from me in appreciation for the wonderful help and services I have received from several wonderful amateurs. — *Wanda S. Tan, Duarte, Calif.*

(*Continued on page 148*)

W2FX, president and co-founder of one of hamdom's most exclusive and respected organizations, tells about

The Quarter Century Wireless Association, Inc.

BY JOHN DI BLASI,* W2FX

THIS organization of "Old Timers" with twenty-five or more years in ham radio was first discussed and planned during a 10-meter round table on Friday night, November 4, 1947, by its founders, W2FX, John DiBlasi; W2UD, now OA4J, Uda Ross; W2FD, John Gioe; W2EF, Ed Crane; W2DX, Irving Groves and W2DI, Dr. Ernest Cyreax. With the increasing number of hams the founders felt that the Old Timers would soon be forgotten, and an organization to commemorate and perpetuate the hams who cut their eye teeth on "spark" and who pioneered our hobby, should be formed. The first official meeting was held in New York City on Friday evening, December 5th, 1947, at which time thirty-four charter members were present and the QCWA was founded.

The original purpose of the QCWA is still maintained in its constitution. This is "to foster and develop friendship and cooperation among amateur radio operators of twenty-five or more years standing" and "to take general interest in all matters affecting or involving amateur wireless or radio and sponsor such actions as may be deemed proper in their interests."

* President, QCWA, 155 Bayview Road, Plandome Manor, L. I., N. Y.

John DiBlasi, W2FX (left) and Ralph Barber, W2ZM, president and executive secretary of the Quarter Century Wireless Association. They are shown beside the Association's blue-and-gold banner, adopted last year to celebrate the fifteenth anniversary of its founding. Membership in the QCWA is open to hams who held amateur licenses 25 or more years ago and are presently licensed. Many members can boast of a half-century of hamming. Present enrollment is 3000 and growing steadily.

The Association has never actively engaged in soliciting membership, but by its continued advocating of the purposes for which it was founded, it has steadily grown to an internationally recognized fraternity of over 3000 members, of which sixty-eight are outside the United States. Our organization is proud of its twenty-four "YL" members and of its twelve husband and wife teams.

This membership represents a cross-section of men and women who make amateur radio their hobby or engage in the entire field of modern communications as we know them today. The organization is incorporated in the State of New York and there are twenty-two chapters actively engaged in furthering the spirit and cooperation of the "grey beards" in their locales throughout the United States.

There are chapters in the following areas: Arizona; Baltimore, Md.; Dayton, Ohio; Boston, Mass.; Canton, Ohio; Cleveland, Ohio; Delaware Valley, New Jersey; Findlay, Ohio; Florida; Michigan; Missouri; Northern California; Northwest; Pittsburgh, Pa.; San Diego, California; Susquehanna Valley, Pa.; Oklahoma; Upper Midwest; Washington, D. C. and the West Gulf. National headquarters are in New York. Each of these chapters holds a charter from the national headquarters and runs its unit under the prescribed methods as outlined in the bylaws.

All members receive a membership certificate, dues card, membership roster and newsletters from time to time. They attend national and chapter dinners and activities, and participate in "on-the-air" round tables on all bands with all modes of communications. Yearly QSO parties are held for all QCWA members to take part in, with a prize for high score entrants each year. Many of the chapters hold picnics and other noteworthy activities to give their members that "glad to belong" feeling! Provision has also been made for life membership in the QCWA and the increasing number of life members indicate these members agree that the QCWA is going to represent them for a long time to come.

Members may secure a QCWA lapel pin or button, which is their emblem of belonging to the "grey beards." They may also obtain QCWA stamps to identify them as members.

(Continued on page 148)

Hints and Kinks For the Experimenter

ZENER-LIMITED "HANG" A.G.C.

A MODIFIED version of Goodman's "hang" a.g.c. system [1] used by William L. Hale, K8JIX, is shown in Fig. 1. The modification is simple and might well be a desirable addition to any receiver employing "hang" a.g.c.

In order to obtain selectable "hang" durations, three separate, switched resistors were substituted for R_{1A} in the original circuit. The values chosen were 4.7 megohms for long "hang," 1.5 megohms for medium, and 0.47 megohms for fast recovery. In addition, K8JIX shunted the 0.47 megohm resistor with a 14-volt Zener diode, CR_1. When fast recovery is selected the diode prevents C_1 from charging to more than the Zener voltage when a strong signal appears. This limits the "hang" duration to a fixed maximum regardless of signal strength and is useful for c.w. break-in operation. The instantaneous attack of the a.g.c. system reduces receiver gain to a reasonable level when the key is closed yet the gain recovers between letters to allow a breaking station to be heard.

K8JIX found the diode unnecessary in the medium and slow-recovery switch positions, which he normally uses only for s.s.b. In this mode a negative bias from his transmitter disables the a.g.c. amplifier, as well as the audio in his receiver, so the a.g.c. line is inoperative when his s.s.b. transmitter is turned on and recovery time is of no consequence. In other situations, however, the diode could be shunted directly across C_1 and perform its limiting function at all times.

[1] Goodman, "Better A.V.C. for S.S.B. and Code Reception," *QST*, Jan. 1957.

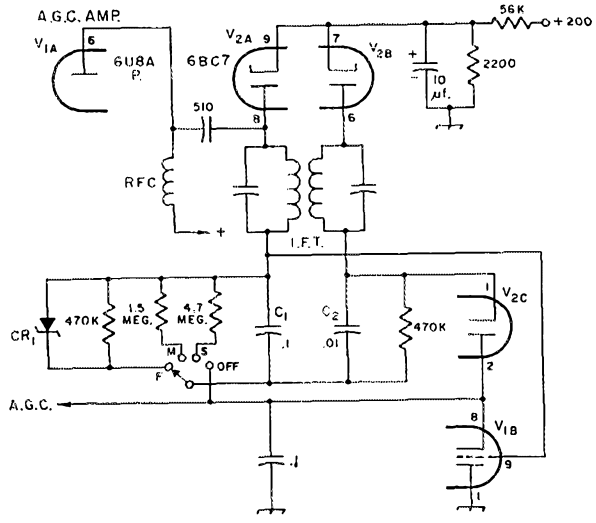


Fig. 1—Hang-a.g.c. circuit with diode limiting for fast recovery in break-in operation. CR_1 is a 14-volt Zener diode.

The resistor values and Zener voltage were chosen by K8JIX to suit his particular requirements. Other values may be employed to obtain different "hang" characteristics.

PLASTIC TUBING SPREADERS

OPEN-wire feed-line spreaders can be constructed from large diameter polyethylene tubing. I use ⅝ inch o.d., ½ inch i.d. tubing which is stocked by laboratory supply houses and sells for about 15 cents a foot. The tubing can be purchased for as little as 10 cents a foot in 100-foot rolls from Bel-Art products, Pequannock, New Jersey.

To make the spreaders, cut off the desired length of tubing; cut slits in each end with a sharp knife and pierce a hole at the bottom of each slit. If the hole is made smaller than the diameter of the feeder wire, the wire will be gripped firmly when pressed into place. No additional tying or fastening should be necessary. — *Dr. A. W. Golfman, WN2HDQ*

EXTENDING APX-6 FREQUENCY

IDEAS for extending the tuning range of the APX-6 transmitter have been proposed in the past and have included using a false cavity bottom and cutting the tuning plunger to a shorter length. I use a third method which is simpler than either of the above. Between the Veeder dial-plunger assembly and the three cavities is a plate. This plate is attached to the Veeder dial-plunger assembly by four flat-head screws. Four quarter-inch thick washers at each screw placed under the plate will raise the plate and, in effect, shorten the three plungers by about ¼ inch. If ¼-inch washers are not available, thick nuts will serve just as well. This modification will also raise the frequency range of the receiver. — *Jon Butler, WA4INJ*

WIDE-BAND F.M. RECEIVER — THE EASY WAY

AVAILABILITY of two-way f.m. communications gear for the 50- and 150-Mc. regions has given wide-band f.m. a considerable boost of late. This fixed-frequency equipment is ideal for nets and other routine communications work by amateurs, but to many of us the idea of being stuck on one frequency, especially for receiving, takes most of the fun out of it. W3ZWR, Philadelphia, comes up with a solution to the receiving problem that is so obvious that one wonders why more v.h.f. enthusiasts have not thought of it: the discarded TV set.

A high percentage of retired TV receivers land in the scrap heap because of picture tube trouble, or other failings concerned with the video portion of the set. The sound often is as good as ever. It's a simple matter to retune Channel 2 in most TV tuners so that the low end of the fine tuning range will be 52.5 Mc., the lowest frequency where wide-band f.m. may be used. The tuning range will usually be enough to cover the frequencies normally used by hams for wide-band f.m. in the 50-Mc. band.

This can be carried a step further by converting other channels to 144- or 220-Mc. service. We can't go into details for the countless types of TV tuners now in circulation, but some years ago we did a detailed conversion job on the Standard Coil Tuner, a device found in many makes of receivers. We revamped one for 28, 50, 144 and 220 Mc. This was intended to be used as a converter with a communications receiver, but using it with the TV set's wide-band f.m. sound i.f. is a very simple matter.

Oddly enough, we "just happen to have" some of these July, 1951, issues of *QST* still in stock. They're 50 cents each, postpaid — first come, first served.

Another good bet, suggested by W3ZWR, is the Mallory Inductuner, a continuous-tuning front end used in many TV sets of early vintage. This one may cover 50 through 220 Mc. without modification, plus the f.m. band and all v.h.f. TV channels. If it doesn't quite make the two ham bands at the ends of the tuning range, it should be a simple matter to adjust the oscillator frequency slightly as required. — *Edward P. Tilton, W1HDQ*

SEMICONDUCTOR HEAT-SINK CLAMP

WHEN soldering transistors, diodes or other heat sensitive devices, it is a good practice to clamp the leads of the component with a pair of long-nose pliers or other heat-sink clamping device.

I discovered that a common tie clasp works very well as a heat-sink. Every workbench should have more than one of the clamps, since at least two are necessary when soldering diodes in a voltage doubling circuit or when two diodes are connected in series or parallel. — *J. Allen Selvidge, WØOMG*

REPLACEMENT R.F. AMPLIFIER

SOME time ago, while working on the development of a v.h.f. multiplexing amplifier, I came across a tube which seemed well suited for receiver front-end work. This tube is the 6EH7 and is readily available from most radio parts distributors.

What makes this tube attractive to the amateur is that it is a high-gain, low-noise, remote cutoff pentode, ideal for receiver front-end use, and that its voltages are near enough to those of the 6BA6 to allow direct electrical replacement. It is only necessary to construct a small 7 to 9 pin adapter plug.

The adapter plug was built as follows: obtain 7- and 9-pin tube sockets similar to Cinch-Jones types TS102P03 and TS103P03 respectively, and about two feet of reasonably hard, tinned, 18–20 wire. Remove the mounting rings from both sockets and the pin connectors and center lug from the 7-pin socket. Drill through the pin holes in the 7-pin socket with a drill sufficiently large to just pass the selected wire. Connect 7 three-inch pieces of wire to the pins of the 9-pin socket as shown in the table. Slide ½-inch long pieces of spaghetti tubing over each lead to prevent shorting. Form each lead so that it will fit through the proper hole in the 7-pin socket and slide the two sockets as close together as possible. The sockets may be held together by electrical tape or other methods. Cut the protruding leads to a uniform length of approximately ¼ inch and form so the completed assembly will insert into a seven-pin socket. The completed assembly will be approximately 1½ inches high. Being in the receiver front end, the over-all lead length should be kept as short as possible. A further, but not essential refinement, would be to use a small bypass capacitor for the 6EH7 screen connection at the 9-pin socket. The only variation in characteristics which requires compensation is the input grid capacitance. In most instances, the antenna trimmer capacitor will easily compensate for this variation, since there is only a 4-pf. difference.

Pin connections for 9-pin to 7-pin conversion.

9-pin socket	7-pin socket
1 and 3	7
2	1
4	3
5	4
6	NC
7	5
8	6
9	2

In the writer's case this substitution was made in a National NC-183D. At 28 Mc., the noise figure, as measured with a Polytechnic Noise Figure Meter, was 13–15 db. with the 6BA6 and 7-9 db. with the 6EH7. Two 6EH7s, for the first and second r.f. amplifiers, were also tried; however, the increase in gain caused a tendency toward oscillation and very little additional improvement in noise figure. — *Eugene B. Fuller, W2FZJ*

Happenings of the Month

Election Results——Incentive License Filing

License Fees——Examination Procedures

Senate Hearing on Reciprocal Operating

ELECTION RESULTS

At its meeting on September 27–28, the Executive Committee examined nominations for director and vice director in the Atlantic, Canadian, Dakota, Delta, Great Lakes, Midwest, Pacific and Southeastern Divisions. For each of six offices, there was only one lawfully nominated and eligible candidate. **Noel B. Eaton, VE3CJ,** was declared re-elected to his third two-year term as director of the Canadian Division. In the same division, **Colin C. Dumbrille, VE2BK,** begins his second term as vice director. **Charles G. Compton, WØBUO,** was re-elected to a third term as director of the Dakota Division. **Robert W. Denniston, WØNWX,** director of the Midwest Division since 1956, was returned to that office. The Midwest's vice director, **Sumner H. Foster, WØGQ,** also won re-election to a fifth term. In the Pacific Division, **Ronald G. Martin, W6ZF,** was re-elected as vice director, the post he has held since 1958.

The remaining ten offices are contested, especially a six-sided race for the directorship of the Delta Division. Ballots were mailed to full members of the appropriate divisions early in October, based on League records of September 20. The ballots must reach headquarters by noon of November 20 to be valid.

The text of the Executive Committee minutes appears at the end of the department.

INCENTIVE LICENSE FILING

Before the
FEDERAL
COMMUNICATIONS COMMISSION
Washington 25, D. C.

In the Matter of
Amendment of Sections 12.21 (b)
12.23 (c), 12.42 and 12.43 of the
Rules and Regulations in the
Amateur Radio Service.

PETITION FOR RULE AMENDMENTS
AND RULE MAKING

The American Radio Relay League, Incorporated,[1] by its General Counsel, respectfully requests that the Commission (1) issue an order immediately amending Sections 12.21(b), 12.42 and 12.43 of its Rules and Regulations to make the Advanced Class amateur radio operator license available immediately to qualified General and Conditional Class licensees, and (2) institute a rule making proceeding to amend Section 12.23(c) of its Rules and Regulations so as to permit radio-telephone operation on certain high frequency (HF)[2] amateur bands only by Amateur Extra and Advanced Class licensees after certain specified dates.[3]

In support whereof, the following is respectfully submitted:

The Reasons For The Amateur Radio Service

The reasons for the existence of the amateur radio service are succinctly stated as follows in Section 12.0 of the Commission's Rules and Regulations:

"(a) Recognition and enhancement of the value of the amateur service to the public as a voluntary non-commercial communication service, particularly with respect to providing emergency communications.

"(b) Continuation and extension of the amateur's proven ability to contribute to the advancement of the radio art.

"(c) Encouragement and improvement of the amateur radio service through rules which provide for advancing skills in both the communication and technical phases of the art.

"(d) Expansion of the existing reservoir within the amateur radio service of trained operators, technicians, and electronics experts.

"(e) Continuation and extension of the amateur's unique ability to enhance international good will."

It is readily apparent from these basic principles and objectives that amateur radio is far more than a hobby — it is a service. The justification for amateur radio's use of limited and extremely valuable natural resources — the radio frequencies — is in the form of service, both to the public and to the nation. Failure to continue achieving these stated principles and objectives may well bring about loss of amateur frequencies to other services. Loss of even a few frequencies, which already are heavily crowded, would be disastrous to amateurs, not only in the United States but throughout the world.

[1] The purposes and objectives of the League, a nonprofit corporation organized under the laws of the State of Connecticut, are stated in its monthly journal, "*QST*", as follows:

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

[2] By international definition, the high frequency (HF) portion of the spectrum lies between 3,000 and 30,000 kc/s.

[3] The proposed additions and deletions are set forth in Appendix A.

The Immediate Problem

A most significant trend has developed in the last few years which has caused increasing concern to the League as to whether the basic purposes and objectives of the amateur radio service, particularly those relating to technical qualifications and proficiency, as set forth in subparagraphs (b), (c) and (d) of Section 12.0, are being and may continue to be adequately achieved.

This trend has arisen from two developments, the reduction of incentive licensing in 1951, and the more recent development and availability of highly complex and efficient manufactured transmitters, receivers and associated equipment at relatively low cost. Each is discussed more fully below.

In 1951, the Commission, after an extensive rule making proceeding in Docket No. 9295, adopted major changes in the amateur license structure. Both lower-level (Novice and Technician) and higher-level (Amateur Extra) classes were established with commensurate examination requirements. All frequency bands and all modes of operation were made available equally to the Amateur Extra, Advanced, General and Conditional Classes.[4,5] Although special privileges were contemplated by the Commission for the new Amateur Extra Class, none has yet been adopted.[6] Thus, once an amateur has obtained his General or Conditional Class license he no longer has any practical or meaningful incentive to increase his technical knowledge and proficiency and earn a higher grade of license.

The second development contributing to the trend is the development and availability of highly complex and efficient manufactured equipment, particularly single sideband suppressed carrier (SSB) radiotelephone transmitters, receivers and transceivers. The design and construction of many equipments are so excellent and the operation is so simple that it no longer is necessary for an amateur using such equipment to have practical knowledge sufficient to construct his own equipment or to even fully understand the circuitry and theory of operation of the manufactured equipment. As a result, there has been little incentive for many amateurs, once licensed, to increase their technical knowledge and proficiency as contemplated by subsection's (b), (c) and (d) of Section 12.0 of the Commission's Rules.

The officers and directors of the League, as well as a significant percentage of its members, particularly those with some years experience as active amateurs, are genuinely concerned over the future of amateur radio, including continued justification for and continued availability of the frequency bands which are the very backbone of amateur radio. Some of their concerns are reflected in the editorial in "*QST*" for September 1963, a copy of which is attached as Appendix B, and in the article "Two Plus Two Equals Four," by A. Prose Walker, which appears in "*QST*" for October 1963.

[4] The Class A, B and C licenses were replaced in 1951 by the Advanced, General and Conditional Classes, respectively. Because it was contemplated that the General and Advanced Class licensees would progress directly to the Amateur Extra Class, the Advanced Class license was issued only to those who previously had qualified by special examination for the Class A license.

[5] Radiotelephone operation had been permitted previously in the 3.5 and 14 mc/s amateur bands only by holders of Amateur Extra First Class and later Class A licensees. No radiotelephone operation was permitted in the 7 mc/s amateur band. Class B and Class C licenses, the equivalent of the present General and Conditional Classes, were permitted to operate radiotelephony in the 28 mc/s band and in the shared portions of the 1.8 mc/s medium frequency (MF) amateur band. The 21 mc/s amateur band was made available to the amateur service in 1952 as the result of the Atlantic City Convention of 1947, and a portion of the 7 mc/s amateur band was made available for radiotelephony operation in 1953.

[6] A Notice of Inquiry, issued in 1959, is pending before the Commission. (Docket No. 12912)

The Proposed Solution

There is no single, simple answer to the problems confronting amateur radio. A broad approach on a number of courses must be followed simultaneously. These include, but are not limited to, increased technical knowledge, proper adjustment of equipment, and improved operating practices.

A year ago, the League embarked upon a long-range program having as its objectives the more efficient utilization of the amateur bands. This program was initiated by the following resolutions of the Board of Directors:

"RESOLVED, That with the continuing growth in the number of amateurs and the resultant increased crowding of amateur bands, the League considers that proper technical operation of equipment is more vital than ever to continued successful operation and efficient usage of amateur frequency assignments, and that the Headquarters staff, especially the technical and communications departments, are directed to institute a program to bring about a better understanding of technical capabilities and limitations of equipment and of operating techniques.

"RESOLVED that, in view of increasing congestion in our limited frequency assignments caused by the steady growth of the amateur body, The American Radio Relay League urges upon all amateurs a more strict observance of the following principles:

"1. To make proper choice of bands below 30 Mc. appropriate to the distance to be covered.

"2. To achieve equipment flexibility so that an adequate choice of frequency bands and powers for desired communications distances may be available.

"3. To use minimum bandwidth, consistent with good engineering practice and compatible with the mode of transmission being employed.

"4. To expand the use of V.H.F. for local contacts wherever possible, with the ultimate aim of conducting all short-distance communication in this portion of the spectrum.

"5. To use the minimum power necessary for each communication."

The League has already embarked upon some of the steps necessary to effectuate these policies and objectives by — for example — publishing in its monthly journal, "*QST*," a continuing series of articles devoted to a better understanding of radio theory, proper adjustment and operation of modern amateur equipment, and proper operating practices. This educational program is to continue. However, in the League's view, it alone will not provide an adequate remedy for the problems which have been enumerated above.

After extensive study, including open forum discussions in dozens of conventions, hamfests, and club meetings throughout the country and consideration of written comments of several thousands of amateurs, the League's officers and directors unanimously have concluded that the programs already initiated, which are discussed above, are not, in themselves, sufficient to bring about a satisfactory solution, and that a strengthening of the incentive licensing program along the lines followed

so successfully for more than 20 years, up to 1951, is essential. At the Board of Directors meeting on May 3, 1963, the following resolution was unanimously adopted:

"The Board of Directors of the American Radio Relay League, Inc., in a meeting assembled at Hartford, Connecticut, on May 3, 1963, considering that frequencies now assigned and essential to the amateur radio service will continue to be allocated by international conferences and treaties; in further recognition of the growing demand by other services for more frequency space; in the belief that even more efficient utilization of amateur frequencies is essential; after an extensive examination of the technical advances and growth of the United States amateur radio body in the last ten years, after carefully considering the many comments and suggestions from the membership, and after extensive deliberation; hereby establishes the following objectives as one of several major policies of the League to promote the continued existence and growth of amateur radio.

"1. Extension of the existing incentive-licensing structure by re-establishment in the United States of an advanced class of amateur license requiring (a) holding of an amateur license of Conditional or General Class for a period of at least one year immediately preceding application therefor, and (b) a new written examination covering advanced amateur practice as applicable to modern amateur techniques. Further code examinations for then existing Amateur Extra and General and present Advanced Classes of licensees shall not be required. The effective date shall be such as to afford all existing amateurs ample opportunity to qualify for this new class of license.

"2. Assignment of portions of the high frequency (HF) amateur bands as appropriate to the higher grades of licenses.

"3. Modification of the rules concerning the Conditional Class license to limit the term and permit renewal only for handicapped persons, those in military service, or upon a finding by the Federal Communications Commission of genuine hardship.

"4. A complete review and revisions of the present written examinations for various classes of amateur licenses in light of present amateur techniques.

"The Board directs the officers of the League, with the advice of its Executive Committee, to proceed with the implementation of these objectives."

This petition is limited to items 1 and 2 of the Board's resolution. No proposals are submitted concerning item 3, modifications of the rules concerning Conditional Class licenses, because it is understood the Commission already has initiated a study of possible modifications of this class of license.[7] With respect to item 4, the League already has submitted informally certain suggestions for updating examination questions.

The proposed amendments to various rules are set forth in Appendix A. The requested amendments of Sections 12.21(b), 12.42 and 12.43 are intended to make the Advanced Class examinations immediately available to all General and Conditional Class licensees who, at time of examination, have held either a General or Conditional Class license for at least one year immediately prior to the examination. To obtain his Advanced Class license, a General Class licensee would be required only to pass a written examination on advanced radio theory and operation as applicable to modern amateur techniques. An additional code examination would not be required. A Conditional Class licensee would be required to pass all elements required for the General Class, including a Commission-supervised code examination, and the additional element on advanced radio theory and operation.[8] By amending Sections 12.21 (b), 12.42 and 12.43 at an early date by a simple order, which the Commission may do, ample opportunity will be offered to all present General and Conditional Class licensees to obtain the required one year experience and to pass the examination prior to the effective date of any changes in operating privileges. Under the proposed procedures, no amateur, whether he be General, Conditional, or some other class, need lose any privileges if he is willing to make a reasonable effort to qualify. In cases of individual hardship, such as physical disability, age, or military service, the Commission would be urged to grant appropriate waivers upon satisfactory showings of inability to appear for a Commission-supervised examination.

The proposal to make portions of the high frequency (HF) amateur bands available only to Amateur Extra and Advanced Class licensees will take considerable time to implement. Therefore, the League proposes that the program be instituted in steps over a period of at least four years and not become even partially effective until at least one year after adoption of the amended rule so as to minimize the inconvenience upon individual amateurs. Under the proposed amendment of Section 12.23, every amateur will have approximately two years advance notice that the program is under consideration and, if he confines his voice operation to the 3,500 to 4,000 kc/s band, will have at least four years to obtain an Advanced Class license.

Conclusions

The officers and directors of the League — the elected representatives of more than 80,000 amateurs licensed by this Commission — are gravely concerned over the future of amateur radio. As stated in the editorial of "*QST*" for September 1963 (attached as Appendix B), the warning signs are too numerous to be ignored. Although perhaps unpopular, action by the Commission cannot be postponed without endangering the continued existence of amateur radio. For these reasons, the Commission is urged to act promptly and favorably upon this petition.

Respectfully submitted,

THE AMERICAN RADIO RELAY LEAGUE, INCORPORATED
225 Main Street
Newington 11, Connecticut

By ROBERT M. BOOTH, JR.
1735 DeSales Street, N.W. *Its General Counsel*
Washington 36, D. C.
October 3, 1963

[7] The Commission, by an order released September 13, 1963, amended Section 12.44(c) of its Rules to strengthen the procedures for conducting Conditional Class examinations (FCC 63-813). It is understood that the Commission also is making a spot check survey to determine what additional changes in policies and procedures, if any, may be desirable.

[8] At the present time, the Commission, under Section 12.45(a) of its Rules, may order a Conditional Class licensee ". . . to appear for a Commission-supervised license examination at a location designated by the Commission." Failure to appear or failure to pass the examination will result in cancellation of the license. Thus, all Conditional Class licensees always should be prepared to take the General Class examination on short notice.

APPENDIX A

Proposed Additions and Deletions,
Sections 12.21, 12.23, 12.42 and 12.43 [1]

§ 12.21 Eligibility For License

Persons are eligible to apply for the various classes of amateur operator licenses as follows:

(a) *Amateur extra class.* (No change proposed).

(b) *Advanced class.* [New advanced class amateur operator licenses will not be issued; however, Advanced Class (or Class A) licenses may continue to be renewed as set forth in § 12.27.] *Any citizen of the United States who prior to receipt of his application by the Commission holds and has held for a period of one year or more a valid General Class or Conditional Class amateur operator license.*

(c) *General class.* (No change proposed).

(d) *Conditional class.* (No change proposed).

(e) *Technician class.* (No change proposed).

(f) *Novice class.* (No change proposed).

§ 12.23 Classes and Privileges of Amateur Operator Licenses

(a) *Amateur extra class.* (No change proposed).

(b) *Advanced class.* (No change proposed).

(c) *General and Conditional classes.* All authorized amateur privileges [,] *except radiotelephony after July 1, 1965 in the amateur frequency band 14,000 to 14,350 kc/s, after July 1, 1966 in the amateur frequency bands 7,000 to 7,300 and 21,000 to 21,450 kc/s, and after July 1, 1967 in the amateur frequency band 3,500 to 4,000 kc/s.*

(d) *Technician class.* (No change proposed).

(e) *Novice class.* (No change proposed).

§ 12.42 Examination Elements

Examinations for amateur operator privileges will comprise one or more of the following elements:

Element 1 (A): *Beginners' code test.* (No change proposed).

Element 1 (B): *General code test.* (No change proposed).

Element 1 (C): *Experts' code test.* (No change proposed).

Element 2: *Basic amateur practice.* (No change proposed).

Element 3 (A): *Basic law.* (No change proposed).

Element 3 (B): *General regulations.* (No change proposed).

Element 4 (A): General amateur practice: Advanced radio theory and operation as applicable to modern amateur techniques, including, but not limited to, radiotelephony, radiotelegraphy, antennas and propagation.

Element 4 (B): *Advanced amateur practice.* (No change proposed).

§ 12.43 Examination Requirements:

Applicants for original licenses will be required to pass examinations as follows:

(a) *Amateur extra class.* (No change proposed).

(b) *Advanced class. Elements 1(B), 2, 3(B), and 4(A).*

(c) *General class.* (No change proposed).

(d) *Conditional class.* (No change proposed).

(e) *Technician class.* (No change proposed).

(f) *Novice class.* (No change proposed).

Credit will be given for Element 1(B) to General Class licenses.

[1] Underscoring or italics, except in headings and subheadings, indicate requested additions. Requested deletions are enclosed by brackets.

LICENSE FEE REAFFIRMED

At its meeting September 25, the Federal Communications Commission, by a 5-to-2 vote, denied 17 petitions for rehearing in Docket 14507, including that of the League, and thus reaffirmed its May decision to place license application fees into effect on January 1, 1964. At the same time it made some minor changes and clarifications of the fee schedule; the only one affecting amateurs was to exempt from the fees applications concerning amateur stations for recreation purposes under military auspices ("602 stations"). At press time the text of changes in Part 12 of the FCC rules was not available; we expect to print it in this department next month.

A bill (HR 6697) has been introduced into Congress by Representative Walter E. Rogers (D-Texas) to block the FCC's license fee proposal. In the face of the heavy workload of "must" legislation still facing the Congress, it seems doubtful that the bill can be acted upon before the fees go into effect. Nevertheless, the League's General Counsel has already expressed to Representative Rogers our support for his bill, and our desire to testify at any hearings which may be held on HR 6697. Individual amateurs may of course express their support of the bill to Mr. Rogers and to the representatives from their respective states by letter, special "opinion" telegrams, or our own unique form of expression, the amateur radiogram.

NEW FORM 610

In preparation for automation of its licensing unit, FCC has revised its Form 610 under date of August, 1963. The new forms should be available from FCC offices about November 1, and they must be used for all applications filed after November 30. The new form combines the present Forms 610 and 610-A, and will be used for any type of filing by an amateur — new, renewed, or modified; second-station, military recreation station, club station, operator-only or what have you. We expect to have more complete information next month.

TIGHTER MAIL EXAM PROCEDURES

On its own motion, the Federal Communications Commission has adopted tighter examination procedures for Novice, Technician, and Conditional Class licenses, effective November 1, 1963.[1] Hereafter, examination papers may be requested only from the FCC Licensing Unit, 334 York Street, Gettysburg, Pa., 17325, by either the applicant or the volunteer examiner; the request must show the names of both, with complete permanent addresses and the basis of qualifications of the examiner (as outlined below). The papers will be sent, however, only to the

[1] At press time, the FCC indicated a change in effective date of its order on mail examination procedures to December 1, 1963, and further slight changes in the procedures to be followed, although retaining all the changes shown in this issue. We'll have the rest of the story in the December issue.

examiner, who must return them either completed or unopened within the time prescribed, normally 20 days.

Under the new rules, only one examiner can be used for an examination; he must be a citizen over 21 years of age and must hold an Extra, Advanced, or General Class amateur operator license, or must hold a current radiotelegraph license issued by the Commission or must be currently employed in the service of the United States as the operator of a manually-operated radiotelegraph station. The text of the Commission's Order appears below.

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D. C. 20554

In the Matter of
Amendment of Section 12.44(c) of the Commission's Rules governing examination procedures in the Amateur Radio Service

ORDER

At a session of the Federal Communications Commission held at its offices in Washington, D. C. on the 11th day of September, 1963;

The Commission having under consideration the Amendment of Section 12.44(c) of its rules which sets forth procedures for the supervision of examinations for the Novice, Technician, and Conditional Class Amateur Radio operator licenses; and

IT APPEARING, That it is desirable that the written portion of an examination be supervised by the same volunteer examiner who administers the code test portion of the examination; and

IT FURTHER APPEARING, That a volunteer examiner should be at least twenty-one years of age; and

IT FURTHER APPEARING, That a volunteer examiner should be the holder of an Extra, Advanced, or General Class Amateur radio operator license, or the holder of a Commercial radiotelegraph operator license issued by the Commission, or should be employed in the service of the United States as the operator of a manually operated radiotelegraph station; and

IT FURTHER APPEARING, That it is necessary that the Rules set forth a procedure whereby a volunteer examiner can obtain, supervise, and submit the written portion of an examination; and

IT FURTHER APPEARING, That the rules adopted herein are procedural in nature and hence are not subject to the prior notice provisions of Section 4(a) of the Administrative Procedure Act; and

IT FURTHER APPEARING, That authority for the issuance of the rules herein adopted is contained in Section 4(i) and 303 of the Communications Act of 1934, as amended;

IT IS ORDERED, effective November 1, 1963, That Section 12.44(c) of the Commission's Rules is amended as set forth in the attached Appendix.

FEDERAL COMMUNICATIONS COMMISSION

BEN F. WAPLE
Secretary

APPENDIX

1. Section 12.44(c) is amended to read as follows:

12.44 Manner of Conducting Examinations.

(c) Unless otherwise prescribed by the Commission, an examination for the Conditional, Technician, or Novice Class license will be conducted and supervised by a volunteer examiner selected by the applicant. A volunteer examiner shall be at least 21 years of age and shall be the holder of an Extra, Advanced, or General Class Amateur Radio operator license, or shall hold a Commercial radiotelegraph operator license issued by the Commission, or shall be employed in the service of the United States as the operator of a manually operated radiotelegraph station. The written portion of the examination shall be obtained, supervised, and submitted in accordance with the following procedure:

(1) Necessary examination papers shall be obtained from the Commission's office at Gettysburg, Pennsylvania at the written request of the applicant or the volunteer examiner. The request shall include the names and permanent addresses of the applicant and the examiner, a description of the examiner's qualifications to administer the examination, and, in the case of a request for the Conditional Class license examination, the basis of the applicant's eligibility for such license. Examination papers will be forwarded only to the volunteer examiner.

(2) The volunteer examiner shall be responsible for the proper conduct and necessary supervision of the examination. Administration of the examination shall be in accordance with the instructions included with the examination papers and as prescribed in §§12.47 through 12.50.

(3) The examination papers, either completed or unopened in the event the examination is not taken, shall be returned by the volunteer examiner to the Commission's office at Gettysburg, Pennsylvania within the time prescribed (normally not later than 20 days after the date when the papers are forwarded by the Commission).

RECIPROCAL OPERATING BILL

As we reported briefly last month (page 60), a sudden ray of light has shown on the reciprocal operating bill, S. 920, introduced early this year by Senator Barry Goldwater, K3UIG/K7UGA and 25 others. The last week in August, Senator John O. Pastore, chairman of the communications subcommittee of the Senate Commerce Committee, called Senator Goldwater to say that he could hold a hearing the next Tuesday, September 3, and could the Senator round up some witnesses and appear? Senator Goldwater could indeed, and he was joined at the hearing by ARRL President Hoover, General Counsel Booth, General Manager Huntoon and Director Meyers, who labored Labor Day to prepare their statements.

The League's testimony included statements on the good will to be gained, pointing out that many of the foreign amateurs who might take advantage of the bill are highly influential in their own countries. Evidence was presented to show that the reciprocal operating agreement would make it possible for American amateurs to operate in many more countries than is now possible, and that far greater numbers of American amateurs would be in a position to take advantage of reciprocal agreements abroad than foreign amateurs here. The subject of possible threats to security was thoroughly discussed, including testimony to show that whatever danger there may be from radio espionage already exists and would not be altered by this proposal, since no agent would call attention to himself, and equipment is readily available for any frequency, no questions asked. The history of the present restriction in the Communications Act was put forward, along with evidence of Congress' recent relaxation of non-citizen provisions in other parts of the Act's coverage.

It was the feeling of the League men, and apparently also of the wire services' representatives, that Senator Pastore was favorably impressed, and following adjustment of some minor difficulties caused by the language of the bill, it appears likely his subcommittee will recommend adoption.

NEW YORK CALL LETTER PLATES

New York State amateurs who have not yet obtained call-letter license plates may now apply

(Continued on page 150)

The World Above 50 Mc.

CONDUCTED BY SAM HARRIS,* W1FZJ

THE September V.H.F. QSO Party produced some amazing results on the east coast. K1OOR/1 (King Phillip Amateur Radio Society) set new mountain-top contact records on both 50 Mc. (707) and 144 Mc. (565). Unfortunately, they were only making a practice run and did not have their microwave gear in operation. Their final score totaled around 88,000 for a new high in the September "do" but missed the magic 100,000 plus set by W1MHL in June of 1962.

W1BU, the station of The Rhododendron Swamp V.H.F. Society, operated from their home QTH with single operators on the 50-Mc. and 144-Mc. positions. Helen (W1HOY) topped her previous contact high on 50 Mc. by contacting 442 stations. Only a desultory opening to Florida and VP7CX held the multiplier down to 23. Tobe (K1PYI) single-operating the 144-Mc. position, set a new single-operator contact record with 455 contacts in 19 sections. Frank (W1EHF), assisted by brother Dick (K1AIC), made it 44 in 15 on 220 Mc., 28 in 13 on 432 Mc., and 2 in 1 on each band up to and including 10-kMc. Just passing the long sought-after 1000-contact point the grand total was 78,110 points. Not bad for a 4-operator home station.

The 6220 Club, perennial winners of the September show, operating as W2PEZ/2, turned in their highest September score with 469 in 19 on 50 Mc., 359 in 23 on 144, 53 in 14 on 220, 9 in 5 on 420, and 1 in 1 on 1215 for a 59,210 total. Almost double their 1962 score. W1AJR led Rhode Island with a 7K score fattened considerably by a 23-section multiplier on 144 Mc. While not as good as his 1960 score when 50-Mc. openings were more prevalent, it is more than twice his last two September scores, which gives an idea how conditions were in the east. If you didn't send in your score this time don't forget it after the next party. Nothing like a permanent record of your achievements from year to year to while away the long winter nights.

Moonbounce

The RSVHFS will start 432-Mc. moonbounce transmissions on the 5th of October and will be looking for skeds on this band for the months of October and November. All prospective customers please take note!

144 Mc. & Up.

Just for a change think we'll start this portion of the column with the "Up". Our condolences to Brian, W4OAB, who sez: "May have to seek psychiatric help before I get back on 3500 Mc. Transmitter experiments are sort of semi-concluded. I blew both 416Bs with the flip of one switch last week; have two more tubes but have a fear of throwing that switch." Can't say as we blame you but — be brave — we're with ya! K8HRR has completed his microwave construction after working W8BAX on 5800 Mc. and 10,000 Mc. during July. Ira is planning a field trip with 1296-Mc., 3400-Mc. and 10-kMc. equipment being used. Distance will be approximately 25 miles. Good luck, Ira, but I'm afraid you won't be overloaded with QRM.

432-Mc. activity is slowly coming into its own with thanks directed toward VE2LI who has done a great deal to stir up activity along the east coast on this band. Sez George: "For the past year I have been building equipment for this band and recently erected my 32-element collinear up at 65 feet. I have already started a move to promote activity by sending out a schedule form to a number of 432-Mc. stations. Successful skeds have been kept by me with K2CBA and I raised W1QWJ with a CQ on August 28. Hope to persuade the W1 and W2 gang to turn beams north as I feel sure a few of us can provide a VE2 QSO. I find that when the barometer is high, 30 or over, and then suddenly drops, this is the time to really dig down for those DX signals on 432 Mc. This is exactly what happened with W1QWJ. I also feel that one should not neglect the early morning hours, 0700/0800, as possibilities. May even be better than late evening!" George's nightly effort finally paid off on 432 Mc. on the night of September 18, when he caught a good tropospheric condition. Between 2030 and 2230 EST, VE2LI worked K2GGA, Brewerton, New York; K2CBA, W1BU and K1JIX in Massachusetts and W1UHE and W1AJR in Rhode Island. A 2130 sked with W1HDQ yielded no result, though Ed noted conditions somewhat above normal in a northerly direction during a QSO with K2GRI. George runs up to 250 watts output on 432 Mc., and his *DX* for above mentioned contacts was from 215 to 300 miles.

Among 420-Mc. TV enthusiasts are W9MHP, W9VPN, K9UZW, K4PZT and W7ZRV. Don (W9MHP) sez he is now watching 432 TV with modified u.h.f. G.E. tuner and expects more activity in the fall. W9VPN has a live camera under construction and he, along with K9UZW, is on with *flying-spot-scan TV with good quality pictures.* Doc (K4PZT) comments that he is starting work on a TV station for 420 Mc. and would appreciate hearing from others in his area with similar interests. W7ZRV, Bert, also active on 420-Mc. TV.

S.s.b. is also beginning to appear on 432 Mc. Probably what is the first two-way 432-Mc. s.s.b. contact was made during August between K6HP and K6JC, with very good signals both ways between San Jose and Redwood City. Only slight retuning of either receiver was required, and then only once or twice during the 25-minute QSO. Both Jim and Ken are active on s.s.b. and c.w. on the v.h.f. bands and are looking forward to more s.s.b. action on 432 soon. W6FZA is also now on 432 s.s.b. and is looking for his first two-way contact. Working on gear for 432 Mc. is WA2UDT, who has completed a varactor tripler and 16-element collinear installed at 50 feet. He's now working on a 432-Mc. converter

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

and a 16-element beam for two meters. Bill commented on good conditions on 144 Mc. during August when there were four days of exceptionally good groundwave. Best of these was on the 18th when outstanding signals were heard from W1BXM and W1QXX. At the same time W1LMZ/1 in Maine was also putting a good signal into Plainfield, New Jersey. From Salisbury, North Carolina, K4QIF tells us that August 30 provided him with good tropo to Florida when he worked W4RMU and K4IXC with fair signal reports. W4HHK notes that things have picked up on 432 Mc. since he put his 64-element collinear back up. The band was monitored carefully during August and the automatic transmissions of W5JWL, about 250 miles, were heard on August 23, 24, 25 and 26. His signal varied from 3-1-9 to 4-2-9. Two-way contact was made on August 23, 25. Contacts made with W5RCI and W5JWL on August 23 were the first made by W4HHK without prior arrangements on 144 Mc. As Paul sez: "A real step forward on 432 Mc.!" Nearest of the "regulars" heard by W4HHK on 144 Mc. is about 70 miles away. Old timer in v.h.f. W5UKQ sez that the 432-Mc. equipment is coming along fine with the power supply now being built. W2YPM has been on 432 for three years, runs 100 watts input to a 5894 final using an 18-element long Yagi. So far this year Ed has five states and three call areas on 432 Mc. Out in California W6IEY noted good inversions on 432 Mc. on August 1, 3, 4, 8, 12, 17, 18, 24, 25, 29 to the north. WA9HUV tells us that on getting back on the air after 23 years, he headed straight for 432 Mc. and upon completing the exciter gave out with a short CQ on phone. Who came back? Why W8PT, another old timer v.h.f.er in Benton Harbor, Michigan! "Biggest thrill in 23 years!" sez Norman, and I'll bet it's a good way to keep his interest up on 432 Mc., too. Present 16-element collinear which sits atop a 40' mast will soon give way to a new 64- or perhaps 96-element collinear. K9PAF/9 in Illinois tells us that on September 15 he heard W2BZN and W3SUJ on 220 Mc., A3 from the top of a microwave tower near Antioch, Illinois. K1OOR/1 was also heard but on 144 Mc. "None of these stations came back to our frantic calls." Word received from Tom, WA2BPE sez that he hopes to get a beam up for 220 Mc. and will then be looking for skeds. And — WA9CWZ has his TRC-8 ready to go on 220 Mc., but no antenna as yet. Bill hopes to be on two meters by the time this is read.

If you are at all familiar with the "Two-Meter Standings" box, you can practically tell what's been happening on 144 Mc. by glancing over the box this month. Total states worked are going up and up via aurora, tropo openings, meteor showers, etc., and the boys are in there waiting for the proper conditions "to show" so that each one can up his total. Newcomers are coming to the band, old timers are coming back to the band and the fixed idea in almost everyone's mind is to "get a new state."

From Gorrie, Ontario, VE3AHF sez that he is the most northerly western station active on two meters in that part of Ontario. Sterling has worked several hundred stations, and on the morning of August 27 worked W9JVC and WØLSE, bringing his states-worked on 144 Mc. to 7 states. Plans at the present time call for a 90-foot tower with thirteen-element beam by the 1st of October. Sterling would like to pass the news along that he will be looking for DX contacts late at night and around 7 to 8 DST on good temperature inversion mornings, particularly on a Sunday morning. At Rapid City, South Dakota, WØENC brought his total on 144 Mc. up to 25 by working WØDQY, K8AXU and KØUDZ/Ø all during the month of August. Bob worked WØDQY and KØUDZ/Ø on tropospheric openings, and K8AXU by sked during the Perseids. "Conditions have been good on two meters this month," sez KØJWN. On August 19, Larry heard stations in six states and

2-Meter Standings

W1REZ	32	8	1300	W5BEP	9	3	1000
W1AZK	28	8	1205	W5RDZ	8	5	1375
W1KCS	24	7	1150	W5YYO	7	4	1330
W1AJR	23	7	1130	W5UNH	6	3	1200
W1MMN	22	8	1200				
W1J8M	22	7	1330	W6QSQ	15	5	1390
W1HDQ	22	6	1020	W6NLZ	12	5	2540
W1IZY	20	7	1080	W6DNG	9	5	1040
K1CRQ	19	6	800	W6AJF	6	3	800
W1MEH	18	6	1000	W6ZL	5	3	1400
W1AFO	18	6	920	K6HMS	5	3	1010
K1AFR	17	6	875	K6GTG	4	2	800
				W6MMU	3	2	950
W2CXY	37	8	1360				
W2ORL	37	8	1320	K7HKD	19	6	1330
W2NLY	37	8	1300	W7LHL	10	4	1170
W2BLV	36	8	1020	W7CJM	5	2	870
K2LMG	30	8	1290	W7JIP	4	2	900
K2GQL	35	8	1365	W7JU	4	2	235
W2AZL	29	8	1050				
K2IBJ	27	8	1060	W8PT	39	9	1260
K2CEH	25	8	1200	W8KAY	39	8	1245
W2AMJ	25	6	960	W8SDJ	37	8	1220
W2ALR	24	8	1160	W8IFX	35	8	980
W2RXG	28	8	1200	W8SFG	34	8	1040
W2SMX	23	7	1090	K8AXU	33	9	1275
W2LW1	23	7	1050	W8LOF	32	8	1060
K2HOD	23	7	950	W8GGH	32	8	1180
W2DWJ	23	6	860	W8BAX	32	8	960
W2PAU	23	6	753	W8RMH	32	6	910
W2ESX	21	6	750	W8MVE	31	9	1155
K2KIB	21	5	700	W8NOH	31	8	1090
W2UTH	20	7	880	W8EHW	31	8	860
W2WZR	19	7	1040	W8SVL	30	8	1080
W2RGV	19	8	720	W8EHW	30	8	860
WA2EMA	19	6	1010	W8LPD	29	8	850
WA2PZE	18	6	750	W8WRN	28	8	680
W2RLG	17	6	980	W8DX	26	8	720
K2OEL	16	6	1010	K1CRQ/8	26	8	690
K2JWT	16	6	550	W8ILC	25	8	800
				W8JWV	25	8	940
W3RUE	33	8	1100	W8WNM	25	8	900
W3SGA	31	8	1070	W8GFN	23	8	540
W3TDF	30	8	1125	W8LCY	22	7	680
W3GKP	30	7	1180	W8RLN	21	7	610
W3KCA	28	8	1110	W8GTR	17	7	550
W3BYF	28	8	1070	W8NKM	17	7	550
W3FPH	22	8	1100				
W3LST	22	6	800	W9KLR	41	9	1160
W3LNA	21	7	720	W9WOK	40	9	1170
W3NKM	20	7	730	W9AAG	35	9	1050
W3LZD	20	7	650	W9GAB	34	9	1075
K3HDW	12	6	1015	K9AAJ	33	8	1070
				K9UIE	32	9	980
W4HJQ	39	8	1150	W9REM	31	8	850
W4HHK	37	9	1280	W9ZIH	30	8	830
W4LTU	34	8	1160	W9PRP	28	8	820
W4ZXI	34	8	954	W9LVC	27	8	950
W4WNH	34	9	1050	W9OJI	27	9	910
W4MKJ	34	8	1149	K9SGD	26	8	1100
W4AO	30	8	1120	W9ZHL	25	8	700
W4LVA	26	8	1000	W9BPV	25	7	1030
K4EUS	26	7	1130	W9CUX	24	7	1000
W4EQM	25	8	1040	K9AQF	24	7	900
W4AIB	25	8	900	W9WDD	23	7	900
K4IXC	23	8	1225	W9LF	22	7	825
W4TLV	23	7	1000	W9KPS	22	7	690
W4JC	23	6	725	W9ALU	18	7	800
W4VVE	23	6	724				
W4RMU	21	7	1080	WØBFB	39	9	1350
W4IKZ	20	6	720	WØIHD	31	8	1030
W4OLK	20	6	720	WØLFB	30	7	970
W4LNG	19	7	1080	WØSMJ	29	9	1075
W4RFR	18	9	820	WØQDH	27	9	1300
K4YUX	18	8	830	WØENC	25	6	1225
K4VWH	18	6	590	WØRUF	23	7	900
W4MDA	17	6	757	WØMOX	23	6	1150
				WØIC	22	7	1360
W5RCI	39	9	1280	KØITF	21	6	940
W5FYZ	33	9	1275	WØINI	21	6	830
W5AJQ	32	9	1360	WØTGC	21	7	870
W5JWL	29	7	1150	WØRYG	20	8	925
W5DFU	29	9	1300	WØDQY	20	7	700
W5PZ	28	8	1300	WØJAS	19	7	1130
W5LPG	25	7	1000	WØAZT	18	7	1100
W5KTD	23	8	1200	KØAQJ	16	6	1120
W5SWV	20	5	960	WØIFS	16	6	1100
W5ML	16	6	700				
W5KFU	13	4	1300	VE1CL	8	4	800
W5UGO	13	4	635	VE3DIR	36	9	1330
W5NSC	12	5	1390	VE3AIB	29	8	1340
W5HEZ	12	5	1250	VE3BPR	24	7	950
W5UKQ	12	5	1100	VE3BQN	22	7	790
W5CVW	11	5	1180	VE3AQG	18	8	1300
W5NDE	11	5	620	VE3DER	17	8	1340
K5TQP	11	4	1170	VE3HW	17	7	1350
W5WAX	10	5	735	VE6HO	1	1	915
W5VY	10	3	1200	VE7FJ	2	1	385

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

says that others in his area heard two more than he did. The 25th brought forth stations in Nebraska, and 26th and 27th stations in Kansas, Missouri and Nebraska were heard.

August 23 seems to have been a good date for a number of two-meter enthusiasts. W9GEX worked two Ohio stations and one Indiana station on that day using a Twoer and 5-element beam, and he sez the band was open four hours with signals 5 × 5/7. W9WDD also found it to be a good day when he worked W3RUE in Pennsylvania for a new state. However, it's almost getting to be an old story for Charley as he has worked seven new states between July 2 and August 26 on 144 Mc., bringing his total states worked on two meters up to 23 states. And that was *before* the contest too. (Hope the page will be large enough to make all the changes necessary in next month's boxes!) Charley tells us that on the morning of September 14 there was an aurora which lasted approximately 2½ hours with a total of ten states heard. Most stations were loud and all he heard were on c.w.

After being off two meters for a year and a half, W8MVE got back on the morning of July 4 and was pleasantly surprised to find increased activity in his area (Republic, Ohio). Bob sez that band conditions were normal until August 4 when tropo appeared with stations heard from Western New York running southwest into St. Louis and Kansas. Worked were VE3BPR, K9UIF, WØEMS, W9WDD and WØDQY. Two skeds were held by W8MVE during the Perseids and the first one with K7HKD paid off with a completed contact on August 12. Sked with W5FYZ resulted in complete calls exchanged both ways, but that was it! Grand total now for W8MVE is 31-9-1155.

Out in Michigan, W8EMD has his "North Rhombic" up and working and had his first aurora contacts with it on August 20 and 22, 3s, 8s, 9s and VE3. Second rhombic is under construction. At Ypsilanti, Michigan, K8PBA notes that "Things have changed on two meters during the month of August," when a number of stations beyond what has been the normal 100-mile radius were worked. Had aurora on the 19th and three other nights during the month. At Detroit WN8GQZ noted good conditions on August 26 and 27 when he copied stations in Missouri, Indiana, Illinois and others in the midwest and east. August 27 proved to be "special" for W8ZGW when he worked WØLFE (s.s.b.) for his "first Missouri." K7HKD in Wyoming is now up to 19-6-1330 as a result of working W5UKQ, W5RCI, K8AXU, W8MVE, W9WOK (I've heard tell of him!), W7WVE, W7LHL and W7LEE during the Perseids. W7LHL had skeds which turned out to be quite profitable during the Perseids when he worked K5TQP, K7HKD and K7IDD. Ernie did have bad luck with VE6HO though, never heard even the smallest ping. K7HKD and K4QIF made states #11 and 12 for W5UKQ during the Perseids. At Chester, Virginia, K4EUS had poor luck with his M/S sked with W5UKQ. Some signals heard both ways, but no contact. Sam was portable in Ocean City, Maryland during the last week of August, and heard K2UDA and W2NSD/1 but again no contact.

We finally managed to get a two-meter score from John, K4IXC, who has been supplying a great many Florida contacts to other states needing it. At the first of September score was 23-8-1225, but who can tell what it is now after several auroras and the September V.H.F. Contest. John had m.s. skeds with W1AZK, WAØDZH and managed to work both of these boys, but skeds with W9IFA and W2FVA ended up nil. He would still like skeds with Maine, Vermont, Rhode Island, Maryland, Delaware, Virginia and states west of the Mississippi. If you'd like to try, write to K4IXC, Rt. 2, Box 684P, Melbourne, Florida.

September 22 and 23 produced a number of good aurora signals here in Massachusetts. Farthest state heard and worked from W1BU on 144 Mc. was Indiana, represented by a good signal from W9ZSC. The evening was quite active from about 2300 GMT until 0530 GMT with activity appearing to be greatest around 0300 GMT. Worked in Ohio were W8EHW and W8IFX; West Virginia was represented by K8AXU and W8BKI; Virginia by WA4ISR. Also heard were W8KAY, W4LTU, W8CPA, W8DDO, K8HEG and W4BUZ. W2s were calling W9s (W9TGB, W9ZSC). W3s were calling WØHND.

The same auroral disturbance produced the first 220-Mc. aurora contacts of the season for W1BU. A 144-Mc. contact with K8AXU produced a sked on 220 Mc. which resulted in an immediate contact with 5-5-A signals both ways. If anything the 220-Mc. signals were stronger than those received on 144 Mc. Continual flaying of the band resulted in 3 contacts with W8CSW in Ohio with 5-5-A reports, an

220- and 420-Mc. STANDINGS

220 Mc.

W1AJR	11	4	480
W1AZK	9	3	412
W1BU	14	5	600
W1HDQ	12	5	450
K1JIX	10	3	450
W1OOP	12	4	400
W1RFU	15	5	480
W2AOC	13	5	450
K2AXQ	9	3	240
WA2BAH	4	2	167
K2CBA	13	7	660
K2DIG	4	3	140
W2DWJ	15	5	740
W2DZA	12	5	410
K2DZM	12	5	400
K2ITP	10	5	265
K2ITQ	11	5	285
K2JWT	6	3	244
K2KIB	12	4	300
W2LRJ	10	4	250
W2LWI	12	4	400
W2NTY	12	5	300
K2PPZ	11	4	490
K2QJQ	13	5	540
W2SEU	9	3	225
K2UUR	6	3	210
W3AHQ	4	3	180
W3FEY	11	5	350
K3IUV	8	3	310
W3JYL	8	4	295
W3JZI	4	3	250
W3KKN	10	4	255
W3LCC	10	5	300
W3LZD	15	5	425
W3RUE	10	5	480
W3UJG	13	5	400
W3ZRF	5	4	112
K4TFU	8	4	400
W4TLC	5	1	315
W4UYB	7	5	320
W5AJG	5	2	1050
W5RCI	8	5	700
K6GTG	2	1	240
W6MMU	2	2	225
W6NLZ	3	2	2540
K7ICW	1	1	250
K8AXU	11	5	1050
W8BJG	9	5	475
W8LPD	6	4	480
W8NRM	8	4	390
W8PT	10	5	660
W8SVI	6	4	520
W9JCS	6	2	340
W9JEP	9	4	540
W9OVL	6	3	475
W9UED	4	4	605
W9ZIH	10	5	500
KØDGU	5	3	425
KØITF	6	3	515
KH6UK	1	1	2540
VE3AIB	7	4	450
VE3BPR	3	3	300

420 Mc.

W1AJR	11	4	410
W1BU	10	3	390
W1HDQ	9	3	210
W1MFT	8	3	170
W1OOP	11	3	390
W1QWJ	10	3	230
W1UHE	10	4	430
W2AOD	6	1	290
W2BLV	12	5	360
K2CBA	8	4	220
WA2DTZ	6	3	200
W2DWJ	10	4	196
W2DZA	5	3	130
K2DZM	10	4	390
K2GGA	4	4	383
WA2HQE	8	4	280
K2KIB	4	2	106
W2NTY	3	2	100
W2OTA	10	4	300
K2UUR	9	3	280
W2VCG	9	4	280
K3CLK	9	4	
K3EOF	6	3	250
W3FEY	8	4	296
K3IUV	7	3	310
W3LCC	3	2	
W3RUE	6	4	410
W3UJG	2	4	350
W4HHK	9	4	550
W4VVE	7	4	430
W4TLV	4	2	500
W5AJG	5	1	425
W5HTZ	5	3	440
W5RCI	12	3	660
W5SWV	7	3	525
K6GTG	1	1	180
W7LHL	2	1	180
K8AXU	5	3	660
W8HCC	3	2	355
W8HRC	3	2	350
W8JLQ	6	3	275
W8NRM	3	2	390
W8PT	8	5	400
W8RQI	6	3	270
W8TYY	9	5	580
W8UST	3		25
W9AAG	8	4	525
W9UIF	7	4	275
W9AAJ	7	3	425
W9GAB	9	4	608
W9OJI	6	3	330
KØITF	3	2	158

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

s.s.b./c.w. contact with K2DZM, and a c.w. contact with K2TMB. The s.s.b. signals from K2DZM required some considerable effort to decipher, but once they were tuned in as s.s.b. they were quite readable. The 220-Mc. band was open as far as Ohio from eastern Mass. for over three hours, but nobody was home.

50 Mc.

As expected, August turned out to be the month when 40-Mc. E_s dropped off quite a lot and ground wave had its day. Although a number of stations sent in skip reports, it turns out that a great percentage of these contacts were actually ground wave contact. At Newton, Iowa, WØDRE worked either skip or ground-wave contacts on 15 days during the month, with August 19 being the outstanding contact when he worked WØKGW in Minnesota on Aurora for state #45 on 50 Mc. (When ground wave is mentioned, we mean better than the average ground wave for that particular area.) John sez that although approximately 50 stations are capable of getting on six in his area only about seven stations are active at the present time; that KØVQK and KØWXF are building d.s.b. rigs for 50 Mc.

WAØDZI mentions that conditions were fair to bad during the first part of August, although stations were heard in Nebraska, Missouri, Minnesota, Iowa and the Dakotas at some time during the month. At Wichita, Kansas, the band opened on August 1, 9, and 24 according to KØGIC. The 24th was the best opening when Dot heard 8 states in 5 call areas. WAØFLL at Kansas City, Missouri, noted some E_s on six days during the month with the 24th and 25th bringing in the most stations in 5, 6 and 7 lands. Bob reports that ground wave is on the upswing in his area also. John Anderson, KØFLE at Hastings, Nebraska, sez that ground wave was particularly good at his location on the 22nd when he worked KØZPX and WAØDUI, and that 6s and 7s were worked on the 23rd along with Montana and Florida. Seven days of openings heard by WA9EJA at Clinton, Illinois, and during this time 4s, 5s, 9s, and 0s were heard plus CO2GS. August 25 was ground-wave day for Phil, and as he sez "Ground wave seems to be picking up". "Very good ground wave, but very few band openings," is comment of K9TYH at Evanston. Only openings noted were on August 24 when he talked to K5ZIQ for about 25 minutes. Gerry also notes that several stations in that area are now on 50-Mc. RTTY, including K9EWV, WA9AHX, K9RHC and K9TYH. Anyone needing help to operate that mode can get in touch with either K9EWV or K9TYH.

At Peoria, Illinois, K9ZNU had five days of poor to good E_s and four days of good ground wave during the month of August. (You can see that g.w. is finally catching up on E_s.) Barney sez: "A new tool I find handy in reworking a transmitter or receiver is an old-fashioned button hook. With a little practice one can do almost anything with it in a confined space. My kit now has one at all times." Sounds like a good idea, Barney. Now—who has the button hook?

K9FNB noted that six meters is now very quiet what with few band openings. Sez that the band did open on the 11th to the southeast and that VP7CX was worked with good signal reports both ways.

Don Litwiler, W9MHP sez that E skip has been especially good this past summer and much improved over the last two seasons. Of course the fact that Don nabbed Idaho on July 1 for state #48 might have something to do with this opinion. At Beloit, Wisconsin, another station notes that ground wave is good to fair, although sporadic E has rapidly deteriorated. K9FPM sez he hasn't been very active but has had time to note the above facts. And in Roberts, Wisconsin, K9HBT sez that "Aurora was the way to fly this month," even though he did work E_s on 5 days during the month. Randy notes that aurora occurred on August 6, with VE8BY and WØPHD worked; on the 19th with Missouri, Michigan, Wisconsin, Illinois, Iowa, Minnesota, Massachusetts, Indiana, New York, Kentucky, N.W.T. and Manitoba all being worked. Aurora again on the 20th with 8s and 9s plus VE6MC and on the 22nd with 8s and VE4s. Looks like he was really a busy boy during August.

The aurora sessions of the 19th and 20th were also noted by WA9CWJ at Chicago. From Michigan WA8DZP and W8HFA both noted good skip openings on the 24th when 1s, 2s, 3s and 9s were heard. Skip, W8HFA, sez that 4s and 5s were heard at his QTH all day long. Our one 7-land station reporting this month is K7ICW who reports that "Generally August 1963 50-Mc. conditions were about the same as the last 4 years with a slight increase in the number of stations heard, and with E_s conditions prevailing only on August 13, although a half hour opening did occur on the 25th to Ø land."

Out in La Mesa, California, W6IEY caught openings on 8 days and heard 8 states at various times during the month. "Still some life left on six meters," sez Dick. W5UQR at La Combe, Louisiana, reports that his is now operating six meter s.s.b. on a consistent basis. "S.s.b. activity on six this year during the summer sporadic E has shown a very noticeable increase over that of last year. Equipment for s.s.b. consists of a Heath SB-10 supplying 14-Mc. s.s.b. to a Heath Seneca vastly modified."

In 4 land all agree that there was a good opening on August 24, that E_s is rapidly dropping off and that ground wave is rapidly improving. K4NGD in Alabama; WA4OAB in North Carolina; WA4IRX and K4PZT in Tennessee and W4GVQ in Virginia all have such comments as "Skip very erratic this month"; "6-meter ground wave extended on out beyond the usual 125-mile limit"; "Did not note any band openings after August 24 and few earlier in the month"; "Openings during August rather discouraging although ground wave picked up and improved". From west Florida WA4FIJ reports virtually no six-meter band openings but he is still looking for Idaho and North Dakota.

Ron Toller, WA4FVD also of Florida writes that he has been on 50 Mc. since the end of May 1963. During this period he has worked 39 states with 38 confirmed. Ron plans to be on 2 meters, 220 Mc. and 420 Mc. in the very near future and would like to schedule anyone at anytime on these bands. Report from Paul, WA4FHY, can be retold only in his own words. "I awoke one morning to the smell of my receiver power transformer burning to a crisp. Replacement has not as yet arrived." Our condolences, Paul, and good luck with future transformers.

Delaware and K3KEO come through for that area with practically the same report as others around the country. "Conditions generally poor with a few skip openings, a few good ground-wave evenings and very good aurora on August 19 and 20." S.s.b. is proving to be very effective on 50 Mc. sez Sam. K3DNO and K3PRN in Maryland both report the aurora of August 19. Al (K3DNO) sez that the range extended from 200 miles to the northeast to 800 miles to the northwest. Only signals he copied were high-powered s.s.b. At Forest Heights, Maryland

(*Continued on page 146*)

How's DX?

CONDUCTED BY ROD NEWKIRK,* W9BRD

How:

We see by the papers that Russian scientists are undertaking very serious research into the phenomenon of mental telepathy and other aspects of what we call extrasensory perception. They don't buy the psychic sixth-sense angle, though, preferring to investigate on a more tangible physiological basis what they term "biological radio communication." No big breakthroughs are indicated, but encouragingly successful experiments are claimed.

The "art" of mental telepathy is just about where radio was when young Marconi came along. Plenty of impressive anecdotes and entertaining demonstrations *à la* parlor magic, but little meat to get one's teeth into. Will someone some day perfect an m.t. technique applicable to practical communications usage? Many learned people say it's only a matter of time, and quite a few declare we're right on the verge.

After browsing through some dramatic prose on the subject, like Sherman's *Thoughts Through Space*, and an account of polar explorer Sir Hubert Wilkins's intriguing telepathic experiments of the 1930s (*Strange People* by Frank Edwards), it occurs to us that radio amateurs are in a uniquely advantageous position to probe this strange frontier. What other group has the special privilege of instant and economical long-distance communication between participants in such a venture? (We know there are plenty of hams inclined toward investigation of the unorthodox, because we remember the lively response to a 1951 *QST* article by the mysterious Mme. Evelyn Leigh-Falcon titled *Numerology and Amateur Radio.*)

Golly, *you* may be the Marconi or the Sarnoff of a whole new industrial binge that could culminate in a TV series like "Think Along with Mitch." If you do give it a whirl, fellows, don't forget those "How To —" articles for *QST*. And in time we may be able to offer DXCC diplomas endorsed for m.t., plus a special BPL (Brain Pounders League) listing. *Thimk*, gang, *THIMK*!

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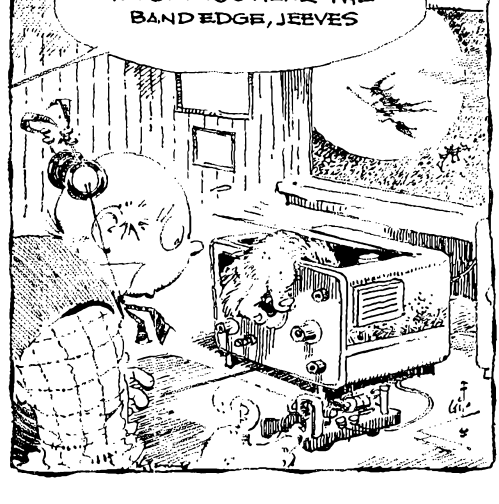
We agree with KØJPL that the certificate-generating crowd must be asleep at the switch. As yet nobody has announced sponsorship of WAZIP — worked all Zip-Codes.

What:

Wonder what effect aurora borealis had on Sir Hubert's m.t. traffic total. Anyway, those shimmering green sky drapes surely put a sag in our DX bands in late September. Up to that time the gang was doing pretty well from 15 through 160 meters. . . . "Forty's hotting up before dark on the east coast." — *K8BFI*. . . . "Things picked up on 15 after a slow summer. South American phones are tempting, but I prefer brass-pounding." — *WA5CVK*. . . . "What a band 40 is! All one needs is a decent receiver." — *W1ECH*. . . . "Abysmal conditions here in August." — *VE7BBB*. . . . "Let's have more overseas stuff in the 21-Mc. Novice range. DX rarely appears above 21,100 kc. on c.w. under present conditions." — *WN9ICQ*. . . . "Not many goodies coming through here on 15." — *K4OGV*. . . . "Lots of 21-Mc. fun QSOing friends in Latin America." — *WA2QMJ*. . . . "Only problem here is getting OM W1WPO away from the receiver long enough for me to work some good ones with our new 14-Mc. beam." — *W1YYM*. . . . "Boy, 20 is crowded lately — just heard four pile-ups on one frequency." — *K9YRA*. . . . "That WAE Test phone session turned out to be bad news for this call area. Nothing less than a kilowatt could penetrate the east coast curtain." — *K9CZY*. . . . "Twenty sometimes opens nicely to Europe and Africa in the afternoons, usually about 2000–2300 GMT." — *WA4CZM*. . . . "Twenty peaked nicely in early August." — *K3SUP*. . . . "Look for 'em in the mornings on 14 Mc., especially 1100–1400 GMT." — *K9BNF*. . . . "I look forward to week-end DXing but 20 usually drops right into the mud for me." — *W7DJU*. . . . "Forty had a spotty summer but better than a few years ago, with Africa fair, Europe very poor, Oceania fair and Asia poor." — *K5JVF*. . . . "August wasn't too bad, a few new ones here and there, but I managed to miss Gus consistently." — *K8TZX*. . . . "If the Boss would fix his TVI I could work a few KP4s while he watches 'Mister Ed' on Channel Two." — *Jeeves*. (It's not TVI, Jeeves, it's *SKI*. You pound that straight key like you're killing spiders.) We think this is a fair consensus of what's been going on. Let's get more specific with a look at

40 c.w., where **Ws** 1ECH 6YKS 7DJU 9NN, **Ks** 2UKQ 3CNN 4MYO 5JTP 5JVF 6SXX/4 6TZX 7SEN 8BFI/4 9ZPG, **WAs** 2KSD 2PXI 5AER 5CVK 6USU 6VAT, **WB6s** CEG DEJ, 1IER, **VE7BBB** and **KL7**FAG have a gay time with **CEs** 1EK 6EZ (7004 *kc.*) 0600 *GMT*, **CO2**FA, **CT1**DJ (22) 7, **CX1s** AAC (1) 6, FB (23) 11, **DMs** 2BTO 3JBM 3MSF 3YCJ 4PL, **FG7**XB (78), **FY7**YK (10) 10, **HAs** 5KDP 8WD, **HC1s** DC (23) 10, LE, **HI8s** LC (10) 5, NPI, plenty of HKs, **HL9**KH (5) 9, **HP1**IE (7) 2, **JAs** 1AEA 1BTG 1BZT 1CFG 1CJU 1CVD 1DH 1EQM 1EZM 1FCQ 1FNA 1FNR 1GBC 1HXX 1ILC 1ISU 1JCA 1JEA 1JEJ 1JRZ 1KVG 1LCS 1LPZ 1LVF 1LWI 1LYZ 1MML 1ON 1VX 1XS 1YDD 2AGP 2BGH 2BVS 2CEZ 2UJ 3BHO 3BYQ 3CAF 3DDG 3DDQ 3DXU 3EGF 3ELF 3FFD 3FIP 3YBQ 5TX 6ASL 6BEE 7ACP 7ARZ 7BDW 7BVA 7OR 7XF 8AGE 8AGU 8FO 0AIC 0RC, **KC6**BO (1) 9, **KV4**CI, a sprinkling of KZ5s, LZ1KEZ (6) 11, some LUs, **OA4**NQN (13) 5, **SM2**BJI, several SPs, one TA2NY, **UA1**KAE of Antarctica, **UA0s** FF (22) 9, KCC LH, **UB5s** KED TR, **UC2**AR (2) 4, **UH8**AE (30) 2–3, **UP2**DK, **UT5**HI, **UW0**FI, VE8s DX (2) 5, RH (1) 5, three dozen VKs, **VPs** ITA (1) 8, 2MM (9) 3, W4VCA/**KH6** (5) 7, **WP4**BOJ, XEs 1JH



* 7852-B West Lawrence Ave., Chicago 31, Ill., 60656.

(2) 5, 2DX (92) 6, 2FJ (13) 5, 2SS, YO5LP, a few YUs, quite a few YVs, ZLs 1QW 1TB 2GH 3IS (18) 9, 3KN, ZSs 1A (3) 6, 2MI (9) 6 of Marion isle, 2RM 6DF, 4X4SE and 5N2ACB (1) 2. Say, where are the 7-Mc. phone reports hiding?

80 c.w., still overdue for a DX boom, supplied **W7DJU**, K9ZPG and **WB6AZI** with things like JAs 1ON 3CIV 7LK, VKs 2DO 3DQ 5TC 5XK, ZLs 1AXB 1AXX 1GG 1TB 1WW 3VI (12) 13 and a few Europeans, while WA5CVK opened the 75-phone season with an XE1DDT two-way.

15 phone reached a low point as autumn moved in, but WAs 2KIZ 2QMJ 2YHA 5AER and XE1RM got through to CE2BJ, KP4s ATU BAL BKP BKW BOD, PY7EC, TG9ED, VPs 2SY 2GAJ 5RG 6LX 7NB, XE1IW and 6YAAH. The North Atlantic path temporarily went thattaway, and Europeans have become almost as scarce on 21 Mc. as they are on 28. The day shift should be reasonably productive this fall, so let's hang on!

15 c.w., even with its many-db. advantage over voice modes, could only treat Ks 2UKQ 4OGV 6SXX/4, WAs 2QMJ 5CVK ØBMW and **WB2BEV** to such modest fare as CM2PP, F8JD, HI8LC, HKs 3VV 7ANV 7YC 7ZT, JA1MHL/mm, KZ5s AWN EHN FZ KCN RZ, LUs 2AO 8DBX, OA4s NPF NQN PF, OE3OT, PYs 2HT 3AZ 5ASN, PZ1AH, TG9FA, TI2s FP LA, VK2AGH, VR2EH, XE1AX, ZK1BV, 4X4ON and 9Q5TJ. We'd even settle for a handful of G3s, but European openings remain few and feeble.

15 Novice reports are on hand from WNs 4MHU 9IHF and 9ICQ who stretched their luck for CE1EK, DJ6HN, HK3HY, HP1AC, KH6UL, KZ5s AWN EHN KCN, LA2MA/mm, LU9DAS, TG9FA, PYs 1CBW 1MCC 1OI 2AWU 3AY 3AZ, PZ1CL, XE2HN, YVs 4GW 4HS 5APF 5BCG, WN5GYL/mm, WP4s BKS BNL BNR BNT BOJ and BOR. The way some of those Caribbean "mm" signals bounce in on an otherwise dead band would lead one to think that islands down there are in the wrong places.

20 phone can be a delight or a disappointment, all depending on what mood you catch it in. W4NJF, Ks 3CNN 3SLP 5JTP 9BNF 9CZV 9IYK, WAs 2KIZ 2KSD 2QMJ 4CZM 6VAT, **WB2BEV**, VE7BBB, KL7FAG and XE1RM account for CE1s DD FX, EL2E, ET3PT, HC1JF*, HI8XJC (340), K5WRD/KP4, KB6EPQ (305), KGs 1FR (340), KG4s BH* CY*, KP4HQ/mm*, KZ5s AX* EM*, LX1DE, OK2KAU, PZ1s AX (333), CE 1–2, TF2WID, TG9BM*, VPs 2MM 2SY* 5LA*, XEs 1FFU 1RM JUE* 2ZS* 3JG*, YS1s IM O, ZL1QW*, 4X4LC, 5A3TV*, 5N2JKO, 5T5AD (213), 5X5IU, 9Q5US and 9X5US, the asterisks indicating non-s.s.b. employers.

RSGB 21/28-Mc. TELEPHONY CONTEST

November 16-17, 1963

Radio amateurs throughout the world are invited to participate in the annual RSGB 21/28-Mc. Telephony Contest starting at 0700 GMT November 16, and ending at 1900 GMT November 17, 1963. Only one contact on each band is permitted, although duplicate contacts must be logged and clearly marked as duplicates without claim for points. Cross-band contacts are not permitted. The exchange consists of a report followed by a three-figure serial number beginning at 001. Overseas stations work G, GB, GC, GD, GI, GM and GW stations. Entries must be submitted only on one side of paper, ruled and headed with the following information: date and GMT time, call of station worked, exchange sent, exchange received, bonus points, and points claimed. Each completed contact with a British Isles station will score 5 points. In addition, a bonus of 50 points may be claimed for the *first* contact with each British Isles country-numeral prefix on each band, *i.e.* G2, G3, G4, GB, GC2, GC3, etc. A further 50 bonus points will be scored for every 10 stations in each of the above categories, regardless of band. A signed declaration showing maximum power input should be included with the entry. It should also state that the station was operated in accordance with the rules and the spirit of the contest and that the decision of the Council of the RSGB shall be final in all cases of dispute. Closing date for entries is December 2, 1963. They must be addressed to the Contest Committee, RSGB, 28 Little Russell Street, London W.C. 1, England.

VE8CL, 250 miles north of the Arctic Circle on Victoria Island, has a familiar voice on 20 meters with 700 watts and a three-element rotary. Len is a Canadian of Chinese extraction, and this fancy igloo is furnished by his employer, Federal Electric Corporation.

20 c.w., where DX quality and quantity still abound despite the sunspot scarcity, finds Ws 1YNE 1YMM 7DJU ØFPX/7, Ks 2UKQ 3CNN 3SLP 4MYO 6SXX/4 6TZX 6YKS 7KTE 7SEN 9BNF 9CZV 9FXW 9YRA ØJPL, WAs 2KIZ 2KSD 2MNQ 2QMJ 2YHA 2YYJ 4CZM 5AER 6OJM 6VAT ØBMW ØBOP, WBs 2BEV 6DEJ, G3JUL, I1ER, and VE7BBB dealing with AP2AR, BV1s USA (55) 15, USC 5–6, CEs 2DI 3DG ØZF, CO2BB (28) 23-0, CM2WP, CN8s FN GB (20) 0, CN2AQ (50) 1, CP5EZ (5) 1, CRs 6BX (20) 22, 6DX 9AH (50) 23, CT1AU (70) 22, ELs 2E 8AF (120) 20, ET3s PT USA, F9UC/FC, FG7s XC XK, FY7s YF 1, YJ, GB3GY of England, GC3s HFE IFB 0, HAs 1KSA 6NI 7KPF 7PZ ØHN, HI8LC, HKØAI, HL9s KH 11, KM (42) 20, HM1AB (39) 7, HP1IE, taboo HS1L (24) 13–14, HZ1AB (70) 19, numerous JAs, JT1s CA 18, KAA, KA2KS, KC6s BK BO (10) 12, KGs 4AM (30), 4AN 6AAY (20) 8, 6SA (49) 7, KM6BI, KP6AZ, KRs 6GA (40) 16, 8AG, KV4AA (81) 20, KX6BK, LZ1s CR FO GX, OA4s CG (20), PF, OEs 1KRÜ 3GHW, PZ1BO, SL6BH, SM2BJI, TF2s WHT (10) 18, WID WIG (15) 1, TGs 5FJ 18, 9AD (3) 4, TI2WR, TU2AU (60) 0, UA1KAE of Mirny base, UAs 9EG 9KTE ØIP ØKFG (19) 8, ØKFS ØMF 17, ØMX (15) 7, ØPI, UB5s FG KIJ 21, UF6s AU KPA, UO5PK, UP2s AL NK, UQ2s GM (41) 14, KCA, UR2s DW FR, UV3TG (10) 15, UWØIP, YO1BA, VE3s BFO/VE8 BGV/SU (20) 22, VPs 2AV 2MM 5BB 5NK 23, 6LJ 7NQ 5, 7NS 7NT (10) 3, 8GQ 9BO 9FC, VQs 2AB 4AQ (28) 20, 4IQ (20) 22, VRs 2DK 2EH 3E (28) 17, VS9MB (60) 18 of the Maldives, Ws 2PCJ/KJ6 0, 4WQQ/VP9, XEs 1AZ 1FE 1NY 2EM 2FO, YN3KM (60) 22, YOs 2IS 3FD 3FF 8AP, YS1O, ZB1s BX CR, ZDs 6OL (50–90) 15–19, 8HB (1) 21, ZE8JW (50) 19, ZK1AA, ZL4JF of the Campbells, ZM6AB, 4X4s FU LC MR (30) 21, 5As 1TW 3CJ, 5B4s CZ (2) 22, FF, 5N2s ACB JKO, 5X5IU, 6O1s MT (60) 20, ND (5) 22, 6W8AC, 9G1s EW (105) 23, GN (105) 23, 9M2UF and 9Q5TJ. We have increasing mailbag mentions of non-amateur interference noted on 20 meters, and we refer you to pp. 64–65 of September *QST* for a summation of the situation.

160 c.w.'s fall-winter DX season got off to an emphatic start, according to W1BB's observations. Even before summer static tapered off, Stew hooked up with 5N2JKO for his 79th 1.8-Mc. country on September 1. G3s GRL IGW MYI OQT OUV PQA RAU, GI6TK, DL1FF, HR3HH and VP8GQ were pouring 160-meter r.f. into the States on one or both of September's first two week ends. Some of the big guns on our side were fired by Ws 1BHQ 1TX 2GGL 2IU 2KHT 2KQT 3ASW, VEs 1ZZ 2UQ 3AGX and 3EWY. Don't forget that things are different this season. Better study the 160-meter area allocations and power input table appearing on page 60, July 1963 *QST*, to ascertain what operating conditions are legal at your QTH. Good 1.8-Mc. fishin' to you, and let us know how you're making out!

Where:

AFRICA — "I act as QSL manager for 9G1s EO EW EX and GN," states VE4OX, who also mans the Manitoba branch of the ARRL QSL Bureau. "S.a.s.e. [self-addressed stamped envelopes] get direct reply, others going out via bureau." WA2MNQ adds that Ghana Amateur Radio Society, P.O. Box 3773, Accra, can relay QSLs to any

legitimate 9G1 . . . . Through ARRL Assistant Secretary W1ECH, ZS1AW remarks, "Rob Johnson is the ninth person to hold the call ZD9AM. He will return to South Africa in April, 1964, at which time he will collect all cards and send his QSLs in return. If you are waiting for his card, please be patient till then." Okay, but it won't be easy. ZS1AW, by the way, is the SARL bureau proprietor . . . . "*I have made* arrangements with ZD8WF to act as his QSL manager," documents W3PN. "Needless to say, s.a.s.e. and exclusive use of Greenwich Mean Time will be appreciated." . . . . W3HNK confirms that he's Stateside QSL representative for ZE4JS . . . . G3JUL pens, "ZD6QL's prime aim is to have as many QSOs as possible and to dispense QSLs to those in need. He will therefore be very active in contests. QSLs will be answered by me, direct or via bureaus, and my address *is okay in the Book*." . . . . EA1FL knows naught about EAs 1FL/ø and øFL, according to NCDXC's *DXer* . . . . W4ECI, still busy with W4BPD's QSLs for various rare operations, tells FDXC's *DX Report* how he manages this mammoth task: "We find it necessary, as soon as a log is received, to immediately make out a QSL for each QSO listed. After this, W/K cards are indexed alphabetically by call areas. Then we start *stuffing the self-addressed stamped envelopes*. A large percentage of the fellows send just one s.a.s.e. with several QSLs for different 'Gus' locations. This causes a serious delay in replying because more than likely we still lack some logs and have to hold off mailing. Please send a separate s.a.s.e. with each card."

ASIA — Signing up as QSL aide for DX stations sometimes leads to frustrations. W5VSQ writes, "As of now I must resign as QSL manager for 4X4DH. No logs or info of any kind received, nor answers to my many letters. Self-addressed envelopes are on file, QSLs have been forwarded to Bruno, and I hope the boys have better luck." . . . . And then there is the chap who accepts duplicated QSL assistance from more than one volunteer. WB2FMK writes, "EP2DM has accepted my offer to act as his QSL manager. I have cards ordered and, as soon as they are ready and Javad sends me his logs, I'll be in business. W/Ks should send s.a.s.e., all others s.a.e. with IRCs [International Reply Coupons] for direct reply." W2IPB was listed as EP2DM's Stateside QSL representative here last month, so we'll see who receives Javad's logs . . . . K4OGV reports arrival of JA1MHL/mm's QSL via K4RSY.

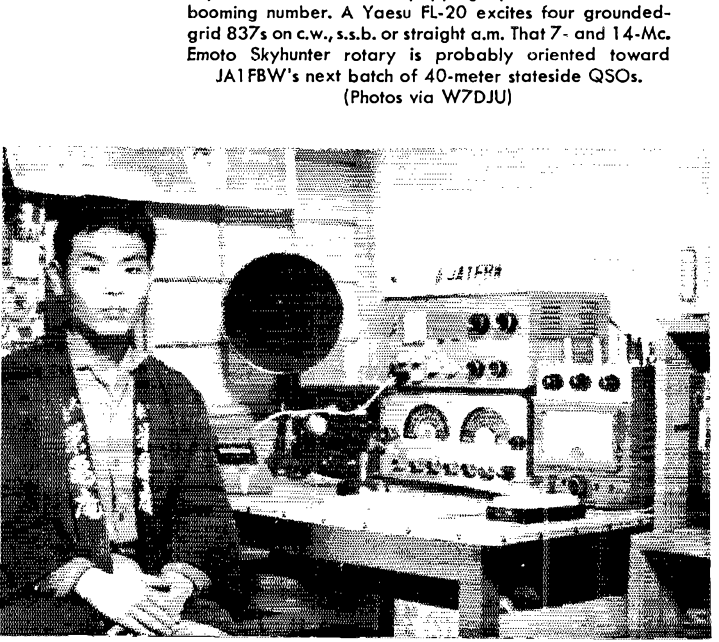
OCEANIA — "Please note that I've closed the books on my VR4CV QSL managership," writes K6EC. "Cards have been shipped, and logs returned to Alan." Ex-VR4CV's Aussie address appears in the roster to follow . . . . K6ERV advises KøJPL to apply direct to VR2BZ regarding VR2BZ/1 confirmations . . . . According to NCDXC, another flurry of CR8AC QSLs went around in August . . . . The Willis work of VK4s HG and WV is confirmed through VK2AGH, notes FDXC's *Florida DX Report* . . . . VE7BBB congratulates VK3RJ on three decades of Victoria WIA QSL Bureau managership . . . . WA6QVR's brief summer stopover at KJ6BZ netted 14-Mc. c.w. hounds some 800 rare Johnston QSLs, all dispensed in August or September.

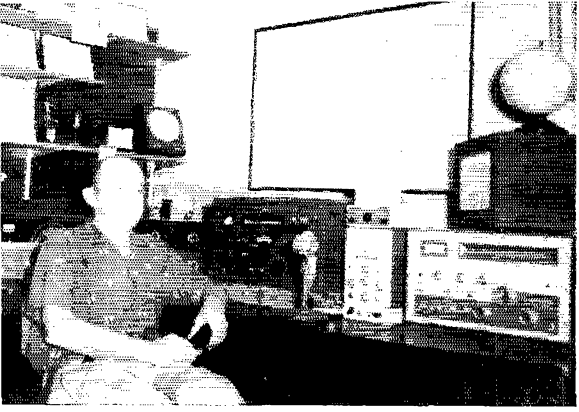
EUROPE — W7FTU/5 recapitulates, "I held the call SVøWZ from September, 1959, till April of this year, and collected about 8000 QSOs with 154 countries. I'm now back on the air in San Antonio, and if any of the gang still need my Crete QSLs they can reach me through my W7FTU address, ISWL, RSGB or 5819 Stonybrook Dr., San Antonio 78242. I expect to remain here for at least a year. Then, if I don't retire, I may try another overseas spot. By the way, the call SVøWZ now is held by another chap in, I believe, Athens."

SOUTH AMERICA — "As of August 8, 1963, I have accepted the job of QSL manager for PZ1CE," declares W1NTH. "S.a.s.e. is a must, and adherence to GMT will speed delivery." K9IYK learns from PZ1CE that PZ1AD is an unauthorized call . . . . WA5CVK's QSL chores in behalf of LU2JV deal only with QSOs made after August 1, 1963 . . . . Ex-VP4NC, now VE3FPF, offers, "Have plenty of old Trinidad QSLs in stock and *I'll* be glad to supply replacements for those lost or strayed." . . . . NCDXC reports recent receipt of VP8AI QSLs for 1959 contacts — *never* give up! . . . . WGDXC's *Bulletin* has it that QSOs for PY1BCR Trindade work in July and August of this year can be confirmed through Box 58, Rio de Janeiro, Brazil. Last year's Trindade contacts by PY1BCR may be QSLd through PY1CK, Box 1044, Rio de Janeiro. The latter address also is recommended for inquiries concerning QSLs for PY1CK/ø (Fernando da Noronha) and PYøNA (Trindade) 1959 activities.

HEREABOUTS — "QSLers of the Month" this month include CEIs DD FX, DU1OR, EP2RV, GM3BLJ, HA5KFR, HC1JF, HI8MMN, HK3RQ, HL9KH, HZ1AB, JA1CUM, KC6BK, KG6IJ, M1QJ, OA4FI, PX1IK, PZ1BD, SP8s MJ YA, TF2WID, TG9s AD BM, UAs 1KBW øBP, VK2APK, VPs 1TA 2MV, YV5s BGG BTK, ZS2MI, 5U7AC, 9A1TAI and 9M2UF. Those colleagues are commended by Ws 5VSQ øEPX/7, Ks 3CNN 4MYO 5JTP 7KTE 7PIG 9AVQ 9BNF 9CZV øJPL, WAs 4CZM 6USU 8AJZ 8GTK øBMW, KL7FAG and VE7BBB, for especially prompt pasteboards confirming recent QSOs. QSL managers W2CTN, KøBLT and ZS1OU also are mentioned favorably in dispatches. Any DX stations in *your* log lately who deserve printed backpats in this listing? Ship their calls Jeevesward . . . . W6YKS, K9BNF, WAs 2MNQ and 6QJM offer their services as QSL managers for DX stations in bona-fide need. WA2MNQ would prefer applicants from Asia or Africa . . . . Help! W4NJF wonders where all the Hammarlund DXpedition QSLs are, K7KTE seeks a hint on confirming ZA3OU and 9Q5AB QSOs, K7PIG seeks a push toward HL9TF's pasteboard, and WA2NFY desires data on ex-ZC4AC's whereabouts . . . . "A question crosses my mind after receiving a large batch of QSLs from the bureau," muses W4NJF. "Why is it that I have such a hard time getting confirmations from s.s.b. stations, while c.w. fellows QSL at the drop of a hat? I have a list of '*Non*-QSLers of the Month' if ever needed, and for the most part they are single-sidebanders." We've heard this complaint before. If true, why so? Are c.w. hounds generally more steeped in such long-standing amateur radio traditions as QSLing? . . . . In employing the following postal recommendations, do bear in mind that they are necessarily neither "official", complete nor accurate. Might help you build up your Zip-Code speed, though. . . .

JA1FBW typifies the enthusiastic younger generation of Japanese amateurs now pepping up our DX bands in booming number. A Yaesu FL-20 excites four grounded-grid 837s on c.w., s.s.b. or straight a.m. That 7- and 14-Mc. Emoto Skyhunter rotary is probably oriented toward JA1FBW's next batch of 40-meter stateside QSOs.
(Photos via W7DJU)





YS1O appears to be El Salvador's most active DXer and has amassed an impressive countries total while managing to accommodate hordes of W/K callers. Oscar has a rotary beam hitched to this gear, favors 20 c.w., and does an outstanding job as QSL manager for YS stations. (Photo via K2UYG)

AC7A (via W4ECI)
AC7SQ (to AC5SQ)
AP2AR, A. Rehman, 36 Purana, Paltan, Dacca 2, E. Pakistan
CEØAB (via CE3HL)
CEØZI, to W4QVJ, Box 8045, Jacksonville, Fla., 32211
CN8FW, Box 1622, APO 117, New York, N. Y.
CN8GB (via W2CTN)
CP6EZ, P.O. Box 145, Temuco, Bolivia
ex-DJØIR-DJØIRA-9A1IR (to K7AEJ)
DL1VR/EA8/am (to DL1VR)
EA8DO, A. Martin, Box 215, Tenerife, Canary Islands
EP2DM (via W2IPB or WB2FMK)
ET3USA, S/Sgt G. Crawford, jr., USA ACS, APO 843, New York, N. Y.
FG7XK (via W2CTN)
FY7YF (via W2BXA)
GC2HFD/a (to G2HFD)
HB1ABH/fl (to HB9ABH)
HC1JF, USAID, c/o U.S. Embassy, Quito, Ecuador
HL9KH (via W9VZP)
HS1L (via W7YB)
HZ1AMS, A. Murray-Stone, Hammarlund DXpedition, GPO Box 7388, New York 1, N. Y.
JA1s BRK-HV-HQG-/JB8 (via JA1CRR)
K5WRD/KP4, W. Kunkel, 72nd OMS, Box 132, Ramey AFB, P. R.
KG6IC, APO 815, San Francisco, Calif.
KP4BOD, F. Bou, I-#11 Cereza St., Campo Alegre, Bayamon, P. R. 00619
LX3s AA AB (via W2CTN)
MP4QBF, P. O. Box 73, Doha, Qatar, Arabian Gulf
OA4NQN (via RCP)
OH5s TK/Ø VF/Ø (via SRAL)
ON4QJ/M1 (to ON4QJ)
PJ5s SA SB (via KØGZN)
PY1BCR/PYØ (see preceding text)
PY3AZ, G. da Silva, Box 100, Alegrete, R. S., Brazil
PY7AKW, D. Caminha, Box 1043, Recife, P. E., Brazil
PZ1CE (via W1NTH)
ex-SVØWZ (see preceding text)
TG9FA, J. Arends, Box 115, Guatemala City, Guatemala
TI6CA (to TI6CAL)
UAØSK, Y. Vitkovsky, Irkutsk, Dist. 124, U.S.S.R.
VK9DR (via VK6RU)
VP1TA, P.O. Box 518, Belize, Br. Honduras
ex-VP4NG, Rev. L. Purdy, VE3FPF, 1407 Lochlin Tr., Port Credit, Ont., Canada
VQ2AB (via W6BAF)
VR1H (to VR2EH)
ex-VR4CV, A. Viegas, 250 Lodge, 250 Victoria Parade, E. Melbourne, Vic., Australia
W4VGL/KG6, via C. O., Far East Section, Marcus, APO 94, San Francisco, Calif.
WA6FXO/KP6 (to WA6FXO)
XE1JH, Administration de Correos, #48, D.F., Mexico
YA1AN (via DL3AR)
ZD6OL (via G3JUL)
ZD8HB, GMRD, Box 4187, Patrick AFB, Fla. (or via RSGB)
ZD8WF (via W3PN)
ZD9AM, R. Johnson, P.O. Box 197, Benoni, Tvl., S. Afr.
ZP9AY (via W2CTN)
5B4JW, J. Worral, CASFO Branch Hq., NEAF, BFPO 53, Cyprus
5N2ACB (via W2CTN)
6OIKH (via OE1SJ)
6W8CY, R. Mercier, Box 971, Dakar, Senegal
7X2ZH, E. Bedoucha, 5 rue Burdeau, Algier, Algeria
9G1s EO EX EW GN (via VE4OX)
9G1YL, Mrs. Ruth Kaiser, Box 3247, Kumasi, Ghana
9Q5US, c/o U.S. Embassy, Leopoldville, R. C.
9X5US, Box 28, Kigali, Rwanda

Your benefactors for the preceding glossary are **Ws** 1WPO 1YYM 4QVJ 6YKS 7UVR, **Ks** 2UKQ 3CNN 4MYO 4OGV 5JVF 6EC 6TZX 7KTE 9FXW 9IYK ØJPL, WAs 2KIZ 2MNQ 2NFY 2PXI 2QMJ 4CZM 5CVK 6OJM ØBMW ØBPO, **WB2BEV**, **ON5AX**, **ZS1AW**, DARC's *DX-MB* (DLs 3RK 9PF), DX Club of Puerto Rico *DXer* (KP4RK), Florida DX Club *DX Report* (K4IIF), International Short Wave League *Monitor* (12 Gladwell Rd., London N. 8, England), Newark News Radio Club *Bulletin* (L. Waite, 39 Hannum St., Ballston Spa, N. Y.), North Eastern DX Association *DX Bulletin* (W2DGW, K2UVU), Northern California DX Club *DXer* (WA6TGY), VERON's *DXpress* (PAØs FX LOU VDV WWP) and West Gulf DX Club *DX Bulletin* (W5IGJ). Any fresh "Where" gen in *your* files? Send it along, if you will.

Whence:

OCEANIA — YJ1DL gives us the DX picture at Espiritu Santo: "I've been off the air for a long time due to receiver problems, having worked my way through several old models. Now, thanks to arrangements made through W6TT, I have a new NC-303 and hope to resume daily DX activity. Conditions are quite poor at present, however, and many commercials clutter the 20- and 40-meter bands here. One consolation is the improvement in broadcast reception, KOMA, 1520 kc., has been coming through very nicely, so 160 meters should be producing real DX. At the moment I'm rockbound, 14,088 kc., with a Viking II on straight a.m." . . . . . K8BFI/4 found 7-Mc. VKs breaking through before dusk on the long path as summer closed . . . . . K2UKQ mentions the potent 8-watter of VK3NC on 20 c.w. . . . . WA6QVR tells W1IKE of his recent lively DX stopover at KJ6BZ. "Visiting Johnston Island on temporary duty with the Navy, I found KJ6BZ well stocked with equipment but undermanned. So I thought I'd see if any c.w. boys wanted a shot at KJ6. Had trouble finding a key to use but when I did get on I was clobbered. It was my intention to work just a few stations but I wound up working hundreds. KJ6BZ has since been dismantled due to construction work but I'm sure it will be back on the air later, s.s.b. likely. Near-by KJ6BV works single-sideband occasionally for stateside traffic." . . . . . KC4USP is the alias of KØCSJ while aboard Operation Deepfreeze supply ship USS *Hissem* out of Dunedin, N. Z. Watch for KC4USP on 14,270-kc. s.s.b. . . . . Club sources supply additional pointers from Pacific points: VK4HG, late of Willis isle, has a New Guinea tour upcoming. . . . VR6AC left a host of DX friends when he joined Silent Keys in September. . . . One 5W1AD stirs 'em up around 14,030 kc., 0900 GMT. . . . MacQuarie's VKØDM is popular on 20 c.w. and a.m., 1300–1400 GMT. . . . KC6KR keeps Western Carolines workable, 14,100 kc. at 0700 GMT or so. . . . VK4JQ's 14-Mc. Willis work occurs mostly on week ends, 0600–0730 GMT.

ASIA — HM1AP, via W1s AZK ECH HDQ and K8IUZ, tells us that Korean amateurs now are authorized use of 3500–3545 kc., just in time for the fall 80-meter DX boom. KARL displayed and operated HM9A/p at the September Seoul science fair . . . . . K3CUI notes, in Russia's *Radio*, that UAØs AG BN BP DC EH EK LA RV SK VQ and WC are active on single-sideband in the rarer Siberian regions . . . . . No more jokes about "Worked All Islands" awards, fellows. There *is* such a certification! It's sponsored by Japan's *Denpa-Kagaku* radio magazine. JA1BN can supply detailed WAIA information . . . . . W7DJU regrets that 14-Mc. conditions were so blah during the All-Asia DX test in August. "Got up at 3:00 A.M. local time for this event. Four hours later I had only hooked four JAs, and that was it." . . . . . W1ECH hears that JA6AK and other JAs are scouting for Statesiders on 160 c.w. . . . . Asia items via aforementioned clubs and groups: Restless W4BPD dropped in on AC3PT at the Sikkim royal palace after his heroic 3600-QSO AC5A/AC4 and AC7A binges in September. The Maharaj, impressed by Gus's DXciting activities, has purchased a brand new hamming outfit complete with five-element spinner. . . . UWØIH may close out 20-c.w. Wrangel island work this month. . . . HS1s L P and X, active on 14-Mc. s.s.b., look forward to Thailand's eventual removal from that irksome FCC/ITU Ban List. . . . K4UTE anticipates a two-year Afghanistan assignment beginning in January. . . . VS9AAA & Co.

threatened Kuria Murias *radiation* around this time. . . . UA4IF can assist toward single-sideband QSOs with UH8AY and UJ8KAA who hang around 14,107 kc. at 0200-0300 GMT. . . . HZ1AMS (ex-5N2AMS), who holds credentials as MP4s BEF MAP QBP and TAX, probes JY-land propagation possibilities. . . . WA6IVM has an 80-meter QSL from VS1LP, a 160-meter two-way the next objective. . . . EP2s AB BR DJ and PV, the latter with straight a.m., keep Iran raisable on 20-meter voice. . . . BYs 1CK 1E 1PK and 9SX are 14-Mc. c.w. entries heard from the Chinese mainland. They work only each other, as a rule, but their increasing activity is of interest.

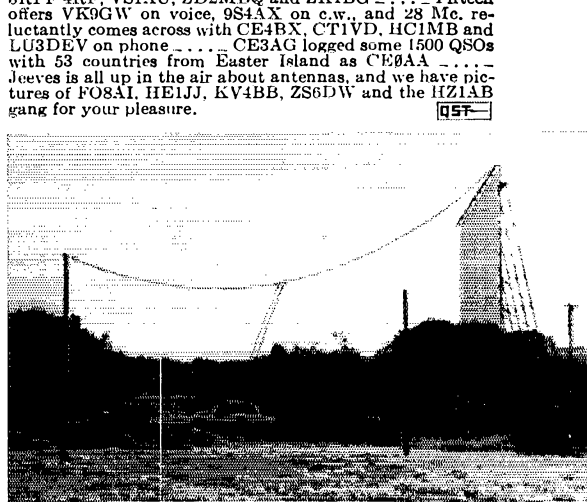
AFRICA — "ZD6OL now has a better QTH at Blantyre and is very active," remarks G3JUL. "Alan had more than a thousand contacts on 40 meters from Zomba. Most of his current operation is on 14,050- and 14,090-kc. c.w. at 1500-1900 GMT, but all DX bands are worked during contests. W/K QSOs are scarce." _ _ _ _ _ EL2U terminated his flying stint with Liberian Air Taxi and is settling down in New Jersey. Joe and missionary EL2V visited pleasantly with WA2KRN in late summer. EL2V should be back in Monrovia by now, active with a Valiant, Mohawk and rhombic, but he expects to be assigned a different call _ _ _ _ _ 5T5AD adds an HX-50 to his Nouakchott layout, according to W4NJF, and will dodge QRM more adroitly on 20 sideband. If you speak French you'll make a hit with Alban. W4NJF also mentions the recent erasure of a marauding leopard and elephant in EL6A's back yard _ _ _ _ _ Other Africa notes noted in the clubs press: FB8ZZ staffers indicate probable DX action by Crozet's FB8WW early next year. . . . Fierce local QRM on Ascension, of all places — ZD8s JB on a.m., HB and WF on c.w. . . . TU2AU (W8HMD), active s.s.b.-wise on 14,100-14,125 and 14,330-14,350 kc. at 2000-2300 GMT, has applied for TY2 XT2 ZD3 5V4 and 7G1 operating papers. _ _ _ _ _ Watch for VQ4I Dec. 9 until 2100 GMT Dec. 11; then 5Z4I or 5Y4I until the 14th. Occasion is Kenya's independence. Special QSLs will be sent. (Per RSEA, VQ4IQ).

EUROPE — You may still have time to catch the c.w. chunk of RSGB's 7-Mc. DX Contest on the 2nd-3rd of this month. Details appeared in October's "How's" _ _ _ _ _ J. Howard of American SWL Club says that HA5DD emcees a Radio Budapest DX program each Tuesday at 2300-2400 GMT, Wednesday at 0200-0330, on the 25-, 30- and 41-meter bands _ _ _ _ _ SP8RW became SP2RW recently, leaving a 116/99 DX tally at the old QTH. This via VE7BBB _ _ _ _ _ K7AEJ's ears are still ringing from his 2000 contacts as 9A1IR earlier this year. After trying his FP8 luck, Don may DXpedite to other North American hot spots _ _ _ _ _ *Boys Life* editor W2GND enjoyed some far-end DX work from SV1SV in August at that gala Boy Scout jamboree _ _ _ _ _ G3NXV and XYL will visit these shores in January. "I should like to meet amateurs interested in the 160-meter transatlantic DX tests and shall be in Florida from about January 16th to 26th." W1BB may be able to supply Bob's itinerary _ _ _ _ _ SV0s WF and WQ are said to be set for an 18-month DX demonstration on Rhodes _ _ _ _ _ W9AC of Hallicrafters tried the juicy DX end at 4U1ITU and HV1CN in late summer, following a U.S.A. visit by I1CNS of HV1CN.

SOUTH AMERICA — "Nice to get home to Ontario again after four years overseas," writes ex-VP4NC. "Miss the DX attraction of that Trinidad prefix, though. The VP4s gave me a nice send-off with a splendid dinner and a beautiful West Indian coffee table gift from members of the South Trinidad Amateur Radio Society. I'll be seeing them from VE3FPF!" _ _ _ _ _ ARRL E. Fla. SCM W4QVJ and Florida DX Club cohorts will be terminating a successful Juan Fernandez CE0ZI multiband, multimode DXpeditionary outburst around the time you read this, if all goes well _ _ _ _ _ KØWGY will sign a CP call on 15 and 20 before long. Paul does broadcast work at such SWBC outlets as CP75, 4985 kc. _ _ _ _ _ WA2s WBH and WUV reportedly eye Easter isle for possible January DXcitement _ _ _ _ _ Saba island is scheduled for activation by KØs GZN and GZO as PJ5s SA and SB in January.

HEREABOUTS — Notes from Old Mexico courtesy VE7BBB and Guadalajara Radio DX Club president A. Romero: XE3s AF EG ES JG and RW work with straight a.m. on 20 meters, and Spanish-fluent *aficianados* have the inside track for QSOs. The first Maine and North Dakota stations to work XE1RM will receive interesting trophies; XE1s FFU and IW promise similar bonuses to initial contacts with Alaska, Del., Hawaii, Me., N. H., Nev., N. C., Vt., W. Va., P. R. and C. Z. XE1s FFU and RM like 14,330-14,350-kc. single-sideband, while XE1IW prefers regular a.m. on 21,350 kc. _ _ _ _ _ FG7XT visited VE2s BCT and PC in August. John's 299 pounds should place him in the running for Biggest Ham honors _ _ _ _ _ WA2QMJ's friend K2JKU just became KP4BOD. No more New Jersey winters for Francisco, thank you _ _ _ _ _ The QRP Amateur Radio Club now numbers 1050 members in fifty countries. WAØBMW, the outfit's DX rep, invites under-100-watt men to ship s.a.s.e. to K4WVX for info _ _ _ _ _ More QRP notes (we mean *real* QRP): W6YKS's two-watt 6K6 final is very readable at ZL2GH on 40. WA2QMJ marvels at the prodigious 15-meter phone signal of KP4BKW's 9-watter, and WB6AZI works ZL3VI on 80 c.w. with an eight-watt crystal oscillator _ _ _ _ _ WA2KSD's fruitful antenna farm, five arrays in all, has a maximum height of 27 feet. "Who says you need 60-foot towers?" Well, depends on what neighborhood clutter one has at ground level, we suppose _ _ _ _ _ W4NJF denounces c.w. QRM in the 14,100-14,200-kc. s.s.b. DX range, and reports the Norfolk area 6-meter DX-tipoff net going great guns. Friend K4ASU returned from a visit to several dozen countries with a high regard for the tactical operating ethics of Stateside DXers _ _ _ _ _ K9YRA says we omitted to point out the real meanings of RST579 and RST599X in our September "How's" quiz. "Thanks for contest QSO," and "I need your QSL bad, OM," respectively _ _ _ _ _ WA6OJM liked VR4CU's method of handling DX pile-ups. Say, you want to hear expert handling of DX pile-ups when the chips are really down? Just monitor the work of shore-to-ship stations WCC, WSL, WNU, KPH, etc., on the 6-, 8- and 12-Mc. marine bands _ _ _ _ _ K5FKD, former sec.-treas. of WGDXC, is making heartening progress toward recovery from paralysis caused by a traffic accident _ _ _ _ _ W3ASK advises that K6HME's continuous 600-c.p.s.-modulated 28.6-Mc. beacon transmitter will keep running till the 16th of this month (see p. 78, October *QST*). Ed and W6MIGI are researching 10-meter propagation as the sunspot minimum approaches. Signal reports are solicited _ _ _ _ _ W3BVL collected DXCPR's All-P. R. sheepskin, a toughie won only by a dozen candidates so far. The club's "8X8X8" award, however, already adorns the walls of dozens of DX men _ _ _ _ _ NCDXC tidbits: W6AM has seven rhombics on his 25-acre plot, the newest diamond being a "Gus special". . . . ZS2CV, VK9XK and HK3RQ are recipients Nos. 58, 59 and 60 of the club's California Award, W6GPB administrator. . . . W6TI's DX bulletin service, W6WX officiating, goes on the air at 0600 GMT, Saturdays, 1600 and 1830 on Sundays _ _ _ _ _ FDXC's radioteletype DXpert, W4RWM, finds DLs 3IR 9EX, HB9KU, HL9KK, HZ1AB, I1RIF, KA8AB, KH6EQ, KM6COY, KR6EB, ON4UB, PAØFB, PY2BCD, SVØWT, VK2EG, VP4RQ, YV1EM, ZL1WB, ZS6UR and 5A2TC active on RTTY, mostly 14 Mc.

Ten Years Ago in "How's DX?" — W1BB's fresh 160-meter WAC gets the spotlight in our opening comments, the first such achievement on record. There's a photo of Stew's historic QSLs from EI9J, EK1AO, HC1JW, KV4AA, ZC4XP and ZL1AH _ _ _ _ _ Twenty phone has a nice assortment in ACs 3SQ 4NC, CRs 5SP 8AA, CS3AC, FD4BD, HZ1AB, JY1XY, KA6IJ, KP6AA, KS4AU, M1B, OQ0DZ, ST2NW, SU1MR, VRs 3C 4AE, VS5AQ, VU5AB, ZC6UNJ and 3A2AM _ _ _ _ _ On 14-Mc. c.w. there are CR5AD, I5FT, MD5RM, MF2AG, OE13USA, OQ5s GU NK, ST2AR, SUIs GB GG MQ SS XZ, TA3AA, VQ1RO, VS2DF, W7IIS/KP6, YI2AM, ZC5VS, ZDs 2G 4BN and 9AA _ _ _ _ _ Forty's select include CEØAA, FK8AO, far-south LUs 3ZO 3ZS 4ZO 5ZO, PK6RN, VKs 1RL of Macquarie, 9YY, VR2s AS CG and ZK1AB _ _ _ _ _ The boys on 80 c.w. hunt down FF8AR, OQ5s AQ VN, VQs 3RFF 4RF, VS1AU, ZD2MBQ and ZK1BG _ _ _ _ _ Fifteen offers VK9GW on voice, 9S4AX on c.w., and 28 Mc. reluctantly comes across with CE4BX, CT1VD, HC1MB and LU3DEV on phone _ _ _ _ _ CE3AG logged some 1500 QSOs with 53 countries from Easter Island as CEØAA _ _ _ _ _ Jeeves is all up in the air about antennas, and we have pictures of FO8AI, HE1JJ, KV4BB, ZS6DW and the HZ1AB gang for your pleasure. QST



ZS2FM drives his mobile outside the welter of urban noises to work the U.S.A. on 160 meters with this rural longwire. Its high end is anchored to an outdoor-movie screen. Mike, with a 6V6 final and 75A-4 receiver tied to this antenna, clicked with W1BB on 1.8 Mc. this July and August. At this location ZS2FM also records 18- and 22-Mc. emissions by the planet Jupiter. When h.f. conditions are slow Mike busies himself with homebuilt gear on frequencies as high as 10,000 Mc. (Photo via W1BB)

CONDUCTED BY JEAN PEACOR,* K1IJV

It Must Have Been the Lace Border

IN 1939, *QST* published a lace bordered article encouraging the women of amateur radio to read a recently published book entitled *Two Hundred Meters and Down*, the story of amateur radio. Part of the ad read: "Goodness knows — and *now* won't tell — how many of you YL key-twitchers there are." Since that time, the YLs *have* been telling!

Sparked by the contents of the article, Ethel Smith, ex-W7FWB and now K4LMB, wrote a letter to the editor asking all YLs to contact her. Her hope was that women radio amateurs would stand up and be counted. As a result, twelve YLs responded to Ethel's plea, and the Young Ladies' Radio League was born in May, 1939. In October, 1939, the first constitution of the YLRL was drawn up, an election of officers held, and Ethel Smith became YLRL's first president.

Within a year YLRL grew to 99 YLs. Each year more and more have joined the ranks, with a peak of 1000 members being reached in 1962.

Many fine women operators have presided as officers of the YLRL during the past twenty-four years. Under their leadership, YLRL has continued to grow and has furthered cooperation among women radio amateurs, developed proficiency in radio operation and furthered the interests of amateur radio.

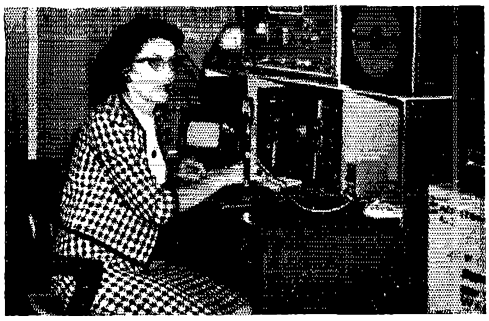
YLRL sponsors a variety of activities. Many popular certificates are offered, including YLCC, WAS-YL, WAC-YL, and DX-YL. For the contest minded, there are the YL Anniversary Party, Howdy Days and the YL/OM contests.

All YLs possessing a valid renewable amateur radio license are eligible for full membership in YLRL. Family membership is available to the second or additional full member of any one family residing at the same address. Associate membership is open to all women who meet the general membership qualifications but are unable to comply with all the requirements specified for full membership. Adopted membership shall be granted to those associate members residing outside the U.S. or Canada who are unable to send money for their dues and are, therefore, "adopted" by YLRL groups or individuals. Women

* YL Editor, *QST*: Please send all news notes to K1IJV's home address: 139 Cooley St., Springfield, Mass.

Louise McDonald, K2IMI, located in Indian Lake, N. Y., is not only the only licensed YL in Hamilton County, N. Y. but believed to be the only ham. An ORS and active traffic handler, Louise operates mostly c.w. on 80, 40 and 20 meters.

ZZZ's don't always portray sleeping—particularly not in the case of XE2ZZZ, a very active 18-year-old YL from Obregon, Mexico. Delia Gutierrez is the daughter of XE2UB and is heard often operating 40-meter c.w. looking for WAS contacts. (Photo courtesy of WA6GNA).



Blanche Randles, K1IZT, present vice president of YLRL, is the newly elected president. First licensed in 1955 as W4GXZ, Blanche was the first secretary of Floridora YLs, is also a past treasurer of Framingham Radio Club and secretary of YLRL, and present certificate custodian for WRONE. A very active worker with both Rainbow Girls and Eastern Star, she still finds time to knit, sew, collect unusual earrings and bells, work part time, and keep house.

holding Novice Class licenses are eligible for associate membership during the term of their Novice License and shall be transferred to full membership upon obtaining a renewable license. Members receive *YL Harmonics* which is published bi-monthly.

YLRL Election Results

Best wishes and congratulations to the newly elected officers of YLRL. They will serve for a one year term commencing January 1, 1964.

Martha Edwards, W6QYL, vice president of Laylarc, is YLRL's new vice president. Licensed in 1953, Martha and her OM, Noel, W6RDQ, have lived in Virginia, operating portable, and in Beirut, Lebanon, where her call was OD5CH. She has served as chairman of the favors committee for the 1st International YLRL Convention, advertising chairman of YLRL, is a life member of Waylarcs, Assoc., member of Baylarc, and the present YLRL 6th District Chairman.

President — K1IZT — Blanche Randles, 62 Linda Avenue, Framingham, Mass.
Vice President — W6QYL — Martha Edwards, 44203 N. Date Ave., Lancaster, Calif.
Secretary — K7MRX — Fran Bailey, Box 3, University Station, Moscow, Idaho
Treasurer — K8MZT — Shirley Rex, 2225 Mt. Vernon N.W., Canton 9, Ohio

New District Chairmen:
K1OLM — Joyce Garlick
WA2GPT — Beatrice Dietz
W3GTC — Carolyn Currens
W4TVT — Claire Bardon
W5ZPD — Cindy Dougharty
W6BDE — Esther Given
K7RAM — Bobbie Wilson
K8LHF — Marion Allen
K9ILK — Fran Yelch
KØWZN — Annabelle Meck
KH6DUM — Hattie Bloomer

Edie McCracken, K1EKO, continues as editor of *YL Harmonics*.

YLRL members extend a vote of thanks for a job well done to the officers for 1963: Pres., Jean Kincheloe, K6OQD; Vice Pres., Blanche Randles, K1IZT; Secretary, Fran Bailey, K7MRX; and Treasurer, Shirley Rex, K8MZT.

Field Day

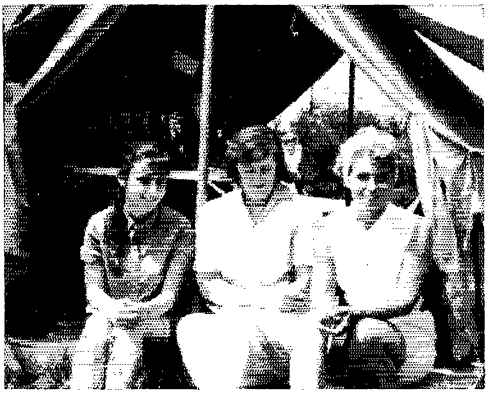
The 31st annual Field Day saw YLs participating from the hilltops of Massachusetts to those of California. No doubt many more YLs were active that June weekend than reports received show. However, to all who took to the fields — Vive le Field Day!

About 25 amateurs camped at a Boy Scout camp site in Chesterfield, Mass., and set up field day operations. Using the call K1OXT, three YLs of the group helped to pile up their score. Lee Bock, KN1ZTC, operated 2 meters, Ruth McConkey, K1QQG, 6 meters, and Doris Young, K1UOR, 80-meter cw.

Eleven enthusiastic YLs from the Los Angeles YL Radio Club operated as W6MWO/6 from the mountain cabin of WA6BNS, Meta Brazell. The usual visions of tents and sleeping bags were forgotten here. Picture instead, a cabin with wall-to-wall glass on one wall, wall-to-wall fireplace on another, and an electric stove! Field Day weekend isn't complete without a little smoke and one transmitter obliged in this regard. Expert trouble shooters were standing by for such an occasion and repaired all damage in thirty minutes (20 minutes was spent repairing the soldering iron — 10 minutes to fix the rig). Running two transmitters simultaneously, the Laylarcs contacted 372 stations, using Class A (up to 30 watts) and Class B (between 30 and 150 watts), and had a total score of 2397.

Also in California, eleven YLs of the Bay

Shirley Rex, K8MZT, has been elected YLRL treasurer for a second term. Known as "Grammer" Shirley on the DX bands, she is a former secretary of Chix on Six. Buckeye Belle #1, certificate custodian for the Worked Ohio Ladies' Award, and secretary to the Red Cross Mutual Aid Net of Ohio and Ohio SSB Emergency Net. She is also serving as general chairman of the International YLRL 25th Anniversary Convention to be held at Columbus, Ohio in June, 1964.



(left) Boy Scout campers? Lee Bock, KN1ZTC; Ruth McConkey, K1QQG; and Doris Young, K1UOR (right) Baylarc YLs waiting for Field Day starting time are (l. to r.) W6ALL, WA6LIZ, WB6ADM, WA6PKP, K6HIW, and W6BDE.

Area YL Amateur Radio Club operated WA6MAO/6 from Junipero Serra Park in San Bruno. Their two rigs produced 325 contacts, using Class A and Class B power, for a total score of 2289 points and a lot of fun for all.

The Colorado YL Amateur Radio Club was well represented by eleven YLs using the call WA0ESM/0. Operating three transmitters, using Class A and B power, they made 326 contacts and a total score 2736. (Scores tabulated by Ellen White, W1YYM.)

Feedback

The Certificate Custodian of the Ohio YL Award (see page 69, June, 1963 *QST*) is Shirley Rex, K8MZT, 2225 Mt. Vernon N.W., Canton 9, Ohio.

Coming Events

YLRL Anniversary Party -- the 24th annual contest for all YLs. Phone section Nov. 6–7. See October column for rules. QST

Strays

Credit where credit is due department: the eastern area office of Red Cross is in Alexandria, not Arlington, Virginia, as mentioned on page 38 of *QST* for October.

—···—

Well, it had to happen. The hootenanny craze has hit ham radio. One of the reports of electronic sing-alongs comes from WA2RDU, who sent along several sets of lyrics. Try this one to the tune of *Ol' MacDonald Had a Farm*, and then write some of your own:

Old MacDonald had a shack, ee ay ee ay oh.
And in this shack he had some VOX, ee ay ee ay oh.
With a cough-cough here, a woof-woof there,
Here a sneeze, there a burp, now and then a chirp-chirp;
Old MacDonald had a shack, ee ay ee ay oh!

And in this shack he had a speaker, ee ay ee ay oh.
With a beep-beep here, a beep-beep there,
Here a beep, there a beep, everywhere a beep-beep,
Woof-woof here, cough-cough there,
Here a sneeze, there a burp, everywhere a chirp-chirp
Old MacDonald had a shack, ee ay ee ay oh!

(Left) WA4BOP/K1ZZS accepts the John Gore Memorial Scholarship from FCC Commissioner Bartley at the Atlantic Division Convention in Washington D.C. The Gore Memorial is a scholarship sponsored by the Foundation for Amateur Radio, Inc. It is named after the late W3PRL, a former president of the Foundation. (Right) The Oscar satellite mock-up is presented to the National Air Museum of the Smithsonian Institution by Oscar Chairman K6LFH. Museum Director Philip S. Hopkins, on the left, accepts.

Correspondence From Members-

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

MORE ON THE ARRL PROGRAM

¶ Congratulations on your fine editorial in September *QST*. I had postponed taking a stand on this issue of incentive licensing because I had the impression that the ARRL was seeing nonexistent problems, and that the license examination changes proposed would work a hardship on many amateurs. However, the reference to the position of amateur radio in the radio conferences, along with the violent and ignorant protests of *QST* correspondents, convinced me that the standards of ham education must be raised if we are to retain our frequency assignments. — *WA2HGB.*

¶ Your editorial is a far cry from the first excuse you had for trying to impose regulations whereas 75% of the hams would either be off the air or tied down so that they probably would quit. When the highways get crowded do you impose much stricter examinations for drivers? You know as well as anyone else that the old time electronic men and the ones that radio comes easy to, would like to have most of the bands to themselves and your proposals will do just that. I always thought the ARRL was representative of all hams and not a special interest group. Even if the majority lose I am glad to have found out the facts so I can stop contributing to their society. When my present subscription expires, I will have had it along with a lot of others . . . — *W4MXG.*

¶ Stop making excuses for promoting incentive licensing as you did in your September editorial. Incentive licensing is a good idea, and should be able to stand on its own merit, with or without the frequency allocation pressures.

There are a few things left in the U.S. which money alone cannot buy. Happiness is one, and a valid amateur license is another. It is unfortunate that running an amateur radio station is more complicated than using a paint-by-numbers set, but that's the way it is, and certain people will have to realize that not everyone is entitled to an amateur license, and with our crowded conditions, not everyone is entitled to full use of the frequency spectrum. — *K9QFL.*

¶ . . . May I suggest that if the League is sincere in the stand which it is taking upon so-called incentive licensing and is truly interested in the amateur as distinguished from the electronic professional, it can prove this by recommending to the FCC that one further requirement be met, namely, that the applicant pass a test to establish his ability to send and receive the code at 25 w.p.m. This requirement would then make it clear that any amateur possessing the "super license" is skilled in all of the phases of amateur radio. . . . — *W6BDZ.*

¶ I feel ARRL goofs occasionally. I think you presented "The Proposal" to us in a less than tactful manner. Many hams feel that their toes have been crushed and yell misrepresentation. Rumors are everywhere, and stem from your proposal.

But alas, I have been waiting for just one ham to tell me that what you propose will do ham radio harm. No, this is not being said! So, perhaps we *have* been misrepresented, but until someone convinces me that this move will do anything but preserve my ticket, I'm for the ARRL proposal, if not ARRL, 100%. For proof, I'm simultaneously mailing my membership application, after spending two years as a non-member. I guess I value my ticket more than my toes. — *K4CBY.*

¶ We are not renewing our memberships this year due to our feeling of disgust with ARRL over the incentive licensing issue. We will miss your magazine. — *K5KNE, W5JBU.*

¶ Why can't the ARRL leave well enough alone? Don't the know-it-all members of the ARRL hierarchy know that some people like things the way they are? If the FCC upgrades their licensing procedure doesn't West Hartford realize some people will actually have to waste their valuable time studying basic theory and relearning what they didn't learn properly, when they could be sitting in the middle of 75 with their KW-plus improving our civilization by rag-chewing in 20-minute bursts without indentification? It's people like the ones at the ARRL who started the American Revolution when most of us were satisfied with paying a tea tax! But as for me, I think I'll save my tea tax money and resubscribe to *QST*. . . . *K4RIN.*

¶ This renewal is for magazine. To hell with your incentive license. — *W15CYI.*

¶ First I want to say that I was against incentive licensing, and since you were apparently so darned fair as to print all the pros and cons, I studied the proposal again, with renewed interest, and in this issue I found that there is a trend to a cooling off and that the whole attitude now seems to be going through a subtle change FOR incentive licensing. I imagine that a lot of hams who went off the deep end, initially, will gradually come back into the fold, without fanfare, and I am glad to be one of them. — *WA2YPW.*

¶ . . . In recent months the ARRL no longer represents the majority of amateur radio operators. By the actions taken without consent or approval of the membership at large, the Board of Directors have become a dictatorial group, and the ends they claim to be reaching for do not justify the means they employ. — *W4AAUR.*

¶ I am opposed to the so-called incentive licensing program and am joining under protest. — *K5YXN.*

¶ . . . Where are the amateurs of yesterday who were willing to dig in, learn, experiment, and build to improve not only the state of the art but also themselves. Certainly not many of the protestors of incentive licensing would qualify. . . . — *W5AFC.*

¶ While I am not yet entirely sure that I agree with your incentive licensing proposals this would certainly be no reason to quit the League. Just because a group of Senators makes a proposal that not everyone agrees with is no reason for a responsible citizen to leave the United States to become a citizen of some foreign country. — *W2REH.*

¶ First of all let me express my objection to the proposals stated regarding the so-called exclusive bands for the select few. I also believe in additional education for the hams, that is if time permits. Some of us are very busy making a living and consider ourselves fortunate that we have our Generals. My proposal is that a band should be created for the higher type license. Let's not take away from the Generals what they already have. It is my opinion that our objections will not count and the Board will go ahead with their proposals regardless.

I cannot see myself belonging to your organization and I fully intend to cancel when my subscription comes due. I just can't go along with the Board's action on this matter. — *K9ZMQ.*

¶ I am renewing my lapsed membership in support of the League's stand on the new license requirements. — *WA2IVB.*

¶ . . . Being a newcomer to amateur radio (6 years) I do not know how it was in the old days, but I do know that at the time I passed the examination it would have been possible and easy to have passed the examination without knowing anything about radio, theory, or regulations. How? Simply purchase a copy of the *License Manual* and memorize it. So, who is to blame for the sad state of affairs at the present time? You done it, so let's see what can be done about it. Yes, many toes will be trod on, and words will be many and heated, but something must be done. — *KØEFL.*

¶ For some years I have been happy with a Conditional Class license. Your proposed changes would mean a loss of a day's pay for another exam, without any benefits. Lately your ideas sound like children playing games. When will it be my turn to spin the bottle? — *K1YOZ.*

¶ . . . When years ago I wanted to operate 20- and 75-meter phone, I had to study for the test, drive 160 miles to San Francisco, stay over night, take the exam and return the next day. During the exam, Casey White, a blind man, from a neighboring town arrived to take the test. I might say that both Casey and I passed, and I can also assure you that neither Casey nor I are in the genius class.

In America, it seems, everything is made so easy for us. In VK or ZL land — you never hear them griping about their regulations. In other words, it is a privilege to be an amateur and what's worth having is worth working for . . . — *W6SHW.*

¶ . . . I as a Conditional Class licensee was much put out by the League's venture into incentive licensing. In fact, I expressed my views rather plainly to other hams that I contacted. I even went as far as cancelling my subscription to *QST* and of course League membership.

But then a funny thing happened. I tried to look at your point of view as an un-biased observer. The fact was plain to see that you people have been right all along. It does not appeal to my intelligence in today's ever-changing world to sit back and ridicule those who are progressive enough to step forward. If the early pioneers of ham radio did what the so-called hams are doing today, we would still be using spark, and driving Model T's . . . — *K1QGC.*

¶ . . . There is no doubt about it. The politicians have been at work. They have tacked two totally unrelated points, incentive licensing and limiting the Conditional license, to a fine program. These two points are in the interest of a few rather than all radio amateurs or League members. The purpose of the license is to assure the licensee has knowledge sufficient for proper operation of a transmitter. It is granted this may change as the art improves and licensing examinations must change also, but incentive licensing does not meet this requirement. Operation in the proposed restrictive bands does not require significantly different basic knowledge . . . — *W9HOT.*

¶ Frankly gentlemen, some of the fantasies currently being entertained by the League gall the hell out of me. It would appear that the League's most learned Board of Directors has deteriorated into a group of senile old cronies who are playing the role of the over-loving grandfather to the hams. It is the belief of myself as well as most of the other amateurs I know, that the League and its directors would have us all back on spark if they thought it wouldn't foment a mass lynching at Hartford.

What I would like to know is who, in the holy name of Hiram P. Maxim, do you think you are? I'll tell you, gentlemen. You are just another bunch of hams, just like me and all the others. The only trouble is that you've developed some mighty distorted ideas about what other hams want. According to your oath of license an amateur should not advocate the overthrow of our peaceful form of government, however it would appear that there is quite a little dictatorship forming in West Hartford. The ARRL once saved ham radio, and the hams have never lived it down. Gentlemen, this is 1963, not 1914. I had never heard of the League until after I got my General and only then from a dissatisfied amateur. The hams of today don't owe you a damned thing . . . — *K5TLG/KZ5MF.*

¶ I am growing increasingly concerned that the ARRL will back down from its stand on incentive licensing due to the surprisingly large number of dissenting "votes." I urge you to stick to your guns. Surely the results will be worth losing a few deadweight amateurs. Maybe the CBers will make room for them. — *W4YOK.*

¶ . . . It's not a matter of principle or anything like that, that people may tell you; it's just a question of whether the operator can stay on the air. Naturally, I'm assuming that all amateurs want all privileges in all bands.

Right now I'd be against it, just by reason of being lazy. I've passed my Novice, and I've studied hard for my General. I hope to take the test this November. Of course, after all that work, I wouldn't want to be told I've been restricted to certain bands.

But when I could pass the higher form of license as recommended by you, I'd be for incentive licensing. The bands would be clearer, and all the other arguments.

It seems the whole issue is whether more hams feel they can pass the exam or whether more hams can't. If they can't, ten to one they'll be against it. If they can, the situation would be reversed . . . — *WN2JQC.*

¶ . . . I don't know how I will make out with "incentive licensing." With three children and a

household to keep going, I find little time for study, and I used the full year that I was a Novice to get my other ticket. But, I'm going to jump right in and try to see if I can learn some more and at the same time, improve my operating practices and just, in general, become a better ham . . . — *K5UKK.*

¶ . . . It seems to me that those amateurs who protest most vigorously the League's proposed incentive licensing plan are those who are afraid that, in order to keep their present privileges, they are going to be forced to go through the unpleasant task of learning what they already should know. — *WA2BWO.*

¶ . . . If I am required to take an examination, and fail it, I shall go out and find someone who has passed it and coach with him until I have it. I feel the amateur fraternity has had many privileges handed him on a silver platter, and now that he may be required to show his qualifications and responsibility for their full enjoyment, feels he is being imposed upon. The few extra hours of study that may be necessary to obtain the extra privileges that attend the incentive licensing system, will pay off in rich dividends. — *W5BQ.*

¶ It is with great pleasure that I renew my membership in the ARRL. In the past months I have heard much about the incentive licenses and the ARRL program. At first I was mad but since then I have done something about it. With the threat of not renewing my Conditional in the near future, I decided to go for my General ticket. Now I feel much better and safer with the General. I have always wanted a General but never had the courage to get it until now. I wish to thank the gang at Headquarters for waking me up and pushing me forward in amateur radio. Let's hope the rest of hams against the program wake up too. — *K1NIJ.*

¶ . . . This may be the last time that we will renew our membership as we are beginning to feel that the organization is becoming somewhat dictatorial, and instead of working in the interests of the members, plans on aiding legislation "against" members. Some of the editorials recently are quite childish, and take the attitude that the membership is a bunch of dumb bunnies — and take it or leave it . . . *KØGZN.*

¶ I definitely am not in sympathy with your nonsense of special privileges and future renewals will depend on what happens in the future. — *W8OH.*

¶ . . . It must be strongly emphasized that no one need lose any privileges if he is willing to take the necessary few hours to bone up on a bit of knowledge that is required to take the examination and pass it. Since we are not advocating an additional code test to the Advanced Class exam, a conscientious amateur operator should not have much difficulty with such an exam if he makes any effort toward understanding the technical aspects of the equipment he is using on the air. I feel that our greatest criticism is coming from those who do not care to extend this effort . . . — *W7KON.*

¶ . . . We elect Directors to represent us, then complain at their decisions! I wonder how many of those who do not agree with ARRL decisions, by the directors, bothered to vote for *their* director in the last election in their area?

I have disagreed with League decisions before, and expect to again, but the over-all actions, in spite of my disagreements, have proven to be well thought out, and have always been in the best interest of amateur radio. If we all agreed on everything, we would all be smoking the same brand of cigarette, driving the same model car, and be married to the same woman, Heaven forbid! — *W1JSH.*

¶ With this second reminder of the expiration of my membership I have decided to express my feelings about your recent proposals.

First, you have said you aim to improve the "amateur as a whole." That is the mark of a socialist who, in my opinion, is simply a gutless commie. Our so-called republic is being swayed by "New Frontiersmen" to improve the "total man" by forcing the individual man to give up his private property rights, free speech, and to support "parasites," foreign and domestic.

Next you are for the money man, not upholding the rights of the little man. You should stand ready to defend the individual's rights at the drop of a hat.

I refuse to support a group that does not uphold my views. So classify this with the rest of the "crackpot" letters and forget about it. I only hope that the League will come to its senses before its too late. I stand by what I believe in and refuse to let self-styled wiser heads do my thinking for me. Go ahead, fools, your road is paved with good intentions. —*WA4HHS.*

¶ . . . If the collective dedication to the constructive aspects of our hobby has so little binding force that we take to shouting intemperately at each other at any fancied infringement of our sacred "rights" then I question our basic "rights" to the immensely valuable portions of the public domain that are the amateur bands.

I hope and believe our fraternal bonds will be a little stronger when we are asked to achieve higher goals. For the citizen who chooses not to join our reduced ranks there is always (as one of your correspondents put it with unconscious irony) the alternative of a subscription to *Playboy* magazine. — *K4VBL.*

¶ It is quite apparent from the correspondence in September *QST* that our amateur ranks are split over the League's view on several important issues, all or most of which were initiated by the ARRL Board. What strikes me is the fact that the issues themselves do not seem as controversial as the fact of the Board making a proposal. Of the proposals, the one on incentive licensing is the only truly controversial one. The others, on improved operating practices, are only steps which would logically be taken by any amateur who takes pride in operating a technically "clean" station. Several letters argued that the Board was dictatorial, and one even made reference to our elected officers when making this charge. This, in my opinion, is as false as calling the government of the United States a monarchy or dictatorship. We must remember that amateur radio is part of an international affair, to which the FCC represents all the radio stations in our country. The League, in turn, is representing (alone, mainly because no other organization of its size exists) amateur radio before the FCC. When frequency space is at such a premium, it must be realized that amateur radio is not really necessary, unless the amateur body can prove itself more than a mere body. I take pride in the amateur license I worked for and in being a member of the ARRL, which wants me to get the most out of that license. — *W9DGL.*

Operating News

F. E. HANDY, W1BDI, Communications Mgr.
ROBERT L. WHITE, W1WPO, DXCC Awards
GEORGE HART, W1NJM, Natl. Emerg. Coordinator
LILLIAN M. SALTER, W1ZJE, Administrative Aide
ELLEN WHITE, W1YYM, Ass't. Comm. Mgr.

Welcome, ARPSC. The new plans for our Amateur Radio Public Service Corps combine the two major success patterns of AREC and NTS and the announcement is, of course, the news of the month. More than 35,000 amateurs are registered in the Emergency Corps with self-dedication to emergency radio objectives. In a dozen years of progress the National Traffic System has tripled the number of net sessions giving state and national coverage. We hope AREC groups (every amateur should be registered with one) will step up the number of meaningful exercises and stress local-net formations. Both divisions of ARPSC keep their identity. We plan *local* NTS net certificates where there's a radio outlet to the higher level NTS nets.

New Tools for the Communicator: Precedences Announced. Consult pages 94 and 96 of October *QST* for those **EMERGENCY, PRIORITY** or **ROUTINE** (precedence) ARRL definitions. These follow the message number. The precedence is to be put on by originators in introducing any message into amateur radio circuits. A precedence becomes part of every message, and as with other parts may not be changed by relaying operators. This new tool (and some optional EX-handling instruction definitions) were fully explained in October *QST*, in the CD bulletin, and from now on will be printed in the back of every ARRL logbook.

How can *you* help support the ARPSC idea and be recognized in the traffic, NTS, or the AREC division? By your AREC registration and some activity as you can fit it in! First may we recommend that to be ready constantly to play a part in any important call for amateur stand-by radio communications in the public interest *every* amateur make himself familiar with amateur message form, as well as these precedences. ECs (AREC) should, this year, put out a call to the nearest and most skilled traffic netters, to give the group, or your club, a talk on the fun and procedures in their specialty, messages and net operating. AREC men and other amateurs seldom seeing a formal piece of traffic, may well draft a message to somebody, making it a routine precedence and after listening to the nearest section net (consult Station Activities or ask for our Net Directory) try reporting in with it. A little traffic from time to time makes you "even more welcome" on a traffic net, you know. This is the most pleasurable way we know to get the know-how of operating efficiently when the chips are down . . . a new and good experience

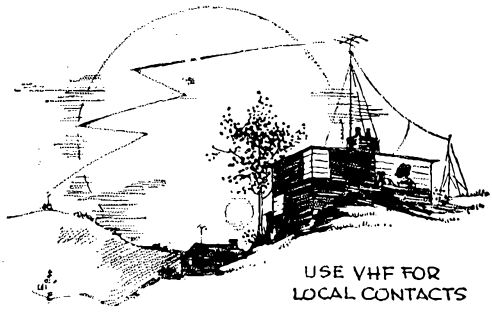
On emergency alerting: in actual emergency we depend on SECs, ECs and Net Managers both to be watchful and to do some conferring with their counterparts in their areas. The aim is to alert as many local and regional nets as needed, and man them as fully as possible. The operations should be stand-by or stepped up to take place at three, six or twelve hour intervals, as may be called for. These leaders may also request or designate pt-to-pt stations and schedules to satisfy expected special hot-line requirements between any two points. "Every net becomes an emergency net" under ARRL disaster plans, given this local implementation.

The San Antonio (Texas) Radio Club and the Six Meter Club of San Antonio combined to furnish communications for a cerebral palsy telethon on Aug. 17–18. At the left is the setup at W5SC, the SARC club station, with (l. to r.) K5IEG, WA5GSW and W5BGE operating on 40, 6 and 80 meters respectively.

Club Membership Potentials. *The South Bay Amateur Radio Society* (Calif.), K6UMC, Pres., has been active in opposition to the FCC license fee. This club has written 53 senators urging passage of bill S-920! *The Coke Center Radio Club* (Pa.) reports in its bulletin that a prime concern in any club is (1) can the club continue to attract new members, and (2) what is being done to increase the tenure of present members and assist them. This club made a survey indicating a potential of 122 amateurs resident in its county. Club projects: support of the CD Net and a *new* Novice group, the latter assisted by K3UKF, a graduate of the club's code and theory course. *The Springfield (Ohio) Amateur Radio Club* in "Q-5" reports having had contests, Field Day, banquets, auctions, programs and bull sessions. Now it has a new projected program, tangible and challenging and in step with these times. Practical means and motivation (points?) will inspire members to hold to highest criteria and operating principles in amateur radio.

Suggestions for a Radio Course Now Available. We're happy to send *any* amateur club, anywhere, our course outline. At this season we suggest setting up a program to help newcomers attain General Class as well as Novice Class FCC amateur licenses. Both code and theory classes are needed. A notice in the local paper or on the school bulletin boards will often bring a surprising registration for such club efforts. Additionally, if you have a group of fellows who can receive their code for practice right in the amateur bands, let us know how many circulars (CD-5-7-9) giving our W1AW schedule of over-the-air practice you would like. Distribute such helping items to your group, once it is in session. There's a form available too, for clubs to report the dates or period proposed for their early fall classes. Let us have such dates for information for any prospective amateurs near you who may ask us for help. With the above ask for our circular CD-158. This reviews in detail, for those who give exams, the FCC code examination *standards* to follow.

"Licensing Classes." For the special purpose of assisting your selected club instructors in teaching both code and theory, ARRL now has on hand brand new revised reprints of Bill Welch's (W1SAD-WA6VTL) book, entitled *Licensing Classes*. This compilation contains sample class questions, gives lists of suggested reference books and identifies the most useful training helps. April 1962 *QST* had an article by Bill that gives some general advice well worth having in this field. However, any club that has begun the serious registration of candidates for a class, and lined up those who will teach, is then invited to get in touch with ARRL for this information. Since there are a limited number of copies, the rule strictly observed will have to be *one book* to a club group when classes are starting



for instruction. Bill's helpful notes are not for sale, nor available to other than bona fide amateur groups that give us full data on plans actually in progress. This publication is available to affiliated and non-affiliated groups alike.

Affiliated club programmers with classes will of course wish to secure some additional bookings that are available under the ARRL Training Aids club program. TA-32 is a list for such clubs of what items we have in the visual and tape listings that are correlated to any FCC exam subjects. Generally speaking, affiliated clubs may book any items the members have not seen. We also mentioned some *new* items in October *QST*. For your regular club members who engage in A-3 (voice) operating, may we urge you to book the new T-6 tape which explains and discusses "How to Run Your Linear."

Thirtieth Sweepstakes! Our first "SS" was held in Jan. '30, its popularity going up with each passing year. The early "SS" lasted two full weeks: you had to write and exchange radiograms in each direction. 'Twas to teach the order of message parts. Without losing the values this has all been streamlined, and takes only week-end time. The test of how well you can operate and how your station gets out moves along at a faster clip today and you will like it.

All U.S. and Canadian operators may take part. For operators seeking WAS this is a chance to polish off those missing states. Half the fun is in meeting old friends and making new ones. To win in one's section calls for skill and a good signal. You must be versatile and use more than one band. If you use low power, you are competing only with stations in the same bracket. Contest rules (in full elsewhere in this *QST*) give us the ability to choose either phone or c.w. for our Sweepstakes week ends, Nov. 9–11 and 16–18. Remember the rule changes for this year. Send the "check" in your exchanges by giving just the last two digits of *the year you were first licensed*. For the "date" spell out the abbreviation for the month and give the date (but not year) of your birth. As you log you can note with interest these facts about the amateur you are working. Reporting forms are sent on request. Don't miss taking part. Best of luck and we'll be looking for your report. —*F. E. H*

Being in favor of public service is in somewhat the same category as being against sin, in favor of motherhood and in favor of upgrading the amateur service. Trouble is that so many of us will go along with all these things provided the methods used to achieve them do not cause us any inconvenience. We *say* we are in favor of good and against evil, but what many of us mean is that we are in favor of what's good *for us* and against what's bad *for us*, and the devil can take the rest.

Note that we say "many," not "all," or even "most." The fact is that most of us are agreed, generally, on methods of achievement, but we need the assistance of the above dissenting "many" to carry them out. Perhaps we can do it without them, but we *know* that we can do it *with* them and a lot faster. Therefore, the fact that the cry "I'm against it" is so often accompanied by the cry "I resign" is a little disturbing.

What's all this resigning, anyway? In the past few months we have instituted some methods, procedures and policies which we knew beforehand would not meet with unanimous approval, but which we felt were (1) the best way to accomplish the desired end, and (2) the way which most of the dedicated public service leaders would go along with. True, we didn't take a vote. Referendum is not a practical way to administer *any* organization. If it were, all we'd need on our Board of Directors and here at headquarters would be some vote-counters, preferably without any opinions or backgrounds of their own. As it is, what you have are people who feel they are doing the jobs they are doing because someone feels they have the experience, the know-how, the judgment and the intelligence to do it well.

Our part in upgrading the amateur service is to enhance its public service performance and image. In our opinion, this is not just an important part, it is *the most* important part. Every amateur who has thought about how best to do it has come up with different ideas on the subject, and many of them have given us the benefit of these ideas. This is progressive, and worth while, and it is appreciated and valued. The ideas are digested, some accepted and some discarded, ideas of our own based on almost fifty years of national experience are added, and a definitive program gradually developed. It isn't easy to come up with something which has a good chance of being both beneficial and popular. On the other hand, there isn't anything sacred about the ARPSC program now being promulgated. Very seldom is a new and untried idea an instant success. It has to go through stages of growing pains, correction of minor and major difficulties and obstacles, changes in many minor respects and a few basic ones to eliminate the impractical, the obsolescent and the too-difficult.

We are not asking you to help us. All we ask is that you help to put the amateur's public service program over the top — and you can't do this by getting out or staying out of it. If in your opinion those who are doing the implementing are a bunch of incompetent nincompoops or dunderheads, there are ways in which they can be replaced — but you won't do it by throwing up your hands and walking away.

This column, this month, is written to what we believe are a minority. It is written after the *ARPSC Bulletin* and *SET Bulletin* have been mailed and before the Simulated Emergency Test. Between now and the time you read this, there will have been some interesting comments made. Glad to have yours, too, if you care to make any. — *W1NJM.*

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AREC/RACES personnel in Albuquerque, N.M., were alerted on Aug. 10 at 1915 local by the c.d. director as a result of severe flooding in the area. Mobile radio units were assigned to the c.d. and Red Cross headquarters as a command radio circuit, and an additional unit was placed at the evacuation center. Twelve mobiles were assigned patrol duty in the flooded area and at other strategic points along the main flow of flood waters. All units were in operation by 1940. W5UAF was net control at c.d. headquarters; W5LQM performed as Red Cross liaison and W5WBG was at the evacuation center. Stationed at the Embudo Flood Control Dam were *W5s* FAG and WZK. Patrolling mobile stations were *K5s* RNE TCU SFU WME KWU KUV MGR, *W5s* QIJ YVO. Fixed stations on monitoring and relay service duty included *K5s* ECN BBK, *W5s* FJE ONK, WA5GRF. C.d. Communications Chief (and SCM) W5ZUN, who submitted this report, makes special mention of the excellent work turned in by K5ECN, W5UAF, W5WBG and W5LQM.

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The regular operation of the North American Single Sideband Net was interrupted, on Aug. 24, by an emergency call from HC1OW. K3DKII was the only station in the net receiving HC1OW, so he asked net control WA4ECY to keep the frequency clear while he investigated. It turned out that a drug was needed to save a man's life and that the drug could be obtained in Miami and put on a plane flight to Ecuador. K3DKII called the designated doctor in Miami and direct communication between HC1OW and the doctor was established and the shipment of the drug arranged — after which the net resumed its operation, as though this were all in the day's work. — *K3DKU, EC Butler County, Pa.*

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On Aug. 29 another flood hit the Albuquerque area, although not as serious as the one on Aug. 10 (see above). A two-meter command link was established between Red Cross and c.d. headquarters and an additional ten-meter unit was placed at the Red Cross to provide direct liaison to field operating units. Thirteen operators put in around 273 man-hours and drove approximately 337 miles in this emergency. — *W5ZHN, SCM New Mexico.*

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The Milwaukee AREC conducted communications for the Memorial Day Parade on the afternoon of May 30. Ten amateurs took part under W9DSY/mobile, who acted as control station. The amateur units, operating on two-meter f.m., were posted with the parade starter, the assistant parade marshall, along the parade route and with the mobile first aid units of the Red Cross. — *K9KJT, EC Milwaukee County, Wis.*

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The Calgary, Alberta, AREC set up communications for a Boy Scout camp situated in the hills about eighteen miles west of Calgary, using the call of club station VE6NQ. The station was set up in the headquarters building at the camp and was quite comfortably appointed. Although conditions were poor and contact sometimes failed on phone (even on s.s.b.), c.w. could always get through. Fourteen amateurs took part in this exercise. — *VE6FK, EC Calgary, Alberta.*

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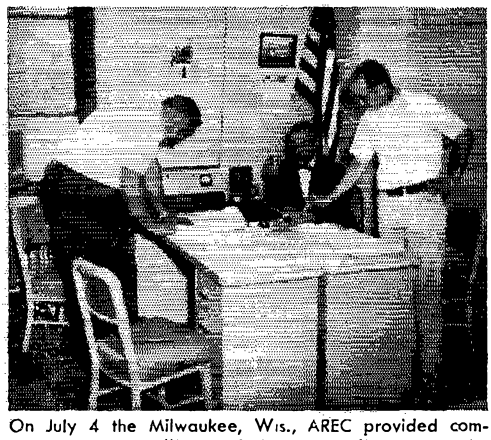
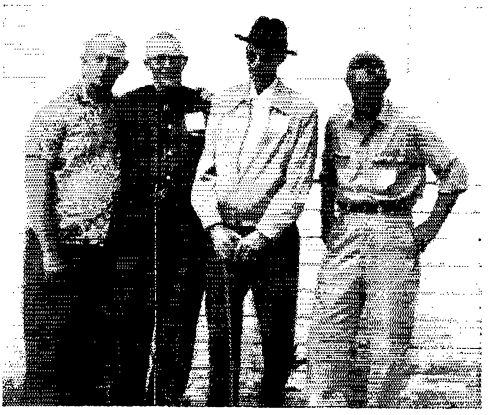
On June 9 the Dearborn County (Ind.) Amateur Radio Net provided communication for the local polio immunization drive. Net Control K9ZIW operated at the Dearborn



On July 4 the Milwaukee, Wis., AREC provided communications for the "Day in Old Milwaukee" circus parade. The photo above shows the control set-up at police headquarters. That's W9WYW standing on the left of the desk, K9ZPP seated and W9DSY on the right. The rig has a 2-meter f.m. unit on the local AREC frequency of 146.67 Mc.

The Iowa 160-Meter Net held a picnic in June at Webster City, Iowa, attended by 51 net members and twelve mobiles. To the right are the four charter members of the original 160-Meter Net group organized in 1950 (l. to r.): WØDIB, WØBTX, WØCGL, WØBTR.



County Hospital, and seven other amateurs operated at vaccine distribution points in Dearborn and Ohio counties. The net began operation at 1000 EST and closed down at 1730 EST. A terrific job was done despite some propagation difficulties. Ten amateurs took part. — *K9ZIW, EC Dearborn County, Ind.*

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On June 17, a family in Albertville, Ala. requested assistance from K4WSS, EC for Marshall County, to locate and contact an airman (exact whereabouts unknown) to advise him of a death in his family. K4WSS originated a message and put it into the section a.m. net (AENP). By the time the airman was located, the message had passed among several nets, including the s.s.b. net (AENM) and the NTS Fifth Region Net. Within two hours after help had been requested, the man had been contacted. — *W4NML, SEQG Alabama.*

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On June 29, the Milwaukee AREC took part in another parade, this time in Kenosha on behalf of the V.F.W. The problem was to furnish coordinated communications for the state V.F.W. parade, transmit routine traffic for V.F.W. officials and supply emergency communications if required. Five amateurs accomplished the job handily on 146.67-Mc. f.m. V.F.W. officials were very pleased at the outcome. — *K9KJT, EC Milwaukee County, Wis.*

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The Georgia Section held a statewide simulated emergency test on June 29 and 30, with the Georgia State Net furnishing the circuit for the long haul traffic. The test featured local emergencies ranging from a simulated local power failure to a simulated disastrous flooding of the Oconee River. The Georgia State Net (GSN) on 3595 kc. operated continuously from noon until 2200 on June 29 and from 0800 to noon on Sunday. Nineteen stations handled 77 messages during the test. Although a.m. was used for the local v.h.f. and h.f. nets, the backbone of the test was the contributions made by the c.w. operators, especially W4DDY, the RM. — *W4YE, SEC Georgia.*

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On July 20, from 1340 to 1804, W1DYG, Maine SEC, conducted an informal net on 3940 kc. for the purpose of gathering weather information for the eclipse of the sun in Maine, including reports from Oak Bay, Canada, to New York. W1DYG also transmitted before, during and after the eclipse for test purposes. All reports indicated that the signal was fading before the eclipse, steady through its totality, then fading again afterward, but fully readable at all times. — *K1DYG, SEC Maine.*

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On the evening of August 2 the AREC group in Duluth, Minn., participated in the Duluth "Portorama" activities at the request of the Duluth police department. The group provided parade control on 29.6 Mc. from 1900 to 2115, nine amateurs participating. KØFOW and WAØERW operated from the Duluth Police Traffic Control Center. — *KØKKQ, SEC Minnesota.*

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On Aug. 3 the Macon County (Ala.) Emergency Net went into action to assist in a county population check. Five mobiles reported to go into the remote areas of the county to check on the number of families between Tuskegee and the next nearest town of the county line. The information was needed by the county c.d. director The operation was a complete success. — *K4HJX, EC Macon County, Ala.*

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July reports were received from 38 SECs, representing 18,197 AREC members. This is better all around than July of a year ago, and even a little better than last month. Sections reporting: West Fla., East Fla., Mo., Ore., Alberta, N. C., Ohio, Nevada, Ark., E. Mass., Wash., Maine, So. Texas, Del., Ont., Los A., NYC-LI, Ind., Kans., Ala., S.C.V., Tenn., Utah, Mich., Minn., Ariz., No. Dak., New Mex., La., So. Dak., N.N.J., Mont., W. Pa., Iowa, E. Pa., R.I., Ga., Md.-D.C.

Races News

On July 21, at 1330, the Jackson County (Mo.) RACES organization held an exercise. The mission was to handle traffic for a simulated semi-nuclear attack on Kansas City which occurred at 0930. Base stations were on the air at Swope Park for Kansas City C.D., also at WØEZM for the state link to Jefferson City. At Lake Jacomo the radio van was used. WØGSM in Ruskin Heights and mobiles were used, as this was primarily a mobile exercise. KØTGU/mobile was located at Richards Gebaur AFB, originating traffic from there to the air base. WØOHM/mobile was dispatched to Independence to investigate a reported fire. KØGRC in Grandview was tied in on six meters through KØOKI. WØJXI mobile was dispatched to Lee's Summit to report condition of the fire department there. Four base stations and four mobiles with a total of 11 operators took part. — *KØTCB, Comms. Officer Jackson County, Mo., RACES.*

A.R.R.L. ACTIVITIES CALENDAR

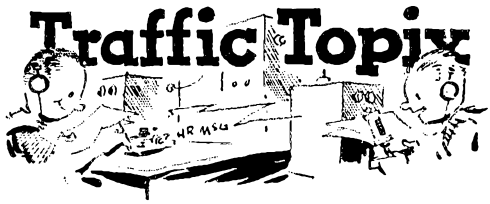
(Dates shown are per GMT)

Nov. 1: CP Qualifying Run — W6OWP
Nov. 9–11, 16–18: Sweepstakes Contest
Nov. 20: CP Qualifying Run — W1AW
Dec. 5: CP Qualifying Run — W6OWP
Dec. 19: CP Qualifying Run — W1AW
Jan. 3: CP Qualifying Run — W6OWP
Jan. 4–5: V.H.F. Sweepstakes
Jan. 11–13: CD Party (c.w.)
Jan. 17: CP Qualifying Run — W1AW
Jan. 18–20: CD Party (phone)
Feb. 8–9: DX Competition (phone)
Feb. 1–16: Novice Roundup
Feb. 6: CP Qualifying Run — W6OWP
Feb. 14: Frequency Measuring Test
Feb. 22–23: DX Competition (c.w.)
Feb. 15: CP Qualifying Run — W1AW
Mar. 14–15: DX Competition (phone)
Mar. 28–29: DX Competition (c.w.)
June 13–14: V.H.F. QSO Party
June 27–28: Field Day

OTHER ACTIVITIES

The following lists date, name, sponsor, and page reference of *QST* issue in which more details appear.

Nov. 16–17: 21/28 Mc. Telephony Contest, RSGB (p. 82, this issue).
Dec. 14–16: Virginia QSO Party, Roanoke Valley ARC (next month).



Ah, youth, it's wonderful! Not so long ago, we attended a section net meeting and were impressed by the array of bright young faces, among the greying and balding heads, looking eagerly and somewhat impudently at us from the audience. As discussions went on among the old timers, the youngsters occasionally giggled, talked covertly among themselves, and sometimes inserted a comment or question surprisingly apropos. Occasionally an elderly frown was directed their way, but more often an indulgent grin was the reaction. It was a wonderful meeting and most significant, showing as nothing else could that youth is finding its way into amateur radio again.

Sometimes they are noisy, impetuous, impulsive, disrespectful and quarrelsome. Sometimes they get in your way, under your feet and in your hair, and they think they know it all and you don't know anything. On c.w. they slide back the weights or crank up the keyer and send four times as fast as they can receive — or try to, anyway. On phone they overmodulate and fill the air with animal noises which hardly enhance our public image. There have been times when some of us old timers have mused about resurrecting The Old Man and his gang of plug-uglies, armed with wouff-hongs, rettysnitches and uggerumphs, and taking some of these young squirts for a ride.

However, kids will be kids (there were both young boys and young girls at the above-mentioned meeting, another sign of the times), and the unfavorable attributes of youth are not permanent. Neither are the favorable ones, which is a pity. As the years pass, the youngsters start taking on the characteristics of adults, and that's when even the worst of them start to show the results of your patience, forebearance and tutelage. That is, if you *had* patience and forebearance and *tried* to teach them something.

Our public service nets very much need the extra lift that these enthusiastic newer operators can give us. We can ill afford to drive them elsewhere into less altruistic amateur radio pursuits. So welcome, youths, wilderness and all! Join us in our effort to make amateur radio a service of which we can all be proud forever more. — *W1NJM.*

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Here is an example of a routine message originated in the amateur service containing handling instructions and a filing time. By c.w.: NR 17 R W1NJM HXE CK8 NEWINGTON CONN 2215Z OCT 15 GEORGE THURSTON W4MLE AA 2116 GIBBS DR AA TALLAHASSEE FLA BT PLEASE ADVISE SET RESULTS IN FLORIDA EARLIEST 73 BT HART W1NJM AR N. By phone: "Message number one seven, routine, W1NJM, I spell Nancy John Mary, HX Edward, check eight, Newington, Connecticut, two two one five zebra, October fifteen, to George Thurston, W4MLE, I spell Mary Lewis Edward, two one one six Gibbs, I spell George Ida Baker Baker Susan, Drive, Tallahassee, Florida (pause), please advise SET, I spell Susan Edward Thomas, results in Florida earliest seventy-three (pause) signed Hart, I spell Henry Adam Robert Thomas, W1NJM, end of message, no more."

The HXE indicates that a reply is expected. The R is a precedence indicator; others are P or EMERGENCY, as explained last month. The rest of the message follows previous standards.

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August Net Reports.

Net	*Sessions*	*Check-ins*	*Traffic*
Northeast Area Barnyard	—	887	15
All Service	3	20	9
75-Meter Interstate SSB	31	1133	945
7290	44	1388	904
North American SSB	—	674	706
20-Meter S.S.B.	26	—	1864

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National Traffic System. There have been a few dire predictions concerning the fate of our long-haul emergency traffic over NTS. Well, by this time we will have a better idea, with the SET behind us, and so the criticisms will either have been borne out or negated.

Nevertheless, some of the criticisms need discussion, lest many NTSers are under the same impression as our critic.

BRASS POUNDERS LEAGUE

Winners of BPL Certificate for August Traffic:

Call	*Orig.*	*Recd.*	*Rel.*	*Del.*	*Total*
K6BPI	78	2264	2058	206	4606
W3CUL	169	1963	1641	298	4071
W9IDA	12	1331	1270	21	2634
W0LGG	242	1043	961	73	2319
W9JOZ	16	1049	1021	2	2088
K0ONK	128	745	687	107	1667
W7BA	11	755	703	49	1518
W0SCA	25	673	665	0	1363
W6RSY	38	598	430	175	1241
W8UPH	11	597	525	71	1204
K9ZLA	183	497	487	9	1176
W1PEX	32	551	521	27	1131
K9DHN	542	270	232	14	1058
W6JXK	37	506	379	127	1049
W3EML	39	525	445	19	1028
WA9CCP	20	498	302	190	1010
W3VR	29	466	454	3	952
WA2EXP	4	477	432	37	950
WA2TQT	111	408	0	408	927
W7DZX	8	424	396	5	833
K9KZB	18	375	349	26	768
WA2RUE	23	369	299	50	741
K4AKP/6	35	353	299	52	739
K0FPC	55	321	317	45	738
W2RUF	20	353	233	80	686
WA2VYS	21	323	289	22	655
K7IWD	32	314	300	7	653
W4TBX	11	302	302	0	645
K9IMR	53	297	168	126	644
W1TXL	73	302	254	11	640
K3QFG	4	306	286	18	614
WA4AVM	44	275	271	4	594
K2VNL	13	290	263	19	585
W9PHR/5	41	278	248	18	585
K1WKK	57	279	243	3	582
WA2VLK	24	281	264	11	580
WA2KQG	39	272	219	43	573
WA9AKE	39	264	228	33	564
W2EW	181	192	76	110	559
K5TEY	3	274	265	5	547
WA9AJF	32	267	164	80	543
WA2QJU	33	263	159	87	542
W5PPE	28	259	211	44	542
W9DYG	32	275	215	16	538
WA4IJH	18	255	242	13	528
K2SIL	9	258	253	4	524
K4VFY	101	211	198	13	523
W8DAE	43	243	164	68	518
K4FRM	16	243	206	21	516
K7CTP	38	250	63	161	512
K1RYT	6	255	249	0	510
W4RYG	11	248	236	12	507
WA2BLV	13	244	229	14	500
Late Reports:					
K4PQL (July)	10	493	474	16	993
K7IWD (July)	35	347	325	10	717
W7GUH (June)	119	233	222	11	585

More-Than-One Operator Stations

Call	*Orig.*	*Recd.*	*Recd.*	*Del.*	*Total*
W6IAB	413	2223	2146	69	4851
W4YDK	2316	924	872	52	4164
KR6GF	1032	198	48	147	1425
KR6MD	548	120	102	18	788
W4PFC	15	268	210	35	528

BPL for 100 or more *originations-plus-deliveries*

K6GZ 315	K1WKJ 124	WA2CCF 104
W7APS 296	K3NZB 118	KN1ESG 101
W9NZZ 225	K4CDZ 118	WA4BAW 101
K8AAG 217	K8GOU 117	Late Reports:
K1PGQ 151	K1DQC 107	W9EXP (June) 123
WA0BYO 149	WB2ALF 107	W4MLE (July) 122
K4SJH 141	K3SMT 106	WA6WTD (July) 100
K8VDA 140	WA4ENJ 105	

More-Than-One Operator Stations

KR6MH 175 KR6DI 165 KR6MB 153

BPL medallions (see Aug. 1954 *QST*, p. 64) have been awarded to the following amateurs since last month's listing: K1LOM, K1ONW, K3APM, K3MQE, W4MLE, K5ANS, WB6BBO, WA6MIE, K7IWD, WA9CCP, K0OAL.

The BPL is open to all amateurs in the United States, Canada, and U. S. Possessions who report to their SCM a message total of 500 or more or 100 or more originations plus deliveries for any calendar month. All messages must be handled on amateur frequencies within 48 hours of receipt in standard ARRL form.

that the admittedly-arbitrary boundary lines of NTS regions and areas are sacred and inviolate. They are not, of course, and especially not in an emergency. Most questions about NTS are already answered in CD-24, if you will only take the trouble to read it carefully. Others you can answer yourselves if you will apply a little common logic. For example, NTS has two basic stated purposes; one is to provide a message-handling service by means of which messages go from point of origin to point of destination *systematically* in the shortest possible time; the other is to provide a maximum amount of training in handling record messages. These two objectives are capable of conflicting with each other, and occasionally they do.

A purist who feels the latter objective is the more important would have a message originating in Richmond, Va., and destined for Washington, D.C., go through 4RN, up to EAN, back to 3RN and down to the Maryland-D.C. section net for delivery, because this follows the system's line. But isn't this a little ridiculous, our critic implies, when VN has a station in Arlington or Alexandria, just across the river from Washington, who can telephone the message immediately? We agree, it *is* ridiculous, and in such a case it certainly would be common sense to route the message to the Alexandria station. There are many similar cases in which toll-free telephone lines cross state boundaries and it doesn't make sense to send the message completely around the NTS circuit when it can be delivered without leaving the section net. Examples? The two Kansas Cities, St. Louis and East St. Louis, Philadelphia and Camden, Cincinnati and Covington, Chicago and Gary, Duluth and Superior, even Detroit and Windsor. Almost *any* sizable city on a state boundary has suburbs in the adjoining state, and where coverage in such suburbs or other city is available, it should be used. This is only sensible. Section net managers and RMs should be aware of such possibilities and use them. Our NTS routings are supposed to make traffic flow systematic, but not ridiculous.

Now in the above example, suppose the message had been for Baltimore instead of Washington. Wouldn't it be easier, not to mention quicker, to have someone run the message over to the MDD net and give it directly to a Baltimore station, instead of putting it through the whole NTS circuit? *Sure* it would, both easier and quicker. If the message were of "emergency" precedence, this is precisely what should be done. But ordinarily, it is a bad practice, for several reasons. First of all, if you give special handling to this particular message, you should give the same type of handling to messages for Charlotte (send a station to NCN, and while he is at it he might as well take all other N.C. traffic), for Atlanta (and take all Ga. traffic), for Charleston (either, or both, S.C. or W.Va., and take all traffic for those sections, too) and a lot of other places. Might even include Philadelphia, Louisville, Cincinnati and Jacksonville. By the time you get through dispatching stations, there won't be anyone left in your net to receive traffic from stations dispatched to your net. And when your stations get to their nets, there won't be anybody there, either, because they'll have been dispatched to other nets with traffic.

Secondly, as you can readily see, widespread use of this practice would "starve" higher-echelon NTS nets, and they would soon disintegrate. Thirdly, it's a step backward into the hodge podge of yesteryear, to get away from which was one of the reasons NTS was created in the first place. It just isn't systematic. We should follow the NTS line, but we should be sensible about it.

It is possible that if we had had emergency traffic handling in mind when NTS was first created, we would have set up a somewhat different system. Some of our critics would have us reorganize the entire system, or create a new one just for emergency purposes. But we happen to be of the opinion that NTS, with a few minor modifications and special provisions, is quite capable of doing a quite creditable job in emergencies — just as good a job as any new system could do and without the organizational and reorganizational headaches involved. We hope you don't (didn't) disappoint us. — W1NJM.

By this time the SET will have been completed by most of you, for better or worse. It would assist us greatly in our analysis of results if all NTS net managers would drop us a brief, informal report of what transpired. Can do?

August reports

Net	Sessions	Traffic	Rate	Average	Representation (%)
1RN	62	491	.305	7.9	65.4
2RN	62	894	.634	14.4	100.0
3RN	62	614	.363	9.9	98.4
4RN	55	600	.373	10.9	89.3
RN5	62	1040	.500	16.8	87.6
RN6	49	595	.369	12.1	76.1
RN7	61	546	.300	9.0	66.8
8RN	62	456	.257	7.4	89.2
9RN	62	571	.514	9.2	58.1
TEN	54	664	.528	12.2	62.9
ECN	27	104	.182	3.9	75.3[1]
TWN	30	180	.278	6.0	53.3[1]
EAN	31	1853	1.070	59.8	100.0
CAN	31	1339	.859	43.1	100.0
PAN	31	949	.679	30.6	100.0
Sections[2]	1222	7683		6.3	
TCC Eastern	124[3]	486			
TCC Central	93[3]	270			
TCC Pacific	98[3]	864			
Summary	1963	20201	EAN	10.0	2RN
Record	1973	25618	1.440	14.8	100.0

[1] Region net representation based on one session per day or less. Others are based on two per day or more.

[2] Section nets reporting (46); VN, VFN, VSN (Va.); 50th State (Hawaii); TN (Tenn.); E. Tenn. Phone, Tenn. SSB, Tenn. Phone; NJPTN, NJN, NJ6-2 (N.J.); WIN, BEN (Wis.); CN (Conn.); AENM, AENJ, AENH, AENB, AEND, AENY, AENP Eve, AENP Morn, AENO, AENT, AENR, AENS (Ala.); SCN (S.C.); MDD (Md.-Del.-D.C.); EPA (Pa.); NCN, NCSN (N.C.); QMN (2 Mich.); OBN (Ont.); GSN (Ga.); TEX, NTTN (Texas); BUN (Utah); SCN, SCVSN (Calif.); SGN, PTN (Me.), MSN (Minn.); OFN (Ont.); RISPN (R.I.).

No records, but we came close in sessions and topped last year in nearly every particular, so perhaps we're on our way to new pinnacles.

The "regulars" are keeping 2RN humming. K3APM has been designated assistant 3RN manager by W3UE. K5IBZ was NCS-of-the-*month* on RN5. WB6BBO (formerly W3WRE) is new manager of RN6, replacing K6LKD, who issued region net certificates to the following as his last act: K6IME, *WA6s* ZID BRG UHM TWS OLQ, *W6s* VIJ QAE, K6IME, K4AKP/6, W7WST/6. 8RN will probably move the late session to 2330Z to combat skip conditions, which are starting to get bad already. W9ZYK has resigned as 9RN manager and W9QLW is temporarily in the saddle. QRN is raising hob with TEN, but WØBYV hopes for a let-up with the coming of fall. W4UGI/Ø now has a new call, WØHXB; he expects things to improve on TWN now. W9DYG deplores losing men like K4AKP and W9ZYK, but is confident the gang will fill their shoes to keep things rolling. WA6ROF relinquishes the PAN reins to an old pro, K4AKP/6; Assistant PAN Manager W6RSY received a special PAN certificate for his fine work.

Transcontinental Corps. The new TCC Director for the Central Area, replacing W9JOZ who resigned some time ago but who has been gamely holding the fort, is W4ZJY. Dave is also RN5 manager, which post he will relinquish as soon as a qualified replacement can be found. This is the second time that one man has held both of these jobs, and we want to dispel any notion that they go together. They do not. It is just happenstance.

August TCC reports:

Area	Functions	% Successful	Traffic	Out-of-Net Traffic
Eastern	124	67.7	1544	486
Central	93	88.2	1020	270
Pacific	89	64.5	1728	864
Summary	306	72.1	4292	1620

The TCC roster: Eastern Area (W3EML, Dir.) — *W1s* EMG NJM WFZ, *K1s* LOM NEF, W2MTA, K2SIL, *WA2s* BLV VAT VLK, *W3s* EML IVC, *K3s* MVO NZB QFG, *W4s* DLA DVT, K4PQL, *W8s* BZX CHT ELW QFO, Central Area (W9JOZ, acting Dir.) — W4ZJY, *K9s* ZLA DHN, *W9s* JOZ DYG CXY VAY, KØs FPC ZPN, *WØs* SCA BDR, Pacific Area (W7DZX, Dir.) — K4AKP/Ø, K6GID, *W6s* EOT HC, *WA6s* BRG ROF, W7DZX, *KØs* EDH EDK.

DX CENTURY CLUB AWARDS

Honor Roll

The DXCC Honor Roll consist of the top ten numerical totals in the DXCC. Position in the Honor Roll is determined by the first number shown. The first number represents the participant's total countries less any credits given for deleted countries. The second number shown represents the total DXCC credits given, including deleted countries. Positions in cases of ties are determined by date of receipt. All totals shown represent submissions received from August 1, through August 31, 1963.

W1FH....311/332	W7GUV....309/328	CE3AG....307/326	W3LMA....306/323	CX2CO....304/321
W4DQH....311/329	W9RBI....308/328	W2LPE....307/323	W8JBI....306/321	W4TM....304/322
W2AGW....311/330	W3KT....308/327	K3UPG....307/326	W8MPW....306/320	W2LV....304/318
W6CUO....310/330	W8BF....308/324	W6YY....307/323	W0DU....306/323	W8DAW....304/322
W8BRA....310/328	W8DMD....308/325	W0QVZ....306/323	LU6DJX....305/324	G3AAM....303/322
PY2CK....310/328	K2GFQ....308/325	W2TQC....306/320	G4CP....305/324	W8KBP....303/320
W1GKK....310/330	W2HMJ....308/323	W4QCW....306/319	W8EWS....305/324	W4AIT....303/321
W3GHD....310/329	W1ME....307/325	W2JT....306/320	G2PL....305/323	W2WZ....303/322
KV4AA....309/329	W5MMK....307/323	W7GBW....306/325	VE7ZM....305/324	W2ZX....303/318
W8KIA....309/326	W5ADZ....307/325	W1JYH....306/324	W1BIH....305/325	W0ELA....303/321
W7PHO....309/323	W9LNM....307/325	W1CLX....306/324	W3JTC....305/323	K2DCA....303/316
W9NDA....309/328	W4GD....307/324	W8KML....306/322	W6GPB....305/322	W9AMU....303/316
4X4DK....309/323	HB9J....307/326	W2BXA....306/325	W0AIW....305/323	W5ABY....302/315
W9YFV....309/328	W5ASG....307/326	W6EBG....306/326	W3JNN....305/324	W1ZW....302/315
W8JIN....309/329	W9HUZ....307/323	W8LKH....306.322	W6AM....305/325	K6ENX....302/315
W8UAS....309/325				OE1ER....302/320

Radiotelephone

W3RIS....311/331	4X4DK....308/322	W6YY....306/322	W4DQH....304/320	W3JNN....302/318
PY2CK....310/328	W1FH....308/324	CX2CO....304/321	W8KML....304/320	PY4TK....300/313
W9RBI....308/326	W7PHO....308/322	VQ4ERR....304/322	W8PQO....302/315	W0AIW....299/316
W8GZ....308/326	W8BF....307/323		W2ZX....302/317	W6AM....298/317

New Members

From August 1, through August 31, 1963 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.

G3HCT....230	YV5ACP....125	YV5AZR....107	W9ECF....104	4X4MR....102	W5LQC....100
HK3LX....226	VE3CCR....115	YV5BOA....107	WA6OET....103	K8ZIP....101	K8SGK....100
W4RIS....210	W3UHV....112	WA6GFY....105	HC1DC....103	DJ3NQ....101	W9ZMK....100
W2MJ....195	VE2BCK....112	K0OSV....105	JA1HTK....103	W1BA....100	DJ6LD....100
FY7YF....178	PA0GNI....112	K0OSW....105	DJ1XF....102	W2WAS....100	HI8MMN....100
JA3IW....132	ZL4LB....109	DJ4XE....105	PY2BBO....102	K3EHM....100	VR2EH....100
	WA9ENF....107	HB4FD....105	VP2MV....102	W4HHN....100	

Radiotelephone

W1ONK....295	DJ7AA....117	W6WX....115	G3NMH....108	W9JJC....103	W5LEF....101
VE3TR....129	XE1EK....116	K3GKU....113	WA2WDV....106	HA1M....103	KL7BJC....101
ZS6BBP....127	W2LEC....115	W8GG....112	VE3CCR....106	TG9SC....103	DJ2WN....101
HC1CD....118		W2GKZ....109		K0IFL....102	

Endorsements

W5AFX....320	W0AJU....285	W9TKD....251	W4QVJ....220	DJ4HR....170	DJ2SR....142
W5KC....320	ZP5CF....285	K4EDF....250	G4VU....220	W3DAO....169	YV5BS....142
W7AC....320	W4EEE....284	VE3PK....250	WA6DUG....216	K0IFL....168	K4YFQ....141
W7ENW....320	W2TP....283	W2OBX....246	DJ1VS....214	DL1ME....168	OZ7BQ....141
W5CKY....315	W1TS....281	ZP5LS....246	WA2CBB....211	DJ2WN....168	K8GJD....140
W7KTN....314	W4CKB....281	K2GUN....244	W6ISQ....210	HB9BJ....168	DJ1UE....140
W0QDF....314	W4HA....281	K2MGR....243	W9NN....210	K1HTV....165	OZ2NU....140
W2SUC....312	W8ZCQ....281	WA2ELS....242	W8VLK....209	K9JJR....164	VP7NQ....140
W4OM....312	W1BGA....280	W2BMK....240	G3FPK....209	W1SIK....163	W3UZF....137
W9GIL....312	W2FXA....280	W6LGZ....240	W5VSQ....208	W3AHX....163	ZS5UP....136
W2UVE....311	W6SQP....280	W9IRH....240	OZ4RT....204	WA6KNE....162	W8ESG....134
W7WVE....311	W7AQB....280	W0AUB....240	W1CV....201	SM5MIC....162	K8RDE....133
W8PUD....311	W4DQS....279	OZ7GC....239	K6LAE....201	W8NAN....161	ZL1TB....132
G8KS....311	W4LRN....279	LA6U....237	KL7MF....201	DJ1WT....161	K6EIE....131
W1HX....310	W1ACB....274	W0NFA....236	W5LEF....200	K1ANV....160	W7OEB....131
W2FXN....310	K4ZKI....271	W3BVL....234	W5MBB....200	W2ABL....160	OH2EW....131
W2TVR....310	W2CWK....270	W1LOP....233	W6VVR....200	W7AIB....160	W1DDO....130
W3CGS....310	W5DA....270	WA2DIG....233	W8ETU....200	K7BJE....160	W1RFQ....130
W7YGN....310	W6KG....270	W4NO....233	VE3AGC....191	W0RZU....160	W2PCI....130
PA0FX....310	W7CMO....270	W3AFM....232	W1ALK....190	TI2WA....160	K3JHG....130
DJ2BW....307	W0MCX....270	F8EJ....232	W5KTW....190	SM5BHF....159	K4GRD....130
W2GT....305	W1AEW....267	HB9EO....232	K8WOT....190	WA2HUV....155	WA5CBL....130
W2NUT....305	W2KIR....266	OZ3Y....232	IS1FIC....190	K1YRO....154	K6POC....130
HB9MQ....305	SM5CO....266	W1IKB....231	W8YAH....189	VQ4WLH....154	W9ARV....130
W1ZZK....304	W0DEI....265	W3INH....230	MP4BBE....186	W3GOQ....153	K9OPF....130
W6EPZ....302	VE2BV....264	W9HQF....230	W1BPW....184	WA6HRS....151	W9RDI....130
W3RUT....301	WA2OJD....263	KP4RK....230	W4TK....180	F2PO....151	W9VFZ....130
W2PCJ....300	W7TFH....263	W5QN....228	K6CHJ....180	WA2JBV....150	DJ6QB....124
K4AIM....300	K4HNA....262	W1AUR....227	KH6WW....180	K2KBI....150	JA2LC....123
W5LGG....300	W6UQQ....262	W3QQL....226	W8PQS....180	WA4CXR....160	K1IGO....122
W0VBQ....300	K6EDE....261	W4NJF....226	G8JMI....176	K8ZPK....150	WA2BRI....121
W9HCR....299	G3HDA....261	W6ERS....225	W5EJV....175	K0BHM....150	JA3BG....121
DL6EN....296	ZP5ET....255	K2JGG....224	F3ZU....175	VE7BW....150	W6FB....120
W4BQY....295	W9IHN....254	W1HWH....223	K9WTS....174	W3VQE....149	K8AJK....120
W6BSY....293	K6BHM....253	WA6TGY....223	OK3UI....174	W7DQM....148	WA4BJL....118
W1GYE....290	W5EJT....252	W9FKH....223	HI0B....172	WA6MWG....146	W8NPF....118
K4ICK....290	HB9KU....252	W2UFT....222	W1ONP....171	K3MNW....144	W4ZM....114
W8JSU....290	W1AJG....251	W3WPG....222	K8VDV....170	DJ5IM....144	ON4UN....114
VE3BWY....290	W4MS....251	W9AZP....221	VE3CYL....170	PA0NLC....144	W1JKS....111
DL9RK....290	W8LY....251	SP8CK....221		WA4DCP....142	W3ZVJ....111

Radiotelephone

W9JJF....300	W4OM....271	W2TVR....236	W2QWS....205	W7CMO....174	W6KUT....140
TI2HP....300	W8ZET....270	W3BVL....222	HB9KU....205	K0RDO....170	W7DQM....140
G8KS....296	DL6EN....266	W2BOK....221	W4RLS....203	HA8O....170	W5EJT....137
W5AFX....291	CX2AX....263	W0NFA....221	G3NUY....201	W5DA....169	K9JJR....134
W9QVZ....291	W1ZW....261	K8LSG....220	W2RGD....200	W7BTH....166	SM5MC....134
W2FXN....290	W2TP....260	HK3LX....220	W2HXG....200	SP8CK....166	DL1ME....132
DL1IN....290	W4HA....260	W6BSY....218	W9FVU....191	W2ODO....153	W4BQY....131
ZP5CF....284	ZP5ET....255	K1JMV....216	TI2PI....191	DJ3OJ....152	W7AQB....128
W4EEE....283	W0MLY....251	OZ3Y....212	W2GT....190	W5HZH....150	K1GHT....126
W4PDL....282	W1WDD....250	XE1CV....211	W0MCX....190	HA1J....149	K2YIY....126
K8RTW....282	W4PAA....250	W2PTM....210	W1AUR....183	SM5MC....146	W9SRJ....125
W1CLX....280	ZS6UR....246	W4NJF....210	W2WMG....180	YV5BS....142	SM5BHF....125
W9LNM....280	DJ2BW....245	DL3DW....206	W1OHJ....176	K2KGS....140	W4NI....124
W8PUD....277	W1BIH....240	WA2ELS....205	G3HDA....175	W3UMU....140	W2CZF....120

NATIONAL CALLING AND EMERGENCY FREQUENCIES (kc.)

3550	3875	7100	7250
14,050	14,225	21,050	21,400
28,100	29,640	50,550	145,350

During periods of communications emergency these channels will be monitored for emergency traffic. At other times, these frequencies can be used as general calling frequencies to expedite general traffic movement between amateur stations. Emergency traffic has precedence. After contact has been made the frequency should be *vacated immediately* to accommodate other callers.

The following are the National Calling and Emergency Frequencies for Canada: *c.w.* — 3535, 7050, 14,060; *phone* — 3765, 14,160, 28,250 kc.

SUGGESTED OPERATING FREQUENCIES

RTTY 3620, 7040 14,090, 21,090 kc.

WIDE BAND FM 52.525 146.94

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, NST −7, PDST −7, PST −8, Hawaii −10, Central Alaska −10.

CODE PROFICIENCY PROGRAM

Twice each month special transmissions are made to enable you to qualify for the ARRL Code Proficiency Certificate. The next qualifying run from W1AW will be made Nov. 20 at 0230 GMT. Identical tests will be sent simultaneously by transmitters on 1805, 3555, 7080, 14,100, 21,075, 28,080, 50,900 and 145,800 kc. The next qualifying run from W6OWP only will be transmitted Nov. 1 at 0500 Greenwich Mean Time on 3590 and 7129 kc. *CAUTION:* Note that since the dates are given per Greenwich Mean Time, Code Proficiency Qualifying Runs in the United States and Canada actually fall on the evening previous to the date given: *Example:* In converting, 0230 GMT Nov. 20 becomes 2130 EST Nov. 19.

Any person can apply. Neither ARRL membership nor an amateur license is required. Send copies of all qualifying runs to ARRL for grading, stating the call of the station you copied. If you qualify at one of the six speeds transmitted, 10 through 35 w.p.m., you will receive a certificate. If your initial qualification is for a speed below 35 w.p.m. you may try later for endorsement stickers.

W1AW conducts code practice daily at 0230 GMT on all frequencies listed above with speeds of 15, 20, 25, 30, and 35 w.p.m. on Tuesday, Thursday, and Saturday, and at 5, 7½, 10, and 13 w.p.m. other days. Approximately 10 minutes' practice is given at each speed. To check your copy, the texts used on several transmissions are listed below. The order of words in each line of *QST* text is sometimes reversed. To improve your fist, try to send in step with W1AW. (Please note that there will be no code-practice runs on the nights of the quarterly Frequency Measuring Tests.)

Date Subject of Practice Text from Sept. *QST*

Nov. 4: *It Seems to Us*, . . . , p. 9
Nov. 7: *Radio Control of Model Airplanes*, p. 11
Nov. 13: *The Bugless Bug*, p. 23
Nov. 19: *Intermodulation Design in Linear Amplifiers*, p. 52
Nov. 22: *Fun as a Technician*, p. 76

Date Subject of Practice Text from *Understanding Amateur Radio*, First Edition

Nov. 25: Safety, p. 12
Nov. 27: Fire and Lightning Protection, p. 12

W1AW SCHEDULES

(November 1963)

Operating Visiting Hours

Monday through Friday: 3 P.M.–3 A.M. EST.
Saturday: 7 P.M.–2.30 A.M. EST.
Sunday: 3 P.M.–10.30 P.M. EST.

The ARRL Maxim Memorial Station welcomes visitors. The station address is 225 Main St., Newington, Conn., about 7 miles south of Hartford. A map showing local street detail will be sent on request. The station will be closed Nov. 28, Thanksgiving Day.

Operating Frequencies

C.w.: 1805, 3555, 7080, 14,100, 21,075, 28,080, 50,700, 145,800.
Voice: 1820, 3945, 7255, 14,280 (s.s.b.), 21,330, 29,000, 50,700, 145,800.

Frequencies may vary slightly from round figures given; they are to assist in finding the W1AW signal, not for exact calibrating purposes.

Official Bulletins

Bulletins containing latest information on matters of general amateur interest are transmitted on the above frequencies according to the following schedule in Greenwich Mean Time:
C.w.: Monday through Saturday, 0100; Tuesday through Sunday, 0500.
Voice: Monday through Saturday, 0200; Tuesday through Sunday, 0430.

Caution: Note that in the U. S. and Canada bulletin hours usually fall on the evening of the previous day by local time.

W1AW CONTACT SCHEDULE

Would you like to work W1AW? W1AW welcomes calls from *any* amateur station in accordance with the following schedule:

GMT	*Sunday*	*Monday*	*Tuesday*	*Wednesday*	*Thursday*	*Friday*	*Saturday*
0030–0100	.....	.....	7255*	.....	7080	.....	7255*
0120–0200[1]	.....	.....	7080	3555	7080[2]	3555[2]	7080
0210–0230[1]	.....	.....	3945	50.7 Mc.	145.8 Mc.	3945	3945
0330–0430	.....	.....	3555	3945	7080	1820	3555
0440–0500[1]	.....	.....	3945	14,280	3945	14,280	3945
0520–0600[1]	.....	.....	3555[2]	7255*	3555	7080[2]	3945
0600–0700	.....	.....	14,280	14,100	3555	14,100	.....
0700–0800	.....	.....	7255*	3945	7080	3945	7255*
2000–2100	.....	.....	14,280	21/28 Mc.[3]	14,100	.....	.....
2100–2200	.....	14,280	21/28 Mc.[3]	14,100	21/28 Mc.[3]	21,330	.....
2200–2300	.....	14,100	14,280	21,075[2]	14,280	14,100	.....

[1] General-contact period on stated frequency begins immediately following transmission of Official Bulletin which begins at 0200 and 0430 on phone and at 0100 and 0500 on c.w. Starting time is approximate.
[2] W1AW will first listen for Novices before checking the rest of the band for other contacts.
[3] Operation will be conducted on either 21,075, 21,330, 28,080 or 29,000 kc.
* Operation may be on s.s.b. as announced at the beginning of the period.
Station Staff: W1QIS, W1WPR, K1MET.

Station Activities

• All operating amateurs are invited to report to the SCM on the first of each month, covering station activities for the preceding month. Radio Club news is also desired by SCMs for inclusion in these columns. The addresses of all SCMs will be found on page 6.

ATLANTIC DIVISION

EASTERN PENNSYLVANIA—SCM, Allen R. Breiner, W3ZRQ—SEC: W3DUI. RM: W3EML. PAM: K3CAH. V.H.F. PAM's: W3SAO, W3SGI. K3JHF is a new ORS. The Cen-Penn 6-Meter Net had QTC of 110. The E. Pa. C.W. Net had QNI of 257 and QTC 264. W3FLP, Delaware County EC, was shut down for repairs. Polly, formerly of Shenandoah and now W8FLA, is with the FCC at Allegan, Mich. and extends 73 to his old E. Pa. buddies. W3EU went QRO with new power lines to his shack. K3LTI experienced a smashed rotor on his nine-element beam for 6 meters. The Milton ARC started a class for Novices. See W3LXN for registration. 2 meters were added to the already over-burdened mobile of W3AHZ, New Gear Dept.: K3MVO added an HC-10 to his HRO. K3SLP installed an SB-10. K3MNT got a new paint job for his shack. VE3DJV and VE3DJW visited with K3HTZ. K3HNP vacationed in a rare county in Texas. KN3ZOL is a new Novice in the Berwick area. K3VIZ, K3ZGO and K3TYF are now General Class ops. K3SZE has become an active trafficker on the E. Pa. C.W. Net, which meets nightly on 3610 kc. at 6:30 EST. W3SAO and Mother Rat were parked in your editor's back yard again for three weeks. This time they were assisted by K3LBT, who helped shake things up a bit on 6 meters from Schuylkill County. Philadelphia EC W3ELI spent two weeks on vacation, two weeks at military camp and then two weeks at home getting rested up from the ordeal. During United Nations Week Oct. 20-26, the Council of Amateur Radio Clubs of Delaware Valley set up and operated station K3UN in Philadelphia. The AREC membership in Philadelphia County is well over 100 and Delaware County is pushing closer to the 200 mark. Registration applications or information may be had from W3ELI or W3FLP or this office. K3DCB is attending electronics school in Detroit. W3OY attended the Atlantic Division Convention in Washington, D.C. W3CUL and W3VR spent a few weeks in Tampa, Florida. W3IVS took care of the sheds during their absence. See ye' all in the SS Contest. Traffic: W3CUL 4071, W3EML 1028, W3VR 952, K3MVO 340, K3JSX 138, K3CAH 132, K3MQE 110, K3BHU 67, W3NNL 50, K3JHF 34, K3MNT/3 33, W3ZRQ 33, K3LTI 31, W3VAP 29, W3BFF 22, K3HNP 22, W3JKX 18, K3ARR 17, W3OY 11, W3BKF 9, W3EEN 9, W3LXN 8, K3HTZ 7, W3QDW 7, K3TYL 6, W3BUR 5, K3EOU 4, K3SLP 4, K3SZE 4, K3JLG 3, K3EMA 2, W3FLP 2.

MARYLAND-DISTRICT OF COLUMBIA—SCM, Andrew H. Abraham, W3JZY—SEC: W3CVE. RMs: K3JYZ and W3TN (for the MDD Traffic Net which meets on 3649 kc. daily at 0000Z). W3ZNW (for the MDDS (slow) Traffic Net on 28.1 Mc. and 160 meters at 0130Z). PAM: W3EQK. The MEPN meets on 3820 kc. M.W.F. at 2300Z and on Sat. and Sun. at 1800Z. W3AHQ has been elected to Life Membership in the National Capitol V.H.F. Club. W3CJT, EC for the District, is active getting members for his AREC program. W3ECP was a busy man at the convention. W3EOV assisted in the Wouff Hong at the convention. W3EQK is back on the air with an SB-33 sideband transceiver. W4EXM/3 is spending some time fishing; Art also has a new job. WA5GVF/3 is active on 6 and 2 meters. K3GZK is working a little DX. W3HQE wonders where the summer has gone. K3EIW is sending code practice on all normally-used amateur bands simultaneously. K3LLR is having receiver problems. K3NCM reports that traffic was very slow in August. K3ORS is back on the air with a 300-ft. long wire. K3QDD is building a keyer and will have a linear amplifier working soon. K3QFG made the BPL but will not be as active with traffic because of school work. K3QOY is leaving for college. K3QZZ is back in Philadelphia hard at work with school books. K3RQH is constructing an electronic keyer for use on his OB schedules. K3RGB reports that the Baltimore area AREC held a very successful SET. K3RUQ is leaving for Charlotte Hall Military Academy. Tim says that he will be active only during the summer months. K3SGD reports that the 10-meter band is opening more toward South America and that K3WIT has his v.f.o. retuned and will be moving around on the 10-meter band. K3TZK has moved and is on the air with a beam. K3VGX has his General Class license. K3SMT has been appointed as 3RN representative Sun. nights and Ralph made the BPL in August. W3TN is having a hard time making the BPL. W3ZNW will start holding MDDS sessions on 28.1 Mc. and on 160 meters this winter. I want to thank all of the MDD net members who assisted at the booth at the convention and did such a splendid job. It was a pleasure to meet so many appointees in person. The following in OESs sent in fine reports: K3DNO, W3GCO, WA5GVF/3, K3LLR and K3PRN. Traffic: (Aug.) K3QFG 614, K3QDD 390, W3TN 240, K3SMT 239, K3OSX 75, W3ATQ 69, K3RUQ 64, W3HQE 59, W3PQ 53, K3ORS 42, K3WBJ 31, K3GZK 28, W3EOV 23, W3ECP 17, W3ZNW 16, K3JYZ 11, W3BKE 7, K3QZZ 7, K3RGB 6, K3SGD 6, WA5GVF/3 4, K3NCM 2, K3RQH 2. (July) K3QDD 387, W3IVC 238, W3EOV 27, K3JYZ 22, K3GZK 14.

DELAWARE—SCM, M. F. Nelson, K3GKF—PAM: K3LEC. RM: W3EEB. DEPN meets Sat. on 3905 kc. at 1830 local time. DSMN meets Tue. on 50.4 Mc. at 2100 local time. Renewal: K3KAJ as ORS. The Second Annual Hamfest in Dover was very successful with more than 500 amateurs present and a total attendance of more than 1300. The transmitter hunts were won by K3JEX and K3OBU. The three top prizes went to W3VXJ, K3RUJ and WA2LKM. The hamfest committee did an excellent job and all First State amateurs owe them a vote of thanks. An AREC "booth" at the hamfest enrolled those Delaware amateurs interested in our Emergency Corps program. Any others interested are urged to drop me a card or call WY 4-1124. K3MPZ worked California, Oregon, Washington (state) Puerto Rico, Cuba and the Bahamas on 6 meters in August. He also worked W4MMP groundwave in North Carolina. Traffic: W3EEB 139, K3GKF 15, K3SXA 9, K3MAZ 7, K3AZH 6.

SOUTHERN NEW JERSEY—SCM, Herbert C. Brooks, K2BG—SEC: K2ARY. PAM: W2ZI. RM: WA2VAT. Gloucester County, under the direction of EC K2JKA, has an AREC Net each Fri. at 8 P.M on 50.9 Mc. They have issued an AREC *News Letter* containing plans for the fall. WA2WWF, Wenonah, is sending Official Bulletins on RTTY. WA2NGI, Gloucester Co. Radio Club, has issued 54 certificates to working members. The Levittown (N.J.) has a communications display at the Rancocas Valley Hospital. The display was set up and manned by WA2THL, WA2VWM and WN2JIV. WA2BLV made BPL with a total of 500. W2RG, Merchantville, is vacationing in Vermont, N.J. Phone and Tfc. Net totals for August: 31 sessions, QNI 613, traffic 140. The net's annual dinner was held Oct. 19 at Bhares Tavern, Rt. 33. K2JJC, Pitman, has his SB-10 on the air. W2BEI, Audubon, has returned from the hospital. K2RXB, Margate, is confined to the Atlantic City hospital. The Princeton YMCA station, K2PWK, has a kw. station on the air. WA2LBL is the club's president. WB2IRU received his Tech. Class license. W2BAY, Haddonfield, vacationed on Cape Cod enjoying the weather and 2- and 6-meter activity. SJRA's *Harmonics* editor has given up this. K2MOV, Delanco, has returned from KX6-Land. K2BG's son is now WN2INZ/1 at Ft. Devens, Mass. The Burlington Co. Radio Club, meets the 2nd Mon. in the Court House, Moorestown, Gloucester Co. ARC's *Crosstalk* is edited by W2LVW. You need not be a League appointee to send me a monthly report. All section news will be greatly appreciated. Traffic: WA2BLV 500, W2RG 239, W2ZI 41, W2MMD 26, WA2KAP 10, K2SHE 8, W2ZVW 6, K2JJC 5, W2BEI 4, W2IU 1.

WESTERN NEW YORK—SCM, Charles T. Hansen, K2HUK—SEC: W2ICZ. RMs: W2RUF, W2EZB and W2FEB. PAM: W2PVI. NYS C.W. meets on 3670 kc. at 1900, ESS on 3590 kc. at 1800, NYSPTEN on 3925 kc. at 1800, NYS C.D. on 3610.5 and 3993 kc. (s.s.b.) at 0900 Sun. and 7102.5 kc. at 1930 Wed., TCPN 2nd call area on 3970 kc. at 1900, 1PN on 3980 kc. at 1600, 2RN on 3690 kc. at 0045 and 2345 GMT. Congratulations to three BPLers this month: W2RUF, WA2KQG and K2SIL. Endorsements: K2TDG as ORS, K2RYH as ORS and WA2VOK as OES. W2PZI is building an s.s.b. transceiver. WB2FPG has received his General Class ticket.

(Continued on page 98)

THE EMPIRE DX CERTIFICATE

SIXTEEN years ago — in the September 1947 issue of the R.S.G.B. Bulletin — the Council of the Radio Society of Great Britain announced that a new operating award — to be known as the Empire DX Certificate — was to be made available.

BY a coincidence the same issue of the Bulletin carried an account of the difficulties which had arisen at the Atlantic City Radio Conference and the news that the width of the 14 Mc's band would, in due time, be reduced by 50 Kc's.

THE Empire DX Certificate is designed to encourage amateurs to make contact with other amateurs in various parts of the British Commonwealth. Special emphasis is placed on 14 Mc's contacts.

THE rules governing the award are simple, yet in the 16 years that have elapsed since it was introduced the number issued has only just exceeded 300.

THE Certificate may be claimed by any licensed radio amateur who has been a fully paid-up Corporate member of the R.S.G.B. for at least three consecutive years at the time of the application and who can produce evidence of having made two-way communication with Amateur Radio stations located in at least 50 British Commonwealth Call Areas on the 14 Mc's band and with Amateur Radio stations located in at least 50 British Commonwealth Call Areas on other amateur bands. In the case of the "other" amateur bands a particular Call Area may be claimed only once, irrespective of the band on which the Call Area was worked.

A FULL LIST of the British Commonwealth Call Areas is given in a leaflet available on application from the R.S.G.B., 28 Little Russell Street, London, W.C. 1.

THE certificate is hand produced in color on vellum and provides an outstanding example of the draughtsman's art. Every certificate holder receives, free of charge, a distinctive lapel badge, bearing his call sign.

H. S. BRADLEY, W2QHH, was the first U.S. amateur to obtain the award, followed closely by Gerry Mathis, W3BES. That was in 1949; since then just over 40 have gone to the North American continent including four to Canada and Newfoundland (VE3ADV in 1957, VE3AIU in 1958, VE3BWY and VO3X in 1959). A United States amateur, Chas. W. Boegel, Jr., W0CVU, was the first in the world to qualify for the E.DX.C using two-way single sideband operation. His certificate is dated May 31, 1962.

IT has been said with truth that the Empire DX Certificate is one of the most beautiful and distinctive operating awards available in the world today. Are you in the running for it?

73

JOHN CLARRICOATS, G6CL
General Secretary, R.S.G.B.

ARTHUR O. MILNE, G2MI
Past President and QSL Manager, R.S.G.B.

Station Activities

(Continued from page 94)

WNY section members who attended the ARRL Convention in Washington, D.C., included K2HUK, W2ICZ, WA2KND, W2SAW and W2GB. W2ICE was host at the First National Meeting of Radio Historians at the Antique Wireless Assn. Barn Museum in Holcomb, N.Y. WA2AIL is conducting code classes under the auspices of the RARA. W3YA, Atlantic Division Director, spoke at the Sept. meeting of the RARA. K2HUK spoke at the RAWNY meeting. Both reported on the ARRL Board proposal on incentive licensing. There have been many rumors and much misinformation has been repeated by hams who should know better, regarding this issue. Once the facts are known, the average ham can't help but decide for himself that the program is sound and constructive. WN2FRY has worked 13 states on 40 meters. WN2FSA has managed to work 38 states on same. All amateurs are invited to report items of interest to the SCM by the third of each month. Appointees are required to report as a condition of the appointment. Traffic reports should be relayed over the air to W2RUF on NYS C.W. or mailed on a post card. It is most convenient to report via the Form 1 report card, available upon request from ARRL. Traffic: (Aug.) W2RUF 686, WA2KQG 573, K2SIL 524, W2OE 485, K2-KTK 140, W2EZB 122, W2FEB 77, K2OFV 47, W2QHQ 39, W2RQF 24, K2IMI 22, K2HOH 17, WB2CET 15, K2SRY 10, K2PBU 8, WB2FPG 4, WA2GLA 4, K2RYH 4. (July) K2KTK 13.

WESTERN PENNSYLVANIA—SCM, Anthony J. Mroczka, W3UHN—SEC: W3LIV. RMs: W3KUN, K3-OOU and W3NUG. The WPA Traffic Net meets Mon. through Fri. at 2400 GMT on 3585 kc. The Keystone Slow Speed Net (KSSN) meets 2330 GMT Mon. through Fri. on 3585 kc. K3OOU is the recipient of an A-1 Operators' Club certificate. K3HID has an SB-10. The Foothills RC has resumed publication of its *W3UWW Newsletter*. W3ZIJ is on s.s.b. The Horseshoe RC reports via *Hamateur News*: W3QKE is back on 6 meters; K3BDI now is sail boating; W3BTX is home from the hospital. A new amateur in the Pittsburgh area is K3-ZMH, formerly K1ZBQ and HA2U. Coke Center RC reports: K3NFS, W3WST and K3IRM recently got married; K3PLP is moving to Cleveland; K3VXS piloted the Connellsville Little Leaguers to the Eastern Regional Championship. W3RTV is moving to Stevensville, Mich. The Uniontown ARC, via *Magpie*, reports: K3SCH has a Heath Tweet; K3HLJ is attending school at Penn State; K3QIO is away at school. The Etna RC reports, via *Oscillator*: W3MIW has been named Sec. Control in Section 5 Allegheny County; K3HLS moved to the West Coast; K3RQV is having all kinds of beam trouble. K3UHC has his s.s.b. 6-meter rig built. Up Erie way: Six-year-old Moe Baker received his Novice call, KN3-ZIM; the Wesleyville High School ARC call is K3UWS; K3HFL is on 6-meter s.s.b. W3VKD is getting his antenna farm ready for the fall DX Contests. K3SOK and K3PYS comprise a father-son combination. The radio station, W3YA, at Pennsylvania State University, is being dismantled to make way for the new expansion program. We are sorry to see the old station go after many years of faithful service. Those attending the WPA Traffic Net Picnic at Parker State Dam in September were W3ELZ, W3IYI, W3KNK, W3KUN, W3LNQ, W3-MGU, W3NEM, W3OEO, W3SMV, W3UHN, K3ZNB, K3PYS, K3SOK and their families. Traffic: (Aug.) K3-NZB 486, K3DKH 311, W3NEM 139, W3KUN 134, K3-PYS 53, K3TEZ 49, W3IYI 38, W3UHN 32, K3OOU 10, K3OWN 10, K3SMB 10, K3HID 6, K3COT 4, K3EXE 1. (July) K3OOU 51.

CENTRAL DIVISION

ILLINOIS—SCM, Edmond A. Metzger, W9PRN—Asst. SCM: Grace V. Ryden, W9GME. SEC: W9RYU. RM: W9USR. PAM: W9VWJ. EC of Cook County: W9HPG. Section net: ILN: 3515 kc. Mon. through Sat. at 1900 CST. All ECs are asked to check into the EC Net every Sun. at 1600 GMT on 3840 kc. New Novice stations heard were WN9HEU, WN9JEH, WN9JEI and WN9-JKO. Among those receiving their General Class licenses were WA9FDX, WA9FDY and WA9DLZ. K9AHS is putting the finishing touches on a new 2-meter rig. Our sympathy to the families and friends of K9PRX and W9YBY, who recently passed away. W9JFN is the new NCS of the Chicago Area Emergency Net (CAEN) which meets daily on 1805 kc. at 1900 CST. K4KWQ/9 is now a Champaign resident. W9APK is moving to Kalamazoo, Mich. K9EAB is sponsoring the Cook County certificate. The CHC Net meets every Sun. at 2100 GMT on 3890 kc. Many notices have been received from clubs announcing their code and theory classes. If anyone is interested in such instructions, have them contact their local radio clubs. The Peoria Hamfest was well attended and many eyeball QSOs were made. W9RUK demonstrated visual observation of modulation with panadapter and oscilloscope at a recent meeting of the North Shore Amateur Radio Club (Chicago). K9PRB has been appointed EC of Will County. WA9APD has enlisted in the Air Force. WA9BIT has a new TA-33 and is working out FB. A new radio club has been formed called the Illiana RTTY Club and meets at Avalon Park. K9TRP received her DXCC certificate. WN9IAN, the youngest member of the Price family, received his Novice Class license, making it a 100 per cent all-ham family of 6. Net manager W9NWK reports that the Interstate Single Sideband 75-Meter Net had a traffic count of 945 messages. W9IDA, WA9CCP, K9KZB and WA9AJF are recipients of the BPL award. Traffic: (Aug.) W9IDA 2634, WA9CCP 1010, K9KZB 768, WA9-AJF 543, K9LRN 90, K4WQ/9 75, K9CYZ 56, K9DRS 45, W9PRN 16, W9QQG 14, K9RAS 6, K9FWB 4, WN9-GLY 4, K9EIV/9 2, W9DBO 1, W9LNQ 1. (July) W9-EXP 241, W9JXV 94, K9RNQ 14.

INDIANA—SCM, Donald L. Holt, W9FWH—Asst. SCM: Clifford M. Singer, W9SWD. SEC: W9SNQ. PAMs: K9KTL, K9CRS, K9GLL. RMs: W9TT, K9-DHN, W9JOZ. Net skeds (all times in GMT): IFN, 1330 daily and 2300 M-F on 3910 kc.; ISN (s.s.b.), 0030 daily on 3920 kc.; QIN (training), 1700 M-W-F on 3745 KC.; QIN, daily at 0000 and RFN at 1200 Sun. on 3656 kc. Please note the new time of the QIN (training) net and encourage Novices and others to participate. WA9-JCF is a new XYL in Anderson. WA9EBR is a new General Class licensee and WN9HUP is on 80 meters. Both are in Logansport. K9WSU is a new station on 6-meter s.s.b. K9IVG is on the air with a new HT-37. W9NZZ made BPL this month, which makes 132 in 11 years. W9BTZ is net manager of the 6-Meter IMO Net with K9GLL, K9QWI and W9DJM as NCSs. QIN Honor Roll: K9DHN, W9TT, K9VHY, K9ZLA, K9KTL, WA9-ELY and K9UXX. Those making BPL: W9JOZ, K9ZLA, K9DHN and W9NZZ. *Amateur Radio exists as a hobby because of the service it renders.* August net reports: IFN 221, ISB 1322, QIN 409. QIN (training) 0. RFN 30. Hoosier V.H.F. 109, 9RN 571. Indiana is represented 100 per cent. Traffic: (Aug.) W9JOZ 2088, K9ZLA 1176, K9DHN 1058, W9ZYK 361, W9NZZ 341, W9TT 281, K9-IVG 180, W9QLW 160, K9KTL 140, K9RWQ 123, W9VAY 108, WA9EED 107, K9CRS 98, WA9BFB 71, K9GEL 65, W9CC 56, W9QVQ 50, K9ZLB 46, W9FWH 45, W9BUQ 30, K9UEF 30, W9SNQ 23, W9YYX 23, K9UXX 22, WA9ELY 21, K9VHY 21, W9BTZ 20, W9RTH 20, W9OG 18, W9FJI 15, K9ILK 15, W9DGA 14, K9ARW 13, W9-QWI 12, WA9ECX 10, K9QXI 9, K9MAN 8, K9UHQ 8, K9MWC 7, K9FPA 6, W9AQW 5, W9BDP 5, W9ZZR 4, K9PVS 3, K9SUH 3, K9BSL 2, K9DHF 2, K9WET 1. (July) WA9EED 40, K9MWC 9.

WISCONSIN—SCM, Kenneth A. Ebneter, K9GSC—SEC: W9RCC. RM: W9KQB. PAMs: W9NRP, W9SAA and W9NGT. Nets: WIN ON 3535 kc. daily at 0045Z, BEN on 3950 kc. daily at 2400Z, WSBN on 3985 kc. daily at 2315Z and SWRN on 50,400 Mc. Mon.-Sat. at 0300Z. Renewed appointments: W9DFS and K9GSC as OESs and W9SZL as EC. Net certificates went to K9FHI for BEN; WA9AKE and WAØBES for WSBN, K9FPM received his RCC certificate. K9WRQ has a new tower. K9HBT received 6-meter WVE award No. 4. W9CCO worked W9RQM from KG4AN. K9WIE has his DX up to 110/81. WA9AVZ is working with a one-watt 2-meter walkie-talkie. WA9EDZ has a new vertical and is on 20 meters. W9KQB and K9HBT have moved their QTHs. WA9CWU has 49 states worked and is looking for Alaska. K9PKQ, K9ODK, K9LGU, WA9FLQ and WN9FQA are on 2 meters. W9VIK and W9VHP are looking forward to life in the Ozarks. Net reports: BEN, 1205 stations cleared 373 messages in 31 hours. WSBN, 1312 stations cleared 570 messages in 30 hours. Station activity reports for this column are welcomed each month by the SCM. BPL certificates for August traffic were sent to K9IMR, WA9AKE and W9DYG. Traffic: (Aug.) K9IMR 644, WA9AKE 564, W9DYG 538, W9CXY 220, W9AOW 148, WA9BWD 76, K9GSC 71, WA9FOM 63, W9NRP 39, W9YT 38, WA9AOI 32, K9LWZ 31, W9OTL 29, W9VHP 29, W9CBE 27, K9FWJ 20, K9BLN 19, K9WIE 16, K9-LGU 10, W9UEB 10, W9APB 9, K9BOJ 9, WA9CDY 6, K9FPM 6, W9IQW 6, K9FHI 5, W9ONI 2. (July) W9-VHP 66, WA9FOM 30, K9ZMU 8, W9VIK 7, W9ZB 3.

DAKOTA DIVISION

NORTH DAKOTA—SCM, Harold A. Wengel, WØ-HVA—SEC: WØCAQ. PAM: KØTYY. The Minot Amateur Radio Association held its 2nd Annual Picnic at the Garrison Reservoir. About 71 hams and their families were present and a good time was reported by all. Guest speaker was Dakota Division Director Charles Compton, WØBUO, who spoke on incentive licensing. The North Dakota 75-Meter Fone Net reports 22 sessions with 391 check-ins, maximum 29, minimum 9, 29

(Continued on page 100)

an announcement of significance to all amateur radio operators

The Heath Company takes pleasure in introducing on the following pages, the first of a complete series of fully integrated SSB amateur radio equipment that will set new standards for value, quality, style, and performance. To be designated the Heathkit SB Series, these products represent a major step forward in amateur radio SSB equipment. Now, the best in SSB design features are combined with Heathkit's leadership in electronic kit techniques to bring maximum performance and operating convenience to amateurs at modest prices.

What design features are essential or desirable for the best SSB performance? Some of the more important ones are high mechanical and electrical frequency stability achieved only by employing crystal-controlled heterodyne circuitry with low frequency variable frequency oscillators, optimum receiver selectivity and minimum transmitted signal bandwidth obtainable by means of the excellent shape factors exhibited only by crystal or mechanical filters, linear tuning with 1 kc dial calibration, smooth anti-backlash dial, automatic level control, small size, and light weight. The SB Series has all these plus the several improved and unique features listed below.

To provide even better performance plus maximum ease of assembly, these new Heathkit SSB products also feature linear dials providing 500 kc frequency coverage per bandswitch position while maintaining 1 kc calibration marks spaced approximately ⅛" apart, a high frequency bandpass IF (8.4—8.9 mc) for improved image rejection and suppression of spurious responses, preassembled and prealigned LMO (linear master oscillator), circuit boards and wiring harnesses, plus specially tooled cabinet, knobs, dial mechanism, and LMO components. When the transmitter and receiver are operated in the transceive mode, in addition to the usual practice of employing a common VFO and high frequency oscillator, the receiver BFO is used as the transmitter carrier oscillator to prevent even minute frequency changes between transmit and receive due to crystal tolerances. This attention to detail is typical of the careful, thorough engineering behind the Heath SB Series.

Only Heathkit experience and know-how can provide the engineering and manual skills necessary to bring such quality and performance to kit-form SSB equipment. Despite this background, Heath engineers spent over two years in the design of the equipment, and the developing and specifying of the critical components (such as the LMO, crystal filters, and dial mechanism). Only the most capable manufacturers have been selected to supply the special components and, as always, only the highest quality parts are employed throughout.

Carefully read the features and specifications of the SB-300 SSB Receiver described on the next two pages. The entire SB Series will exhibit all these fine performance characteristics using the same basic critical components in equipment covering all amateur interests.

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Benton Harbor, Michigan

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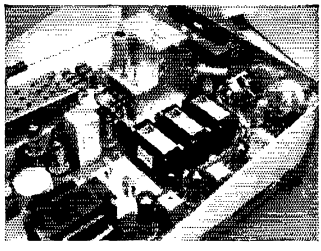
the deluxe HEATHKIT®

SB-300

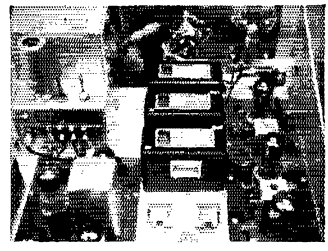
SSB RECEIVER

$264.95

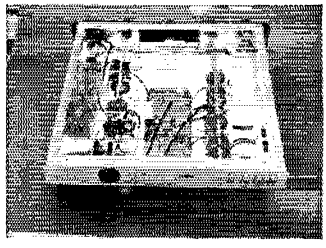
deluxe features for finest performance



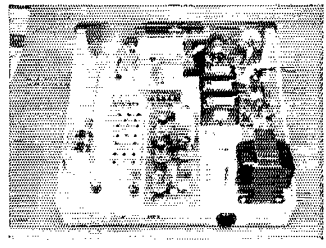
Precision-built Linear Master Oscillator (LMO) is completely assembled and calibrated, ready to install; specially designed dial assures accurate readout and smooth frequency control.



Prebuilt, hermetically-sealed 2.1 kc crystal bandpass filter for SSB provides the excellent nominal shape-factor of 2:1 (60/5 db). Optional AM and CW filters shown installed.



Two heavy-duty 3/32" circuit boards and precut, cabled wiring harness maintain a clean, uncluttered layout for fast, easy assembly, years of faithful performance.



All adjustments are conveniently made from the top of the chassis; chassis screening clearly identifies coil and tube locations, etc. Entire top of ventilated cabinet opens for easy access.

SB-300 features

- **Complete coverage of 80 through 10 meter amateur bands with all crystals furnished, plus provision for VHF converters**
- **Crystal-controlled front-end for same tuning rate on all bands**
- **1 kc dial calibrations—100 kc per dial revolution provides band spread equal to 10 feet per megacycle—tuning knob to dial ratio approx. 4:1**
- **Provision for transceive operation with matching SB-400 Transmitter (available soon)**
- **Prebuilt linear master oscillator (LMO), wiring harness and two heavy-duty circuit boards for fast, easy assembly**
- **Professional styling and features throughout for finest HF and VHF amateur band communications**

Experienced amateurs will especially appreciate the careful attention to detail behind the design of the SB-300. Its many features include a crystal controlled front-end that provides the same tuning rate on all bands, a prebuilt Linear Master Oscillator (LMO) for linear tuning with 1 kc dial calibrations, built-in crystal calibrator and 2.1 kc crystal-lattice bandpass filter, a smooth, non-backlash vernier dial drive mechanism, and a beautifully styled cabinet and panel. Cabinet top opens completely for easy access to top chassis components. Optional AM and CW filters are low-cost and easily installed, their steep-sided bandpass eliminates, not merely attenuates, adjacent interfering signals for exceptional reception.

Circuit features include a high frequency I.F. for maximum I.F. and image rejection, audio inverse feedback, fast-slow-off AGC control, stability of 100 cps after warmup, and a host of other deluxe features that assure finest communications results. Order your SB-300 now for 60% savings over comparable factory-built receivers! A matching Transmitter, 1 KW Linear Amplifier, and an All-Band SSB Transceiver will be available soon!

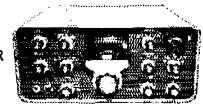
Kit SB-300....17 lbs.....no money dn., $25 mo..... **$264.95**
SBA-300-1 CW Crystal Filter (400 cps)....1 lb..... **$ 19.95**
SBA-300-2 AM Crystal Filter (3.75 kc)....1 lb..... **$ 19.95**

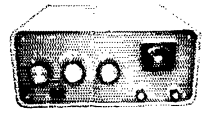
Check the superb specifications below and see what a tremendous dollar value the SB-300 represents!

Frequency Range (megacycles): 3.5 to 4.0, 7.0 to 7.5, 14.0 to 14.5, 21.0 to 21.5, 28.0 to 28.5, 28.5 to 29.0, 29.0 to 29.5, 29.5 to 30. **Intermediate frequency:** 3.395 megacycles. **Frequency stability:** 100 cps after warmup. **Visual dial accuracy:** Within 200 cps on all bands. **Electrical dial accuracy:** Within 400 cps on all bands. **Backlash:** No more than 50 cps. **Sensitivity:** Less than 1 microvolt for 15 db signal plus noise-to-noise ratio for SSB operation. **Modes of operation:** Switch selected: LSB, USB, CW, AM. **Selectivity:** SSB: 2.1 kc at 6 db down, 5.0 kc at 60 db down (crystal filter supplied). AM: 3.75 kc at 6 db down, 10 kc at 60 db down (crystal filter available as accessory). CW: 400 cps at 6 db down, 2.5 kc at 60 db down (crystal filter available as accessory). **Spurious response:** Image and IF rejection better than 50 db. Internal spurious signals below equivalent antenna input of 1 microvolt. **Audio response:** SSB: 350 to 2450 cps nominal at 6 db. AM: 200 to 3500 cps nominal at 6 db. CW: 800 to 1200 cps nominal at 6 db. **Antenna input impedance:** 50 ohms nominal. **Muting:** Open external ground at Mute socket. **Crystal calibrator:** 100 kc crystal. **Front panel controls:** Main tuning dial; function switch; mode switch; AGC switch; band switch; AF gain control; RF gain control; preselector; phone jack. **Rear apron connections:** Accessory power plug; HF antenna; VHF #1 antenna; VHF #2 antenna; mute; spare; anti-trip; 500 ohm; 8 ohm speaker; line cord socket; heterodyne oscillator output; LMO output; BFO output; VHF converter switch. **Tube complement:** (1) 6BZ6 RF amplifier; (1) 6AU8 First mixer; (1) 6AB4 Heterodyne oscillator; (1) 6AU6 1 M osc.; (1) 6AU6 second mixer; (2) 6BA6 IF amplifier; (1) 6AU6 Crystal calibrator; (1) 6HF8 1st audio, audio output; (1) 6AS11 Product detector, BFO, BFO amplifier. **Power supply:** Transformer operated with silicon diode rectifiers. **Power requirements:** 120 volts AC, 50/60 cps, 50 watts. **Dimensions:** 14-7/8" W x 6-5/8" H x 13-3/8" D.

WATCH FOR THESE NEW HEATHKIT RELEASES!

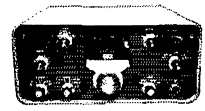
SB-100 ALL-BAND SSB TRANSCEIVER

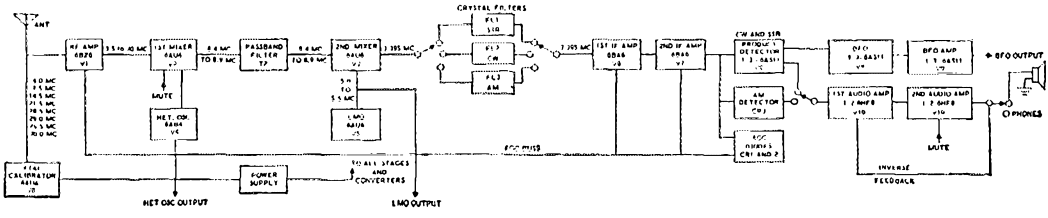




SB-200 1 KW LINEAR AMPLIFIER

SB-400 SSB TRANSMITTER





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pieces of formal traffic and 55 informals handled with 7 relays. Traffic: KØITP 112, WAØAAD 31, KØGGI 19, WAØAYL 15, WAØEWW 4, WØCZL 3, KØTYY 2, WAØDAR 1.

SOUTH DAKOTA—SCM, J. W. Sikorski, WØRRN —SEC: WØSCT. Newly-elected officers of the Sioux Falls, ARC are KØRSL, Beaver Creek, Minn., pres.; KØALC, Sioux Falls, vice-pres.; KØFKJ, Dell Rapids, secy.; WAØECK, Sioux Falls, treas. WØRSP had his OES and EC appointments endorsed for another year. KØBMQ resigned as RM after several years on the job. His successor has not been appointed. WAØAEC is a new net station at Yankton. I received four reports this month—just about a new low. Traffic: (Aug.) WØSCT 129, WØDVB 79, WAØAOY 77, KØGSY 35, WØZWL 25, KØVYY 24, KØBMQ 19, KØBSW 11, WØFJZ 8, KØTXW 7, KØCXL 6, WØIGG 6, KØYJF 6, KØZTV 6, WAØARZ 5, WAØDJE 5, WØYVF 5, KØZKJ 4, WAØAEC 3, WØOFP 3, WØZLS 3, KØAIE 2, WØGWW 2, KØKOY 2, WAØBMG 1. (July) WAØBMG 2.

MINNESOTA—SCM, Mrs. Helen Mejdrich, WØOPX —Asst. SCM: Emerson Mejdrich, WØRIQ. SEC: KØKKQ. RMs: KØZRD, KØIJU. PAMs: WØYHR, KØVPJ. MSSB PAM: WØHEN. Appointments issued are KØKNL as EC; KØJFJ as ORS. We are happy to announce that SEC KØKKQ has renewed his certificate and will continue his fine work. OO WØTIV continues active and reports 5 violations. KØRCF (OO, OBS, OES, ORS) reports inactivity, but finds time to cite 15 violations, build a 100-watt 2-meter amplifier, report on observations of Sporadic E, Tropispheric and H layer propagations on 2 and 6 meters, work 591 contacts in the recent CD Party and up his DXCC count to 119 countries. The Rochester Amateur Radio Club provided communications for an August Boy Scout Canoe Derby. Among those participating were KØUKU, WAØEWK, WAØ,WAØCCB, KØAKI and KØZIW. Aeronautical mobile KØEEQ worked KØEWA, KRO and PSI while flying over Northern Minnesota. New General WAØFCJ is working the bugs out of his v.f.o. and plans to add a buffer stage to his transmitter. Congratulations to OPS KØICG and his XYL, who recently celebrated their 50th wedding anniversary. KL7DMB and his XYL, KL7DLW, recently visited your SCM while mobiling in the area. KØFBB is now stationed in Arizona and is scheduling his friends evenings on 14315 kc. OBS WAØCQG now has his General and is very enthusiastic about the new 2-meter TVI filter. He reports formation of the Twin Cities V.H.F. Club—The North Star Hi-Banders. Your SCM and family thoroughly enjoyed the many ham picnics this past summer, meeting new friends and renewing old friendships. Congrats to BPLer WAØBYO! KØDAX is a Silent Key. Traffic: (Aug.) WAØARA 339, WAØBYO 206, KØIJU 150, KØIHD 81, WØATO 68, KØJFJ 67, WØOPX 56, KØUXQ 48, WØHEN 46, KØZRD 39, KØJFV 38, KØVPJ 37, WØKYG 35, WØUMX 33, WØYHR 27, WAØFQF 22, KØGPI 19, WØRIQ 19, WAØDGW 18, KØMIZ 17, KØSRK 17, WØBUO 16, KØIYJ 15, KØZKK 15, WØRQJ 14, WØALW 13, KØFTB 12, WAØDXV 11, KØFLT 11, WØMXC 10, WØRA 10, KØICG 8, KØIFS 8, WØRHM 8, WØTHY 8, WØEQO 7, WNØFNS 7, WAØABU 4, WAØASV 4, KØLWK 4, WAØDCJ 3, KØZRE 1. (July) WØKYG 51, KØRCF 34, WØRQJ 7.

DELTA DIVISION

ARKANSAS—SCM, Curtis R. Williams, W5DTR—SEC: W5KRO. PAM: K5SGG. RM: K5TYW. Two amateurs in the state have received their Amateur Extra Class licenses, K5TNM and W9PHR/5. WA5BBS is active on 75 meters in the Harrisburg area with his new General Class ticket. Amateurs in the Blytheville area are 100 per cent s.s.b. for General Class and higher. W9PHR/5 is our OBS making daily (except Sat.) transmissions on 3790 kc. at 1845 CST at about 13 w.p.m. Net reports for August:

Net	*Freq.*	*Time*	*Days*	*Sessions*	*QTC*	*QNI*	*Average*
AEFN	3885	0600C	M-Sat.	27	94	1114	41
OZK	3790	1900C	Daily	31	99	231	7

K5TCK and WA5EKA have returned to the U. of Arkansas. The Central Arkansas Radio Emergency Net set up an amateur radio booth at the Arkansas Sports-A-Rama. My special thanks to all net controls and alternates on the section nets. Start thinking about the 1964 Razorback Hamfest. The Arkansas V.H.F. Society met in Malvern for a dinner get-together on Sept. 8. I would like to cite WA5AVO and WA5EKA for high QNI on RN5. Arkansas was represented 100 per cent again in July on RN5. Congratulations to W9PHR/5 on making the BPL. K5EDH/5 has some new gear ordered. W5JWL is conducting some scatter experiments with a W1 on 2 meters. Anyone in the state interested in forming an s.s.b. net, please contact the Traffic: W9PHR/5 585, W5DTR/5 130, WA5EKA 129, WA5AVO 64, K5TYW 28, K5SGG 24, K5YEP 18, W5HPL 15, W5RYM 11, K5GKQ 8, K5TCK 5, W5DYL 4, W5FML 4, K5ICH 4, WA5CAG 3.

LOUISIANA—SCM, Thomas J. Morgavi, W5FMO—SEC: W5MXQ. RM: W5CEZ. PAM: W5CEW. Communications Department appointments have been renewed for W5MXQ, W5CEZ, K5CZV, W5UKQ, W5BUK, W5WYN, K5CTR and W5DNL. Check the expiration date on your appointment certificate and mail it to your SCM before it expires. K5MOJ got his 1st-class license with radar endorsement. The Springhill ARC put a float in the Annual Rodeo Parade this year and drew very favorable comment by operating a station on 20 meters as the float progressed down Main Street. K5ELM and W5ADE operated from home while K5QNK, W5SQO, K5WOD, WA5FRU and K5ELJ helped run the SR-150 and keep the antenna out of the traffic lights. W5JFB has been working maritime mobile in the Gulf of Mexico. K5KQG put up an inverted "V" K5WOD is busy homebrewing a 12"x15" radio shack. W5UKQ is very active on v.h.f. with skeds and perseids. The Jonesville Hamfest was a big success with about 300 attending. W5EA wrote to say he had a fine time. The passing of K5AGJ leaves a big hole in the amateur ranks. Paris was very active on the c.w. and s.s.b. nets handling traffic. His role in the Jefferson Amateur Radio Club was one of achievement. He will be sorely missed. The breaking up of Louisiana into three sections has the MARS group working like beavers. W5CEZ writes that the coordinators' job is going to take time. W5MXQ had a short stay in the hospital during August. W5CEW has 282 countries worked and confirmed. Traffic: W5CEZ 447, K5CKR 97, W5MXQ 42, K5CZV 40, K5QXV 26, W5EA 14, K5LZA 10, W5FMO 8, K5MOJ 6, W5NDV 6, K5FYI 4.

MISSISSIPPI—SCM, S. H. Hairston, W5EMM—Enjoyed visiting with old-timers such as W5BX, W5JR and W5OSA in Jackson. K5BWN was glad to get his award from the Keesler Club. Congratulations to WA5-EZQ on working that rare DX. Luck on the new venture, W5TRF. WN5FTC has moved from Bay St. Louis to Vicksburg and is ready for the General Class exam. K5RUO now has a new 15- and 20-meter quad and worked five new countries in no time. W5WZ is interested in forming a Mississippi Single Sideband Net for traffic handling. Contact him or me if you would like to join. WA5CAC has had good luck working on DXCC with only 75 watts. WN5GAL has a new SX-101. Both of K5GAD's transmitters went out together, but he's back on the air now. K5KSK is now driving a kw. linear with his DX-40. Mississippi Section Net certificates were issued to K5YTA, W5WZ, WA5EKA and W5JDF. Anyone knowing the address of W4CJD/7, formerly W5CJD/5, please notify W5JDF. W5JHS is back calling the Gulf Coast Side Band Net after a Texas vacation. Traffic: W5JDF 163, W5WZ 119, WA5CAC 8, K5GAD 7, K5RUO 6, K5DZE 5.

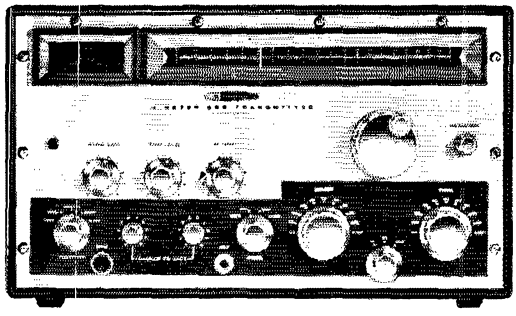
TENNESSEE—SCM, David C. Goggio, W4OGG—SEC: W4WBK. RMs: W4OQG and W4ZJY. PAMs: W4RMJ, K4WWQ and WA4AIS. New appointments: W4-RMJ as PAM for TPN, K4ZTT as OO. W4ZJY reports August RN5 traffic as 1040 with Tennessee QNI 92 per cent. August section net reports.

Net	*Freq.*	*Time*	*Days*	*Sessions*	*QTC*	*QNI*	*Average*
ETPN	3980	0640E	M-Fri	22	37	386	17
TSSN	3980	1830C	M-Sat	27	49	791	29
TPN	3980	0645C	Daily	31	235	923	30
TN	3635	1900C	M-Sat	26	80	164	6

Congratulations to the RAC of Knoxville on the success of its radio school. The Oak Ridge ROC already is making plans for next year's Field Day and the June V.H.F. QSO Party. Hamfests: The Frye ARC picnic and auction attracted 100. The W4PJV picnic at Beechgrove for the Tennessee Phone Net was attended by 28 net members. W4VJW says 54 amateurs registered for the Cedars of Lebanon Picnic. The Delta RC had 152 amateurs registered from 5 states. *Coming Events*: Nov. 9 and 16 Sweepstakes contest-Last year we had only 13 c.w. and 4 phone entries. All amateurs are eligible whether able to operate 1 hour or 40. The Delta Div. Convention, Nov. 29, Lafayette, La., promises a fine program. TSSN winners of ARRL certificates: W4s AEE, BVP, CAT, CBN, CSX, CVG, CZE, DRI, EKA, HDG, HHQ, HID, IWV, KKR, PFP, RMJ, SFF, TVJ, WBK, WBY, WXN. K4s, CMZ, EWI, NRZ, PKM, WUH, WA4s, AVX, BXH, BWW, CRH, GBA, GOL, HZP and IHG. All appointees: It is essential to report your monthly activities to keep your appointment. ECs should submit Form 5 to the SEC before the 1st of the month. Traffic: W4PQP 312, W4ZJY 273, W4RMJ 245, W4MXF 170, W4OGG 132, K4WWQ 82, K4OUK 57, W4-

(*Continued on page 106*)

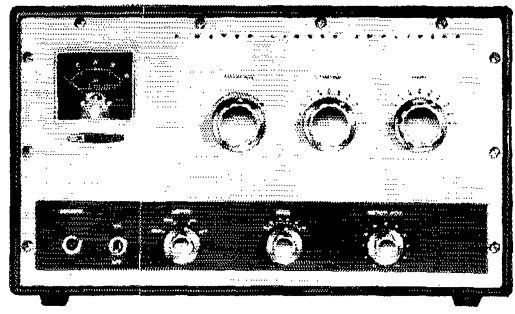
the most SSB on SIX comes from HEATHKIT!



HX-30 6-METER SSB TRANSMITTER

Most of the SSB signals on 6 meters today emanate from Heathkit HX-30's because of the extra value, quality, and features this fine transmitter offers. The versatile HX-30 provides three types of transmission, SSB (upper/lower sideband), AM & CW. Its stable VFO with special anti-backlash helical gear drive assures velvet-smooth tuning and a phasing type SSB generator plus heterodyne circuitry permits operation as clean as any low band unit. An audio filter limits bandpass for improved sideband suppression...gives your signal extra "punch" and readability under adverse conditions. Other features include grid-block keying with key click filter, two crystal positions for net or MARS operation, push-to-talk circuitry and built-in VOX with anti-trip circuitry. Delivers 10 watts P.E.P. RF output to antenna. Covers 50-54 mc in four 1 mc segments. Order your HX-30 now and save with Heathkit!

Kit HX-30...46 lbs....no money dn., $18 mo. **$189.95**



HA-20 6-METER LINEAR AMPLIFIER

A perfect style and performance mate for the Heathkit HX-30 SSB Transmitter! The HA-20 Linear Amplifier provides the extra power you need for reliable communications during band openings. Efficient design requires just 2.5 to 10 watts P.E.P. driving power for a full 70-watts P.E.P. output to the antenna. Its tuned-grid input permits a variety of drive power levels and the tuned, link-coupled output easily matches any 50 to 75 ohm coaxial transmission line. Complete RF shielding minimizes TV interference and adds high circuit stability for consistently fine performance. The push-pull 6146 final amplifiers are neutralized for maximum stability and fan forced-air cooled for long tube life. Panel metering of final grid current, plate current, and relative power output is also featured. Order these two fine rigs now or add the linear at any time for extra power on six!

Kit HA-20...38 lbs....no money dn., $10 mo. **$99.95**

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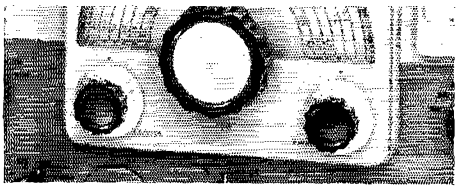
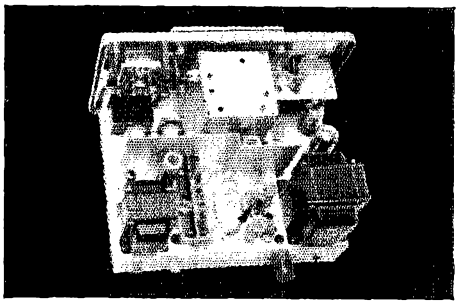




EASY TUNING

Basic tuning controls are located on the VFO dial escutcheon—QSY within the phone or CW portion of a band is usually possible by merely changing the VFO frequency setting.

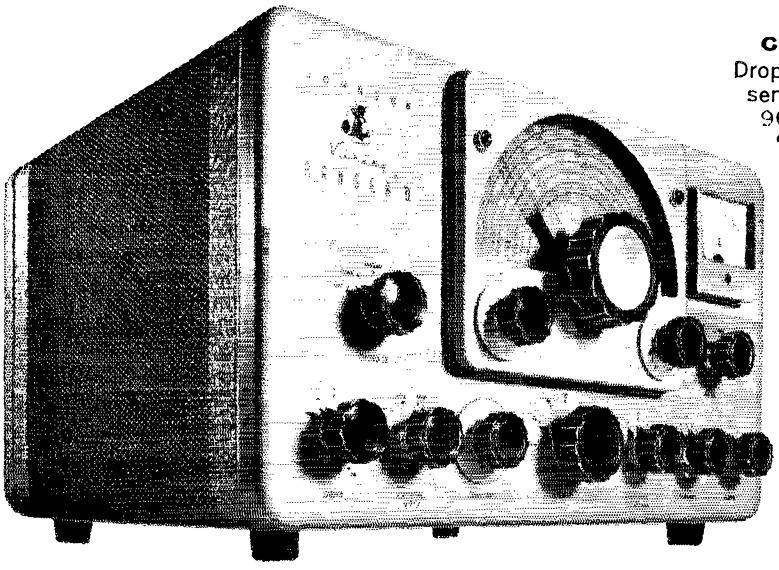
FEATURES

Built-in temperature compensated, extremely stable VFO—separate, calibrated bandspread dial scales for all 7 bands—highly efficient pi-network tank circuit—flexible, timed sequence keying system—self-contained power supplies—effectively TVI suppressed!

Some may call it "ancient modulation", some simply call it AM phone—but whatever you call it, AM still represents a major portion of today's amateur activity—and the "Ranger II" is one of today's most popular AM rigs! For AM or CW operation, for 160 through 6 meters—the "Ranger II" offers the "biggest-little" 75 watts you'll find on the air! Rated at 75 watts CW and 65 watts high-level AM, the "Ranger II" delivers communications quality audio with the necessary punch to break through today's QRM! An excellent "first" transmitter for the Novice or the new General, the "Ranger II" will drive any of the popular kilowatt level tubes and will provide a high quality speech driver system for high powered modulators without modification! What else? The "Ranger II" offers attractive styling in a compact cabinet and is available at a reasonable price.

RANGER II

Cat. No. 240-162-1..."Ranger II" Kit ... **Net $249.50**
Cat. No. 240-162-2..."Ranger II" Wired **Net $359.50**

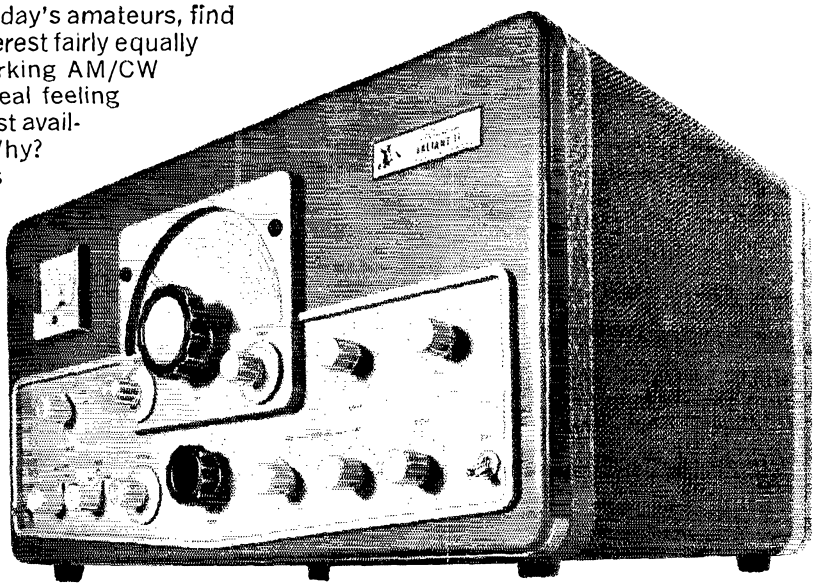


COMPLETE CATALOG

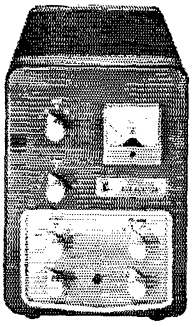
Drop us a card and we will send you Amateur Catalog 962 which gives the full "Ranger II" story, as well as detailed information on our complete line of amateur transmitters and accessories.

If you, like many of today's amateurs, find yourself with your interest fairly equally divided between working AM/CW and SSB, there's a real feeling of frustration with most available equipment. Why? Because most AM rigs require extensive modification to operate SSB—and no SSB rig offers high level AM and Class "C" CW—and the end result is compromise in one mode or the other!

Not so with the Viking SSB Adapter/Valiant II combination, for here's the package that gives you 275 watts CW and SSB plus 200 watts high level AM phone! Now, keep your contacts and work old friends no matter what portion of the band they are operating in, and no matter what mode they are using—and do it with maximum punch!



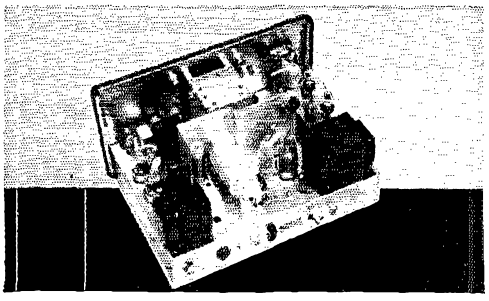
VALIANT II SSB ADAPTER



SSB ADAPTER

Filter-type SSB generator—bandswitching 80 through 10 meters—more than 50 db sideband suppression—more than 45 db carrier suppression. Features built-in multiplier requiring VFO input only—design and front panel make operating practically foolproof!

Cat. No. 240-305-2 . . . Wired, tested . . . Net $369.50



VALIANT II

Outstanding flexibility and performance in a compact desk-top rig! Bandswitching 160 through 10 meters—275 watts input CW or SSB (with Viking SSB Adapter) and 200 watts AM!

Cat. No. 240-105-1 . . . . . Kit . . . . . Net $375.00
Cat. No. 240-105-2 . . . . . Wired . . . . Net $495.00

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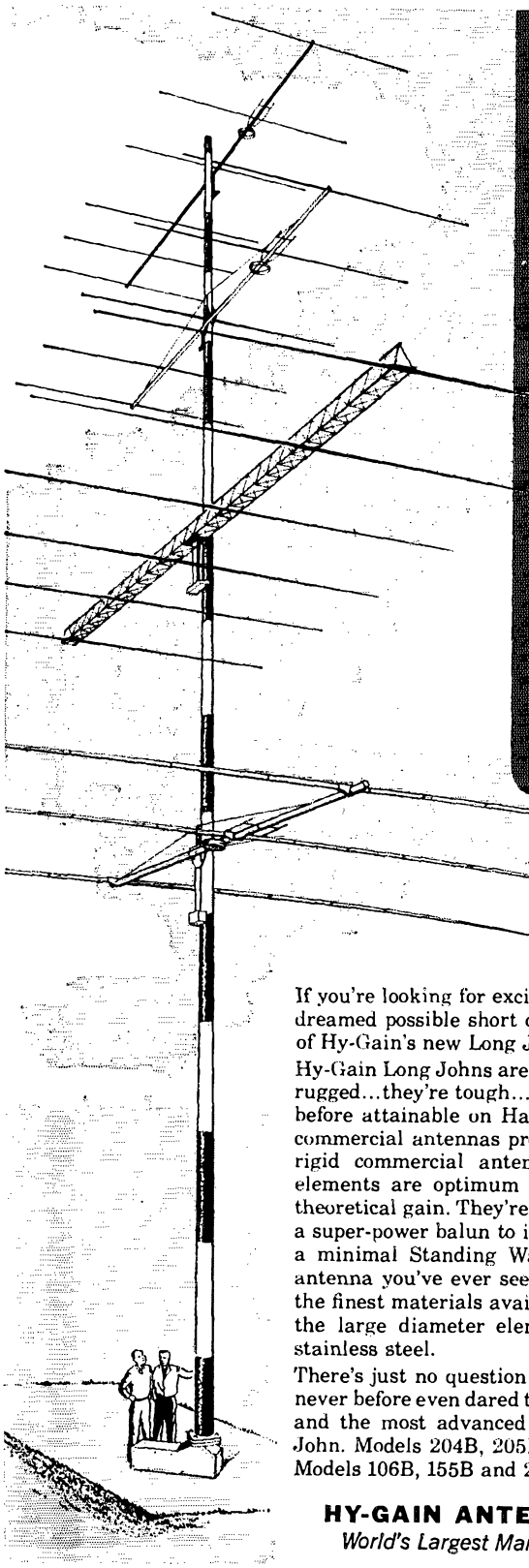

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Commercial Antennas for Ham HF Bands

If you're looking for exciting new adventures in DX...adventures you never dreamed possible short of bouncing a signal off of Telstar...you'll want one of Hy-Gain's new Long John HF Beams.

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There's just no question about it...if you're looking for performance you've never before even dared to dream about combined with master craftsmanship and the most advanced technological skill...you'll want a Hy-Gain Long John. Models 204B, 205B and 403B are available for immediate shipment. Models 106B, 155B and 206B will be available for delivery in December.

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World's Largest Manufacturer of HF Communications Antennas

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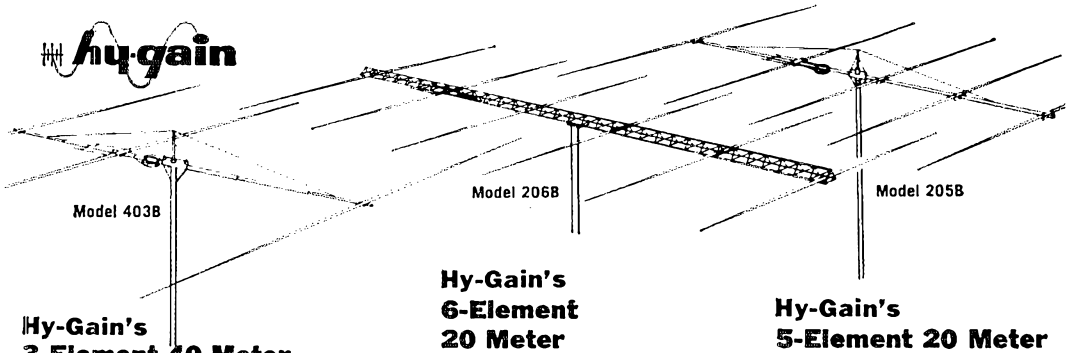


Hy-Gain's 3-Element 40 Meter LONG JOHN

$1190 Ham Net

Electrical:

Gain*	
Front-to-Back Ratio	20-25db
VSWR (at resonance)	1.2:1
Impedance	50 ohms
Power Handling Capability	5 KW AM; 10 KW PEP

Mechanical:

Longest Element	73 ft.
Element Diameter	2½ in.
Boom Length	47 ft.
Turning Radius	40 ft.
Boom Diameter	4 in.
Maximum Wind Survival	100 mph
Wind Load (at 100 mph)	800 lbs.
Total Wind Surface Area	25.6 sq. ft.
Net Weight	350 lbs.

Hy-Gain's 6-Element 20 Meter LONG JOHN

$790.00 Ham Net

SPECIFICATIONS

Electrical:

Gain*	
Front-To-Back Ratio	20-25db
VSWR (at resonance)	1.2:1
Impedance	50 ohms
Power Handling Capability	5 KW AM; 10 KW PEP

Mechanical:

Longest Element	38 ft.
Element Diameter	1½ in.
Boom Length	64 ft.
Turning Radius	36.5 ft.
Boom Diameter	18" Tower Construction Type
Maximum Wind Survival	100 mph
Wind Load (at 100 mph)	1080 lbs.
Total Wind Surface Area	42.4 sq. ft.
Net Weight	330 lbs.

Hy-Gain's 5-Element 20 Meter LONG JOHN

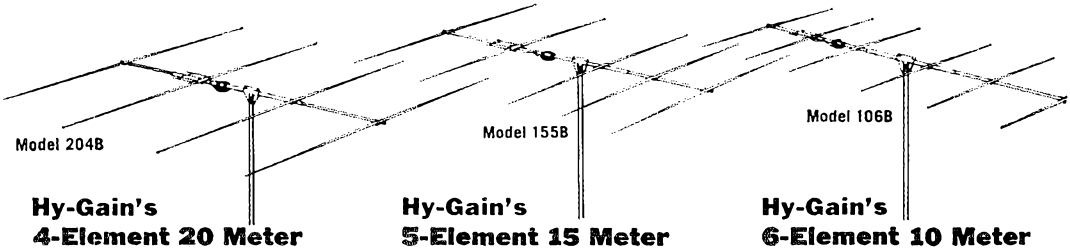
$575.00 Ham Net

Electrical:

Gain*	
Front-to-Back Ratio	20-25db
VSWR (at resonance)	1.2:1
Impedance	50 ohms
Power Handling Capability	5 KW AM; 10 KW PEP

Mechanical:

Longest Element	38 ft.
Element Diameter	1½ in.
Boom Length	46 ft.
Turning Radius	30 ft.
Boom Diameter	4 in.
Maximum Wind Survival	100 mph
Wind Load (at 100 mph)	550 lbs.
Total Wind Surface Area	18.1 sq. ft.
Net Weight	190 lbs.



Hy-Gain's 4-Element 20 Meter LONG JOHN

$350.00 Ham Net

Electrical:

Gain*	
Front-to-Back Ratio	20-25db
VSWR (at resonance)	1.2:1
Impedance	50 ohms
Power Handling Capability	5 KW AM; 10 KW PEP

Mechanical:

Longest Element	38 ft.
Element Diameter	1½ in.
Boom Length	31 ft.
Turning Radius	24 ft.
Boom Diameter	4 in.
Maximum Wind Survival	100 mph
Wind Load (at 100 mph)	360 lbs.
Total Wind Surface Area	12.8 sq. ft.
Net Weight	116 lbs.

Hy-Gain's 5-Element 15 Meter LONG JOHN

$390.00 Ham Net

SPECIFICATIONS

Electrical:

Gain*	
Front-to-Back Ratio	20-25db
VSWR (at resonance)	1.2:1
Impedance	50 ohms
Power Handling Capability	5 KW AM; 10 KW PEP

Mechanical:

Longest Element	25 ft.
Element Diameter	1¼ in.
Boom Length	32 ft.
Turning Radius	21 ft.
Boom Diameter	3 in.
Maximum Wind Survival	100 mph
Wind Load (at 100 mph)	340 lbs.
Total Wind Surface Area	11.2 sq. ft.
Net Weight	125 lbs.

Hy-Gain's 6-Element 10 Meter LONG JOHN

$350.00 Ham Net

Electrical:

Gain*	
Front-to-Back Ratio	20-25db
VSWR (at resonance)	1.2:1
Impedance	50 ohms
Power Handling Capability	5 KW AM; 10 KW PEP

Mechanical:

Longest Element	18 ft.
Element Diameter	1¼ in.
Boom Length	36 ft.
Turning Radius	20 ft.
Boom Diameter	3 in.
Maximum Wind Survival	100 mph
Wind Load (at 100 mph)	160 lbs.
Total Wind Surface Area	5.28 sq. ft.
Net Weight	100 lbs.

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OQG 56, W4VTS 56, K4JXG 42, W4PFP 39, WA4HRG 38, W4KAT 31, K4RIN 31, W4WBK 30, W4LLJ 20, W4ZAC 17, W4CYG 16, K4CPC 13, W4PJV 13, W4TYV 13, WA4GLS 12, WA4AIS 11, WA4AWG 11, K4HRY 11, W4HPN 9, WA4DBG 8, WA4HIG 8, K4MIF 8, K4NRZ 8, W4JVM 7, W4TZJ 7, K4RUC 6, W4VFL 6, W4VNU 6, W4UIO 5, WA4CRH 4, WA4EHY 4, WA4LAX 4, WA4FDR 2, WA4HRX 2, K4RQP 2, W4SGI 2, K4STR 1.

GREAT LAKES DIVISION

KENTUCKY— SCM, Mrs. Patricia C. Schafer, K4QIO—SEC: W4TFK. PAMs: W4SZB, K4ECJ, W4BEJ. V.H.F. PAM: K4LOA. RM: W4CDA. Asst. RM: K4NYO. RM (KNN): WA4APU.

Net	Freq.	Time	Days	Sessions	QTC	QNI	Average
EMKPN	3960	0630E	M-F	22	50	309	6
MKPN	3960	0830E	Daily	31	45	509	13
KPN	3960	1930E	M-F	22	83	509	23

W4JUI is building a fixed multi-element 20-meter beam for schedules with K4HTO/6 in Los Angeles. W4BTA has increased his station's efficiency with two new antennas and a Matchbox. WA4CQG reports several band openings on 50 Mc. with most activity to 1,2,4 and 5/Cincinnati heard Q5 most nights. He will build a five-element 2-meter beam for the next V.H.F. Contest. W4BAZ and WA4CQG have started a 6-meter net. Contact them. The Henderson Amateur Radio Club is building a club house. Code practice still is held on four v.h.f. bands. K4NHY, W4BEJ, WA4APU and K4NLY were 100 per cent in checking in EMKPN. K4ZIQ is back on the air with an SX-42. Look for K4VDN, back at Purdue as K9HLU/9. W4ISF is experimenting with "Junk Box" for 6-meter transmitter and converter designed to put good, cheap, strong signals on 6 meters using a 2E26 final and a 6U8 6BQ6 converter. Traffic: W4BYG 507, K4VDN 140, W4RHZ 114, WA4LCH 85, W4BAZ 76, W4CDA 47, K4TQZ 42, W4BEJ 38, K4QIO 35, K4VDO 34, W4USE 32, WA4APU 28, K4LOA 22, W4BTA 20, W4EON 20, W4QCD 20, W4BEW 16, WA4CQD 16, K4YZU 14, K4NHY 11, W4ISF 10, W4SZB 9, WA4GFN 8, K4SWL 8, W4YYI 8, K4HOE 7, WA4JQR 5, W4KJP 5, W4JUI 4, K4NLY 4.

MICHIGAN—SCM, Ralph P. Thetreau, W8FX—SEC: W8LOX. RMs: W8EGI, W8IXJ, W8FWQ, K8KMQ. PAMs: W8CQU, K8LQA. V.H.F. PAM: W8PT. Appointments: WA8ASK as EC; K8KMQ and W8RTN as ORSs; W8EMD as Class I OO; W8AAM as OPS; W8EMD, W8MBM, WA8JJH and K8PBA as OESs. The Muskegon Area ARC has resumed publication of *"Flashovers"*. WA8GCW passed the General Class exam and is now operating KG6FAE on Guam, looking to give Novices DX contacts on 15 meters. W8APN reports: W8UCG is back from the hospital. K8CCG and K8OOK from military duty and K8TDT has a 400-ft "V" beam. QMNer K8TDJ now edits GRARA's *QRM*. The Kent RC and GRARA teamed up to beat the Muskegon RC's FD score. K8RQO now is in France with the Air Force. K8EXG, hospitalized in July, is OK now and has a new SX-117. K8JTU made General. K8VDA and K8GOU made the BPL on s.s.b. K8VAY worked WA9BBB, then WA9EEE right after. K8GJD has started his junior year at the U. of M. Did you hear about the ham who was putting up a new tower, when his next-door neighbor, a little girl, saw it and said, "Does your Erector set work better now?" This from GRARAs *QRM*. W8PT has worked 7 states, 4 call areas, 310 miles on 432 Mc. K8PBA worked 176 stations, 8 states, in 59 counties in 24 hours on 2 meters. K8HNW is out of the hospital and o.k. WA8CXG and WA8CXF are a husband-and-wife team in Ann Arbor. Calhoun Co. ARC, W8MIF, bought a 15-kw. Krohler a.c. generator for the club. W8WVL has another jr. operator. This makes 3 QRM generators, he says. W8IWF still is transmitter hunting and DXing. K8QLL is tied up in the CAP. The SVARA is sponsoring License Preparation Courses. WA8JTM made General. WA8ANO is off the air; lightning messed his station up. The Metropolitan Ragchewers Club meets the 1st Sun. of each month at Lakewood House, foot of Lakewood at 3 p.m. with the accent on helping the handicapped to obtain radio licenses. W8ZGW has worked 12 states, 6 sections, 650 miles, on 144 Mc. so far. Traffic: (Aug.) K8VDA 402, K8NJW 348, K8GOU 313, WA8DZP 210, W8QFO 178, K8BYX 155, K8KMQ 131, K8YAY 85, W8REZ 69, W8ELW 69, WA8ENO 55, W8RTN 49, WA8ASV 48, W8FWQ 48, K8VCB 41, WA8DNZ 40, WA8CXF 30, W8FX 26, K8TIG 21, W8IHKT 19, W8DSE 18, K8LNE 17, W8ZHB 16, W8AUD 15, VE3CYG/W8 13, W8EU 12, W8UFS 11, WA8CXG 10, K8TFE 10, K8JED 8, K8HLR 6, K8QLL 6, W8NJM 4, K8GJD 3, W8TBP 3, W8IWF 2. (July) W8CQU 48, WA8CXF 37, K8QLL 16, VE3CYG/W8 8.

OHIO—SCM, Wilson E. Weckel, W8AL—Asst. SCM: J. C. Erickson, W8DAE. SEC: W8HNP. RMs: W8BZX, W8DAE, W8IEP and K8ONQ. PAMs: W8VZ, K8BAP and K8CBK. WA8AEY received his General Class license. W8HFK has a new RME V.H.F. 602; WA8AJZ an HTH-150 and CAA and QCWA awards. Your SCM attended the Warren ARA's hamfest at Newton Falls, along with more than 1000 of which about 800 were amateurs. Prizes were a Drake TR3 won by W8TAE, a Clegg 99 with National V.F.O. by W8PWI, a Mosely receiver with speaker by K3TRN, a Hallicrafters HA-5 by Les Lake of Madison, Wisc., and a Hallicrafter's S-118 by W8IJW. The proceeds from the hamfest bought the club a 2-meter transceiver so any Trumbull County amateur who is hospitalized will have a station on the air. The Greater Cincinnati ARA's *The Mike & Key* is full of news on the coming hamfest but informs us that the club saw two films and that W8NIDN is home from the hospital. Queen City Emergency Net's *The Listening Post* states the organization's annual picnic was held. Parma RC's *P.R.C. Bulletin* tells us the club saw Ohio Bell films "Seconds for Survival" and "Solar Batteries." The Cleveland AREC and the Cleveland Area of ARC held picnics. K8BXT sends news that W8PTQ moved to California; WA8EEH has a new Valiant; K8ORG is mobile on 80 meters with a Swan; K8ZAB has a new NCX-3; K8DAS has a new TR-3 and K8BXT is mobile on 80-40-20 meters with a new NCX-3. W8WYS is now K7YUN in Arizona. K8ONQ adopted a baby boy. K8LGA and K8LGB are now publishing the *Buckeye Net Bulletin*. Canton ARC's *Feedline* tells us the association held its annual picnic; W8KYR returned to Canton after three years at school; WA8GMY and WA8HCL are new hams in Massillon; K8OBW and K8VKT have a new HQ-170A; K8JZN vacationed in Florida and W8ASN, W8EJL, W8OYV, W8RAS, K8QZL, WA8DRT and WA8EEX have new HE-50As and are mobile on 10 meters. Findlay RC's *W8WT News* has a very interesting informative discussion on the talk of license changes written by W8WE a few days before he became a Silent Key. WN8JZP is a new ham in Grove City. Toledo's *Ham Shack Gossip* names W8LNV as its Ham of the Month and tells us the Toledo Mobile RA held its annual picnic; W8HYW is in the hospital and K8VKD was on vacation. K8VGL received his General Class license. K8TUO has been appointed OBS. Those who made the BPL in August were W8DAE, W8UPH and K8AAG. Warren ARA's *Q-Match* informs us that W8RQ spoke of his DX experience with c.w. gear and rhombic and long-wire antennas; W8HSP discussed his DXing and W8PTQ toured the West Coast mobile on 10 and 6 meters. Six Meter Nomad's *The Amateur Extra* states that W8VAJ and K8IGD returned from a trip to Buffalo and Niagara Falls and that a recent wind storm in Parma Heights toppled the beams of K8VGF. K8VIL and WA8GFV. WA8BZR received his 25-w.p.m. CP award. The Hammarlund Mfg. Co. sponsored a DXpedition with K8ITH, K8EJN and K8YOM operating from Carter, Elliot, Morgan, Menifee, Powell, Lee, Owsley, Breathitt and Martin Counties in Kentucky, Bland, Craig, Bath and Highland in Virginia and Greenbrier and Pocahontas in West Virginia. They averaged between 90 and 200 contacts per county with a total around 2000. The Eastshore V.H.F. Radio Club reports that WA8EYG has a new Drake 2B and W8WTI a new Johnson Challenger. Traffic: (Aug.) W8UPH 1204, W8DAE 518, K8LGA 332, K8DKU 263, K8DIU 253, K8AAG 249, W8MIGA 161, W8GRG 143, WA8BXY 134 W8BZX 125, WA8BOV 113, WA8AJZ 111, WA8BZR 97, K8RXD 80, K8UBK 62, K8HDO 61, K8LGB 56, K8ONQ 54, W8QCU 51, W8AZF 42, W8AL 38, K4LFF/K8BDT 33, W8CXM 31, WA8BXN 27, K8VWN 27, K8ZBN 22, W8DQD 21, W8YGR 14, K8DDG 13, K8VGL 12, K8PCL 8, K8PJH 8, WA8ALS 7, W8LZE 7, K8BFU 7, K8YML 6, WA8EEW 4, K8ZJG 4, W8DIH 3. (July) WA8AJZ 155, WA8BZR 102, WA8AEY 5. (June) K8VGL 333, K8PCL 5. (May) K8PCL 20.

HUDSON DIVISION

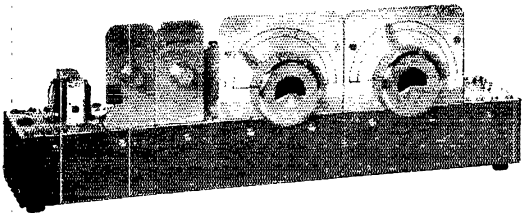
EASTERN NEW YORK—SCM, George W. Tracy, W2EFU—SEC: W2KGC. RMs: W2PHX and K2QJL. PAM: W2IJG. Section Nets: NYS on 3670 kc. nightly at 0000 GMT; NYSPTEN on 3925 kc. nightly at 2300 GMT; ESS on 3590 kc. nightly at 2300 GMT; MHT (Novice) on 3716 kc. Sat. at 1800 GMT. Inter-club on 28,690 kc. Mon. at 0120 GMT; Emergency Coordinators on 146.550 kc. Fri. at 0015 GMT. Endorsements: K2UTV as OBS and ORS, K2DEM as OO and OPS. Congrats to WA2VYS on making her second BPL in August. K1LYL is a new resident of Poughkeepsie. Welcome. K2CBA received the "Worked All Conn." award. K2KRK, of Forest Hills, is attending R.P.I. Traffic-handler K2UTV is now active from Eastchester. K2DEM returned to Yale Law School. New officers of the Westchester ARA include W2AMK, pres.; WA2NRV, vice-pres.; K2ZVI,

(*Continued on page 110*)

EXPERIMENTER, SWL or RADIO AMATEUR

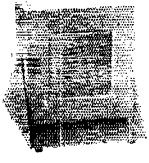
Select your receiver, transmitter, or VFO from easy-to-build International AOC kits.

Simple step-by-step instructions show you how to assemble factory prewired units. Designed for top performance at a low cost!



RECEIVER KITS

This new line of International receiver kits cover a wide range of amateur, citizens band and special frequencies. Designed for AM, CW, or SSB reception, this basic receiver using a superheterodyne circuit* with regenerative second detector may be expanded to a more elaborate receiver by the addition of other Add-On-Circuits. Sensitivity usable to below 10 microvolts for voice and 1 microvolt for code. Nuvistor rf amplifier, mixer, oscillator, I.F. transformer, detector/1st audio, and power audio amplifier. Tube lineup: 6DS4 nuvistor, 6BE6, 6U8, 6AQ5. Shipping weight: 15 lbs.



Receiver kit includes 4" speaker and power supply.

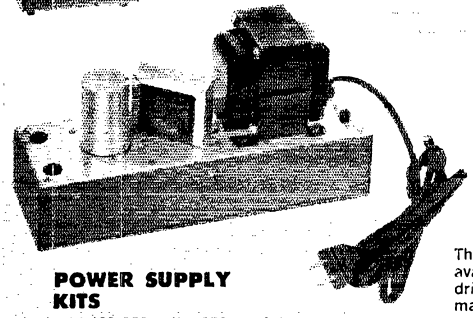
Kit	Frequency	Price
AOR-40	Special	$69.00
AOR-41	150 kc — 450 kc	62.50
AOR-42	2 mc — 6 mc	62.50
AOR-43	6 mc — 18 mc	62.50
AOR-44	80 meter/40 meter	62.50
AOR-45	15 meter/10 meter	62.50
AOR-46	6 meter	66.50
AOR-47	2 meter	66.50
AOR-48	Citizens 27 mc	62.50

*AOR-41 uses a tuned rf circuit with 6BA6

TRANSMITTER KIT

A compact package delivering a plate input of 50 watts for CW operation on 80 or 40 meters. 12BY7 crystal oscillator—6DQ6 power amplifier. Pi-network final. When used with AOR-44 receiver, transmitter operates from receiver power supply. Meter and TR switch.

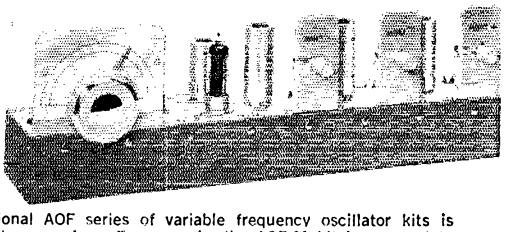
AOT-50 transmitter kit less power supply and key, but with one 40 meter novice band crystal. Shipping weight: 5 lbs. **$35.00**



POWER SUPPLY KITS

AOP-100 350 volts, 150 ma intermittent or 100 ma continuous service, 6.3 volts @ 5 amps. Shipping weight: 8 lbs. **$18.50**

AOP-200 650 volts, 250 ma intermittent or 200 ma continuous service, 6.3 volts @ 10 amps. Shipping weight: 10 lbs. **$32.50**



VFO KITS

The International AOF series of variable frequency oscillator kits is available in three versions. For example, the AOF-91 kit is a complete driver unit to be used with 6 meter and 2 meter transmitters. Approximately .5 watt of power is available on both bands. Tube lineup: 6BH6 oscillator, OB-2 voltage regulator, 12BY7 buffer-amplifier/multiplier. Shipping weight: 5 lbs.

Kit	Frequency	Price
AOF-89	VFO 8 mc — 9 mc and buffer	$22.00
AOF-90	VFO 8 mc — 9 mc plus buffer multiplier and 6 meter output	29.00
AOF-91	VFO 8 mc — 9 mc plus buffer multiplier, 6 meter/2 meter output	36.00

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IS DECIDED IN THE MARKET PLACE, BY PUBLIC CHOICE. AN ANTENNA THAT SURVIVES THE COMPETITIVE STRUGGLE CONTINUES TO BE ADVERTISED. THE FREAKS, EXPERIMENTS, AND REJECTS DISAPPEAR FROM VIEW.

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WHAT DOES THIS PROVE? THAT GOTHAM DESIGN, GOTHAM PERFORMANCE, GOTHAM MATERIALS, GOTHAM PRICE AND GOTHAM SERVICE ARE WHAT HAMS WANT.

GOTHAM VERTICALS DELIVER THE CONTACTS

THE ULTIMATE PROOF OF THE FINE PERFORMANCE OF THE GOTHAM VERTICAL ANTENNAS IS IN THE ACTUAL FIELD RESULTS, BY HAMS ALL OVER THE WORLD.

PROVEN! PROVEN! BY THESE EXCERPTS FROM UNSOLICITED TESTIMONIALS:

CASE HISTORY #71

"I am very delighted with the first V80 and want another for a different location." A. C., California.

CASE HISTORY #159

"I ordered a Gotham V40 Vertical Antenna and found it so successful that several others are wanting them, too. Will you please send me four more." W. A., Alaska.

CASE HISTORY #248

"I just wanted to let you know how pleased I am with my Gotham V80 antenna. I have worked a W.A.S. of 46/43, a WAC of 3/3, and DXCC of 14/12 in about 12 months." G. W., Maryland.

CASE HISTORY #111

"The V160 did a beautiful job on a VE1 for me. Also, I forgot to take it down during the hurricane of last week. It is just as straight as it was when I bought it." D. S., New Jersey.

CASE HISTORY #613

"I have never been happier with any antenna than I have been with the V80. I have worked all bands with it and have had tremendous success — i.e., DL4s, ZS3, etc., all solid copy." R. D. S., Penna.

CASE HISTORY #483

"My V80 is working wonders. I am able to maintain a 1:1 SWR all across the 40 meter band. After many years on 10, 15, and 20, the XYL and I are getting great kicks out of some of the lower bands." J. A., New Mexico.

CASE HISTORY #146

"I have had very good luck with mine (my V80) feeding it with a Johnson Adventurer; works fine on all bands." B. I., Nebraska.

CASE HISTORY #555

"Being an owner of your V80 vertical I would like to let you know of the excellent results I am getting with it, both working the DX and the local stations on the lower bands. It certainly is an excellent antenna system." F. H. Jr., New York.

CASE HISTORY #84

"A few months ago I purchased your V40 vertical and have achieved outstanding results on the air." K. G. B., North Carolina.

BEAMS

Rugged Yagi design, full half-wave, Gamma-matched

2 Meter, 12 Element	$24.95
6 Meter, 4 Element	25.95
10 Meter, 4 El., #R10	40.95
15 Meter, 3 El., #R15	49.95
20 Meter, 3 El., Deluxe	59.95
15-20 Two-Bander	49.95
10-15-20 Tribander	59.95

FREE CATALOG

WHY

THE GOTHAM VERTICAL ANTENNA IS THE BEST ALL-BAND ANTENNA

- Absolutely no guying needed.
- Radials not required.
- Only a few square inches of space needed.
- Four metal mounting straps furnished.
- Special B & W loading coil furnished.
- Every vertical is complete, ready for use.
- Mount it at any convenient height.
- No relays, traps, or gadgets used.
- Accepted design—in use for many years.
- Many thousands in use the world over.
- Simple assembly, quick installation.
- Non-corrosive aluminum used exclusively.
- Multi-band, V80 works 80, 40, 20, 15, 10, 6.
- Ideal for novices, but will handle a Kw.
- Will work with any receiver and xmitter.
- Overall height 23 feet.
- Uses one 52 ohm coax line.
- An effective modern antenna, with amazing performance. Your best bet for a lifetime antenna at an economical price.

73.
GOTHAM

DO YOU KNOW

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3. EVERY GOTHAM ANTENNA IS SOLD ON A TEN DAY TRIAL BASIS. IF YOU ARE NOT FULLY SATISFIED, YOU MAY RETURN THE ANTENNA PREPAID FOR FULL REFUND OF THE PURCHASE PRICE. THIS IS YOUR GUARANTEE OF FULL SATISFACTION.

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Enclosed find check or money-order for:

☐ V40 VERTICAL ANTENNA FOR 40, 20, 15, 10 AND 6 METER BANDS..... $14.95

THE V40 IS ALSO MADE FOR CITIZENS BAND OPERATION, WITH SPECIAL INSTRUCTIONS. DESIGNATE CB-11 ANTENNA. PRICE SAME AS THE V40

☐ V80 VERTICAL ANTENNA FOR 80, 40, 20, 15, 10 AND 6 METER BANDS. MOST POPULAR OF THE VERTICALS. USED BY THOUSANDS OF NOVICES, TECHNICIANS, AND GENERAL LICENSE HAMS... $16.95

☐ V160 VERTICAL ANTENNA FOR 160, 80, 40, 20, 15, 10 AND 6 METER BANDS. SAME AS THE OTHER VERTICAL ANTENNAS, EXCEPT THAT A LARGER LOADING COIL PERMITS OPERATION ON THE 160 METER BAND ALSO..... $18.95

HOW TO ORDER. Send check or money order directly to Gotham. Immediate shipment by Railway Express, charges collect. Foreign orders accepted.

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Address.....

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

secy.; K2CIJ, treas.; W2KUV, W2KKH and K2SJO, directors. August picnics were held by the Schenectady Club at Sacandaga Lake and by the NYSPTEN and ESS Nets at Thatcher State Park in Albany County. Large crowds were reported by all groups. The new Westchester County AREC Net, on 146,556 kc. each Fri. at 2015, EDT, reports 22 active members. The "Earlton Gang" has a unique combined QSL card with five calls. Nice idea. W2THE is representing N.Y. State on the Region 1 RACES Command Net each Thurs. WB2ACI is a new Technician in Greenville. WA2IRK worked five new states for a total of 45/39. The Rip Van Winkle Club Picnic was held at North Lake State Park. Traffic: WA2VYS 655, WA2UZK 296, WB2FZC 223, WA2HGB 168, WA2PUM 82, WA2TJX 75, W2PKY 65, W2THE 44, W2EFU 43, K2SJN 34, WB2HYB 24, WA2-MID 21, WA2JWL 11, W2URP 9.

NEW YORK CITY AND LONG ISLAND—Retiring SCM, John S. Brandau, K2OVN—RM: W2WFL. V.H.F. PAM: W2EW. Section nets: NLI, 3630 kc. at 1500Z nightly; NYCLIPN, 3908 kc. at 2230Z nightly; V.H.F. Net, Tue.-Wed.-Thurs. on 145.8 Mc. at 0100Z and Fri. through Mon. on 146.25 Mc. at 0000Z; Mike Farrad on 7238 kc. at 1700Z; All Service Net at 1900Z on 3925 kc; Q5 Net on 3935 kc. at 2100Z daily. May I wish all a Happy Thanksgiving, and especially W2OBU and his XYL, our former SCM. We all miss you, George. The following stations have earned BPL certificates for good work in traffic-handling for the month of August: WA2EXP, WA2TQT, WA2RUE, WA2VLK, W2EW and WA2QJU. W2EW, who has been reappointed V.H.F. PAM, extends a warm invitation to all operators who wish to be trained in traffic-handling to sign into the V.H.F. Traffic Net. WA2EXP did a great job handling long haul during the summer. Welcome back, WA2-GPT. WA2VZN and WB2BKS are Generals. WB2CHC, the jolly chaplain from the V.A. Hospital in Brooklyn, is now a Tech. and working hard for Gen. Cl. A Section Net certificate went to WA2BRT, W2IAG, Queens EC, reports good attendance on the AREC nets and would welcome new members. New officers of the Bronx High School of Science RC are WA2UXZ, pres.; WA2TGL, vice-pres.; WB2EJB, secy.; WB2FHI, act. mgr. WB2-ERQ reports he is assisting his local Scout Troop teaching code and suggests that operators with spare time do the same. K2UCU is operating on 1296 Mc. with a PT-13 running 100 watts. W2QPQ while on vacation, in his car in Quebec City, was followed by VE2AFI and VE2RU. After much honking of horns a long eyeball QSO was held on the sidewalk. WB2DUD is the new Kings County 6-Meter AREC EC. WA2GFP is working on 420-Mc. television. W2PF is the acting editor of *QCWA Newsletter*. W2MNX, K2BBO and W2QPQ received certificates from N.Y. City Civil Defense for conducting a 20-week Novice class. Amateurs interested in N.Y. City RACES should contact W2HDV, RACES supervisor. K2OZC is operating s.s.b. with the S/Line. WA2CXN, an amateur astronomer, had the interesting assignment of going to Maine to film the almost total eclipse of the sun. Officers of the TELCO (Telephone Co.) ARC are WA2HYH, pres.; W2FPF, vice-pres.; W2-WJO, secy.; W2BPA act. mgr. WA2FUL is a freshman in college. WA2VKK worked CT3EF on a long wire. Winner of the Crossband Club bunny hunt was WB2-DOF. W2RKK is back from Maine. WA2VLK made BPL for the third time. WA2TQT reports a tremendous band opening on 6 meters during the summer. WA2TYU has left for Georgia. All amateurs should get behind the emergency program in this section. A few hours spent in a traffic or AREC emergency net each week will pay rich rewards in the event of an emergency. Contact your EC for details: W2FI, Nassau; W2IAG Queens, W2VKF, St. Island, W2KNA Suffolk, W2OKU Brooklyn, WA2QAO Bronx. Club bulletins and items of news are welcome. Traffic: (Aug.) WA2EXP 950, WA2TQT 927, WA2RUE 741, WA2VLK 580, W2EW 559, WA2QJU 542, W2MTA 291, K2THV 92, WA2RMP 79, WB2GKX 75, WA2UUQ 57, K2KYS 53, WB2EGV 44, WA2PSL 31, W2-HSR 29, K2UFT 28, WA2VZN 26, WA2LSJ 25, W2EC 17, WA2ZXR 17, WA2FUL 8, W2IAG 6, W2EFN 5, WA2VKK 3, W2PF 2, WA2WAO 2, WA2YDB 2. (July) WA2RUE 393, K2UFT 69, W2HSR 37, WB2EGV 30.

NORTHERN NEW JERSEY—SCM, Edward F. Erickson, W2CVW—NNJ Amateur Radio Public Service Corps Nets—Aug.:

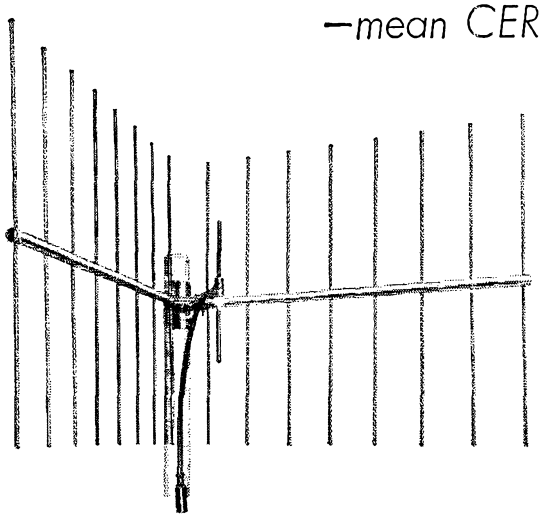
Name	*Freq.*	*Time*	*Days*	*QNI-QTC*	*Managers*
NJN	3695 kc.	2400Z	Dy	384-502	W2QNL-RM
NJPN	3900 kc.	2300Z	Ex. Sun.	613-140	K2SLG-PAM
NJPN	3900 kc.	1400Z	Sun.		
NJ6-2	51.15 Mc.	0100Z	T, Th, Sun.	156-313	K2VNL-PAM
NJ6-2	146.70 Mc.	0300Z	W, Sun.		

AREC local net skeds are available from SEC K2ZFI. New appointments: WB2BCS as EC; WA2MYB and WB2DEP as ORSs; WB2ALF as OBS. WA2KVQ and

(Continued on page 112)

C-P COMMUNICATION ANTENNA SYSTEMS

—mean *CERTIFIED PERFORMANCE!*



Base Station Corner Reflector Advanced Design Antenna

(10X-Unidirectional Gain)

Cat. No. 161-509, Frequency Range 450-470 MC

Cat. No. 161-509 Corner Reflector Antenna is designed for use in the 450-470 Mc band. All reflector screen components are manufactured of high strength aluminum alloys, all mounting components are fabricated of hot-galvanized steel and all radiating components are fabricated of aluminum. The above combine maximum strength, optimum electrical performance and minimum weight for the first time in an antenna of this type.

This lightweight aluminum antenna is ideal for use in multiple corner arrays.

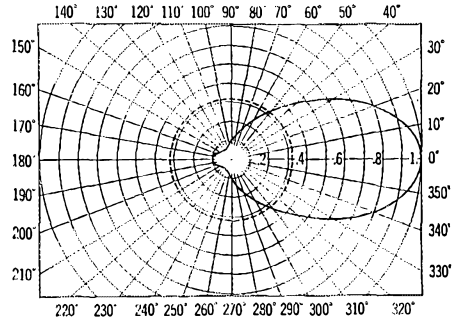
Electrical Specifications:

Nominal input impedance	50 ohms
Forward gain	10 db
Front-to-back ratio	20 db
Maximum power input	250 watts
Internal feedline	RG-8A/U
Flexible terminal extension	18" of RG-8A/U
Termination	Type N male with Neoprene housing
VSWR	1.5:1
Bandwidth	±3%
Lightning protection	Direct ground

Mechanical Specifications:

Reflector (size per side)	2' x 2'
Reflector material	High strength aluminum alloy
Radiating element material	High strength aluminum alloy
Radiating element diameter	⅜"
Rated wind velocity	100 MPH
Lateral thrust at rated wind	16 lbs.
Torsional moment on mounting pipe	16 ft. lbs.
Weight	8 lbs.

Stainless steel hardware supplied to mount antenna on 2" IPS pipe.



Horizontal field strength pattern of Corner Reflector 10X-Gain Antenna Cat. No. 161-509. A dipole pattern is shown for reference.

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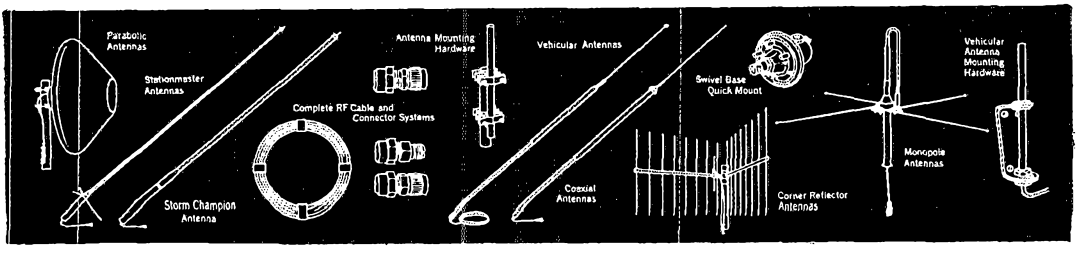
LOS ANGELES 65, CALIF. — Telephone CHapman 5-1143 (Area Code 213)



WB2ALF as OESs. WB2ALF has been hearing and working DX on 2-meter c.w. The Belleville Radio Club, W2UUU, is on 145.350 and 146.484 Mc., phone and m.c.w. with K2UCY in charge. WA1ALZ received a 2RN certificate for his duty as WA2WSB. WA2APT enjoyed his first NCS duty on NJN. NCS can be a challenge, learning towns, stations, etc., and keeping them all sorted out in one's mind. WA2ZKT traveled to Vt. and is a member of the C.A.P. WB2CQQ and OM W2JFO are new residents of Somerville. W2BVE has a new Drake 2-B. W2MZR is looking for members for his AREC unit in the Forked River area. WA2PBN has 5 countries and 33 states on 6 meters. K2UKQ is a member of the YL International S.S.B.ers. W2EWZ, W2IAZ and W2OGM graduated from the U.S. Army Staff College at Ft. Leavenworth. K2AGJ received CHC 1050 and 4 other new awards. WA2EJZ has received the HTH award. WA2KIY has a new 40-meter antenna. W2FNM operates mobile from a Model A 1930 Ford! WA2YGV has a new 10-meter beam. WN2JOP is a new Novice in Clifton. WA2VUY and WB2CYU have a new v.f.o.s. W2DGA has a new D-104 mike. WA2UPF is DXing on 15 meters. WB2DDA has a new electronic keyer. Any licensed amateur is welcome to join the Knights of the Round Table Net, which meets on 146.70 Mc. at 8 P.M. local time Mon., Wed. and Fri. WB2COZ has a new 2-meter converter and is constructing a 220-Mc. transmitter. Howard also is an Asst. EC. K2LNS reports meteor openings on 6 meters and other DX on 2-meter c.w. W2MHJ has a de luxe 2-meter mobile setup running 100 watts input and a nuvistor converter. WA2PWI has been operating 6 meters from N.H. and Vt. Tom received the call WA1AKE for his summer home. K2OEI has quite an array of v.h.f. gear including setups for a.m., c.w. and s.s.b. Bill also is on 2-meter f.m. and is interested in forming an AREC net on that mode covering Monmouth and Middlesex Counties. WB2BCS and his daughters, WA2VYN and WA2VZK, also are busy developing a 2-meter AREC net in the Red Bank area. Traffic: (Aug.) K2VNL 585, WA2UOO 352, WB2ALF 311, K2UCY 229, WA2WAJ 186, WA2KVQ 173, WA2CCF 122, WA2SRK 115, WA2GQI 80, WA2GQZ 80, WA2APT 79, W2CVW 78, WA2MYB 69, W2QNL 66, W2ANG 55, WA2ZKT 52, WB2COZ 38, K2ZFI 29, K2JTU 28, WA2BNF 21, W2ABL 17, WB2DEP 17, W2DRV 17, W2PEV 14, K2SLG 14, K2OEI 13, K2EQP 11, K2SBS 11, W2BVE 10, W2FNX 10, WA2JTZ 8, WB2FCT 7, WA2GQZ/2 7, K2MFX 7, W2MZR 5, WA2ZQH 5, W2OXL 4, WA2PBN 4, WB2IBC 3, WA2OPX 3, K2UKQ 3, WA2APY 2, W2NIV 2, W2EWZ 1, WA2VYN 1, (July) WA2GQZ 74, WB2DDA 48, W2BVE 16, WA2KRC 5, WA2OQP 3.

MIDWEST DIVISION

IOWA—SCM, Dennis Burke, WØNTR—SEC: KØEXN. PAMs: KØBBL and WØLSF. RM: KØLGG. New appointee: WØUTG, Des Moines Co. EC. WAØBRU reports activity on 6 meters. KØDYS has three new Novices and one Technician. WØNWX snagged an AC5/4 on 20-meter c.w. WØNWX and WØQVZ represented Iowa at the DXCC Meeting in Chicago Sept. 14. Our section can be proud of the accomplishments of these two fine amateurs. Our brasspounders give a good account of themselves. We need more brasspounders and fewer "wall wailers" and "teeth gnashers." If you want to gripe be sure that you know what it is you are griping about. We have about twenty-five fine clubs in this section. These people are the backbone of amateur radio so "get on the ball" and support your organizations. Let your voice be heard in constructive matters and remember that honest differences of opinion are as American as apple pie. Aug., net reports: 160 meters, QNI 580, QTC 14, sessions 31; 75-Meter Phone, QNI 818, QTC 129, sessions 26; Jasper Co. EN, QNI 214, sessions 14; Hamilton Co. EN, QNI 129 (a record for this time of year); Webster Co. RACES and AREC Net, QNI 32, sessions 16. At least one s.s.b. net should report to this SCM. Traffic: (Aug.) WØLGG 2319, WØSCA 1363, WØNTB 140, KØQKD 55, WØUSL 50, KØBBL 29, KØKAQ 20, WØMMZ 19, WØREM 12, KØJMA 11, WØJPJ 11, WØYDV 10, WØFMZ 5, WØNWX 5, WØQVZ 4, KØTDO 3. (July) KØMST 11.

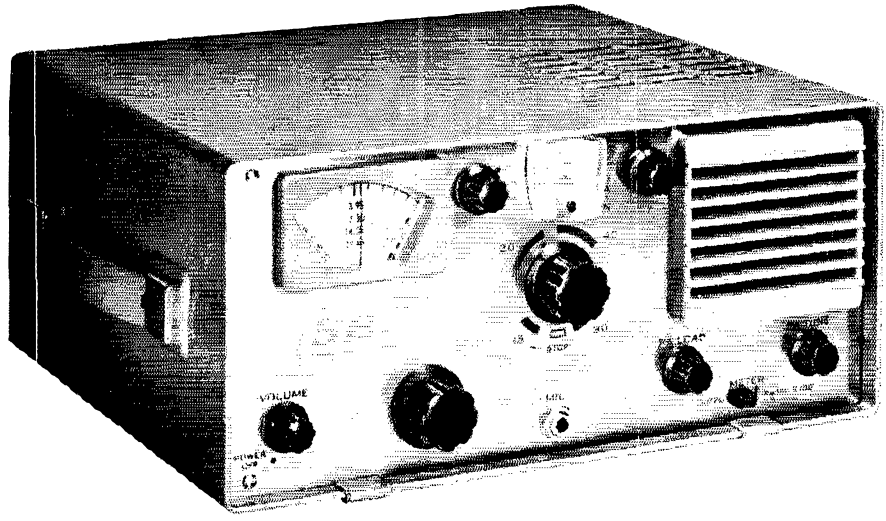
KANSAS—SCM, C. Leland Cheney, WØALA—SEC: KØBXF. PAMs: KØEFL and WØBOR. RMs: WØQGG and WØPFG. V.H.F. PAMs: WØHAJ and KØVHP. New appointments: WØCJI as EC; WAØEDD as ORS. August net reports:

Net	*Freq.*	*Time*	*Days*	*Sessions*	*QTC*	*QNI*	*Ave.*
KPN	3920	1245Z	M-W-F	17	37	298	17.5
"	"	1400Z	Sun				

Net Controls: KØEFL, KØQKS, WØORB and KØYTA.
QKS 3610 0030Z T-T-S-Su
Two more clubs were on deck with their bulletins this

(*Continued on page 114*)

SB-33 *without question...* one of the biggest...and best ssb transceiver values!



Compare SB33 price-wise. The 115 volt AC power supply and the loudspeaker are built-in—**are included in the low 389.50 price!** And in addition, SB-33 gives you **four bands**—selectable sidebands—a **Collins mechanical filter** that is used both on transmit and receive.

Compare SB-33 circuit-wise. 20 transistors—13 diodes—1 zener diode—virtually all solid-state with exception of the two husky linear amplifier tubes and that in the RF driver. The transistors are all in low-level applications—consume very low power—have very long life expectancy. And of course, **no heaters** so that cabinet temperature is lower, equipment size can be smaller, stability higher. Much of the advanced transistorized circuitry is **bilateral**—two directional—operates both transmit and receive. This means fewer components, less assembly and wiring. These savings are passed on to you in the form of a low selling price.

4-BANDS: 80-40-20-15 meters

POWER INPUT: 135 watts P.E.P. maximum. (Speech waveform)

RECEIVER SENSITIVITY: Better than 1 μv for 10 db signal/noise ratio

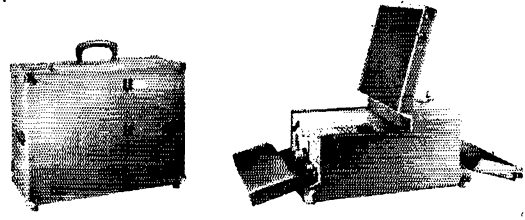
SIDEBAND SELECTION: Upper or lower sideband selectable by panel switch without change in frequency

TUBE AND SEMICONDUCTOR COMPLEMENT:
2—PL-500 beam power tetrodes
1—12DQ7 driver
20—Transistors
13—diodes, 1—zener diode.

POWER SUPPLY: Built-in **115V AC supply.**

LOUDSPEAKER: Built-in

SIZE: 5½"H, 11¾"W, 10¼"D. 15 lbs.



Functional, luggage-type carrying case has thick foam rubber nesting for SB-33 also felt-lined accessory compartment. **39.50**

SB-33 Special Inverter
12V DC/115V AC.....59.50

SB-33 De Luxe VOX/Compressor 39.50

SB-33 Mobile mounting base, locking type 12.50

389.50

SBE Sideband Engineers

318 ROEBLING ROAD, SOUTH SAN FRANCISCO, CALIFORNIA

month, the Wheat Belt Radio Club and the Tee-Ni-Chat Club. If your club has a bulletin or paper, please send a copy to the SCM so he can keep informed. Congrats to WØVDQ on making DXCC 300. Your SCM would like to hold several section meetings throughout the state. An invitation to hold one of the meetings in your area will be appreciated. To stimulate individual activity for the year ending October 1964, your SCM will offer TOPS awards to the top operator in each appointment classification. These will consist of suitable trophies to be won on a one-time basis. Will you be a winner? If you do not now hold an appointment, contact the SCM. Traffic: (Aug.) WØBYV 137, KØYTA 64, KØKHG 35, WAØEDD 27, KØGII 20, KØQKS 17, KØEFL 14, KØGIG 13, WØWFD 9, WØ-BMW 8, KTØGR 8, WØALA 6, KØBXF 6, WAØDZI 2, KØLPE 2, WØFDA 1. (July) KØGQO 1.

MISSOURI—SCM, Alfred E. Schwaneke, WØTPK—SEC: WØBUL. RMs: KØONK, WØOUD. PAMs: WØ-BUL, WØBVL, WØOMM, KØONK. It is my sad duty to report the following Silent Keys: KØOLW, WØ-PYK, WØSBY. New OPS appointments: KØBWE and KØWOP. WØGBJ renewed his ORS appointment for the 30th year, a record in this section. New NCSs for MEN are WØORB and KØWKC; for MON, WAØCWV. College will interrupt the net and traffic activities of KØFPC and KØVPH. A new Tech. Class licensee in Marshall is WAØGJN. KØJPJ has taken over EC duties in the Springfield area. There was a big crowd and lots of prizes at the Springfield Picnic. KØIHY, formerly in Joplin, is now operating from Waynesville. WØCWT reports 31 active members in the Three rivers ARC. The Lecoma Lid Society is a new non-A-1 operator net on 50.46 Mc. New officers of the Zero-Beaters ARC in Washington are KØGDD, pres.; WØNVM, vice-pres.; WNØGTT, secy.; WAØAVG, treas.; KØPHD, act mgr, WØKCG and WØORF both have new NCX-3 rigs. KØTCB/KØTGU have a new HT-37 and an HT-41 linear, KØBWE has a new HQ-110 receiver. WAØFLL reports 32/30 for WAS on 6 meters. WØHHG got his 24th state on 6 meters in July. Net reports: MSN, QNI 110, QTC 37, NCSs WAØCWV 10, KØONK 10, KØFPC 4. MON, QNI 182, QTC 236, NCSs WØOUD 11, KØFPC 8, WØKIK 4, WØGBJ 2, KØVNB 2. SMN, QNI 18, QTC 10. PON, QNI 240, QTC 69, KØBWE 9, KØONK 4, KØVIQ 4, WØAYB 2, KØMMR 2, KØRKW 1. MO S.S.B., QNI 169, QTC 50, KØIHA 5, WØOMM 4, MEN, QNI 406, QTC 249, KØONK 4, WØTPK 4, WØBUL 3, KØVPH 1, WØORB 1. Traffic: KØONK 1667, KØFPC 738, WØ-HTO 144, KØVPH 139, KØTGU 132, WØOUD 115, WØ-BUL 17, WAØCHD 14, KØWOP 12, KØVIQ 10, KØ-RKW 42, WØGBJ 33, KØBWE 28, WAØCWV 19, WØ-RTW 106, WØOMM 74, WØKIK 64, WØTPK 58, KØ-OGM 8, WØAIM 6, KØIHY 3, WAØFLL 2, WØBVL 1.

NEBRASKA—SCM, Frank Allen, WØGGP—Appointments: WAØBBS as OPA, KØOAL as EC, KØUWK as PAM. August net reports: Nebraska Emergency Phone Net, WØEGQ, NCS, QNI 852, QTC 155, 31 sessions, 100 per cent check-in; WAØBES, New members: WAØ-BOK, WØBWK, KØEQH, KØIJW, KØOFM, KØ-QVM, KØUWE, KØYAN/Ø. Nebraska Storm Net, QNI 414, QTC 18. WØFIG, NCS, reminds us of a time change for the net effective Nov. 1, 1830 CST for the winter. West Nebraska Net, WØNIK NCS, QNI 478, QTC 47, 100 per cent check-in: W4LEE/Ø, WØNIK, KØAIE. Nebraska 75 Meter Morning Phone Net, WØEGQ NCS for Aug., QNI 497, QTC 94, 29 sessions. KØDGW has resigned as NCS and KØUWK took over as NCS Sept. 1. Net listings with all amateurs invited to check in are:

Nebr. Emerg. Phone	3983 kc.	1830Z	WØEGQ NCS
West Nebr. Phone	3850	1400	WØNIK
Nebr. Storm Net	3982.5	0030	WØFIG
75 Meter Morning	3980	1330	KØUWK

Traffic: WAØBYK 267, WAØBES 115, WØFIG 100, WAØDXS/Ø 94, WAØBID 92, WØLOD 89, WAØAES 88, WØEGQ 29, KØCFM 27, WØBKW 19, KØMSS 18, W1CJP/Ø 17, WØWUV 16, WØVZJ 14, KØMZV 10, WØ-NIK 9, WAØAKG 6, KØJFN 6, WØGGP 5, KØYZP 5, KØZEO 5, KØOOV 4, WØPQP 4, KØHJY 3, W4-LEE/Ø 3, WAØBOK 2, WAØDFS 1, WAØDNV 1.

NEW ENGLAND DIVISION

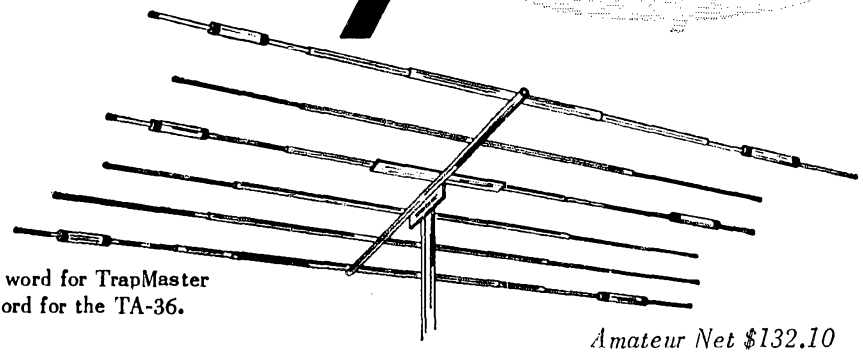
CONNECTICUT—SCM, Robert J. O'Neil, W1FHP—SEC: W1EKJ, H.F. PAM: W1YBH, RM: K1GGG, V.H.F. PAM: W1FHP. Traffic Nets: CPN, Mon. through Sat. 1800, Sun. at 1000 on 3880 kc. CN, Daily 1845 on 3640 kc. V.H.F. NET, Mon. Wed. and Fri. at 2030 on 145.980 Mc. CECN (Conn. Emergency Coord. Net) Sun. 0900 on 3880 kc. with alternate EC as net control station. EC endorsements went to W1ADW, Danbury; K1QAH, Southington, and W1GEA, Norwichtown. BPL honors went to K1WKJ, K1DQC and K1WKK. ORS endorsement went to W1ADW. K1LFS resigned as Offi-

(*Continued on page 116*)

Mosley

MODEL TA-36

for 10-15-20 meters



Incomparable is the word for TrapMaster and terrific is the word for the TA-36.

Amateur Net $132.10

The new clean-line TA-36 . . . the three band beam that will give your signal that DX punch!

This wide spaced, six element configuration employs 4 operating elements on 10 meters, 3 operating elements on 15 meters and 3 operating elements on 20 meters.

Automatic bandswitching is accomplished by means of exclusive design high impedance, parallel resonant "Trap Circuits". Built for operation at maximum legal amateur power.

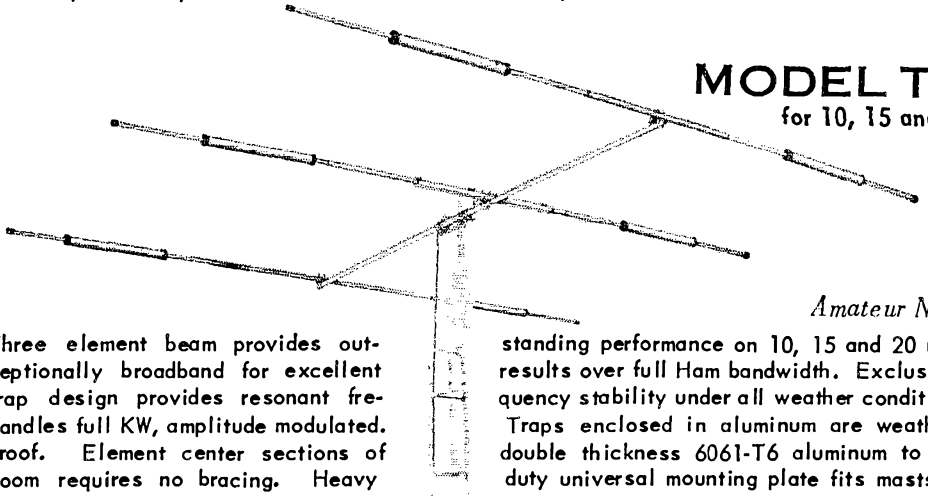
Traps are weather and dirt proof offering frequency stability under all weather conditions. Just one coaxial feed line is needed. 52 ohm, RG-8/U is recommended.

Antenna comes complete with illustrated instruction booklet and color coded elements for ease of assembly.

SPECIFICATIONS and PERFORMANCE DATA: Forward gain on 10 meters is 9 db., on 15 meters is 8.5 db. and on 20 meters is 8 db. Front-to-back is 20 db. or better on all three bands. SWR is 1.5/1 or better at resonance. Transmission line - 52 ohm coaxial. Maximum element length is 29 feet. Boom length is 24 feet. Turning radius is 19' 3". Assembled weight is 69 pounds. Wind load (EIA Standard) is 210.1 pounds. Wind surface area is 10.7 square feet.

MODEL TA-33

for 10, 15 and 20 meters.



Amateur Net $104.75

Three element beam provides outstanding performance on 10, 15 and 20 meters. Exceptionally broadband for excellent results over full Ham bandwidth. Exclusive MOSLEY trap design provides resonant frequency stability under all weather conditions. Easily handles full KW, amplitude modulated. Traps enclosed in aluminum are weather and dirt proof. Element center sections of double thickness 6061-T6 aluminum to reduce sag. Boom requires no bracing. Heavy duty universal mounting plate fits masts up to 1½" OD. Feed with one coax line. RG-8/U is recommended.

SPECIFICATIONS and DATA: Fwd. gain up to 8 db. Front-to-back is 25 db. SWR is 1.1/1 or less, at resonant frequencies. Maximum element length is 28 feet. Boom length is 14 feet. Turning radius is 15.5 feet. Assembled weight is 40 pounds. Wind surface area is 5.7 square feet. Wind load is 114 pounds. Shipping weight is 53 pounds.

MOSLEY Electronics Inc., 4610 N. Lindbergh Blvd., Bridgeton, Mo., 63044.

cial Observer as he is away at college. Lou, K2PRB/1 and W1NGR have completed their 3300-Mc. rigs and are looking for skeds with anyone else. Members of the Spiritan ARC of Norwalk are back from summer classes with the exception of K1JXG, who is leaving for Tanganyika, Africa, and will look for contacts on 20 meters. A new station on CPN is K1RTI, Stamford. CN held a meeting Sept. 14. News and a report from K1GGG will follow later. A new bulletin is available from Fred, RM. W1ETF is running a KWM-2 and driving a 4-400A final and hitting the DX bands. K1HTV is working at WTIC. Middlesex County contacts are wanted around 80-meter c.w. CN held 31 sessions with an average of 10 stations with 10.6 messages per session. High QNI went to K1WKK, K1ZND and W1RFJ. CPN held 31 sessions with an average of 24 stations and average traffic of 9 per session. High check-ins were K1s AQE, LFW, NTR, OJZ, ILJ, YTG, UQQ, EIC, and W1s LUH, DAV, FHP. Stratford lists new call letters, WA1AGA. WA1AFZ and W1BHZ, and W1KIS is working with new S/Lines. The club station has new antennas on both 6 and 2 meters, a kw. amplifier for all bands and some new Novices. KN1s ETL, EZF, EZL, EZK and EZJ. A nice club report was received from W1BHZ. OESs reports fair openings during August. A new certificate for working over 50 stations on 2 meters is being given by K1RJH and K1RKT. Check the dates of the next LO Party week end and pick up the winter-operated stations on all bands, counting 6 and 2 for multi-band contacts. K1PLR reports that the ALA V.H.F. Society received the club call WA1AKF. Those letters are not fakes but something new for the W/K 1 area. Traffic: K1WKK 582, K1WKJ 239, K1DQC 232, W1EFW 170, K1PGQ 153, W1RZG 127, K1PQS 107, K1EIR 86, K1GGG 74, W1FHP 66, W1AW 61, W1LUH 48, K1AQE 39, W1-CUH 30, K1NTR 29, K1OJZ 28, W1CTI 27, K1WXN 24, W1YBH 24, W1BDI 22, K1RTI 21, W1QV 18, K1-PLR 16, K1DGK 15, K1JAD 12, W1MPW 12, W1BNB 11, K1MBA 11, W1GEA 10.

MAINE—SCM, Arthur J. Brymer, W1AHM—SEC: K1DYG, PAM: K1ADY, RM: K1MZB. Traffic nets: Phone, Seagull Net, 3940 kc. 1700-1800 daily except Sun. Pinetree Net, 3596 kc. 1900 daily Mon.-Fri. First Regional Net, 3605 kc. 1815-1930 daily. The Maine State C.D. Net meets Sun. at 1100 EDT on 3993 kc. and Wed. at 1900 on 3530 kc. W1BYK is net control. The AREC Net meets Sun. at 0900 EDT on 3940 kc. K1DYG is net control. WA1AHP, WN1AJK and WN1AJU are new Novices; WA1AHX, WA1AHY and WA1AHZ are new Technicians; K1MFO is a new Conditional; W1-HNH and W1YEF are new Generals. Congratulations to all on their new tickets. K1MZB is changing his QTH a short distance and will be portable for a few weeks; he also is a freshman at Gorham State Teachers College. K1LPC is in his second year at Maine Vocational Technical Institute. K1GZL was in Florida visiting with the hams in the Jacksonville area in September. He (K1GZL) also worked KC4USV at McMurdo Sound, Antarctica, on 40-meter phone with a DX-100, 150 watts, on a three-element wire beam. The next project from K1GZL is a 2-kw. PEP with 2 4-400 HW22 Heathkit S.S.B. exciter. Quite a few appointments were endorsed recently. There still is no news from the upper part of the state. Traffic: K1MZB 63, K1MDM 14, K1-VEZ 6, K1RQE 4.

EASTERN MASSACHUSETTS—SCM, Frank L. Baker, Jr., W1ALP—W1AOG, our SEC, received reports from the following ECs: W1s AAU, FON, LVK, K1s QLG, PNB, K1GTX, W1LAV and K1GFR, who have been in the hospital are all home. Sorry to report that W1KQN is a Silent Key. K1BGK is our new PAM for 6 meters. Give him your support. K1OUM is EC for Somerville. K1CCL is a new OO. The Whitman Radio Club is conducting classes Mon. nights at 413 Wash. St. from 7.30 to 9.30. All are welcome to take part. K1UFD has a new beam and tower. W1VAH has an electronic keyer and key. W1UXN is a Silent Key; he passed away in Florida. W1HLQ is building a house. K1FJM, Newton, has a Twoer and is on 80 meters some. W1NF has a new vertical antenna. The Town of Barnstable Club, K1PBO, meets the 1st Wed of the month at the fire station. Officers are W1NPR, pres.; W1YAN, vice-pres.; K1BIF, secy.-treas. K1NIX, ex-W9QBO, is a new OO. WN1AFD, Lexington, has a Twoer and is getting a linear and receiver. W1PEX and KN1ESG made the BPL. W1RHU now is in Cambridge. W1VRK says that the 1964 New England Division Convention dates are May 9 and 10. KN1WTO is secy. of the TIMAC ARC. K1UGE writes that they are going to increase power to 600 watts and that they are going to train a young blind girl employee for her license and then set up a station at her home. K1ONW has been working in Groton, Conn. for the summer but is going to Tufts U. The EM12MN held 24 sessions, 172 stations, 207 traffic. The 6-Meter Cross Band Net held 22 sessions, 355 QNIs, 138 traffic. A net certificate has been issued to

(*Continued on page 118*)

A DISCUSSION of the relationship of average power to peak power in an SSB linear amplifier is a tight squeeze on only one page, but by leaving out the usual math and squiggly drawings of wave envelopes, perhaps we can make it fit — for purposes of discussion, we'll take the NCX-3 final amplifier which uses a pair of 6GJ5 pentodes rated at 200 watts peak input. PA components in the NCX-3 are sufficiently conservative to allow tune-up at full power, and so we load the final to 200 watts by inserting full carrier in the TUNE position and adjusting the cathode current as shown on the meter with the pi-net controls until the "dip" indicates 300 ma. 300 ma. x 700 plate volts = 210 watts (the extra 10 watts is screen power). If we put a scope on the rig to observe the wave shape of the maximum output voltage (which indicates relative power) we'll see a rectangular pattern without hills and valleys — a so-called single-tone pattern in which the peak power is identical to the average power. Since effectively only one tone is driving the final, the power input is 200 watts, period. Now if we place the NCX-3 in the SSB mode, and insert *two* pure audio tones into the mike input (two-tone test) differing slightly in frequency but identical in amplitude, the scope picture changes from a rectangle to the familiar sinusoidal envelope used to check linearity. You'll notice that the peaks of the envelope are sharp and unflattened, and are the same height on the scope as was the single-tone rectangular envelope — peak power is identical. However, at the cross-over points on the axis of the envelope the power is zero. Therefore, the average power must be some number between the 200-watt-peak part of the cycle and the zero part of the cycle — and it can be mathematically shown that under two-tone conditions the average power is exactly one-half the peak power, or 100 watts. If we look at the meter, we notice that it *indicates* approximately 150 ma., which multiplied by the plate voltage also comes out to 100 watts average power input. A milliameter has inertia, and so it cannot read the actual peak current of 300 ma. — instead it acts as a mechanical averaging device and fairly accurately reports the average plate current. With only two tones inserted, peak power is twice the average power indicated by the meter. But the moment a more complex waveform is introduced, such as the human voice with its multiple tones, all bets are off. If we now connect a mike to the rig and observe the waveform on the scope produced by a good lusty *ahhhhh*, we see a pattern vaguely resembling a number of pine trees sliding off the screen on their sides. When mike gain is properly adjusted, the peaks of this complex wave-shape are still the same height on the scope as were those of the single and two-tone envelopes — peak power is still the same. But now the average power is distributed in the "branches" of the pine trees — and is some number less than one-half peak power, depending on the tones present in the particular voice. Typically, average power under speech conditions is one-third or less of peak power, assuming no compression or processing of the audio to reduce the peak to average ratio of the voice itself.

IF WE LOOK at our mechanical averaging device, the milliameter, we note that, sure enough, the meter is kicking around 100 to 125 ma., approximately one-third the peak current of 300 ma.

NOW THIS is all rather interesting. For one thing, it tells us that if the linear is capable of delivering the peak power, the peak power is double the indicated power as shown on the plate meter *only* under two-tone conditions. Further, actual peak power with unprocessed speech is approximately 3 or more times the average power indicated by the meter reading!

UNDER no conditions, with speech, can the average power be as high as that obtained under two-tone conditions — one-half the peak power. So, with an efficiently operating class AB1, AB2, or class B linear of any power level, don't assume that the plate current meter on speech should average one-half of that meter reading corresponding to maximum single-tone output — If you do so, the chances are excellent that you are flat-topping the linear with consequent splatter.

— Mike Ferber, W1GKX
National Radio Company

K1QQJ. W1ACB has been boating and water skiing, as has W1OHA. W1FQA has the new tower and beam up. W1JNV is building a 1-kw. final. W1BGW made RTTY WAS certificate No. 3; also worked AC5A/4 on s.s.b. K1QJT built the 420-Mc. superregen unit in the *Handbook* and is back on 2 meters. He used to be East Bay SCM. WITZ sends a picture of his new 80-ft. tower, Rohn G25, TA-33 Tribander beam and CDR Rotor. W1AQV says he is helping to train some new hams-to-be. KN1ESG is waiting for his General and has a Vibroplex bug. K1PNB is on the air in New Hampshire. K1BGK is moving the tower up to 70 feet. W1AUQ's rig got a lightning kick and ruined transformer. K1-CMS and his wife, K1LA, are off to Mexico and will be mobile. Appointments endorsed: K1ICJ Sharon, W1-HLQ Stow, W1AWA No. Reading, as ECs; W1DDN and K1QJT as OESs; W1AQV and W1AWA as OBSs; W1AWA as OPS. W1JOB moved to Littleton. My ZIP code is 02185. What's yours? W1YRW is Alt. Radio Officer for Carlisle. K1VOK is active in our traffic nets. K1BUF and W1ZQM now have a new sked, a baby girl. Congrats. K1UGO will be on 6 meters. K1WRO, Lynn, is on 2 and 6 meters, also mobile. KN1ZQD is on the air some. Traffic: (Aug.) W1PEX 1131, W1LES 379, W1-EMG 173, K1GKA 164, KN1ESG 110, W1DOM 108, K1-PNB 95, W1EAE 87, W1ZSS 61, W1AOG 39, K1LCQ 32, K1OCD 32, K1BGK 30, W1OFK 30, W1VYS 28, W1FON 22, W1AUQ 18, K1SMT 12, W1SIV 11, K1CMS 8, K1OWK 6, K1VOK 3, WØPAN 2. (July) K1TSD 258, W1EAE 139, W1ZSS 31, K1ONW 14. (June) W1EAE 76.

WESTERN MASSACHUSETTS—SCM, Percy C. Noble, W1BVR—SEC: W1BYH/K1APR. C.W. RM: K1-IJV. PAM: K1RYT. The Western Mass. C.W. Net held a very enjoyable picnic at K1LBB's. Those in attendance (most with their families) were W1AZW, W1BVR, W1DVW, K1IJU, K1IJV, W1KQK, K1LBB, W1MNG, K1YMS, K1ZBN, W1ZPB and K1ZVJ. The youngest in attendance was six-week old Joy Anne Congdon of the W1ZPB family. Sixteen different stations reported into the WAIN during the month. W1DPY still is debugging his new linear. K1JQT left for college in Ohio Sept. 20. W1STR's new Hy-Gain antenna has improved his 2-meter work tremendously. W1DWA received his QRP-25 award. K1VPN has a new 6-meter beam, Culver Dorsey. W1FNY, was the speaker at the September meeting of the Berkshire County Amateur Radio Association. After more than ten years W1VC applied for his old call, W1VC, and received it. W1UUK has 196 countries worked. K1BII has a new Triex 60-tooter. The Hampden County Radio Club made 592 contacts during Field Day with a score of 3552 points. K1PMK was FD chairman. New officers of the HCRA are W1IC, pres.; K1-IJU, vice-pres.; K1PMK, secy.; W1LRE, treas.; W1-DGA, K1EFH, K1RPD, W1ZER, K1LDT, K1GIV, K1-PTG and K1IYT, directors. Traffic: K1RYT 510, W1BVR 115, K1ZBN 112, K1SSH 110, K1IJV 98, K1LNC 59, W1ZPB 44, K1LBB 43, K1VPN 23, K1TTT 10, W1MNG 9, K1ZVJ 6, K1JQT 4.

NEW HAMPSHIRE—SCM, Albert E. Haworth, W1YHI—SEC: W1TNO. PAM: K1NXV. RM: K1BCS. Summer being over the nets are picking up again. W1-AIJ reports that the gang at W1OC may have had a first. The summer meeting was held on a "Party Barge" somewhere in the middle of Pleasant Lake, thanks to W1CNX. The N.H. QSO Party was held under the sponsorship of W1OC. Congratulations to all for keeping N.H. on the air. K1DWK reports the Merrimack County AREC Net was under the leadership of K1DEQ for July. All applications and endorsements will be published next month so that you can keep your file up to date. W1TNO will have a complete listing of all AREC members next month. Don't forget to get your yearly endorsement of membership. Your SCM is back on the air at his new QTH. W1BYS completed a fine cross-country mobile trip with many FB contacts. More c.w. operators are needed to cover N.H. in the IRN and NHN (c.w.). Traffic: (Aug.) K3YQJ/1 22, W1CUE 13, K1IIK 9, W1AGM 4. (July) W1CUE 16, W1AGM 9, W1AIJ 2, K1IIK 1. (June) K1IIK 3. (May) K1IIK 8.

RHODE ISLAND—SCM, John E. Johnson, K1AAV—SEC: W1YNE. RM: W1BTV. PAM: W1TXL. Appointments: W1YNE as OBS and W1YRC as OO. Endorsements: W1YNE as SEC; K1NJT and K1NJN as OESs. RISPN report: 31 sessions, 648 QNI, 110 traffic. The W1AQ Club of Rumford was honored by a visitor from VE-Land. John Clements, formerly from Quebec, told the club about obtaining a ticket in Canada and John hopes to have his General Class ticket soon. WRI Certificate No. 35 was issued by the club to VE1AFP. The NCRC Club of Newport has a new code and theory class conducted by K1PTV and W1JFF. W1WLG reports the club auction will be in charge of W1TXL. KQCSJ, a member, will operate amateur equipment while on "Operation Deepfreeze" for the Navy. K1YQP, of the club, received his General Class ticket. K1PAM received his WAS certificate. WN1s AKO, ALJ, AIZ, AJE

(Continued on page 120)

Powerful with 1500 watts PEP,* GSB-201 is an outstanding example of the modern trend toward high power in a small package. And this little powerhouse is really small...only a foot across the front ...fits neatly on your desk or table top...integrates smoothly with your existing equipment. Fine looking, functional, with every operating convenience. Finished in attractive blending light colors.

Powerful in all transmission modes: 1500 watts PEP for SSB... 1000 watts input for CW...400 watts input AM. Can be driven by exciters in the 65-150 watt category, GSB-100 and similar equipment. Stable, efficient grounded-grid circuitry. Substantial portion of drive power appears as useful amplifier output.

Versatile. Full bandswitching with pi network output for five bands, 80, 40, 20, 15 and 10 meters. Full vision panel instrument reads plate current or relative RF output...simplifies loading, monitors output. Panel switch allows tuneup at low power.

Economical. Four, low-replacement-cost 811A's are used in output. Long life silicon diodes in HV power supply eliminate less modern vacuum-tube-type rectifiers. Antenna changeover relay and bias supply are built-in.

TVI-Proofing. All control leads from amplifier are shielded and filtered.

SPECIFICATIONS:

Coverage: 80, 40, 20, 15, 10 meter bands.

Power input: 1500 watts PEP, SSB.
1000 watts input, CW.
400 watts input, AM.

Power consumption: Approx. 2000 watts peak.

Driving requirements: 65 to 150 watts depending upon input.

Input impedance: 50 ohms nominal.

Output impedance: 50 ohms nominal with SWR less than 3:1.

Output circuit: Pi network. Antenna relay built-in.

Tubes: 4—811A's. (Silicon diodes used in bridge circuit for high voltage supply.)

Dimensions: 8½" high, 12⅝" wide, 17" deep.

Model number: #3340.

*Twice average DC.

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and AJF received their Novice Class tickets. Technician Class tickets were received by K1s YOW, WRN, NVS and WA1s AIH, AIX and AJB. K1s WFS and ERG received their General Class tickets. Those appointed Asst. ECs for East Providence by K1PAM are K1s ABE, NKR and W1BFN. K1RRK was appointed asst. net mgr. for the AREC Net. Traffic: W1TXL 640, K1TPK 93, K1STB 16, K1NJT 14, W1YNE 13, K1RRK 7.

VERMONT—Acting SCM, E. Reg. Murray, K1MPN—Green Mt. Net, 3855 kc. 2130Z daily. Vt. Fone Net, 3855 kc. 1300Z Sun. Vt. C.W. Net, 3520 kc. 2300Z daily. Vt. S.S.B., 3955 kc. Congrats to K1LYH, K1WSP, K1WZD, K1ZPZ, K1URQ, WA1AFP, K1YCZ, K1YZK, who have passed the Conditional Class exams. Welcome to new Novices KN1s F1X, F1Y, FSM, FTA, FUU, FWW, FXP, FYR, FZX, WN1ACN, AFM, AIV; also to Technicians K1UZH, WFN, WUZ, ZYK and EPK. W1WFZ's XYL KN1FTA presented him with a jr. operator. There was a big turnout for the International FD at Burlington last July. VE2BOP ran off with the grand prize. The BARC deserves a big hand for all the blood, sweat and tears expended in promoting the event. The CVARC will sponsor another Vt. QSO Party next Feb. Watch *QST* for the exact dates. The Green Mt. Net checked in 697 stations in Aug. Traffic: (Aug.) K1BQB 43, W1WFZ 25, K1SLU 16, K1LLJ 15, K1IZS 7, K1MPN 1. (July) W1WFZ 661. (June) W1WFZ 96.

NORTHWESTERN DIVISION

IDAHO—SCM, Raymond V. Evans, K7HLR—Section news and station reports are mighty scarce this month. How about it, folks? Let's hear from you. We soon will have a new PAM and RM for the section and possibly a new SEC. Be sure to check the expiration date of your appointment and send your certificate in for endorsement. K7IAR is off the air temporarily and awaiting the arrival of a new NCX-3. K7SJM renewed his appointment as EC for Custer County. Traffic: W7EMT 80, K7HLR 14, W7GGV 11, K7NEY 10, K7OAB 8.

MONTANA—SCM, Walter R. Marten, W7KUH—Asst. SCM/L.F. PAM: Dr. Marvin F. Hash, W7YHS. SEC: K7AEZ. V.H.F. PAM: W7TYN. RM: W7FIS. Appointment: K7DCH, Kalispell area EC. Endorsement: W7YHS as PAM. K7PKN, former EC at Kalispell, moved to Spokane. W7CGG, former EC at Sidney, moved to Helena. The Montana C.W. Net has been reorganized and meets Tue., Thurs. and Sat. on 3520 kc. at 6:30 P.M. Net control is K7NHV. K7EWZ continues very active with traffic RN7. K7NHV made 105,525 points in the CD Party. KN7YXU is a new Novice in Bozeman. K7VTT and K7WOC are new Conditionals in Bozeman. W7ZPT moved from Great Falls to Bozeman. K7BGZ graduated from MSC with a BS degree in electrical engineering and has accepted a job at Point Magu, Calif. W7NPV has moved into his new home in Bozeman. W7FLC moved from Bozeman to Vandenberg Air Force Base, Calif. W7EET is selling his equipment. K7MFA got married. W7GAP moved to Spokane from Billings. W7NQL made W7GAP a proud papa—a boy. W7LBK visited MARS station K6USA at the Presidio of San Francisco. K7QWB is on the air with a kw. linear. K7ILD has added a new motorized printing press to his home shop. K7TZE has moved back to Great Falls to attend the Deaf and Blind School. The following Missoula area stations have been operating on 2 meters: K7CUK, W7JIZ, W7COH, W7NEG, W7PDE, K7IMZ and K7MGL. Frequency is 144.39 Mc. time 6:30 P.M. 145.44 is the monitoring frequency for Billings, Harlowton monitoring frequencies are 144.45 and 50.2 Mc. A very successful picnic was held at Big Arm State Park by the Western Montana radio clubs at Missoula, Kalispell and Columbia Falls. W7BPG won the OM's prize. W7EGN gave a report on 6 meters. K7DCH brought his boat. W7IBG has joined the s.s.b. mobile gang. W7OIQ is now operating his s.s.b. rig from Helena, Bozeman and Livingston. Among those attending the Big Sky Radio Club (Great Falls) picnic at Kings Hill were K7PKV, K7PKW, W7YPN, K7DGR, K7DGQ, W7PDK, W7RZY, K7MOY, K7PWW, W7WYG, W7KJX, W7KUH, K7PQM, K7INR, W7VLZ, K7CHA. Winners of prizes were W7WYG, W7RZY, W7KJX and the XTK of K7PKW. W7QYA is showing slides of her world tour at club meetings, picnics and hamfests. K7ECF has been talking to W7JHR, formerly of Dillon, now at Ellensburg, Wash. W7FSP has moved from Dillon to Butte. W7ZKA is back on the air with an s.s.b. rig after returning from the Marines. K7KLE visited friends in Great Falls. W7JZW made a trip to Great Falls using his new s.s.b. mobile rig. W7KUH held a meeting with Asst. SCM/PAM W7YHS, SEC K7AEZ and Northwestern Division Director W7CPY. W7SEW is on the air with new s.s.b. equipment. K7PKV is doing a very fine job with the new Montana S.S.B. Net. K7PKW

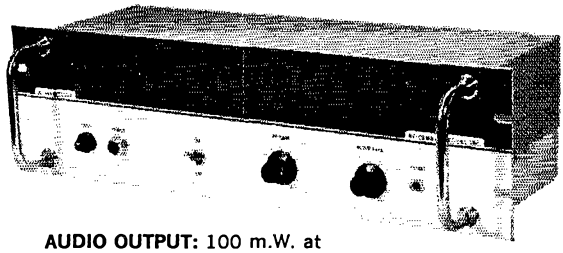
(Continued on page 122)

SSB COMMUNICATIONS

Announcing

TWO NEW **FIXED CHANNEL** SSB RECEIVERS FOR *COMMERCIAL APPLICATIONS*

Model RF-501, Single Channel Strip Receiver



FREQUENCY RANGE: 1.6 to 28 Mc with Four plug-in heads

FREQUENCY STABILITY: 3 parts in 10^7 per day

SENSITIVITY: 1uV for 10 db S+N/N

IMAGE REJECTION: 65 db

IF REJECTION: 70 db

IF BANDWIDTH: 2.1 KC, Mechanical Filter

AGC: 3 db Audio Variation, 10uV to 100,000uV
Time Constant 0.02 seconds charge
2.0 seconds discharge

AUDIO RESPONSE: 350 to 2450 cycles

ANTENNA IMPEDANCE: 50 ohms unbalanced

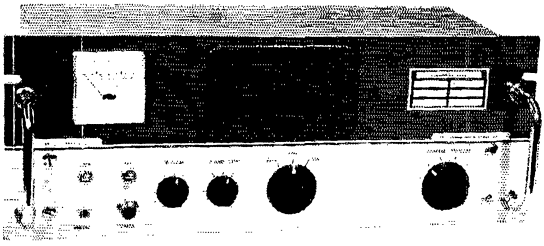
AUDIO OUTPUT: 100 m.W. at 600 ohms balanced, 1 watt at 3.2 ohms

POWER INPUT: 115/230 volts, 50/60 cycles Approximately 65 watts

SIZE: 5¼" H x 17" W x 6" D

WEIGHT: 15 pounds, approximately

Model RF-503, Six Channel SSB Receiver



METERING: "S" Meter

POWER INPUT: 115/230 volts, 50/60 cycles Approximately 70 watts

SIZE: 7" H x 17" W x 8" D

WEIGHT: 17 pounds, approximately

FREQUENCY RANGE: 1.6 to 25 Mc

MODE: SSB-Selectable upper/lower sideband and Compatible A.M.

FREQUENCY STABILITY: ±2 part in 10^6

SENSITIVITY: SSB-1uV for 10 db S+N/N
A.M.-1.5uV for 10 db S+N/N at 30% Modulation

IF BANDWIDTH: SSB-2.1 KC Mechanical Filter
A.M.-7.0 KC

AGC: Fast/Slow Time Constant

AUDIO RESPONSE: 350 to 2450 cycles

ANTENNA IMPEDANCE: 50 ohms unbalanced

AUDIO OUTPUT: 100 m.w. at 600 ohms balanced 1.5 watts to built-in speaker

SPEAKER: 4 x 6 inch

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visited K7PWY in Gardiner and W7HCJ in Spokane. K7ISW made a trip to Lewistown. W7FL is now a regular s.s.b. fan. W7PRH is heard from Yellowtail Dam. Regular early morning QSOs are being held by W7CK and W7JAT, who are brothers, and W7CCZ, the son-in-law of W7CK. W7FGZ made a Labor Day week end trip to Glacier Park. W7CDG was heard on s.s.b. mobile in Washington, Idaho and Montana on his recent vacation trip. W7QYA's beam came down during a recent storm. W7IWW put up a new 20-meter beam and is working DX. W7SCG is now working at Yellowtail Dam. K7MOS has a very fine looking home-made mobile rig. K7PQM installed a mobile rig in his car. Traffic: (Aug.) K7EWZ 138, K7NHV 1. (July) K7NHV 2.

OREGON—SCM, Everett H. France, W7AJN—SEC: W7WKP. RM: W7ZFH. Net activity reports: July: OSN, sessions 21, attendance 167, traffic 43. BRAT awards went to W7BVH, W7ZFH and K7IWD. OAREC, sessions 9, traffic 40. W7ESJ, of Portland, has been making a few trips to the Coast with a QRP rig, 30 watts, and finds that through contacts the results are good. He is trying to establish a QRP relay net along Highway 99. W7GWT, Asst. EC for 2-meter AREC, reports Mountain rescue operations on July 4 with W7DPV and K7OWF 2-meter and 75-meter mobile at the search area, and K7SLI and K7PQF on the air the 4th and 5th relaying traffic from 2 to 75 meters. W7PJO was NCS on 75. On July 14 the Portland area 2-meter AREC group furnished communications for the Kiwanis Speed Boat Races on the Willamette River. W7NGW was NCS with K7EPA, K7BKS, W7RCL, W7ASK, K7NNZ, K7TXE, W7DVR, K7QPP, KN7VID, K7BED at home stations relaying landline traffic. August: OSN, sessions 23, attendance 148, traffic 38, BRAT awards went to W7BVH, W7ZFH, K7IWD, W7DIS, a newly-appointed Official Observer, sends in a long list of cards mailed out. W7DIE is using an ART-13 on 160-80-40 meters with a 50-ft. vertical. K7GTY has a teletype receiver working now. W7ADY has a Pawnee transmitter and is active on MARS and C.D. Nets. Traffic: (Aug.) K7IWD 653, W7ZFH 100, K7CBA 42, K7CNZ 12, W7DEM 12, W7MAO 11, W7AJN 8, K7KTG 6, K7SHC 5. (July) K7IWD 717, W7ZFH 56, W7MAO 24, W7AJN 15, W7BVH 12, W7DEM 8, W7KTG 2. (June) W7GUH 585, W7BNS 8.

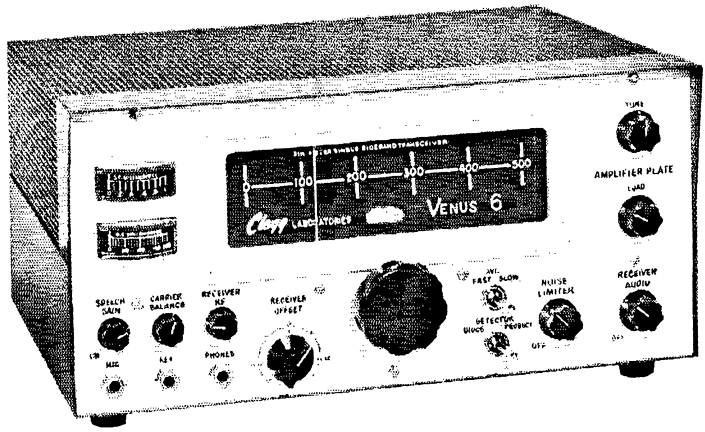
WASHINGTON—SCM, Robert B. Thurston, W7PGY —Asst. SCM/SEC: Everett E. Young, W7HMQ. RM: W7AIB. PAM: W7LFA. Active nets in Washington are WSN, 3535 kc., WARTS, 3970 kc., CBN, 3960 kc., ESN, 3920 kc., NSN, 3700 kc. The first two listed are members of the National Traffic System (NTS). All active amateurs are invited to participate in the net of their choice and to apply for station appointments available to League members. About 150 attended the Skagit Salmon Bar-B-Q at Deception Pass. The Northwest Slow Speed Net had 31 sessions with 347 QNIs and 123 QTCs. A number of new members have joined NSN including a couple of YE boys. K7CTP made the BPL for the second time. K7TTV is purring over his new HT-37. K7PXA has a new linear on the air. K7OUF is moving to a new QTH. W7OEB returned from three weeks in W6-Land. W7HMQ held a meeting of the AREC group in Richland on Sept. 13. K7LHU has moved to Richland. K7PWM and KN7VGI have a new SX-117. K7BFI is selling his station to replenish his school fund. K7RAM has been elected seventh district chairman of the YLRL for 1964. A new General Class licensee in the Walla Walla area is K7YOZ. We understand W7QHR is heading for Thailand to engineer a 200-bed hospital. K7IAE finally has his receiver going again. K7JRE is QRL building a new 6-meter rig. The new EC for Chelan County is K7-REV. KN7VDY and KN7VKX passed the General Class exam. The Burlington Amateur Radio Club is starting a Novice class. W7JC spends most all of his time on 3.5 Mc. mornings working DX. K7SRI is about to build an electronic keyer. W7AIB attended the Northwest DXCC Convention in Seattle and then went to Vancouver, B.C., and Harrison Hot Springs for a short vacation. KH6EGE and KH6EGF were recent visitors at the VARC in Puyallup. W7JJK is attending Colorado U. The annual picnic of the VARC was a big success. W7HMQ and his XYL, W7WHV, attended the NWARCS Picnic at Centralia. K1RFX/7 believes he has the first Drake TR-3 in the Spokane area. K9GVX/7, MARS Director at Fairchild AFB, has been transferred to Little Rock, Ark. W7NSU vacationed at Depot Bay for three weeks. A couple of more new calls heard from the Walla Walla Area are K7YIC and K7YNE. W7EMP is going sightseeing via Yellowstone and Glacier. W7-CHI vacationed in New Jersey. W7ZAW took a trip to Rhode Island and W7GYH and family vacationed at Fort Stevens Park near Astoria, Ore., overlooking the beautiful blue Pacific. Traffic: W7BA 1518, W7DZX 833, K7CTP 512, W7APS 354, K7JHA 194, K7IEY 40, K7JRE 37, W7-AMC 31, W7AIB 22, W7OEB 19, W7BTR 10, K7PIG 8, K7SRI 7, K7NHG 5, K7IAE 3, W7EVW 1.

(Continued on page 124)

NOW ARRIVING ON TRACK SIX!

Clegg's VENUS 6 TRANSCEIVER

A COMPLETE SSB STATION FOR 6 METERS



Yes, the long awaited VENUS 6 SSB TRANSCEIVER is now being delivered to your distributors. Here's a brand new high quality compact attractively styled SSB RECEIVER and TRANSMITTER that puts you on 50 MC single sideband without all the fuss, bother and expense associated with adapting low frequency SSB exciters, relays and linear amplifiers. Its 20 tubes and 4 semiconductors provide performance equivalent to 35 tubes.

ELECTRICAL SPECIFICATIONS

TRANSMIT: Frequency—Any preselected 500 KC segment between 49.7 and 52 MC (50.0 to 50.5 supplied unless otherwise specified). Power Ratings—85 watts P.E.P. input—all modes (AM, SSB, and CW). SSB Performance—(9MC Crystal lattice filter)—Unwanted sideband down more than 40 db. Carrier suppression greater than 50 db. Distortion products down more than 30 db at full ratings. Frequency Stability—less than 1 KC warmup drift after first five minutes. Less than 100 cycle/hour drift after 30 min. warmup.

RECEIVE: Frequency Range—Same as Transmit. Frequency Stability—same as Transmit. Sensitivity—Less than .25 UV for 10 db s/n. Selectivity—2.8 KC at 6 db, less than 6 KC at 50 db. Overload Characteristics—Less than 2% cross modulation results from any two signals separated by more than 20 KC if stronger signal is less than 5 MV across 50 ohm input. Spurious Responses—images and IF leak through down more than 75 db between 49.8 and 51 MC. AVC Characteristics—less than 6 db change in AF output for input change from 2.5 UV to 1 MV(52 db). Fast attacks, panel selectable release time. AF Power Output—more than 2 watts, 3.2 ohms. Power Requirements—met by the Clegg Model 416A, 115 Volts AC, 60 cps input power supply as well as by many commercially available power supply packages.

PHYSICAL DIMENSIONS: 15" W by 7" H by 10½" D. Net wgt., approximately 18 lbs.

VENUS 6 TRANSCEIVER—Amateur Net Price **$475.00**

115 V. A.C. 60 CPS Power Supply—Amateur Net Price **$115.00**

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PACIFIC DIVISION

NEVADA—SCM, Leonard M. Norman, W7PBV—K7UGE needs Africa for the Worked All Continents award. W7VYC/KX6 is being heard nightly from KX6-BQ with a good signal. K7ICW has a new 2-meter rig and is being heard in Boulder City. he also is the new editor of the Las Vegas Radio Club's *Newsletter*. K5-RLX and XYL K7RWL have moved into a new home, complete with a new vertical antenna. K7QPK is off to college in California. W7BJY received the e.w. Armed Forces Day award certificate. W7TGK is picking the bugs out of the scope he received. New amateurs are K7QLU at Boulder Beach, K7YWH at Henderson, K7-YWL at Boulder City. K7YWF, ex-WA6LGR, is active on 6 meters. K7DNE is active on 2 meters. K7OLQ is the new EC at Pioche. W7YDX moved to Las Vegas. K7TYF is busy on a homebrew 2-meter rig. The Nevada 1964 Centennial Award certificates are off the press and the QSL cards should be available soon. QSOs confirmed by 5 of the 1964 Special Centennial QSL cards will receive the special certificate.

SANTA CLARA VALLEY—SCM, Jean A. Gmelin, W6ZRJ—Asst. SCM: Ed Turner, W6NVO. SEC: WA6-EIC. RM: K6KCB. PAM: WA6HVN. V.H.F. PAM: WA6RRH. The section net for S.C.V. is the Northern California Net, NCN, which meets daily on 3635 kc. at 0300Z. All amateurs in the section are invited to take part in this net. The Santa Clara Valley Section Net meets at 0300Z on 146.7 Mc. Tue. through Sat. WA6EIC has requested relief as SEC and your SCM is open for nominations. W6RSY made the BPL with a better-than-average total and still was gone for one week during the month. W6JXK also made the BPL. Ralph vacationed in September. K6GZ reports better-than-average NCN activity during the summer. WA6OLQ went on the inactive list after a fine summer on NCN. Joe is attending Claremont Men's College. Good luck, Joe. K6DYX ran a high-speed code test for the Connecticut Wireless Assn. in September. Smitty is active on RTTY and e.w. on Navy MARS and NTS traffic nets. W6PLG is active on NCN and Navy MARS. W6DEF enjoyed a vacation in the Southwest and East. W6PLS reports that activity is slow in the Half Moon Bay area but he looks forward to things picking up this fall. WA6JSA works NCN and reports contacts with W1, KP4, KM6 and KL7 on 160 meters. K6VQK reports that the Monterey Bay Radio Club had a booth going at the Monterey County Fair during August with much interest shown by visitors. K6MTX is completing his new shack this fall. Jim has been helping WA6HVN and the gang at the San Jose Red Cross put a new communications trailer into operation. The trailer boasts several rigs and setups on the amateur bands and is complete with RTTY installation. The trailer was donated by the San Jose Chapter of the Red Cross from surplus. WA6HVN reports that the trailer was used by the Santa Clara County Amateur Radio Association as an exhibit at the Santa Clara County Fair in September. W6CYL is installing RTTY gear to be used for Oscar work. WA6UAM is back from a successful summer at Carnegie Tech. Howie attended the Atlantic Division Convention in Washington, D.C. WA6YDF is drill officer for c.d. and active with the Los Gatos Chapter Red Cross amateur station. W6YHM is back from Alaska. W6ZRJ vacationed in the Pacific Northwest for three weeks in August. Emergency groups in the section began preparations for SET and fall activity. WA6RXM worked W6KB/6 on Fremont peak on 2 meters. Traffic: W6RSY 1241, W6JXK 1049, K6GZ 359, WA6OLQ 357, K6DYX 133, W6YBV 86, W6AIT 52, W6PLG 49, W6DEF 31, W6PLS 13, WA6JSA 8, K6VQK 5, K6MTX 2.

EAST BAY—SCM, B. W. Southwell, W6OJW—As there was no column last month because your SCM was out of the state on vacation there is lots of news for this month. WA9FDU/6 has a new Apache rig. WA6-RGD has an RTTY job at Mckay Radio. Congrats to WA6YES/WA6YET on the new OM harmonic. WA6ECF is trying out his new Marauder. WA6UQM has a new TB-500 Tribander and got in his first CD party in July. WA6CLI has a new electronic keyer and was portable in Nevada during the summer. WA6MJP got his DXCC sheepskin. W6ZF is working over his Collins 30-K. WA6UQM is hitting the DX with his QRP rig. Via postal, K6GK has visited TF, SM, EI, G, OZ, GM and LA countries, winding up with DL and HB9 before back to the U.S.A. WA6BZA got his old call, W6UB, back after a 4-year wait. WA6LGE and WA6LGD were transferred to DU-Land. The NCARTS plans to give away a model 26 TWX at the Bay Area Hamfest. K6-ESZ gives RTTY bulletins at 0215 GMT, Fri. on 3620 kc. and 146.475 Mc. W6OT has a 144-Mc. Gooneybird, courtesy of W6FDJ. K6UHT and WN6GVF are new members of the HARC. WN6UCA has a new 21-Mc. beam. WN6CVZ got her General Class ticket. K6LQF has a new NCX-3 s.s.b. rig. K6JNW has a new Heath

(*Continued on page 126*)

How to choose a microphone for SSB

Model 664
$51.00 Amateur Net

Hand us a blank check. Tell us you want the best microphone you can buy for SSB — with price no object. We'll hand you the Model 664 dynamic cardioid microphone. We'd like to tell you why the 664 is so uniquely suited to SSB operation.

Let's start with the transmitter. Almost every quality SSB transmitter, commercial or home-brew, incorporates an automatic level control circuit. And the general practice in transmitter design is to assume that the microphone response will be flat. On this assumption, the audio input circuits are designed to shape your speech characteristics, in conjunction with the ALC control, so that proper transmitter setup gives you maximum PEP.

Anything less than flat microphone response limits your ability to obtain maximum PEP, and your effective radiated power will be reduced. To satisfy this basic requirement, the 664 is unusually free from peaks or dips in response. It allows maximum PEP while retaining your natural voice characteristics.

Another important SSB feature, found in almost every modern transmitter, is voice operation. The 664 flat response, plus the effective Variable-D® cardioid pattern, reduces the possibility of accidentally opening the VOX circuit when speaker level is high. That's because the 664 rejects sound from the back and sides of the microphone. You can operate with higher receiver volume with complete safety. And noise, reverberation and echoes in the ham shack are reduced by the cardioid pattern to give you better intelligibility on the air.

Despite the performance advantages of the 664, this is not a fragile microphone, far from it. It's rugged, almost indestructible. The dynamic design meets the most rigorous tests for quality and service. And at the heart of 664 dependability is the diaphragm, made of Acoustalloy®; a unique plastic material available only from Electro-Voice. Acoustalloy is virtually impervious to shock, temperature extremes, humidity and the countless other environmental conditions that gradually destroy less rugged instruments.

But there's more to the list of 664 advantages: High output level, handsome appearance, and the guaranteed backing of a manufacturer of unquestioned integrity and wide experience in electro-acoustics.

While we manufacture microphones ranging from the communications units in the Gemini space program to professional models that have won an Academy Award for their contribution to motion picture sound, no field is closer to our hearts than amateur communications. And the engineers and hams in our organization are particularly responsive to the needs of the amateur fraternity. They insist on good value for every product, in every price range.

But when price is no object, their choice is the 664 for SSB. Outstanding in performance and value for even the most critical amateur radio operator. We urge you to try the 664 in your own shack soon. We guarantee your satisfaction, or your money back.

ELECTRO-VOICE, INC.
Dept. 1132Q, Buchanan, Michigan

Electro-Voice®
SETTING NEW STANDARDS IN SOUND

Twoer. WA6MJY got his General Class license. WB6ABV has a new Knight R100. WA6OLP, WA6BYN and K6MHD joined the HARC. A new 6-Meter Net has been formed on 50.55 Mc. at 0400 GMT Fri. WN6CUA had his DX60 emitting smoke instead of r.f. recently. WA6PNC has a new Swan. W6HF has a new Webster bandspanner mobile whip. Finished in baby blue no less. WA6MJY returned from W2-land. Because of the resignation of WA6MIE as SEC, the section has need for someone for this position who is AREC-minded. Contact the SCM if interested. W6BXE is on 75-meter mobile. The Martinez Ten-Meter Net is on 28.680 Mc. at 0300 GMT Thurs. W6DEX has a new Marauder. W1HWK, Father Dan, was a visitor at the QTH of WA6CNW/WA6CNV in August. WA6SQV's XYL is now WB6FIL. WØYBR/6 is a new member of the LARK. WA6ODP/6 made WAS in 24 hours on Field Day. WA6FKN is on RTTY. WA6VAT has a new tower for his quad. W7QOH/6 and his XYL have a new YL Harmonic. The Silverado Amateur Radio Society is awaiting the assignment of W6RBQ (memorial) as its club station call. Traffic: (Aug.) W6ZF 8, WB6EKX 6, (July) W4FOR/6 198, WA6RGD 188, WA9FDU/6 100, W6ZF 8, W7QOH/6 7. (June) WA9FDU/6 34.

SAN FRANCISCO—SCM, Wilbur E. Bachman, W6BIP—EC: K6KZF. I would like to take this opportunity to thank all my appointees for the help and reports which they have so kindly mailed me each month during my two-year term as Section Communications Manager of the San Francisco section. Because of out-of-state work assignments in connection with my job, I thought it best that one of the local amateurs, who remains in the section more take over this ARRL work. Since there was but one valid nominating petition on file in the closing date, C. Arthur Messinco, W6UDI/K6CWP has been declared elected SCM, Estelle, Art's XYL also is one of San Francisco's hams. She has worked very faithfully as secretary of the San Francisco Club and president of the BAYLARC so will be able to give the OM lots of help in making up the monthly report. Therefore, as my last report I am thanking all my good friends for all past help and requesting that they continue to give the new SCM the news each month as that is the only way he can see that ARRL gets data on each and every club in the section. 73 to the fellows and 88 to the ladies.—W6BIP.

SAN JOAQUIN VALLEY—SCM, Ralph Saroyan, W6JPU—Let us all give thanks for our blessings and hope that all of us have a very nice Thanksgiving. After my plea for news, I find that I have another fan in Turlock. WA6VML, who wrote to tell me that he has a DX-100 and an SX-96 receiver and is on 75- and 40-meter c.w. Other than that, activities here in this *hot* San Joaquin Valley apparently are at a standstill. W6MXR has a Galaxie 300 and is going mobile with it. K6SEV has a 20-A and is on 40- and 75-meter s.s.b. W6QFR went fishing and got plenty of salmon. W6QFR also has a new Heath 75-meter s.s.b. transceiver. WA6URV is the manager of the "Skeeter" Net. W6BAN and K6BGK got some motorcycles and are planning on some transistorized 6-meter gear. WB6ETQ is on 75-meter s.s.b. with a KWM-2. K6BKZ had a relay burn out in his transceiver. W6ADB is on 40-meter c.w. ragchewing and handling traffic. Now that vacations, hot weather and stuff are over, let's hear from you. Traffic: W6ADB 201, WA6VPN 15.

ROANOKE DIVISION

NORTH CAROLINA—SCM, Barnett S. Dodd, K4QFV/W4YZH—Asst. SCM: Robert B. Corns, W4FDV. SEC: W4MFK. RM: WA4FJM. PAM: K4ODX. V.H.F. PAM: W4BUZ. K4EWD reports a growing AREC group and planning a 6-meter net. W4FDV reports the Wake County Amateur Radio Club summer code class now is graduating Novices. K4PTB reports the Anson Radio Club has built a Twoer, bringing the total 2-meter rigs to five, and is planning a 2-meter net. The Shelby Amateur Radio Club recently held its biggest and best hamfest. WA4DAA reports his DX total now stands at 96/81. WA4ANH has completed an antenna tuner for 80 through 10 meters, using open wire feeders and plans to work some phone. K4CWW now is building a Heath HW-12. Goodwill ambassadors W4MFK and WA4FJM made a trip to ARRL Headquarters, returning via the Atlantic Division Convention in D.C. Haven't had a complete report on the trip yet, but bet it was a "Doozie." A very FB report was received from W4BUZ on plans for the v.h.f. AREC program. K4QIF worked W5UKQ on two meteor scatter. WA4JCS is getting better results with a reworked 6-meter beam. Congrats to K4CDZ on making the BPL for the third time. K4YYJ, W4OAB and K4QIF sent in FB OES reports. Net Traffic: NCN 341, THEN 107, OCEN 82. Traffic: W4EJP 372,

(*Continued on page 128*)

K4CDZ 281, WA4PDS 257, W4WLZ 173, K4QFV 72, WA4FJM 71, K4CWW 68, WA4ANH 58, K4QDO 36, WA4EIS 35, K4YYJ 35, W4BAW 34, WA4DAA 27, WA4-DKZ 26, W4FDV 17, K4PTB 13, W4COJ 12, WA4JCS 12, W4VSJ 9, K4EO 8, K4EWD 2.

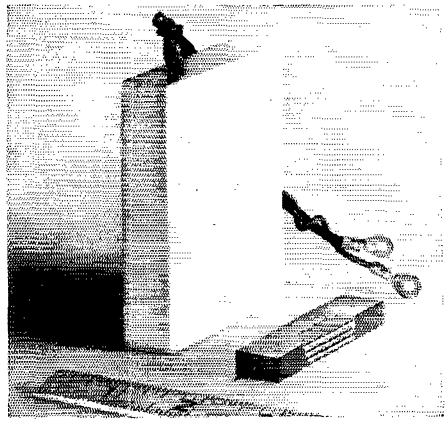
SOUTH CAROLINA—SCM, Lee F. Worthington, K4HDX—SEC: W4BCZ. RM: W4PED. S.S.B. PAM: K4JOQ. A.M. PAM: K4KCO. Nets: C.W., 2400Z and 0300Z, 3795 kc.; a.m., 0100Z, 3930 kc.; s.s.b., 0100Z, 3914 kc. The Rock Hill ARC held its annual hamfest Sun, Oct. 13. Congratulations are in order to the members of the Rock Hill Club on their fine management of this annual event, which is always first class. The South Carolina ARRL Section Meeting was held on the Saturday preceding the hamfest with its many distinguished guests including W4MWH, Roanoke Division Director. This annual meeting for all ARRL members is well on its way toward becoming the most important and informative event of the year. W4TLC, in his excellent OES reports, states he has worked over 90 miles on 432 Mc. All South Carolina appointees are reminded to check their last endorsement date and send certificates to the SCM for reendorsement where called for. K4PJW lost his 80-meter antenna during a recent squall and operated "half-mast" a while. Net Traffic: c.w. 112, s.s.b. 69, a.m. 23. Traffic: K4LND 92, W4AKC 63, WA4LPV 59, K4OCU 57, W4PED 46, W4NTO 6.

VIRGINIA—SCM, Robert L. Follmar, W4QDY—Asst. SCM and SEC: H. J. Hopkins, W4SHJ. RMs: K4MXF, W4ZAU, W4SHJ, W4QDY, W4KFC reports that his XYL now is WN4PAE and 13 year-old Andy is WN4PRF. Vic also reports that he is busy with K4CG and Fairfax Co. radio clubs. W4BZE's expedition to the Outer Banks was a complete success. W4CVO and his XYL visited So. America recently. W4DVI is back in the TCC harness with the station "K" sked, aspiring for DXCC with 127/91. The Alexandria Radio Club has a "new" used SX-101. K4KNP recently modified the keying of the DX-100B per Apr. 1959 *QST*. New hams in Williamsburg are WN4OFU and WN4OUS, says WA4-EPH, who reports 240 counties for USA-CA/500. W4-MXU figures on higher power to lick poor antenna capabilities. W4PTR, in Lynchburg, is the first to report the operation of a 2-meter f.m. net for traffic and DX liaison. W4ZAU is the new VSN mgr. and K4MXF the new VN mgr. They relieved K4ITV and W4LK, who did outstanding jobs during their tenure. K4SDS is working on an all-transistor rig to take on camping trips. W4DLA is back from a 2-week vacation and visited W3EML, his TCC boss. WA4BVE reports that her new jr. operator is growing like a weed and probably will start code and theory classes soon! W4BGP is on a 3-week business trip to W6-Land. K4PXY has over 75/USN/MM stations that he skeds with traffic! K4PQL copied 50 w.p.m. with a pencil at the convention and copped the prize! WA4EUL is plagued with rig troubles. W4RHA is Keeper of the Kennels while W4IA is away. W4NLC is fighting with his homebrew keyer. W4WBC has a new Heath Warrior linear. W4TBX, the new mgr. of the VSBN and W4JMA, his assistant, are working like mad to line this net up with the NTS; he has a new SX-117 receiver. K4IIP is back home after two months at Ga. Tech. Traffic: (Aug.) W4TBX 645, W4PFC 528, W4DVT 272, WA4FCS 213, W4RHA 198, W4DLA 161, W4JMA 144, W4MXU 130, W4QDY 100, K4PQL 97, W4-PTR 86, K4WVT 80, W4LK 73, K4DCN 68, K4ITV 61, W4JUJ 43, WA4EPH 40, K4SDS 39, W4NLC 26, WA8-BAG/4 25, W4NVX 25, W4SHJ 25, K4KNP 24, K4JYL 18, K4FSS 14, W4ZM 14, W4BZE 11, W4BGP 8, K4SGQ 8, W4ZAU 8, WA4BVE 7, K4PIK 7, W4TE 7, W4MK 4, W4OWV 4, K4YZT 3, K4BAV 2, K4GRZ 2, W4KX 2, W4JXD 1. (July) K4PQL 993, WA8BAG/4 22, W4BZE 15, K4IIP 4, K4JYL 4. (June) K4MXF 27.

WEST VIRGINIA—SCM, Donald B. Morris, W8JM—SEC: W8SSA. PAM: K8EPI. West Va. Nets may be found on 3570, 3890, 3903 and 3905 kc. and the new 10-meter phone net, nightly on 29.3 Mc. at 0200. The Tri-State ARC of Huntington is quite active, with W8DUV as publicity chairman. The recent transmitter hunt found the following active: W8AFX, WA8ACF, WA8ACH, WA8ACW, W8DUV, W8DUW, WA8FVI, W8GIO, K8-IYU, WN8IWQ, WN8KCJ, W8NJI, W8SDO, W8SDU, K8UHC and K8VNL. The Black Diamond ARC sponsored the Bass Lake Hamfest held at Hinton Sept. 1. W8WUB former PAM, attended from Michigan. WN8-JIG and WN8JED are new stations in the Kingwood area. Congratulations to W8DRU and the v.h.f. gang in the Hinton area for the fine article, page 76, Sept. *QST*. SEC W8SSA has been quite active in the EC program and has lined up the following ECs: Hancock County, K8ZPR; Kanawha, W8IRN; Logan, WA8DXS; Mineral, K8RLC; Monogolia, W8GUL; Monroe, K8-GWV; Upshur, K8YNM. My sincere thanks to the amateurs of West Virginia for supporting me for another term as your SCM. More ORSs, OPSs, OOs, OBSs and a

(Continued on page 130)

Building better electronic gas tanks...



Today's most intriguing pastime is attempting to fit an elephant into a trunk. This game comes under the general heading of microminiaturization.

We, at Sylvania, are not ones to pass up such an interesting challenge. And so it was -- with minds alert to thinking small -- that we developed an ultracompact, high-capacity nickel-cadmium battery from a unique process we use in manufacturing "Sarong" tube cathodes.

As applied to batteries, we form a film containing nickel and, after cutting to size, the resulting strips are sintered to form flat, self-supporting cell plates that need no bulky backing. The porous plates are then loaded with the activating chemicals and stacked to form rectangular cells.

The result is a nickel-cadmium battery with 50% more capacity per unit of volume and 30% more capacity per unit of weight than comparable types...and capable of being recharged well over 2000 times. For instance, the 12-volt battery pictured has a nominal capacity of 500 mA hours yet weighs only ½ pound and occupies a space of only 5.5 cubic inches. Other types, up to 28 volts, have capacities from 50 mA hrs. to 4 Amp hrs.

Because of their inherent voltage stability, these new Sylvania Ni-Cd batteries are particularly suited to transistorized equipment or similar low-rate-discharge applications where space is at a premium.

Currently our output is being consigned to military equipment, but we expect to make Sylvania Ni-Cd batteries available through electronic distributors in the near future.

73, Bob Lynch K2RMN

SYLVANIA

SUBSIDIARY OF
GENERAL TELEPHONE & ELECTRONICS

V.H.F. PAM is needed. Your cards and letters will be appreciated. K8TPF reports for PON: Phone, 225 stations with 90 messages; C.W., 44 stations with 34 messages, total 269 stations and 124 messages. Traffic: (Aug.) WA8FIC 109, K8TPF 104, K8VFK 88, WA8CKN 57, K8EPI 48, W8CKX 36, W8DUV 22, W8JM 10. (July) K8TPF 214.

ROCKY MOUNTAIN DIVISION

COLORADO—SCM, Donald Ray Crumpton, KØTTB—A vote of thanks goes to WØSIN, Colorado SEC, for the fine job he is doing in holding together the AREC during these trying times in amateur radio. We have had several new appointments to make and this is quite a job in itself. Some of the highlights in Colorado activities were the Pikes Peak Hill Climb and the Pikes Peak Marathon, which is a walking hill climb. KØYGH has been appointed communications director for the Hill Climb Association. Winter is coming to Colorado soon so ham activities will be on the move. All Colorado hams have been asked to write the Division Director or the SCM in regard to the ARRL proposal on incentive-type license structure in addition to the present incentive structure. Please get this done as soon as possible so a full report can be sent to ARRL. Traffic: W4UGI/Ø 365, KØZSQ 246, KØDCW 65, KØQGO 42. KØWGC 40, WØSIN 19.

UTAH—SCM, Thomas H. Miller, W7QWH—Asst. SCM: John H. Sampson, W7OCX. SEC: K7BLR. W7ZC recently moved to Springdale, Utah, and is active on 7 and 14 Mc. on c.w. and s.s.b. W7LQE and W7VTJ have rebuilt their equipment with sloping panels. They have an Eico 720 a.m. transmitter and an HX-50 for c.w. and s.s.b., both driving an HT-31 amplifier. They also have a VHT-18 vertical. W4VIW, in South Carolina, is anxious to work some Utah stations on 6 meters. K7RPA is now in Chickasha, Okla. and sends his regards. K7SDF finally made the roll on BUN. K7TQE has a small but active AREC group in Brigham City. BRAT awards on BUN for August went to W7OCX, K7MPQ and K7DJM. W7VTJ really has helped out during bad skip conditions on BUN. K7RGY has earned a BUN certificate. Congratulations. Traffic: W7OCX 139, W7VTJ 29, W7QWH 8, K7SDF 8.

NEW MEXICO—SCM, Carl W. Franz, W5ZHN—SEC: K5QIN. V.H.F. PAM: W5FPB. 10-Meter PAM: W5WZK. The NMBC has changed its time to 0700 MST and the NMEPN to 0730 MST effective Nov. 1. The Albuquerque AREC/RACES organizations did a very fine job during the Aug. 10 and 29 flash floods in Albuquerque. Red Cross, civil defense and city officials are very appreciative of their efforts. More than 400 amateurs and families attended the White Sands ARC Picnic at Cloudcroft which, from all accounts, was a great success. The Albuquerque Los Alamos AREC/RACES groups would like to hear from others in the state who would be interested in joining them. Albuquerque Red Cross took an active part in this year's SET. We would be interested in setting another date for an additional SET exercise. If there is any interest please get in touch with your SCM or SEC. Your SCM will be moving to a new address soon. Traffic: W5AHU 79, W5UBW 75, W5WZK 24.

WYOMING—SCM, Lial D. Branson, W7AMU—The Pony Express Net meets Sun. at 0800 MST on 3920 kc. The YO Net is a c.w. net on Mon., Wed. and Fri. at 1830 MST on 3610 kc. The TWN Net is a daily net at 2000 MST on 3570 kc. Lial, Wyoming SCM, visited W7PVN on his ranch 50 miles south of Casper. Bob reported that a couple of weeks before, while he was busy putting up hay with a crew of men down in the meadow, they saw smoke coming out of the roof of his house and rushed up to find it afire. They rescued radio gear, piano, TV set, some utilities and other contents but the house, pictures and recordings were a total loss. They have moved down to his mother's ranch temporarily, until they can build a new house. W7AEC is sporting a new car—a Thunderbird; K7IAY is back on the air and sounds fine. Traffic: (Aug.) W7BHH 24, W7AMU 12. (July) W7BHH 4.

SOUTHEASTERN DIVISION

ALABAMA—SCM, William S. Crafts, K4KJD—SEC: W4NML. RM: W4USM. PAMs: K4BTO, K4DJR (v.h.f.), K4TNS and K4WHW. August reports of all section nets (all times GMT):

Net	*Freq.*	*Time*	*Days*	*Sessions*	*Ave. Tfc.*	*Ave. Attendance*
AENB	3575	0100	Daily	31	7.7	8.8
AEND	3725	2200	Mon.-Sat.	25	1.7	8.7
AENM	3965	0030	Daily	31	4.49	37.2
AENO	50.55	0115	M.W.F.	13	3.4	32.8
AENP	3955	1230	Mon.-Sat.	26	2	17
AENP	3955	0000	Daily	36	4.8	30.2
AENR	50.55	0115	Tue.-Thur.	9	.44	26
AENT	3970	2230	Daily	31	9.29	15.74

(Continued on page 132)

The New Standard of Performance

The SS-1R sets a new standard of performance for amateur band communication receivers. A completely new front end design[1] provides superb freedom from cross modulation and overload, while the low noise balanced mixers deliver superior sensitivity — with *no r.f. stage.* Steep-skirted crystal bandpass filters and newly developed high-Q IF circuits provide optimum selectivity with greater than 80 db ultimate attenuation. Extreme linearity, double loop AGC and front end freedom from cross modulation make this selectivity as effective as though it were *at the antenna terminals.* Frequency precision and stability exceed that of most frequency meters; frequency is read directly on a *digital* display.

There are many new operating conveniences not found in other amateur equipment. The unique SS-1R design, plus fixed tuned WWV positions at 10.0 and 15.0 MC (and an auxiliary 5.0 to 5.5 MC band), permits autocalibration of the amateur bands — *with no cursor lines to twiddle.* The manual tuning rate is slow enough for easy and exact sideband tuning — 10 kc. per knob revolution — while pushbutton motor tuning gives fast traverse. An optional noise silencer accessory with spectacular performance[2] is available, as will be a Video Bandscanner. The SS-1R may be operated in transceiver mode with the SS-1T transmitter.

[1] "A New Approach to Receiver Front-End Design", W. K. Squires, W2PUL, QST, Sept. 1963. [2] "A Pre-I.F. Noise Silencer", *ibid.*, Oct. 1963.

SPECIFICATION PROFILE

- **Frequency Coverage:** 80 through 10 M (eight 500 kc. segments). Fixed tuned WWV at 10.0 and 15.0 MC; 5.0-5.5 MC auxiliary (WWV 5.0 MC). Two general coverage 500 kc segments
- **Selectivity:** 5 kc./2.5 kc./0.35 kc.
- **Stability:** Less than 500 cps warmup drift (typically in less than 5 min.); less than 100 cps thereafter including low to high line variation
- **Sensitivity:** ½ μv, or better, for 10 db S/N on 10 M with 5 kc. bandwidth
- **I.F. and Image Rejection:** Greater than 60 db
- **Cross Modulation:** Example: Receiving a **10** μv signal with 2.5 kc. selectivity, an unwanted **0.1 volt** signal 20 kc. away produces negligible cross modulation
- **Internal Spurious:** None at stated sensitivity
- **AGC:** Attack — 1 ms., **Slow** release — 1.0 sec., **Fast** release — 0.1 sec. Audio rise less than 2 db from 5 μv to 0.3 volt
- **ANL:** I.F. type; operates on AM, SSB, and CW
- **Size:** 7¾" H x 16¼" W x 13" D, 25 lb.

Squires-Sanders, Inc.

475 WATCHUNG AVENUE, WATCHUNG, N.J. • 755-0222

We are announcing 4 trophies for Alabama winners in ARRL contests: An SEC cup for the group with the highest FD score, an SCM cup for the highest club SS score, an RM cup for the highest individual c.w. SS score and a PAM cup for the highest individual phone SS score. Winners will be decided by *QST* listing. First awards will go to 1963 winners. K4WWP was voted the outstanding member of AENT for the third quarter. W4IHX won first prize at the N. Ala. Hamfest. W4AVM is the new NM of AEND. WA4AVM and WA4ENJ made the BPL. New on 6 meters: WA4PUX with a Thor; K4BFF with 500 watts s.s.b.; K4BSK, K4WOP and K4WOQ now mobile on 6. Other new equipment: K4-WWP, a Valiant; W4USM, 10-meter mobile; WA4LGF, a 2B and a Ranger; W4WLG, a Valiant and tower; WA4IIG, a DX-40 and an RME-4350. New hams: WA4PVG, Huntsville; WA4KNH and WA4KSS, Jasper. WA4LXK now is Tech. class. WA4AVM and WA4ENJ put on a successful ham display at a department store in Florence. W4PVG is the new Alabama Dist. One Army MARS Director. Traffic: (Aug.) WA4AVM 594, K4WOP 334, K4WWP 330, K4ROR 318, K4BSK 209, WA4ENJ 203, W4USM 173, K4WHW 100, K4AOZ 75, K4FZQ 42, K4NUW 42, WA4IQP 41, W4OGT/K4NGD 35, WA4EDF 32, K4HJM 30, K4BRZ 29, K4KJD 25, K4ANB 16, K4-NKT 16, W4NML 13, K4DSO 10, WA4KZT 9, K4WSS 9, K4BTO 8, K4GXS 6, K4CTB 5, W4DS 5, K4GRA 5, K4WSH 5, K4FTC 4, WA4EEC 3, K4RIL 3, WA4-MRQ 2, W4CIU 1, WA4LGF 1, K4TDJ 1. (July) W4DS 6.

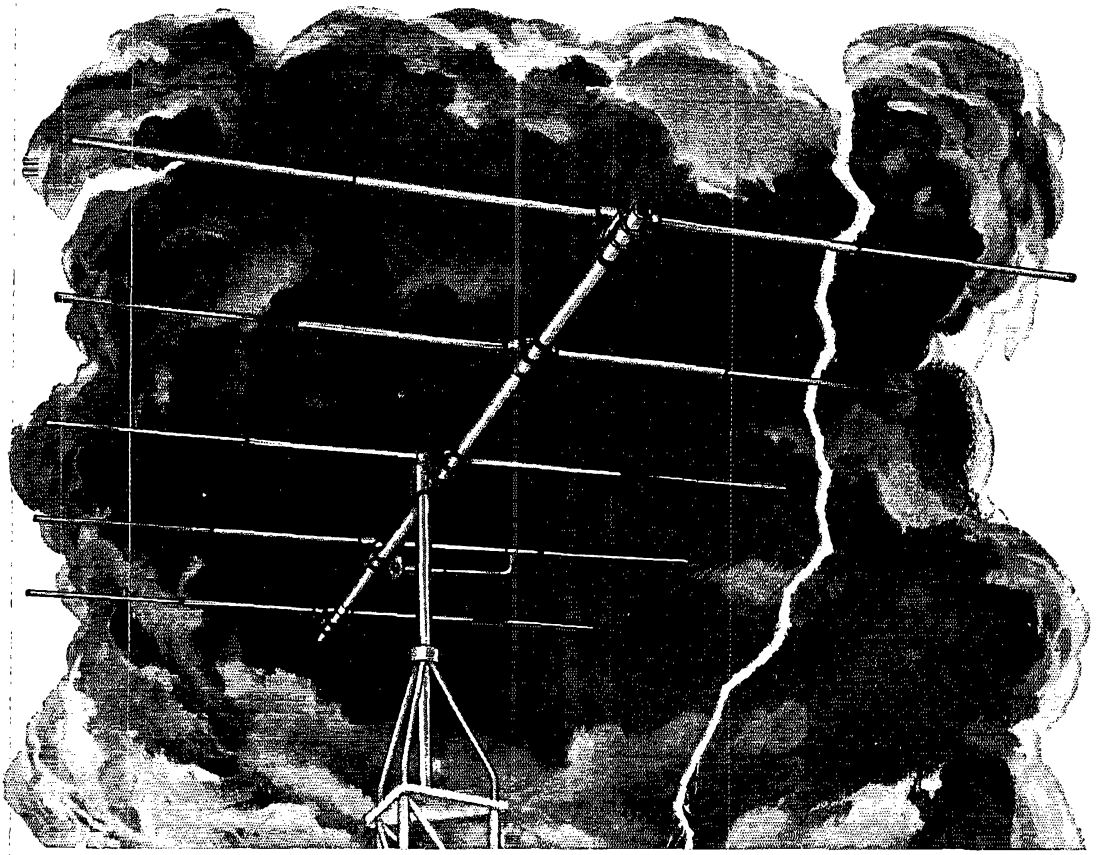
EASTERN FLORIDA—SCM, George E. Cushing, W4QVJ—SEC: W4IYT. Net reports for August:

FAST	28 Sess.	339 Tfc.	12.1 Avg.
Fla. Phone	24	135	5.6
Midday	27	174	6.5
QFN	62	482	8.3
Tropical	31	241	7.7
Gator	31	133	4.3

School activities are putting WA4JYB, WA4BGW and others in text rather than log books. WA4IJH, old timer, received his second BPL Medallion. The first was as K3IMP. W4MIN now is on with an SB rig. Others are building, modifying and preparing for the busy winter operating season. K4DAX was standby and handled traffic during a cable outage to Anna Maria Island. The North Florida Club, (Jax) had over 70 attending to hear TV-ham radio discussed and explained. It was the largest attendance in a decade at a Jax meeting. V.H.F. PAM WA4FVD, who is Deputy Sheriff at Marathon, racked up 43,000 points in the summer V.H.F. Contest. K6SXX/4 fought 7-Mc. QRN during the summer months and now has nearly 60 countries on 40-meter c.w. Enjoyed attending the St. Pete Club meeting. This is the club with printed activity plans for each month of the year—in advance! Enthusiasm results. The seasonal pilgrimage of our northern friends starts now. Bring them to your club's meetings and functions. See you in the SS. Traffic: (Aug.) WA4IJH 528, W4KIS 446, WA4BAW 282, K4BY 231, W4MIN 186, K4SJH 143, WA4JYB 135, WA4-BGW 123, W8LDU/4 123, W4TRS 103, W4EHW 98, K4-KDN 83, WA4JQQ 60, K4DBT 54, W4GUJ 51, WA4-GBM 47, W4ZJZ 45, W4IYT 34, WA4LBM 34, W4OGX 29, K4ILP 28, WA4IXI 28, K4FQP 20, W4SMK 19, K4DAX 12, WA4FVD 9, K4JLD 8, K4MTP 7, K4OSQ 7, W4FP 6, W6SXX/4 5. (July) WA4GBM 307, WA4BAW 205, WA4-BGW 131, W4AKB 127, K4DAX 40, W4IYT 28, K4ENW 21, W4ZJZ 11.

WESTERN FLORIDA—SCM, Frank M. Butler, Jr., W4RKH—SEC: W4MLE. PAM: W4WEB. V.H.F. PAM: W4ZGS. RM: W4BVE. Tallahassee: WA4JQX is testing new home-brew 6-meter transmitter and receiver. K4-YPI keeps regular 6-meter skeds with Wewahitchka and Panama City. WA4GES is on 6 and 2 meters with a Seneca. The 2-Meter Net now has 12 stations checking in. Port St. Joe: W4WEB is on 6 meters and monitoring 50.2 Mc. regularly. K4RZM has a new Galaxie 300 SSB transceiver. Panama City: K4CEF, WA4FJF and WA4BLX were appointed Asst. RACES ROs for West Fla. WA4FIJ was section winner of the June V.H.F. QSO Party. Ft. Walton: W1VTU/m was a recent visitor. Two-meter ship-to-shore communication for the recent skindiving contest was furnished by WA4BOZ, WA4-EVU, WA4OGB, WN4OFN, WA4NWC, W4PLK, W4SRX, W4ZBB and W4ZGS. Pensacola: K4SMB meets several traffic nets—a.m., c. w. and s.s.b. The V.H.F. Club had an FB picnic at Ft. Pickens. WA4HCN, WA4IIF and WA4IZM are now General Class. W4AXP moved the emergency generator to a new QTH. The PARC held a shrimp boil for members and visitors at Sea Glades on Gulf Beach Hwy. W4FRJ/m had the wiring in his car burn up. K4DDD and K4CFS won the 10-meter bunny hunts. Register your mobile gear and other emergency-powered equipment with your EC now. Traffic: (Aug.) K4VFY 523, W4MLE 170, W4ZWD 87, WA4FIJ 50, W4-WEB 34, K4QAC 23, W4BVE 16, K4SMB 13, WA4DCN 12. (July) W4MLE 163, K4QAC 14.

(*Continued on page 134*)



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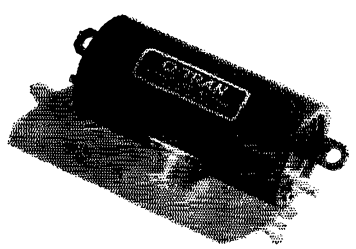

GEORGIA—SCM, James A. Giglio, W4LG—SEC: W4YE. PAM: W4FYH, K4PKK and W4RZL. RM: W4DDY. The net frequency of the Georgia Peach YL Net has been moved back to 7260 kc. The net meets each Thurs. at 0900 EST. K4IFF is NCS. The list of mobiles continues to grow. Add K4KEC, K4OUB, K4SBH, W4HEG and K4KPU. K4FUE continues to improve his equipment. K4VHC used his vacation to increase the efficiency of his station. It's good to have K4MCL active again on 20 and 40 meters. CHOP is "Bud," K4BVD has returned to his studies at M.I.T. Good luck, Rusty. Our idea of a "topflite" club publication is the *Atlanta Ham*. Keep going, Virginia. K4FRM has made BPL the hard way—via GSN, GCN, 4RN, 4RDN, AENB and AEND. Whew! K4WWY's collection of gear has forced him to move to larger quarters. We hear a desk and swivel chair have been added to the mass. Hi! We welcome a new arrival to K4NIS. The proud grandparents are W4YEK and W4TJS. Traffic: K4FRM 516, K4WWY 252, W4DDY 224, W4RZL 32, W4MLA 30, K4VHC 18, WA4GPA 12, K4MCL 12, K4FLR 11, WA4HSN 6, K4FUE 2, K4BVD 1.

SOUTHWESTERN DIVISION

ARIZONA—SCM, Kenneth P. Cole, W7QZH—Asst. SCM/SEC: George Mezey, K7NIY. PAM: W7OIF. RM: W7LND. The Copper State Net meets at 1930 MST Mon. through Fri. on 3880 kc.; the Grand Canyon Net Sun. at 0800 MST on 3880; the Tucson AREC Net Wed. at 1900 MST on 3880; the Cochise County AREC Net each Sun. a 1400 MST on 7260; the Tucson 2-Meter Net at 1000 MST on 145.35 Mc. The Scottsdale Amateur Radio Club meets the 3rd Mon. of every month at 7:30 P.M. at the Western Savings and Loan Building, Scottsdale, Ariz. The Arizona Amateur Radio Club meets the 1st and 3rd Thurs. of every month at the United Fund Building, Phoenix, Ariz. The Old Pueblo Radio Club meets the 2nd Thurs. of each month at 6015 East Broadway, Tucson, Ariz. Visitors are welcome to attend these meetings. A 6-Meter YL Net has been established by the Phoenix V.H.F. Club and can be found every Tue. at 2000 MST on 50.34 Mc. All YLs are invited. The V.H.F. Club also is establishing a library. Please contact K7IZR for donations of technical manuals. The Old Pueblo Radio Club reports recent visitors. W7QNC, K7EIM, K6BOH and XYL spent their vacation in the old hometown renewing old acquaintances. K7VXS and K7LSW are the proud possessors of new towers and beams. K7NKC and VKE are new members of the Scottsdale Amateur Radio Club. K7KAV and KAW, OM and XYL, are on a 2 month vacation through the northern United States and Canada. Their "rolling ham shack" contains a 30S-1 kw. linear. The KWM-2 is used both mobile and portable. Contact them on 14,287 or 14,296 kc. K7GPZ reports he is a new grandfather. Ex-W8NAF now is K7YSE. K7-KCB recently tested his 1000-v.-400-ma. mobile power supply manually (both hands). This is not recommended, even for electrical engineers! K7RDH has moved. Traffic: W7FKK 105, K7VQI 8, K7RUR 7.

SAN DIEGO—SCM, Don Stansifer, W6LRU—The August meeting of the Orange County Club featured a talk on RTTY by W6AEE. New generals in the Santa Ana area include WA6ZSS and WB6AIT. The call of the Anaheim Club is WB6GDY. New in the San Diego area is K1TFV/6, an OO from E. Mass. K4AKP/6 made BPL for August with a traffic count of 739 and is the new manager of the Pacific Area Net, replacing WA6ROF, who is QRL with college. WA6WTD reports making WAS with QRP. OES W6IEY reported openings on 6 meters eight days in August to eight different states. K6TFT, 2-meter EC, reports new 2-meter f.m. activity in this area. Local area hams will be pleased to learn that two locals who had heart attacks are on the mend: K6HQJ, who moved to Seal Beach, but checks in each Sun. morning on the 75-meter AREC Net, and ex-SEC W6-LYF, who has a new trailer and again is active on low power. W6MHY and his XYL have returned from a tour of the East Coast for four weeks. Thanks to those who nominated me as SCM again. Without your support and cooperation this job just couldn't be done. First appointment I'll make in my new term is that of W6SK as Section Emergency Coordinator. This job has been vacant for some time and I'm sure all ECs will cooperate with Don as he tries to build up the AREC. He was SEC 15 years ago and knows the job well. W6EWU will remain as my Asst. SCM, as he has for the past 10 years. Traffic: (Aug.) W6IAB 4851, K6PBI 4606, W6YDK 4164, K4AKP/6 739, W6EOT 459, WA6HRG 302, WA6ROF 180, K6IME 60, K6TFT 28. (July) WA6WTD 106, K6TFT 50.

SANTA BARBARA—SCM, William C. Shelton, K6-AAK—SEC: WA6CKN/WØCUG/6. RM: W7WST/6. The RM would like to have some traffic outlets on the SCN in the following areas: Paso Robles, Santa Maria, Santa Barbara, and San Luis Obispo. The net meets nightly on 3600 kc. at 0300 GMT. If you are interested in traffic

(*Continued on page 136*)

handling, please contact the RM. The *SCN Net News* as published by W6BHG, is now kaput because of a heavy postal burden. WA6OKN had a fine vacation back at his home in Ø-land and picked up his old call. The LERA of VAFB has a fine newsy paper each month for its members. The club is quite active with a very fine station at the club house on VAFB. OO WA6TCX will vacation in Florida, the SCM's old home state. His very fine reports indicate his dedication to the ham's welfare. Traffic: W7WST/6 151, K6AAK 38.

WEST GULF DIVISION

NORTHERN TEXAS—SCM, L. L. Harbin, W5BNG—Asst. SCM: E. C. Pool, W5NFO. SEC: K5AEX. PAM: W5BOO. RM: W5LR. The Big "D" Hamboree held Aug. 17 was a huge success. Sponsored by the Dallas ARC, more than 1800 attended. Among the highlights of the meeting were the transmitter hunts. K5MTS, an XYL, won the 75-meter hunt—the prize a Drake TR-3 transceiver. Many of the old transmitter hunters said, "That gal just lucked into it." When the results of the 10-meter hunt were announced and Dorothy was declared the winner every one decided that maybe she knew what it was all about. The prize for this hunt was a Swan SW-240. Dorothy decided not to hunt for the 6-meter transmitter. W5DWL won the 6-meter hunt, the prize a Clegg Thor transmitter. The Waco Hamfest held Sept. 1 had an attendance of 220. W5YUO was the winner of the transmitter hunt. I am not able to understand why there are not more in attendance as this hamfest is held in an air-conditioned mall at one of Waco's finest shopping centers with plenty of parking places. The KC Club of Ft. Worth reports good results from the class of instruction, with 7 Novices and two Generals passing their examinations. K5PHT has moved to Ft. Worth. K2GKK/5 has a new baby girl. K5HWN lost his car in a recent garage fire. What made it so bad was that the new NXC-3 had just recently been installed. The Red River ARC's new officers are WA5CMC, pres.; K5RLB, vice-pres.; WA5CTD, secy-treas.; W5IKM, net control. Traffic: W5BKH 352, W5AFI 184, K5PXV 68, W5BIC 46, W5BOO 34, W5LR 15, K5ETA 8.

OKLAHOMA—SCM, Bill F. Lund, K5KTW—Asst. SCM: Cecil P. Andrews, W5MFX. SEC: K5DLP. Bill is the new SEC and his address is 901 Bell, Lawton. You ECs get in touch with Bill and get your reports in. We want to thank W5PPE for the fine job he did as SEC under Preacher. W5PPE worked 8 states the last week of August on 2 meters using his home-brew 120-watt rig. There seems to be a lot of activity on 2 meters lately. K5KHA and K4CAY are running high power and really pushing 2 meters. If W5EHC doesn't quit running to Washington, D.C., all the time he might have to get a 3 call. W5LBT, W5RRN, W5HXT and K5MTT have new Drake TR3s and K5LUR, K5DZV and K5YTB have SB-33s. K5HVS described and demonstrated his new Heath 80-meter transceiver at the Bartlesville Club which drew a lot of interest. K5VSY is the new EC at Bartlesville and K5PIA is the new PAM for v.h.f. in Oklahoma. W5DRZ still is issuing the 77-county award. If you fellows would work more locally and QSL, Preacher would like to get rid of some of the awards. K5AMT and other Owasso hams are doing more on v.h.f. now. The Electron Benders Club in Tulsa has started a new school and have about 50 enrolled. Traffic: K5TEY 547, W5PPE 542, K5VNJ 146, W5DRZ 52, K5OCX 32, W5KIY 26, W5PML 26, W5MFX 17, K5ZCJ 17, W5UYQ 12, K5ZEP 11, K5YAQ 10, W5PNG 9, K5JOA 8, K5MTC 7, W5EHC 6, WA5FLV 5.

CANADIAN DIVISION

MARITIME—SCM, D. E. Weeks, VE1WB—Asst. SCMs: A. E. W. Street, VE1EK, and H. C. Hillyard, VO1CZ. *Attention all C.W. operators*: A weekly get-together is tentatively scheduled for section c.w. operators, 3660 kc., Sun. 0900 AST (1300 GMT), with VE1HJ as NCS. The first meeting date is Nov. 10, weekly thereafter. A special invitation is extended to newly-licensed amateurs. VE1OM reports that the ECN (Eastern Canada Traffic Net) desperately needs VE1 representation. It meets daily at 0045 GMT on 3540 kc. The NSARA held a very successful annual get-together at Luneburg over the Labor Day week end with over 250 in attendance. Newly-elected officers are VE1HL, pres.; VE1MA and VE1FQ, vice-pres.; VE1AX, secy. VE1PX was awarded the Leo Doucette Memorial Trophy, while VE1WG received the NSARA Award. VE1LG, our oldest active amateur, was presented with a picture of the famous Bluenose on the occasion of his 88th birthday! The SONRA group recently held its annual picnic, which was highlighted with a visit from the "W" and "K" boys from Argenita. VO1FF and VO1DO recently visited FP8-Land. VE1WL has been on a trip to the British

(Continued on page 138)

Isles. VE1ALH, VE1DR and VE1OK are active on 6 meters. Traffic: VE1OM 18.

ONTARIO—SCM, Richard W. Roberts, VE3NG—Toronto has a new PAM for 2 meters with the appointment of VE3DRF. Our sincere thanks to VE3DUU for his leadership while holding his PAM appointment. VE3FGV advises of an error in August *QST*, The Ont. Que. Net meets *every* day of the week. Welcome back to VE3CSA, who broke his neck while up north. Our good wishes to VE3EBI, who is the new editor of the *Gray Bruce Bulletin*. To VE3DPO, the founder and retired editor, a million thanks from us all. The outdoor meetings of the Ottawa mobile gang really are a great idea. Other clubs take note. VE3AK was in VE1-Land for a visit; likewise VE3YN, who met with VE3AYS. VE3BD paid a visit to Quebec City. VE3AFA has a new s.s.b. rig. VE3BFK is on s.s.b. VE3BD also has gone D. Duck. Lots of boys are getting on 6 meters this fall. VE3AUH is back in Islington from Sunridge. From the Canadian Director, VE3CJ, I learn that during the fiscal year '63/'64 to date (i.e. Apr. '63-Aug. '63) 1148 American hams entered Canada and were granted operating privileges. Reverse figures will be available soon. My thanks to the Seaway Valley ARC for the invitation and I understand that the hamfest was A-100. VE3FSC is going on 2 meters. VE3DJK has a big Wheel. VE3DPH is heard with good reports all over Ontario. VE3BLZ was a visitor to the Toronto CNE. VE3DOO and VE3PR sked every A.M. The DOT is cracking down on the unmodulated carriers that appear each evening. VE3UW, the QSL Mgr., requests that you forward 5x7 envelopes, self-addressed, and separate five-cent stamps to him at 20 Almonte Rd., Downsview, Ont., for QSL cards. If you already have sent envelopes, etc., it's O.K. but the above holds good for the next batch you forward. Welcome to VE3FJQ, a newcomer to 75 meters. VE3EZC has returned to 144 Mc. The Lakehead gang has a good program for the winter months. VE3ZCD has a good signal all over Ontario on 75 meters. Traffic: VE3CFR 135, VE3NG 105, VE3EHL 82, VE3DPO 74, VE3GI 65, VE3BAQ 41, VE3BUR 38, VE3FGV 37, VE3ETM 29, VE3ELQ 28, VE3AMI, 25, VE3AKQ 22, VE3BLZ 22, VE3EAM 14, VE3CFI 9.

QUEBEC—SCM, C. W. Skarstedt, VE2DR—Asst. SCM: Jean P. Achim, VE2ATL, VE2UQ, when signing VE2UQ/VE8, gave a few stations their first VE8 contact on 160 meters. A long-wire antenna proved useless but a top-loaded tower did the trick. Later he visited VE1 sections P.E.I. and N.B. and had many fine QSOs from these points. He reports VE8YT has promised to give 160 meters a whirl this winter. The annual OT's corn roast at the SCM's QTH proved pleasant despite poor weather. Three W operators also attended. The average ham years of the ten oldest OTs was 39.5 years. We welcome VE3YP, who now resides in Pointe Claire. We are not sure whether the 97-lb. shark got VE2OR or vice versa. VE2SI enjoyed a visit to Scotland and England and our QSL Mgr., VE2YA, also visited these countries plus Ireland. Ex-VE2LO now signs VE3BOJ. From VE2ATL: VE2BEZ seeks information on how to get the DXpedition to Clipperton Is. Can anyone help? VE2ATL is directing a slide with sound show dealing with emergency communications. When completed, this project will be available to all ARCs. OA8P (ex-BCZ) est retour à Montréal. VE2JC est de retour dans l'air avec ses bulletins, le samedi à 11 heures sur 3750 kc. VE2AWR a acquis le SP-600 de VE2PY. VE2BMR, VE2BKI, VE2BKG, VE2BLA sont maintenant licensiés en téléphonie. Félicitations aux nouveaux diplomés des cours de VE2JC: VE2AEE, VE2ACD, VE2BRT, VE2BHT, VE2AEW, VE2BRG. Le résultat des dernières élections à RAQI sont les suivants: VE2PS, pres.; VE2AAH, vice-pres.; VE2LG, secy.; VE2AID, VE2NP, VE2PX, VE2AOS, VE2BAY, VE2AIL, VE2AIV, VE2AM, VE2OX, VE2NU, VE2BAE, VE2RA, VE2PH, VE2TJ, dir. Traffic: VE2AGQ 124, VE2ALH 88, VE2DR 44, VE2EC 28, VE2AIR 21, VE2BHH 16.

ALBERTA—SCM, Harry Harrold, VE6TG—SEC: VE6FS. PAM: VE6PV. RM: VE6AEN. ECs: VE6FK, VE6SS, VE6ABS, VE6AJY, VE6AFJ, VE6PZ. OPSs: VE6CA, VE6PV, VE6HM, VE6SS, VE6BA. OOs: VE6HM, VE6NX, VE6PL. OBSs: VE6HM, VE6AKV. ORS: VE6BR. OESs: VE6DB, VE6HO, VE6AKV. VE6PV reports that summer check-ins were away down because of the summer holidays, and that the winter sked for APN is now in effect. VE6FS would like to see more of the boys turning out to the annual AREC Picnic. With three new ECs we should have a very good emergency group this winter. By the time this issue gets to you we will be back on our winter sked and VE6PV welcomes all the old members and any new hams who wish to join APN. VE6HM, you didn't let us know how you enjoyed your trip into the Far North. The boys in VE8-land are very quiet these days with no reports. How do all of you fellows expect to get any reports in this space if you don't send something in? Traffic: VE6HM 112, VE6TG 17, VE6FS 6, VE6BA 4, VE6SS 4, VE6BC 2, VE6SDS 2, VE6FK 1.

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(Continued from page 35)

5) *Reporting:* Follow the sample shown in reporting contest results. Printed contest forms will be sent free on request. Indicate starting and ending times and dates for each period on the air. All Sweepstakes reports become the property of ARRL and none can be returned.

There are no objections to one's obtaining assistance from logging, "spotting" or relief operators, but their use places the entrant in the multiple-operator class, and it must be so reported.

A single-operator station is one manned by an individual amateur who receives no assistance from other persons during the contest periods. He may not have assistance in any manner in keeping the station log and records, or in spotting stations during a contest period. The operation of two or more transmitters simultaneously is not allowed. Contest reports must be postmarked no later than December 18, 1963, to insure eligibility for *QST* listing and awards.

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

6) *Awards:* Certificates will be awarded to the highest c.w. scorer and to the highest phone scorer in each ARRL section. A c.w. certificate will also be awarded to the highest scoring Novice or Technician in each section where at least three such licensees submit c.w. logs; similarly, a phone certificate will be earned by a Novice or Technician in each section where a total of three such licensees submit phone logs. A certificate also will be awarded to the highest scoring Novice and Technician from sections of less than three entries . . . that in the opinion of the Awards Committee displayed exceptional effort. Only single-operator stations are eligible for certificate awards. Multiple-operator scores will receive separate *QST* listing in the final results.

A gavel will be awarded to the highest club entry. The aggregate scores of phone and c.w. reported by club secretaries and confirmed by the receipt at ARRL of contest logs constitute a club entry. Segregate club entries into phone and c.w. totals. Both single- and multiple-operator scores may be counted, but only the score of a bona fide club member, operating a station in local club territory, may be included in club entries.

The highest single-operator c.w. score and the highest single-operator phone score in any club entry will be rewarded with a "club" certificate where at least three single-operator phone and/or three single-operator c.w. scores are submitted.

7) *Disqualification:* Failure to comply with the contest rules or FCC/DOT regulations or the necessity for avoiding interference with channels handling amateur emergency communication shall constitute grounds for disqualifications. In all cases or question, the decisions of the ARRL Awards Committee are final. QST

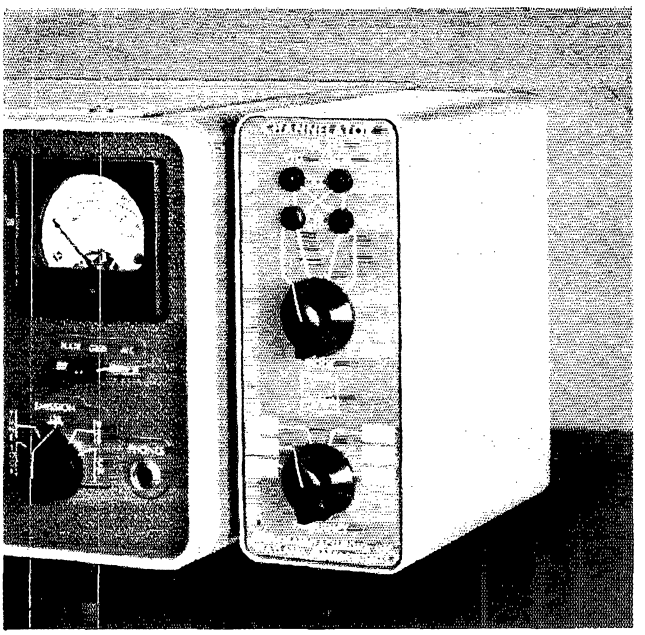
Sweepstakes from the Sidelines

(Continued from page 44)

lived with a stranger. My easy-going "nut" had turned into a repulsive human being. His sunny disposition had vanished with the thing-a-ma-bob. Finally, I begged him to take it back, and accepted my fate. He kissed me and hurried out to the shack, muttering something about next November.

Now, every November, on the fateful day, I kiss my husband good-bye, and become a silent and suffering maid for two weeks. I serve his meals to the left of the desk (he operates code now, and his right hand is frozen to the bug). I cut up his meat, butter his bread, bring his drinks, sharpen his pencils, light his cigarettes, and empty his bedpan. Finally, I carry the bundle reverently off to the post office to be sent registered mail to ARRL Headquarters and start steeling myself for next November. QST

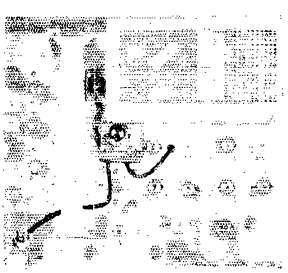
WATERS ACCESSORY PRODUCTS FOR COLLINS KWM2/2A

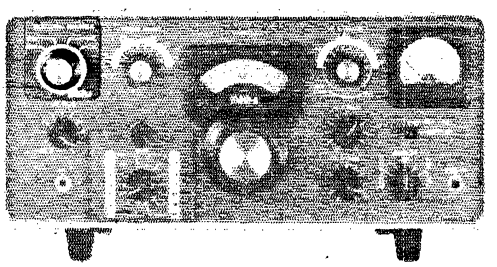


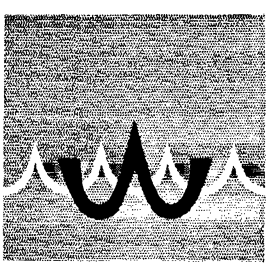
CHANNELATOR™
Crystal Frequency Control

The CHANNELATOR resolves KWM2/2A transceiver tuning problems. Instantaneous switching to any of six pre-selected, exact crystal frequencies; covers complete PTO range. A built-in heterodyne frequency meter and "pullable" crystals permit exact frequency adjustment for NET or ROUND TABLE operations. You can operate normal PTO or "split channel." The Channelator installs in minutes — all cables and plugs are furnished, only cable to solder — no drilling; operates from any fixed or mobile KWM2/2A power supply. PRICE, less crystals: **$75.00** Crystals, any frequency, USB or LSB: **$6.00** each

EVT™ Electronic Vernier Tuning gives you 20-to-1 tuning ratio in your KWM2/2A. A stable, solid-state varactor tuning device, EVT attaches to your PTO *without* wiring changes. Precise, slow-rate tuning makes small frequency changes easy, especially when "mobiling" in traffic. Tuning range is ±500 cycles from any PTO setting. Zener regulator maintains well-known Collins stability. EVT may be used with *any* power supply. PRICE: **$23.95**







Q-MULTIPLIER/NOTCH FILTER™ Eliminates heterodynes and other unwanted signals with over −40 db notch tunable over the entire IF passband. Assembled and ready for installation, the Q-Multiplier/Notch Filter becomes an integral part of your KWM2/2A with escutcheon plate and knobs matched to the Collins panel; no drilling. PRICE: **$53.75** (Also available for Collins 75S-1: **$39.95**)

AVAILABLE AT LEADING DISTRIBUTORS

WATERS MANUFACTURING, INC., WAYLAND, MASSACHUSETTS

Other Waters Products: Coaxial Switches – Dummy Load/Wattmeter – "Little Dipper™" (Transistorized Dip Oscillator)

QCWA

(Continued from page 63)

At the Golden Anniversary Celebration of Amateur Radio Licensing banquet held in New York City last October, it was a pleasant surprise to see that more than sixty per cent of award recipients were members of the QCWA. It was also very gratifying to know that almost all of the members of the committee who made possible the Golden Anniversary Celebration of Radio Licensing, while they were representing other sponsoring societies, were QCWA members.

The Quarter Century Wireless Association is so well thought of that the Radio Society of Great Britain started a similar organization last year. Anyone who had a valid amateur radio License twenty-five or more years ago and is presently licensed, may be eligible for membership in the Quarter Century Wireless Association. An information sheet and application may be secured from Ralph G. Barber, W2ZM, Executive Secretary, 244 Forest Avenue, Locust Valley, New York.

The devotion of its officers and directors and the hard work of its staff, account for the phenomenal success and have led to the fulfillment of the purpose for which it was founded. QST

"AA"

(Continued from page 27)

few hours right at his table, otherwise don't bother him. He'll be getting treatments from others around the country all weekend. Don't worry about little things . . . strange outbursts, certain audible phrases, things like that. You won't notice much improvement until late Sunday night. But by Monday morning, he'll be OK again. A bit pooped, but OK."

"Oh, I hope he'll be all right by Monday."

"One thing, Mrs. TGY. Joe may have another attack next weekend."

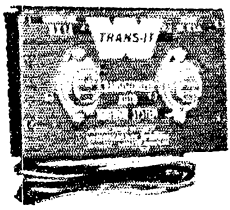
"Oh my . . ."

"But don't worry. He'll get more EBT . . ahh . . . Electromagnetic Balm Therapy from other WF sufferers and be in good shape again by the following Monday. Then I think he'll be OK for a month or so, but don't be surprised if he has another violent attack next February and March. Bad season for AM . . . Anopheles Marconii . . . world wide attacks then."

"At least these attacks aren't *every* weekend. Rather odd times to get . . . But I suppose there were a few things Joe didn't want to tell me before. Like, well, you see, on this card he gave me . . . the one with your phone number on it . . . printed right in the middle of the card are large red letters, 'AA'. Naturally, I knew Joe . . ."

"Noooo, nooo Mrs. TGY, not that. That AA card is carried by victims of AM — Anopheles Marconii — that is, ahhh Weekend Fever Victims. These little cards save many lives. Just

(Continued on page 144)



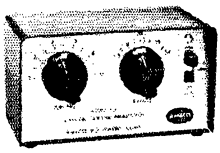
WORKMAN MODEL BX 14 TRANSISTORIZED AUTO IGNITION SYSTEM

Has built-in coil boosters. Easy to install. SAVES GAS, POINTS AND PLUGS.

Amateur Net **$10.77**

AMECO PCL, 6-160 METERS ALL BAND NUVISTOR PRE-AMP

Improves performance of all weak signal receivers. 2 Nuvistors in cascode give an overall gain of 20 db and noise figures of 1.5 to 3.4 db depending upon the band. Controls: bandswitch, tuning capacitor, and off/standby/on switch for inserting or removing pre-amp. Power requirements of 120V @ 7 ma., and 6.3V @ .27A. can be obtained from your receiver or from AMECO PS-1 supply. Size: 3″ x 5″ x 3″



wired & tested **$24.95**

SUPEREX HAM HEADPHONES

Full comfort even after many enjoyable hours of continuous use. Superb comfort even for eyeglass wearers. Crisp, distortionless reproduction and high sensitivity allows you to single out that weak signal and hard to reach station. 600 ohms impedance, completely adjustable head harness. **$24.95**

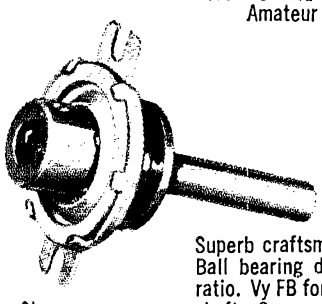
MURA MODEL NH-200 COMPACT SUPER ANALYZER

RANGES — DC Volts: 0-.25, 1, 10, 50, 250, 500, 1000 V. (20,000 ohms/volt). AC Volts: 0-10, 50, 250, 500 (8,000 ohms/volt). DC Current: 0-50 ua, 10 ma, 250 ma. Resistance: 0-5K, 500K, 5 Meg. Db: -10 to plus 22 direct reading. Complete with test leads and batteries. Shipping wt.: 2 lbs., 4½x3⅝x11½″.

Amateur Net $11.95 imported

BULLSEYE BUYS AT ARROW

hand picked for hams by hams...



Shown approx. actual size.

PRECISION PLANETARY-VERNIER for exceptionally fine tuning

Superb craftsmanship by Jackson Bros. of England. Ball bearing drive, ¼″ dia. Shaft 1⅛″ long: 6:1 ratio. Vy FB for fine tuning. Easily adaptable to any shaft. Comparable value $5.95 Model 4511/DAF

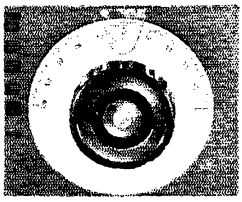
Amateur net $1.50 ea. 10 for $13.50

PRECISION BALL DRIVE DIAL

Another superb product of Jackson Bros. of England. 4″ dia. dial with 6:1 ball drive ratio. Fits standard ¼″ shaft. For that velvet touch...

Amateur net $3.95

Does not include panel.



VERSATILE MINIATURE TRANSFORMER

Same as used in W2EWL SSB Rig—March, 1956 QST. Three sets of CT windings for a combination of impedances: 600 ohms, 5200 ohms, 22000 ohms. (By using center-taps the impedances are quartered). The ideal transformer for a SSB transmitter. Other uses: interstage, transistor, high impedance choke, line to grid or plate, etc. Size only 2″ h. x ¾″ w. x ¾″ d. New and fully shielded.

Amateur net $1.39.
3 for $3.49.
10 for $10.75

Trade-ins welcomed.

MAIL ORDERS PROMPTLY PROCESSED. SAME-DAY SHIPMENT FROM STOCK.

TO SAVE C.O.D. CHARGES, PLEASE INCLUDE SUFFICIENT POSTAGE WITH YOUR ORDER. ANY EXTRA MONEY WILL BE RETURNED.

ALL PRICES F.O.B. N.Y.C.

Arrow's Export Dept. Ships To All Parts Of The World!

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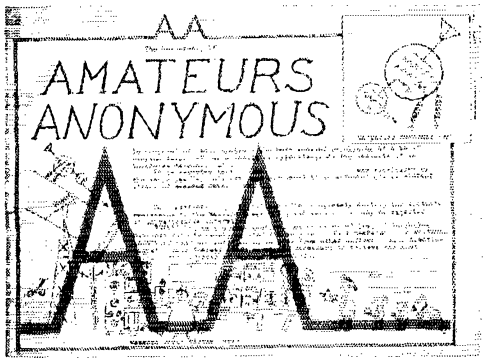
65 Cortlandt St., N.Y. 7, N.Y. • 525 Jericho Tpke., Mineola, N.Y. • 225 Main St., Norwalk, Conn.
212 — Digby 9-4730 516 — Pioneer 2-2290 203 — Victor 7-5889

like we save Joe's. Helps get proper EBT injections in time . . . yeeeaaahhh . . . ahh . . ."

"Well, thanks very much for saving my new husband. I'll just do what you said. I hope his attack isn't too . . . Oh, by the way, what does the 'AA' stand for if it isn't . . . you know . . ."

"Oh, 'AA' means Amateurs Anonymous."

QST



A new citation is offered this year. In keeping with the theme of the story starting on page 27 of this issue, W6ISQ will send a special "AA" citation (a certificate not good for anything except framing—and even that's a dubious value) to any station working all 74 ARRL sections, or scoring over 200,000 points (citizens of Virginia and Indiana, take heed). Published results of the Sweepstakes in a spring 1964 *QST* will be the basis for issuing this citation.

Control Towers

(*Continued on page 61*)

eventually, somebody else will come along, including a 2RN rep to take the THRU traffic.

It should be obvious that a written list or else knowledge of the QTH's of all regular net members is a vital necessity. Without it, you'll slow down the net tremendously.

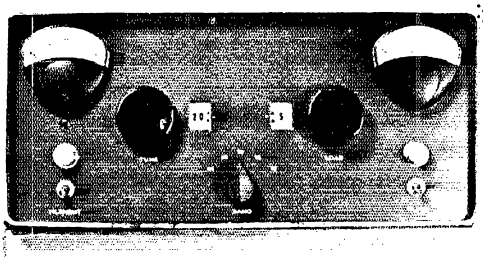
That's about all there is to being a net control. The theoretical and practical sometimes coincide, making life easy. When they don't, cheer up; things could get worse, and they usually will.

If you can copy 25 w.p.m., take a listen to EAN on 3670 kc. at 0130 GMT every night for a week. You'll hear real operating "savvy." It may not be immediately apparent, but if you keep a record of how much traffic is cleared and who is sent off frequency when, I think you'll find it's not as random as it seems. Sometimes you'll outguess the NCS, but remember, *he's* under pressure — *you're* not. It's like driving from the passenger's seat; you can see a few more salient features because you're not the one who's concerned with the actual driving of the auto.

By the way, the path to being a net control is not a short one. One doesn't jump into it overnight. One gets to be a regular NCS only by spending plenty of time proving capability as a regular net member. Believe me, from what I hear on the traffic nets every now and then, that's more than enough challenge for most people!

QST

Introducing



The
NEW
HENRY
2K
LINEAR
AMPLIFIER

MAXIMUM

POWER • EFFICIENCY • RELIABILITY
VALUE

2000 WATTS P.E.P. SSB*
FULL LEGAL POWER AM and CW
UTILIZES TWO EIMAC 3-400Z TUBES
Console Size: 29½" H, 14¾" W, 13½" D

- **FLOOR CONSOLE 2K $675**
  (Self Contained Power Supply)
- **DESK MODEL 2KD $645**
  (With External Power Supply)
- **RF SECTION only 2KR $425**

11240 W. Olympic Blvd.
LOS ANGELES (64)

931 N. Euclid
ANAHEIM

Henry Radio Stores

BUTLER
MISSOURI

- **WRITE OR CALL FOR SPECIFICATIONS**

* Twice average DC

R.F. Chokes for the V.H.F. Bands

(Continued from page 43)

Chokes that must work over a wide range of frequencies also require special attention, if the application is a critical one. This is handled on lower frequencies by winding chokes in sections, to hold down distributed capacitance and prevent amateur-band resonances. The important point here is to keep choke impedance high, compared with circuit impedance. For v.h.f. applications where single-layer chokes are normally used the distributed capacitance can be held down by space-winding and using a minimum of cement. The choke should have only just enough inductance to make it work on the lowest frequency involved. Our 50-Mc. choke referred to above is an example. It is still very good at 144, and usable even at 220. A single-layer choke, close-wound with fine wire and heavily doped with lacquer, may not do for more than one band in circuits where choke efficiency is important.

You can tell a good choke from an inferior one easily enough. Connect it across your driver-stage tuned circuit, and see what it does to your final-stage grid current. Also note how much you have to retune the driver circuit to restore resonance. A perfect choke would have no harmful effects, and it would not heat up. You won't find one that good, but a well-designed choke will come close. If the choke is not a good one, don't run the test too long at any appreciable power level, or you won't have to *look* for indications — you'll smell them! QST

The World Above 50 Mc.

(Continued from page 74)

W3GCO expresses disappointment in a mobile trip of 300 miles. One almost-complete contact during the trip.

WA2PWI has interesting comments: "Most of my operating was done from Weirs Beach, New Hampshire, during August and also from Morgan, Vermont. The Vermont location was only six miles from Canada. Worked Porto Rico and Manitoba and many states but at no time did I hear a New England station while in Vermont." Golly, and it was probably a new county too! At Cheektowaga, New York WA2VOK sez that openings have been few and local activity hard to find, but ground wave has been good on a few evenings. Report from W2CNS (s.s.b.) sez that aside from the usual (?) skip conditions ground wave has been excellent. Bob has worked stations in the Boston area about 225 miles, to the north he worked VE3BPR about 200 miles, to the west stations near Pittsburgh about 250 miles. Aurora was heard on August 19 and 20 when stations up and down the coast were worked. On the 20th, VE8BY was worked with his signal first sounding like an aurora signal then changing to what sounded like E_s. Bob would like to know "Wha's goin' on?" He'd also like more of the gang to point their beams toward Binghamton, New York for ground-wave contacts. WA2TQT, in New York City, notes opening on August 1 with all signals 5/8 or better from Missouri, Kentucky, Ohio, Indiana,

(Continued on page 148)

With the compact, new National NCX-3

Here's the newest and hottest transceiver on the market—a complete SSB/AM/CW station with a *conservative* 200 watts of SSB punch—at a price far less than you would expect to pay for National's famed quality and performance!

Complete coverage of 80, 40, and 20 phone and CW bands – including VOX or Push-to-talk, grid block break-in keying with adjustable release time, adjustable pi-network output, and all other features that mean so much for your operating convenience and pleasure. Backed up by a full year guarantee.

And, Harrison helps you to enjoy the best ham gear *now*. For example, after a typical liberal allowance for your present gear, or a suitable down payment, a new National NCX-3 can be yours for 24 monthly payments of around $17.00. Terms are always arranged to suit your convenience!

Want more dope on the NCX-3? Phone...or drop a card to: Harrison Radio Corp., Dept. B, 225 Greenwich St., New York, N. Y. 10007, or better yet, come on in with your old gear!

National NCX-3—$369.00
AC Pack/Speaker—$110.00
DC Mobile Pack—$119.50
New! Xtal Calibrator XCU-27—$26.60

73 *Bil Harrison* W2AVA

HARRISON

Mail orders carefully and promptly filled.

225 Greenwich Street • New York 7, N. Y. • BA 7-7922
[Jamaica Store: 144-24 Hillside Avenue • RE 9-4102]

West Virginia and Illinois. August 2–10 produced good ground wave conditions followed by the same type of conditions on August 28. From Massachusetts K1VPJ sez: "Despite predictions (whose?) skip was relatively low this month with only one recorded in my log. On the evening of the 17th, New York and New Jersey were in for approximately two hours when ground-wave conditions were better than normal." We've heard in a round-about manner that VE3BPR at Belleville, Ontario heard a station in 4 land during this past skip season. The rumor has not been confirmed as yet. QST

Members Are Saying

(Continued from page 62)

The new building must be a real pleasant change of working conditions for all those concerned. Good luck in the future and may progress be, for the most part, unhindered. — *WA6RXI/6.*

I hope this small donation will help maintain the distinction that *QST* and the ARRL now have. — *WA2LDC.*

Today I passed my General and I just realized that without W1AW, *QST*, and the countless books put out by the ARRL, I would have not passed the examination. So here is my small contribution towards your building fund. — *WN2FXZ.*

I had not intended to make another contribution until renewal. The "double" offer was too good to pass up. — *W5AFC.*

Am very happy to make this small "gift", which I know will do us members and readers of the ARRL and *QST* as much good as it will you fine folks at the new headquarters. — *W6AMZ.*

At the recent 1963 Annual Wyoming Hamfest, Director Smith suggested that it would be a good idea to "pass the hat" for the building fund. This was done, and it is my pleasure to forward the amount to you. The report of the hamfest committee given to the Sheridan Radio Amateur League, a 100%-ARRL club, showed a small surplus after hamfest expenses. It was voted to match the hamfest donation, and the two amounts are transmitted herewith. — *Sheridan Radio Amateur League* (*Wyo.*).

Some time ago our club gave a check for the building fund. For so worthy a cause I want to add my personal contribution. In appreciation of your efforts in behalf of the amateur, may I say a sincere "thanks." — *WN4MVW.*

Sorry I couldn't send in earlier a contribution (even as small as it is), but as a teenager I'm hoping you can realize what a disastrous financial situation I'm in. But this being summer I figure I can get along without my weekly gas allowance. So here it is — all of it, believe it or not! — *WA6IFG.*

We are enclosing our contribution to assist you in your/our building fund. Best of success for the future and keep up the good work. — *Saskatchewan Amateur Radio League.*

Being a college student I find it extremely hard to manage on the money I have. Some day when I am through with school I will make a large contribution, whether there is a building fund or not. For now please accept this small donation. — *WA2VNH.*

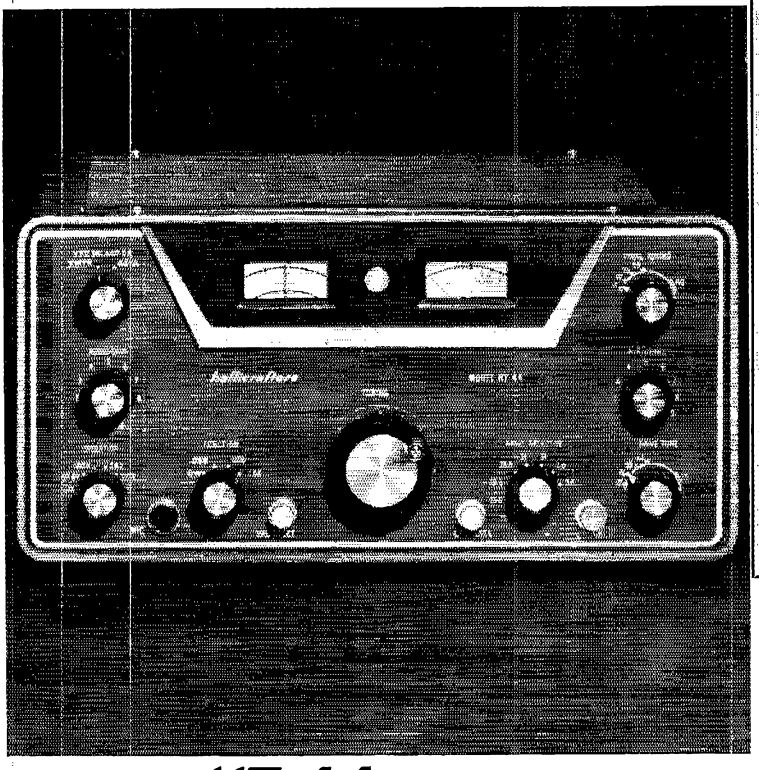
Please accept my contribution. I surely hope it will help you in your building fund. I enjoy reading

(Continued on page 150)

Now Available from

Your Ham Headquarters— WASHINGTON to FLORIDA

SPECIALIZING IN THE BEST AT EASY TERMS
HIGH TRADES AND LOW DOWN-PAYMENTS
WRITE FOR DETAILS OF OUR TIME PAYMENT PLAN



HT-44 SPECIFICATIONS

Versatile compact amateur band transmitter for independent operation or slaving with SX-117 receiver for function as transceiver. SSB, AM, or CW on 80 through 10 meters. Features Hallicrafters stabilized phasing system for sideband generation with −40 db of sideband suppression @ 1 kc and carrier suppression of −50 db. Distortion products, −30 db. VOX/CW break-in and PTT operation. Panel-adjusted VOX/CW delay for maximum Phone-CW flexibility. Exclusive AALC gives greater talk power with speech compression up to 12 db. Power input 200 watts DC on CW and SSB, 50 watts AM. Same size and style as SX-117. Furnished with crystals for 3.5-4.0, 7.0-7.5, 14.0-14.5, 21.0-21.5, and 28.5-29.0 mc. Less transceiver cables, $395.00. P-150 AC power supply, $99.50.

the NEW **HT-44** *Transmitter by* ***hallicrafters***

Fifth & Kostner Aves., Chicago 24, Ill.

ELECTRONIC WHOLESALERS INC.

9390 N.W. 27th AVE., MIAMI 47, FLA. *Phone OXford 6-1620*

2345 SHERMAN AVE., N.W., WASHINGTON 1, D.C. *Phone HUdson 3-5200*

1301 HIBISCUS BLVD., MELBOURNE, FLA. *Phone PArkway 3-1441*

938 BURKE ST., WINSTON-SALEM, N. C. *Phone PArk 5-8711*

2310 BOB WALLACE AVE., S.W., HUNTSVILLE, ALA. *Phone 534-2461*

QST very much and listening to the bulletins from WIAW. — *KIVMH.*

The enclosed check is my long overdue contribution to the building fund. I personally think the League is a good thing. I have been reading *QST* since 1935 and I have belonged to the League almost as long. For this I say thank you and good luck. — *W9QMK.*

Many thanks for your kind attention during our visit at headquarters. It makes one proud to be part of an organization with such dedicated members. Please pass this small contribution to the fund. — *WB2BPK.*

Please accept this small contribution toward the building fund. Sorry to be so late about sending it along. I am solidly behind the League officials in all their decisions, which are worked out for the best interest of amateur radio as a whole. — *W1PYY.*

With the enclosed check is our hope that ARRL will continue serving the cause of a hobby that has meant so much to so many. — *San Luis Obispo Amateur Radio Club (California).*

After seeing the tabulation by divisions and noting that the Southeastern Division is at the bottom of the pile, I resolved to do my bit (and very late, I reluctantly admit) to add to the building fund. Come on, gang, — let's at least get off the bottom. — *W4IRL.*

Enclosed is my check for the building fund. This check is to ARRL in lieu of renewing my subscription to another radio magazine. You can use this money to better advantage for all hams than I could personally receive from the magazine. You are certainly doing a good job for all amateurs although most of them do not seem to realize it. — *KØONL.*

Happenings

(Continued from page 70)

for them. The amateurs must hold registration of the motor vehicle in his own name, and must not have had any moving-traffic violations in the past 18 months. The special-plate fee of $5.00 and a photocopy of the amateur license must be sent with the application to: Special Registration Section, Motor Vehicle Department, 135 Ontario St., Albany, N.Y. (Some photocopy service companies have an incorrect list of prohibited documents, and may be reluctant to copy the amateur license. Authority to photocopy is implied in Section 12.68 of the FCC Regulations; "The station license or a photocopy thereof shall be posted. . . ." See page 69 of any recent edition of the *License Manual.)*

Amateurs having any special problems or questions should get in touch with the Albany Amateur Radio Club, Robert Delaney, K2BUF, Secretary, 418 Second Avenue, Albany 9, N.Y. The Club has been doing a fine job of liaison between the amateurs and the Motor Vehicle Department, and deserves the thanks of all New York hams.

Those who have previously obtained call-letter plates will receive 1964 renewal applications through the mail.

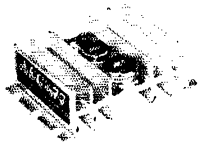
(More on page 152)

by hams... for hams... Harvey is reliability

Harvey

VALUES OF THE MONTH

TRANSISTOR IGNITION BY AUTOMOTIVE ELECTRONICS —



Complete, factory wired, AEC 77 system for installation in all 6- or 12-volt vehicles with negative ground.

Increases power up to 10% . . . assures fast starts at low end . . . full power at high rpm . . . up to 20% more mpg . . . increases spark plug life 3 to 5 times over normal . . . insures 75,000 mile point life . . . gives instant starting in sub-zero weather . . . eliminates frequent tune-ups . . . simple 20 minute installation by anyone . . . cures ignition problems . . . MOBILE RADIO IGNITION INTERFERENCE REDUCED.

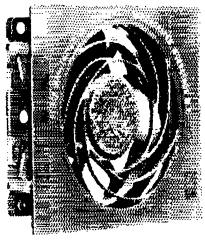
In conventional ignition systems, high voltage at the spark plugs falls off over 50% as engine speeds increase. The result is a weak spark causing incomplete combustion, loss of power, fouled plugs and poor gas mileage. The rugged AEC 77 electronic ignition increases and maintains maximum high voltage output at the spark plugs with no high voltage fall-off at any speed.

Says World Champion Racing Driver Phil Hill, "Rarely does a device come along that improves power, performance, and economy at the same time. My congratulations to AEC 77".

Every AEC unit uses high quality components such as Delco high voltage 15 ampere transistors and Motorola 50 watt zener diodes. Every AEC Ignition coil is wound with Formvar insulated wire, oil impregnated and hermetically sealed for maximum insulation and cooling.

Complete AEC 77, factory wired, with 400:1 coil ratio, 6/12 volts **$39.95**

Please add 75¢ for postage and handling.
25% deposit on COD's.



ROTRON WHISPER FAN

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Operation up to 5 miles over a simple, two-wire line. No batteries or other external power required. Just the thing for tuning up that beam. Use anywhere a telephone or any other two-way communication set-up is needed. It's portable and flexible.

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LICENSES REVOKED

The FCC has revoked the licenses of two more amateurs for failure to respond to notices of violation, follow-up letters and Orders to Show Cause. Ernest J. McDaniel, K6CEN, of San Jose was originally cited January 11 for failure to transmit his call sign every ten minutes as required by Section 12.82(a)(1)iii. Mr. McDaniel failed to answer the citation and a follow-up letter dated February 25, 1963. An Order to Show Cause dated April 30 also went unanswered. Revocation of the license became effective August 28.

The Commission issued a citation October 10, 1962 to George E. Wilson, WØKLY of Arcadia, Missouri, for A-3 operation on 3797.9 kc. A follow-up letter went out on January 11, 1962 and the Order to Show Cause on April 2. No response having been received to any of these communications, the Commission revoked Mr. Wilson's license as of July 30, 1963.

MINUTES OF EXECUTIVE COMMITTEE MEETING

No. 295

September 27-28, 1963

Pursuant to due notice, the Executive Committee of The American Radio Relay League, Inc., met at the Headquarters office of the League in Newington, Connecticut, at 9:55 A.M., September 27, 1963. Present: President Herbert Hoover, Jr., in the chair; First Vice President W. M. Groves; Directors Charles G. Compton, Robert W. Denniston, Noel B. Eaton, and Morton B. Kahn; General Manager John Huntoon; Vice President F. E. Handy; and Treasurer David H. Houghton. General Counsel R. M. Booth, Jr., was also present.

The Committee proceeded to examine nominations in the director elections, with careful attention to the application of the eligibility rules concerning membership, license status and freedom from commercial radio connections. The Committee made findings and ordered actions as detailed below, all by unanimous action.

ATLANTIC DIVISION

For Director:

John B. Power, W2AXU, was found lawfully nominated, but the Committee was in receipt of a letter from Mr. Power withdrawing his name as a candidate. Allen R. Breiner, W3ZRQ, Gilbert L. Crossley, W3YA, and Harold T. Grace, W3HFY, were found lawfully nominated and eligible and their names ordered listed on ballots to be sent to full members of the division.

For Vice Director:

Alfred Obrist, W2IYR, was found lawfully nominated, but the Committee was in receipt of a letter from Mr. Obrist withdrawing his name as a candidate. Fred C. Kaffer, W2PPS, and Edwin S. Van Deusen, W3ECP, were found lawfully nominated and eligible and their names ordered listed on ballots to be sent to full members of the division.

CANADIAN DIVISION

Noel B. Eaton, VE3CJ, was found lawfully nominated and eligible. Being the only eligible nominee, he was thereupon declared, pursuant to the By-Laws, to be duly re-elected as Director of the Canadian Division for the 1964–1965 term without membership balloting.

For Vice Director:

Colin C. Dumbrille, VE2BK, was found lawfully nominated and eligible. Being the only eligible nominee, he was thereupon declared, pursuant to the By-Laws, to be duly re-elected as Vice Director of the Canadian Division for the 1964–1965 term without membership balloting.

DAKOTA DIVISION

For Director:

Paul M. Bossoletti, WØGZD, was found lawfully nominated but ineligible due to lack of the required membership continuity. John W. Sikorski, WØRRN, was found lawfully nominated, but the Committee was in receipt of a letter from Mr. Sikorski withdrawing his name as a candidate. Charles G. Compton, WØBUO, was found lawfully nomi-

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6900	$229.50
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NATIONAL

NC-270	$224.50
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600L	$249.50
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HT-33	249.50
HA-1	59.95
SX-111	195.00
HT-40	74.50

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KWM-2	$949.50
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HQ-170	$295.00
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HEATH

DX-60	$ 74.50
QF-1	9.95
CA-1	4.95
AR-3	29.95
HX-10	329.50

GLOBE

Scout D. L.	$ 99.50
755A	34.50

MISCELLANEOUS EQUIPMENT

Clegg 99ers	$99.50
Int'l. Xtal. 6 meter converter w/P.S. (BC-I.F.)	19.50
Ameco PS-1	8.95
Ameco CN-50	34.95
Millen 90831 (40 watt modulator).	59.95
Carter 12V to 110V. (100 watts) Gen-E-Motor, new	44.50
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TUBES—NEW-GUARANTEED

All individually boxed except where noted in bulk.

	Reg.	Each	Dozen
6H6	$3.50	$1.05	$11.50
6SJ7	3.75	1.15	12.65
6J7	4.55	1.25	13.75
45 (Bulk pack).	2.05	.65	7.15
2A6 (Bulk pack)	3.65	1.10	12.10
6A8G	5.80	1.75	19.25
6AE6G	2.05	.65	7.15
6S8GT (Bulk pack)	2.75	.85	9.35
6C4 (Bulk pack)	1.50	.45	4.95
6J6 (Bulk pack)	2.35	.75	8.25

1963 Calendar and Schedule Pad Free with purchase of 5 Receiving Type Tubes

BEAMS—NEW AND USED (AS INDICATED)

Mosley V-27GP (CB) new	$29.95

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Mosley VPA1520 (New)	$109.50
Mosley VPA1020 (New)	99.50
Mosley V144GP (2 mtr.) used	17.50
Mosley VPA20-2 (New)	39.50
Mosley V3 (New)	19.95
Mosley V3 Jr. (New)	15.95
Mosley TA32 (New)	59.95
Mosley TA32 Jr.	42.95
Mosley A320	66.95
Mosley S153	42.50
Cushcraft AGP15	11.95
Cushcraft AGP10	10.95
Cushcraft ATGP3	24.95
Cushcraft A28A	21.95

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Attachment for solder feed for Weller 8100, D550, S-500, 8250	.99

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per 600 ft.	17.84
Heavy Duty per 100 ft.	5.89
per 600 ft.	34.75

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nated and eligible. Being the only eligible nominee, he was thereupon declared, pursuant to the By-Laws, to be duly re-elected as Director of the Dakota Division.

For Vice Director:

Arthur H. Ekblad, WØJWL, was found lawfully nominated, but ineligible under the license requirements of By-Law 8. Charles M. Bove, WØMXC, Martha J. Shirley, WØZWL, and John W. Sikorski, WØRRN, were found lawfully nominated and eligible and their names ordered listed on ballots to be sent to full members of the division.

DELTA DIVISION

For Director:

Robert G. Affel, W4TDW, Sanford B. De Hart, W4RRV, Graham H. Hicks, W5HHP, Thomas H. Morgavi, W5FMO, Philip P. Spencer, W5LDH/W5LXX, and Floyd C. Teetson, W5MUG, were found lawfully nominated and eligible and their names ordered listed on ballots to be sent to full members of the division.

For Vice Director:

Franklin Cassen, W4WBK, William B. Egbert, K4JIG, and John S. Sisson, Jr., W4WZC, were found lawfully nominated and eligible and their names ordered listed on ballots to be sent to full members of the division.

GREAT LAKES DIVISION

For Director:

Ephraim E. Barnett, K8JSQ, John O. Baumgardner, W8BF, and Dana E. Cartwright, W8UPB, were found lawfully nominated and eligible and their names ordered listed on ballots to be sent to full members of the division.

For Vice Director:

Robert B. Cooper, W8AQA, and Charles C. Miller, W8JSU, were found lawfully nominated and eligible and their names ordered listed on ballots to be sent to full members of the division.

MIDWEST DIVISION

For Director:

Robert W. Denniston, WØNWX, was found lawfully nominated and eligible. Being the only eligible nominee, he was thereupon declared, pursuant to the By-Laws, to be duly re-elected as Director of the Midwest Division for the 1964–1965 term without membership balloting.

For Vice Director:

Sumner H. Foster, WØGQ, was found lawfully nominated and eligible. Being the only eligible nominee, he was thereupon declared, pursuant to the By-Laws, to be duly re-elected as Vice Director of the Midwest Division for the 1964–1965 term without membership balloting.

PACIFIC DIVISION

For Director:

Harry M. Engwicht, W6HC, and Larry M. Reed, W6CTH, were found lawfully nominated and eligible and their names ordered listed on ballots to be sent to full members of the division.

For Vice Director:

Ronald G. Martin, W6ZF, was found lawfully nominated and eligible. Being the only eligible nominee, he was thereupon declared, pursuant to the By-Laws, to be duly re-elected as Vice Director of the Pacific Division for the 1964–1965 term without membership balloting.

SOUTHEASTERN DIVISION

For Director:

George E. Cushing, W4QVJ, was found lawfully nominated, but ineligible due to lack of the required membership continuity. James P. Born, Jr., W4ZD, Albert L. Hamel, K4SJH, and Thomas M. Moss, W4HYW, were found lawfully nominated and eligible and their names ordered listed on ballots to be sent to full members of the division.

For Vice Director:

Betty M. Collier, K4ZNK, was found lawfully nominated but ineligible under the license requirements of By-Law 8. Charles J. Bolvin, W4LVV, and Leland W. Smith, W4YE/W4AGI, were found lawfully nominated and eligible and their names ordered listed on ballots to be sent to full members of the division.

At this point the Committee discussed an oral report by the General Counsel on the progress of Senate Bill 920, concerning reciprocal operating agreements.

On motion of Mr. Compton, affiliation was unanimously GRANTED to the following societies:

Amateur Radio Technical Inter-County Society
Upper Darby, Pa.

Ardmore Amateur Radio Club, Inc.....Ardmore, Okla.

Why Mrs. White never lights the oven any more -without looking inside first

Irene White of Oakland, Maine, still tells this one on her husband, Clayton.

It seems that on moving day Clayton thought it would be a good idea to put his Savings Bonds and other valuable papers in a safe place. He picked the oven.

Like most safe places, it was completely forgotten. Until next morning when they lit the stove—and Clayton smelled something burning.

The story has a happy ending, though. Clayton sent the charred remains of the Savings Bonds to the Treasury Department and received new ones in exchange.

The Treasury keeps a microfilm record of every U.S. Savings Bond sold. So a Bond can never be *really* destroyed, no matter what happens.

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Hilltop Transmitting Association, Inc., Felton, Pennsylvania
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Knox Presbyterian Radio Club..... Falls Church, Virginia
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Largo, Florida
Long Island DX Association..... Middle Village, N.Y.
McPherson Amateur Radio Club..... Canton, Kansas
Medford Wireless Association..... Medford, New Jersey
Mid-Hudson V.H.F. Society.....Poughkeepsie, New York
Mount Saint Michael H.S. Radio Club.. Bronx, New York
Radio Research Club, Inc..... Brookings, So. Dakota
San Diego V.H.F. Club.....San Diego, California
Tamiami Amateur Radio Club..... Venice, Florida
Teletype Employees Amateur Radio Club.. Skokie, Illinois

On motion of Mr. Eaton, unanimously VOTED that the Committee extends hearty congratulations to Director Compton and the membership of the Dakota Division on being the first division to achieve its quota in the Building Fund Drive.

The Committee was in recess for luncheon from 1:05 P.M. to 1:30 P.M.

The Committee then engaged in extended discussion concerning the Board's instructions to accomplish an upgrading of the amateur license structure, during the course of which the Committee was in recess from 3:40 P.M. to 4:05 P.M., and again from 5:08 P.M. to 5:30 P.M.

The Committee next discussed the progress of the educational campaign through *QST* and other League publications to accomplish a better understanding among amateurs of the technical capabilities and limitations of equipment and operating practices. During this discussion, Technical Director George Grammer joined the meeting.

The Committee examined the draft of a proposed agreement with the American Red Cross concerning mutual aid in the field of disaster and emergency radio communication. On motion of Mr. Eaton, unanimously VOTED that the President is authorized to sign such an agreement in the name of the League.

The Committee recessed at 6:45 P.M., reassembling at the same place at 9:50 A.M. on September 28th with all members present.

The Committee discussed the outline of a program, presented by the General Manager, for the commemoration during the year of 1964 of the League's 50th anniversary. On motion of Mr. Groves, unanimously VOTED that the Headquarters is directed to proceed with this program.

On motion of Mr. Denniston, unanimously VOTED to reimburse Project Oscar, Inc., in the amount of $298.46 for miscellaneous expenses during the past year.

On motion of Mr. Compton, unanimously VOTED that Messrs. Noel B. Eaton, Milton E. Chaffee, and David H. Houghton, with F. E. Handy and John Huntoon as alternates, are appointed as a Committee of Tellers to count the ballots in the current elections.

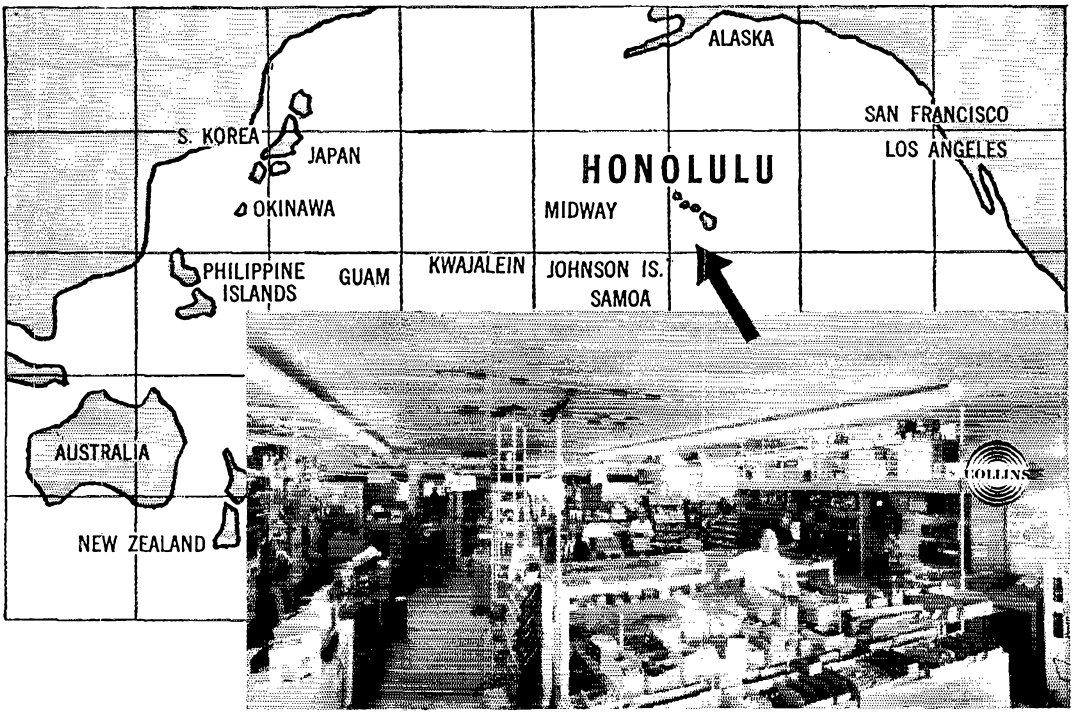
The Committee was in recess for luncheon from 12:00 P.M. to 2:00 P.M.

At this point the Committee, having consulted individually with each of the elected directors of the League on the subject, again discussed implementation of the Board's program for upgrading the amateur license structure. On motion of Mr. Groves, unanimously VOTED that the General Counsel is directed to file with the Federal Communications Commission a petition seeking a change in the amateur rules so as to reactivate the Advanced Class License and to permit radiotelephone operation only by Amateur Extra and Advanced Class licensees in the voice portions of the following bands effective on the dates indicated:

July 1, 1965 — 14,000 - 14,350 kc.
July 1, 1966 — 7000 - 7300 kc.
21,000 - 21,450 kc.
July 1, 1967 — 3500 - 4000 kc.

There being no further business, the Committee adjourned at 3:15 P.M.

JOHN HUNTOON, *Secretary*



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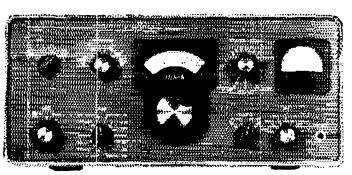
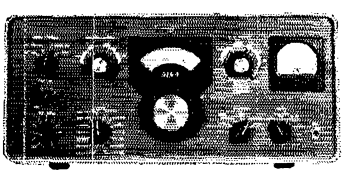
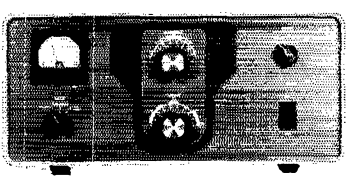
COLLINS



75S-3 Receiver — $680



32S-3 Transmitter — $750



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NEW BOOKS

Basic Oscillators, by Irving M. Gottlieb. Published by John F. Rider Publisher, Inc., 116 W. 14th St., New York 11, N.Y. 202 pages, including index, 6 by 9 inches. Paper cover. Price, $4.50.

The theory of oscillators from definitions to practical circuits is what this book is about. Analogies between mechanical and electrical oscillators, concepts of energy interchange and definitions are included in the first chapter, Definitions and Parameters of Oscillators. The second chapter covers the components and characteristics of oscillators and is followed by a chapter on oscillation-producing devices. This chapter has all of the oscillation-producing devices and even includes information on sparkgap oscillators, arc oscillators and neon bulb oscillators. Chapter four, Theory of Oscillation, goes into the tunnel diode, multivibrators, phase-shift and blocking oscillators, to name a few. The final chapter is all about practical oscillators with data on just about every oscillator circuit, some familiar, some not so familiar to radio amateurs: Hartley, Colpitts, Pierce, Clapp, Tri-Tet and Butler, Lampkin, Miller, Meissner, Meacham-Bridge, and Franklin.

Ironically, the last paragraph in the book is devoted to neutralization of r.f. amplifiers!

Practical Radio Servicing, by William Marcus and Alex Levy. Second edition. Published by McGraw-Hill Book Company, 330 West 42nd St., New York 36, N.Y. 617 pages, plus index, 6 by 9 inches, cloth cover. Price, $11.95.

This second edition presents procedures for servicing all types of a.m. and f.m. radio receivers and phonographs, including transistor, hybrid and printed circuit types. The book assumes that the reader has almost no knowledge of radio servicing and starts with a slow and comprehensive analysis of the most common broadcast receiver in use, the a.c.d.c. set. Information is included on the use of basic test instruments necessary for successful service work.

The book is divided into 27 chapters which are usually devoted to a specific section of the receiver or type of trouble. Chapter titles are sometimes colorful yet ably identify and describe the chapter contents. Some chapter titles are: Squeals and Put-Puts, Man-made Interference, Servicing Auto Radios, Servicing I.F. and Detector Stages, etc.

This text contains the kind of information that would be useful to radio amateurs troubleshooting their communications receivers, too.

Dictionary of Modern Acronyms and Abbreviations, by Milton Goldstein. Published by Howard W. Sams & Co., Inc., 4300 West 62nd St., Indianapolis 6, Indiana. 160 pages, 5½ by 8¼, hard cover. Price, $4.95. Cat. No. DAG-1.

This collection of coined words and abbreviations (over 6,000 of them) is entertaining to read even if you aren't looking up some special abbreviation used for government agencies, military services, computers, mechanical electronics, or other specialized fields. Several amateur radio acronyms can be found: YL, OM, CUL, etc. Even HAM is included but, of course, means High-speed Automatic Monitor!

Probably the best way to sum up this book is to say "AAOROAAA" (An authoritative one-source reference on acronyms and abbreviations).

RCA Tunnel Diodes, RCA Semiconductor and Materials Division, Radio Corporation of America, Somerville, New Jersey. Technical Manual TD-30, 5½ x 8½ inches, 159 pages, paper cover. Price, $1.50.

This latest addition to the RCA technical publications describes in nine chapters the latest switching and microwave application for tunnel diodes and tunnel rectifiers.

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32S1	449.50	DX40	37.50
30S1	879.50	DX20	27.75
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SX111	177.75	T60	34.75
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SX96	127.50	G76	219.75
SX71	107.75	GSB101	187.95
SX110	99.75	HL 6 mtr	144.75
SX140	67.95	CLEGG ZEUS	479.50
SX99	87.50	99er	97.75
S108	87.50	AF68	99.95
S94	19.95	LA400C	129.50
CRX-2	67.50	HQ110AC	189.75
S118	69.50	HQ100	99.75
S107	54.75	HQ105	169.75
S53A	39.75	HQ170C	217.95
SR34 (3 way)	239.50	HQ170A&NS	279.75
HT40	57.50	HQ145X	187.75
HT37	339.50	HQ180	297.50
HT32	347.50	HQ140X	129.50
HT32B	477.75	HQ150	149.95
HT33	229.50	MOSLEY CM1	124.95
INVADER 2000	799.50	R9A	47.50
RANGER	147.50	6900	219.50
VIKING 1	69.95	2A	184.50
COURIER	129.50	2B	208.95
B&W 6100	647.50	VIKING 2 PW	134.50
HX 50	299.50	VALIANT	247.50
GPR 90	299.95	200 V	589.50
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*ORDER BLANK TO: (1) trade ur present gear, (2) order above units, (3) sell ur gear for cash.

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Although the manual is written primarily for circuit design engineers, radio amateurs will find the book useful in understanding tunnel diodes and can have some fun experimenting with the "Novel Devices and Circuits" chapter.

The first chapter goes into the concept of tunneling and, by the use of simplified energy-band diagrams, compares tunneling to electron flow in conventional semiconductor diodes. A separate chapter, "Characteristics," presents a thorough discussion of the circuit behavior of tunnel diodes, as well as the effects of temperature and radiation. The chapter on switching contains more than 30 practical circuits. Also included in the manual is a seven-page technical data section which gives ratings and characteristics for over 40 RCA germanium and gallium-arsenide tunnel diodes and rectifiers.

Radio-Television-Electronics Dictionary, by the National Radio Institute Teaching Staff. Published by John F. Rider Publisher, Inc., 116 West 14th St., New York 11, N. Y. 5½ by 8½ inches, 190 pages, including appendix. Cat. No. 307, paper cover. Price, $3.50.

A comprehensive compilation of radio, television, and electronic terms that should be useful to non-technical personnel, beginners and those active in the electronics field. Just about all areas are covered, including terms covering vacuum tubes, transistors, and computers.

Dictionary of Electronics Communications Terms, by the Howard W. Sams Engineering Staff. Published by Howard W. Sams & Co., Inc., 4300 West 62nd St., Indianapolis 6, Indiana. Cat. No. COM-1. 5½ by 8½ inches, 160 pages, paper cover. Price, $3.95.

A collection of over 2,500 definitions of communications terms applicable to two-way radio, broadcasting, microwave, amateur, and CB communications systems, equipment, and principles. Included are many slang and colloquial terms such as "fist," "bottle," and "rock," which should be a help to the beginner who is confronted with words that have no apparent connection with electronics or communications. Only one Q signal is listed in the dictionary, and probably to some it is the most important: *QSL Card!*

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W1AW, ARRL Headquarters Station

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Handi-Talkie

(Continued from page 49)

3004A) as indicated in Fig. 3. The speaker grille was made from brass water/gasoline straining mesh obtained from an automotive-parts store. In initially mounting the decks, bear in mind that one or more of the decks may have to be removed for adjustment. If the deck bases are trimmed to fit snugly between the box lips, they may be simply wedged in place until all adjustments are complete.

Antenna Mounting

The antenna mount shown in the photos and Fig. 4 was turned down from a piece of ⅞-inch aluminum rod. The top end was drilled and tapped to match the base of the antenna. The latter is a 3-foot collapsible unit of the type

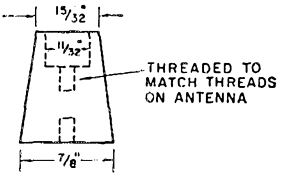

Fig. 4—Details of the antenna mount.

used with some portable "all-wave" radio receivers. It telescopes down to 6 inches and can be removed entirely by simply unscrewing it from the mount. Of course, a longer antenna would be better but, in spite of its small size, the 3-foot antenna does very well over ranges usually associated with hand portables.

Being of metal, the mount had to be insulated from the box with nonconducting washers. I found that it was highly important to minimize the capacitance between the mount and the box. Otherwise, a considerable amount of r.f. will never make it to the antenna. I didn't realize this at first, and used a single washer on both sides of the hole. Now I have washers stacked up to at least a half inch on both sides with an increase of about 20 db. in transmitter output. It would pay to use your ingenuity to arrive at an arrangement that is both mechanically strong and of low capacitance.

Tuning and Operation

After all construction has been completed, place S_1 in the receive position and close S_2. Listen for a sound resembling a miniature Niagara Falls in the speaker. If any high-pitched squeals are heard, and the receiver appears to be blocked, it is probable that the i.f. amplifier is oscillating. Try reversing the connections to

(Continued on page 164)

KEC's Mechanical Filter

for all purposes . . . especially in SSB

Needle-sharp selectivity
Compact, lightweight
Extreme stability
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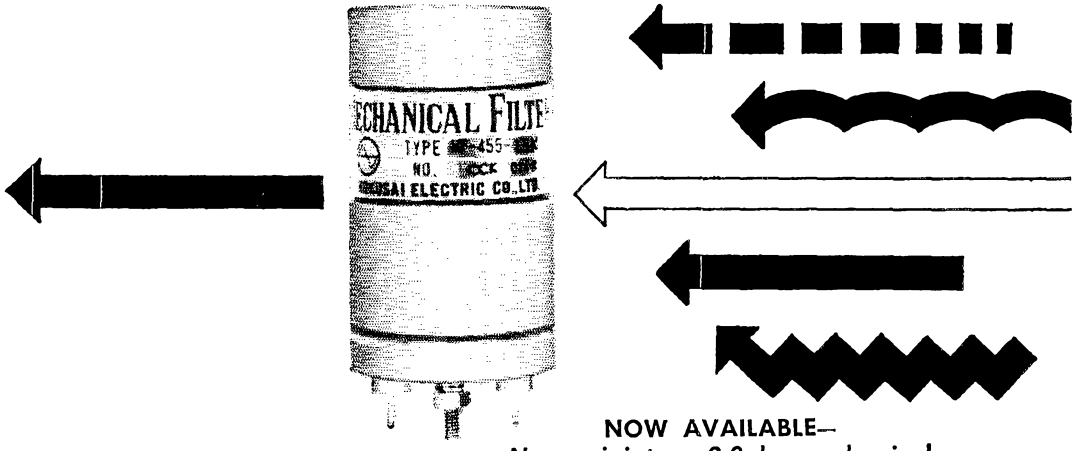

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New miniature 2.3 kc mechanical filter—Type MF 455-10Z—$17.50

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Type	6 dB deviation bandwidth	60 dB deviation bandwidth
MF 455-10K	More than 2 KC	Less than 7 KC
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KOKUSAI ELECTRIC CO., LTD.
Tokyo, Japan

each winding on each i.f. transformer, one set at a time. If the oscillation persists, remove C_7. The consequent detuning should stabilize the strip. There may be some reduction in gain, but you will find that there is still more than enough. If C_7 is built into the i.f. can, simply take a narrow screwdriver and break the capacitor by jabbing at it until it cracks. Push the two broken halves away from each other so that they cannot possibly make contact. This method is much better than trying to remove the capacitor from the can. The insides of the transformer are much too delicate to tamper with with a soldering iron or wire cutters.

After all trace of i.f. oscillation has been removed, plug a pair of headphones into a grid-dip oscillator and place the g.d.o. close to L_4. Tune the g.d.o. in the vicinity of 7 Mc. and listen for a heterodyne. If one is heard, the receiver oscillator is functioning. If not, adjust the slug of L_4 about a turn at a time until the signal is heard. If no signal can be heard at any position of the slug, take the slug out and replace it with a brass screw. Once the oscillator signal has been found and adjusted to approximately 7 Mc., set the g.d.o. aside and proceed to monitor on the speaker.

The next step is to align the i.f. amplifier in Deck 3. Shift the deck around as necessary to permit fitting a screwdriver into each i.f. can. Peak each stage for a maximum rushing sound. By means of your station v.f.o., or some similar signal source, transmit a signal in the 40-meter band, swishing the v.f.o. until it can be heard in the receiver. Then move the v.f.o. frequency about 10 kc. at a time toward the desired frequency, following it with adjustment of the i.f. stages for maximum response. Peak the response of the mixer by adjustment of the slug in L_1, substituting a brass screw for the iron slug, as mentioned earlier, if necessary.

In adjusting the transmitter, the oscillator is tuned in exactly the same manner as the receiver oscillator. After the oscillator is working properly, adjust L_7 for maximum S-meter reading on your home-station receiver. It was found experimentally that the number of turns on L_6 had to be adjusted to suit the individual characteristics of the transistor used at Q_6. Maximum drive was obtained with anywhere from 9 to 15 turns on L_6 with different transistors of the same type. Start out with 15 turns and unwind the turns, one at a time, until Q_5 oscillates smoothly and Q_6 puts out the most according to your receiver S meter, each time readjusting the slugs of L_5 and L_7.

When this has been accomplished, speak quite closely into the microphone (speaker) and listen on a receiver for any audio distortion. A slight readjustment of L_7 will most likely take care of this. The unit is now ready for operation.

The entire cost of one unit was $21.61, not including the miscellaneous parts and hardware I found in my junk box. The most expensive item in the entire circuit cost 94 cents.

May you have many hours of around-the-town hamming with the handi-talkie. QST

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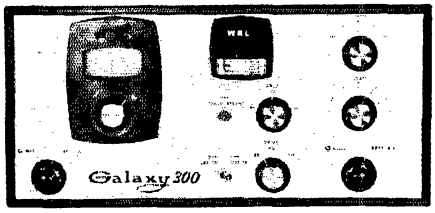

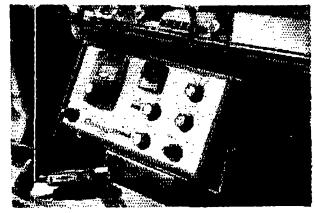

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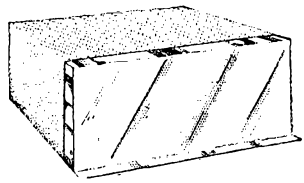

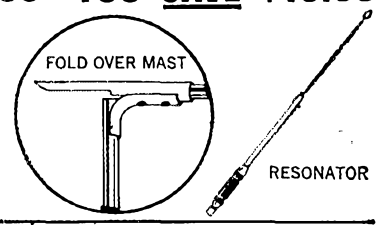

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W1MMX, John F. Donnelly, Newport, R.I.
K1PXA, John Malaguti, Jr., Belmont, Mass.
K1TPQ, Gorham B. Harper, Yarmouth Port, Mass.
WB2DIC, John F. Gramlich, Brooklyn, N.Y.
W2FMP, Elmer A. Doland, Midland Park, N.J.
W2GLU, Charles Manley, Center Moriches, N.Y.
K2LFI, Bruce M. Meyers, Albion, N.Y.
W2LYE, Robert C. Upritchard, Wantagh, N.Y.
W2RHZ, Alexander C. Gresens, Pittsford, N.Y.
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W5UF, John R. Whitworth, Waco, Tex.
K5VHJ, Eric A. McVadon, Sr., Baton Rouge, La.
W6JRM, Howard K. Breedlove, Yucaipa, Calif.
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W9DD, Leslie D. Frazer, Richmond, Ind.
W9EJV, Harry K. Evans, Lafayette, Ind.
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W3, K3 — Jesse Bieberman, W3KT, P.O. Box 204, Chalfont, Pa. 18914.

W4, K4 — Thomas M. Moss, W4HYW, Box 20644, Municipal Airport Branch, Atlanta 20, Ga.

W5, K5 — Brad A. Beard, W5ADZ, P.O. Box 25172, Houston 5, Texas.

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W7, K7 — Salem Amateur Radio Club, P.O. Box 61, Salem, Oregon.

W8, K8 — Walter E. Musgrave, W8NGW, 1245 E. 187th St., Cleveland 10, Ohio.

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VE8 — George T. Kondo, VE8RX, c/o Dept. of Transport, P.O. Box 339, Fort Smith, N. W. T.

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VO2 — Douglas B. Ritcey, Dept. of Transport, Goose Bay, Labrador.

KP4 — Joseph Gonzalez, KP4YT, Box 1061, San Juan, P. R.

KH6 — John H. Oka, KH6DQ, P.O. Box 101, Aiea, Oahu, Hawaii.

KL7 — Alaska QSL Bureau, Box 6226, Airport Annex, Anchorage, Alaska.

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(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**
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(6) **A special rate of 10¢ per word will apply to advertising which, in our judgment, is obviously noncommercial in nature.** Thus, advertising of bona fide surplus equipment owned, used and for sale by an individual or apparatus offered for exchange or advertising inquiring for special equipment, takes the 10¢ rate. Address and signatures are charged for. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and all advertising so classified takes the 35¢ rate. Provisions of paragraphs (1), (2) and (5), apply to all advertising in this column regardless of which rate may apply.
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MICHIGAN Hams! Amateur supplies, standard brands. Store hours 0830 to 1730 Monday through Saturday. Roy J. Purchase, W8RP. Purchase Radio Supply, 327 E. Hoover St., Ann Arbor, Michigan. Tel. NOrmandy 8-8262.

HAM TV Equipment bought, sold, traded. Al Denson, W1BYX, Rockville, Conn.

TOROID RTTY Kit: Mark-Space discriminator and bandpass filters. Includes 4-88 Mry and 1-44 Mhy uncased like new condx, toroids: information sheet, mounting hardware and six mylar capacitors, $5.00 ppd. Toroids: specify 88 or 44, less capactrs. $1.00 each. 5/$4.00, ppd. KCM Products, Box 88, Milwaukee 13, Wis.

ACT Now!! Barry pays cash for tubes (unused) and equipment. Barry Electronics, 512 Broadway, NYC 12. Call 212-WAlker-5-7000.

SELL, Swap or buy ancient radio sets and parts, magazines. Laverty, 118 N. Wycombe, Landsdowne, Penna.

INTERESTED In two-meter linear amplifiers, transmitters, receivers, etc. If the price is reasonable, for members of St. Mary's Radio Club, or as tax exempt donation to Missions. K8WLB, St. Joseph's Mercy Hospital, Centerville, Iowa.

304TL tubes wanted. Also other xmttg and special purpose tubes. We will buy military or commercial transmitters and receivers with designations ARC, GRC, URR, 51 and MN. Air Ground Electronics Co., 64 Grand Pl., Kearny, N.J.

HAM Discount House. Write us for lowest prices on Ham Equipment. Factory sealed cartons. Specify equipment wanted. H D H Sales Co., 170 Lockwood Ave., Stamford, Conn.

CALL Cards, badges, decals. "All the Goodies". Illustrated literature with samples 25¢. (Clubs! Write on your letterhead for special prices). Decker, K1VRO, c/o Errol Engraving, 36 Hampden St., Westfield, Mass. 01085.

QSLS?? SWLS?? WPE?? Largest variety samples 25¢ (refunded). Sakkers, W8DED, Holland, Mich. (Gospel QSL samples 25¢).

PICTURE QSL Cards of your shack, etc., made from your photograph. 1.00, $14.50. Also unusual non-picture designs. Samples 20¢. Raum's, 4154 Fifth St., Philadelphia 19140.

C. FRITZ QSLS. Highest quality consistently for a quarter century! Samples 25¢ deductible. Box 1684, Scottsdale, Ariz. (formerly Joliet, Ill.)

QSL SWL, cards that are different. Quality card stock. Samples 10¢. Home Print, 2416 Elmo, Hamilton, Ohio.

QLS Specialists. Distinctive Samples 15¢. DRJ Studios, 2114 N. Lavergne Ave., Chicago 39, Ill. 60639

QSLS: samples 25¢ (refundable). Schuch, W6CMN, Wildcat Press, 6707 Beck Ave., North Hollywood, Calif.

QSLS "Brownie," W3CJI, 3111 Lehigh, Allentown, Penna. Catalog with samples, 25¢.

QSLS-SMS. Samples 10¢. Malgo Press, Box 375 M.O., Toledo 1, Ohio 14107.

DELUXE QLS. Petty, W2HAZ, Box 27, Trenton, N.J. Samples, 10¢.

QSLS, Special, 100 50 Star U.S. Flags on glossy cards, $3.70. Ppd. Other samples 10¢ or 25¢ refunded. Dick, W8VXK, Rt. 4, Gladwin, Mich.

QSLS-SWLS, 100 2-color glossy, $3.00; QSO file cards, $1.00 per 100. Samples, 10¢. Rusprint, Box 7575, Kansas City 16, Mo. 64116

PICTURE Of yourself, home, equipment, etc. on QSL cards made from your photograph. 250—$7.50 or 500—$10.00 postpaid. Samples free. Write to Picture Cards, 129 Copeland Ave., La Crosse, Wis.

QSLS, Distinctive samples dime. Volpress, Box 133, Farmingdale, N.Y.

CREATIVE QSL Cards. Free, new catalog and samples. Personal attention given. Wilkens Creative Printing, P.O. Box 1064-1, Atascadero, Calif.

QSLS, SWLS, WPE. Samples 5¢. Nicholas & Son Printery, P.O. Box 11184, Phoenix 17, Ariz.

QSLS, SWLs, XYL-OMs (sample assortment approximately 9¢) covering designing, planning, printing, arranging, mailing; eye-catching, comic, sedate, fantabulous. DX-attracting, prototypal, snazyy, unparagoned cards (Wow!), Rogers, KØAAB, 961 Arcade St., St. Paul 6, Minn.

SUPERIOR QSLs, samples 10¢. Ham Specialties, Box 73, Hobbs, New Mexico (formerly Bellaire, Texas).

QSLS 300 for $4.35. Samples 10¢. W9SKR, "George" Vesely, Rte. #1, 100 Wilson Road, Ingleside, Ill. 60041

QSLS. Samples 25¢. Rubber stamps: name, call and address $1.55. Harry Sims, 3227 Missouri Ave., St. Louis 18, Mo.

QSLS 3-color glossy, 100, $4.50. Rutgers 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. Sample 15¢. Agents for Call-D-Cal decals. K2VOB Press, 62 Midland Blvd., Maplewood, N.J.

QSLS $2.50 per 100. Free samples and catalog. Garth, Jutland, N.J.

FREE Catalog of QSLS, WPE and CB cards. New designs. Longbrook Press. Box 393-A, Quakertown, N.J.

QSLS, All kinds, free samples. W7IIZ Press, Box 183, Springfield, Ore.

AT Last! Something new in QSL cards! All original designs. Send 10¢ for samples to Yarsco, Box 307, Yorktown Heights 1, N.Y.

PHOTOSTAMPS of your station with gummed back for your QSLS. 100 $1.50. Samples 10¢. Morgan, W8NLW, 443 Euclid, Akron, Ohio.

QSLS from the "Hobby Horse" printer. Glossy, red and green, $2.00 per 100 postpaid. Free sample. Hobby Print Shop, Umatilla, Fla.

DON'T Buy QSLS until you see my free samples. Bolles, W5OWC, Box 9363, Austin, Texas.

QSLS. Send 10¢ for samples. Deductible. Blantons, Box 7064, Akron 6, Ohio.

QSLS. Stamp and call brings samples. Eddie Scott, W3CSX, Fairplay, Md.

QSLS 200, $2.50. Samples free. Amee's Printery, Bob, W9FXQ, Box 13A, Oak Lawn, Ill.

QSLS by the Ink Well, Spencer, Mass. Samples free, Menard, W1DQU.

QSLS 200 2-color, $3.00. Samples 10¢. Brigham, 32 Colson St., North Billerica, Mass.

RUBBER Stamps $1.00. Call and address. Clint's Radio, W2UDO, 32 Cumberland Ave., Verona, N.J.

ALL QSLS, $2.50/100. Free catalog. Longbrook, Box 393-A, Quakertown, N.J.

QSLS. Nifty, thrifty, dime. Filmcrafters, Box 304, Martins Ferry, Ohio.

QSLS, 3-color glossy, 100, $3.79; nice colors, including beautiful metallic purple, blue and green. Samples 10¢. Gates Print, 317-11th Ave., Juniata, Altoona, Penna.

ALL New! Postage stamp size photographs for QSLS. Your photo in either of two sizes: 100 small or 50 large, $2.00 per gummed-backed, perforated, sheet. Free samples. Q-Stamps, Box 149, Dept. 1A, Gary, Ind.

ATTRACTIVE QSLS: Guaranteed largest selection of individual styles. Samples 25¢ (deductible). Paul Levin, K2MTT, 1460 Carroll St., Brooklyn, N.Y. 11213.

QSLS, Gorgeous 5 and 6-color rainbows for 2 color prices. Beautiful quality. Immediate service. Samples 10¢ refundable. Harms, WA4FJE, 905 Fernald, Edgewater, Fla. 32032.

QUALITY QSLS. New low prices. Samples 10¢, 25¢, 50¢. Savory, 172 Roosevelt, Weymouth, Mass.

RUBBER Stamps to make your own QSL cards. Complete QSL kit. Includes 3 stamps, ink and pad, also 5 year certificate for QTH and call changes. Complete, $6.50. Write for free information and sample impressions. E & R Rubber Stamp, 50 Gerald Rd., Rantoul, Ill.

RUBBER Stamps for hams, sample impressions, Hamp, W9UNY, 542 N. 93, Milwaukee, Wis.

STEAM Engine driven generators, 500 watts AC/DC, kits, $34.50 up. Catalog, $1.00 refundable. Richardson Const. Corp., Sterling, Va.

WINDMILL Generators: 300 to 2000 watts. kits, $19.00 up. Catalog, $1.00, refundable. Richcraft Engineering, Sterling, Va.

I Am looking for the Largest (Pre-Neutrodyne) old radio and also the one having the most controls. Does anybody have candidates? Will also buy other pre-1925 radios. Worcester, R.D. 1, Frankfort, N.Y.

WANTED: 2 to 12 304TL tubes. Callanan, W9AU, P.O. Box 155, Barrington, Ill.

COLLINS Owners: Increase S/Line and KWM-2 versatility. Receive Mars, RTTY, Short-wave, citizens and space transmissions with same precision as ham signal. Just plug adaptor in. Receive twelve adritional 200 Kc segments, $29.75. Less crystals. Tele-Labs, P.O. Box 6, Brooklyn 8, N.Y.

CASH promptly paid for your ham gear. Trigger, 7361 North, River Forest, Ill. FR 1-8616.

TUBES Wanted. All types, highest prices paid. Write or phone Lou-Tronics, Inc., 131 Lawrence St., Brooklyn 1, N.Y. Tel. UL 5-2615.

ATTENTION Mobileers! Heavy-duty Leece-Neville 6 volt 100 amp. system, $50; 12 volt amp. system, $50; 12 volt 6 amp. system, $60; 12 volt 100 amp. system, $100. Built-in silicon rectifier alternators 12 volt 60 amps. $100; 12 volt 100 amps, $125.00. Guaranteed no ex-police car units. Herbert A. Zimmerman, Jr., K2PAT, 1907 Coney Island Ave., Brooklyn 30, N.Y. Tel DEwey 6-7388.

MUST Dispose: 82 copies Proceedings of the IRE. 3 volumes complete, 1926 to 1952. Real bargain for lot. Write for list Mrs. Miriam Y. Knapp, W1ZIM, 191 Beechwood Rd., West Hartford 7, Conn. Tel: 521-2055.

MUST Sell antique wireless collection. Send large SASE for list. W6LM, Box 308, Wrightwood, Calif.

USED Dial telephones. $4.00; Magneto, $8.00 plus postage. Guaranteed in working condx. Write for information and quantity discount. John Vogeli, Owendale, Mich.

CLEANING Shack: SX-28A, $40.00; you pay ship. New BC-696, 457, 459, $10.00; 12 v/50 A. Leece alternator complete, $50.00; Original 51-J4 manual, $10.00; 4D32, 4X150A, $10.00; 4X250B, $20.00; 5R4WGY, $1.25. John Conley, W7ZFB/4, 301 Burgwyn Rd., Montgomery, Ala.

COMPLETE stations for sale: HQ170C and GSB100; VHF-1 and H.B. 2-6-10 receiver; all operating and very clean. No reasonable offer refused. Bob, 626, 26, Cairo, Ill.

TRADE: Gonset G-76 transceiver, 1 yr. old, with new D/C, P/S; Turner mike, cables, manual. For movie sound camera and projector or Hy-Grade tape recorder. Fone 516-CH. 9-0923. Write Albert J. Bertolisi, 382 Fulton St., Farmingdale, L.I., N.Y.

SELL: SX-101-A, like new, $250.00; Eldico SSB-1000, $300.00; Collins 32S1 and AC pwr. supply, like new, 575; Sony CS300 stereo tape recorder with 2 mikes, like new, $250.00; Concertone-Stereo recorder, five heads, 10½ in. reels, perfect, $500; Transtenna T-R switch, outboard, $50.00. Lamb, 1219 Yardley Rd., Morrisville, Penna.

COLLINS Owners! Work AM! Wired kit, $5.00. No soldering, holes, chassis removal! Switch In-Out! (State model) Kit Kraft, 8763 Harlan, Ky.

FOR Sale: 3600-0-3600 at 1000 Ma, plate transformers, with dual 110V and 220V primaries, $35.00. General Electric 120 mtd., 3500V, filter capacitors, $45.00. Pete W. Dahl, 5331 Oaklawn Ave., Minneapolis 55424, Minn.

??You haven't seen The Ham Trader yet? Send us a post-card so you can. Box 153QS, Franklin Square, N.Y. 11010.

WANT For cash—a good complete station. Must be perfect, like-new condx. Offers and complete information: Al Claf, Box 7565, Mexico City.

WANTED: All types of aircraft or ground ratios. 17L, 618F or S 388, 390, GRC, PRC, 51J, RVX. Especially any item made by Collins Radio, ham or commercial. Also large type tubes and test equipment in general. For fast cash action contact Ted Dames, W2KUH, 308 Hickory, Arlington, N.J.

BC610-F, new condx. All tuning units and some spare parts. Speech amplf. Ant. coupler. Asking $450.00. Wm. K. Kern, K9BEH, 1807 12th St., Bedford, Ind.

BOOST Reception: 3.5-30 Mc. SK-20 Preselector Klt. $18.98. Boost modulation, AAA-1 Clipper-Filter kit, $10.99. Reduce noise—NJ-7 Noiseiector. IF wired, $4.49. Postpaid! Literature free. Holstrom Associates, Box 8640-T, Sacramento 22, Calif.

SELL: KWM-2 Sr., 11858, 312B-5 Sr., 10390, 516F-2 AC power-supply, in new condx, used but few hours, $1200. Rev. A. J. Tamulis, W9PQS, Macon, Ill. Tel. ROckwell 4-3795.

COLLINS KWS-1, No. 959. Looks new, guaranteed perfect. Includes antenna relay, instrux manual, spare tubes. Will ship. Best offer above $725.00 or will trade for KWM-2. Will accept NCX-3, SR-150 as part payment. Al Weiss, W6UGA, 2370 Knob Hill, Riverside, Calif. OV 3-3149.

SELL: SB-10, $75.00; QF-1 Q-multiplier, $5.00; RME152A converter, $40.00. Fred Graening, Tremont, Ill.

PROFESSIONAL Quality microphones 440SL, 440- 444 Shure Bros. Send card for attractive offer. W. J. Miller, 55 E. Washington, Chicago 60602.

COMPLETE Ham station w/Collins S/Line xmtr and revr. 516F-2 power supply and 312B4 station control unit, brand new. Present market price over $2100, plus provincial taxes. Will consider all reasonable offers. Write J. Long, 920 Chenier Ave., Ottawa 15, Ont., Canada.

CANADIANS: Sell Johnson Invader 2000, Valiant R390 revr, digital Readout, DB23, Tapetone receiver, parts, numerous test equipment. Send for list. Want General Radio Bridge 916 or similar. VE3BVX, 11 Sussex North, Lindsay, Ont., Canada.

CANADIANS: Sell complete mobile, $250.00. Comanche receiver transistor pwr. supply, six-band 60-90 watt xmtr. Addition of AC pwr. supply completes for fixed station use. VE2-BKM, Harvey, 6101 Des Angevins, Montreal 5, Tel. 352-3627.

ATTENTION Canadians! HT-33 Hallicrafters kilowatt linear amplifier. Only a few hours of operation. Specially priced to move fast. $490.00. F. T. Gaspard, Gaspard & Sons, Ltd., 143 Smith St., Winnipeg 1, Canada.

FOR Sale: KWM-2, 516F2, $895.00; National NCX-3, new, $330.00; Drake 2AC calibrator, $8.00; Johnson low-pass, $7.00; 4/CX250B, new, $30; 4/1000A/CHimney, new, $50. W2LEC.

FOR Sale: Viking Valiant transmitter; Hallicrafters SX-101A receiver plus antenna relay, low pass filter, mike. The price is only $590 complete. Lowell West, WA2HPW, 189 W. Shore Tr. Sparta, N.J.

SELL: Plate transformer, 635 volts, 250 ma. with matching 9 hy. choke, $17.50; new dynamotor, 12v input, 420 volts 160 ma., $7.50. Postpaid. Aden, 2120 Martha, N.E., Albuquerque, N. Mex.

FOR Sale: 75A3 3-1 Kc filter in gud condx. Must sell, college, make offer. Dan Pierce, KØQCT, 1930 8th Ave., Kearney, Nebr.

WANTED: QST and CQ Binders and early issues both magazines. Pre-1925 receivers and transmitters, McKenzie, KØSVJ, 1200 West Euclid, Indianola, Iowa.

400 watt transmitter. 4-125A final, 304TL modulator with VFO and power supply. Cannot ship. Will deliver 100 miles of Nashville—$125.00. Gonset Super Six, $20.00. W4WGJ, 1511 Rosebank, Nashville, Tenn. CA-80639.

SELLING Complete station: Heath Mohawk, 6M converter, spkr, $325, used 5 hrs. Heath Seneca $175, used 1 hour; EV #7295 mike, $12; 110 VAC coax relay, $10; 6 VDC coax relay, $16, new, Cush Craft 6M halo, $10, new; Delta Radio desk, $40. K. Kaiser, 83 Newport St., Arlington, Mass.

JUNGLE Medical center: Needs KWM-2, 312B-5, 516F-2, used, desperately. Anyone knowing of above, or wishing to purchase for or donate to please contact immediately. Tax Deductible. HR2SY, Pan American Health Service, Inc., Apartado 191, San Pedro, Sula, Honduras.

WANTED: 2AP1-A and HRO-60 coil sets. W8VJD, 203 W. Kaye, Marquette, Mich.

STOLEN! NCX-3 transceiver, serial No. 48-6606; NCX-A power supply, serial No. 49 6248. I bought this equipment new July 5, 1963. It was stolen 10 days later from Notre Dame High School, Niles, Ill. SWR bridge and a $50 mike, Electro-Voice 664 were also taken. Fifty dollar reward is offered for information leading to recovery of this stolen gear. Rev. Leon Boarman, W9GNM.

G76 Gonset transceiver, very clean. In original carton with manual; $275.00. Richard Subin, 309 North Thurlow Ave., Margate City, N.J.

DX-40 absolutely perfect, $50. Amplifier 150 CW 120 plate modulated fone June and July '61 QST pictures SASE, $50. WA2PVQ.

McCOY 48B1 9 mc. SSB filter, xtals and coils for circuit, p. 310 Handbook, $30. J. T. Morey, W2HXF, 210 Mountain Ave., Princeton, N.J.

FOR Sale: NC-183D $170; all components for KW power supply, $60; final amplifier 80 thru 15, using 4-250A, $25; final amplifier for 6 meters using 4-125A, $20. Everything in best condx. Jim Herb, W3SHP, Snydertown, Penna. P.O. Building.

AUDIO Test station: H/P 205AG generator; General Radio 1176A freq. meter, Hammarlund pwr. supply, Jensen Monitor spkr, all in 37" rack on dolly. $250.00. F.o.b. Clearwater, Fla. K4HPF, P.O. Box 1334, Clearwater, Fla. 33517.

COLLINS 75S-2, 7 xtals for RTTY, RTTY IF crystal, Serial 1054, $475. Collins 399C-1 PTO, $95; Auto-Mate K5/50 Electronic Keyer, Vibroplex key, $45. K8MPU, 3700 Olentangy Blvd., Columbus 14, Ohio.

SELL: Heath, SWR Bridge, Op. amp. and "Q" multiplier, $13 ea; Supreme Minimeter, $5. All like new. Paul May, Lowell Rd., Salem, N.H.

NATIONAL NC-125 receiver, speaker, 100 kc. freq. stand., in excint cond; Ranger transmitter, neatly wired and works FB; Electro-Voice 915 mike, Heath GD-1B grid dipper, other accessories, $225.00 or your best offer for complete station. Arthur Turner, 33 University Road, Cambridge 38, Mass.

BARGAINS: New Clegg "99ER" factory carton, $139.50; 3-element 6 meter beam, $11.95; 6 element 2-meter beam, $9.95; 55A-12 volt alternator, $59.50; low-loss foam RG8, .09 1/2 cents ft. PL-259 connectors, 10 for $3.50; Collins 32S-1, less PS, $425.00; Drake 2-A with calibrator, $195.00. Wacon Sales, 1400 Clay, Waco, Texas.

WANTED: Parts, sets, as is GRC-9, BC-610, GRC-27, Autodyne, 236 Park Avenue, Bethpage, L.I., N.Y.

QSTS. Four bound volumes; September 1921 through August 1924. September 1922 missing. Make offer. Howard Mock, 5442 Hawthorne Dr., Indianapolis, Ind.

COLLINS 75S-1, late model, serial number 2812, $325; HT-32A, $350.00; Gonset GSB-101 linear amplifier, $175. All equipment perfect, in mint condx. No scratches. Instruction books included. W7YAM, 4545 E. 8th St., Tucson, Ariz.

MALLORY Full wave noise filter 15a @ 220 VAC 30a @ 115 VAC. Eliminate AC appliance disturbances. Value, $17.00. $2.25 ppd U.S.A. New, sealed units. WB2CQM, 73 Bay 26th St., Brooklyn, N.Y.

FOR Sale: HT32A, line new condx, $450.00; HT33A, like new, factory conversion from AB2 to AB1 new PA with 6 hrs operation, $600.00. A. Avallone, 30 Aetna Ave., Torrington, Conn.

SALE: Communicator III 6M, mike, xtals, halo, $180; 300 w. AC/DC power supply, $30. Master Mobile all-band coil, $5.00; misc. parts, $15.00. Shupe, 1429 Meadowlark, Pittsburgh 16, Penna.

DX-40 plus matching VFO, in gud condx, $60. Will ship. K8LBQ, 24001 Hazelmere Road, Shaker Heights 22, Ohio.

SELL: Sonar all-band 120-watt xmtr. VFO, like new, $90. S38D, $25.00; Heath Q-mult. $5.00. K2LI T, 2707 Quentin Rd., Brooklyn, N.Y.

SELL: HQ-129X with spk. Clean: $100. Harry Harding, 3511 No. Reta Ave., Chicago, Ill. BU 1-3508.

ELMAC AF-67, PMR-8, PE-103 dynamotor 6 or 12 volts. $199.00. Gonset Tri-Band inc. free. WA9HDX, 321 Broadway, Goodland, Kans.

TEACH Your dollars more cents, send them to Harvard—Harvard, Mass., that is, for the best deal on a complete selection of ham gear used and new write Herb, W1IBY.

GONE SSB: Sell Heath VHF-1, clean throughout: also 40 ft. crank-up tower. Best offer takes it. K2OBM. 516-MA-3-9430.

SELL: SSB KW: HT-37, RME 6900 and matching speaker; Heath Warrior, extra cables, mike, relay, bug, etc. Perf. condx, less than year old. Pick up deal only, $800. Gray W2EUQ, 173 Deerland Ave., Painted Post, N.Y. 607-96-25924.

NOVICES: SX-25, 13 tubes, filter, $50.00. AT-1 transmitter, $15.00. KØWWV.

SELL: Our son is overseas, must dispose of his ham equipment: HQ-170 and spkr, Heath SWR bridge and Astatic T-3 mike, in perf. condx: $300.00. K9OVT, 1520 Norfolk, Westchester, Ill.

FOR Sale: Ranger with PTT, $125.00; Viking 6N2 with 6N2 VFO, $125.00; all factory wired: Millen type 90831 modulator, $25.00. W2IHA, George A. Diehl, 20 Wilson Ave., Chatham, N.J.

FOR Sale: Tech manuals: BC-221, BC-603 and 604; $4.00 each; TM-11-2617 rhombic antenna, OSA oscilloscope. HQ-160 rec., $2.00 ea; BC-1335, $3.00; Philco trouble shooting w/ schematics for BC-348 and BC-610, $1.50 each. W4OSC, Box 254, Ware Shoals, S.C.

VIKING Valiant in exclnt A-1 condx, shipped in original carton, $225.00; Collins 75A4 serial #4108 in exclnt A-1 condx, shipped in original carton, $425.00. Bob Parnell, K9GXB, 648 Washington St., Marengo, Ill.

SELL: Eldico SSB-100A transmitter with instruction manual, $225.00; Scott 330 AM/FM binaural tuner, $150.00; Macintosh 30 watt hi-fi amplifier, $100; AR-22 rotator, $25.00. W6RVQ, 29327 Heathercliff Rd., Malibu, Calif. GI 72793.

COLLEGE! Must sell Apache, $199; Warrior, $179; SB-10, $69; Eico 425 'scope, $39; keyer (homebrew) 18-70 wpm, $30; E-V mike, $5.00. All units exclnt condx. WØFHO, Winona State College, Box 365, Winona, Minn.

COLOR TV Motorola for trade for ham equipment. Would like mobile equipment Johnson 6 & 2 or what have you? Also have DX-60, $55.00. Write K1VNE, Tom Abare, 6 Tuttle St., Bellows Falls, Vt.

MOBILE Johnson Viking, 600V transistor PS, Shure dynamic mike, 10M transistor converter, 12 volt coaxial relay, 10 and 75 whips, body mount, cables, plugs, instructions, etc. $100. Jack Luck, K3VAP, 113 Iroquois Dr., Butler, Penna.

SELL: Cleaning out. Send for list of power supplies, meters, miscellaneous parts, etc. Molyneux, 5801 Shadesview Dr., Mobile, Ala.

MOSLEY VPA40-2 beam, $35.00; VPA10-15 3-el. $20.00. J. Franke, 2521 Clara, Ft. Wayne, Ind.

FOR Sale: NC-300, $180; DX-60 and HG-10 VFO, $70, both for $240.00. In perf. condx. James V. Loven, Jr., W4GJP/5, 2415 33rd, Apt. 2, Lubbock, Texas.

SELLING: DX-60 transmitter and HG-10 VFO, in gud condx, $85.00. K1WGM, "Bob", 12 Peacock Farm Rd., Lexington 73, Mass.

COMPLETE SSB rig: Marauder, factory-tested, $350; SX-101A, $275. Both for $600. K9FIP, RR #1, Carmel, Ind.

COLLINS Transmitter 32V-1, Condx exclnt, Frequency shift adaptor and low pass filter. $165.00. Free delivery to within 200 miles. Claude Sweger, Box 58, Fort Stockton, Texas.

LOOKING? Shopping? Trading? Trying to save money? Write to Bob Graham for special deals on new and reconditioned used gear. Cash or budget. Graham Radio, Dept. A, Reading, Mass. 01867. Tel: 944-4000.

PHOTOCOPY Of your amateur license, 50¢; 2 for 75¢. W5-LSR, Maury Franks, Station A, Searcy, Arkansas.

FOR Sale: 1 Eico xmtr, like new, model 720, $80; 1 Clegg Thor 6 transceiver, 2 months old and still in guarantee, with power supply, $290.00. Sam Zito, 9900 Pine Ave., Niagara Falls, N.Y. Phone: 297-36-47.

SALE: KWM-2, PM-2 in CC-1 case. Waters rcl. tuning, 30L1, like new, $1250. W5UV.

GSB-100 and GSB-101: SX-101A, factory wired Valiant, bug, mike, Simpson test equipment: $995. Brooklyn RN3-051-WA2-OEK, 9204 Rost Place, Brooklyn, N.Y.

SELL Or swap: Fourteen new General Electric FG-67 thyratrons. What's your offer? D. Lovett, K8BXT, 3629 Northwood Dr. S.E., Warren, Ohio.

VIKING Ranger, in gud condx, $150.00; 2000V at 400 Ma. power supply, $55.00. Write Roger Kramer, 706th Radar Squadron, Dickinson, N.D.

FOR Sale: Collins KWM-1. Used very little. Never mobile. No PS but matching plug: $350.00. Will ship. WB6BFQ, Box 1018, El Centro, Calif.

HEATH Shawnee. Exclnt wiring. Laboratory aligned. $180.00. Two 100 milliwatt Johnson Personal Messengers: $150. W1-CDO, John Maguire, 23 Borden St., New Bedford, Mass.

VIKING II xmtr, only 80 hours air-time, factory assembled. First check over $135.00 takes it F.o.b. Norfolk, Virginia. S. P. Feldman, 7211 Newport, Norfolk 5, Va.

FOR Sale: In exclnt condx: one owner Collins 75A2 with crystal calibrator and matching speaker, $250.00. Like-new Gonset G-76, P/S, $60. Karl Lipscomb, 87 Canterbury Lane, Joplin, Mo.

20M Swan transceiver w/trans. DC supply, Turner 350C mike and New-Tronics mobile antenna. In exclnt condx: $200.00. Will ship. WA6JCZ, 24151 Friar St., Woodland Hills, Calif.

FREE To buyer of complete station, many small items for shack. AF67, PMR7, new 1070 supply, new Band-Spanner ant., $165.00 takes all. Write Wyka, W9DFB, Box 215, Durand, Ill.

MICROWAVE diodes 1N416EM 1000-4000 Mc. 11 matched pairs: 2 wide band xtal detectors, model 420A using 1N26 xtals, 10 mc.-12.5 k mc. Sale or trade, make offer. WA9JPV, 229 Montclair, Peoria Heights, Ill.

FOR Sale: HT-37 and HT-41 and Drake 2-B and Q-Mult., Xtal calibr, with parts thrown in for $760. Used less than 50 hours! Will sell separately. Rev. William Jablonske, W9NNS, Box 456, Richland Center, Wis.

SALE: $100 buys 100-watt 6-meter rig, 829B in Millen final. Well metered in new Bud 19 x 28 in. rack. Heath VFO, spares, in great condx. All replies ans'd. K2ZEX, Ben Sherman, 2243 E. 26th St., B'klyn. 29, N.Y.

WANTED: Commercial, Military, All types, ARC, ARN, ARM, BC, GRC, PRC, TRC, URR, URM, TS, 618S, 17L, 51R, others. Ritco, P.O. Box 158, Annandale, Va.

TELREX Triband TM-30C, two months old, cost $385. Make offer. Want Telrex 5 or 6-element beam. 200 mile radius. David Haymond, 61 Norwood Rd., West Hartford, Conn.

$1.00 will change all your old xtals to new freq. where you want them, safe etching method, complete, no gimmicks, air-mailed. Ham-Kits, dummy loads, Cranford, N.J.

GONSET Twins, G-77, G66B, 3-way pwr. supplies, with mike, cables, ant., all ready to go on the air: $200. Bob, K6TKZ, 637 E. Harvard, Ont., Calif.

RANGER II. $260; KW power supply with screen and bias, relay rack, two new 813's, $80. Knight R-100 receiver $80. WA2NQC, 1 Lake Drive, Roosevelt, N.J.

RTTY: Sell Model 15 printers, AN/FGC-1 terminal unit. Write. 255A relays, $3.25 PP; sockets, 75¢. Rudolph, 3431 Douglas Dr., Murrysville, Penna.

HUNTER Bandit 2000A linear new August 1963; Globe Champ 300, DX-40, RME-6900. Going mobile exclusively. Make offer. Will ship. K8KBW.

APACHE in exclnt condx: $165.00; HO-10 Monitor 'scope, $40.00. K6KMG, 14035 Glenn Dr., Whittier, Calif.

MUST Sell: Gonset G-76 with mounting brackets, and chrome plated bug. $250. K4HFP, 1024 Carolina Ave., Salem, Va.

ESTATE Of K9DMZ: Heath HX-30, 6 meter SSB, used only 2 months; Johnson 6N2 and Eico modulator factory-wired. Reasonably priced. Contact K9PRB, 329 Dwight, Joliet, Ill.

WANTED: Good Heathkit DX-40, Rohssler, 3501 Foster Ave., Brooklyn, N.Y.

GOING Back to 6 and 2 with homebrew gear; have Apache, SB-10 combination wired by electronics engineer, excellent condx, $260. John Meyer, W5JFB, 110 Sherwood Forest Dr., New Orleans 19, La.

PARTS Sale: Too many—both new and surplus. New K. W. Modulation transformer, PE-103's, tubes, filament transformers, relays, etc. What do you need? Send stamp for list. W4-NJE, Box 4192, Lynchburg, Va.

COLLINS 75S3, $550; nearly new. Used very little by WI-ZZK. DXCC honor roll member who is now in college and cannot use. This premium receiver is absolutely like-new and guaranteed. A terrific buy at $130.00 off Collins price. F. W. Rockwood, W1IOB, 186 N. Rolling Acres, Cheshire, Conn. BR 2-8559.

FOR Sale: HQ-129X with matching spkr, manuals, 100; factory-wired Viking I with Johnson TVI kit installed, Johnson 122 VFO, manuals, $100. KØBEJ, George Chambers, 302 South Glendale Ave., Coffeyville, Kans.

FOR Sale: Drake 2B with Q-multiplier and calibrator. Used 3 months: $225.00. Wanted: Collins PM-2, 312B5, CC2 and MM-2. WA2ZZC, 126 Fairway Gate, Roslyn Harbor, N.Y.

SELL: HQ-170, $225.00; Polycomm 62B, $250; both in exclnt condx. K2UMH, 469 Kenwood Ave., Delmar, N.Y.

COLLINS 32V3, $225; 75A4 serial 5221, $475. Both exclnt, original owner, K3UNR, 3730 Northampton N.W., Washington 15, D.C.

INVADER 200 Viking Johnson SSB AM/CW, 200 watts P.E.P. Have two rigs. Will sacrifice. $400. Vy Clean. K9RHI. Bob Wendorf, RR2, Box 185, West Chicago, Illinois 60185. Area code 312-231-0962. All inquiries answered.

FOR Sale: QSTs in binders from 1923 to 1928. Balance not in binders. Will sell all for $150.00. You pay the freight. Cash deal only. Leon A. Faber, 4348 E. Palo Verde Drive, Phoenix, Ariz.

COMPLETE Station: Hallicrafters SX-101A, $225.00; HT-32, $325.00; HT-33 linear amplifier, $300; Mosley TriOBand antenna, $50.00. All for $800. Norman Kurkonis, W1ZWF, 8 MacLarnon Rd., Salem, N.H. Phone 898-2285.

OSCILLOSCOPE D.C. to 2 200 Kc. Heathkit compact, Model 10-10, expertly wired. Original kit cost $80. Perfect condx. $75. W2PZP, 35 Karyn Terrace, Middletown, N.J. Phone 671-0522.

SELL: Heath HX-20 SSB xmtr, HP-20 AC supply; xmtr factory aligned, perfect condx, both for $215.00. QFI Q Multiplier, $5.00. Charles Berens, 2295 Sierra Dr., White Bear Lake, Minn.

DUMONT Lab Oscilloscope (originally cost $1,000). Will trade for receiver HQ-180, 75A4, etc. WA5AAO, Box 57, La Grange, Texas.

BEST Offer: HQ-145 matching speaker and xtal calibrator. Norm, WA2JIS, 1147-65th St., Brooklyn 19, N.Y.

FOR Sale: 3OL1, $375; UCS-300 VAC, VAR., $30.00; BC221, $55.00; New BC639/pwr supp., $80.00; used BC639, $50; BC-779, $65.00; new tubes 813s at $5.00; 250THs, $15.00; 803, $2.00; 450TL $15.00; 6L6 at $1.00; 3B28, $2.00; VT-127, $2.50; 833-A, $15.00; 4-250, $15.00; 4-1000A w/air socket and chimney, $75.00. W. R., 8510 Comanche, Canoga Park, Calif.

LEECE-NEVILLE Rectifier 50 amp., $5.00; 100 amp. 28 volt, $10; Selsyn 110 volt, $2.00. Trade dual beam oscilloscope for good SSB generator. B. J. Kucera, 10615 So. Highland Ave., Cleveland, Ohio.

FOR Sale: LM frequency meter, calibration book, manual, AC supply, spare xtal and tubes. $60.00: HQ-110C, $145.00; HQ-170, $225.00 or will trade for shotguns or rifles. Ed Muller, 23 Fiske Pl., Brooklyn, N.Y. 11215.

MOHICAN GC1A, transistor portable, general coverage receiver, $85.00, Ranger, sequential keying, unmodified, $130.00. W2AAW/Ø, 1505 Freeman, Bellevue, Nebraska.

SELL: 75S3, still in warranty. Gonset GSB 201. KØIDV, 1166 Burns Avenue, St. Paul, Minn.

CW Audio filters, variable band width, minus 40 DB for 500 cycle band width. Band width adjusts from 50 to 350 cycles. New invention. Prices start at $5.95. Money-back guarantee, ten day free trial. Write for complete specifications. T. W. Holden, K9JAX, 301 West 16 Place, Chicago Heights, Ill.

"KID From Texas" Year End Sale: New Swan SW-240 with Ad-Com power supply, $369; National NCX-3, $269; Elmac AF-67, $49; Viking II, $99.00; new model SBE SB-33 transceivers ready for delivery. HQ-110, $99.00; Viking I, $69.00; DX-100, $79; Gonset GSB-201 in sealed carton, $249.00; HT-33A, $199.00; HT-41, $239.00; 20-A, $99; BC-610, $129.00; immediate delivery on Drake TR-3; SR-150 with AC P/S, $589. Check with W5KFT, "Kid from Texas", and save $$$. Bryan, W5KFT, Edwards Electronics, 4124-34th St., Lubbock, Texas. SW 5-2595.

COLLEGE! Sell Drake 2B, $250; Valiant, $250.00. WA2ODT, 5644 Mapleton Dr., Utica, N.Y.

SX-115 New, with guarantee card. $375.00. No trades. W2WEE, FU-8-0851. Ed Muska, 77 Union Ave., Colonia, N.J.

DRAKE 2B receiver. In absolute mint condx, used less than one hour. Cannot be told from brand new. $215.00. Or you make offer. Vert Mandelstramm, W3ADS, 2419 Lillian Dr., Silver Spring, Md.

FOR Sale: 6.3 KW 120V AC Hercules motor generator for sale cheap. 250 running hours. Mod. 15 teleprinter. W2ZXM, Kurt Carlsen, 65 Alwat St., Woodbridge, N.J.

SALE: KW parts. Thordarson Multimatch modulation xfrmr, new, $25.00; Heavy duty UTC-CG108, 10 hy. 500 Ma. choke, new, $20.00: Johnson KW Matchbox like new condx, no Monimatch, $75.00; Johnson 6 and 2 mtr. converter, $45.00 Central Electronics 20A SSB exciter and 458 delux VFO H/W, $150.00; Pollard KS 15512L2 5" scope made for Western Electric. In heavy duty case, $35.00. H. W. Kutz, K2GGU, 223 Swarthore Rd., Glassboro, N.J.

THUNDERBOLT for sale: factory wired, used about 30 hours. Sacrifice $300. Richard Mead, R.D. #1, Owego, N.Y.

COLLINS 75A3 with product detector, $300; Collins 32V2, $200. Must sell. John P. Tiedeck, WA2SDE, Indian Run Farm, Woodstown, N.J.

SELL: Lafayette 6 meter HE-35, 2 crystals, microphone mobile brackets, $45.00. Bruce P. Tis, 113 Dave's Lane, Southport, Conn.

GLOBE Champion with T-R switch and xtal calibrator built-in. Exclnt shape. $250.00 delivered 100 mile radius, Elmira, N.Y. W2TJH, Lyman Howe, RD 1, Big Flats, N.Y.

STAMP Collectors: I need six-meter transceiver such as Gonset or Clegg. Will pay in U.S. mint plate blocks. Robert Cobaugh, W2DTE, 29-29 213th St., Bayside, L.I., N.Y.

HEATH Test equipment all professionally wired and unscratched. Electronic switch, $22.00; capacitor tester, $8.00. Condenser checker, $20.00; TV alignment generator, $50.00; RF signal generator, $20.00; VTVM, $26.00; variable power supply DC 0-500 V regulated, $36.00 Superior tube tester, $25.00. K3IBQ, 608 Maple Ave., Southampton, Penna.

FOR Sale: Invader 2000, SX-117, R-48 speaker, Johnson TR switch, Bendix MicroMatch and indicator, Electro-Voice 664 microphone and PTT stand, B&W low-pass filter. Gud condx, like new, 2000 and SX-117 less than a year old. Complete rig: $1250.00. W5HCF, Phone: NO 4773452. D. Pontenot, Rt. 3, Box 185DC, Lake Charles, La.

SELL: Gonset equipment in original cartons: Comm. IV (never used), $285.00; VFO (never used), $55.00; G-76 and AC power supply (used only 2 hours), $410.00; Mod. 3247 FM converter (never used), $70.00. F. Berger, K1PJO, 865 Clinton Ave., Bridgeport, Conn.

CALIFORNIANS: Wired Ranger II kit, in perf. condx, only one month old, no scratches, perf. signal. Take over payments to Henry plus money already paid on kit plus $20. Call for more info: WA6YRW. REG NO 20194. Reg Dowmont, 4217 Hazel Kirk Dr., Los Angeles 27, Calif.

HT-37 Cream puff, $320.00; also NC-300 with calibrator and speaker, $195.00. Both for $500.00. Write to W2DQN for on-the-air demonstration sked any band. 43 Sequams La., E., West Islip, N.Y.

HEATHKIT Apache, in exclnt condx, $200; Elmac AF67, clean $90.00; James No. 1050 6/12 volt supply, $20.00; Gonset Super Six converter, $20.00; NC-200, $50.00. E. Dohner, KØHPB, 436 West Peakview Ave., Littleton, Colo.

SELL: Collins 75A1, 3 kc. mechanical filter, speaker, $198.00; Hallicrafters HT-32, $345.00; both are in exclnt optg. condx, instruction manuals. K1DLT, 21 Harvest Hill Lane, Stamford, Conn.

NATIONAL NC-183, Viking I, Knight VFO. Best offer. WA2TMB. 1437 Neilson St., Utica, N.Y.

SELL: Lafayette HE-30, like new condx, $60.00 or trade for Johnson Matchbox. Charles Hyde, WB2FKZ, R.D. 2, Ballston Spa, N.Y.

TRANSISTORS 2N332, 2N336, 2N337, 2N338, 2N657, 2N699, 2N706, 2N834, 2N964, 10 for $5.00; 2N424, 2N1050, 5 for $5.00. Two 4CX300A's with new sockets, $40.00. W7POS, 2319 East Indianola, Phoenix 16, Ariz.

SELL: Viking Invader, exclnt condx, $375.00; SX101A, exclnt condx, $250.00 both for $600.00. Prepaid shipment. Certified check, K3LIX, 328 South Highland, DuBois, Penna.

SELL: DX-100, SB-10, HQ-150, Johnson Matchbox, D-104, good condition, $400.00. Gary Sundstrom, P.O. Box 232, Camden, Maine. K2LXL/K1YQE.

SSB Pacemaker, $170; 420 W Globe Linear, $70; exclnt condx, K6UNA, 12262 Lambert Circle, Garden Grove, Calif.

KWM-2, 516F-2 AC supp., 312B-3 spkr, E-V 729 mike. In mint condx. $880.00. W6DZQ, 177 W. Blithedale, Mill Valley, Calif.

WANTED: S36A, S37 receivers; also Hickok signal generator, type 288X and Panadaptors BC1031C, SA8T-200, or the equivalent. Equipment should be in new-new condx. MacGregor, 5820 Oregon N.W., Washington 15, D.C.

FOR Sale: Globe Chief Deluxe, 5 xtals 5 PL-259s, brass key and plug. Less than 10 hours use on xmttr. Dave Schwimmer, WB2GOJ, 115 Ashland Place, Brooklyn 1, N.Y.

FOR Sale: 20 m. PR-813 CW xmtr, VFO, Electronic keyer, Q-multiplier, vertical antenna, low-pass filter. W2WDW, Bill Johnson, 77 Paula Blvd., Selden, L.I., New York. PRimrose 5-8938. SElden 2-6061.

FOR Sale: 75A2 with 3.1 filter, product detector, vernier knob, $265.00; S-76, realigned, $90.00; DB23, $25.00; DX-40, retubed, $50; VF1-$15.00. All in gud condx. Will ship. K4WGW, Hank Plumb, Rte. 1, Crossville, Tenn.

SELL: Hallicrafters HT-40. $49.00; Elmac PMR1, $69.00; VXO (QST, July 1963) all new parts, $49.00; Ameco: CB6, $10; New Nuvistor CN50W, in factory carton, $45.00; PS1, $5.00; JT30 microphone, $5.00; assorted tubes, pictures of equipment available. Carl, WA2IMG/2, 199 Kartest Drive North, Rochester 16, N.Y.

SWAP equipment, components with other hams! Many offers in "Equipment Exchange". Interesting sample copy free! Write: Brand, publisher, Sycamore, Ill.

FOR Sale: Heath Comanche, Cheyenne, speaker, mike; A.C. power supply. Built and calibrated, but never operated. In new condition. $190 or best offer. Ted Bergstrom, W1UQW/DL41Q, c/o General Dynamics Electronics APO, 684, New York.

2-METER Station, separately or all for $227.00: Health Seneca, in gud condx, $147.00; 2 never used beams, Hy-Gain 210, $13.25 each, 1 used beam Hy-Gain 25, $5.00; home-brew converter for 2 meters, $32.00, NC-100A, gud condx, $45.00. WAØCAE, 300 South Oak St., Waconia, Minn.

FOR Sale: New 4CX300A with socket and chimney, new 4CX-1000A, Collins noise blanker for 75S-1, Heath Q-Multiplier, best offers: 5 kc and 6 kc filters for 75A-4, $30.00 each, both for $55.00. WØAXQ, 2118 Afton Way, Colorado Springs, Colo.

FOR Sale: 75A4, #3698 with extra 2.1 kc filter, $375.00; KWS-1, #1116 with all modifications, $600.00. If both are taken by one party, will include MM2 Multiphase R.F. Analyzer and home-brewed station control, $1000.00 for all items. Harold McKissick, 1450 Mandel Ave., Westchester, Ill.

SALE, Trade: Teletype parts, equipment, typing reperforator, motors, Collins terminal unit, HT-37, 32V2. Wanted: Teletype transmitter-distributor parts, model 14 tape reels, end-of-line indicators. General Radio Synchroscope, comparison oscilloscope, other frequenty standard components, back issue catalogs (General Radio, Hewlett-Packard, Measurements, Boonton, etc.). Also want books of U.S. Navy history, U.S. Naval Institute Proceedings. W4NYF.

SELL: HQ-140X, $100; speaker and guaranteed 30-days. Dennis G. Reising, 516 So. 28th St., Lincoln, Nebraska.

18 Antique radio tubes; de Forest Ultraudion (Hudson filament), Myers "red head" audion, Royal Ediswan Fleming Oscillation Valve, 3 Western Electric 239-A's, RCA UX-199, four RCA 24A's, two Telefunken DRP triodes, Suddeutsche KTD triode, VT-1, VT-11, CG1162/Navy 5W, and an unidentifiable diode. Also have "Year Book of Wireless Telegraphy and Telephony" for 1914 and 1920. Best offer. Miss Jessie York, c/o W1CUT, 18 Mohawk Drive, Unionville, Conn.

75A-1 Receiver, speaker, manual, immaculate, $190; Viking II transmitter, in exclnt condx, all mods. incorporated, full xtal deck, mike, ant. relay, baluns, folded dipole kit, spare tubes, manual, $115; Morrow 5BRI converter, in mint condx, cables, manual, orig. carton, $30; AR-88 rcvr, vy good; Super Pro, pwr. supply, spkr, vy gud. Write WØLWZ, 1030 So. Dudley, Denver, Colorado 80226.

NEED College money: Perfect Drake 2B, $185.00; will ship. Globe Chief deluxe w/modulator, $35.00; Heath VF-1 w/power supply, $25.00; Dow-Key DK60-G2C, $7.50. K3RHD, Scott Phenix, George School, Penna.

DX100B, carefully wired, little used. Works fine. $140. W6RIJ, SY 8-5253.

FOR Sale! 150 watt transmitter, single 813, 80-10 meters, plus HT-18 VFO, $80; Super Pro BC-779 receiver, converted 15-10 meters, power supply, needs minor work, $75; TR-4 rotor, indicator. Needs calibration, $14. Shipping is addtl. Novices! For sale: DX-35 transmitter, 50 watts. Beautifully wired, $35.00. Is excellent first rig. Set spare tubes included. Shipping additional. Walt Deemer, 8 Garden Pl., Apt. 5, Brooklyn 1, N.Y.

SELL: SX-101, MK-III, in perfect mint condx, hardly used, $210. Panel meters, panel mounted power supplies: crystals, filament xfrmrs, 14 Mcs. converted Command xmtr. Command dynamotors, etc. Stamped addressed envelope for list. Roberts, W1KUK, 49 Daniel Rd., West Haven, Conn.

HALLICRAFTERS HT-32A, spotless condx, looks and operates like new. Will ship. $395.00 FOB. Want good KWM-2 or S-Line, late serial numbers preferred. George Clark, WØUDZ, 2317 Vine, West Des Moines, Iowa.

SELL: #3024 Gonset 2 meter VFO/Audio preamplifier with 3057 Gonset deluxe 2 meter 12V DC/115V AC Communicator II, plus factory zipper bag. New condx, perf. working order, with manuals. Cash: $145.00. F.o.b. Dallas, Texas. Harry Lord, W5JH, 4143 Sunberry, Dallas 27, Texas.

75A4, 6-3.1, 500 cycle filters, vernier dial, $520; 32S-1, $445; condx faultless. AR67 and PMR6A Elmac, $110. Dave Sandine, 10357 Hale Ave., Chicago, Ill. PR 9-0061.

NC-105 SSB and AM rcvr. Separate product detector and built-in "Q" multiplier. Perfect condx, $85 firm, no trades, no shipping. W9OXL, 1400 Chicago Ave., Evanston, Ill. UN 9-4749.

FOR Sale: DX-60, HG10 matching VFO, four 40-meter xtals in exclnt condx, best offer over $85. K1TGX, Jerry Molaver, 34 Collins St., Waterbury, Conn. Phone 7365928.

UNUSUAL Opportunity! Have to clean out accumulation of equipment, gadgets, tubes, parts every ham wants cheap. Needs? List for stamp. W4API, Box 4095, Arlington, Va., 22204.

WANTED: Large quantities of xtals. Send list of frequencies, type of holder and asking price. Nat Stinnette, W4AYV, Umatilla, Fla. 32784.

SALE: 30S1, mint condx. $950.00. W2JXH.

SELL Apache SB10. HQ170. Make an offer. K3JSK, Dave Zweier, 157 Chestnut St., Sunbury, Penna.

WANTED: 2 Kc mechanical filter F455J-21, also need Ham-M rotator. K1PNS, 24 Rockwood Dr., Waterford, Conn.

PERSONALIZED Book Matches. Your name and call. Black with silver imprint. 100 for $3.35. Cash with order. Eugene Enterprises, Box 188, Swarthmore, Penna. 19081.

FOR Sale: SX-99, $75; Viking II with VFO, $170; ART-13, 110V AC, $95. Super Six, $20. S. Schwartz, 5 Thoreau Rd., Lexington 73, Mass.

FOR Sale: National type XCU Deluxe WWV crystal calibrator for NC-303. Can also be used with NC-300, $24.00. Hycon-Eastern type 2215KA Bandpass xtal filter, $24. K8BFI/4, 4605 N. 17th St., Arlington 7, Va.

COLLINS 75S1 with 500 cycle CW filter and xtals; Waters notch-filter, serial 1603, excint, $390. K3TPL, Bradford Sheppard, 765 Moredon Rd., Meadowbrook, Penna. 215-TU-7-1602.

75A-4 serial 5577, 3.1 and 6 kc. filters. In A-1 condx, $475. Would consider Drake 2-B and 2-BQ speaker in trade. Ed Coles, 5007 N. Vassault St., Tacoma 7, Wash.

SELL New 79-B pulse gen., $60; oven controlled master osc., 2-32 Mc., LM freq. meter with book, $30, cable and power supply, $10. Robert Ireland, Pleasant Valley, N.Y. 12569.

COMPLETE 2m General Electric FM transceiver 6/12 volts with mic, controls, cables, antenna, crystals, $80: Heath MP-10 12dc to 110V AC 240W converter, $25; Twoer, K8JIC, Box 182, Allen Park, Mich.

MUST Sell: T-150 xmtr, used less than 5 hours, $85. WN2IDK, 621 Oradell Ave., Oradell, N. J. Phone CO 2-1670.

SELL: Hallicrafters SX-100, R-46B spkr, Heath Sixer. Gud condx. Make offer. Will pay shipping. K8NOO, 1501 Howard, Petoskey, Mich.

ADVENTURER transmitter for sale. Best offer over $30.00. Add shipping cost. WA6PFY, 716 Longwood, L.A., Calif. 90005.

KWM-2: both supplies, blanker, mount. Excint. $1150. Wanted: Super Pro to 30 Mc. W2CE, Tel. FReeport 9-0415.

VIKING Ranger I, Drake 2B, like new, both $370. WA2HFB, 63-61 99 St., Rego Park 74, N.Y.

TAPE Recorder AKA1-M6. Resembles Roberts 990A. Reasonable. KH6EWG.

20M SSB. W2EWL exciter with heavy power supply, $55. K2AHS.

SELL: HQ-170 factory aligned, $235.00; FW Eico 720 xmtr, FW 730 modulator, 722 FW VFO wired for switch-to-talk, including Johnson low-pass filter, $140; D-104, $10.00; Mosley V4-6 vertical with RG-8/U coax, $15.00; all in mint condx. Price firm. First $400 check takes all. You pay shipping. Gene O'Brien, 20 Blvd., New Rochelle, N.Y. WA2QDR.

COLLINS 75S-2 receiver, 500 cycle filter. Robert Meyer, 6015 5th Ave., Brooklyn, N.Y. Tel: GE 9-8414.

HQ-170 with speaker, $260; Johnson Challenger xmtr, $100; HA-5 VFO, $60; station used very little. Sam Carter, E. McKinney Rd., Cincinnati, Ohio, 683-0273.

NEW Lafayette HE-30 all-band receiver, RF stage, in carton, $50; Viking Navigator, F/W, pert., $105. Mobile: G-66, Gonset Commander, supplies. Write for details. W1PRT, 19 Bidwell, Bloomfield, Conn. 06002.

CLEANING House: Knight R-55 rcvr, $38. Heathkit GC-1A rcvr with AC power, $75. Manuals included. M. Tanaka, 710 Lake Shore, Chicago 11, Illinois.

HT-32, $289; HQ-160, $195; 32V xmtr, $139.00; 75A2A 3.1 kc filter, $249; SP-600JX, $275; R-274 rcvr, 54-54 Mc., $295; Ranger, $139.00; Drake 2B, $210; Thor VI transceiver, $295; Wheatstone pert. for c.w. $175; Boehme keyer, $125; C-E 200V, $625. Alltronics-Howard Co., Box 19, Boston 1, Mass. 02101 (RI 2-0048).

HEATH Comanche recr/AC pwr. supply, $75. Philmore CR-5AC rcvr, $25. In gud condx. WA8EXC, 2111 Fleetwood Drive, Groose Pointe Woods, Michigan.

75A-4, $450; 32S-1 and 75S-1, $750; KWM-1, $350; MP-1 w/ cable, $150.00. W8WGA.

CRYSTALS Airmailed: Kits, SSB, Nets, MARS, Marine, CD, CAP, etc. Custom finished FT-243 .01% any kilocycle 3500 to 8600 $1.75 (five or more mixed or same frequency FT-243 $1.50) (ten or more same frequency, $1.25). 1710 to 20,000 Kilocycles $2.25. Overtones supplied above 10 megacycles. Fundamentals 10,000 to 13,500 $3.25. Add 50¢ each for .005%. For HC-6/u hermetics above 2000 add 65¢ each. QST Kits, FT-243: "SSB Package" five mixer $11.95, seven matched filter $11.95; "DCS-500", "Three Band Converter", "IMP" $9.95/set. Write regarding specific needs. Airmailing 10¢/crystal, surface 5¢. Crystals since 1933. C-W Crystals, Box 2065-Q, El Monte, California.

GALAXY Sales have brought in hundreds of trades: Cash. KWM-1, $329.00; Champ 300, $199.00; King 500C, $439.00; GSB-100, $229.00; HX-50, $299.00; Apache $189.00; Valiant, $225.00; Pacemaker, $169.00; 75A-1, $199.00; 75A-4, $375.00; SX-111, $169.00; SX-101, $179.00; HRO-50T, $149.00; HRO-60T, $249.00, and many more. Write for list N-3. Leo, WØGFQ, Box 919, Council Bluffs, Iowa.

COMPLETE SSB Rig: HT-32 xmtr; NC-300 rcvr; TA-33 beam; accessories. Like new. Offers for whole or part. Goldenson, Sunny Ridge Rd., Harrison, N.Y.

MUST Sacrifice my station to get neighbors off my back. Will sell Valiant F/W in mint condx for $275. Also must sell RME 6900 mint condx, $250. Take both for $495 and will throw in B&W low-pass filter. Dan Safran, WA2PBY, 163-70, 16 Ave., Whitestone, L.I., N.Y. BA 5-2933.

THE Thrill is like the September QST article says. Graduated to contest multi-channel. Complete and flying Ambrold Charger and Debolt Live Wire Trainer model airplanes at much saving in money and work. With .15 O.S. and K-B motors. Varicomp and motor control escapment equipped. Orbit and F and M single channel, $115 and $105 respectively. Write for list of my other surplus R.C. and ham gear. Walter V. Jennings, W5ABN, 11121 Tascosa Dr., Dallas 28, Texas, 75328.

FREQUENCY Standard, Hewlett-Packard, Model 100A converted to 100B. Provides 100, 10, 1, 0.1 Kc. Contains crystal oven, three fail-safe dividers, cathode-follower outputs, regulated power supply. 15 tubes; in original clear wood cabinet. Condx excint. $200.00. R. Gonzalez, 2910 Verle Ave., Ann Arbor, Mich.

WANNA Try a rhombic? Here are four fifty-foot plywood masts, with guy-wires, anchors and bases, the works for $125.00. Used on several field days, otherwise in dry storage, excint condx. Prefer pick-up deal, but will ship. W9ERU, Box 350, R.R. 4, Rockford, Ill.

SELLING Out: Drake 2-B, $200; HQ-110, $150; DX-35, $40; Viking Adventurer, $30; Lafayette HE-35, $25. All prices firm. John Phillips, K2QAI, 298 Clermont Ave., Brooklyn 5, N.Y. JA 2-2629.

FOR Sale: Johnson Matchbox 275 watt, $32.00; TG-34A code practice set, $15.00; Bud closed cabinet, 25" high (scratched), $15.00. K2ORN, 357 Plymouth Road, Union, N.J.

SELLING QSTS: Oct., Dec. 1916; July, Oct., Dec. 1921; complete run January 1922 through December 1958. Sell all as package. Highest over $100. J .R. Palmer, 7425 Schuyler Dr., Omaha 14, Nebr.

CRYSTALS: FT-243; 3500½-3980, 7010, 7300, at 95¢; 6/8 Mc for 6/2 meters, 2/90¢. DC-35 holders: 1810, 3665, 3807.5, 3870. 2/$1.40. Guaranteed. Postage 5¢ xtal. Richard Wilder, W2ZCZ, 33 Wexford, DeWitt, N.Y. 13214.

SELL: NC-300 with speaker, $225; NC 6/2 meter converters, $25 each; Apache, $210; SB-10, $75; all in gud wkg order and clean. W8TAJ, 1061 Burkwood Rd., Mansfield, Ohio.

HAMMARLUND HQ-180C, serial #2085, electrically and mechanically perfect. No scratches nor worn spots. Absolutely like new. $300. F.o.b. W5BQ, 4910 Bon Aire Dr., Monroe, La.

FOR Sale: LW-51 deluxe transmitter, $60; also GR-91, $25.00 or your best offer. Both one year old and in mint condx. K3QKR.

MUST Sell: DX-100 with Heath modifications: SB-10, GPR-90 receiver, all excint condx. Dave Fraser, K2LAI, 427 E. 69th St., NYC 21, N.Y. Tel. TR 9-8087.

HALLICRAFTERS SR-150 amateur band. Fixed/mobile transceiver and its accessories for $695.95. Contact Michael Reed, 1021 Garrison St., Fremont, Ohio. Tel: 332-3453.

WANTED: KWM-2. Quote lowest cash price to John Wertz, Box 118, Springfield, South Carolina.

SB-33, have two. Sell one: $275.00. R. E. Lindly, WAØCMW, 1310 Pleasantview, SU 8-2562, Derby, Kansas, 67037.

BOSTON Area. Sell HQ-129X, $95. SX-101 MK III, $175.00; KW 2200 VDC supply, $45.00. Want: HQ-170A. Phone DA-4-3956 evenings. W1KSB, 5 Bickford Rd., Malden, Mass.

IN Excint condx: Old QSTs: Dec. 1921, Dec. 1923, Jan. 1924, February 1924, April 1924. Complete run from September 1924 to August 1963. Write wants, and give full info. Mrs. Leslie Frazer, 915 College Ave., Richmond, Ind.

NATIONAL NC-270 factory-sealed carton, $175.00. Audio Exchange, 153-21 Hillside Ave., Jamaica, L.I., N.Y.

CHRISTIAN Ham Fellowship (undenominational, non-profit, missionary and fellowship organization) now being organized. Details free, write Harry Wieskamp, WA8CFH, 96 E. 21st, Holland, Mich.

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HEATHKIT V7, VTVM, like new condx, $17.00. Wehe, W6VZB, 16080 Cambrian, San Leandro, Calif.

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NOVICES: Globe Scout 680A/w 2 PR crystals, $60.00; Hallic. SX-99, $95.00; both are in top-notch condx. Complete station: $150.00 or individually as listed. WN2HDV, 22 West St., White Plains, N.Y.

MUST Sell going to college. Valiant—factory-wired, with field strength meter and extras $296. HQ-110, $176; TA-33 Jr beam, $46.00 AR-22 rotor, $21; D-104 mike and stand, $15.00; De-Luxe Vibroplex Lightning bug/cord, wedge, $15.00; all units in excint condx. Complete station: $550 or individually as above. Over 200 countries worked with this station. Charles Lachterman, 3 Archer Lane, Scarsdale, N.Y. SC 3-7641.

SIDEBANDERS: 3" Heathkit OL-1 oscilliscope, $36.00. K2-YWE, 43 Davis Ave., White Plains, N.Y.

SELL: SX-111, like new, $175.00. W2SWA.

POLISHED chrome cigarette lighter, American made, lifetime guarantee, gift boxed, engraved call and handle. $2.98 Ppd. Check or M.O. Tennesseans add 3% tax. BLM Sales Co., Box 2305, Donelson, Tennessee.

SELL: Collins 32S1 and 516F2 AC supply, $475. K9ALP, Louis Arnold, Physics Dept., Univ. of Kentucky, Lexington, Ky. Tel: 252-2200-Ext. 2205.

JOHNSON Pacemaker 90w. SSB-AM-CW transmitter, perfect, $205.00; 400w 220-440 Mc. transmitter. PP4X150A's driven by single 4X150A driven by 12AT7 xtal osc. and multipliers. Compact 5" x 10" x 10" RF tight enclosure. Front panel tuning. With tubes less P/S and blower: $100.00. Scintillation counter. Gertsch variable ratio trans. Phazor phase meter, SP-44 Panadaptor. Tom Perera, K2DCY, 410 Riverside Drive, N.Y., N.Y. 10025.

COLLINS KWM-1, mobile mount, homebrew converter and AC supply. Car to house in 30 secs. $500 gives almost two rigs. Richard Kelly, WA2CMY, 130 Pontiac, Webster, N.Y.

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CLEANING House: L & W and 2 xmttr, 50 watt, never used, almost complete 816 p/s, NC-183 rcvr, 6 & 2 mtr, Nuvistor converter w/p-s, some 4X150 and 4X250s, plus misc. items. You make offer. All or part or send for more info. K8HWJ, 834 Cuthbert Rd., Toledo 7, Ohio.

SELL: Gonset Communicator III, six meters, vy clean, w/xtals, mike, cables: $140.00. F.o.b. Miami, Fla. WA4ITK, 4031 Woodridge Rd.

WANTED: Used Johnson KW Matchbox with coupler in perf. condx. J. A. Selvidge, WØOMG, 1103 Gardner St., Poplar Bluff, Mo. 63-901.

FOR Sale: Hammarlund HQ-100, $100; HC-10 converter, $80. Both are in gud condx. Ray Bentley, W5DRH, 1007 Alabama, Amarillo, Tex.

SELL: NC-300 with National six meter converter, speaker, and 100 Kc xtal calibrator: $230.00. Knight T-50 with six Novice xtals: $30. Prices F.o.b. Cedar Rapids. Want: Gud 75A-4. WAØBFF, John Gerber, 340 19th St. N.W., Cedar Rapids, Iowa.

QST Library, run of 1952 through 1961 four issues missing. Best offer. AF-67 and James p/s (needs Vibrators). $75. Sorry, no shipping! Write: K3NHY, 639 South Broad St., J-5, Lansdale, Penna.

VIKING II with Model 122 VFO, Sequential keying. In excint condx: $135.00. George Carson, WØJV, 316 Lee, Iowa City, Iowa.

SX-99, vy gud condx: $90.00. F.o.b. WN8IDF, Northport, Mich.

FOR Sale or Trade. Gonset 500W RF linear amplifier, $95.00 or want Hallicrafters S-36; National HFS or 6 meter xmtr. W8FQS, 1525(E), Bridge Road, Charleston 4, West Virginia.

VARIAC, Powerstat 1.8 Kva, 115-230 volts, $35.00; ARC-1 as May, 1960 CQ, $125.00. W7ZFB, 301 Burgwyn, Montgomery, Ala.

HALLICRAFTERS HT-37, in excint condx, $275.00. F.o.b. Greenville, S.C. L. H. Gregory, W4VWW, 121 Coleman Ct.

SIDEBAND Equipment priced to go (college!): Gonset GSB-100, $275; Hallicrafters SX-99, R-47, $90.00. Accessories low priced. Preston Hadley III, 633 Fairmont Ave., Westfield, N.J. AD 2-8363.

FOR Sale: DX-100, $150; SX-101A, $300; both for $400. In excint condx. K1TFA, 727 Pine St., Forestville, Conn.

SELL: College, Apache TX-1; TA-33 Jr. with cable, $270. K4YSK, Box 13988 University Station, Gainesville, Fla.

COMPLETE 6-volt mobile: 75M xmtr, Super Six, S-meter, squelch, noise limiter, band-edge marker, field strength meter, power supply, whip and 6-band loading coil. $60.00. Also: RME 4350-A dual conv, 160-10 M ham-band rcvr, xtal filter, xtal calibr. Excint, $150.00 or trade for transceiver. M. W. Scripter, 708 B Eagle Heights Apt., Madison, Wisconsin, 53705.

WANTED: 5-element 20 meter or 3-band beam and tower. Leo M. Severe, RR #2, Box #5, Wilmington, Ill.

RANGER, Factory-wired. No modifications. $150. Harry Partin, 5555 Blackstone, Chicago, Ill.

JOHNSON KW desk/pedestal, $750. Will deliver within 150 miles radius. Paul W. Haczela, 679 Bedford Rd., Pleasantville, N.Y. RO 9-0176. K2BQO.

FOR Sale: Hy-Gain Mono. 20-meter beam. In excint condx: $40.00. W2VP, Milton, N.Y. 12547.

WE Have some excellent bargains in new and used antennas, transmitters and receivers. Write for list. Hornet Antenna Products Co., Inc., Box 808, Duncan, Okla.

"HOSS-TRADER" Ed Moory needs some folding money. Down go prices on reconditioned equipment: HQ-129-X, $79.00; 32V-3, $179.00; 32V-2, $159.00; 2-A, $159.00; 2-B, $189.00; 10-A, $49.00; Johnson Invader, $349.00; HT-32, $289.00; HT-37, $279.00; SX-111, $149.00. New TH-4 beam and demo Ham-M rotor, $179.00. Used TR-3, $439.00. New Hunter Bandit, $449.00. New Swan Tri-Bander, $265.00. New 20-meter Swan, $159.00; 100-V, $439.00; NCX-3 $289.00. New 75S-1, $369.00. KWM-2 in sealed carton with warranty, $839.00; Heath Warrior, $179.00; 75 meter Swans, $159.00. New TR-3, old price, $495.00. Demo 30L-1 in warranty, $389.00. Terms cash. Ed Moory Wholesale Radio, Box 506, DeWitt, Arkansas. Phone WHitney 6-2820

HQ-170C, excint condx, $270 offer. WA2TGL

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CENTRAL Electronics 100V, $475.00; Super Pro BC-779 w/PS, $95.00 or you make offer. Both in perf. condx. F.o.b. Tenafly, N.J. W2TJZ, 101 Christie St., Eggensperger.

TS-174 Het. freq. mtr., excint condx. 20-250 Mc w/PS. $135.00 F.o.b. K1AOX.

TRANSFORMERS: New 3 KV-700 MA-D.C. approximate weight 40 lbs. $62.75 f.o.b. Los Angeles. Los Angeles Specialty Engineering, 9007 Avalon Blvd., Los Angeles, Calif.

BC-221-F with power supply, $48.00; New Gonset model 3022 Monitone, $19.00; 2—never used, 4X250B, $10.00 each. Send SASE for list of high-grade components. Moving to smaller home so will have no workshop there. Walter Kozacko, W1NS, 1711 Central Ave., Needham, Mass.

WANTED: Tubes, all types, write or phone W2ONV, Bill Salerno, 243 Harrison Avenue, Garfield, N.J. Tel: GArfield 471-2020.

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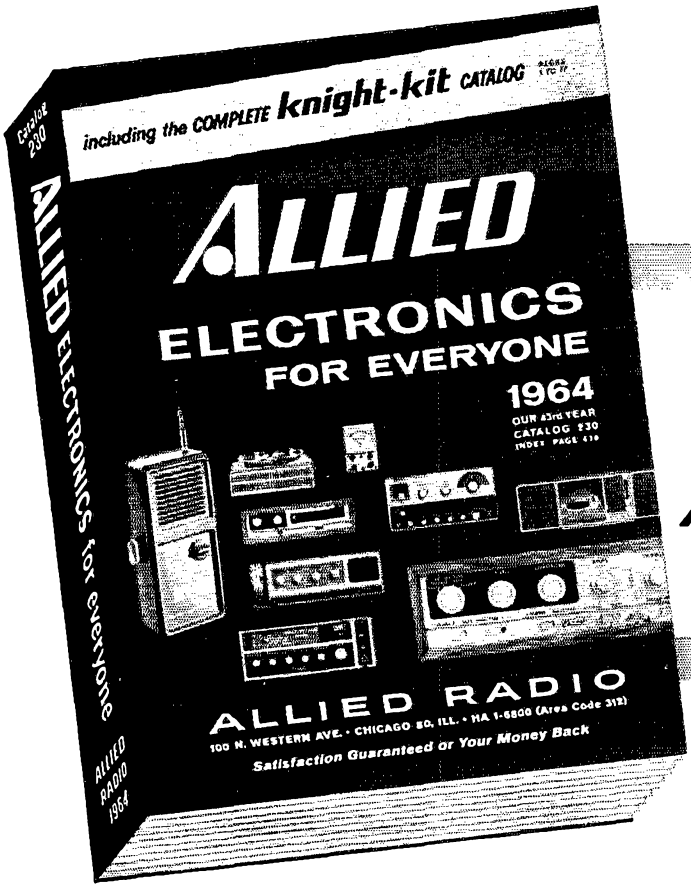

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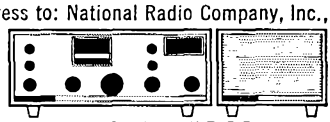

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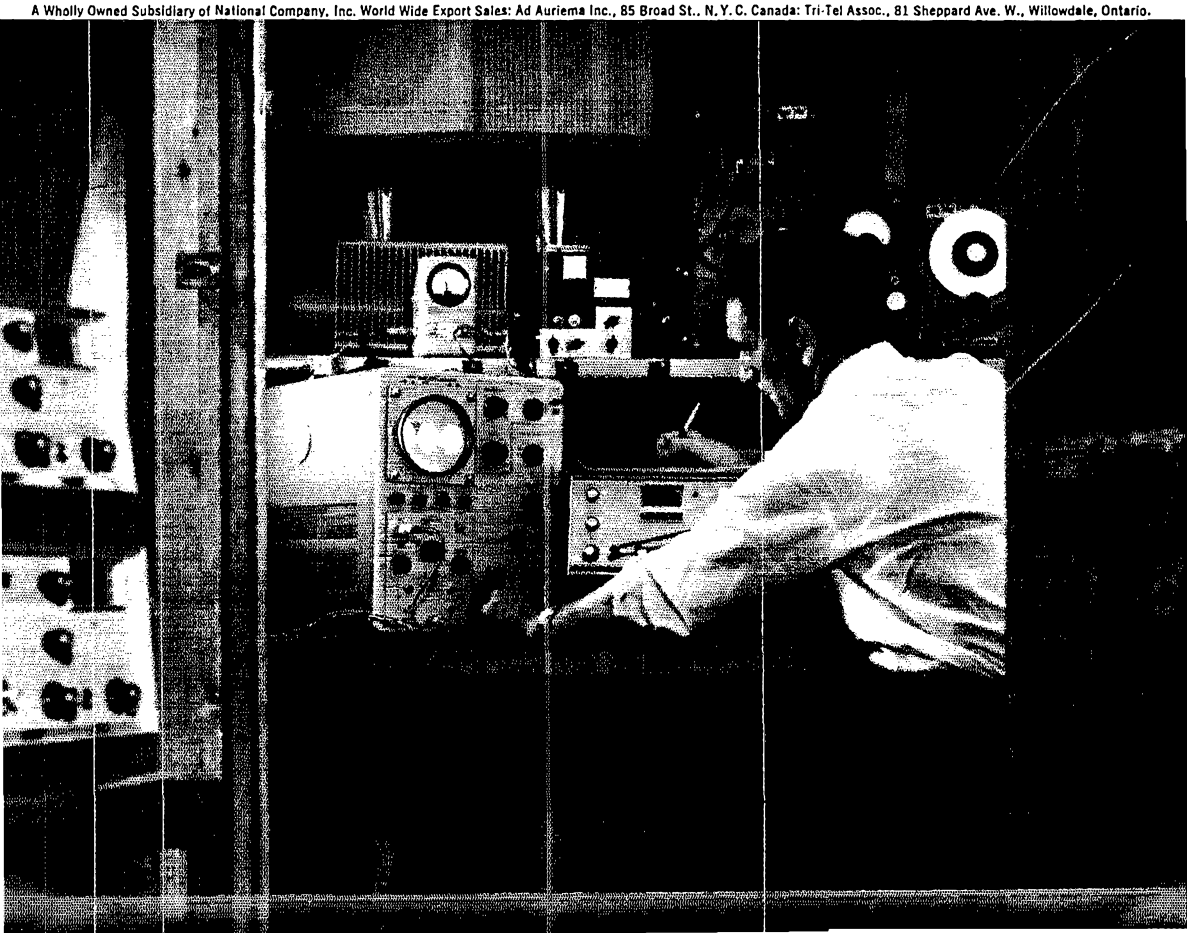

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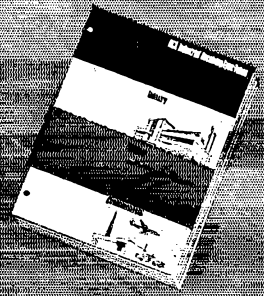

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