

January 1967

60 Cents

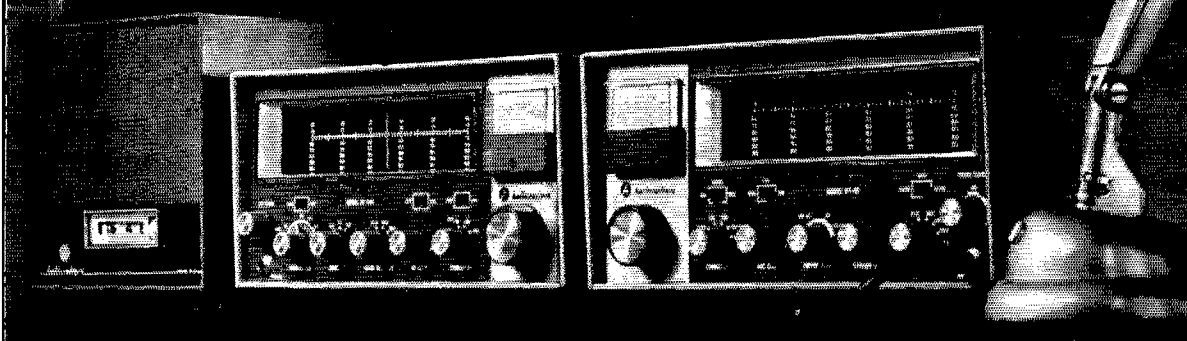
QST

devoted entirely to

amateur

radio





SX-146 Receiver

This is an amateur band receiver of advanced design employing a single conversion signal path and pre-mixed oscillator chain to assure high order frequency stability and freedom from adjacent channel cross-modulation products. The SX-146 employs a high frequency quartz crystal filter and has provision for installation of two more crystal filters. The receiver may also be used from 2 to 30 mc, with the exception of a narrow gap at 9.0 mc, with the connection of auxiliary oscillators. The highly stable conversion oscillator chain may be used for transceiver operation of the matching HT-46 transmitter.

FREQUENCY BANDS: 3.5-4.0; 7.0-7.5; 14.0-14.5; 21.0-21.5; 28.0-28.5; 28.5-29.0; 29.0-29.5; 29.5-30.0 mc [28.0 to 28.5, 29.0 to 30.0 requires extra crystals at users option].

SENSITIVITY: Better than 1 μ v for 20 db S/N.

TUBES AND FUNCTIONS: 6JD6 RF amplifier; 12AT7 Signal mixer and cathode follower; (2) 6AU6A 9 mc IF amplifier; 12AT7 AM detector—AVC rectifier—product detector; 12AT7 USB—LSB crystal oscillators; 6CW8 Audio amplifier and audio output; 6BA6 Variable frequency oscillator; 6EA8 Crystal heterodyne oscillator and pre-mixer; Plus diode power supply rectifier, ANL diode and AVC gates diode; *6AU6A—100 kc crystal calibrator oscillator; *Harmonic generator diode.

PHYSICAL DATA: Size: 5 $\frac{7}{8}$ " x 13 $\frac{1}{2}$ " x 11". Shipping wt., 20 lbs.

FRONT PANEL CONTROLS: Frequency: Power off CW-upper-lower and AM; Audio gain; Band selector—3.5, 7.0, 14, 21.0, 28.0, 28.5, 29.0, 29.5; Selectivity—0.5, 2.1, 5.0 kc (0.5 and 5.0 kc filters optional extra); Pre-selector; RF gain; AVC on-off; Cal. on-off; ANL on-off; Phone set jack; Smitter.

REAR CHASSIS: S-meter zero adjust; Internal-External oscillator switch; Slave oscillator output; External oscillator input; Antenna socket; Speaker, ground and mute terminals; Grounding stud; AC power cord.

POWER REQ.: 105/125 volt—50/60 cycle AC—55 watts.

I-F SELECTIVITY: Uses a 6-pole crystal filter to obtain a nose-to-skirt ratio better than 1 to 1.8.

Amateur net, \$269.95

Model HA-19 plug-in, 100-kc quartz calibrator available as accessory. Amateur net, \$19.95

*Part of HA-19 calibrator.

HT-46 5-band transmitter

All new from the ground up! Here's the "new breed" transmitter that matches your SX-146 . . . works independently or may be interconnected for transceiver operation.

FEATURES: 180 watts PEP input on SSB; 140 watts on CW; Frequency control independent or slaved to SX-146 receiver; Upper or lower sideband via 9 mc quartz filter; Built-in power supply; Press-to-talk or optional plug-in VOX; grid block for keying for CW.

FREQUENCY COVERAGE: 3.5-4.0, 7.0-7.5, 14.0-14.5, 21.0-21.5 mc and 28-30 mc in four 500-kc steps. Crystal supplied for 28.5-29.0 mc coverage. Other plug-in crystals at user's option.

TUBES: 6BA6 VFO; 6EA8 Heterodyne crystal oscillator and mixer; 12AT7 Carrier oscillator-third audio; 12AT7 Mic amplifier; 6EA8 9 mc I-F amplifier and AALC; 6AH6 Mixer; 12BY7 Driver; 6HF5 Power amplifier; 0A2 Reg.

FRONT PANEL CONTROLS: Frequency Tuning; Operation-Off, Standby, USB, LSB, CW-Tune, Standby LSB USB; Microphone gain; Driver tune; Carrier level; Band selector; Final tune; VFO selector—Transmitter-Receiver; Dial cal.; Calibrate Off-On; Meter MA-RFO.

REAR APRON FUNCTIONS: AC Cord; Ground lug; Fuse; Key jack; VOX accessory socket; Antenna jack; Receiver input (for transceiver); 11 pin control socket; bias adjust.

PHYSICAL DATA: Size: 5 $\frac{7}{8}$ " x 13 $\frac{1}{2}$ " x 11". Shipping wt., 26 $\frac{1}{2}$ lbs.

HA-16 Vox Adapter, \$37.95 Amateur net, \$369.95

R-51 Speaker.

4 x 6 inch oval speaker and attractive 24 hour clock, amateur net \$34.95

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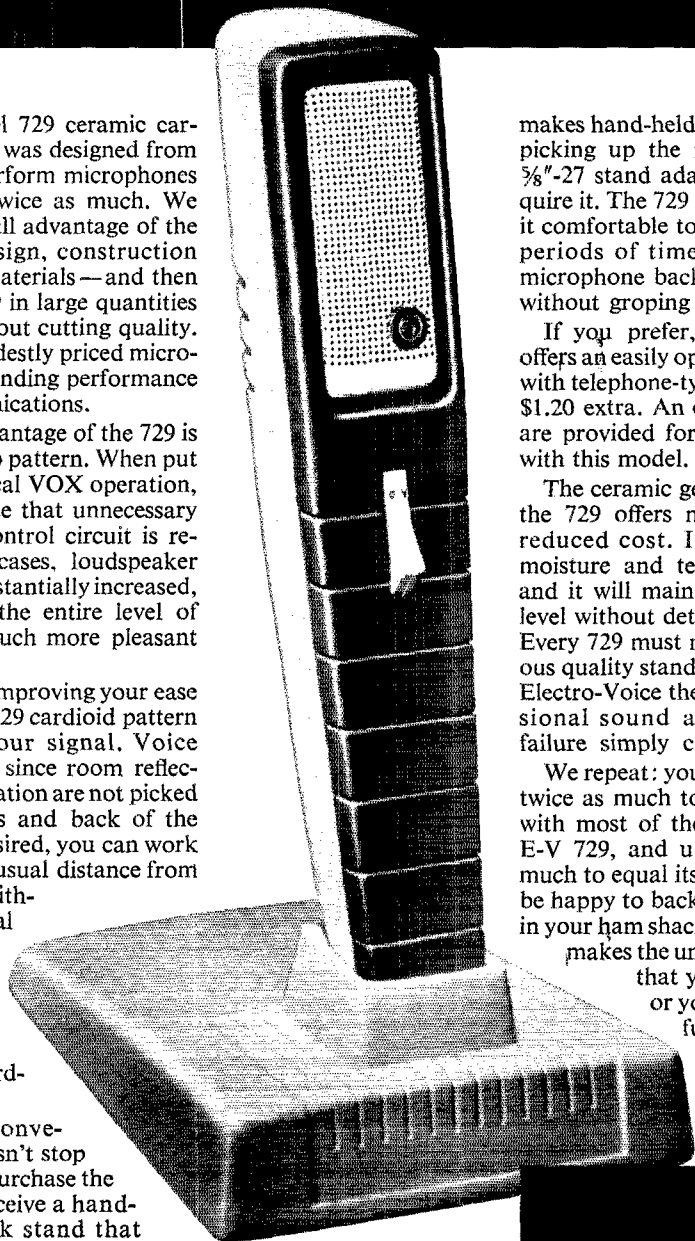
Unless you pay \$30⁰⁰ or more, you can't buy a microphone as good as the E-V 729...for only \$14⁷⁰*!

The E-V Model 729 ceramic cardioid microphone was designed from the start to outperform microphones selling for over twice as much. We did it by taking full advantage of the most modern design, construction techniques, and materials—and then producing the 729 in large quantities that cut cost without cutting quality. The result is a modestly priced microphone with outstanding performance for voice communications.

The biggest advantage of the 729 is its cardioid pickup pattern. When put to the test of critical VOX operation, you'll quickly note that unnecessary tripping of the control circuit is reduced. In most cases, loudspeaker volume can be substantially increased, as well, making the entire level of your operation much more pleasant and effective.

But more than improving your ease of operation, the 729 cardioid pattern also improves your signal. Voice quality is crisper, since room reflections and reverberation are not picked up from the sides and back of the microphone. If desired, you can work at up to twice the usual distance from the microphone without losing essential audio clarity. This working flexibility simply cannot be matched by an omnidirectional microphone, regardless of price.

And the 729 convenience story doesn't stop there. When you purchase the Model 729 you receive a handsome slip-in desk stand that



makes hand-held operation as easy as picking up the microphone, plus a 5/8"-27 stand adapter should you require it. The 729 shape and size make it comfortable to hold, even for long periods of time. And putting the microphone back in its base is done without groping or fumbling.

If you prefer, the Model 729SR offers an easily operated rocker switch with telephone-type contacts for only \$1.20 extra. An extra set of contacts are provided for controlling a relay with this model.

The ceramic generating element of the 729 offers many advantages at reduced cost. It is impervious to moisture and temperature changes, and it will maintain its high output level without deterioration for years. Every 729 must meet the same rigorous quality standards that have made Electro-Voice the standard in professional sound applications where failure simply cannot be tolerated.

We repeat: you have to pay at least twice as much to find a microphone with most of the advantages of the E-V 729, and up to three times as much to equal its performance. We'll be happy to back up our claims right in your ham shack. For Electro-Voice makes the unequivocal guarantee that you must be satisfied or your money will be refunded. Write for free E-V catalog and list of the E-V distributor nearest you.

*Model 729 amateur net. Model 729SR (illustrated) \$15.90 amateur net.

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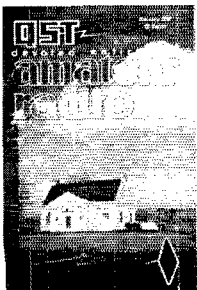
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OUR COVER

W1AW has undergone modernization and a face-lifting program — expanded space, new furnishings, equipment and antennas, and an impressive master control console. See the picture story on page 58 of this issue.



QST

JANUARY 1967

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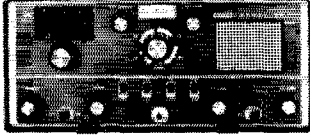
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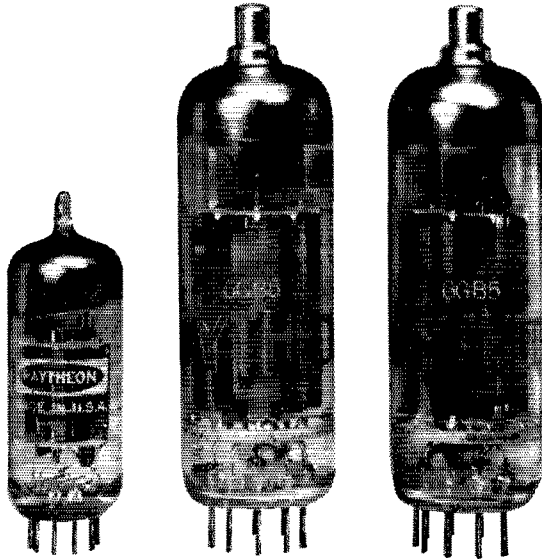
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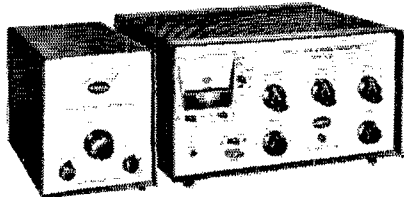
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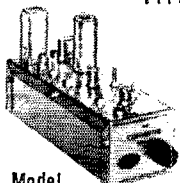
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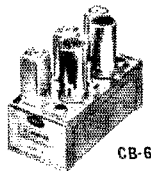
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Reports Invited. All amateurs, especially League members, are invited to report station activities on the first of each month (for preceding month) direct to the SCAM, the administrative ARRL official elected by members in each Section. Radio club reports are also desired by SCAMs for inclusion in QST. ARRL Field Organization station appointments are available in areas shown to qualified League members. General or Conditional Class licensees or higher may be appointed OBS, OES, OPS, OO and OBS. Technicians may be appointed OES, OBS or V.H.F. PAM. Novices may be appointed OES. SCAMs desire application leadership posts of SEC, EC, RM and PAM where vacancies exist.

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West Indies (P.R.-V.I.)	KP4DV	Albert R. Crumley, Jr.	P.O. Box 10073 Caparra Heights San Juan, P.R. 00922
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It is an incorporated association without capital stock, chartered under the laws of Connecticut. Its affairs are governed by a Board of Directors, elected every two years by the general membership. The officers are elected or appointed by the Directors. The League is noncommercial and no one commercially engaged in the manufacture, sale or rental of radio apparatus is eligible to membership on its board.

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

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

All general correspondence should be addressed to the administrative headquarters at Newington, Connecticut.



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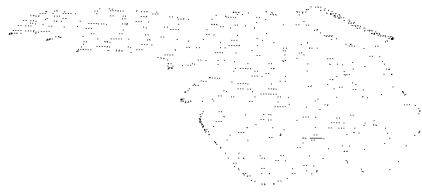
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"It Seems to Us..."



THE YEAR IN REVIEW

Another one has come and gone. Without being nostalgic about the bearded old man, what did 1966 offer us radio amateurs? Quite a few things!

Internationally, IARU showed its greatest growth, with 6 new member-societies bringing the worldwide total to 72. Seventeen of them met in YU-land in May for a Region I conference to discuss mainly the defense of amateur frequencies, and organizational matters. Region II will hold a similar meeting this spring, in Caracas. Region III, despite the disadvantage of wide geographical separations, moved toward organization of its own division.

W0NWX became IARU as well as ARRL president in May, and with other officers and staff helped strengthen liaison between the hemispheres with visits to various member-societies. The Intruder Watch shifted into high gear with more than 100 W/VE amateurs standing guard over the bands along with similar groups in other countries. (Domestically, more than 15,000 interference reports were processed through Hq. and sent to FCC.) To the end of fostering amateur growth in "new and developing" African and Asian nations, as a further step in preservation of our frequencies, ARRL successful pilot programs of furnishing literature and training equipment were in process of expansion to cover additional countries. Not the least of other projects to the same general end was the completion of an extensive study, by the Stanford Research Institute, of amateur radio as an international resource for technological, economic and sociological development. Copies of the report will be distributed, internationally through IARU societies as well as domestically, to telecommunications officials to provide further background on the amateur position.

The League also took an internal look at itself, with the results summarized in the Waters report in May *QST*. However ironical for a communications group, the most striking fact was failure to get the message through! One remedial step was a membership drive, launched in October, to strengthen organized amateur radio through expanded membership in both clubs and the ARRL.

Old Sol came back to life during 1966. DX conditions improved markedly on 20 and 15 meters — not to mention 10 meters, which in the autumn gave out with world-wide openings. Also welcoming the new sunspot cycle,

v.h.f. DXers found the almost-forgotten buzz of the aurora returning. Six-meter fans enjoyed a good summer *E* season. The first transequatorial and F_2 50-Mc. DX in several years was noted beginning in the spring and then again in the early fall. Two-meter men weren't left out either; the November Leonids meteor shower was one of the best ever, and 1,300-mile contacts were made almost at will.

Looking at public service, RACES became a part of the over-all ARPSC effort, though there was no change in control or administration. Although amateur emergency communications preparation showed its mettle when called upon, Nature seemed less inclined to plague the populace with major disasters than in some earlier years. Emergency and traffic-handling information was combined in the form of a *Public Service Communications Manual*; later in the year, the League's 24th and newest publication, *The Radio Amateur's Operating Manual*, rolled off the presses. Authored by W4MLE, it is a combined guide and reference source on all phases of operating activity.

Regulationwise, the year was comparatively quiet, despite a flurry of incentive licensing discussions triggered by a national news story. Docket 15928, FCC's proposal, hopefully will receive further action before its second birthday in March. FCC did deny further appeals for reduction in licensing fees, as well as petitions by individual amateurs for power reduction, for family non-licensed operating privileges, and for an end to contests. Eight new questions were added to the Novice Class written exam. Despite still slow growth, the number of U.S. amateurs approached the 280,000 mark. New reciprocal operating agreements in 1966 brought to 21 the number of countries granting privileges to U.S. hams.

Despite modest progress in many areas, 1966 overall was something less than outstanding. The curve was level rather than upwards. Better h.f. propagation conditions may of itself spark renewed activity. But more than that we must all rededicate our personal efforts to ensure that new momentum is pointed in a positive and productive direction for our fraternity, in addition to the personal pleasure and enjoyment it will bring us all.

Put another way, a year from now in addition to the question, "what did 1967 offer us hams?", we should be prepared to answer an equally-important one: what did *we* offer 1967?"

QST

League Lines . . .

FCC has amended its rules to recognize Hertz as an alternate term for c.p.s. However, we appraise the action as tongue-in-cheek, with no intention of wholesale changeover. Until that happens we expect to continue cycling.

Reports of club Hamquest '67 activity coast-to-coast show campaigns moving into high gear. Best results come from thorough planning and organization . . . building prospect lists, assigning personal, direct contacts to membership of club. One approach to get interest of non-club/League member hams: open house meetings with description of club/League programs, social periods, refreshments. Guest Night a similar idea -- every member bring a guest ham.

If you run into an odd 6-kc. buzz on 40-, 20- or 15-meter phone, it may not be a commercial intruder at all but rather one of several U.S. amateur stations with special FCC authority to transmit slow-scan pictures to the Antarctic.

Why the Morse code requirement when the applicant is interested only in phone? To that perennial query, this time from the editor of "CB Magazine," FCC Chairman Hyde provided a succinct answer: "(Code proficiency) is a requirement of international regulations . . . necessary and justifiable from the standpoint of emergency preparedness and in the interest of maintaining a balanced structure of operating qualifications, including those operators who profess the intent of restricting themselves to the use of telephony . . . Emergency conditions arise where radiotelegraphy may be the sole means of establishing communication. For these reasons alone, I believe that it is in the public interest to require all amateur operators to demonstrate their knowledge of the Morse code."

Honestly, despite what recent visitors may have seen with their own eyes, it isn't true that the Hq. crew has gone CB. The 27-Mc. transceivers in various staffers' hands have all been converted to 10 meters, as the basis for a future how-to-do-it article. An informal net of 5-watters, in operation evenings on 29.6 Mc., showed once again the utility of low-power for short-distance communication in the absence of extensive interference.

When is ARRL going to discover the transistor? A bit irritated with this outdated, unoriginal-but-often-parroted question, we made an analysis of the 1966 volume of QST. Of 58 articles involving either tubes or transistors, 26 used the latter exclusively. They covered receivers, mobile transmitters, frequency standard, speech filter, audio oscillator, u.h.f. oscillator, two-tone test generator, mobile converter, and code monitors. Sorry, no kw. linears yet!

Help us to help you. When requesting more than one type of info from Hq., place each question on a separate sheet of paper -- but in the same envelope. Otherwise, with seven departments and 70 employees, some time can elapse between first and last answers to a letter on several varied subjects.

D. C., which has been served by ground-wave propagation. The area which should be aided notably by the relocation will be the West Coast of the U. S. A. Here the propagation time delays of signals from WWV and WWVH were nearly equal, and it was difficult to separate the time pulses. Also, reception frequently was marred by fading, resulting from the fact that the signal strengths were usually nearly equal. With the relocation, this region is pushed out into the Pacific Ocean, where there are few users.

Finally, there is the advantage of administrative efficiency. WWV is now located on the same site as two other NBS standard-frequency and time stations, WWVB (60 kHz.) and WWVL (20 kHz.). Therefore, there can be some reduction in staff since all of the transmitters can be monitored from a single point, and the staff of one station can assist or fill in at the other in case of emergency. Furthermore, communication lines with the parent organization responsible for the administration of these stations, the Radio Standards Laboratory of the National Bureau of Standards in Boulder, Colorado, are greatly simplified. Also, it is easier to synchronize the station with the NBS Atomic Standards, which are located in Boulder.

When the Greenbelt station was established, the property was under the jurisdiction of the U. S. Department of Agriculture. The radiation of standard-frequency signals did not disturb agricultural experiments that were conducted in adjacent fields. However, in time, jurisdiction passed to NASA, who constructed the laboratories of the Goddard Space Center adjacent to the transmitter site. When NASA was confronted with the problem of trying to conduct experiments under conditions where a few inches of unshielded wire would give a sizeable deflection on an oscilloscope, their management requested that when NBS replaced its obsolete transmitters

they be relocated at some more remote point. This situation also encouraged the move to Fort Collins.

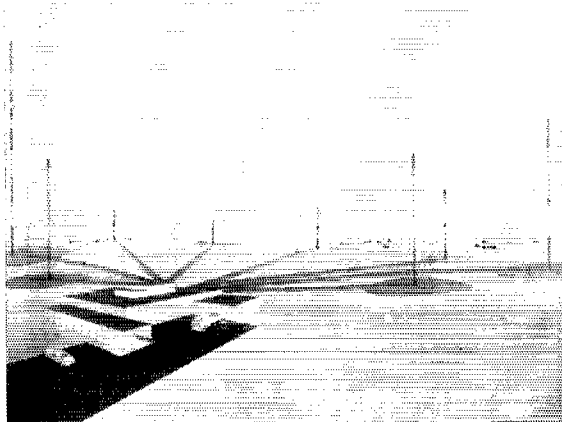
Before the final decision to rebuild and relocate WWV was made, permission was obtained to allow a special voice announcement to be made over it for one month in the summer of 1964. In it, listeners were requested to write in. The some 4,600 who did were sent a rather lengthy questionnaire, and about 3,500 of these were returned filled out. About one-quarter of the respondents were representatives of organizations. These statements in themselves indicate the need for the station. It is interesting to note that 35 percent of the respondents were licensed radio amateurs, confirming the interest of amateurs in the station. The detailed answers provided guidance in determining which of the services should be retained and which should be changed and how. They also provided assurance that the specific needs of the Washington ground-wave high-accuracy area would be met largely by other existing services. It might be noted that 10 MHz. was the most widely used carrier frequency and 25 MHz. was the least.

Layout of the Fort Collins Site

The new site is located about seven miles north of the City of Fort Collins on Colorado Route No. 1, and is about an equal distance to the east of the first foothills of the Rocky Mountains. The land is nearly flat. The soil has a high alkali content and a high electrical conductivity. Portions of three small lakes are contained within the area of the site.

The most conspicuous feature is the group of nine 400-foot towers which supports the WWVB-WWVL main and standby antennas. The building housing those transmitters is amongst these towers. These antennas are essentially top-loaded verticals with arrays of horizontal wires forming capacitive hats and with the bottom ends of the vertical radiators terminating in "helix houses" (actually two stories tall) containing loading coils. The ground conductivity has been improved by burying a network of wires.

The new WWV station was financed by a Congressional appropriation of \$970,000. The largest expenditure has been for the transmitters. However, a considerable portion has been used in constructing the new building and in adding a new wing to the old building. The new building is one story high and is located in a depression in the terrain so that its roof is approximately level with the ground of the area to the north, where the WWV antennas are located. Thus, the building should cause no shadows in the antenna patterns. In the main portion of the new building, there are located eight transmitters along an area adjacent to three of the outside walls. The area adjacent to the fourth outside wall, the front, contains the main entrance and offices. The center of the building contains a laboratory and shielded enclosures for housing the frequency-control equipment. Wings of the building contain a workshop, a garage, and a diesel-powered gen-

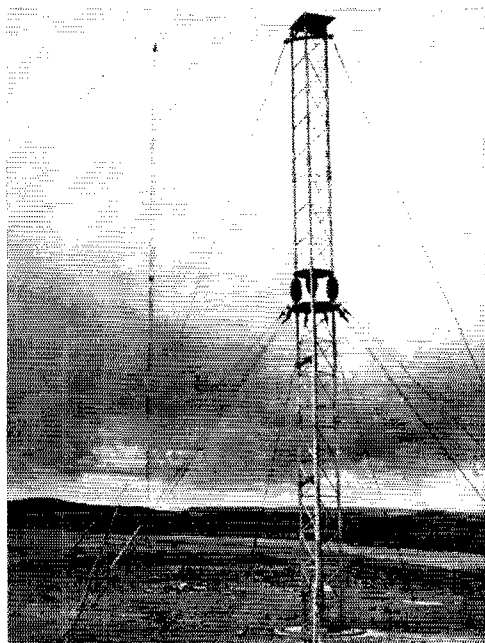


Artist's rendition of WWV building and the eight antenna masts which form an arc on the ridge east of the building. To the left is the 200-ft. high 2.5-MHz. dipole antenna and to the right the 100-ft. high 5.0-MHz. dipole. Between them are the dipoles for the 2.5-, 10.0-, 15.0-, and 20-MHz. signals. In the left and right foreground are the two 88-foot standby wide-band monopole antennas.

erator for emergency power. Commercial electric power is supplied by underground cables from two different sources. The building is thoroughly air-conditioned, since dust was a major maintenance problem at the old station at Greenbelt, and it is recognized that potentially the problem is likely to be worse at the new location on open prairie.

The addition to the old building contains some offices for administration of the whole site and such much-needed amenities as a conference room and a small kitchen. The road system is such that visitors come first to the old building, and hence these central facilities are located here.

Incidentally, visitors *who make advance arrangements* through either the Boulder or Fort Collins offices are most welcome. In such cases we can be sure to have someone on hand to receive them. However, unannounced visitors are to be discouraged, as the staff is small and often there is no one who can leave his duties to receive them.



A view of the 20- and 2.5-MHz. dipole antennas.

TABLE I
LOCATIONS OF WWV ANTENNAS

Frequency	Latitude	Longitude
2.5 MHz	40°40'55.2"N	105°02'31.3"W
5 MHz	40°40'42.1"N	105°02'24.9"W
10 MHz	40°40'47.8"N	105°02'25.1"W
15 MHz	40°40'45.0"N	105°02'24.5"W
20 MHz	40°40'53.1"N	105°02'23.5"W
25 MHz	40°40'50.5"N	105°02'26.6"W
Average	40°40'49"N	105°02'27"W

The WWV Antenna System

The transmitter power levels are slightly increased, but the transmission frequencies at the new station are the same as at the old: 2.5 kw. on 2.5, 20, and 25 MHz., and 10 kw. on 5, 10, and 15 MHz. At both the old and new stations it was considered necessary to have eight transmitters: six in operation and two as standby.

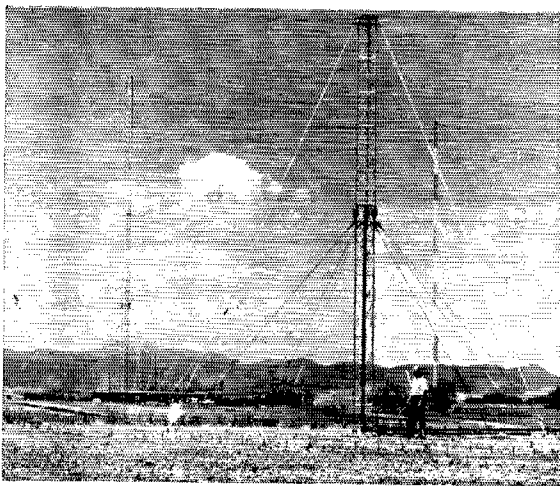
In the old WWV there was a schedule for the rotation of transmitters so that in turn each transmitter was taken out of action for a while for cleaning and other maintenance, the switchover taking place during one of the scheduled silent periods so that the transmission schedule was uninterrupted. Also, at the old WWV the antennas were fed by open-wire lines which were switched between transmitters. However, at the new WWV in Fort Collins, antennas are fed by rigid coaxial line, and each one is connected permanently to a single transmitter, the layout being such that no two coaxial lines cross. Altogether there are eight antennas at the site. Six are half-wave modified "sleeve" vertical dipoles, one for each of the above frequencies. The remaining two are broad-band h.f. monopole antennas for the two standby transmitters. These eight are located approximately at equal intervals on a semicircle, with the two wide-band standby antennas at the opposite ends of the semicircle, and the others placed in such a way

to make interaction a minimum. The exact locations are given in Table I.

The half-wave vertical antennas, with heights compensated for end effects, employ standard commercial tower sections and are designed to withstand winds up to 112 m.p.h. The antennas are center-fed with rigid coaxial cable and are mounted on hinged bases fastened to concrete foundations. The upper one-quarter wavelength section, supported on insulators from the lower one quarter wavelength section, constitutes the upper half of the radiating system. The sleeve consists of nine equally-spaced quarter-wave-long wires connected from the center of the tower (one-quarter wavelength above ground) that slope downwards to the ground at an angle of 45 degrees. This sloping skirt, each wire appropriately insulated from ground, not only functions as the lower half of the radiating system, but also serves to guy the antenna.

With this design the driving point impedance is approximately equal to the 50-ohm coaxial line, and the current developed at the junction of the base and ground plane is minimized. This permits connecting the coaxial shield and the tower base directly to ground. In addition, tests made on the antenna indicated that a radial ground screen did not make any detectable change in the input impedance; thus it was not incorporated into the system.

This design, readily adaptable to a coaxial feed line, provides low angle omnidirectional radiation and yields a gain of approximately 1.7 db. over its one-quarter-wavelength monopole counterpart. By employing a double-stub adjustable tuner, it can be matched precisely to 50 ohms. Finally, with the shorted stubs connected into the feed line at the antenna base, each is at d.c.



One of the monopole standby antennas and one of the dipole single-band antennas. The striped tower in the background is one of the four supporting the WWVL main antenna. The building is the WWVB-WWVL Transmitter Building before the addition of the new wing.

ground potential, thus protecting the transmitters from possible lightning damage.

The wide-band standby antennas, also fed by 50-ohm rigid coaxial line, are series-excited, base-fed, vertically-polarized, omnidirectional radiators. The antennas operate over a radial ground screen and cover a frequency range of 2.5 to 25 MHz.² The antennas are capable of handling 50 kw. of power with a nominal standing wave ratio of less than 2.5 to 1 when connected to a 50-ohm line. Continuous coverage is accomplished without switching.

Transmitters

The eight transmitters contain bandswitching units which are identical except for the obvious difference that four of them have high-powered amplifiers. Thus, although the single-band antennas cannot be switched between transmitters, in case of breakdowns units may be interchanged.

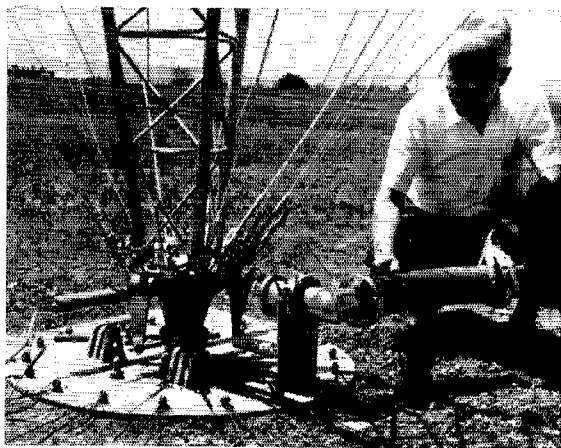
As stated earlier, modulation is introduced at very low levels, and s.s.b. or a.m. may be used with any degree of carrier suppression which may be desired. Provision is included even for applying different modulations on the two sidebands, although there is no contemplation of the use of this feature in the near future. The s.s.b. generator uses a crystal filter at 5 MHz., and provision is made for synthesizing all oscillator frequencies from the local cesium atomic standards. A great deal of attention has been paid to obtaining frequencies of high spectral purity.

The modulation is controlled by an elaborate device called "the time code generator-programmer", and two spares are on hand in case of breakdown. This device, in conjunction with an announcing machine and two code keyers, provides the complete WWV audio modulation

² This antenna was described in detail in November 1966 *QST* (Pappentus, "The Conical Monopole Antenna"). — Editor.

program. Such features of the program as propagation forecasts, geolerts, and UT2 corrections³ are readily changed as necessary by manual switches on the announcing machine or by replacing code wheels on the keyers.

The bulk of the transmitters is composed of linear amplifiers, which are standard commercial stock items, identical with some which are in wide use by military, commercial, and amateur stations. However, because of the severe requirements for reliability with twenty-four hour daily operation, the power amplifiers are derated to fifty percent of their normal levels: for example, the amplifiers which are used at 10 kw. output are ones which in standard commercial service would be rated at 20 kw. (Such derating had also been in practice at the old station.) The building layout is such that the power of each transmitter can be raised from its present level by the addition of at least one more stage, should it be desired at a later time.



Hugh Stewart, Information Officer, views the base of one of the broad-band monopole standby antennas.

Participation of Amateurs

The engineers in charge of all three stations are amateurs: Leo Honea WA3ADB, ex-KH6MG (WWV); Richard F. Carle KØLYM (WWVB-WWVL); and Sadami Katahara KH6DK (WWVH). Also, the engineer in charge of the design and construction of the new WWV is an amateur: Peter P. Vierzicke WØNXB. Other amateurs on the staff of the stations are John A. Duffield KØKHZ, Howard E. Michel, Jr. KØBPY, and George Tam KH6EM.

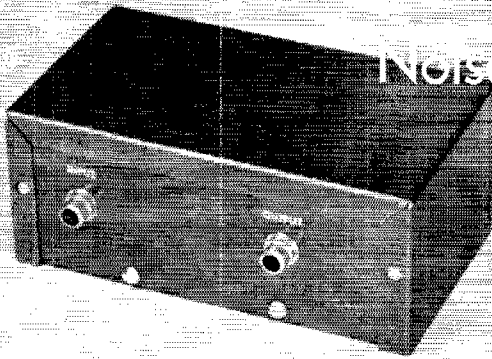
Amateurs participating in other parts of the NBS Time and Frequency Program include: Miss Kay Barelay KØBTY, Don Halford WØJVD, Don Hilliard WØEYE, Edward Rogers KØGKB, J. E. Gray, WØGNV, and the author.

(Part II, describing the frequency-controlling equipment, will appear in a subsequent issue.)

QST

³ Information on these services is contained in NBS Miscellaneous Publication 236, "NBS Standard Frequency and Time Services," 1962 edition; for sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20102, price 15 cents.

Experimental Noise Blanker



BY DOUG DeMAW,* WICER

WITH ignition noise being somewhat troublesome during 10- and 6-meter mobile reception, and at times a problem on 2 meters, there is a need for a noise-silencing system that will permit using the standard car radio as an i.f. unit while solid-state h.f. and v.h.f. converters are connected ahead of it. In bygone days, cutting into the second-detector stage of the car radio was easy to do, enabling most hams to add their own a.n.l. circuit. But since printed-circuit boards have become standard bill of fare in car radios, only the bravest possess the daring that is required to cut into the circuit board and add a noise limiter. Perhaps the best approach to the noise-reduction problem is to add an outboard circuit of some kind that will eliminate any need for tampering with the car radio.

Having used vacuum-tube versions of noise blankers in v.h.f. and u.h.f. reception with 14 and 28 Mc. as the converter i.f.,¹ it seemed reasonable to assume that the same system would perform well in the 0.5- to 1.6-Mc. i.f. range. However, to eliminate the need for plate and screen grid voltages, which would be required if a tube model were used, a transistorized version was worked out, the description of which follows.

Conventional Design Methods

Low-cost transistors and ordinary circuit design have been combined to produce the circuit of Fig. 1. The output from the converter is fed into J_1 . The signal is amplified by a high-beta transistor, Q_1 , and then passed on to Q_2 , another high-beta transistor, for further amplification. The overall gain of the blanker is established by R_1 and C_1 , a subject that will be discussed later. The amplified signal is applied to CR_1 and CR_2

where positive and negative noise-pulse peaks are clipped. Output to the car radio is taken from J_2 and is of a uniform level across the entire broadcast band.

Because broad-band response was desired from the noise blanker, low- Q tuned circuits were used in the collector circuits of Q_1 and Q_2 . Allowing for approximately 10 pf. of stray circuit capacitance, it was determined that a 2.5-mh. r.f. choke would establish resonance at 1000 kc., the center of the i.f. tuning range. Chokes of that value were used at RFC_1 , RFC_2 , and RFC_3 . Despite the low Q of the resonant circuits, ample gain was available from the 2-stage blanker to deliver satisfactory performance. The 1000-ohm resistor in parallel with RFC_1 was added when a tendency toward instability was noted, undoubtedly brought about by the light output coupling used in the circuit, and because of the high beta of the transistors.

Physical Layout

The breadboard model of the blanker was built in a rather hasty manner, but despite the helter-skelter layout, instability did not occur and the performance of the unit was as good as that of the model shown in Fig. 2, an etched-circuit version.²

The main consideration in wiring up the circuit is to isolate J_1 from J_2 as much as possible so that stray coupling between the input and output terminals of the blanker will be minimized. Straight-line layout is recommended for the entire circuit.

This model is housed in a $5\frac{1}{4} \times 3 \times 2\frac{1}{8}$ inch Minibox. There is a considerable amount of unused space, as shown in Fig. 2. However, should the builder desire to operate the unit from a small 9-volt battery, the unused space

* Asst. Technical Editor, *QST*.

¹ *The Radio Amateur's V.H.F. Manual*, page 81. *The Radio Amateur's Handbook*, 43rd edition, page 427.

² No template is available for the etched circuit board. It was made from a Vector 27X-A etched-circuit kit.

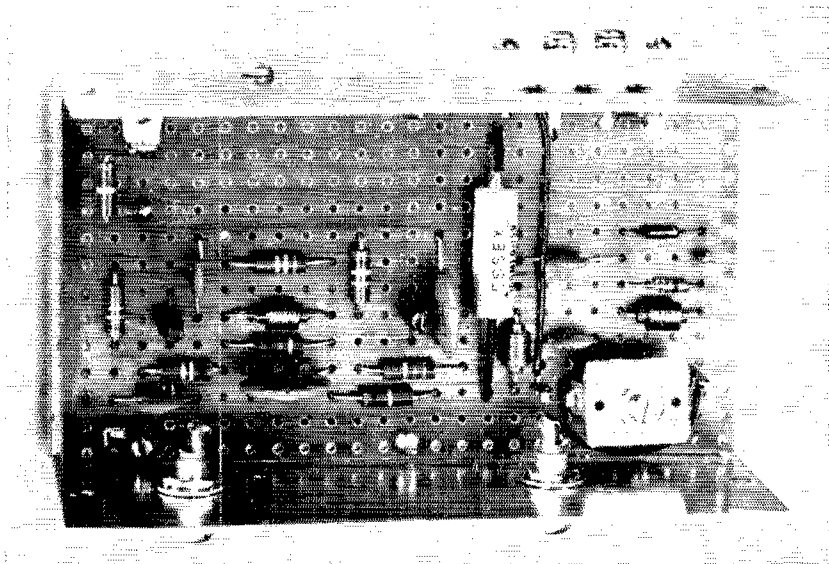


Fig. 2—Inside view of the blanker. C_1 is at the lower right. If a 5000-ohm control is used for R_1 , it will mount at upper left corner of circuit board. Space is available at the top center of the chassis for a 9-volt battery. J_1 is at the lower left. J_2 is at the lower right of the box, near C_1 .

could not be used as a basis for blankers at other intermediate frequencies such as 1.4 Mc., 21 Mc., or 28 Mc. At the higher i.f.s it is recommended that slug-tuned inductors of reasonable Q be substituted for the r.f. chokes used in this circuit. They should be resonant at the chosen i.f. and stagger-tuned to provide a fairly broad response across the i.f. range. Also, transistors with a higher F_T rating should be used. If low-beta transistors are employed, it may be necessary to add a third stage of amplification to the blanker to assure adequate gain ahead of the blanking diodes.

Although it wasn't tried, this unit might help the 160-meter operator to eliminate much of the

Loran pulse noise. The circuit of Fig. 1 provided good output at 2 Mc. and might be useful between the antenna and the 160-meter receiver. If this is done, and a transmitter is used, it would be wise to bridge a pair of small-signal silicon diodes reverse-connected between J_1 and chassis ground. This will protect Q_1 from burnout while transmitting.

Whether you're interested in v.h.f. or 10-meter mobile operation, this gadget will save you from the chore of cutting into the car radio. Used between the converter and the car radio, the blanker will rid you of the worst of your ignition noise — and that of nearby automobiles. QST

1967

Tentative dates for major ARRL operating activities.

<p><i>January</i></p> <p>7-8 VHF SS 14-16 CD (c.w.) 21-23 CD (phone)</p>	<p><i>February</i></p> <p>4-5 DX Test (phone) 4-19 Novice Roundup 18-19 DX Test (c.w.)</p>	<p><i>March</i></p> <p>4-5 DX Test (phone) 18-19 DX Test (c.w.)</p>	<p><i>April</i></p> <p>15-17 CD (c.w.) 22-24 CD (phone)</p>
<p><i>May</i></p>	<p><i>June</i></p> <p>10-11 VHF QSO Party 24-25 Field Day</p>	<p><i>July</i></p> <p>8-10 CD (c.w.) 15-17 CD (phone)</p>	<p><i>August</i></p>
<p><i>September</i></p> <p>9-10 VHF QSO Party</p>	<p><i>October</i></p> <p>7-8 Simulated Emergency Test 14-16 CD (phone) 21-23 CD (c.w.)</p>	<p><i>November</i></p> <p>11-13 SS (phone) 18-20 SS (c.w.)</p>	<p><i>December</i></p>

The "Iambimatic" Concept

Unique Feature for Relay-Type Electronic Keyer

BY HARRY GENSLER, JR.,* K8OCO

CONVENTIONAL electronic keying has greatly improved the ease and precision of c.w. operation for a great many amateurs. The standard "el" key makes it very easy to send letters consisting of strings of dots or dashes. Letters which contain dots alternated with dashes (requiring a back-and-forth motion) have encouraged the use of memories in more complex keyers, such as the Ultimatic¹ and Penultimatic.² The latter keyer recognizes the problem of dropping dots in letters like *k*; the dot memory provides greater reliability, and also eases the timing requirements of the operator. The former keyer adds a dual lever, a dash memory, and automatic spacing.

The "Iambimatic" concept is somewhat different. It works entirely like the conventional electronic keyer when used with a single paddle keying lever; it is self-completing and uses no memories.

The Iambimatic feature comes to light when used with double-paddle keying levers. If both levers are closed for a time (a long "squeeze"), dots alternated with dashes come forth from the keyer (. . . - - -).³ This feature greatly reduces the effort required to send certain letters. A *CQ*, for example, is sent as follows:

C: one long squeeze. A little "English" is used to close the dash lever slightly ahead of the dot lever; the squeeze must be released at the end of the letter.

Q: the same as above, except that the dot lever is not actuated until after the first dash has been sent.

Other characters are also simplified (A, L, X, R, AR, SK, etc.). Sending these or a *CQ* on the Iambimatic gives one the funny feeling that the key is sending the letters on its own.

Dot/dash selection is simple. If only one lever is closed, then the dot or dash corresponding to that lever will be sent. If both levers are squeezed at roughly the same time, the first lever closed will determine the dot/dash selection. If both levers are closed from the time of the end of the last dot or dash, then the next dot or dash will be the opposite of the last one sent.

The Iambimatic concept may be applied to practically any keyer. Three examples will be

given: Iambimatic modification of the HA-1 ("TO") keyer, a home-brew Iambimatic keyer, and a universal Iambimatic modification design.

HA-1 Adapter

Fig. 1 shows the very simple modification for the Hallicrafters HA-1 keyer; the circuit has performed perfectly at K8OCO for the last two years. Basically the circuit consists of a flip-flop, formed by neon bulbs V_1 and V_2 , and a transistor gate, Q_1 . One neon bulb will light if the dot contact only is grounded and the other will light if the dash contact only is grounded. If both levers are closed, the bulb corresponding to the lever closed first will light and the other will

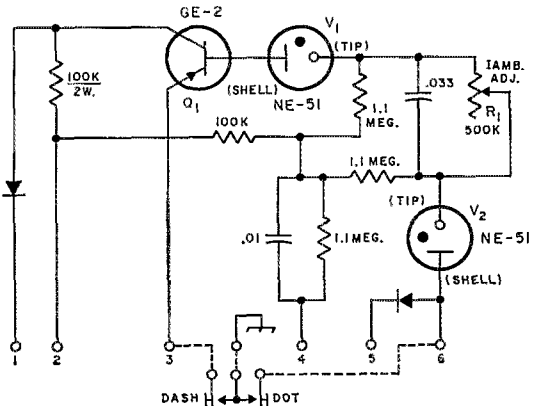


Fig. 1—Circuit of the Iambimatic adapter for the Hallicrafters HA-1 ("TO") keyer. Capacitances are in microfarads; unless indicated otherwise, resistances are in ohms ($K = 1000$), and fixed resistors are $\frac{1}{2}$ -watt. Capacitors are ceramic. Diodes are any silicon. Transistor Q_1 is a G.E. type. See author's note at end of article.

R_1 —Linear-taper control.

V_1, V_2 —Matched pair of NE-51 neon bulbs (see text).

(Note that connections should be made to the tips and shells of the neon bulbs as indicated.)

Connections to numbered terminals are as follows:

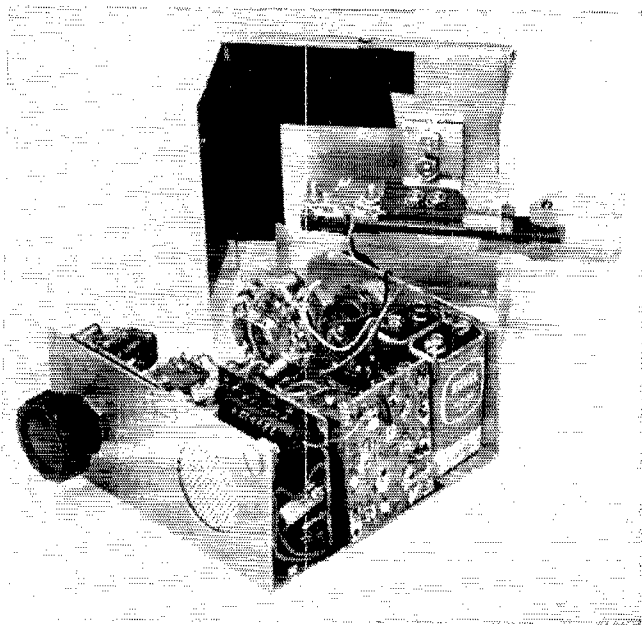
- 1—Remove original connections from Pin 8, SO_1 , of HA-1 keyer, and shift these connections to Terminal 1 of adapter.
- 2—To -105 volts regulated at Pin 7 of V_6 in HA-1.
- 3—Connect to Pin 8, SO_1 , of HA-1.
- 4—Connect to Pin 3 or 4, SO_1 , of HA-1.
- 5—Remove original connections from Pin 5, SO_1 , of HA-1, and shift these connections to Terminal 5 of adapter.
- 6—Connect to Pin 5, SO_1 , of HA-1. Connect dash contact of keying lever to Pin 8, SO_1 , of HA-1. Connect dot contact of lever to Pin 5, SQ_1 , of HA-1. Connect lever to Pin 1, SO_1 , of HA-1.

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¹ Kanda, "The 'Ultimatic'—Transistorized," *QST*, Sept., Oct., 1960.

² Muir, "The Penultimatic Electronic Keyer," *QST*, March, 1962.

³ Like the Iambic meter of classical Latin poetry, in which the bards would alternate short and long syllables.



Front view of K80CO's keyer, showing the speaker grille, and some details of the monitor and lambimatic circuit boards. The tape strips in the cover are to avoid grounding some of the exposed circuitry.

remain off; a pulse from the closing of the relay in the HA-1 at the end of the dot or dash will trip the flip-flop and the other lamp will be lighted. Thus the bulbs will alternate at the end of every dot or dash. The gate, Q_1 , is designed to close the dash contact of the HA-1 whenever the dash bulb is lit. Thus a .-. sequence follows when both levers are squeezed.

The components were assembled on a small board which was mounted in the HA-1 keyer next to the relay. Be careful not to place the neon bulbs too close to anything else, or the transistor

too close to a heat source. The neon bulbs have to be closely matched; buy a boxful and try various combinations. With both levers closed, plug in a pair of bulbs and rock the 500K variable until the circuit "iambimates" (goes .-.). When you find a pair of bulbs that "iambimate," mark the maximum and minimum settings of R_1 that give reliable "iambimation" across the entire speed range; then leave the resistor set between these two points. Use the bulb combination that gives the greatest difference between the maximum and minimum marks.

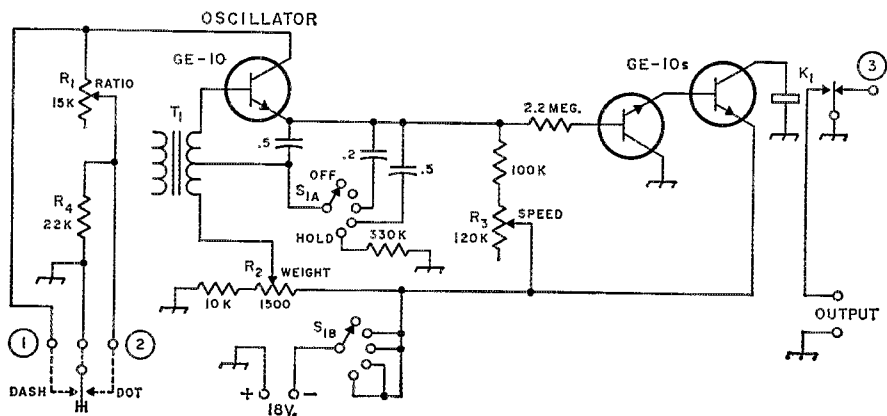


Fig. 2—Basic keyer circuit. If side-tone-monitor and/or lambimatic feature of Figs. 3 and 4 are to be added, connect similarly-numbered terminals together. Capacitances are in microfarads and, unless indicated otherwise, resistances are in ohms (K = 1000). Capacitors are 10-volt ceramic; fixed resistors are 1/2-watt. Transistors are G.E. types.

K_1 —10-mw. 5000-ohm s.p.d.f. miniature d.c. relay (Lafayette 99C6091).

R_1, R_2, R_3 —Linear-taper control.

R_4 —22,000 ohms, 1/2-watt.

S_1 —Miniature rotary switch, 1 section, 2 poles, 5 positions Centralab PA1003, PA2003, or similar).

T_1 —Transistor input transformer: 2000-ohm c.t. primary (d.c. resistance 150 ohms) (Argonne AR-115, or similar). Use primary only.

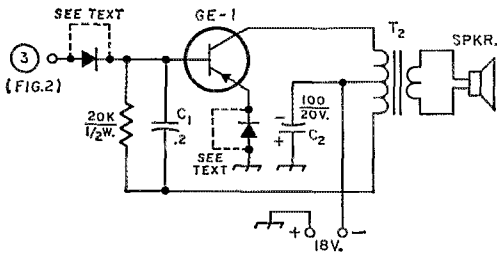


Fig. 3—Sidetone monitor circuit. Connect Terminal 3 to Terminal 3 of Fig. 2. Capacitances are in microfarads; resistances are in ohms (K=1000). C₁ is 10-volt ceramic; C₂ is miniature electrolytic. Diodes are any silicon; they may be omitted if the circuit of Fig. 4 is not used. Transistor is a G.E. type. T₂ is a transistor output transformer, 500 ohms c.t. to voice coil. Speaker used in original unit is 2-inch.

A Complete Iambimatic Keyer

The circuit of the home-brew Iambimatic keyer in the photographs is shown in Figs. 2, 3, and 4. These represent the basic keying unit, monitor, and Iambimatic feature. Fig. 2 represents a fully satisfactory conventional keyer which can be used alone or with the other two options. It is basically a transistor version of the "POO-Key, Jr."⁴ The very-low-leakage silicon transistors used (GE-10) make this circuit possible, and render the performance independent of temperature and individual transistor characteristics. In the oscillator circuit (at the left in Fig. 2) the transistor gets a positive bias from R₂ which also serves as a weight control. Different capacitors (exact values depend on the characteristics of T₁) are switched

⁴ Livingston, "The Poo-Key, Jr.," QST, Sept., 1961.

in for speed ranges of 10-20 w.p.m., 15-30 w.p.m., and 20-40 w.p.m.; other switch positions are OFF and HOLD. R₄ is used to suppress an occasional short dash; its resistance should be as low as possible without disturbing normal operation.

Fig. 3 is the circuit of the monitor, which was stolen from W5LAN.⁵ The resistor-capacitor combination may be modified to change the tone. The volume level is not overpowering, but is quite acceptable. The two diodes are to isolate the monitor from the Iambimatic feature (these two sections share the u.c. contact of K₁ to ground); the diodes may be omitted if the latter circuit is not used.

Fig. 4 is the diagram of the Iambimatic feature. The circuit is similar in principle to Fig. 1. However, a transistor flip-flop is used here; transistor gates are used to key the flip-flop. The GE-2 transistor and the relay K₂ form the dash gate. Diodes CR₁ and CR₂ may be omitted (replace with a short) if the circuit of Fig. 4 is to be used with the circuit of Fig. 2. Omit CR₃ if the circuit of Fig. 4 is not to be used with the circuit of Fig. 2. The combination of 470K resistor and 0.02-μf. capacitor may have to be changed for extremely fast speeds.

The keyer in the photographs contains the circuitry of Figs. 2, 3, and 4 in a 2 × 2 × 4-inch Minibox. Each of the three sections is built on a 2 × 2-inch circuit board. Two 9-volt transistor radio batteries power the unit; battery drain is 50 mw. key-up and 160 mw. key-down. Voltages between 13 and 22 have been used successfully.

The keying levers are homebrew. Each lever consists of half the length of a thin jig- or coping-

⁵ Old, "Transistorized Electronic Key and Monitor," QST, May, 1959.

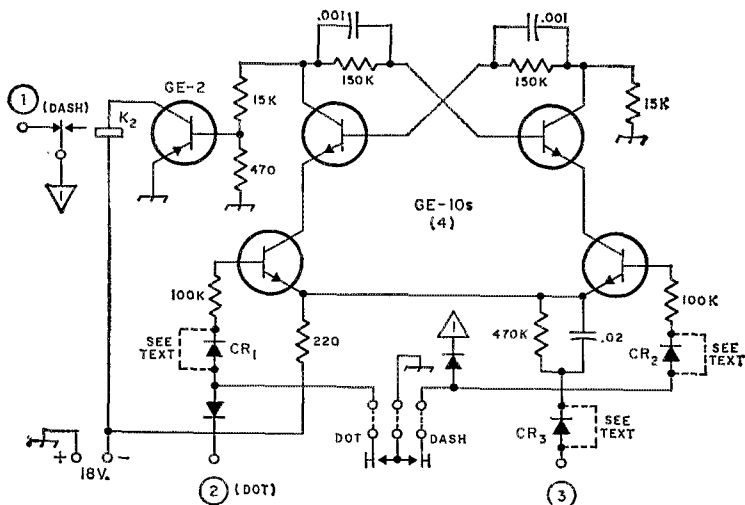
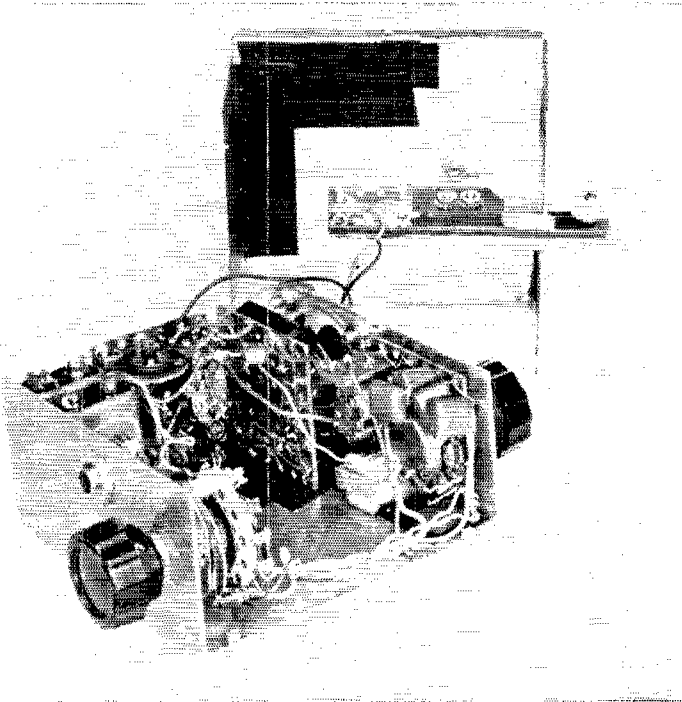


Fig. 4—Circuit of the Iambimatic feature for the keyer circuit of Fig. 2, or for other relay-type keyers with negative voltage at the key-lever terminals. When used with the circuits of Figs. 2 and/or 3, similarly-numbered terminals should be connected together. Diodes CR₁ and CR₂ may be omitted when this circuit is combined with that of Fig. 2. CR₃ need be used only when this circuit is combined with that of Fig. 3. When used with other relay-type keyers, Terminals 1 and 2 should be connected, respectively, to the dash- and dot-lever terminals of the keyer. Terminal 3 should be connected to ground through a spare set of normally-closed contacts on the output relay of the keyer.

Capacitances are in microfarads; resistances are in ohms (K = 1000). Capacitors are 10-volt ceramic; resistors are 1/2-watt. Transistors are G.E. types. Diodes are any silicon. K₂ is similar to K₁, Fig. 2.



Rear view of the Iambimatic keyer. The circuit board at the right contains most of the components of the basic keyer, including the speed control. Immediately to the left is the sidestone monitor unit. The third board to the right of the batteries contains the circuitry of the Iambimatic feature. The speed-range switch is in the foreground.

saw blade. Small pieces of foam rubber are used for spacing and to remove contact bounce. The saw blades are soldered to part of a copper-clad circuit board which is bolted (copper removed around bolts to preserve insulation from ground) to a solid piece of steel. This is firmly secured to the bottom of the Minibox.

Iambimatic Feature for Other Keyers

The circuit of either Fig. 4 or Fig. 5 may be used to convert any keyer with a relay to an Iambimatic keyer. It is easy to determine which circuit to use: Simply place a voltmeter from ground to either the dot or dash terminal of your present keyer. If a negative voltage is

registered, use the circuit of Fig. 4; if a positive voltage, use the circuit of Fig. 5.

In either case connect Terminal 1 to the former dash terminal of your keyer and Terminal 2 to the former dot terminal. Use a dual-paddle keying lever and connect it to the new key-lever terminals in either Fig. 4 or Fig. 5. Connect Terminal 3 to a spare normally-closed contact to ground on the keying relay. Then connect up the 18 volts (batteries or a voltage doubler from the filament supply). Close both paddles and listen for the "Iambimation".

Once the Iambimatic keyer has been completed, it will take a short time to get used to. Start with C/Q, and then practice your way down the alphabet. After a while you will wonder how you ever managed to get along with a conventional electronic keyer.

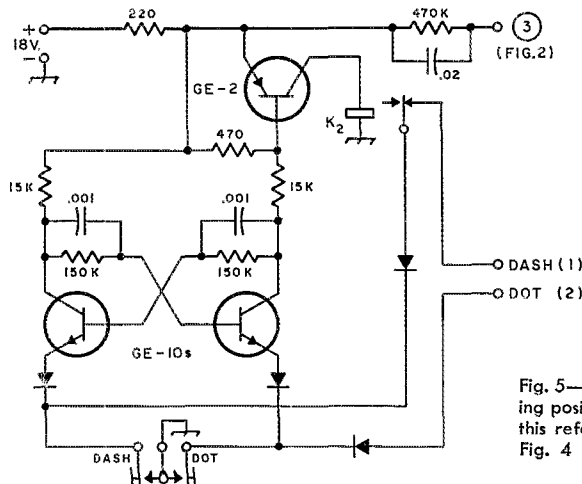


Fig. 5—Circuit equivalent to that of Fig. 4 for keyers having positive voltage at the key-lever terminals. Except for this reference to polarity, the content of the caption of Fig. 4 applies here. This version cannot be used with the circuit of Fig. 2.

Most of the component values may be varied somewhat without affecting the performance of the unit. However, C_2 , C_3 and the four multivibrator resistors should be within 10 per cent of the specified values or the multivibrator may either fail to synchronize with the oscillator or may operate on a subharmonic other than 50 ke.

Construction of the unit involves a "homebrew Vectorboard" technique as shown in the photograph. A piece of $\frac{1}{8}$ -inch Masonite is drilled

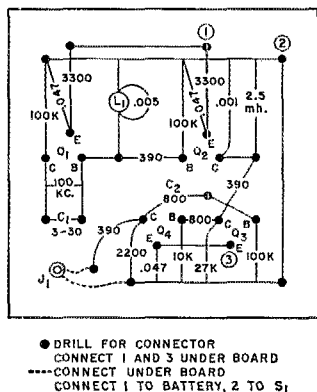


Fig. 2—Scale layout of circuit board. Outside dimensions are 5 by 5 inches. J_1 the output connector, is a phone jack.

with a No. 42 drill to accept Vector T9.4 connectors¹. A layout and drilling template is shown in Fig. 2.

The connecting wires which provide mechanical support for the crystal socket and oscillator tank coil, L_1 , should be No. 12 or No. 14 gauge. The remaining connections may be made with smaller wire.

After the wiring is completed, the unit is placed in operation as follows: Turn S_1 off, insert the crystal and transistors into their sockets and connect the battery. Turn the slug in L_1 full in and set the capacitor, C_1 , to minimum capacitance. Connect the multivibrator output to the station receiver input and tune the receiver to approximately a 100-ke. multiple. Now turn S_1 on and screw the slug in L_1 out just far enough to start the oscillator. Tune the receiver to approximately a 50-ke. multiple and screw the slug in L_1 out just far enough so that the multivibrator will start every time S_1 is turned on.

To adjust the oscillator to exactly 100 ke., tune WWV on the station receiver and adjust C_1 to bring the oscillator to zero beat. This is most easily done when the WWV carrier is unmodulated. If WWV cannot be received, a check of the local broadcast station listings should reveal a station having a carrier which is a harmonic of 50 or 100 ke.

QST

¹ These connectors are available from Lafayette Radio Electronics, 111 Jericho Turnpike, Syosset, L. I., N. Y.

Strays

ARRL FLORIDA STATE CONVENTION TROPICAL HAMBOREE

Miami January 21 & 22

The Florida State Convention/eighth annual Tropical Hamboree will be held Saturday and Sunday, January 21 & 22, at the Miami Bayfront Park Auditorium. Activities have been planned to interest the ham and his XYL. Manufacturers will exhibit the latest in radio equipment. Tech talks and meetings are scheduled for DX, VHF, SSB, MARS, QCWA and the many other phases of the amateur radio field. The ARRL meeting will be led off by S.E. Div. Director Bolvin and Vice-Director Hamel. Representatives of Army, Navy and Air Force MARS will address the group. Another speaker is George Grammer W1DF, Technical Director of ARRL and Technical Editor of QST. For the rug-chewers and bargain hunters there will be a station on the air manned by the Dade County ARPSC, auction and swap shop. For the ladies we have two days of programs and demonstrations on home beautification.

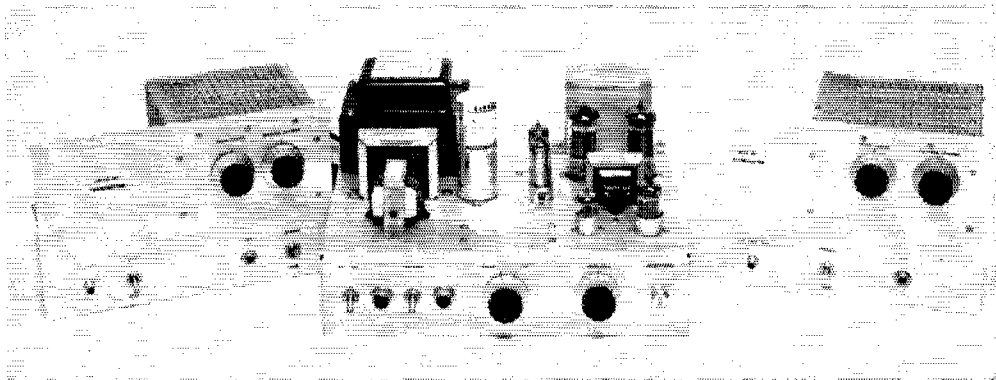
Festivities will include a banquet Saturday evening at the headquarters hotel. In order to satisfy the multiple wishes of you convention goers the banquet will be served "buffet style" with a varied menu selection to titillate your taste buds and the after-dinner program will be for general interest.

Headquarters hotel is The Everglades at 244 Biscayne Boulevard; special rates are \$9.00 single, \$14.00 double, no deposit required. Convention registration is \$1.50; banquet tickets \$6.00. For tickets and hotel reservations write to Dade Radio Club, P.O. Box 73, Biscayne Annex, Miami, Florida 33152.

QST

SWITCH TO SAFETY!





50 Watts on Six and Two

An Easy-to-build A.M./C.W. Transmitter

BY NORM BRADSHAW,* WIDJV-WSEEF AND DOUG DE MAW,** WICER

With the emphasis today on the use of high-cost v.h.f. transmitting tubes, their expensive sockets, and the special hardware that goes with them, it seems appropriate to take a few steps in the opposite direction. The v.h.f. transmitter described in this article uses a 6146B final and features low-cost tubes in the exciter. Most of the power-supply parts can be garnered from a junked TV set and many of the other components are stock items in the v.h.f. experimenter's "goodie" trove.

ALTHOUGH it is not always true that the cheapest way is the easiest way, or vice versa, examination of the transmitter described here will show that both conditions are reflected in its design. At best, the terms "cheapest" and "easiest" are nebulous; they must be related to personal finances and individual craftsmanship. The best we can do is to work toward a compromise that best suits our individual needs. Such a compromise is reached in this two-band v.h.f. rig.

The transmitter has a common power-supply modulator chassis and uses separate r.f. assemblies for the 6- and 2-meter bands. The key-shaping network is built in a Minibox so that it can be used with either r.f. unit during c.w. operation. Low-cost, readily-available tubes are used. This feature and the use of power-supply components that can be taken from an old TV set help to reduce the overall cost. The com-

plexity of the project is lessened by the omission of unnecessary gewgaws—often used for window dressing, although of no practical value.

In designing the equipment, emphasis was placed on features that are often lacking in v.h.f. transmitting gear. An abundance of audio is available—30 watts—offering more power than is needed to obtain 100-percent modulation. The speech stages are designed to provide good response in the most useful range for voice communication, 300 to 3000 c.p.s. A clean, chirp-free c.w. note is assured because of voltage-regulated oscillator operation in both r.f. units, and because of the shaping network that is connected in the keying lead. Ample grid drive is available in both r.f. units, through use of tubes that are capable of giving good performance at their respective operating frequencies. Neutralization has been included in the design of both final stages, greatly reducing the possibility of instability and its attendant TVI. Each r.f. chassis has a v.f.o. jack so that external frequency control can be used, if desired.

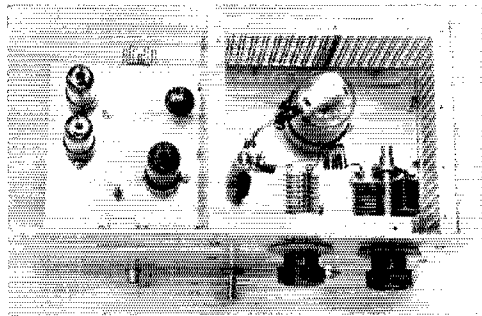


Figure 1—Top view of the 6-meter r.f. deck. The VR tubes are at the upper left, V_1 is to the right of them, and the tuning knob for C_1 is just above V_1 . The 6146B and its plate tank are enclosed in the shielded area at the right.

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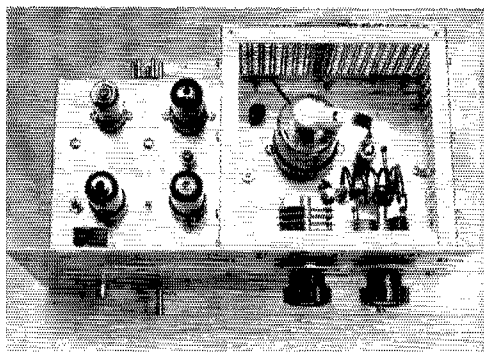


Fig. 4—Top-chassis view of the 2-meter r.f. assembly. The amplifier compartment is at the right. Copper strapping is used to connect the 6146B plate cap to the plate coil. The neutralizing stub is adjacent to the 6146B tube envelope. The oscillator stage is at the lower left of the photo, the VR tube is directly above it, and the buffer and doubler are at the center of the chassis.

6-Meter R.F. Section

A $5 \times 9\frac{1}{2} \times 2$ -inch chassis is used for the 6-meter section of this transmitter. The area around the 6146B is enclosed by a perforated-aluminum box which is $5\frac{5}{8}$ inches wide, 5 inches deep, and 4 inches high. Angle stock, $\frac{1}{2}$ inch in width, is used to form the top and bottom supports for the perforated stock. The angles were formed in a vise and are visible in the photographs. The top of the cage is enclosed by a perforated-stock cover which is held in place with No. 6 sheet-metal screws. The aluminum front panel is 10 inches wide and $6\frac{1}{2}$ inches high.

The oscillator, V_{1A} of Fig. 3, uses 25-Mc. overtone crystals, but a v.f.o. whose output frequency is 8.3 or 12.5 Mc. can be connected to J_1 if variable-frequency control is desired. A double-tuned circuit is used between V_{1B} and V_2 to provide additional 50-Mc. selectivity. This helps to prevent 25-Mc. energy from reach-

ing the p.a. stage and being passed on to the antenna system. A parasitic choke, Z_1 , installed in the plate lead of V_2 aids in preventing spurious frequencies from being generated. The final plate tank, $L_6C_4C_5$, is a pi network which is designed to work into low-impedance loads in the 50- to 75-ohm range.

A tune-operate switch, S_1 , enables the operator to adjust the transmitter's grid drive without having the final stage operating. Cathode keying is employed at V_2 . The key is plugged in at J_5 , a closed-circuit jack. Grid and plate current metering is made possible by connecting a 1-ma. meter to a set of jacks on the rear apron of the chassis. For grid-current tests, the meter is plugged into J_3 and J_4 where the voltage drop across R_1 is measured. The resultant current range is 0 to 10 milliamperes. A similar arrangement is used to meter the plate current; the meter is plugged in at J_6 and J_7 and reads the voltage drop across R_3 , providing a plate-current range of 0 to 200 milliamperes. A similar metering system is used in the 2-meter r.f. assembly.

The neutralizing capacitor, C_3 , is a piece of No. 14 enameled wire protruding approximately $2\frac{1}{2}$ inches above the chassis. A small feedthrough bushing is used to bring the wire through the chassis.

The 2-Meter Assembly

The 2-meter r.f. deck is also built on a $5 \times 9\frac{1}{2} \times 2$ -inch chassis. The amplifier shield cage is $5\frac{1}{4}$ inches wide, 5 inches deep, and 4 inches high. Its construction is similar to that of the 6-meter unit.

The oscillator, V_{3A} of Fig. 6, is designed to use 8-Mc. fundamental crystals, or can be controlled by a v.f.o. whose output is in the 8, 12, or 24-Mc. range. In v.f.o. operation S_2 shorts out RFC_4 . This is necessary to prevent self-oscillation in V_{3A} .

The 24-Mc. output from V_{3A} is fed to V_{3B} where it is tripled to 72 Mc. Buffer stage V_4 ,

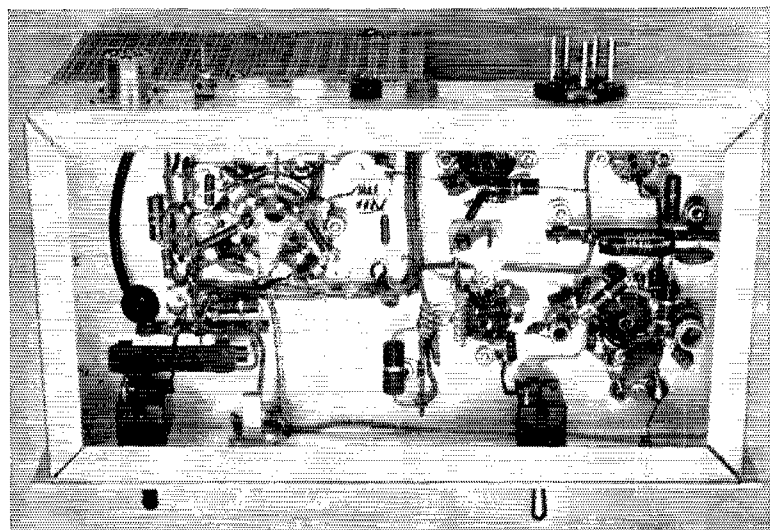


Fig. 5—The underside of the 2-meter r.f. unit. The oscillator tripler is at the lower right and the buffer is just to the left of it. Doubler stage V_6 is at the upper center. A brass ring surrounds the socket of V_5 and is used as a ground bus. The 6146B p.a. is at the left of the chassis.

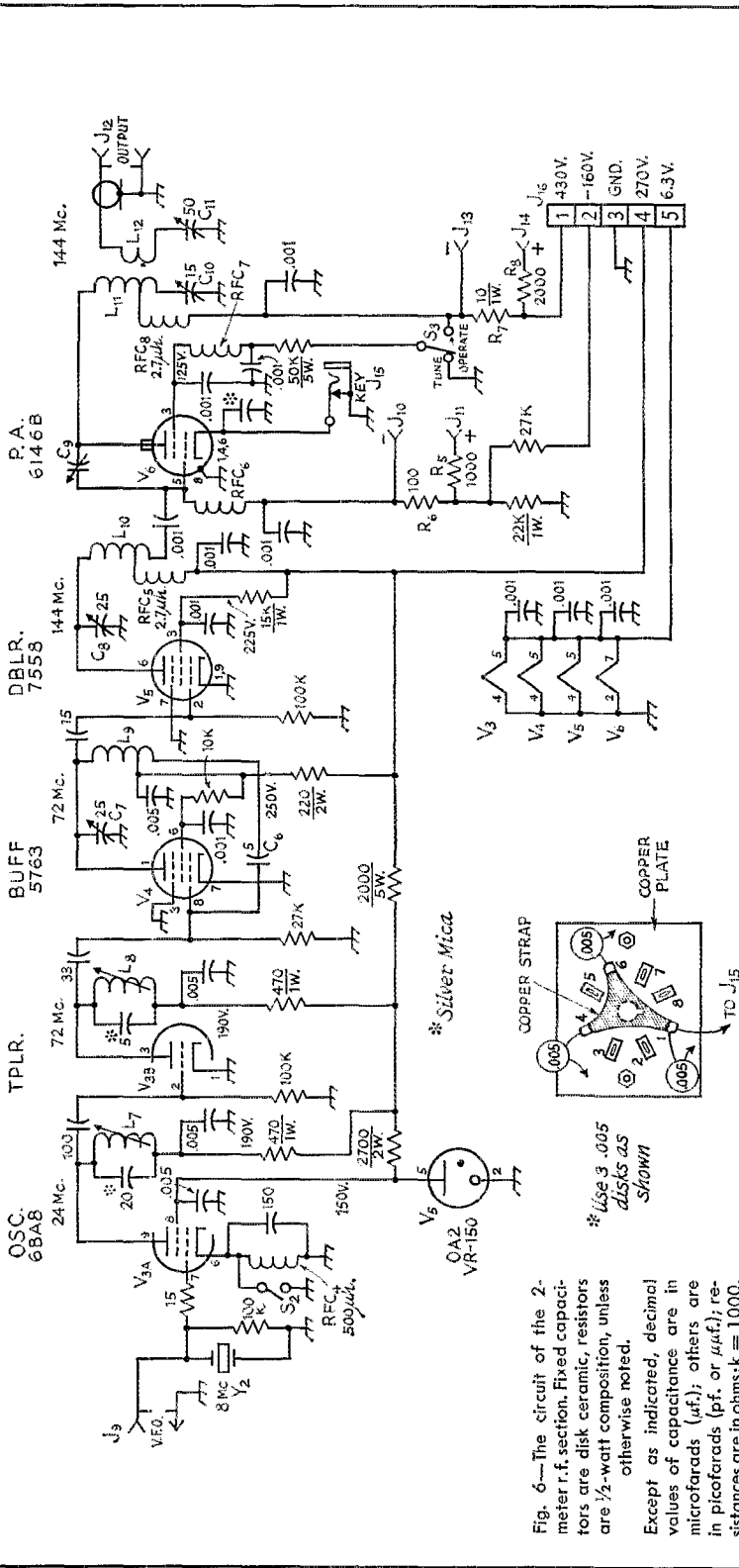


Fig. 6—The circuit of the 2-meter r.f. section. Fixed capacitors are disk ceramic, resistors are 1/2-watt composition, unless otherwise noted. Except as indicated, decimal values of capacitance are in microfarads ($\mu\text{f.}$); others are in picofarads (pf. or $\mu\mu\text{f.}$); resistances are in ohms; k = 1000.

- C₁—Neutralizing capacitor.
- C₂—25-pf. miniature variable (Millen 25025E).
- C₃—Neutralizing stub. See text.
- C₁₀—15-pf. double-spaced variable (Millen 22910 suitable).
- C₁₂—50-pf. miniature variable (Millen 22050).
- J₆—Phono connector.
- J₇, J₁, J₈, J₁₄—Insulated banana jack.
- J₁₂—SC-239 type chassis connector.
- J₁₅—Closed-circuit jack.
- J₁₆—5-pin male connector (Amphenol 86CP5).
- L₇—10 turns No. 22 enam. wire, close-wound on 3/8-inch dia. ceramic slug-tuned form. (Miller 4400 form used.)
- L₈—7 turns No. 22 enam. wire, close-wound on 1/4-inch dia. ceramic slug-tuned form. (Miller 4500-4 used.)
- L₉—4 turns No. 20 tinned, 5/8-inch dia., 5/8 inch long. Tap 1 turn from cold end. 4 turns from 10-turns-per-inch, 5/8-inch dia. coil stock (Airdux 510T or Polycoil 1735 suitable).
- L₁₀—4 turns No. 20 tinned, 5/8-inch dia., 1/2 inch long. Tap 1 turn from grid end.
- L₁₁—4 turns No. 10 tinned, 5/8-inch dia., 1 inch long. Tap 1 turn from C₁₀ end.
- L₁₂—2 turns No. 20 insulated wire, 5/8-inch dia. Space approximately 1/4 inch away from C₁₀ end of L₁₁. (See text.)
- R₁—R₅, inc.—5 per cent tolerance, or better.
- RFC₄—500- $\mu\text{h.}$ choke (Millen 34300-500).
- RFC₅—2.7 $\mu\text{h.}$ choke.
- RFC₆—7- $\mu\text{h.}$ choke (Millen J300-8.2 suitable).
- RFC₇—0.82- $\mu\text{h.}$ choke (Millen 34300-0.82 suitable).
- RFC₈—2.7- $\mu\text{h.}$ choke (Millen 34300-2.7).
- S₂—S.p.d.t. toggle. (Xtal-v.f.o. switch shown in xtal. position.)
- S₃—S.p.d.t. toggle.
- Y₁—8-Mc. fundamental type crystal.

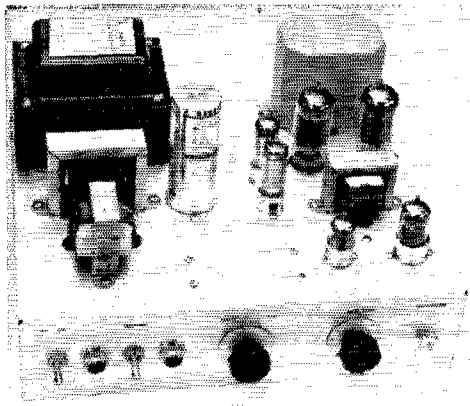


Fig. 7—Top-chassis view of the modulator/power supply. The audio section is at the right side of the chassis and the power supply is at the left.

a 5763, amplifies the signal before it is passed on to V_5 , where it is doubled to 144 Mc. V_5 is the driver for V_6 , the 6146B output amplifier. C_9 , the neutralizing wire, is arranged in the same way as is C_3 in the 6-meter unit. It also projects $2\frac{1}{2}$ inches above the chassis.

This 6146B cathode is keyed at J_{15} , and the circuit is the same as that used in the 6-meter unit. The keying characteristics of both r.f. assemblies are determined by the shaping network of Fig. 10. Its use is discussed later.

A series-tuned tank is used in the plate circuit of V_6 . Because of the rather high value of output capacitance of 6146Bs, this technique is desirable if a reasonable LC ratio is to be had on 144 Mc. Capacitor C_{10} is used to tune L_{11} to resonance. L_{12} couples the output to the load and C_{11} is used to help tune out any reactance that L_{12} and the line may show.

Special care has been taken to bond the cathode pins of the 6146Bs as shown in the insert sketch of Fig. 6. This helps to reduce inductance in that part of the circuit, contributing to better stability. The Y-shaped strap can be made from flashing copper or brass shim stock. Pins 8 and 2 of the 6146B should be returned to chassis ground by soldering short lengths of $\frac{1}{4}$ -inch-wide copper strap between the tube socket pins and ground. In the 2-meter model, a 2-inch square brass plate is mounted under the chassis at V_6 so the tube socket protrudes through it. It is held in place by the 6-32 socket hardware. A similar plate is used at the socket of V_5 , but is circular in shape. Such plates are handy for making solder connections in v.h.f. gear when short leads are desired — a thing that is hard to achieve when aluminum chassis are used.

Power Supply and Modulator

It is unnecessary to give a detailed description of the power-supply and audio circuits shown in Fig. 9, since conventional designs have been used. There is nothing tricky to adjust. There is also nothing critical about the layout of the parts,

and the available space in the $10 \times 12 \times 3$ -inch aluminum chassis eliminates any need to crowd the circuit. The main consideration is that the audio components be kept as far away from the power supply section as possible, thus reducing the possibility of hum in the audio. The recommended layout is given in Figs. 7 and 8.

R.f. filtering is used at the input of the speech channel to prevent squeals and howls, a malady common to some v.h.f. modulators. Additional r.f. filtering is used in the grid circuit of V_{7B} . The modulator operates in AB_1 , using RCA 7868s to produce 30 watts of audio output. These tubes are designed for hi-fi work and are reasonably priced.

The power supply is designed around many of the component values found in a transformer-powered TV set.¹ This was done in an effort to minimize the cost of the transmitter. Silicon rectifiers are used in the high-voltage circuit, and in both bias supplies.

Receiver muting and control of the antenna relay are features made possible by the use of K_1 , a d.p.d.t. 115-volt a.c. relay. External connections to the relay contacts are made at J_{19} . A phone-c.w. switch, S_6 , disconnects the secondary of T_2 from the B-plus line during c.w. operation. An extra set of contacts on S_6 is used to disable V_9 and V_{10} at the same time.

Checkout

A three-foot-long power cable is used between the modulator/power-supply chassis and the r.f. strips. The cable should have a male connector to mate with J_{18} , and a female connector for connection to J_8 or J_{16} .

Plug the power cable into J_3 of the 6-meter assembly. Connect a 1-ma. meter to J_3 and J_4 . Place S_1 in the TUNE position and connect a 50- or 75-ohm dummy load to J_2 . Apply power and

¹ The power transformer filter choke, and filter capacitors can often be taken from a junked TV set.

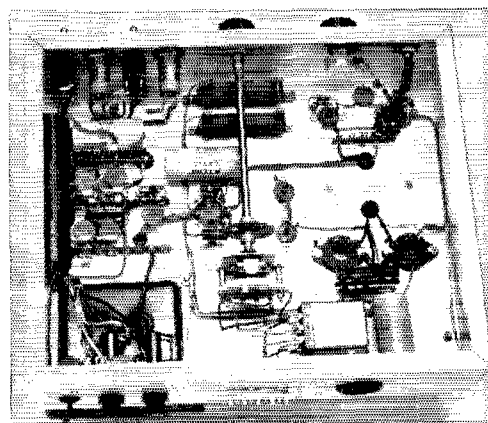
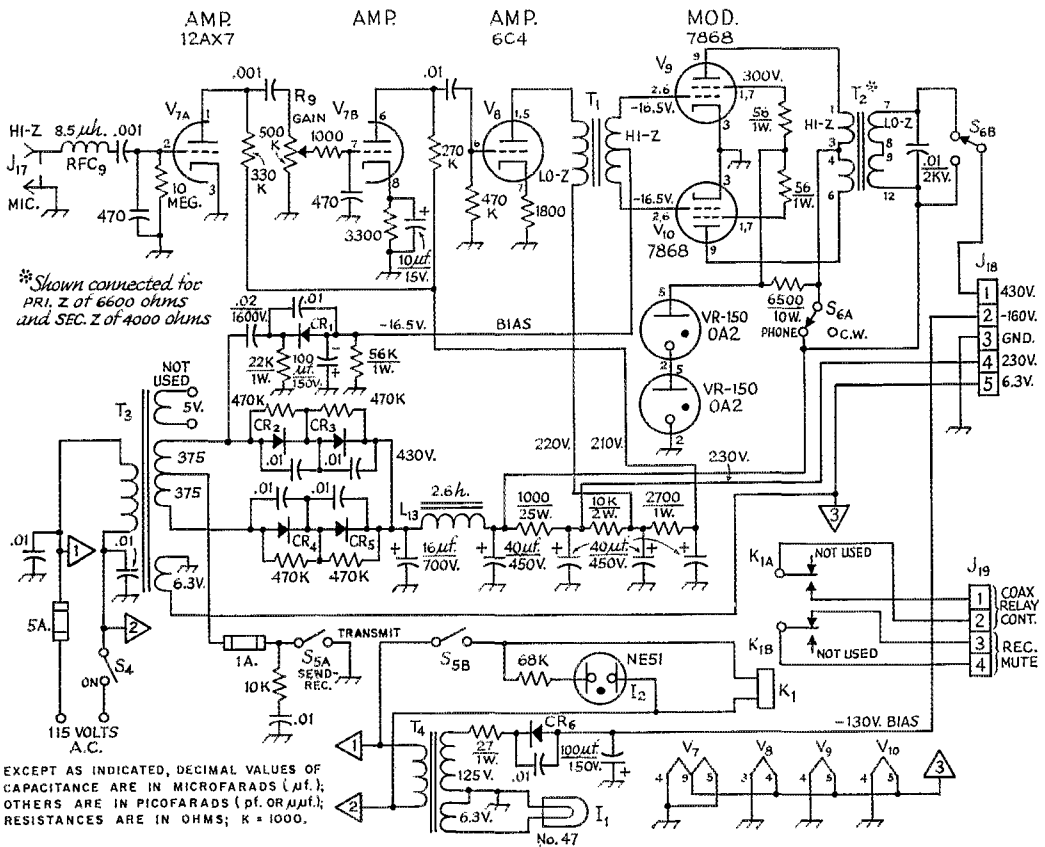


Fig. 8—Layout of the underside of the power supply and modulator deck. The audio section is at the right, and the power supply is at the left. The phone-c.w. switch is at the lower-center of the photo. Relay K_1 is just below and to the right of the switch.



*Shown connected for
PRI. Z of 6600 ohms
and SEC. Z of 4000 ohms

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

Fig. 9—Schematic diagram of the power supply and 30-watt modulator. Capacitors are disk ceramic. Those bearing polarity marking are electrolytic. Resistors are $\frac{1}{2}$ -watt composition unless noted otherwise.

- CR₁-CR₅ inc.—1000 p.r.v., 750-ma. silicon diode.
- CR₆—600 p.r.v., 250-ma. silicon diode.
- I₁—No. 47 lamp or equal.
- I₂—NE-51 neon lamp.
- J₁₇—Two-terminal microphone connector.
- J₁₈—5-pin female connector (Amphenol 77MIP5).
- J₁₉—4-terminal barrier strip (Millen E-304A).
- K₁—D.p.d.t. 115-volt a.c. relay. Two contacts not used. (Guardian IR-1220-2C-115A.)
- L₁₃—2.6-h., 300-ma. filter choke (Stancor C-2706 suitable).
- R₀—0.5-megohm control, audio taper.
- RFC₀—8.5- μ h. choke (Millen J300-8.2).

- S₁—S.p.s.t. toggle.
- S₅—D.p.s.t. toggle.
- S₆—Ceramic rotary, 1 section, 2 poles, 5 positions, 2 positions used. (Centralab 2505).
- T₁—Interstage transformer, 1:3 step-up ratio. (Stancor A-63-C.)
- T₂—Varimatch modulation transformer, 30 watts. (UTC-S19.)
- T₃—Power transformer; 370 volts, 275 ma.; 6.3 volts, 7 amp.; 5 volts, 3 amp. (not used). Stancor P-6315 or equivalent type from old TV set.
- T₄—Power transformer (bias); 125 volts, 15 ma. (Stancor PS-8415).

adjust L_1 , C_1 , and C_2 for maximum grid current as indicated on the meter. It may be necessary to detune L_1 slightly from the peak setting in order to assure quick starting of the oscillator each time the transmitter is turned on. Use C_2 to adjust the grid current to approximately 3 ma.

Turn off the transmitter and plug the 1-ma. meter into J_6 and J_7 . Place S_1 in the OPERATE position and turn the transmitter on. With C_5 adjusted for maximum capacitance, quickly tune C_4 for a dip in plate current. Turn C_5 toward minimum capacitance until the plate-current reads 100 ma. at resonance. It will be necessary to readjust C_4 for a dip in plate current as C_5 is tuned. The off-resonance plate current

should go as high as 150 ma. if the circuit is operating properly.

The 6- and 2-meter sections are both neutralized by the same method, as described later under "Neutralization."

Tuneup for the 2-meter assembly is similar to that of the 6-meter section. With the meter plugged into J_{10} and J_{11} , and with S_3 in the TUNE position, apply power to the transmitter and peak L_7 , L_8 , C_7 , and C_8 for maximum grid-current reading on the meter. Should it be impossible to get a reading on the meter, initially, "rough tune" the low-level stages to resonance by peaking them, one at a time, with a wavemeter. Alternatively, a grid-dip meter can be

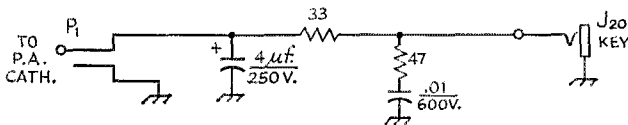


Fig. 10—Schematic diagram of the key-shaping network. The unit is housed in a small-size Minibox and is installed between the key and the key jack of the r.f. deck in use during c.w. operation. The shaper is removed from the circuit

during phone operation. P_1 is a PL-55 style plug and J_{20} is an open circuit jack. The 4- μf . capacitor is electrolytic. Resistors are $\frac{1}{2}$ -watt composition. Resistance is in ohms. The 0.01 capacitor is in μf . and is disk ceramic.

employed to get the tuned circuits close to their desired resonant frequencies. The transmitter will deliver plenty of output with as little as 1 milliampere of grid current, but it is better to use the 3 ma. recommended by the tube manufacturer. C_8 can be used as a drive control to set the grid current at the desired value.

With a 50-ohm dummy load connected to J_{12} , place S_3 in the OPERATE position and quickly adjust C_{10} for a dip in plate current (1-ma meter connected at J_{13} and J_{14}). C_{11} can be used to establish a loaded plate current of 100 ma.

Neutralization

Since both the 6- and 2-meter assemblies use a stiff piece of wire (adjacent to the tube envelope and parallel to the anode) as a neutralization capacitor, the procedure is the same on both bands.² First, adjust the transmitter for normal grid and plate currents. With a dummy load connected, and with the tune-operate switch in the TUNE position, rotate the plate-tuning capacitor through its range while observing the grid current. If the grid current drops when the plate tank is tuned through resonance, move the neutralizing wire toward or away from the tube envelope and repeat. Position the wire so there is least effect on the grid-current reading when the plate tank is tuned through resonance.

An alternate method of neutralizing the 6- and 2-meter units is to connect a sensitive wavemeter to the output jack of the unit being tested and adjust the neutralizing wire for minimum output with the tune-operate switch in the tune position. *Caution:* When adjusting the neutralizing wire, be careful to avoid contact with 6146B plate voltage. Turn the transmitter off each time the wire is adjusted.

Operation

Because the 6146Bs are operated well below their maximum ratings, tube life should be excellent. Both units can be run at 50 watts input on phone and 60 watts input on c.w. A plate current of 120 ma. is recommended for voice operation, and 140 ma. is satisfactory for c.w.

When the transmitters are placed in operation, the lid should be screwed into place on the shield cage. A metal plate encloses the bottom of each r.f. chassis to help confine the r.f. from the low-level stages. Rubber feet are attached to the bottom plates to prevent damage to the

² On 2 meters, conventional neutralization cannot be used because the natural self-neutralizing frequency of the 6146B lies below 144 Mc. C_9 is used to add capacitance between the grid and plate elements as shown in Fig. 6.

operating table. A good earth ground should be connected to the chassis of the equipment to lessen shock hazard.

Adjustment of C_8 in the 2-meter assembly, and of C_2 in the 6-meter unit, can be done by inserting an insulated screwdriver through a hole in the cover of the shield cage.

If the loading control, C_{11} , on the 2-meter unit does not seem to have any effect on the plate current of V_6 , try moving L_{12} away from, or closer to, the end of L_{11} . Then readjust C_{11} . A setting should be possible where C_{11} will have considerable effect on the loading of V_6 .

For operation on c.w., S_6 in the modulator deck is turned to the c.w. position, automatically disabling the output stage of the audio section. The shaping network of Fig. 10 is plugged into the key jack of the r.f. assembly being used, and the key is connected to the shaping-network box. The c.w. note should be chirp-free and without clicks.

Tests made with a calibrated wattmeter indicate an efficiency of approximately 60 percent with both r.f. units. With 50 watts input, the output power is 30 watts.

Some Closing Remarks

There is no reason why the entire transmitter could not be built in a single enclosure if the constructor so desired. For convenience, the metering might be done with a panel-mounted instrument. A switch could be used to select the various metering points in the circuit.

Used individually, the r.f. strips of this transmitter can be made to serve as exciters for high-power amplifiers. Also, the 2-meter assembly is ideal for use as a driver for a 432-Mc. varactor-diode tripler of the type described in March 1966 *QST*, page 14.

QST

First-Day Covers Still Available

When the Amateur Radio First-Day Covers were processed in Anchorage on December 15, 1964, we gambled and had a few extra unaddressed covers prepared, because orders for the first-day covers were still coming in and we didn't want anyone to be disappointed. We still have some of these left. They are all singles, unaddressed but carrying the stamp and the official first-day cancellation, and they will be mailed to you in an envelope. Prices are 35c each, three for a dollar. Send your orders to ARRL Hq., 225 Main Street, Newington, Conn., 06111.

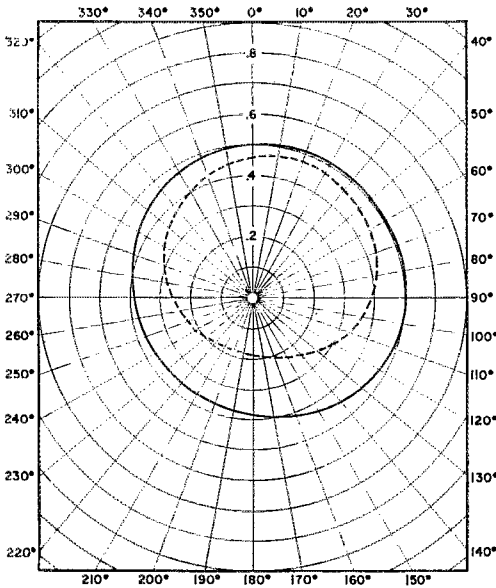
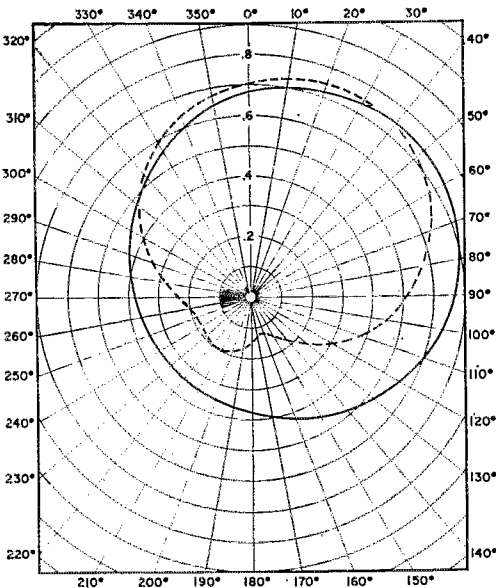


Fig. 2—A: Calculated patterns of relative E -field strength for a radiation angle of 15 degrees above the horizon; dry soil. Solid curve, whip vertical; dashed line, whip tilted 45 degrees.



B: Same for a radiation angle of 30 degrees.

angle of elevation, and ground constants has been given by G3HHP.² Using standard techniques³ the E -field expressions were corrected by the ground factors for 2S Mc. and angles of elevation, Δ , of 15 and 30 degrees. Higher wave angles are

² Hills, "The Ground Beneath Us," *R.S.G.B. Bulletin*, June 1966, p. 375.

³ Schelkunoff and Friis, Chapter Seven, *Antennas/ Theory and Practice*, John Wiley and Sons, Inc., New York, 1952.

less useful for contacts from 14 to 2S Mc.⁴ These ground factors revealed that, at their maximum point, the horizontally polarized E -fields from the model over dry soil were 11.7 and 5.9 db. below the corresponding vertically polarized fields for Δ of 15 and 30 degrees respectively. As the conductivity approached seawater values, the horizontal terms were even smaller; namely, 14.2 and 8.3 db. For simplicity only vertical terms were retained in the patterns.

The patterns of the calculated E -fields are presented in Fig. 2 for the 15- and 30-degree wave angles. Solid lines show the fields from the vertical element normal to ground while the dotted lines denote a rather extreme element tilt of 45 degrees. The relative field strengths can be directly compared from one wave angle to the other; however, directly comparing field values of the normal and tilted configurations automatically implies a constant input current. It is immediately noted in Fig. 2 that the quadrant containing the ground plane also contains the strongest fields. Moreover, these fields generally change only slightly from 0 to 90 degrees.

When the vertical element is perpendicular to the radials, the field pattern is symmetric about the 45-225 degree directions. Here orientation is more important at the high elevation angle where the pattern undergoes a maximum/minimum variation of 6.4 db. compared to a 3.3-db. variation at the lower angle. As mentioned before, the attractive increase in field strength at the higher angle usually cannot be advantageously employed on the higher-frequency bands.

Pattern symmetry becomes lost as the vertical element tilts back from the normal. Not only does the direction of maximum field shift from 45 degrees toward 20 degrees, but also the field strength from the rear of the model is particularly reduced. Numerically the fields in front of the model are 8.3 and 13 db. stronger at the 15 and 30 degree elevations.

Low-Frequency Considerations

Mobile operation on 40 and 80 meters is more difficult to analyze. Even in Texas cars and whips don't come equipped with $\frac{1}{4}$ -wavelength dimensions. Instead, the sizes of both the car body and the whip approach small fractions of a wavelength. Also, in this range the loading coil becomes increasingly important in relation to the current distribution on the whip. Finally, contacts can be made on these bands by radiation at fairly high angles of elevation, which complicates the previous polarization argument by filling in certain parts of the pattern with a significant combination of vertically- and horizontally-polarized fields.

The relative directivity pattern for a very small dipole has only a slightly greater beamwidth than the similar figure-8 pattern for a half-wave dipole having $\frac{1}{4}$ -wave elements⁴. Thus it would be reasonable to expect that the character of

⁴ Chapter Two, *The A.R.R.L. Antenna Book*.

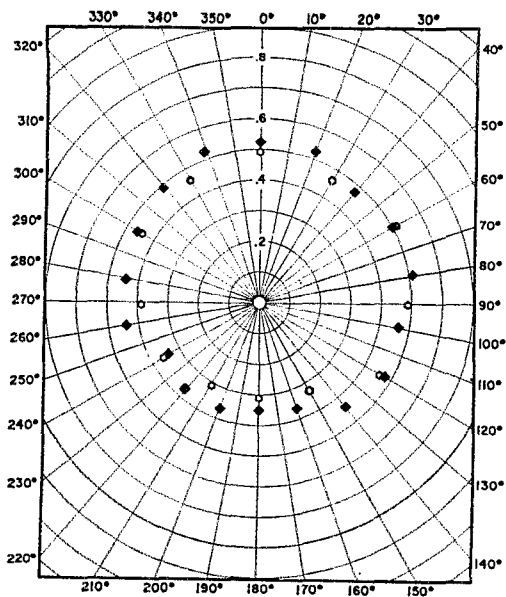
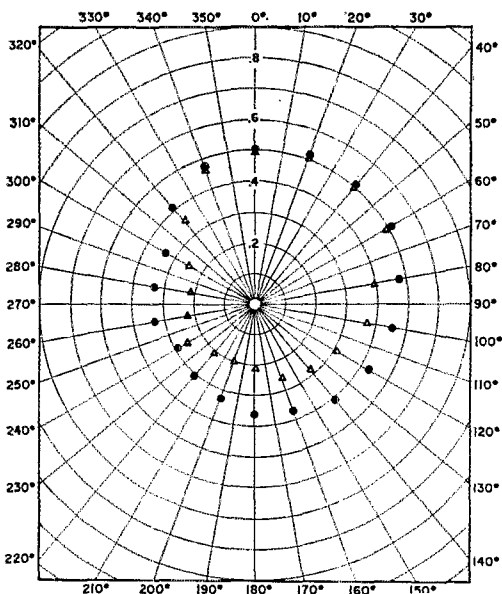


Fig. 3—A: Solid points, experimental data taken on model antenna system shown in Fig. 1, at a frequency of 430 Mc. Open points, 14-Mc. data taken on actual automobile installation.



B: Solid points, experimental data on scale-model car shown in photograph, at 430 Mc., whip vertical. Open points, same with whip tilted 45 degrees.

the patterns of Fig. 2 would be more nearly omnidirectional because of the short length of the radiating elements. Consequently this factor along with the increased usefulness of the higher angles of elevation would reduce any directivity effects for 80- and 40-meter mobile contacts.

It is interesting to speculate about the patterns

predicted by the model for an incomplete ground plane installation at a fixed station. On the lower bands, particularly, it is not always practical to extend the long ground radials in a symmetric shape about the base of a vertical antenna. The model should be useful in understanding such cases if the obstruction limiting the ground plane to less than a circle does not likewise prevent the vertical element from being installed in the clear. For example, the patterns for a vertical installed at one corner of a garden would probably differ from those for a vertical next to the corner of a house, even though both conditions might have a 90-degree area that was unavailable for ground radials. Basically, the model suggests that a hole or depression exists in the radiation pattern centered in the area having no radials. Directly opposite the hole is centered a broad field maximum over the ground radials. The hole is a function of the angle of elevation, and its maximum depth is of the order of 6 db. or so below the field in the opposite direction at elevations near 40 degrees. Naturally the hole width could be greatly reduced as the area about the base is more evenly covered with radials.

Experimental Results

The computed patterns were subjected to several checks. One check utilized an experimental model of Fig. 1 at 430 Mc. The wire model was located about three wavelengths from a two-element beam fed by a 6J6 rig from an old *Handbook* design. The detector was a 1N23 crystal operating in the square-law region. The measured *E*-field pattern is given in Fig. 3A for the vertical element perpendicular to ground and an angle of elevation of 15 degrees. There is good general agreement with the calculated pattern of Fig. 2A. Tilting by 45 degrees produced a maximum/minimum gain of 5 db. An increase of radiation in the forward directions was noted at higher elevations.

Of course the primary reason for examining the incomplete ground plane model lay in the degree that it approximated 10-20 meter mobile radiation. Included in Fig. 3A is a mirror image (whip mounted on right rear fender) of some 20-meter *E*-field data taken on the mobile installation of WA4KQO. While the receiving antenna was higher than the whip-Hillman combination, the angle of elevation unfortunately was not measured. It was less than 5 degrees. The experimental points are characteristic of the low-angle radiation from the model.

To further confirm the effects of tilting the whip away from the normal, a 1/15.4 scale model of a Tornado was constructed. At this scale, the 430-Mc. whip was equivalent to a $\frac{1}{4}$ wave whip on 10 meters. An aluminum foil skin 0.00125 inches thick covered the balsa stringer shell. Fig. 3B presents the measured field strengths at a 15-degree wave angle. Input power remained constant as the whip was tilted. Again comparing the experimental data with the curves of Fig. 2A, it is apparent that the ground-

(Continued on page 148)

• *Beginner and Novice*

A Two-Tube 75-Watt Transmitter

Using Parts from an Old TV Set To Keep Costs Down

BY LEWIS G. McCOY,* WIIICP

THIS article describes a crystal-controlled oscillator-amplifier transmitter, capable of 75 watts input, constructed from old TV parts and readily-available materials. One of the problems in building gear these days is obtaining the necessary parts. We have made an effort to make this job as easy as possible while still keeping the cost down.

Every ham should do *some* construction work in order to get a working knowledge of how a transmitter operates. Such construction will prove very valuable in answering many of the questions asked by the FCC when you're seeking a higher-grade license. You'll learn while building and have the nice feeling of having built a piece of gear you can be proud of. Let's take a look at the circuit details of the transmitter.

The Circuit

A 6BQ5 is used as a grid-plate oscillator with either 80- or 40-meter crystals. The plate circuit of the oscillator can be tuned to twice or three times the crystal frequency to provide the proper driving frequency to the 6HF5 amplifier stage, as required for output on the 80- through 10-meter bands. The amplifier can be run with as much as 100 watts input, depending on the power supply and the tank circuit loading.

One feature of this rig is the incorporation of a reflectometer between the pi-network tank circuit and the output terminal. The tank circuit is designed to work into a 50-ohm load, and the reflectometer will show when such a load is obtained. Also, the reflectometer will provide a tune-up output indicator showing when r.f. energy is flowing to the antenna system.

In order to keep construction costs down, an old TV power transformer is used to power the transmitter. We have found that old TV chassis usually can be had for a dollar or two — or even for nothing — from TV servicemen. Such units make an excellent start on a junk box. Most TV transformers are in the 600- to 700-volt range, center-tapped, and will provide about 400 volts d.c. out of the type of filter circuit used in this transmitter. They have plenty of current capability and it is an easy matter to get 75 watts or more power.

Also, many of the fixed resistors and capacitors used in this unit can be found in the old sets.

* Beginner and Novice Editor.

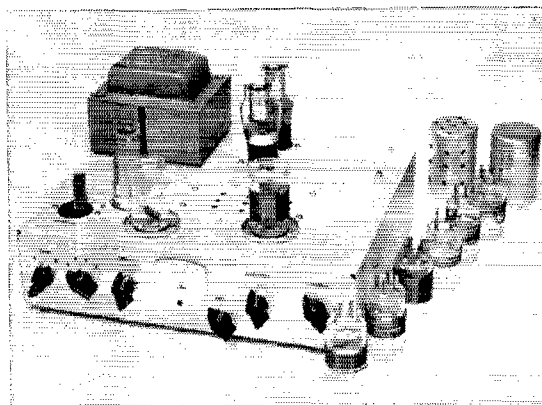
The silicon diodes, CR_3 and CR_4 , used in the power-supply circuit rectify the a.c., which is then filtered by two 60- μ f. electrolytic capacitors in series across the output terminals of the supply.

Amplifier grid and plate currents are measured by a 0-1 milliammeter connected as a voltmeter. Full scale for grid current is 8 ma. and for plate current is 400 ma. In addition, the same meter can be switched to read the rectified forward and reflected currents for the reflectometer.

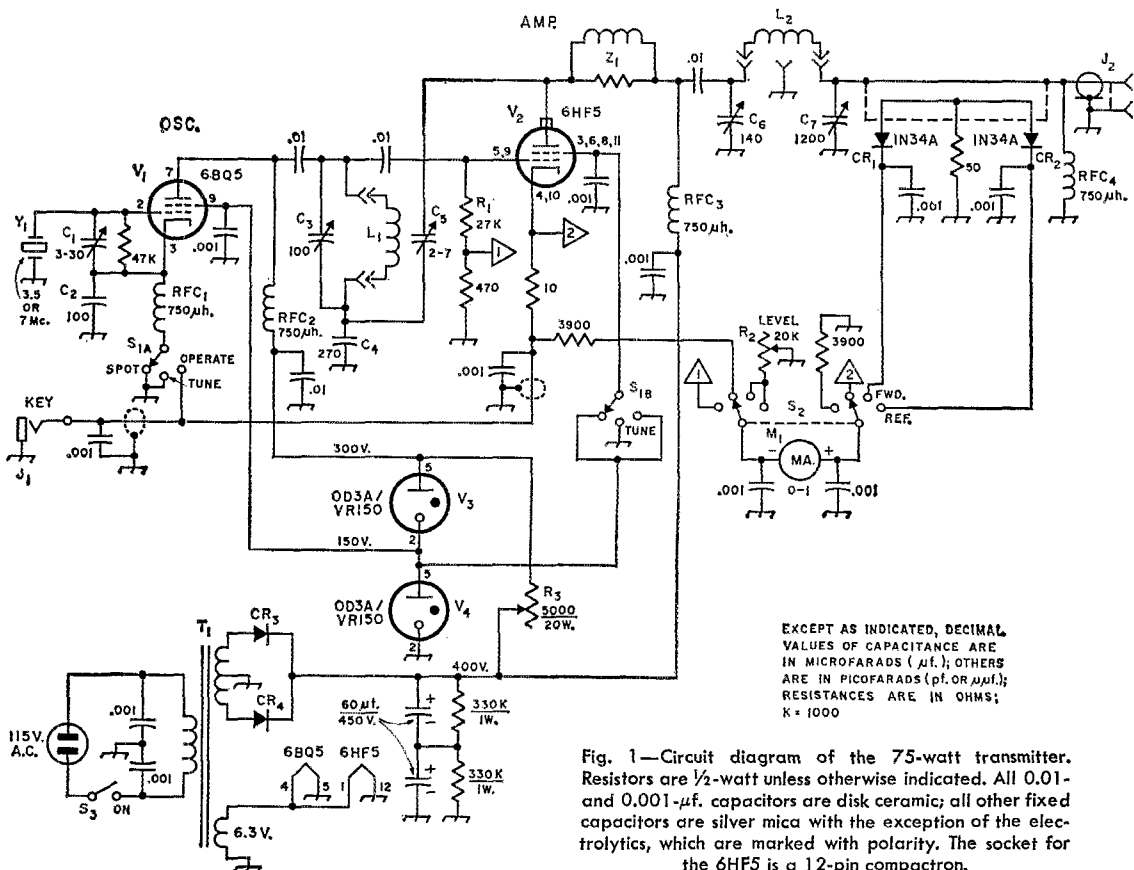
Cathode keying is employed in the rig, and by use of S_1 either the amplifier alone or both stages together can be keyed.

In order to simplify construction, plug-in coils are used in both the grid and plate circuits of the amplifier. This type of construction eliminates the complicated switch wiring necessary for a completely bandswitching rig. In addition, it has the advantage that only those coils really desired need be made up.

One of the problems in using plug-in coils is that of providing adequate shielding for TVI. This was taken care of by using coil shields



The controls across the chassis front from the left are: tune-up switch, meter switch, grid tuning, meter sensitivity control, amplifier tuning and loading control. The two coil shields are Millen type 80011. Note that the amplifier shield is perforated with 1/4-inch diameter holes. This is done to permit ventilation of the amplifier coil as there is some heat dissipated from this coil.



EXCEPT AS INDICATED, DECIMAL VALUES OF CAPACITANCE ARE IN MICROFARADS ($\mu\text{f.}$); OTHERS ARE IN PICO FARADS (pf. OR $\mu\text{mfd.}$); RESISTANCES ARE IN OHMS; K = 1000

Fig. 1—Circuit diagram of the 75-watt transmitter. Resistors are $\frac{1}{2}$ -watt unless otherwise indicated. All 0.01- and 0.001- $\mu\text{f.}$ capacitors are disk ceramic; all other fixed capacitors are silver mica with the exception of the electrolytics, which are marked with polarity. The socket for the 6HF5 is a 12-pin compactron.

- C₁—3-30-pf. trimmer.
- C₂—100-pf. silver mica.
- C₃—100-pf. variable (Millen 26100 or similar).
- C₄—270-pf. silver mica.
- C₅—1.5-7-pf. trimmer (Centralab 825-EZ, Erie COPO-10R or similar).
- C₆—140-pf. variable (Millen 22140 or similar).
- C₇—3-section variable, 365-400 pf. per section (broadcast t.r.f. type), with sections in parallel.
- CR₁, CR₂—1N34A germanium diodes.
- CR₃, CR₄—1400-volt p.i.v., 600-ma. silicon diodes.
- J₁—Open-circuit key jack.
- J₂—Coax chassis connector, type SO-239.

- L₁, L₂—See coil table.
- M₁—0-1 d.c. milliammeter.
- R₁—27,000 ohms, $\frac{1}{2}$ watt.
- R₂—20,000-ohm control.
- R₃—5000 ohms, 20 watts, with slider.
- RFC₁—RFC₄, inc.—750- $\mu\text{h.}$ r.f. choke (Millen 34300-750).
- S₁—Two-pole, five-position rotary, three positions used (Centralab PA1003, Mallory 3226J).
- S₂—Same type as S₁, four positions used.
- S₃—Single-pole, single-throw toggle.
- T₁—TV power.
- Y₁—3.5- or 7-Mc. crystal.
- Z₁—9 turns No. 20 space-wound on a 100-ohm, 1-watt resistor.

which can easily be removed for bandchanging. TVI, while not the problem it was in the early days of television, must still be reckoned with, particularly if the amateur lives in a fringe area and has harmonically-related TV channels to cope with. This rig has adequate shielding in that the critical points are taken care of.

Construction Method

A 3 × 10 × 12-inch aluminum chassis is used to house the rig. In order to obtain adequate shielding, the amplifier tube, V₂, is mounted on a 2 × 2½-inch bracket below the chassis top. As mentioned before, the plug-in coils are

covered by coil shields, and the oscillator tube, V₁, mounted above deck also has a tube shield. In addition, the keying lead which runs from S₁ on the front of the chassis to the key jack on the back is run in shielded line and by-passed at both ends with 0.001- $\mu\text{f.}$ disk ceramic capacitors. With a bottom plate on the chassis, the r.f. shielding is tight. Also, a terminal strip is mounted as close as possible to where the a.c. line enters the chassis and both sides of the a.c. line are by-passed with 0.001- $\mu\text{f.}$ disk ceramic capacitors. This reduces any chances of harmonics escaping via the a.c. line. Reynolds perforated aluminum is used for the bottom plate

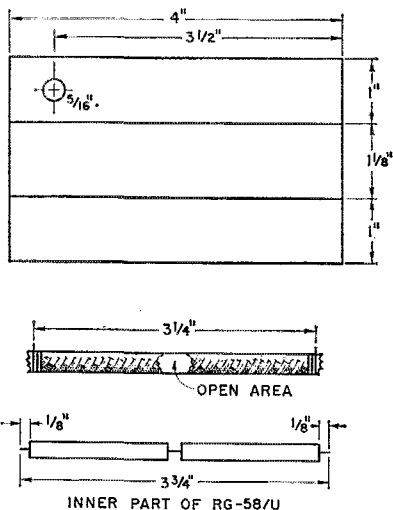


Fig. 2—Construction details of the elements of the reflectometer.

and is screwed with self-tapping screws to the bottom, with the screws spaced no more than three inches apart around the bottom.

The panel meter should also be shielded, particularly if you live in a weak signal area and have harmonically-related TV channels to deal with (Channels 2, 3, 4 and 6). The simplest way to shield the meter is to cut a piece of copper roofing flashing to fit around the meter and another piece to make the back shield where the meter terminals are. Make the holes in the back shield for the meter terminals large enough to clear the terminals. These copper-flashing pieces are easy to solder together, so it is a simple matter to make an effective shield. The shield is soldered to lugs mounted under the meter mounting screws. The meter leads should be bypassed at the meter terminals with 0.001- μ f. disk ceramics. Connect the capacitors between the terminal lugs and the copper flashing, keeping the capacitor leads as short as possible.

When mounting C_3 on the chassis front, be sure the shaft of the rotor doesn't touch the chassis, because both the rotor and stator must be insulated from the chassis. The type of capacitor used for C_3 has mounting studs on either side of the rotor, so it is simply a matter of making the rotor hole large enough to clear the rotor. We used an octal socket for the crystal, as these are easy to get from your old TV set. However, if you have a regular crystal socket it can be mounted in the same area as the octal.

In order to provide ventilation for the amplifier tube, $1/4$ -inch holes are drilled in the chassis top, directly over the tube, as is apparent in the top-view photograph. The chassis bottom plate is made from Reynolds perforated aluminum stock. If a solid sheet of metal is used, there won't be adequate ventilation, which in turn would shorten the life of the tube and other components. Also, rubber feet are used to permit flow of air through the bottom.

Reflectometer Details

Fig. 2 shows the essential construction details of the reflectometer. It is similar in construction to the Varimatch¹ except that RG-58/U is used instead of copper tubing. A piece of copper flashing or other solid metal is cut to the dimensions specified, a $5/16$ -inch-diameter hole is drilled as shown, and the piece is then bent into the form of a U. The end of the U is mounted in the corner of the chassis, as shown in the bottom-view photograph, so that it is flush with the chassis back and is centered around J_2 . The outer braid of the coaxial cable is soldered at one end to the inner-conductor pin of J_2 and at the other end to a short piece of solid wire connected to the terminal point mounted on top of the U at the $5/16$ -inch hole. Make sure that the short length of wire connected to the outer shield doesn't short to the edge of the hole. A length of solid wire, sufficiently rigid to support itself, is connected from the tie point to the stators of C_7 , the pi-network loading capacitor. C_7 is a three-section, 365-pf.-per-section variable with the three sections connected in parallel to give a total capacitance of about 1200 pf.

When soldering the 50-ohm resistor to the inner conductor of the reflectometer pick-up sections be sure that none of the hair-like wires of the outer braid short to the connection. Also, make the resistor leads as short as possible. In our case, the other end of the resistor is soldered directly to the copper flashing, with lead lengths held to less than $1/4$ inch.

The 1N34A diodes can easily be ruined by too much heat when soldering their leads, so a heat sink (pliers or a metal clip) should be attached to the lead between the body of the diode and the soldering point.

Coil Information

The coil table gives all the essential information about the coils. While it may seem a little ridiculous to use wire as large as No. 16 for the grid coils, the builder only needs to get *one* kind and size of wire for all the coils, which makes the shopping chore that much easier. Four-prong coil forms are used for the grid coils and five-prong forms for the amplifier tank.

Fig. 3 shows the wiring of the 80- and 40-meter amplifier plug-in coils. These coils require

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

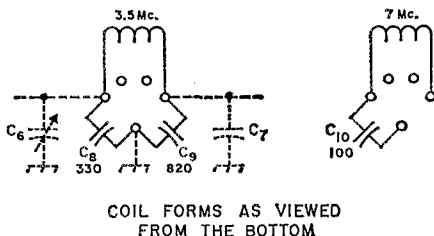


Fig. 3—Connections for the 3.5- and 7-Mc. plug-in coils with their respective capacitors.

C_8 , C_9 , C_{10} —See coil table.

Coil and Crystal Table

	<i>Crystal</i>	<i>Grid, L₁</i>	<i>Pi Network, L₂</i>
3.5 Mc.	3.5 Mc	25 μ h. ¹	17 turns, close-wound ^{2, 3}
7 Mc.	3.5 or 7 Mc.	16 turns, close-wound	20 turns, close-wound ⁴
14 Mc.	7 Mc.	9 turns spaced over 1-inch winding length	7 turns spaced over 1- inch winding length
21 Mc.	7 Mc.	4 turns spaced over 1-inch winding length	6 turns spaced over 1- inch winding length
28 Mc.	7 Mc.	Use 14-Mc. coil	3½ turns spaced over 1-inch winding length

All coils wound with No. 16 enamel or Nylclad copper wire. Coil forms are 1¼-inch diameter, Allied Radio type 24-4P (four-prong), and 24-5P (five-prong).

¹ 25- μ h. r.f. choke (Millen 34300-25).

² C₃ — 330-pf. silver mica.

³ C₉ — 820-pf. silver mica.

⁴ C₁₀ — 100-pf. silver mica.

additional capacitors, as C₆ and C₇ do not have sufficient capacitance for working into a 50-ohm impedance on these bands. The additional capacitors should be silver mica and should be mounted inside the plug-in forms.

Be sure to scrape the enamel off the coil ends before soldering them to the coil pins. Also, file the ends of the coil pins slightly as they have a nickel covering and the solder doesn't "take" easily to the nickel.

If you are a newcomer or are winding coils for the first time, you'll note that in some of the coils the number of turns is to be spaced over a one-inch length. This means that the turns should be as equally spaced as possible throughout a total length of one inch.

The only coil that isn't wound with No. 16 wire is the 80-meter grid coil. A 25- μ h. r.f. choke is used for this band, as it would be difficult to wind a coil of this much inductance on one of the plug-in forms, even with wire smaller than No. 16.

Neutralizing the Amplifier

When you wire the rig, don't make the d.c. plate- and screen-voltage connections to the amplifier tubes until you have completed neutralizing the final. However, all other connections can be made. An absorption wavemeter² will make it easy to neutralize the amplifier, so if you don't have a wavemeter try to borrow or build one.

The first step is to tune up the rig on whichever band you have completed coils for. Using the appropriate crystal, turn on the rig and let the heaters warm up. (*Caution:* Check all your wiring before applying power or the "smoke" test.) With the heaters warmed up, close the key and switch the meter to read amplifier grid current. Tune C₃ for maximum grid current. Next, couple the wavemeter to the amplifier tank coil — be sure to remove the shield! — and set C₇ at maximum capacitance (plates fully meshed). Tune C₆ for an indication on the wave-

meter. The object in neutralizing is to have the least amount of r.f. in the tank coil with C₆ resonated. First, get the maximum reading with the wavemeter and then, using an insulated screwdriver, adjust C₅ to reduce the reading as much as possible. After each adjustment of C₅ you should retune C₆ for maximum, but keep shooting for the setting of C₅ that gives the least reading when C₆ is peaked. It is a good idea to set the wavemeter on a prop or box so that it doesn't have to be moved in relation to the tank coil while you're neutralizing.

Another method of neutralizing, but not quite as accurate, is to adjust C₅ so that there is the least amount of change in the grid current reading on M₁ when the tank capacitor C₆ is tuned through resonance.

Final Tune-Up and Adjustments

After you have neutralized the amplifier, connect up the screen and plate voltages to V₂. Be sure to turn off the voltages when making these or any other adjustments inside the transmitter. The voltages can be lethal so *always* think twice before you dig into a piece of gear. Make sure all voltages are off and short the power-supply electrolytics to chassis to discharge them.

When you first turn on the rig, observe the VR tubes to see if they are lit. Initially, the complete resistance of R₃ should be in the circuit. If the tubes are not lit, turn off the transmitter and use an insulated screwdriver to short the plus-B line to chassis. This is a safety precaution because the electrolytic capacitors in the supply are slow to discharge and you are liable to get a nasty, or dangerous, shock if you touch the plus-B line. Next, reduce the amount of resistance by moving the slider on R₃, then turn on the rig and see if the VR tubes light. If not, turn off the rig, short the capacitors again (every time you work on the rig, in fact), and move the slider again. The object is to have the VR tubes lit both with the key up, and with the key down and the rig running full input. It may take a few adjustments of R₃ to accomplish this.

² *The Radio Amateur's Handbook*, Measurements chapter, or *Understanding Amateur Radio*.

With everything connected up you are ready to try the rig on a dummy load. A 100-watt light bulb can be used as a load. We bought one of those dime-store light sockets, connected a piece of coax to the socket terminals — outer braid to one side and inner conductor to the other — and put a coax fitting on the other end. The fitting connects to J_2 .

Set S_1 in the tune-up position, which grounds the screen of the amplifier tube, switch S_2 to read grid current, and tune C_2 for maximum grid current. The current should be 5 ma. or more. Next, switch the meter to read plate current, open your key, and set S_1 to either position 1 or 3. C_7 should be set at maximum capacitance. Close the key and tune C_6 for a dip (minimum) in plate current. You'll find that the bulb will light dimly. Next, start decreasing the capacitance of C_7 , continually reresonating C_6 and watching the bulb. You should be able to get the bulb almost to the same brilliance as when it is screwed into a regular light socket.

Next, detune C_3 while watching the bulb and you'll notice the bulb will first brighten and then dim. If you detune C_3 far enough the bulb will go out; don't hold this condition long because the amplifier tube will be drawing too much plate current. Adjust C_2 to the point where the lamp is brightest and then check your grid current. You'll find that slightly more than 1 ma. of drive is all that is required for maximum output from the transmitter.

Next, switch the meter to read forward power and set R_2 so the reading is full scale. Then switch the meter to read reflected power and note

the reading. A 100-watt lamp bulb is not a perfect 50-ohm load so there should be some reading on the meter. (If it were a perfect load the meter would read zero, indicating a 1-to-1 standing-wave ratio.) In our case, with the bulb at nearly the same brilliance as when plugged into the 115-volt a.c. line, the reflected reading was about 3 on the meter, which was calibrated from 0 to 10.

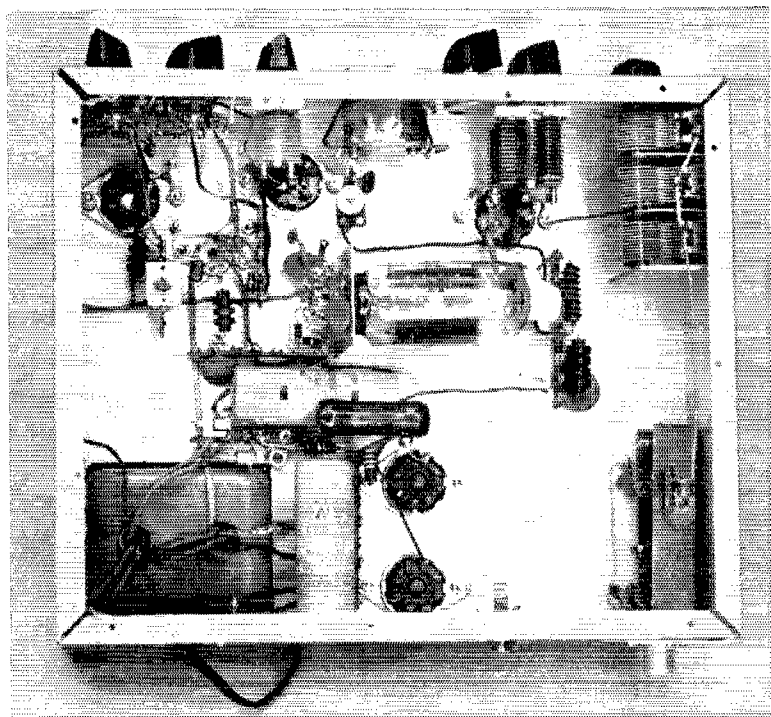
In the grid circuit of V_1 , C_1 is an adjustable feedback capacitor. Tune up the transmitter on the highest frequency band you have made coils for, and with the rig running into the dummy load, set the meter to read grid current and adjust C_1 for maximum drive.

Using the Rig with an Antenna

We have no way of knowing what type of antenna the builder will use, but a couple of points are worth passing on. First, we highly recommend the use of a transmatch between the transmitter and antenna system, particularly for Novice use. A transmatch used in conjunction with the antenna system will provide the proper load for the rig and will reduce or eliminate harmonics. This last is very important to the Novice operating on 80 meters. A suitable transmatch was described in a recent issue of *QST*.³ This unit was designed to be used with either tuned lines, such as open wire or Twin-Lead feeders, or with coax-fed antennas. Regardless of the antenna system used, the transmitter should be connected to the transmatch via a

(Continued on page 138)

³ McCoy, "A Transmatch for Balanced and Unbalanced Lines," *QST*, October, 1966.



The oscillator components are grouped in the upper left hand corner in this view. At the lower left hand corner are the power supply parts. The trimmer just to the rear of the meter is C_5 , the neutralizing capacitor. At the lower right hand corner is the reflectometer.

THE KIT CHECKER

A Simple Tester for New and Old Gear

BY BOLESŁAW A. SKURNOWICZ,* W3OSJ

There is always a need for checking out a piece of equipment after it has been assembled from a commercial kit. Home-made equipment is deserving of the same treatment. One way to be sure that the gear won't go up in smoke when it is first turned on is to go over all of the wiring, completely and carefully, checking resistance readings from B plus to ground, across the transformer windings, and in other parts of the circuit where resistance readings can be compared against those given in the instruction manual.

A more certain way to avoid smoking components when you first turn the switch to ON, is to install the simple tester described in this article, between the equipment and the 115-volt line. The kit checker protects the gear being tested, even if a dead short is present in the circuit. The checker places an ordinary 115-volt incandescent lamp in series with the a.c. input to the piece being tested, thus causing the bulb to consume power from the line when a shorted, or partially shorted circuit exists. The checker also includes a means for measuring the a.c. current being drawn by the equipment.

given a careful inspection, visually, then checked for proper resistance readings as specified in the instruction book. Once this has been done, the line cord from the equipment can be plugged into J_1 of the tester. Next, plug a 25-watt, 115-volt lamp into socket X_1 . Place S_1 in the ON position. When the equipment under test is turned on, the bulb should light to approximately half of normal brilliance if no serious shorts exist. If the bulb becomes *very* bright, this indicates that an abnormally heavy load is being drawn by the equipment and that a short or partial short is present. The larger the lamp used, the greater will be the amount of current that can flow to the load. A 25-watt bulb will allow up to 0.25 ampere to flow. A 50-watt bulb will permit a flow of up to roughly 0.5 ampere. A voltage reading can be taken across the lamp at any time and if this reading approaches that of the line voltage itself, there is trouble in the equipment under test.

If the equipment is working normally, its voltages (bias, B plus, and filament) will be lower than specified by the manufacturer when the tester is in series with the line. The larger the bulb used at X_1 , the higher the circuit voltages will be.

Once it is determined that the equipment is working properly, the light bulb can be replaced by a fuse of appropriate value for the equipment being tested. Generally, a 5-ampere fuse will suffice for all but the largest of equipment. Next, the voltage across R_1 can be measured, with S_1 open, to determine how much current is being drawn by the equipment. A voltmeter is connected between E_1 and E_2 . A reading of one volt, for example, equals one ampere of current. Five volts equals five amperes, and so on. CAUTION: Resistor R_1 will handle a maximum of five amperes, only, so make the tests short in duration. Combinations of paralleled 25-watt resistors can be used to permit measurements on larger equipment, if desired.¹ Although R_1 will not be a precision unit, the results of the tests will be accurate enough to permit a comparison between the manufacturer's stated current figures and those that are calculated from the voltage drop across R_1 .

The checker can be used to trouble shoot appliances, also, such as toasters, electric irons, motors, and the like. It is useful for working on all types of electrical equipment. QST

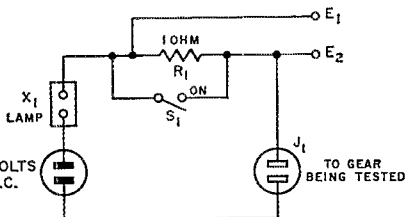


Fig. 1—Schematic diagram of the kit checker. X_1 is an incandescent lamp socket, test points E_1 and E_2 can be insulated pin jacks, and S_1 can be any s.p.s.t. switch that will handle the current being drawn through the circuit. R_1 is discussed in the text. J_1 is a female a.c. receptacle.

Inexpensive Construction

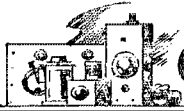
Ordinary household electrical hardware can be used to build the checker of Fig. 1. The layout used should insure against accidental contact with the 115-volt line. A wooden box can be used to house the unit, or a metal utility cabinet will work nicely. The lamp socket, X_1 , can be the porcelain variety used for surface-type house wiring. All components can be purchased for less than two dollars.

Using the Checker

As mentioned earlier, the equipment should be

* R.D. 1, Coudsboro, Pa. 18424.

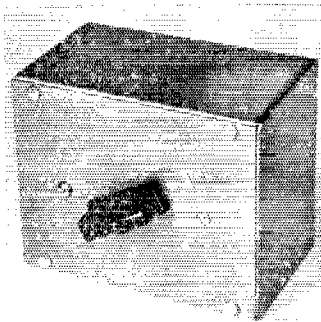
¹ If size and cost are not of great importance to the builder, larger resistors can be used at R_1 . One-ohm resistors are available in 100-, 175-, and 225-watt ratings. — Editor



A Really Rugged Coaxial Switch

ONE application of the new Millen high-power r.f. switch¹ that particularly interests us is for switching separate coaxial lines. As the switch is rated for 13,000 volts (!) and has silver-plated 20-amp. contacts, it should more than handle any amateur transmitter, even with a high s.w.r. in the line.

Before constructing the coaxial assembly shown in the photographs there was some apprehension that because of the size of the switch and the wide spacing between contacts, the completed unit might cause an appreciable mismatch in the line. However, with the construction method shown in the photographs it turned out that there was no need to worry. Testing the switch into a flat 50-ohm load showed that no observable mismatch was introduced, at least not at frequencies up through 30 Mc.



A 3 × 4 × 5-inch Bud aluminum utility cabinet is used to house the coaxial assembly. Special care must be taken in lining up the holes in the front and back covers of the box because the switch is mounted between these two covers. The switch that we had came with six contacts, but only five were used. There is adequate room for the coaxial connectors on the back of the box if the number of lines to be switched is held to five.

Drill the front and back panels as shown in Fig. 1. The switch shaft extends about 1/8 inch out the back, so a clearance hole is required. Also, make sure that the edges of the coax fittings are 1/32 inch in from the edge of the cover, otherwise

¹ New Apparatus, *QST*, July, 1956, page 29.

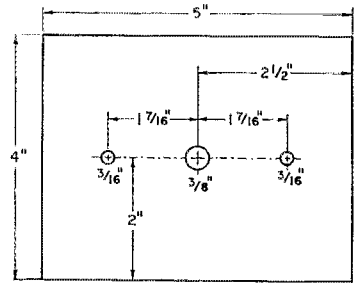
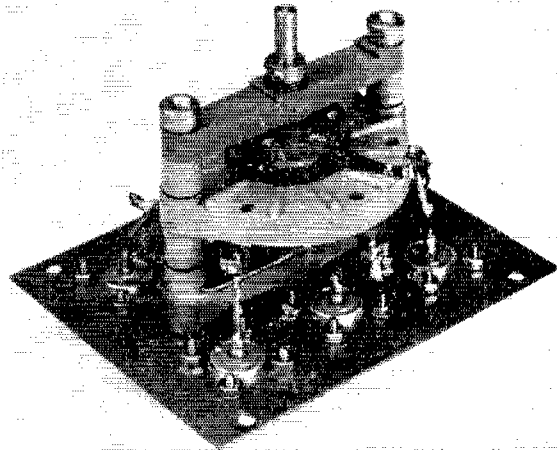


Fig. 1—The front and back panels of the utility box are both drilled as shown above.

the mounting screws won't clear the lip around the inside of the cabinet. If you use a painted utility box, remove the paint from under the coax fittings in order to get good ground connections. An unpainted box will save trouble.

No. 12 solid copper wire is used to make the connections from the switch terminals to the coax fittings. Keep the leads as short as possible.



The leads from each of the SO-239 coax fittings are kept short to reduce any impedance mismatch. As can be seen from this and the other photograph, the switch is supported on both the front and back box panels.

All soldering and wiring can be done with the switch mounted on the back panel, and when the connections are completed install the assembly in the box and mount the front panel. Don't forget to mark or letter the various sockets, because it is easy to make a mistake as to which is the common terminal.

As with other switches, don't change feeders with power going through the lines. With a switch as rugged as this one you probably could, but it isn't recommended.

Total cost of the complete assembly is about \$15 — less than that if you use surplus coax connectors. — *W1ICP*

QST ————— QST ————— QST

Image Dipper

BY DAN UMBERGER,* W8ZCQ

WHILE listening for intruders in the amateur bands, I began to wonder if I was actually hearing intruders or some combination of beats and signals cooked up by my receiver. An idea came to mind for a gadget that would indicate if a signal was in an amateur band or elsewhere. Over a period of years, I had used series-tuned traps to get rid of a lot of things I didn't want to hear. Now a calibrated series-tuned circuit would help me to identify the frequency of an interfering signal.

The gadget is pictured in Fig. 1 and its circuit in Fig. 2. All of the parts came from my junk box. By using plug-in coils, I was able to cover the two ranges I was most interested in, 6.2 to 14 Mc. and 13.8 to 23 Mc. Old octal tube bases made good no-cost coil forms. Phono connectors were used to mate with existing fittings on my

* 2753 Elliott Ave., Columbus, Ohio.

receiving equipment. The tuning capacitor was from an old f.m. tuner and the scale was just a sheet of heavy white paper pasted on the front of an old utility box. The words "image dipper" on the face of the unit point out the fact that many of the signals that I thought were intruders turned out to be images.

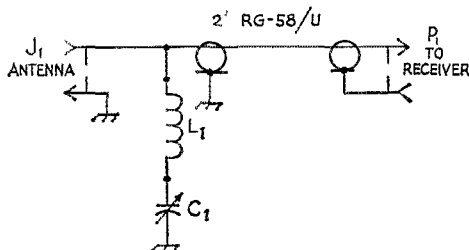


Fig. 2—Circuit diagram of the image dipper. J_1 is a phono jack and P_1 is a phono plug. The component values given below may have to be changed to obtain the designated ranges, depending upon the receiver input circuit.

C_1 —140-pf. variable.

L_1 —6.2–14 Mc.: 8 turns No. 22 enamel, 1/4-inch diam., closewound on octal tube base.
13.8–23 Mc.: 5 turns No. 22 enamel, 1/4-inch diam., closewound on octal tube base.

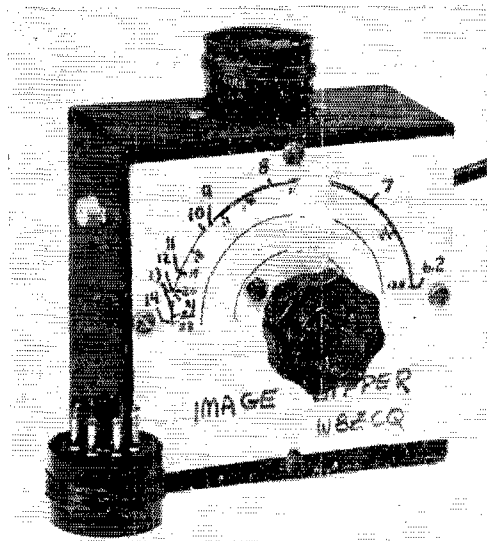
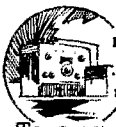


Fig. 1—W8ZCQ's image dipper. The cable at the right is part of a two foot length of RG-58/U that terminates in a phono plug.

Calibration of the image dipper is simple if a grid-dip oscillator is available. Connect the series wave trap to the antenna-input terminals of the receiver and attach the receiving antenna to the image dipper. With the g.d.o. loosely coupled to the trap, mark as many calibration points as desired on the dial scale. Note, however, that switching the receiver to another band or varying the input circuit may effect the accuracy of the calibration. To use the image dipper, simply tune the gadget through its range while listening to a suspected intruder. If the signal doesn't disappear or become greatly reduced in strength when the dipper and the receiver are tuned to the same frequency, the "intruder" is not an intruder at all, but is some sort of receiver product.

QST

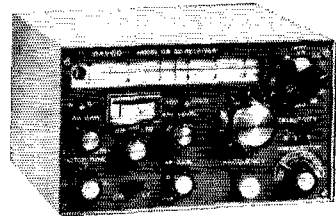


Recent Equipment



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

Davco DR-30 Receiver



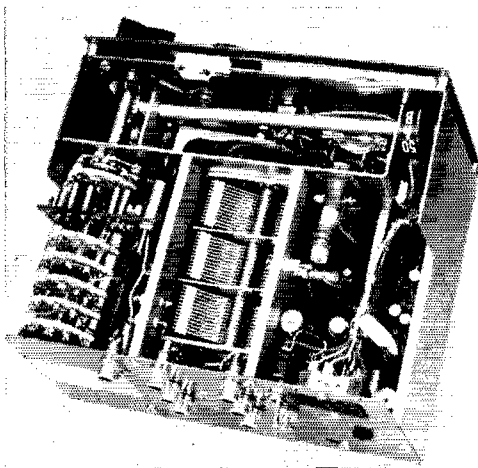
THE DR-30 is a miniature solid-state receiver that employs 25 transistors and 13 diodes in a modern-day circuit. It tunes all of the ham bands from 3.5 through 50.5 Mc. There are three additional bandswitch positions, one for monitoring WWV and two blank positions that can be used to tune additional 540-ke. sections of the h.f. spectrum. The receiver was designed with portability and compactness in mind and it is small enough to be held, easily, in one hand. Included in the design are such features as upper and lower sideband selection, variable selectivity, notch filtering, and a blanker-type noise limiter. A further reflection of Davco's state-of-the-art approach is seen in panel-controlled variable a.g.c. attack times, fast, medium, and slow. The likelihood of front-end overload, cross-modulation, and poor image rejection has been greatly reduced by the use of field-effect transistors (FETs) at the r.f. and first-mixer points in the

circuit. The early-model Davco receivers used conventional transistors in that part of the circuit and strong-signal difficulty was experienced in certain areas of the country.

The good frequency stability of the receiver is due, in part, to the use of a crystal-controlled first-conversion oscillator, Q_2 of Fig. 1. Because crystal oscillators of good design are innately stable, the receiver's overall stability is determined to a greater degree by the v.f.o., Q_9 , which tunes from 1960 to 2500 kc. The latter is the second-conversion oscillator in the double-conversion lineup.

Returning to the input section of the receiver, Fig. 1, front-end transistor Q_1 is protected from strong-signal burnout by two back-to-back connected diodes, CR_1 and CR_2 . The diodes are bridged between the antenna tap on the input inductor and ground. When an incoming r.f. signal reaches approximately 0.5 volt, the diodes short circuit the input signal to ground, protecting the input transistor. The use of FETs at Q_1 and Q_3 helps to eliminate the overload problems mentioned earlier. When compared to ordinary transistors, FETs offer the advantages of near square-law operation. This feature is particularly beneficial in reducing cross modulation. Also, FETs are voltage-operated like vacuum tubes, permitting the use of high-impedance tuned circuits. Since no compromise between power transfer and Q is required, as would be the case if conventional transistors were used, the selectivity of the tuned circuits can be made better. This means that the image rejection should be comparable to that of a vacuum-tube front end of similar design. Further, FETs are far less noisy than conventional transistors, offering a better signal-to-noise ratio.

The first i.f. is produced at the mixer stage, Q_3 , and covers the range from 2405 to 2955 kc. The signal is amplified by Q_{4A} before reaching the second mixer, Q_5 . The v.f.o. output, 1960-2500 kc., is amplified by Q_{10} and is then heterodyned with the first i.f. energy to produce the second i.f. of 455 kc. at Q_5 . The 455-ke. signal is ampli-



Topside view of the Davco DR-30. The three-section variable at the center is the main tuning control. Bandswitching is done with the 6-section ceramic rotary switch at the left of the chassis.

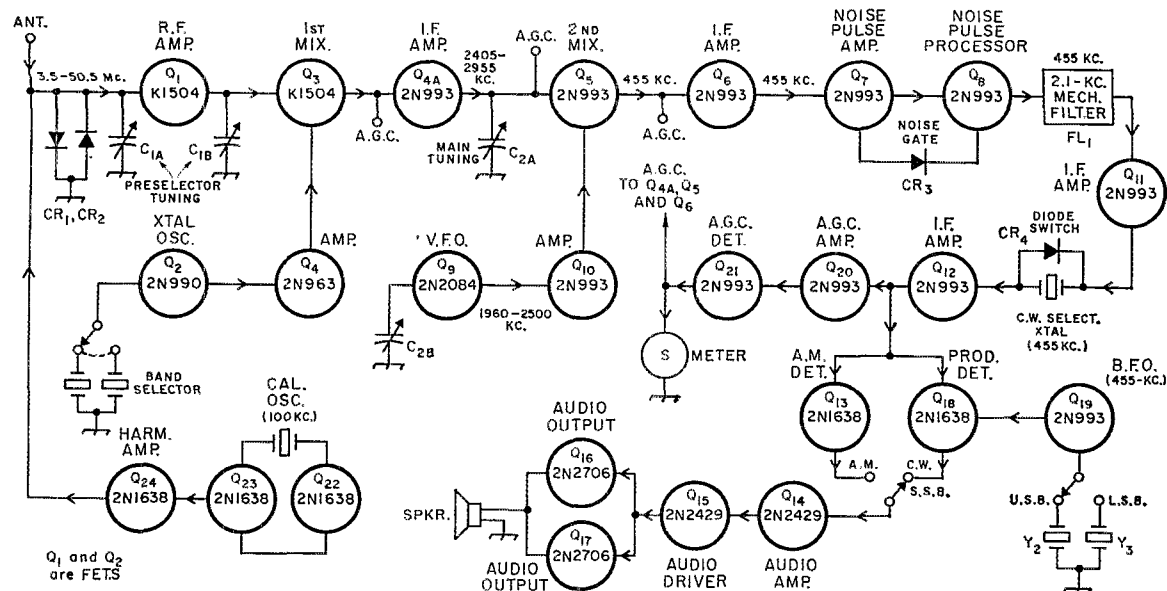


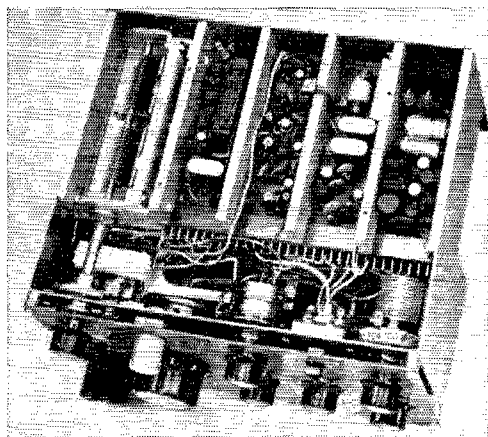
Fig. 1—Block diagram of the Davco DR-30 receiver.

fied by Q_6 and is then fed to the noise-pulse amplifier/processor circuit which consists of Q_7 and Q_8 . At Q_7 the noise pulses are amplified and their rise time is increased. The noise pulses are not significantly lengthened, however, as would be the case if they were removed *after* the highly selective i.f. filters. Further processing of the noise energy is effected by Q_8 which produces a pulse that operates the diode gate, CR_3 . This diode acts as a switch and mutes the receiver when it is turned off by a noise pulse that is riding through the i.f. channel. The philosophy behind locating the noise-limiting circuitry in the early stages of the i.f. system is to prevent the reduction in receiver sensitivity brought about by high values of noise-derived a.g.c. voltage. Receivers that use conventional a.n.l. circuits at the second detector are not protected in this way. The degree of noise limiting is set by a front-panel control (A.N.L. LEVEL) which adjusts the bias on CR_3 , establishing the level at which noise pulses will trigger the diode switch.

Additional diodes (not shown in the block diagram of Fig. 1) following the circuit of Q_8 are used as switches to establish any one of three degrees of selectivity available in the DR-30. The diodes are made to switch by applying d.c. bias to them from a front-panel selectivity control. In the broad-selectivity position three ceramic filters are used to establish a 5-kc. bandwidth. This setting is used for a.m. reception. The medium-selectivity position results in a bandwidth of 2.1 kc. which is set up by the mechanical filter, FL_1 , placed in the i.f.-signal path by one of the switching diodes. This setting is useful for a.m., s.s.b., and c.w. reception. In the 0.5-kc. selectivity condition, the width of the i.f. passband is determined by a 455-kc.

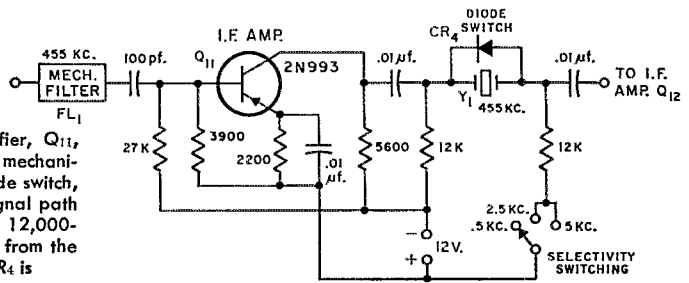
crystal, Y_1 , Fig. 2, through which the signal must travel. Diode switch CR_4 acts as a short circuit across Y_1 when biased into conduction by an external d.c. voltage, thereby removing Y_1 from the circuit. When the bias is removed from CR_4 , the switch opens and the 455-kc. crystal is in the circuit.

The i.f. signal is given additional amplification by Q_{12} after which it is routed to the a.g.c. amplifier, Q_{20} , to the a.m. detector, Q_{13} , and to the product detector, Q_{18} . Output voltage from the a.g.c. detector, Q_{21} , is used to operate the S



An under-chassis look at the DR-30. The two-section variable at the upper left is the preselector peaking control. A planetary drive is used with it to slow down the tuning rate. The Collins mechanical filter and the 455-kc. c.w. selectivity crystal are mounted in the chassis compartment to the right of the variable. The tuning capacitor at the lower right of the photo is used to tune the rejection notch across the i.f. passband.

Fig. 2—Schematic of the i.f. amplifier, Q_{11} , showing the relationship between the mechanical filter and the crystal filter. A diode switch, CR_4 , places the crystal, Y_1 , in the signal path when the d.c. bias is changed. Two 12,000-ohm resistors serve to isolate the r.f. from the d.c. supply. The operation of CR_4 is discussed in the text.



meter and to control the gain of stages Q_{4A} , Q_5 , and Q_6 . A front-panel switch selects the proper detector for s.s.b./c.w. reception (Q_{18}), or for a.m. (Q_{13}). When Q_{18} is switched into the circuit, the b.f.o. is activated by the mode switch and furnishes the necessary injection signal for upper- or lower-sideband reception. The b.f.o., Q_{19} , is crystal-controlled by Y_2 for upper-sideband. When Y_3 is switched into the circuit, the lower sideband can be received. Audio output from the detector in use is amplified to loudspeaker level by the audio-channel transistors Q_{14} , Q_{15} , Q_{16} , and Q_{17} .

A bonus feature in the DR-30 is a variable notch filter which follows i.f. amplifier Q_{12} . The depth of the rejection notch is factory-set by means of a rear-panel adjustment. The notch is tunable across the i.f. passband by using a front-panel control, labeled NOTCH TUNE. The manufacturer states that up to 60 decibels of rejection is possible with the circuit. Another feature of the Davco receiver is its built-in 100-kc. crystal calibrator. Transistors Q_{22} and Q_{23} function as the oscillator. Output from this circuit is fed into the harmonic amplifier, Q_{24} , which builds up the strength of the marker signals to a satisfactory level for use in the upper h.f. range of the receiver.

Mechanically, the DR-30 resembles the Rock of Gibraltar. An aluminum extrusion, $\frac{3}{16}$ of an

inch thick, serves as the main chassis for the receiver. The printed-circuit boards are securely attached to the heavy chassis, contributing to better-than-average mechanical stability. As a test, the writer tuned in a weak c.w. signal with the selectivity at 0.5 kc., then dropped the receiver from a height of approximately 10 inches. There was no significant shift in the pitch of the c.w. note when the DR-30 hit the desk. It would seem that this type of construction would be ideal for mobile work. The tuning capacitor is gear driven and the drive assembly is mounted on another heavy-gauge aluminum extrusion, a further aid to the mechanical stability of the receiver.

The power requirements call for a well-filtered d.c. supply that is capable of delivering between 11.5 and 16 volts. The maximum current drain will be approximately 300 milliamperes with the panel lights switched on. If the lamps are turned off, the drain will drop to about 150 milliamperes. The critical voltages in the receiver are regulated by Zener diodes; therefore there can be some latitude in the value of supply voltage to the receiver without impairing its performance. The DR-30 can be operated from a dry-battery pack, from wet cells, or from an a.c.-operated d.c. supply. The instruction book gives a circuit for the latter, should the owner wish to build one.

The slide-rule dial is calibrated in 5-kc. steps,

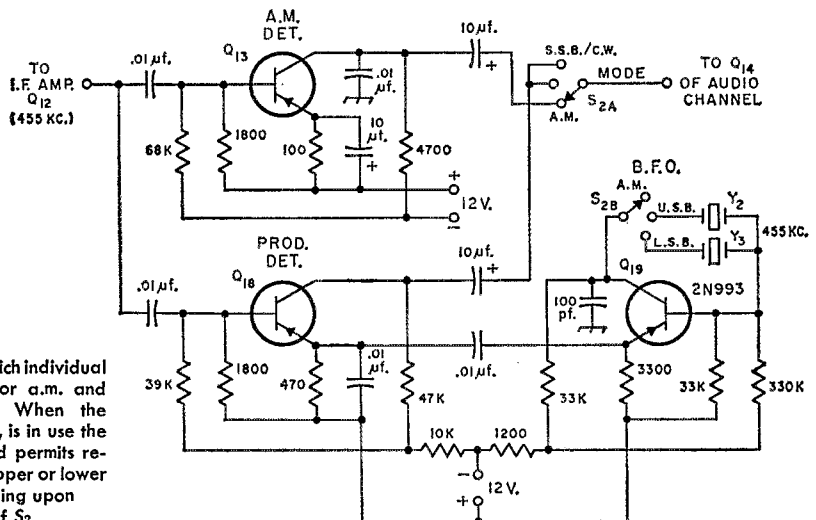


Fig. 3—Method by which individual detectors are used for a.m. and s.s.b./c.w. reception. When the product detector, Q_{18} , is in use the b.f.o. is activated and permits reception of either the upper or lower sideband, depending upon the position of S_2 .

with the skirt on the main tuning marked off in 2-ke. increments. It took a bit of "getting used to" when operating so small a receiver, but after an hour or so of tuning the DR-30, we grew accustomed to handling the controls and the operation felt quite comfortable.

Two-tone cabinetry is used on the DR-30. The outer case is finished in light gray and the panel is painted a darker gray and has a gloss finish. Black knobs with chrome satin inserts are used on the various controls, contrasting nicely with the color of the front panel.

—WICER

Davco DR-30

Height: 4 inches.

Width: 7 1/8 inches.

Depth: 6 inches

Weight: 7 pounds.

Power Requirements:

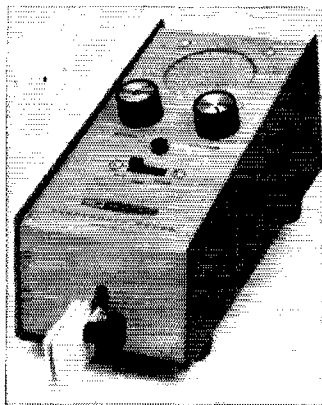
11.5 to 16 volts d.c. at 300 ma. maximum.

Price Class: \$100.

Manufacturer: Davco Electronics, Inc.,

P.O. Box 2677, Tallahassee, Florida 32304

Heath HD-10 Keyer



C.w. buffs haven't been forgotten as far as the Heath Company is concerned. Proof of this can be seen in the Model HD-10 transistorized keyer. Complete with power supply and paddle, the keyer features its own built-in monitor, permitting the operator to listen to side tone with headphones, or by monitoring with the miniature built-in speaker on the top panel of the HD-10.

Making the keyer even more flexible, a terminal block is mounted on the rear apron of the cabinet, permitting external connections for various functions. An outboard paddle can be connected to the terminals, allowing the operator to select between the built-in key or the externally-connected unit. Some other terminals make

possible the addition of dry batteries for powering the keyer during emergency or portable operation. A straight hand key can be connected to the rear terminals too, making the HD-10 useful for that type of c.w. operation.

Assembly time is minimized because the greater part of the circuit is on a printed-circuit board. Since there is little mechanical work to be done, the keyer goes together rapidly and without some of the head-scratching episodes experienced when wiring up the more complex kits. Actually, it was a pleasurable experience in kit building for this writer.

One of the most emotion-mixed moments for a kit builder comes when the project has been completed and it is time to turn the equipment

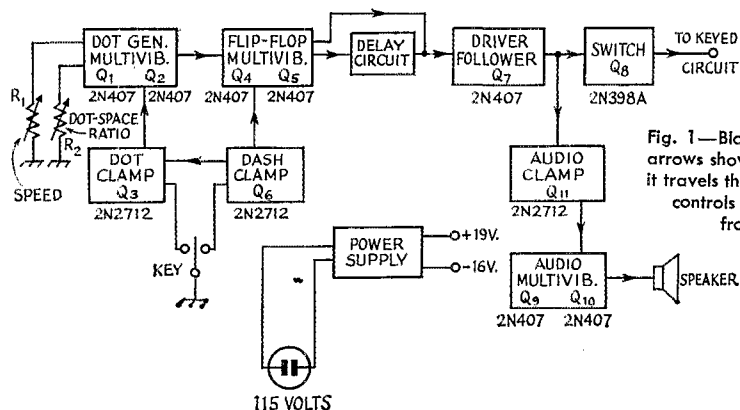
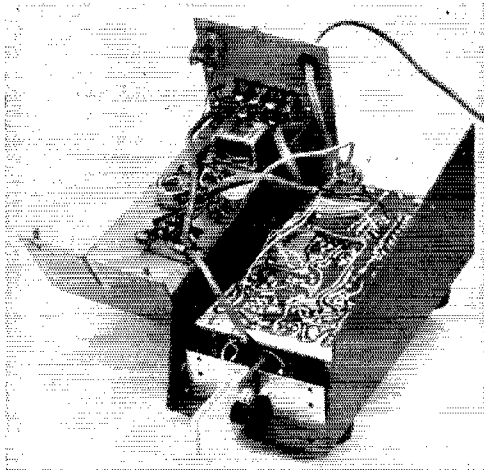


Fig. 1—Block diagram of the keyer. The arrows show the direction of the signal as it travels through the circuit. R₁ and R₂ are controls that are accessible from the front panel of the keyer.



Inside view of the keyer. The top half of the case is removed to show the circuit board, at the right, and the parts which are mounted on the top cover, shown at the left. Multi-conductor cable is used to interconnect the two parts of the assembly.

on to see if it will play. Happily, when the HD-10 was plugged into the wall outlet and the function switch placed in the OPERATE position, the neon panel lamp lit up and no smoke poured forth from the cabinet. An experimental test with the paddle produced dots and dashes. The speed control varied the words-per-minute output of the keyer, and the monitor speaker provided sufficient output for comfortable room volume.

Because this writer is not a c.w. demon, the keyer was set up for the optional 10 to 20 w.p.m. speed. The usual choice, for the seasoned c.w. man, would no doubt be the 15 to 60 w.p.m. range. The desired speed must be determined prior to assembling the kit so that the proper resistors can be soldered into the circuit board. Resistors for both speed ranges are furnished by the manufacturer.

The Keyer Circuit

A total of 11 transistors and 7 diodes comprise the solid-state complement of the HD-10. The block diagram of Fig. 1 shows how the various circuits are integrated. (Basically, the circuit is similar to the one described by W5LAN in May 1959 *QST*,¹ although there are of course considerable differences in detail.) The dot generator, consisting of Q_1 and Q_2 , is a free-running multivibrator. This stage is turned on and off by the dot-clamp circuit of Q_3 . The key's dot contacts control Q_3 which in turn biases the dot generator in and out of conduction by applying a positive voltage to, or removing it from, the base of Q_2 . The switching speed of the dot generator is varied by the setting of R_1 . The dot-space ratio is controlled by R_2 , a screw-driver adjust control, whose shaft is concentric with that of R_1 . The clutch-coupled shafts turn together as R_1 is

¹ — Old, "Transistorized Electronic Key and Monitor," *QST*, May, 1959.

adjusted, maintaining the dot-space ratio as the speed is increased.

A flip-flop multivibrator, Q_4Q_5 , is controlled by the dash-clamp circuit of Q_6 . The dash contact of the keying paddle controls Q_6 , which in turn changes the bias on Q_4 , turning it on or off. A delay circuit, consisting of several capacitors and resistors, is connected between the output of Q_5 and the input of the driver follower, Q_7 . This circuit insures that the output switching caused by the flip-flop multivibrator slightly overlaps that of the dot generator when the dashes are formed. If the overlap did not take place, there would be holes in the dashes, not unlike those caused by contact bounce with bug keys, or relays.

The driver-follower transistor, Q_7 , receives dot and dash signals from the multivibrators. In turn, Q_7 operates the audio-clamp stage, Q_{11} , and triggers the switch transistor, Q_8 . The audio clamp controls Q_9 and Q_{10} , which work together in a multivibrator which oscillates at audio rate. The latter produces the monitoring signal which is heard in the speaker. As Q_8 is driven in and out of conduction by the pulses from Q_7 , the transmitter is keyed through the collector-emitter junction of Q_8 . Because of the ratings of the switch transistor, the keying-line current is limited to a maximum of 35 milliamperes. The maximum permissible voltage, open-circuit or spike value, is -105 volts. These limits make the keyer most useful with transmitters that employ grid-block keying. For other types of transmitter keying where either the voltage or

(Continued on page 140)

Heath HD-10 Keyer

Height: 4 $\frac{1}{4}$ inches.

Width: 3 $\frac{3}{4}$ inches.

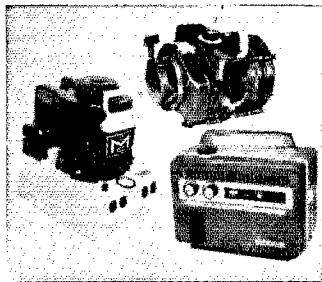
Depth: 10 $\frac{1}{2}$ inches.

Weight: 5 pounds.

Price Class: \$10.00.

Manufacturer: Heath Company, Benton Harbor, Michigan. 49022

Next Month



Lightweight Portable A.C. Generators

Technical Correspondence

PSEUDO-RANDOM SCANNING

Technical Editor, *QST*:

For a number of years now, Professor Deutsch's work on pseudo-random scan has been watched by those of us interested in furthering the cause of narrow-band TV, and I read the latest report by WA2PYX ("Technical Correspondence," October 1966 *QST*) with interest.

If we had perfect image storage devices, the question of scanning patterns would be unimportant; but since the only storage device most hams can afford is the lowly long-persistence cathode-ray tube, the best utilization of the characteristics of this device is vital, and the points raised by WA2PYX deserve further discussion.

P7 is a long-persistence phosphor representative of types readily available to hams. Typically, its brightness drops from 100 percent at excitation, to 10 percent after 1 second, to 1 percent after 12 seconds.¹ This is not ideal for any scanning pattern, and the question resolves itself into one of the subjective effect on the viewer. In a several-second linear scan system, the effect is one of a picture slowly "wiping" on, with the inevitable brightness variations occurring smoothly as the distance from the "writing line" increases. (With frame times of one second or longer, this effect is *not* a physiological "flicker" as was pointed out in one of Bell Lab's picture-phone patents; U.S. 2,922,843.) Phosphor decay in a pseudo-random scan system produces a random brightness modulation in the fine detail structure of the picture.

Pseudo-random scan has an undeniable advantage over linear scan at frame times less than one second where (1) true "flicker" exists, and (2) adjacent picture element brightness modulation or "noise" does not reach unacceptable proportions. The basic question is, however, whether any $\frac{1}{2}$ -second frame time slow-scan system represents an optimum for amateur use in the h.f. bands. Regardless of scanning pattern, we are faced with the basic time-resolution-bandwidth trade-off: Fixing any two parameters fixes the third also. Thus, for any given bandwidth, the longest possible frame time will give the greatest picture detail.

Eight-second frame time linear scan gives a picture in which the last frame's brightness fades to a marginally useful level just as new picture information is "wiped" over the old — a desirable situation when information changes from frame to frame. At long frame times (several seconds) pseudo-random scan loses its advantage over linear scan because phosphor decay causes a large pseudo-random brightness difference between adjacent elements that appears as noise modulation of an otherwise noise-free picture.

No $\frac{1}{2}$ -second frame-time system, linear or pseudo-random, represents an optimum solution for the h.f. bands because it does not make full use of the maximum storage time capability of available CRT phosphors. This results in a requirement for unnecessarily high bandwidth or produces

¹ RCA data on K7 phosphor

unnecessarily low resolution. Practical bandwidth on long-distance paths is generally less than the 2 to 8 kc. suggested by WA2PYX. QRM considerations, multipath effects, fading, and utilization of existing station gear all point to adoption of a frequency-modulation system similar to that used successfully for many years in long-distance facsimile transmission^{2, 3, 4}. This requires 2.5 kc. of "on-the-air" bandwidth with s.s.b. equipment and 5 kc. with a.m. It provides about 1 kc. of "useful" video bandwidth. This would give a very low resolution $\frac{1}{2}$ -second picture. Even if wider bandwidth techniques were used (such as bandwidth-limited 6-kc. vestigial sideband f.m. on "good" ionospheric paths) I think most of us with appreciable on-the-air slow-scan experience would rather see the additional bandwidth used to buy more resolution than reduced frame time.

Where pseudo-random scan seems to me of great value is in a 50- or 100-kc. system for the v.h.f. bands where its flicker-reduction capability would permit a reasonably high-resolution system capable of transmitting some motion. It is possible that the FCC might favorably consider a system of this type on frequencies where wide-band f.m. is now permitted, since the bandwidths are similar. *Copthorne Macdonald, W10NLQ, 5596 Old Stage Road, Boulder, Colorado 80302*

FIRE HAZARD

Technical Editor, *QST*:

An incident happened to me recently, which, in the interest of safety, it might be well to report.

I was awakened by a sputtering sound and a flicker of light from the radio shack, in an adjoining room. Rushing into the shack I found the control box of my TR-44 rotator ablaze with a noisy arc. After pulling the plug and assuring myself that no further danger existed, I returned to bed. Post mortem was held the next morning.

Apparently the small wire spring which holds the switch lever in contact position had rubbed against the primary contacts on the wafer. That side of the switch was completely burned away. What remained of the spring was fused to the shaft bushing, with a little ball of metal on the end to show where the arc had flared.

The 3-amp fuse in the line was still intact — with the odds being 50-50, it was in the grounded side of the line! My rig draws power from a separate 220-volt circuit, with No. 6 wire from a 100-amp. entrance. The 30-amp breakers in that circuit will stand up under considerable load. I was fortunate to come out with nothing more serious than a charred wafer switch and a badly-singed control box.

After this incident I checked into my Ham-M rotator. I find that it is fused in both sides of the primary circuit. Needless to say, when the TR-44 is repaired, it will be also. — *Frank Greene, K51QL, 303 South C Street, Yale, Oklahoma 74085.*

[EDITOR'S NOTE: Accidental grounds can be a real hazard, as too many amateurs have found out, to their sorrow. Fusing both sides of the line, and using a double-pole switch to break both sides when the equipment is not actually in use, is the only really safe procedure.]

² Mathes, et al, "Radio Facsimile by Subcarrier Frequency Modulation," *RCA Review*, Vol. 3, 42f, 1938.

³ Atwood, "Diversity Receiving System for Radio Frequency Carrier Shift Radio-Photo Signals," *RCA Review*, Vol. 12, 177f, 1951.

⁴ Macdonald, "SCFM — An Improved System for Slow-Scan Image Transmission," *QST*, January 1961.

MOS CAUTION

Technical Editor, *QST*:

In reference to the v.f.o. article that appeared in December *QST*: There should be a warning about handling of the 3N128 FET. This is an MOS FET, and as such has a gate capacitance of a few pf., with a gate resistance (ohmic) of thousands of megohms. Thus, a small static charge built up on the gate will develop enough voltage to pop the transistor. There is a warning about this on the data sheet, but many people will probably get the unit and not bother sending for the sheet. The following is from an MOS data sheet:

1. The leads of the device should remain wrapped in the shipping foil except when being tested or in operation, to prevent the build up of static charge.
2. Avoid unnecessary handling; when handled, the device should be picked up by the can instead of the leads.
3. The devices should not be inserted or removed from circuits with the power on, as transient voltages may cause permanent damage to the devices.

The above is from a Motorola data sheet, but of course, it still holds for the RCA transistor. They aren't kidding about this — I lost several by pushing the leads into a polystyrene block when they first came out with MOS FET's a few years ago. — *Marvin Norman, W1CSP, 137 Robbins St., Waltham, Mass.*

SIMPLE SUPER SELECTIVITY

Technical Editor, *QST*:

The human ear is an ingenious device and together with the brain forms a marvelous audio receiving system. The system is basically broad-band encompassing a frequency range of some eight octaves. And yet it may be made extremely narrow-band at the will of the operator without even turning a knob. Most c.w. operators make use of this capability without understanding it, but some simply are not disciplined enough to use it.

In the crowded amateur bands our ears are almost always subjected to more than one signal at a time; however, by concentrating on one of them it is possible to copy that signal provided that the QRM is not intolerable. The ear-brain system bandwidth may be reduced to the order of 50 cycles per second by concentration. You hear what you want to hear!!

In order to improve on the human sound-detecting system a filter with bandwidth less than 50 c.p.s. must precede the ear — possible, but difficult to use with the average transmitter-receiver frequency stability, not to mention "ringing" of the filter. We can probably do better by leaving our receiver bandwidth set at one or two kilocycles and using our own built-in filter. Adjusting the b.f.o. for single-signal detection or making use of the single-sideband selectivity available in modern receivers is highly desirable since this reduces the QRM probability by one-half.

The 50-c.p.s. bandwidth of the ear-brain system seems incredible but is documented and may be easily demonstrated for a single tone in the presence of white noise.¹ Typically, for a signal-to-noise ratio of unity, a pure tone in 3-ke. band-limited noise would indicate a signal report of 569. A signal-to-noise ratio of -20 db. (100 times less signal power) is barely discernable to a trained ear. In addition to being extremely narrow band, the ear-brain system is tunable over a range of about 200 to

1000 cycles with essentially the same bandwidth. Above and below this range the bandwidth increases. The system is therefore able to track a signal which is slowly drifting in frequency. It is interesting to note in connection with ear-brain bandwidth that a musician easily can distinguish half-tones in the musical scale. A half-tone at 500 c.p.s. is about 30 c.p.s.

The amplitude response of the ear is somewhat logarithmic, and consequently will tolerate a wide dynamic range without overloading. The non linear response, however, gives rise to distortion products which are invaluable to a piano tuner but a nuisance to a c.w. operator. Fortunately, these distortion products are much weaker than the weaker of any two original signals, the only one of any consequence being the difference frequency.

Another point worth mentioning is the insipid habit of most operators to tune their receivers so that the desired signal is heterodyned to a frequency of 1000 c.p.s. or higher. Nothing could be worse, for two reasons: First, the ear-brain bandwidth increases above 1000 c.p.s.; and second, it is far easier to separate signals which differ in frequency by heterodyning the signals to as low a frequency as possible. Indeed, if the undesired signal is set to zero beat there will be little difficulty in copying the desired signal. And this can be most desirably accomplished by careful tuning of the receiver and *not* by fiddling with receiver selectivity or mistuning the b.f.o., keeping in mind that the receiver r.f. gain be kept low and the a.f. gain up to minimize overload distortion within the receiver.

The next time you are thinking of buying a more selective receiver, put a little of the thought concentration on the signal you wish to copy and you will save the money — and become a better operator. — *Dick Turrin, W2IMU, Box 45, RR. 2, Colts Neck, N. J.*

Strays

The Royal City ARA, New Westminster, B.C., Canada, is sponsoring a certificate to honor Canada's Centennial Year 1967. The certificate is available to any amateur in the world who submits proof of contact with 100 Canadian amateur radio stations, any band, any mode, during the Centennial year, Jan. 1, 1967, Dec. 31, 1967. A copy of log information, verified by another amateur, will be accepted as proof of contacts. All certificates will be issued free of charge. Apply to: Royal City ARA, VE7FY, 7386 East Grandview Douglas Hy., New Westminster, B.C., Canada.

— . . . —

For the eighth year, Santa Claus will visit the 8-Ball Traffic Net (Los Angeles area) on 50.5 Mc. on Christmas eve, at 6:30 P.M. PST. To those v.h.f. people whose small children would like to hear Santa, get in touch with Net Secretary WA6KWV giving the child's name and the toy he has said he would like to have.

— . . . —

"Miser's Dream" Coil Data

"The Miser's Dream" receiver (*QST*, May, 1965) oscillator circuit has been revised slightly, to give better stability and ease of adjustment of the tuning range. *This* time notes were kept on the coil dimensions, and they can be had, together with the circuit revisions, for 25 cents. Address your request to Technical Department, ARRL, 225 Main Street, Newington, Conn. 06111

¹ Beranek, *Acoustics*, p. 394.

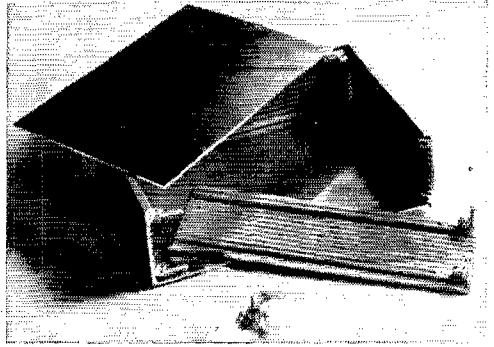
• New Apparatus

Aladin Breadboarding Kits

THE Aladin Kits Company has recently introduced a line of inexpensive breadboarding kits, two models of which are shown in the photograph. For illustrative purposes, both kits are shown partially assembled; normally each breadboard is supplied "knocked down" in a plastic bag.

The kits have several features not usually found in the home-constructed breadboard. Included with each model are several universal "Z" brackets that permit the no-hole mounting of components that normally require the drilling or punching of holes for their installation. The brackets are especially helpful in supporting transformers and chokes that have leads coming out their undersides, as well as tube and transistor sockets. Also supplied with the breadboarding kits are mounting brackets for switches and potentiometers. Each bracket has a $\frac{1}{4}$ -, a $\frac{3}{8}$ - and a $\frac{1}{2}$ -inch hole for accommodating various controls with different mounting dimensions. Brass bus straps are provided for making convenient ground connections as is a tool for the easy insertion of push-in terminals in the perforated board. The $\frac{3}{16}$ -inch thickness of the phenolic deck makes the board suitable for handling good-sized loads with little warping.

The smaller breadboarding kit, model XP48, is in the \$3.00 price class and includes one $4\frac{3}{4} \times 8\frac{7}{16}$ -inch



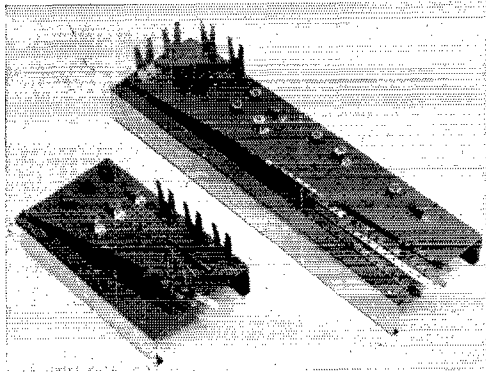
perforated board, two aluminum base plates, 25 silver plated push-in terminals, one terminal insertion tool, six universal mounting brackets, three switch and potentiometer brackets, four 8-inch long bus bars and one package of hardware. The larger model, No. XP417, is similar except that it uses a phenolic board about twice as long and contains greater quantities of many of the items. Kit XP417 sells for under \$5.00. Both models are available from the Aladin Kits Company, 21011 Dequindre Road, Hazel Park, Michigan. — WYDS

monly called, have the necessary grooves in which to mount one or more circuit boards, when the rails are assembled in the form of a case or chassis as shown in the photograph.

In order to construct a typical Frame-Loc case, it is necessary to purchase two rails, since rails are sold only in pairs, and two cover panels. The required corner brackets and screws are included with the rails. Assembly is initiated by inserting two corner brackets in each rail. Then three sides of the box are fitted together and the bottom plate slid in place. At this stage, one or more boards can be inserted in the box. If complete shielding isn't necessary, a circuit board can be installed on top, and the top cover omitted. The box is completed by pushing the remaining side rail in place. This method of assembly results in a very rugged container. However, if more security is desired, the "jam" screws provided can be used to lock the rails together.

Frame-Loc rails are 2 inches wide and come in an assortment of lengths from 3 to 17 inches. Parts are available to extend the rails both in width and length, making possible a multitude of box sizes. Boxes need not be rectangular; they can be built in the shape of an L or otherwise.

The box shown in the photograph measures 6.6 by 4.6 by 2 inches and sells in the \$3.00 price class. Frame-Loc parts are manufactured by Vector Electronics Co., Inc., 1100 Flower Street, Glendale, California 91201. — WYDS



perforated board, two aluminum base plates, 25 silver plated push-in terminals, one terminal insertion tool, six universal mounting brackets, three switch and potentiometer brackets, four 8-inch long bus bars and one package of hardware. The larger model, No. XP417, is similar except that it uses a phenolic board about twice as long and contains greater quantities of many of the items. Kit XP417 sells for under \$5.00. Both models are available from the Aladin Kits Company, 21011 Dequindre Road, Hazel Park, Michigan. — WYDS

Vector Frame-Loc Cases

MOST metal chassis and boxes on the market were designed many years ago, long before printed circuit boards and transistors. These structures must be drilled, cut or modified in one way or another in order to accommodate modern circuit cards. The Vector Electronics Company has introduced a line of aluminum case parts, known as Frame-Loc parts, which require no metal work to support circuit boards. Frame-Loc sides, or rails as they are com-

Terminal Board Kit

APPARENTLY nowadays there are simple transistor projects in every book or magazine on electronics. Most of the less complicated circuits are suited to a terminal-board type of construction. Prepunched boards eliminate much of the drilling required of metal chassis and they permit component and circuit changes with little difficulty. With no boxes to squeeze parts into, wiring is more readily accomplished.

General Electric has introduced a new experimenter's kit, model ETR-4288, which should serve as a good foundation for most simple electronic circuits. The kit consists of a $3\frac{1}{2} \times 4\frac{1}{2}$ -inch sheet of prepunched terminal board, four rubber feet with self-tapping screws and 15 push-in terminals. Two serrated slots in the upper half of each terminal permit the temporary insertion of component leads without soldering, a most useful feature to an impatient amateur modifying a circuit. If desired, the board can be readily cut to a smaller size with a fine-toothed saw.

(Continued on page 138)



Hints and Kinks

For the Experimenter



FINAL TUNING KNOB FOR THE HEATH "SIXER"

THE final-amplifier tuning capacitor in the Heath Twoer and Sixer happens to be a ceramic trimmer not normally accessible from the outside of the cabinet. In order to dip the final, one of two methods is usually used to reach the trimmer; either the unit is removed from the case or a screwdriver is inserted in a hole drilled in the side of the cabinet. However, this is not always so easily done, especially if one is working mobile. The author solved this problem by making a built-in self-retracting knob which is always handy, but which is not in the way during removal of the unit from the case. As shown in Fig. 1, the knob is not fastened to the trimmer and thus will not put any strain on the capacitor or its associated wiring.

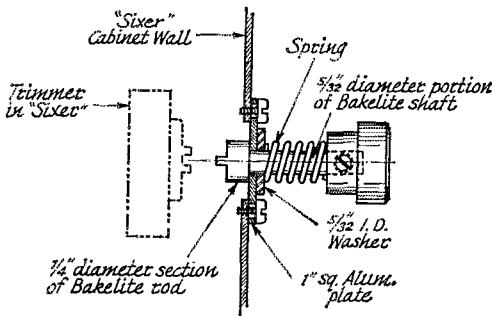


Fig. 1—Details for assembling a final-amplifier tuning control for a Heath Sixer or Twoer.

Begin the modification by drilling a $\frac{1}{2}$ -inch diameter hole in the case directly in line with the trimmer adjusting slot. Make a 1-inch square plate from 16 gauge aluminum stock and drill a $\frac{1}{16}$ -inch hole in the center of the square. Drill two $\frac{1}{8}$ -inch holes in the plate for mounting the plate to the case. These holes should be a little bit on the sloppy side for the screws that will be inserted in them, since the trimmer does not always return to the exact same spot each time the unit is put back in the cabinet. I used screws from an old Command receiver to fasten the plate to the case. Drill two holes in the cabinet to mate with the mounting holes on the plate, being careful to make the holes small enough to allow the screws to self-tap.

Chuck $\frac{1}{4}$ inch of a $1\frac{1}{4}$ -inch length of $\frac{1}{4}$ -inch diameter bakelite rod in an electric drill. Use a file to turn down the diameter of the remaining 1-inch length of rod to $\frac{3}{32}$ inch. File a screwdriver

bit on the face of the $\frac{1}{4}$ -inch diameter portion, as shown in Fig. 1. Mount the plate on the case and insert the bakelite rod through the plate. Slip a $\frac{5}{32}$ -inch i.d. washer over the shaft, along with a small $\frac{3}{8}$ -inch long coil spring and a suitable knob, such as the antenna trimmer knob from a Command receiver. Make sure there is enough compression on the spring to keep the rod retracted. After all the parts are assembled and the unit is installed in the cabinet, it is only necessary to push in the knob and rotate it until the shaft bit engages the slot of the trimmer. — Frank M. Wing, W4TUC

THUMB-GROOVE INDEXING THE HANDBOOK

SECTIONS of the *Handbook* that are frequently used by the reader can be located quickly by filing thumb grooves in the *Handbook* pages as shown in Fig. 3 and labeling these grooves as pictured in Fig. 2. As illustrated in the second sketch, I filed thumb grooves for only three subjects: the wire-size table, the tube index and the general index. These items seem to fill 99 percent of my general requirements. Other grooves can be added at any time, but usually the sections of the book they indicate are only of short-term use. — Norm Cucuel, K1LFH

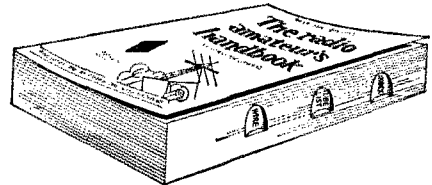


Fig. 2—K1LFH's method of thumb-groove indexing the Handbook.

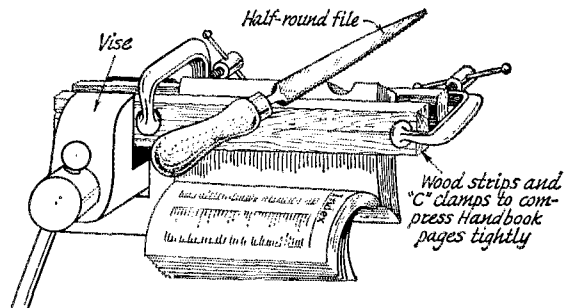


Fig. 3—One method of labeling the thumb grooves.

ADHESIVE-BACKED TERMINAL BOARD ELIMINATES MOUNTING SCREWS

THE low-profile terminal board shown in Fig. 4 is especially useful in dense electronic circuits where mounting space and working space are limited, and where it may be undesirable or impractical to use mounting screws or other hardware fasteners. The terminal board consists of 0.012-inch-thick copper terminal strips cemented between 0.032-inch-thick fiberglass sheets which have a thin layer of pressure-sensitive adhesive backing. Scoring between terminal pairs facilitates detachment of the required number of terminals for specific applications. For soldering connections, the copper terminals are bent outward. The boards are mounted by pressing the adhesive backing onto a mounting surface in the equipment package. — *NASA Tech Brief 65-10396*

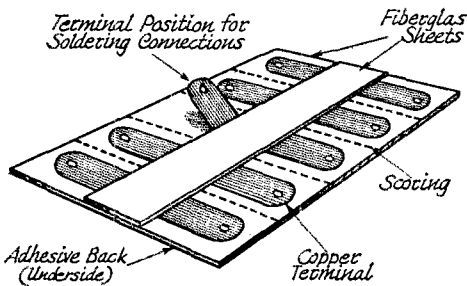


Fig. 4—Details of the adhesive-backed terminal board.

EQUIPMENT FEET

FOOTBALL shoe cleats come in many varieties. The hard rubber and nylon types that are threaded make good standoffs or feet for electronic equipment. Cleats are available from most sporting-goods stores. — *Karl Hatfield, WBXR*

GROMMET CABLE HOLDER

ONE way I have found to make a chassis wiring job neater is to use rubber grommets as wire bundle holders as shown in Fig. 5. If the approximate number of wires that will pass through each bundling point can be predetermined, it will be easy to pick out the proper size grommets to secure a tight fit.

— *Phil MacDonald, WA1CTQ*

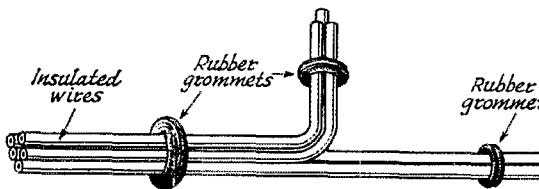


Fig. 5—The rubber grommets, shown here as cable holders, should be chosen to firmly secure the wires in neat bundles.

PHONE-JACK PANEL BEARING

AS shown in Fig. 6, a panel bearing can be made from an extra phone jack by filing away the flange on the inside of the jack and removing the excess contacts, soldering lugs and phenolic insulation. The bearing will be suitable for a $\frac{1}{4}$ -inch shaft if a standard phone jack is used for the modification. — *John Wallace, WA5NPE*

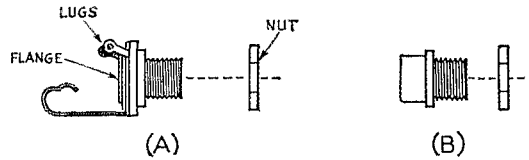


Fig. 6—By filing away the flange and removing the excess parts, a phone jack (A) becomes a panel bearing (B).

CABLE RACKS

I have found that hose racks, ordinarily used for the storage of garden hose on the side of a house, are ideal for keeping accumulated wire and coaxial cable in order. Aluminum racks, which sell for about 75 cents each, make excellent spools for lightweight wires and cables. Steel models cost approximately a dollar apiece and are useful for storing heavy cable such as RG-8/U. Garden-hose racks are sold by most hardware stores. — *Julian Lovejoy, W1BT*

CALIBRATING INEXPENSIVE SIGNAL GENERATORS

INEXPENSIVE wide-range signal generators that use air-core coils can be calibrated exactly, even though they don't have an individual calibration adjustment for each band. Stuff a length of spaghetti tubing with aluminum foil and insert it into the coil to be adjusted. Slide the tubing in and out of the coil until zero beat is achieved on a calibrated receiver. For best mechanical stability, the tubing should fit snugly in the coil. — *Lou Puentes, WB2MYN*

(Since an aluminum core lowers the inductance of a coil, the above method of alignment will not work on those bands where the coils employed have too little inductance. This situation can be corrected by the following technique: Switch the generator to the band which is in error on the high-frequency side by the greatest percentage and fix the position of the tuning capacitor at some convenient frequency. Unloosen the pointer and reattach it at the correct calibration mark. Proceed to calibrate the other bands as suggested by WB2MYN. Observe, however, that the calibration points may or may not be true across the entire scale. Also note that inserting aluminum foil in an air-core coil will lower the Q of the inductor; in some cases, the reduction in Q of an oscillator coil might cause the circuit to cease functioning. — *Editor.*)



ONE of the most important functions in message handling, if not *the* most important, is the ultimate delivery. Without it, the message might as well never have been originated. In fact, it would have been *better* never originated, because a message originated and never delivered is very bad public relations.

Yet there are many amateurs, even those who pride themselves on their message-handling ability, who procrastinate on delivery, or who fail to deliver messages in the most effective manner. We won't even mention those who don't deliver them at all; they aren't worth mentioning. Besides, they are a very small minority.

What's So Tough About It?

So what's tough about delivering a message, you might ask? You receive the message for delivery, you call the party on the telephone and you give him the message. If you can't get him

* National Emergency Coordinator, ARRL.

on the phone, you write it on a postcard and drop it in the mail. This is tough? This needs an article in *QST*?

Well, it isn't always quite so easy as all that. All kinds of difficulties arise in trying to locate the party, and, when you do, in trying properly to explain what it's all about. John Q. Public isn't used to getting messages delivered by someone he never heard of via a service he never knew existed. He is going to want to ask questions, some of which may sound pretty silly to you. But don't laugh! This is a good opportunity to do some salesmanship for amateur radio.

Then there is the other extreme, the type who couldn't care less, who mumbles something and hangs up. Or the one who tells you he received the same message a couple of days ago from someone else. Or the party sending the message wrote a letter at the same time, the letter beating the message by three days. Or the person who originated the message answers the telephone. There are all sorts of embarrassing situations, many of them avoidable.

Precedences

When receiving a message for delivery, the first thing you have to consider is its precedence. There are three precedences: Emergency, Priority and Routine¹. If the message has an Emergency precedence (this will be *very* rare), you deliver it immediately, if you can, by collect telephone, no matter how far away the addressee might be. Emergency precedence is a matter of life and

¹ See Operating Aid 9A, free on request.

The amateur traffic-handler comes in contact with the public at two points: origination and delivery. There are certain hard and fast rules concerning both, but most of it is a matter of judgment and diplomacy. This article attempts to deal with both in the all-important message-delivery function.

HOW TO DELIVER A MESSAGE

BY GEORGE HART,* WINJIM

Some Do's and Don'ts in the End Object of All Traffic Handling

death. This message was put on the amateur circuit in the first place only because no regular means of communication was available. But we won't worry much about this, because it isn't very likely.

Still unlikely but more probable is receipt of a "priority" precedence message. This is worth a collect phone call if the addressee is not located too far away; otherwise, it should be relayed to some amateur station nearer the destination. You should be able to accomplish this on one of the National Calling and Emergency Frequencies.²

But most likely, if you get a message at all, it will be when some station calls you and mentions that he just happens to have a message for your town and would you mind delivering it? Being a good guy who wants to be helpful, you say sure. It's easy to say. But once said, you have committed yourself; and whether you are a non-traffic type or an occasional message handler or a regular traffic net member, you'll want to rise to the occasion to put your best foot forward in representing the amateur service to a member of the general public.

How Not to Deliver a Message

Introducing yourself and stating your purpose to a stranger, to whom you are also a stranger, may seem like a simple thing, but once you get off on the wrong foot you're in trouble. Let's take a horrible example. You receive a message and call the addressee on the telephone. A feminine voice answers.

"Uh—," you say, winningly, "I'm calling Mrs. Dora Jones."

"This is Mrs. Jones," comes the spritely answer.

"Uh—I'm an amateur radio operator," you stammer, not having thought about what you would say. "I have a message for you from Vietnam, signed Dan."

Silence at the other end.

"Mrs. Jones?"

"Has something happened to Dan?" quavers Mrs. Jones.

"Oh, no—that is, not that I know of. I mean—why don't you get a pencil and write this down?"

"Who did you say you are?"

"An amateur radio operator."

"And you know my son Dan?"

"No, no. I never heard of him before. I didn't even know he was your son."

"I don't understand." The voice at the other end sounds very agitated. "Where is Dan? What have they done to him? I haven't heard from him in months!"

So now, by inept handling of the situation, you have gotten Dan's mother all worked up and you have to try to calm her down before you can deliver the message. Even if this works out all right and Mrs. Jones winds up being eternally grateful to you and the amateur fraternity, there



BE TACTFUL!

were still those few uncomfortable and embarrassing moments. If she'd had a weak heart, your opening statement "I have a message . . ." to an anxious mother could have had disastrous or tragic consequences. In any case, you don't want to go around frightening old ladies, do you?

Try It This Way

The best approach is an informal but well-thought-out one. The first thing you do is identify yourself, by name. This makes you a person, whereas calling yourself just "an amateur radio operator" may leave some doubt about it. The first thing a called party wants to know is, who is calling.

"Good evening," you might say, just to be original. "My name is John Hamm. I'm an amateur radio operator over in (identify yourself in terms that will be best understood)." There will usually be a "So what?" silence from the other end at this point, so you might as well keep right on going. "Some of us amateurs handle messages free of charge (getting something free always goes over big) for the general public, just for the fun of it. I received one addressed to you a little while ago, so I thought I'd call you on the telephone. It's a greeting from Vietnam and is signed Dan. Would you like to write it down, or shall I just read it off?"

Chances are Mrs. Jones will bubble all over you, maybe get Mr. Jones on the extension.

"This message is dated Oct. 5," you go on, "and was handed apparently by military radio to Camp Pendleton, Calif., where it was put on amateur radio circuits. It says 'Hello Mom and Dad. I am OK and being treated well. Will write soon. Signed, Dan.'"

There will probably be a small silence while Mrs. Jones scribbles, then she will express her gratitude and appreciation and ask a few questions about how you came to get the message.

² See Operating Aid 12, also free on request.

You might, at this point, offer to send her a copy of it, as a memento — or you might send such a copy anyway. Also, get an answer.

Of course the situations can vary widely. It depends largely on what kind of a character you run into at the other end of the line. As an example, assume you have just made your delivery pitch as above and the answer is a casual "Oh, just read it." So you read it, also as above.

"About time he let us hear from him," says the lady. "Zat all?"

"That's all," you say.

"Okay." Click!

What If . . .

There are all kinds of people, and all kinds of messages. Not many of them are from Vietnam, of course. Some arrive late, some are garbled, some are inane or nonsensical. You have to use your judgment about how to deliver them. But whatever your judgment, don't forget that in accepting the message you have undertaken the responsibility to deliver it or relay it onward. *You don't throw it in the wastebasket!* Not for one year, anyway. It's unethical — and illegal, too!



TO AVOID EMBARRASMENT ~~~
USE THE MAIL!

We have always said that the contents of a message are none of the handling operator's business, and we still say this. However, there is no gainsaying the fact that the contents can affect your judgment in delivery — not in *whether* or not to deliver, but in the *method* used to deliver. Sometimes the contents themselves can be embarrassing, and none of us likes to be embarrassed. Here are the answers to a few "what ifs":

1) What if the message is setting up a date and that date is past? Mail it. You have to deliver the darn thing, but you don't have to listen to the horse laugh of the recipient.

(2) What if the message is garbled and it is returned by the post office? Send a service message to the originating station asking for a better address.

(3) What if the message asks for money or seems to have some unpleasant implication? Use your own judgment. The writer mails 'em.

(4) What if the message obviously is from one teenager to another and contains a lot of juvenile inanities? Again, use your own judgment, depending on the exact situation. If you're a teenager yourself, you won't mind. If you are an adult, you may feel you are putting yourself in a ridiculous position and decide to mail it.

(5) What if the message is "mushy" — that is, contains a lot of sickening endearments? We delivered one like this once and were greeted by a lop of simpering and giggling from the other end. Since then, we've mailed them. However, it depends on the exact content, and some amateurs consider it "fun" to deliver such traffic.

(6) What if the addressee refuses to take you seriously, insists on knowing the gag and who you *really* are. Well, you tried. Mail a copy of the message, to let the addressee know you were for real.

The Undeliverables

Some messages just can't be delivered, no matter how hard you try — and some originators will not answer service messages, especially those stations which originate them in great quantities, such as "fair" stations and stations at military posts. When you have exhausted all possibilities, and you can't get anything out of the originating station, what then? Do you cancel? You do *not*. Only the originating station can do this. If you do not hear from him, you *file undelivered*. Same thing? Almost, but not quite. It preserves the inviolability of the originating station's prerogative, keeps things in their proper perspective. If we gave delivering stations the right to cancel messages, this would happen every time the operator felt he *shouldn't* deliver.

Confirmation Copies

The final act in message delivery is to mail the confirmation copy. This is optional if you have succeeded in delivering by telephone, but always a good thing to do, especially if delivery was made through some person other than the addressee. It is also an opportunity to make another good impression on the general public. ARRL prints message blanks and message delivery cards, either of which can be used to send confirmation copies or make delivery. Personally, we prefer the printed paper blank, because it is both more impressive and more complete. The card has the advantage of being somewhat more convenient.

Type the message on the blank if you can, otherwise write it carefully so it will be legible. Be sure to add your own name and telephone in the space provided.

And that's all there is to it. Once the message is delivered, mark it and the date on the original copy before you file it away for the one year period required by FCC.

Now, don't you feel good? You should, you've just performed a public service.

QST

Annual ARRL Novice Roundup

NOVICES, this is your one and only opportunity to participate as a Novice in your own operating activity, the Sixteenth ARRL Novice Roundup Competition. Don't miss this chance to operate in this contest specially for Novices. The Novice Roundup begins on Saturday, Feb. 4, 1967, at 1800 local time, and runs through Feb. 19, Sunday, 1800 local time. Operating, listening, and logging time must not exceed 40 hours.

How to Participate

Just get on the air any time during the two-week period and contact as many Novices and non-Novices as possible, exchanging QSO number and ARRL section. Non-Novices work only Novices, of course. "CQ NR" means CQ Novice Roundup and you can either answer such a call or call "CQ NR" yourself to get contacts. Here's an example. KNØBPO in Minnesota hears KN1QFC in the Western Massachusetts section calling CQ NR.

CQ NR CQ NR CQ NR DE KN1QFC
KN1QFC KN1QFC K

KN1QFC KN1QFC DE KNØBPO KNØBPO
KNØBPO AR

KNØBPO DE KN1QFC R HR NR 3 WMASS
BK

KN1QFC DE KNØBPO R HR NR 1 MINN
BK

KNØBPO DE KN1QFC R TNX ES 73 SK
DE KN1QFC

ROUNDUP PERIOD

Starts	Ends
Feb. 4	Feb. 19
6:00 p.m.	6:00 p.m.
Local Time	Local Time

On his next contact KNØBPO would send NR2 (meaning contact number 2) then NR 3, NR 4, etc.

Scoring

A certificate is awarded to the highest Novice scorer in each ARRL section. Complete results will be in *QST* including the scores of those non-Novices that enter as well. To obtain your final score simply add the total of your NR QSOs to the highest w.p.m. from your Code Proficiency certificate. Multiply the sum by the number of different ARRL sections (see page 6, this *QST*) worked during the contest. That CP certificate really helps out your score, and you still have time to qualify, so don't miss out. Full details on the Code Proficiency Program are on page 92, this *QST*.

Novices should keep a look out just above and below the Novice frequencies (3700-3750 kc.; 7150-7200 kc.; 21,100-21,250 kc.; 145-147 Mc.) for the higher-power Generals.

Log forms like the one in the sample are yours

for the asking simply by writing to: ARRL Communications Dept., 225 Main St., Newington, Conn. 06111. Study the following rules, and then stand by for the fun of your Novice career, the ARRL Novice Roundup Competition! But don't forget to send in a copy of your log to make your entry official: logs must be postmarked by March 3, 1967.

Rules

1) *Eligibility:* The contest is open to all radio amateurs in the ARRL sections listed on page 6 of this *QST*.

2) *Time:* All contacts must be made during the contest time indicated elsewhere in this announcement. Time may be divided as desired but must not exceed 40 hours total.

(Continued on page 138)

SUMMARY OF EXCHANGES ARRL NOVICE ROUNDUP							
Call. KNØBPO..				Section... MINN.....			
(See page 6 <i>QST</i>)							
B N D S	T I M E	D A T E	M Y N R	M Y S E C T I O N	H I S N R	H I S C A L L	N U M B E R E A C H N E W S E C T I O N A S W O R K E D
ON	OF		SENT		RCVD		
CONTACT	CONTACT						
80	1800	FEB. 3	1	MINN.	1	KNØAKM	1
		1803	1		3	KN9WRX	2
		1815	2		2	KN9ZDI	1
1835	1820		3				1
15	1400	FEB. 6	4		15	KN7MNI	3
		1412	4		7	KN1QFC	4
1425	1418		5	W			

Summary: (Enter below on last sheet used)

Bands used..... **80,15**; Hr. diff. stns. wkd. **5**; Hr. diff. sect. logs... **4**
 Total hours operation..... **1:00**; Code Proficiency award credit..... **10**
 Type transmitter (tube line-up if home-built).....
 Receiver.....; Antenna.....

SCORING:
 **5** QSOs plus..... **10** c.p. points times..... **4** sections equals **60**

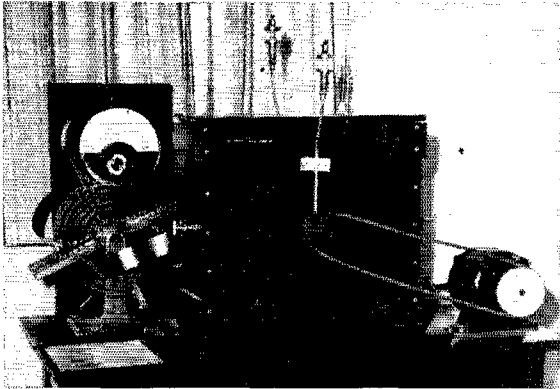
I have observed all competition rules as well as all regulations established for amateur radio in my country. My report is true and correct to the best of my knowledge.

Signature and call.....
 Address.....

This is a sample log form that must be used by all contestants and also shows how to score. You can obtain these forms free by writing to ARRL.

New Look at W1AW

THE Maxim Memorial Station, W1AW, faces the new Headquarters Building at 225 Main St. in Newington, Conn. Recently, the station was given an overhaul with new equipment, furnishings, and antennas. You've seen a picture of the exterior on this month's cover. Here are a few shots taken inside the building, to show you some of the "new look."



"Old Betsy," 1AW's 1920 spark transmitter, is on display in the foyer.



The master control console contains several receivers, signal monitors, transmitter exciters, punched-tape keyer (for code practice and bulletins) and operating accessories. Against the wall at the left is the RTTY position. The rack at the right is a back-up transmitter and RTTY transmitter.

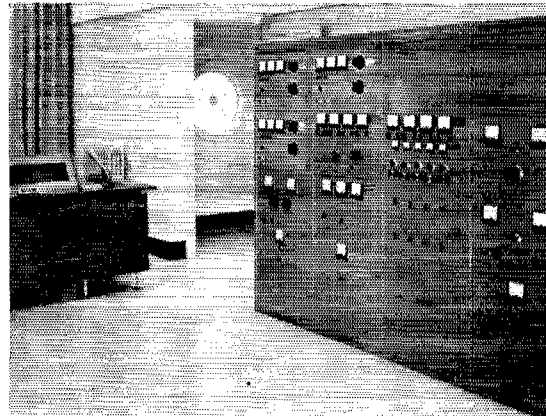
Close-up view of the transmitter racks. In the top two rows are some of the 1-kw. finals for 80 through 10 meters (two more to be added). Other equipment includes a 50-watt 160-meter transmitter, 200-watt 2-meter transmitter, 200-watt 6-meter transmitter, antenna patch panel, and converter to change the 3 Mc. signal from the console exciter to the various amateur bands, 80 through 10 meters.

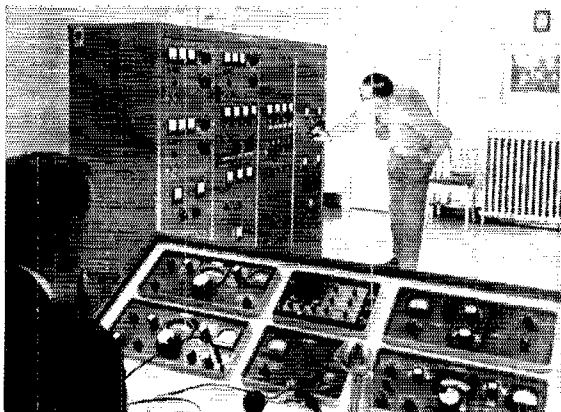


Visitors are always welcome at the station and upon entering are requested to sign the guest log.

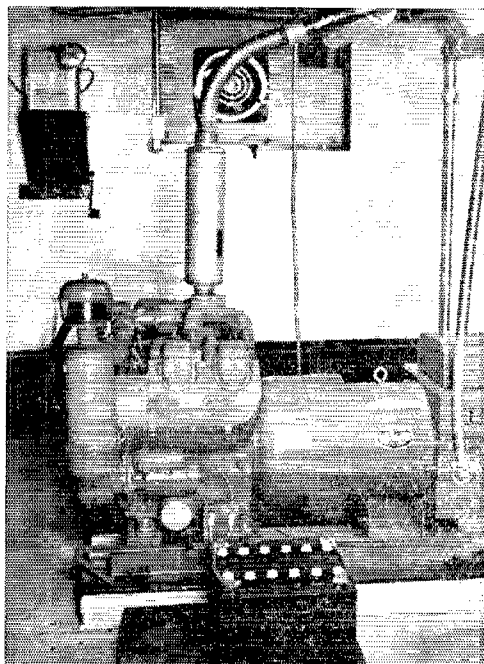


Another view of the console which faces the transmitter racks (right) and the visitor's operating position.





Another view of the transmitter racks taken from behind the visitor's operating position.



In case of a power failure, this 20-kw. 220-volt emergency generator located in W1AW's basement can handle the entire load at W1AW including light, heat and communications. The unit is electrically started and the engine is fueled by propane gas. Notice the emergency lighting on the wall at the upper left. This light (and others located throughout the building) come on automatically with loss of power.

The W1AW workshop is well equipped for emergency repairs or general maintenance.

Now that you have had a chance to browse around the interior of W1AW, here are a few additional details about the station. The operating center of the station is the master console. Located here, along with the usual operating position accessories, are auxiliary receivers and signal monitors. The station v.f.o./exciter is positioned here and generates a basic 3-Mc. s.s.b., c.w., a.m., or RTTY signal, which is then fed to the transmitter racks. A series of converters heterodynes the 3-Mc. signal to the desired amateur band (80 through 10 meters) where it is amplified in the appropriate 1-kw. linear amplifier. The racks also contain s.w.r. bridges and indicators for each antenna system, along with controls for remotely tuning antenna couplers where applicable. There is an antenna patch panel for switching the various transmitters and receivers in the station to the desired antenna.

For code practice or bulletins, an RTTY tape, which has been previously cut at the station, is fed into an RTTY-to-Morse converter, which transforms the RTTY characters on the tape to dots and dashes and then keys the transmitters. Of course, this same tape is used to key the RTTY equipment, too.

W1AW and the Hq. building are situated on a 7-acre site with plenty of room for antennas. Three self-standing 60-foot steel towers (two are visible on the front cover) support 3-element Yagi beams for 20, 15, and 10 meters. A 6-meter omnidirectional antenna shares one tower with the 15-meter beam and a 2-meter omnidirectional antenna is on another tower with the 10-meter beam. For 40, 80, and 160 meters, half-wave horizontal wires are used. The 80 and 40 meter doublets are center fed; the 160-meter doublet is end fed. Feed lines for all the antennas are situated underground and, on 40, and 160 meters, the underground coax terminate at remotely controlled antenna couplers located on the ground directly below the antenna feed points. Open-wire feeders connect the antennas to the tuners.

Page 92 shows the station schedule, and visitors are always welcome. Meanwhile, make use of the varied services provided by the Maxim Memorial Station — daily sessions of code practice, news bulletins, frequency-measuring tests, and general operation.

There's a lot more to see here at W1AW. Why don't you drop in and see it for yourself? **QST**

AMATEUR RADIO PUBLIC SERVICE CORPS

CONDUCTED BY GEORGE HART,* WINJM

Requirements for Being EC

Under this heading in November *QST*, we presented some material on the "why" of being an EC. Gratifying enough, it brought some inquiries about what one has to do to be an EC. This is all explained in *Operating an Amateur Radio Station*, but a few reflections on the subject seem to be called for, so here goes.

The basic requirement is a sincere interest in amateur radio emergency communication. If you have this, then the rest is merely a matter of achievement that goes along with it. We use the word "merely" advisedly. It's a matter of motivation. If the motivation is strong enough, the achievement is almost automatic. If the motivation is weak, the obstacle of achievement seems insurmountable.

But no matter how you look at it, the first achievement is easy: full ARRL membership. We realize five bucks is five bucks, but anyone, we don't care what his status, can salt away that much a year. It's less than a dime a week. It's not an expense, either, it's an investment.

The second requirement may need a little effort — acquiring a General (Conditional) class license or better. The EC is a leader for all kinds of emergency communication within his area of jurisdiction; generally speaking, he cannot acquire the know-how nor the respect of the AREC membership if he himself is restricted in his operating environment. We have gone 'round and 'round about this with some of our officials, but the majority still appear to feel that this is a reasonable and progressive requirement.

The requirements from here on become a little less tangible. One of them is the possession of leadership qualities. Some of us have them, some of us haven't. But this is a matter of opinion — your SEC's and your SCM's opinions, not yours. If you have the willingness (another requirement), let them decide whether or not you possess the requisite leadership qualities. Get a copy of Form 34, fill it out, send it to your SEC, who will forward it to the SCM with his (the SEC's) recommendation, and let the chips fall where they may.

Of course there has to be a vacancy, too. Sometimes, if the present EC isn't doing his job and there is enough interest locally, he can be prevailed upon to give up the post so somebody else can have a crack at it. Or perhaps the SCM can be prevailed upon to cancel him out. There is no reason for the AREC membership to put up with an inadequate EC when someone else in the organization is willing to step in — someone

qualified and able. Put your best foot forward. If that foot boots out a non-performing EC, that's progress.



On June 17-19, The Eastern Suffolk (NY) Radio Club was invited to participate in the Sag Harbor Whaler's Festival. A station was set up by club members and handled over 170 messages, using New York Section Nets for outlets. Shown here are WB2FHP and WB2CRN operating the club station.

(Photo by Joseph Adams)

New Operating Manual

In case anybody hasn't noticed, the ARRL now offers a complete *Radio Amateur's Operating Manual* for sale, for one buck. This isn't a sales pitch, but merely to point out that the existence of the new manual is something we have needed for many years, and we hope all ARPSCers will have a copy in their shacks. It puts under one cover an accumulation of information on all operating phases of amateur radio, with special emphasis on the public service aspects. Even if you have the booklet *Operating an Amateur Radio Station* and the *Public Service Communications Manual*, you will find the new "OpMan" contains much useful additional material for you to read and digest. Once you have done so, you will still want it around for reference purposes. It's an operating "must" in every ham shack, but especially in those whose owners take part in one or more of the three ARPSC divisions. — WINJMA.

National Traffic System

Every once in a while someone comes up with a suggestion for a new operating wrinkle that is so logical that the immediate reaction is "Now, why didn't we think of this long ago?" There is something to be said for adhering to old practices as long as any new ones proposed don't improve anything; but new practices that effect improvements should be seriously considered.

* National Emergency Coordinator.

One such that we can remember offhand is the practice of "who calls first" when two stations are sent off frequency by the NCS to clear some traffic. For many years this matter was unresolved, and practices varied from net to net, sometimes even within nets. Then someone rationalized the matter as follows: the station to receive the traffic should call first, so he can select a frequency near to the designated spot on which he can copy adequately, the station to transmit then zero-beating him exactly. Simple and logical. Why didn't we think of it years ago?

Another practice, common to nets, which has gone unresolved for a long time is how to list traffic being reported into the net. The *Public Service Manual* and the new "OpMan" show examples of such reporting giving the number of messages first and the destination afterward, thus: "QTC 1 ILL 3 WIS 7 MINN," or, by voice, "I have one for Illinois, three for Wisconsin and seven for Minnesota." Now one of our NTSers points out that it would make things a little easier for NCSes, especially when a number of different precedences are involved, to give the destination first, then the number of messages. Reason for this is that often the NCS has the destinations, or destination areas, already on his sheet. If the reporting station says something like "1 P 3 P2 4 R ILL," NCS has to wait until the destination is stated before he knows which column to put the traffic in, then while he's doing it the reporting station is starting on a list for another destination.

Make sense? It sure does. So much so, that we're inclined to accept it as standard procedure. However, for a time at least, it will have to be just a recommendation. We therefore recommend that in NTS nets, the destination designation be sent first, followed by the number of messages for that destination, and further we recommend that the entire unit be separated from the next unit by the procedural sign AA on c.w. To wit: On phone, "I have for Illinois, one; for Wisconsin, three; for Minnesota, 7." On c.w., "QTC ILL 1 AA WIS 3 AA MINN 7 AR."

Net managers may, of course, use their discretion about making this standard procedure in their nets. — WINJAM.

October report:

Net	Sessions	Traffic	Average Rate	Representation (%)
IRN.....	58	604	.355	10.4
2RN7.....	58	430	.552	7.6
3RN.....	58	631	.479	10.9
IRN.....	58	1079	.452	18.6
RN5.....	58	1160	.531	20.0
RN6.....	58	1557	.904	26.8
RN7.....	29	476	.503	16.4
8RN.....	59	516	.324	8.9
9RN.....	29	549	.770	18.9
TEN.....	62	1234	.777	19.7
ECN.....	28	123	.218	4.4
TWN.....	27	273	.457	10.1
EAN.....	29	1983	1.408	68.4
CAN.....	29	1545	1.237	53.2
PAN.....	29	1820	1.125	62.8
Sections ²	1795	13,933		7.8
TCC Eastern.....	116 ³	882		
RCC Central.....	84 ³	849		
TCC Pacific.....	116 ³	1091		
Summary.....	2464	30,735	EAN	11.4
Records.....	2016	24,452	.928	12.3

¹ Representation based on one or less sessions per day.

² Section/Local nets reporting (57): VN VSBNE VSBNL VSN (Va.); PHD MOTTN MOSSB (Mo.); PTN (Maine); OLN BN OSSBN (Ohio); GN QFN FATN WFPN (Fla.); EPA WPA PTTN (Pa.); NTTN (Tex.); NCNE NCNL NCSSB (N.C.); Mich. 6 Wolverine QMIN(2) (Mich.); RISP (R.I.); SCN NCN (Cal.); BUN (Utah); QIN (Ind.); Alta. SSB; GBN (Ont.); WAIN EMNN (Mass.); Iowa 75; OZK (Ark.); CPN (Conn.); LAN (La.); OQN (Ont.-Que.); AFBN AEND AENH AENM AENO AENT (Ala.); KTN (Ky.); MTN (Man.); TN TSSBN TPN ETPN (Tenn.); WSN (Wash.); GSN (Ga.); NJEPTN (N.J.); ILN (Ill.).

³ TCC functions not counted as net sessions.

October was a good month even when we didn't count the SET, so with the SET reports included, we would have

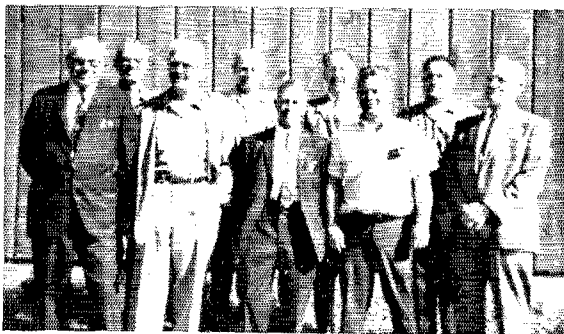
probably broken every record in the book. Speaking of the SET, it appears at this point that NTS outperformed last year's top job. We'll have the full details in an early issue of QST.

Since we have decided not to count the SET as part of the regular October functions, we are going to throw out all the records set while NTS participated in the SET. This goes back to 1962, when the non-SET records were set. As you can see, we broke 'em all except the average and we came pretty darned close to this one.

At this writing, the winter skip conditions don't seem to be as bad as they have been in the past few years. While it's still easy for the fellows on the east coast to work Europe and Africa on 80 and the boys on the west coast to work Japan and into the Pacific, all levels of the system seem to be functioning normally at night. We're keeping our fingers crossed in hopes that this will continue.

W1EFW has just published the third 1RN bulletin, and comments that someone said we needed a bit more traffic, so look what happened . . . up 22%. WA2GQZ comments that after watching the Princeton-Yale football game, he has come to the conclusion that a good New Jersey team can beat a good Connecticut team. (Yeah, only if they're lucky. — Ed.). K3MVO has a few comments on the SET which we will save for the detailed report on that operation. Silent W4SHJ has issued 1RN certificates to W4s CZN SZZ TFL K4CWZ and W1BGL (that's right, a WB4). Representation from Texas on RN5 has improved considerably, comments K5IBZ, but he can't understand why one section's representation increases when another's decreases. This month, old reliable Alabama tumbled to last place, W6BBO has issued RN6 certificates to W6ECP, K6AJU, WA6KZI and WP6NXX. K7JHA reports that the net time of 0245z held up through October, but it appears inevitable that they will have to move to 0145z within the next few weeks. With the improved representation from Alberta, traffic headed in their direction has also increased. W8CHT remarks that the Michigan and Ohio Section nets are attempting to hold late net meetings, to conform with the general operating time schedule as outlined in the Public Service Communications Manual (which is available free upon request to HQ.). W9QLW has issued 9RN certificates to WA4UAZ, W9s KQB RTP NXG, K9RLW, W9As OVI NDV, VE3CYR submitted the 9RN report this month for VE3BZ who was in Arizona on business. K1WJD comments that W2ZVV and W2ZRC have swapped nights as NCS. W9DYG isn't sure where all the traffic came from this month, but he's not looking a gift horse in the mouth. W6VNO has issued PAN certificates to K6LRN, WA6CVU, K7IWD, K7JHA, K7NHL and W7DZX and hopes to take care of the rest of the crew who have earned them shortly.

Transcontinental Corps: W3EML is looking for some one to take the Station D schedule on Thursday and Friday (GMT) anyone interested should get in touch with Bill pronto. W9JUK sends comments on the SET operation



Northwestern Division Director W7PGY called a meeting of League Officials within his Division on Sept. 24, to discuss, among other things, public service in the Division. During a break in the meeting, this photo of (l. to r.): W7PGY, K7JHA, RN7 Mgr.; W7GMC, Asst. Dir.; W7HMQ, SCM Wash.; W7AJN, SCM Ore.; call unknown; W7UWT, SEC Wash.; W7OEB, RM Wash.; W7CPY, V. Dir., Northwestern Division.



California is loaded with prominent traffic men, so here's two more to add to the collection. On the left, Ed Eklund, K6IME, Manager of the Southern California Net and on the right, Jerry VerDuff, WA6ROF, a familiar call on PAN, RN6 and in TCC circles.

(Photo by WA6YWN)

which we will also hold for a later report. W7DZX has things pretty well in hand in the Pacific Area, but is most unhappy with the lack of reports he's getting. How about it men, get your reports in regularly and on time.

October report:

Area	Functions	% Successful	Traffic	Out-of-Net Traffic
Eastern	116	83.6	2410	882
Central	87	80.5	1770	849
Pacific	116	75.0	2181	1091
Summary	319	81.5	6361	2882

The TCC roster: Eastern Area (W3EML, Dir.) — W1s BGD EFW EMG NJM, W2s GVH SEI ZVW, K2s RYH SSX, WA2s BLV UFI/4 UPC WBA/5, W2s AEJ OHK, W3s EML NEM, K3MVO, W4s DVT HJS ZM, WA4EUL, W8s CHT, IBB, K8KMQ, WA8s CFJ GYT. Central Area (W9JUK, Dir.) — WA2WBA/5, W4OGG, K4DZM, WA4s TPB/4 WWT, W5s GHP KRX, WA5JOL, W9s YT CXY DYG JUK KQB QLW VAY ZYK, WA9NFS, W0s YC LCX, K9AEM, WA9MLE. Pacific Area (W7DZX, Dir.) — W6s VNQ EOT IY BGF HC TYM, WA6ROF, WB6HVA, K6s AJU DDX LRN, W7s DZX ZIW HMA GMC, VE7BDJ.

Net	Sessions	Check-ins	Traffic
20 Meter SSB	19	346	1356
7250	42	1502	891
North American SSB	26	733	908
Mike Farad	27	403	470
Hit and Bounce	31	423	735
CNEN	26	1126	14

Diary of the AREC

Monroe County, Ind., amateurs turned in a convincing performance on an unscheduled workout just one week before the annual SET. The staff of the Bloomington, Ind., hospital had planned a barbecue in the hilly country eight miles south of Bloomington on Oct. 1. With no telephones available at the site, the doctors turned to local hams for communications. Upon short notice, K9CGT and WA9CLT set up a six meter transceiver at the barbecue, while K9JJX and K9BNE manned K9IU at Indiana University, and received messages from the hospital for relay to the barbecue site. Throughout the day, numerous messages of routine and emergency precedences were handled. The two operators at the barbecue reported the food was excellent but slightly cool by the time they got around to eating it at 2000 CST. — W9EYX.

On Oct. 13, an explosion rocked the Monsanto Chemical Company plant in Lasalle, Que., less than a mile from the scene of the apartment block explosion of April, 1965. VE2BMS was apparently the first amateur to learn of the disaster and he called VE2ANH, Montreal area EC, to inform him of what had just happened. Shortly after receiving VE2BMS's call, VE2ANH received another call from VE2XO who had the same information. A check of the local radio station's news cast gave the possible cause of the explosion as an airplane crash, while another version had an apartment building blowing up. By the time VE2ANH got on 2 meters, VE2BXW had started the emergency net and was acting as NCS. He was in contact with VE2DCF who was in the vicinity of the explosion. Many other stations were on standby waiting for more information on the location and gravity of the emergency.

Meanwhile, VE2BMS and VE2AYD were at the scene of the explosion where they quickly set up emergency communication links via 2 meter f.m. from VE2BWS and VE2BNL who were operating from a portable station within 300 yards of the explosion. Traffic was relayed to VE2ANH and VE2AYD who in turn either delivered the messages or relayed them further. One example of the type of traffic that was handled was a request for a locomotive to push a tank car full of high explosives away from the fire. Official word has it that had this car exploded, it would have flattened everything within a four mile radius. In the midst of all the fires and traffic jams, telephone service to the local hospital had been disrupted so VE2ANH fought his way through the traffic jams to the hospital to provide emergency communication to the disaster scene. Other stations known to have participated were: VE2s BQP BOQ SH RM. — VE2ANH/VE2BMS.

When a rather severe snow storm parked itself over Northwestern Nebraska on Oct. 14, and started dumping white, fluffy snow all over the place, K9OAL, EC, called an emergency session of the AREC net to provide emergency communications. The storm had caused considerable damage to the power lines and disrupted telephone service. The Pine Ridge Amateur Radio Club station, W9FLO, was designated NCS with W9TZW, K0s OAL ODF ODH and WA9KAK operating and delivering messages alternately. K9OAL and WA9KAK had mobile equipment parked in front should the need arise. Message handling comprised railroad schedules and load reports, road conditions, reporting the location of broken power lines and poles, current weather information and the cancellation of various meetings, police information concerning road conditions and personal inquiries and the relaying of public interest information to the local radio station. By late in the day of Oct. 15, the weather had improved considerably and normal power and communications links were well on their way to being restored and the net was closed down. Other stations known to have participated were: W9s MGV SWG ZWL BSC RHH, K9UOK, WA9s BIL LJY, K7MGM. — K9OAL, SEC Nebraska.

On the evening of Oct. 14, two students from Ferris Institute in Big Rapids, Mich., were traveling south on U.S. 131 about six miles north of Morley, Mich. It was cold and raining, so visibility was poor and the driver misinterpreted a turn sign and began making a turn on the highway prematurely. The outcome of this maneuver was that the car rolled over four times and finally came to rest upside down. About this time, WA1DAG and a friend were driving north on U.S. 131 and passed the accident shortly after it occurred. WA1DAG, a regular member of the Interstate Single Sideband Net, grabbed his mike and broke into the net. Although his signal was extremely weak, W8QZK was able to catch enough of the emergency call to call the attention of the net to the situation. All members stood by while each station strained his ears to copy the emergency message. W8IWF and W8QZK were the only two who could get any information at all and after trying to piece the bits of information together, were able to get an acknowledgement from WA1DAG that they had the information correctly. W8IWF immediately called the Rockford State Police Post and told the dispatcher of the accident. The dispatcher contacted the Reed City post and a cruiser was dispatched to the scene of the accident. — W8IWF.

NATIONAL CALLING AND EMERGENCY FREQUENCIES (kc.)

FULL TIME

3550	7100	50,550
3875	20,640	145,350

PART TIME

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

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

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

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

On Oct. 15, the snow storm that had clobbered the northern part of Nebraska moved south and plagued residents in five counties. About fifty amateurs participated in the emergency operation which involved the relaying of messages of both emergency and Priority precedence. The Nebraska State Civil Defense headquarters station was activated from Lincoln and handled c.d. messages. — *WØHYD*.

On Oct. 20, Utah State University and the U.S. Forest Service joint mountain top effort fell heir to disaster. At 1310 local time, a member of the Forest Service team suffered a heart attack on top of a 9700 ft. mountain. Minutes prior to this, a backhoe cut the coax cable connecting the mountain top repeater system, thus disabling the Forest Service radio system. W7DMD at the site had a 2 meter f.m. handitalkie and relayed information to W7RQT regarding the incident. At 1315 local time, an ambulance and hiking party were set out with W7RQT who was now using a handitalkie also. The ambulance met the crew half way down the mountain and thanks to the quick relaying, the man lived. — *W7RQT*.

On May 17, Ky. SEC W4OYI, scheduled a surprise state-wide alert, to test the facilities of the new communication center. The drill was planned as a complete surprise to all but the SCM, RM and PAM. The local alert was set for 1900 local time, just thirty minutes before the time of the regular club meeting. This insured maximum availability with no pre-alerting. The calling net went into action and fifteen minutes later, they broke both KYN and KTN with a "test-emergency" QNC. In Owensboro, an abbreviated "envelope drill" (see page 27, October 1964, *QST*) simulating a plane crash in a remote area and manning the hospitals. The crash unit mobiles were directed, by envelope, to remote points about five miles apart via circuitous routes. One of them "found" the crash, reported it and guided the other to him. It was a pretty fair test of map reading in the dark.

High precedence "test" traffic was originated to many key cities in the state and to Evansville, Ind. After the long silence as the respective NCSs swallowed the enormity of it all, traffic moved quickly. Fifteen non-local messages were originated. Thirteen were delivered and answers received, in thirty minutes, which isn't bad considering that in each case the addresses were unknown to the delivering station and had to be located. One was at a bowling alley and another was interrupted while making a speech before a civic club.

All told, sixteen AREC members showed up on this surprise drill and thanks to announcements on local radio, four non-members participated and subsequently joined the AREC. — *W4OYI, SEC Kentucky*.

The Englewood, N.J., AREC provided communications for the Englewood Memorial Track Meet held on May 21. Four portables and two walkie talkies were used to help coordinate the all day meet and provide results to the press. Six amateurs participated in the operation. — *W4CCF, EC Englewood, N.J.*

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Forty-nine SEC reports were received for September, representing 20,118 AREC members. This is three fewer SEC reports and 1,000 fewer AREC members than we had last year. On occasion, we have sent letters to some of the SEC's from whom we have not received any reports in the past year or so, urging them please to forward the reports regularly. In one case, the SEC replied that he had been sending the reports to the SCM and that the SCM wasn't forwarding the copies along to us. The SCM became somewhat unhappy and said that he had never received a report from his SEC. This whole problem would never have arisen if the SEC had bothered to send the original copy of his report to the SCM and a copy to us, or vice versa. How about the rest of you fellows who haven't reported in some time? If you need forms, we'll send 'em. Even if you have nothing to report at all, just fill out the form and sent it in, so we can be sure that you're still alive and interested in the post. Those Sections heard from this month are: Conn., E. Mass., Maine, N.H., N.Y.C.-L.I., N.N.J., S.N.J., E. Pa., W. Pa., Del., Ala., E. Fla., Ga., Ky., N.C., W. Fla., Ark., N. Mex., Okla., S. Tex., Los A., Orange, S. Bar., S.C.V., S.V., Mont., Nev., Ore., Utah, Wash., Wyo., Mich., Ohio, W. Va., Ill., Ind., Wis., Colo., Kans., Mo., Nebr., S. Dak., Que., Man., Sask., Alta., B.C.

Strays



The above photograph is one received by Aubrey T. Burton, W4TNT, from the Nimbus II weather satellite on October 7, 1966. Receiving equipment was that described by Anderson, K2RNF in the November 1966 issue of *QST*. With north at the top of the photograph, the eastern coast of the United States is on the left; the Great Lakes on the upper left. The telltale marking along the right edge of the picture is the data code which when converted will give date, time and location of the photograph along with orbital parameters for future tracking plots.

HamQUEST '67

AS THIS issue of *QST* reaches you, the holiday season is upon us and the New Year is just around the corner. One New Year's resolution you might make is to help your club. How? By taking part in HamQuest '67. There are two months left for you to help your club earn a handsome gavel, or a hard-covered '67 *Handbook* for the club files, or a secretary's minute book, or an engraved briefcase, or 12 issues of *QST*.

There are two months left for you to earn for yourself an ARRL Booster pin, or a 1966 *Handbook* for yourself, or one of the new ARRL *Operating Manuals*, or a one-year extension of your own League membership.

All you have to do is sign up some new members in your local club and in ARRL.

Why should all of those non-members join ARRL? What's in it for them? VE2KO of the Montreal Amateur Radio Club *Marcogram* put it this way:

HamQuest '67

Or, Why We Need the ARRL

One common characteristic shared by all hams is a keen self interest. In this aspect we are not so different from people in general. However, one would like to believe that our self interest is somewhat enlightened. This is difficult when one realizes that all hams are not ARRL members. It is impossible when we learn that more than half of the hams interviewed in an ARRL survey are neither ARRL members, nor club members. This in spite of the fact that all these non-joiners felt the League to be serving a useful purpose and realized the importance of a strong organization in amateur radio.

Every ham benefits by the mere existence of the ARRL; but each ham who is *not* a member weakens the voice of the League.

You think you don't need the ARRL?

Who speaks for us when our frequencies are looked at with beady, greedy eyes? At international conferences, the League is heard with respect — an esteem *not* shared by fringe groups who support fanatic leaders who twist and bend the truth to suit their own purposes (personal power, usually).

Who is responsible for the organization of public service communications by which our usefulness can be constantly demonstrated and proven? The ARRL. Each AREC member, each traffic man, is helping *you* to keep the amateur frequencies. What are *you* doing to justify your use of valuable spectrum space? Are you even an ARRL member?

Who will go to bat for you if you are unfairly put on restricted operating privileges as a result of interfering with the first TV set made in Canada? The ARRL. And non-members who ask for help are moochers.

How did you get your ticket? Don't tell me you never copied WIAW code practice? And that dandy little f.s. meter you use to adjust your mobile antenna to resonance? A *Handbook* circuit, I'll bet. Who has published the most comprehensive handbooks on every phase of our hobby? The ARRL.



These are the awards that are going out to members and clubs for their participation in HamQuest '67

You have just invested in real estate — a hill overlooking a lake — and you want the best plan for layout of your rhombics, V-beams, and perhaps a rotatable 80-meter phased array. Who do you ask for help? The ARRL.

Who is behind the effort to get intruders off the amateur bands? The ARRL.

You travel around the world. Once a year. You want to pack up your KWM-2 and operate from here, there, everywhere. Who has been behind all the reciprocal operating agreements? The ARRL.

Do you know the difference between a junction field effect transistor and an insulated gate FET? Ahh — you didn't see the October *QST*. No ham worth his call can get along without *QST*. No matter what your primary interest in the hobby may be — you need *QST*. Even Novices and beginners are well cared for in each issue. *QST alone* is worth the ARRL membership fee. . . .

You cannot afford *not* to be a League member . . .

QST

IMPORTANT NOTICE

Changes of Address

Important postal changes in handling second-class mail matter are now in effect. Please advise us *direct* of any change of address. Four weeks notice is required to effect change of address. When notifying please give old as well as new address and *your zip code*. Your promptness will help you, the postal service and us. Thanks.

Happenings of the Month

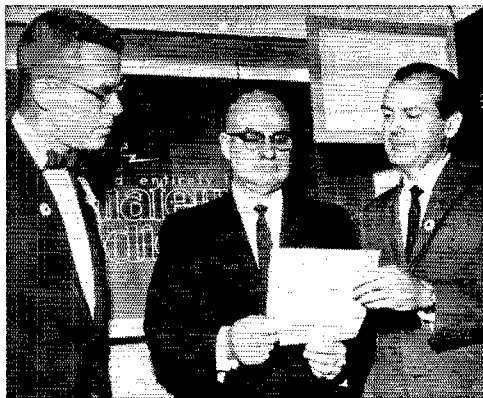
ELECTION RESULTS

League members in eight divisions have completed the choosing of their representatives for the next two years. In the six offices where there were more than one candidate, ballots were sent the second week of October to all amateurs who were members of the appropriate divisions on September 20. On November 21, deadline for receipts at headquarters of the completed ballots, the Committee of Tellers (Directors Crossley and Eaton, Treasurer Houghton) met to supervise the opening and counting of the votes, monitored by a certified public accountant.

In the Hudson Division there were 3394 ballots for incumbent Director **Harry J. Dannals, W2TUK** to 629 for Christopher DiPasqua, **WA2YQW**, in contrast to a tie vote in this division two years ago. **Carl L. Smith, W0BWJ** won a fourth term as director from the Rocky Mountain Division, defeating B.R. Slat's Council, **K0ATZ**, 731 to 380. West Gulf Director **R. O. Best, W5QKF**, had 1243 votes to 859 for Fred E. Ellis, **W5PTZ**, also securing a fourth term thereby.

In the Southwestern Division, two former directors battled it out, with **John R. Griggs, W6KW** defeating Ray E. Meyers, **W6MLZ** 2128 to 1481. OM Griggs, a resident of Granada Hills, California and a senior electronics engineer for LPL Engineering Corporation, was director from the division from 1949 through 1954 and assistant director 1955-1959 and 1961 to the present. He has also served as president of the San Diego Amateur Radio Club and vice president of the Inglewood Amateur Radio Club. He's been continuously licensed since 1922 and is 59 years old.

John's teammate as vice director is **Thomas J. Cunningham, W6PIF**, of El Segundo, California, who garnered 2136 votes to 1349 for William G. Welsh, **W6DDB**. Tom has been an assistant di-



Muskegon Police Chief **W8CJ** (center) receives a life membership certificate in the Muskegon Area Amateur Radio Council, of which he is a charter member, from **WA8IQZ**, left, council president and ARRL prexy **W0NWX**, right, during the ARRL Great Lakes Division Convention October 22, 1966.

rector since 1962. He's a director, past president and past vice president of the Associated Radio Amateurs of Long Beach; chairman and past secretary-treasurer of the Southern California Chapter, Quarter Century Wireless Association; past secretary-treasurer, Los Angeles Council of Radio Clubs, Inc. and a member of RACES. Tom is 54, and works at Hughes Aircraft Company as an administrative budget analyst. His original call, which he still holds at his vacation hideaway, is **W7CUK**, issued in 1932.

Central Division Vice Director **Edmond A. Metzger, W9PRN**, won a second term, chalking up 2051 voters to 1430 for Sidonius M. Pokorny, **W9NRP**.

The uncontested elections, as reported in this department of *QST* for November, placed the following in office for 1967-1968: Directors Philip F. Haller, **W9HPG**, Central; Robert York Chapman, **W1QV**, New England; Robert B. Thurston, **W7PGY**, Northwestern; Victor C. Clark, **W4KFC**, Roanoke; Vice Directors Stan Zak, **K2SJO**, Hudson; Bigelow Green, **W1EAE**, New England; R. Rex Roberts, **W7CPY**, Northwestern; L. Phil Wicker, **W4ACY**, Roanoke Division; John H. Sampson, Jr., **W7OCX**, Rocky Mountain Division and Ray K. Bryan, **W5UYQ**, West Gulf Division. All terms start at noon on January 1.

FOURTH QSL BUREAU SPLITS

The QSL Bureau in the Fourth U. S. Call Area has been split into two sections to ease a heavy workload for the volunteer personnel of the Bureau and to provide more efficient service.

Q.S.T. de
 Montréal, Canada—site de
L'EXPOSITION UNIVERSELLE DE 1967
 Il faut, dès maintenant, préparer votre voyage

exp067 MONTREAL CANADA

Montréal, Canada—site of
THE 1967 WORLD EXHIBITION.
 Make your plans now to be there

Printed in Canada

This is the year for Expo 67, the World Exposition at Montreal, Quebec. Amateurs of the vicinity are using this bi-lingual QSL card to publicize the event, highlight of which for amateurs is our National Convention in that city June 30-July 1-2.



H.R.H. Prince Philip, Patron of the Radio Society of Great Britain, cut the opening ribbon at the RSGB's 1966 radio exhibition in London. Here, at left, he is welcomed by Society President R. F. Stevens, G2BVN. At right, IARU/ARRL President Robert W. Denniston, W0NWX, and Canadian Director Noel B. Eaton, VE3CJ, bring greetings from W/K and VE/VO lands. Prince Philip exhibited deep interest in the activities of organized amateur radio and the advances in equipment and techniques on display.

Amateurs having call signs beginning with WA4, WB4 or WN4 should now send their self-addressed stamped 5 x 8 inch manila envelopes to Richard Tesar, WA4WIP, 2666 Browning Street, Sarasota, Florida 33577.

Amateurs whose calls begin with W4 or K4 continue to use the Frye Amateur Radio Club, Box 13, Chattanooga, Tennessee 37401.

SPECIAL TEMPORARY AUTHORITY

The Federal Communications Commission, in addition to authorizing some ten modes of operation by amateurs in appropriate frequency bands, further encourages special experimentation by amateurs:

"Adequately qualified amateurs interested in undertaking, purely as an amateur activity, special technical investigations, such as observation and measurement of propagation phenomena, may apply for special temporary authority to employ types of emission other than those provided for in Section 97.61. Requests for such authority should include full details and should be addressed to the Secretary, Federal Communications Commission, Washington, D. C. 20554."

A current example is the one-year permission given to WA6NLQ, W7FEN, K7YZZ, W7ZXM, W9EUD, W9NTP, W9CTC and K9UZW for simultaneous voice and slow-scan TV, with a 6-kc. bandwidth in the 7, 14 and 21 Mc. bands. The special permission allows the transmission of pictures and similar visual material to personnel in the Antarctic.

FCC ADDS HERTZ TO DEFINITIONS

Part 2 of the FCC rules has been amended to include the following definition:

"Hertz. A unit of frequency equivalent to one cycle per second. The terms Hertz (Hz) and

cycles per second (c/s) are synonymous and may be used interchangeably."

We understand that the Commission does not plan a wholesale change to the new name in the immediate future. As was indicated in August, *QST* expects to continue using cycles per second and its multiples pending a more definite decision by domestic as well as international regulatory bodies.

CANADIAN CENTENNIAL CALLS OKAY IN STATES

Canadian amateurs who have secured operating privileges in the United States may use either the standard VE or VO prefix or at their option, the special centennial prefixes 3C and 3B, followed by the regularly-assigned numeral and suffix (See page 88, October *QST*) and by the usual portable or mobile indication (i.e. 3C3CJ/W1). Americans operating in Canada, however, will use the regular VE or VO indicator only (i.e., W1LVQ/VE3).

U.S. CALLS IN BRITAIN SHORTENED

President Robert W. Denniston, W0NWX (and G5ADH) brings back from London the good news that it will no longer be necessary for U. S. amateurs operating under reciprocal privileges to use both the British and American calls (i.e., G5ADH/W0NWX) but instead sign only with the G5 call.

EXAMINATION SCHEDULE

FOR the convenience of those planning to take an FCC examination for General or Extra Class license, we present below a tentative schedule of dates and places. (Applicants for Novice, Technician or Conditional Class licenses should follow procedures outlined in Chapter 5 of the Radio Amateur's License Manual.)



Atlantic Division Director Gilbert L. Crossley, W3YA, at right, presents yet another QST Cover Plaque award to R. C. Dennison, W2HBE, whose article, "The TR-2 Transceiver," was voted best of the August issue by the ARRL directors. Presentation was made at the 50th Anniversary Banquet of the South Jersey Radio Association. (Thanks to W2OGZ for the photo.)

- 1 Boston, Mass. 02109; India & State Streets; Wed.-Fri., 8-10 A.M.
* Also conducts examinations at Bangor, Me. in May; Hartford, Conn. in March and Sept.; Portland, Me. in Apr. and Oct.
- 2 New York, N.Y. 10014; 641 Washington Street; Tues.-Fri., 9-12 A.M.
* Also conducts examinations at Schenectady, N.Y. in Mar., June, Sept. and Dec.
- 3 Philadelphia, Penn. 19108; 2nd & Chestnut Streets; Mon.-Wed., 9-10 A.M.
- 4 Baltimore, Md. 21202; Gay & Water Streets; Mon., and Fri., 9 A.M.
- 5 Norfolk, Va. 23510; Granby & York St.; Fri., 9-10 A.M.
* Also conducts examinations at Salem, Va. in Apr & Oct.; Wilmington, N.C. in June & Dec.; Winston-Salem, N.C. in Feb., May, Aug. and Nov.
- 6 Atlanta, Ga. 30303; 240 Peachtree Street, N.E.; Tues., and Fri., 8:30 A.M.
* Also conducts examinations at Nashville, Tenn. in Feb., May, Aug., and Nov.; Memphis, Tenn. in Jan., Apr., July and Oct.; Knoxville, Tenn. in Mar., June, Sept. and Dec.; Birmingham, Ala. in Mar., June, Sept. and Dec.
- 6S Savannah, Ga. 31402; York & Bull Streets; 2nd & 4th Tues. each month, by appointment only.
- 7 Miami, Fla. 33130; 51 S. W. First Ave.; Thurs., 9 A.M.
* Also conducts examinations at Jacksonville, Fla. in Apr. and Oct.
- 7T Tampa, Fla. 33602; 500 Zack Street; Mon.-Fri., by appointment only.
- 8 New Orleans, La. 70130; 600 South Street; Mon., 8:30 A.M.
* Also conducts examinations at Jackson, Miss. in June and Dec.; Little Rock, Ark. in Feb., May, Aug. and Nov.
- 8M Mobile, Ala. 36602; 113 St. Joseph Street; Wed. by appointment only.
- 9 Houston, Texas 77002; 515 Rusk Avenue; Tues., 9 A.M.
* Also conducts examinations at San Antonio, Texas in Feb., May, Aug., and Nov.; at Corpus Christi, Texas in Mar., June, Sept. and Dec.
- 9B Beaumont, Texas 77701; 300 Willow Street; Tues. by appointment only.
- 10 Dallas, Texas 75202; 1314 Wood Street; Tues., 8 A.M. to 1 P.M.
Aug.; Oklahoma City and Tulsa, Okla. in Jan., Apr., July and Oct.
- 11 Los Angeles, Calif. 90014; 849 S. Broadway; Wed. 9 A.M. and 1 P.M.

- * Also conducts examinations at Bakersfield, Calif. in May; Las Vegas, Nev. in Jan. and July; Phoenix, Ariz. in Jan., Apr., July and Oct.; Tucson, Ariz. in Apr. and Oct.
- 11SD San Diego, Calif. 92101; 1245 Seventh Avenue; Wed., by appointment only.
- 12 San Francisco, Calif. 94111; 555 Battery St.; Fri., 8:30 A.M.
* Also conducts examinations at Fresno, Calif. in Mar., June, Sept. and Dec.
- 13 Portland, Ore. 97205; 620 S. W. Main Street; Fri. 8:45 A.M.
* Also conducts examinations at Boise, Idaho, in Apr. and Oct.; Klamath Falls, Ore. in May.
- 14 Seattle, Wash. 98104; 1st Avenue & Marion Street; Fri., 8:45 A.M.
* Also conducts examinations at Billings, Mont. in May; Great Falls, Mont. in Sept.; Spokane, Wash. in Apr. and Oct.
- 15 Denver, Colo. 80202; 19th Street between California and Stout Streets; 1st & 2nd Thurs., 8 A.M.
* Also conducts examinations at Albuquerque, N. Mex. in Apr. and Oct.; Rapid City, S. Dak. in May; Salt Lake City, Utah in Mar., June, Sept. and Dec.
- 16 St. Paul, Minn. 55102; 6th & Market Streets; Fri., 8:45 A.M.
* Also conducts examinations at Jamestown, N. Dak. in Oct.; Marquette, Mich. in May; Sioux Falls, S. Dak. in Mar., June, Sept. and Dec.
- 17 Kansas City, Mo. 64106; 601 E. 12th St.; Thurs., and Fri., 8:30-11 A.M.
* Also conducts examinations at Des Moines, Iowa in Mar., June, Sept. and Dec.; Omaha, Nebr. in Jan., Apr., July and Oct.; St. Louis, Mo. in Feb., May, Aug. and Nov.; Wichita, Kans. in Mar. and Sept.
- 18 Chicago, Ill. 60604; 219 South Dearborn St.; Fri., 9 A.M.
* Also conducts examinations at Davenport, Iowa in Jan., Apr., July and Oct.; Fort Wayne, Ind. in Feb., May, Aug. and Nov.; Indianapolis, Ind. in Feb., May, Aug., and Nov.; Louisville, Ky. Feb., May, Aug. and Nov.; Milwaukee, Wiso. in Jan., Apr., July and Oct.
- 19 Detroit, Mich. 48226; Washington Blvd. & La Fayette Street; Wed. and Fri., 9 A.M.
* Also conducts examinations at Charleston, W. Va. in Mar., June, Sept. and Dec.; Cincinnati, Ohio in Feb., May, Aug. and Nov.; Cleveland, Ohio in Mar., June, Sept. and Dec.; Columbus, Ohio in Jan., Apr., July and Oct.; Grand Rapids, Mich., in Jan., Apr., July and Oct.
- 20 Buffalo, N.Y. 14203; Ellicott & Swan Streets; 1st & 3rd Fri., 9 A.M.
* Also conducts examinations at Pittsburgh, Penna. in Feb., May, Aug. and Nov.; Syracuse, N.Y. in Jan., Apr., July and Oct.; Williamsport, Penna. in Mar., June, Sept. and Dec.
- 21 Honolulu, Hawaii 96808; 502 Federal Building; Tues. and Wed., 8 A.M. and by appointment.
* Also conducts examinations at Hilo in Oct.; Lihue, Kauai in Nov.; Wailuku, Maui in Oct.
- 22 San Juan, P. R. 00903; 322 U. S. Post Office & Court-house; Fri., 9 A.M.
- 23 Anchorage, Alaska 99501; 4th Avenue at F & G Streets; Mon.-Fri., by appointment only.
* Also conducts examinations at Fairbanks in May and Nov.
- 24 Washington, D.C. 20555; 521 12th Street, N.W.; Fri., 9:30 A.M. and 1 P.M.
* Also conducts examinations at El Paso, Texas in Feb. and Aug., Lubbock, Texas in Feb. and Gettysburg, Penna. 17325; 334 York Street; 1st & 3rd Tues., by appointment only.

IMPORTANT

* Appointments should be made in the previous month with the District Engineer in-charge, who will then furnish the location, date and time of the test. He will probably require advance submission of the completed Form 810 and check or money order for \$4, payable to the FCC.

(continued on next page)

MINUTES OF EXECUTIVE COMMITTEE MEETING

No. 313

November 19/21, 1966

Pursuant to due notice, the Executive Committee of The American Radio Relay League, Inc., met at the Headquarters office of the League in Newington, Conn., at 9:35 A.M. on November 19, 1966. Present: President Robert W. Denniston, W0NWX, in the Chair; First Vice President W. M. Groves, W5NW; Directors Charles G. Compton, W0BUO, Gilbert L. Crossley, W3YA, Noel B. Eaton, VE3CJ, and Carl L. Smith, W0BWJ; and General Manager John Huntoon, W1LVQ. Also present were Communications Manager F. E. Handy, W1BD1; General Counsel Robert M. Booth, Jr., W3PS; Assistant General Manager Richard L. Baldwin, W1KE; and New England Division Director Robert Y. Chapman, W1QV.

Director Chapman demonstrated to the Committee his use of magnetic tape recordings prepared for divisional affiliated clubs for use in instances where personal appearance in response to invitations was not possible.

The Committee discussed at length the progress of the League program to encourage growth of amateur radio in "new and developing" countries, and requested the General Manager to report in detail to directors on the current status.

On motion of Mr. Groves, affiliation was unanimously GRANTED to the following societies: Albany High School Amateur Radio Society

- Albany, N. Y.
- Burnaby Amateur Radio Club Burnaby, B. C., Can.
- Elkins Park Radio Club Elkins Park, Pa.
- Hughes Micro-Wave Radio Club Los Angeles, Calif.
- Jericho Radio Club (H.S.) Jericho, N. Y.
- Knight Raiders VHF Club Passaic, N. J.
- Loomis School Amateur Radio Club (H.S.) Windsor, Conn.
- Saint Benedict's Prep Radio Club (H.S.) Newark, N. J.
- Worth Township Amateur Radio Club Oak Lawn, Ill.
- Assumption Radio Club (N.S.) Wisconsin Rapids, Wise.

On motion of Mr. Compton, unanimously VOTED

to approve the holding of a Central Division Convention in Milwaukee, Wis., on July 7-8, 1967, and a Dakota Division Convention in Minneapolis, Minn., on May 27-28, 1967.

The Committee was in recess for luncheon from 1:10 p.m. to 2:30 p.m., during which Director Chapman retired from the meeting.

The Committee then heard reports from President Denniston and Director Eaton on their attendance at the RSGB equipment exhibition and contacts with U.K. amateur and telecommunications officials.

The General Counsel reported at length on the status of various regulatory and enforcement matters in Washington, and tower/zoning cases in several parts of the country.

Director Compton presented to the Committee information concerning a Lion's Club meeting in Minneapolis calling public attention to the service being provided by amateurs in handling traffic between military personnel in the Far East and their families at home. The Committee requested Director Compton to continue with the arrangements for other such meetings, after suitable liaison with the General Manager and the directors of the divisions concerned.

On motion of Mr. Eaton, unanimously VOTED to nominate Howard W. Shepherd, Jr., W6QJW, to serve for an additional year as ARRL liaison with Project Oscar.

On motion of Mr. Eaton, unanimously VOTED to pay from the Building Fund the cost of installation of the 20-kw. emergency power supply unit at W1AW.

The Committee recessed at 6:00 p.m. and, following the counting of ballots in the current director elections, reconvened at 1:50 p.m. on November 21 with Messrs. Denniston, Crossley, Eaton, Smith and Huntoon present.

On motion of Mr. Smith, affiliation was unanimously GRANTED to the following societies: The Suburban Amateur Radio Club of Union Cty.

Westfield, N. J.
St. Louis Contest Operators Webster Groves, Mo.

There being no further business, the Committee adjourned at 2:00 p.m.

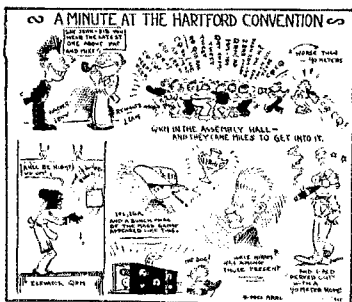
JOHN HUNTOON
Secretary



GP-W1CJD

Philip Gildersleeve, W1CJD

It is with deep sadness that we must report the death on Nov. 4, 1966, of Phil Gildersleeve, W1CJD, ex IANE, whose contributions to QST for almost forty years have become a tradition. Gil's artistic knack for expressing ideas or feelings unique to ham radio was unexcelled. Those of us who worked closely with him never ceased to wonder at his exceptional talent for turning a rudimentary idea into a final masterpiece with a few uncanny strokes of his pen. In addition to his artistic talents (see *Who's Who in American Art*), Gil was an avid radio amateur, a devoted family man and was exceptionally active in community affairs. For several early years he worked as a radio operator aboard merchant ships and in later years was News Editor of the *Middletown Press* (Conn.). Gil's creations will not soon be forgotten. The friendly companion and servant, "Jeeves," a lively and enthusiastic Podunk ARC on the way to a convention or field day, are as much a part of amateur radio as the "Old Man" or the "Wouff Hong." In tribute, we show on the facing page a sampling of Gil's work through the years.



Gil's first QST cartoon (June 1927)

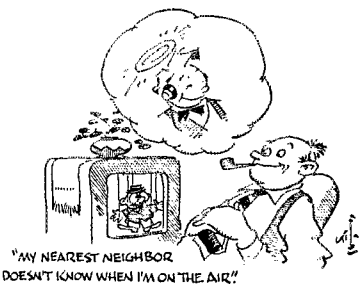
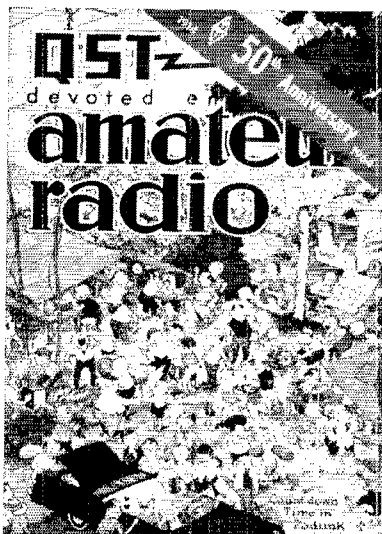


JEEVES

First Jeeves cartoon (Feb. 1940)



A war-time cartoon (May 1942)



A popular subject in the 50s (Feb. 1952)

The Spumoni Caper

Or: Field Day 1964

BY JOHN G. TROSTER, W8ICD



Troster articles were usually enhanced with a Gil cartoon (June 1964)

Ham QUEST '67



Gil did many ARRL house ads (above), contest write-ups, and department headings in QST

Gil's Field Day covers became a tradition as the Podunk ARC took to the field each year (June 1964)

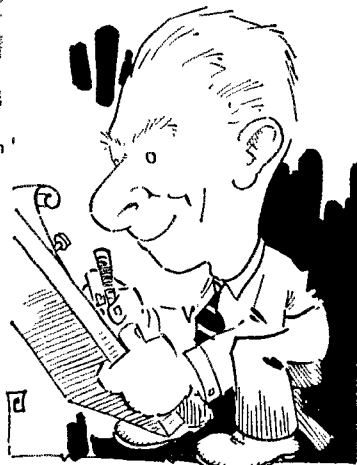


Convention Time

First QST cover (April 1930)

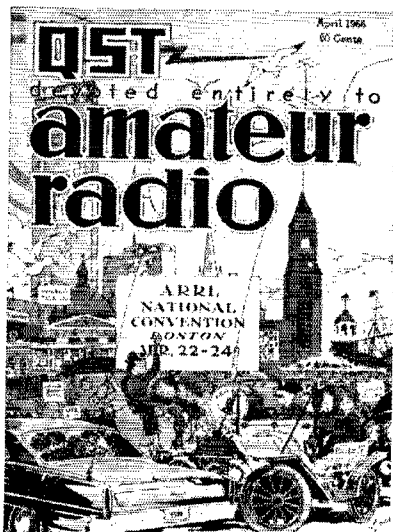


A pun cartoon of the 30s (Sept. 1936)



73 Gil-WICJD

A self portrait (Nov. 1939)



Convention covers were his specialty. This one depicted the 1966 National at Boston (April 1966)

I.A.R.U. News



REGION II TO MEET IN CARACAS

The Inter-American Union of Radio Amateurs (Region II of the IARU) will hold its second General Assembly in Caracas, Venezuela, May 14-17, 1967.

Announcements have been sent to each Society requesting any proposals be submitted to OAAAV prior to March 1 for translation and distribution.

The Radio Club Venezolano is making arrangements for the Assembly called to discuss problems and strengthen international amateur relations.



While enroute to the recent Federation of Clubs of Radio Amateurs of Central America and Panama (FRACAP), IARU President WØNWX visited officials of the Radio Club of Costa Rica. Left to right are TI2HB, Secretary; TI2JIC, Vice President, WØNWX; TI2ER, President, and TI2MEF, Treasurer.



During a coffee-break at the ITU's frequency-management seminar, these three hams checked the bands at 4U1ITU. L to r.: HB9IL, EA5EJ, and VP9AX.

LICENSING IN INDIA

The Government of India, Ministry of Transport and Communications, presently issues two grades of amateur licenses. Grade I licensees are permitted up to 100 watts, phone and c.w., after passing an examination including a 12 word-per-minute code test. The Grade II license is similar to the U.S. novice. Grade II licensees are distinguished by the letter "Z" immediately following the prefix in their call.

Licensees must be at least 18 years old. However, 16- to 18-year-olds may be issued a Grade II license if their application is accompanied by a certificate from the head of an educational institution or legal guardian stating the applicant is interested in and competent to conduct experiments in wireless telegraphy, provided he meets other licensing requirements.

Both licenses are issued for one year; the Grade I license is continuously renewable and the Grade II ticket may be renewed only twice. All licenses are due for renewal between November 1 and December 31.

No third-party traffic mobile, or television operation is allowed.

The *Amateur Radio Society of India* estimates there are 460 amateur stations in the country. It maintains a headquarters in New Delhi.

OPERATING IN SVØ

Greece allows U.S. government personnel operating privileges in their country. The Government of Greece has authorized the Joint United States Military Aid Group Greece (JUSMAGG) to issue a fixed number of SVØW licenses. They are issued for the period of time the individual is in the employ of the U.S. government in Greece. A photostatic copy of the FCC license and completed form available from JUSMAGG, APO, New York, New York 09223 is all that is required for the SVØW application. When an amateur leaves Greece, his former call is immediately available for reissue to another W/K ham.

HURRICANE QUIETS SEVERAL FG7 AMATEURS

The *Radio Club de la Guadeloupe* reports several FG7 amateurs lost most or all of their station equipment during Hurricane Inez. The club is asking for used parts which could be used in repairing the damaged stations. The parts would be distributed by the Radio Club de la Guadeloupe, P.O. Box 387, Pointe-A-Pitre, Guadeloupe.



At the 1966 International Amateur Radio Club convention held in Geneva in August, Ted Robinson, F8RU (center), Secretary of IARC, talks things over with Bill Eitel, W6UF, while Sewell Brewer, EL2S, president of the Liberian Radio Amateur Association, looks on at the left. (W1IKE photo)

FOUR NEW IARU MEMBERS, TWO MORE NOMINATED

Four new Societies have been elected members of the IARU. They are the *Amateurs Radios Algeriens* (ARA) with 126 members, the *Cyprus Amateur Radio Society* (CARS) which lists 25 members, the *Radio Society of East Africa* (RSEA) with 72 members and the *Liberian Radio Amateur Association* (LRAA) having 70 members. Welcome to the IARU!

The *Malta Amateur Radio Society* and the *Faroese Amateur Radio Society* have applied for IARU membership and the application was presented for membership vote in the December IARU Calendar.

U.S. — PANAMA RECIPROCAL SIGNED

A reciprocal operating agreement between the United States and The Republic of Panama was signed November 16.

The complete list of reciprocal agreements and other details appears on page 74 of December 1966, *QST*.



The International Frequency Registration Board of the ITU held a Frequency Management Seminar in Geneva during September, 1966. The purpose of the two-week conference was to explain, particularly to some of the new and developing countries, how to make better use of the radio-frequency spectrum. More than 80 delegates represented some 45 countries. Eight of those present were hams. Standing, l. to r.: 5T5AD, W3ASK, W2SLR, HB9ACD and W1IKE. Kneeling, VP9AX. Elsewhere when this picture was taken were HB9IL and EA5EJ.



During recent visit to IARU Headquarters, Nicolas Simon, YV5BNW, Exterior Secretary of the *Radio Club Venezolano*, discussed IARU Region II Assembly plans with IARU Secretary W1LVQ.

Strays MROV

The 1967 QCWA QSO Party is being sponsored this year by the Delaware Valley Chapter. Only members are eligible for the QCWA certificate and plaque donated by the National Headquarters, and only contacts with other members will count toward this award. Non-member participants are welcome, but are not eligible for awards. Your logs should show (in this order) date and time in GMT, contact No. sent and received, station worked, RST/RS report, freq., QTH, name and QCWA No. Party starts 2200 GMT Feb. 10, ends 2200 GMT Feb. 12. Activity will be found on or around the following freq.: (kc.) c.w. 3540, 3790, 7035, 7110, 14,110, 21,110, 28,110. A.m. 3810, 3950, 7230, 14,240, 21,340, 28,900. S.s.b. 3804, 3995, 7204, 7299, 14,315, 21,410,

21,440, 28,690. *RTTY* 7105, 21,140. Logs should be in the mail before March 20. Mail to: A. G. Wentzel, W2HX, 318 Gardner Ave., Trenton, N.J., 08618.

Feedback

The Stolen Equipment Stray on page 77 of December *QST* mentioned the theft of a KWM-2. The Serial No. given was in error; it should read 13636.

It should be noted that, due to a clerical error, the names Gary C. Liebling, WA0DGG, and Gary L. Creason, WA0HTY, inadvertently appeared in the "Silent Keys" column of the Dec. 1966 issue of *QST*.



Correspondence From Members-

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

SWITCH TO SAFETY

☐ It has come to my attention that MARS has a program of distributing war surplus emergency aerial type kites. These were for use with the survival kit and emergency rafts.

It is particularly important to the safety of the user that such kites be flown in an area where no possibility exists that the wire kiteline can make contact with overhead power company facilities.

There have been a number of cases of electrocution when such a contact was made and the metallic kite line carried the electricity to the person flying the kite and through him to the earth. — *J. E. McMaster, W1MO, Director of Safety, NEGEA Service Corp., Cambridge, Mass.*

CHANGE DX CONTEST

☐ In order to improve the purpose of the ARRL DX Contest, I suggest contest rules be changed to have one weekend when W/K/VE stations may only work countries which they have never verified.

This would offer two excellent advantages: The old pro would not have to pad down his contest log with non-rare countries. Instead he could concentrate on the rare, unworked countries.

This would make it less difficult for newcomers and casual DX workers to work new countries for DXCC credit.

After all, it is only a contest to old-time DXers, while it is a real thrill for newcomers to work a new country.

How about some suggestions from other guys on how to make the test a way to get new countries? — *Richard Wilson, W4QKST, Storm Lake, Iowa.*

FREELoadERS AND FEES

☐ Here's another letter to add to your file on the recent freeloader controversy. I am presently a member of the League and will support it in any way my time will allow. However in my younger student days, I was frankly too broke to belong but it was nice to know the League didn't discriminate against me because I was broke. I'm sure there are many others who have been in my situation also. However, I also agree that lazy selfish freeloaders hurt us all. My present solution — don't throw out the bad if the good goes with it. — *John Deines, K8QOJ, Oxford, Ohio.*

☐ Enclosed check is for my 1967 dues. I am proud to be a member of ARRL, and feel ARRL needs me as much as I need ARRL.

No one has yet convinced me that I should discontinue my membership, and I have not as yet been shown that any other society or group has more to offer.

I'm against "free-loading" use of this five bucks and believe those who have the last word will come up with the right idea that will be best for ARRL. — *C. Nevin Miller, K3BWB, York, Pennsylvania.*

☐ Why not have official ARRL certificates available to members only? Help all other amateurs any way possible; we hams don't refuse to help others! If operating cost rise then let's face facts and increase our dues. — *James Belanger, WA1GCE, Brunswick, Maine.*

☐ If we start refusing help to amateurs, or requiring a fee for the help, except maybe for postage and paper, then we can no longer claim to be for the advancement of the amateur and amateur radio, but rather, only for the advancement of the ARRL and ARRL members. What comes next is requiring a fee from non-members for representing them in legislative matters.

If some members are so worried about "freeloaders," then I think the best way to get rid of them is to work to make all amateurs members. It seems to me that any amateur who writes to the ARRL for help is not anti-ARRL for any reason, and would probably join with just a few reminders and pushes by members. It always seemed to me that \$5.00 was ridiculously cheap for all the ARRL's services, anyway. — *Jay VanSant, WA7ANY, Libby, Montana.*

☐ May I offer an opinion on the League's financial problems? Provide your "Fringe Benefits," such as operating aids and literature, to ARRL members only. Too many hams see little need to join when everything is free anyhow. If a dues hike is definitely needed, then let's do it now. — *Art Brown, W0IOT, St. Paul, Minn.*

BALANCED QST

☐ No comments on our magazine, but I keep thinking if you were to offer only articles on my favorite mode and practices, I would never be exposed to new ideas and methods. Keep the content balanced for all segments and sooner or later that "Dream Rig" or feature article will come along. — *Robert Williamson, WA6JCA, Oakland, California.*

☐ I have been licensed since 1929 and a member of the League for about the same period, and I have always looked forward to *QST* each month. To maintain a well-balanced technical and operating journal over such a span of time is certainly most difficult, as both the equipment and the people licensed as amateurs have undergone quite a change in the years. — *T. O. Jorgenson, K7VVQ, Spokane, Washington.*

SOMETHING FOR EVERYONE

☐ I'm a Novice who had no transmitter to use, until one of my friends (K3RPY) showed me his No-

member issue of *QST*. In it was a 1-watt transmitter for 40 meters any Novice could build.

I had been told about *QST*, but I had no interest to buy it. Now I'm glad to be a member of the ARRL. It really is true *QST* has something for every amateur. — *Sterling Wayne Miles, WN3GOS, Washington, D. C.*

CODE PRACTICE QRM

Ⓞ During the last code proficiency test, those inconsiderate hams who sat right on top of W1AW in the mode of s.s.b. sure messed it up for the unfortunate others who don't have selective receivers. A few kc. can't make that big a difference! — *Tim Karle, Natick, Mass.*

NOVICE ROUNDUP

Ⓞ In regards to a letter in "Correspondence," *QST* for November 1966, written by WA0JES, I think his suggestion concerning the Novice Roundup is excellent. If a certificate was offered to Generals, it would give them an incentive to work as many Novices as they can, instead of just a few, as is often the case. The Generals could supply some hard-to-get multipliers. Such an award might attract more VE stations to operate the contest, and give out some QSOs from the Canadian ARRL sections. — *Gary Giambattista, WN1PXP, Dayville, Conn.*

HERTZ, PRO AND CON

Ⓞ Many items have recently appeared in *QST* condemning the use of the term "hertz" as the unit of frequency, on the grounds that it is a meaningless innovation. Actually, "Hertz" has been used in Europe for decades, along with other such "new" terms as "picofarad."

Adoption of this and other new units and or terms is part of the widespread effort to convert to the International System of Units, pioneered in this country by the National Bureau of Standards.

Let's swallow the pill; it's not so bitter after all. — *Ken Thomson, W5IFH, Pasadena, Texas.*

Ⓞ I usually consider myself a liberal, willing to welcome valid innovations, but this term "Mega-Hertz" is an illogical abomination and I hope you will resist it to the last cycle per second. — *H. R. Hands, VE3AOE, Hamilton, Ontario, Canada.*

Ⓞ In my opinion, Mr. Harris, G3GFN (*QST* for August, 1966 page 48) hit the nail on the head in his explanation of the new term Hertz. I see no reason to change a well-standardized and meaningful term into a useless expression which would require a definition. In addition to the points that Mr. Harris expressed, could you imagine the confusion that would result from the change? I receive a current electronics magazine and I shudder each time I see kHz or MHz printed in it. I would say that Mr. Harris has the proper point of view and I would also be interested to see how many others agree with him. — *John Portelli, WA3CFU, West Pittston Penn.*

A GOOD PUBLIC IMAGE?

Ⓞ This evening three first-rate men of my community were in my home. They showed interest in my ham equipment. I turned it on to let them listen and tuned in a 75-meter phone station. Suddenly

I realized that we had just heard an utterly rotten and putrid "joke." Thanks a lot, "brother" ham, for your "help" in building a good public image of our hobby. Many work hard to build good community opinion and then . . . you! — *Hugh C. Crouch, W1HEZ/K1TJM, Springvale, Maine.*

BC RADIO HISTORY

Ⓞ I have a project which could use some help from old hams everywhere. Five of us around the nation are in a joint endeavor to find old radio programs and tape them for permanent preservation in the audio archives of the Broadcast Pioneers in New York, the Library of Congress in Washington, D.C., the Hollywood Museum, and several schools with good starts. This is a labor of love for all of us, and everything is done gratis.

We are searching not for historic voices or events but the everyday bill of fare of early radio broadcasting. Some *QST* readers may have private recordings — made off the air, found, stolen, borrowed, etc. — of old radio shows, personalities, or unusual stuff. We will pay postage both ways on any loan of such items, and take professional care in the dubbing. Full credit to donor goes with each tape.

Strangely, much of early radio history will be silent if we cannot come up with some recordings.

For instance, any ham have a record of when the network announcers used to reel off in one long breath all the stations joined in the early networks? Anyone have a record of Admiral Byrd and his hams broadcasting from the South Pole? Anyone with a record of Tony Wons on the Camel Caravan? Only recently we lost 8 years of reference copies of CBS Lux Radio Theater when a Hollywood agency threw them out in a move of offices!

So dig in your files, hams, and help us. History will thank you and so will the broadcast pioneers and others. — *Stephen A. Cisler, ex-9SX, 5ADY, P.O. Box 1644, Louisville, Kentucky.*

PHONETICS

Ⓞ I wish you would again call the attention of hams to the use of the ARRL phonetic alphabet. I don't think there is a place for the use of the very cute phonetics that some use, though I understand they did put in many hours trying to think up some real clever call. To me a long crazy phonetic call means the operator is a very new ham or that he does not really know what phonetics are used for. Usually, when I hear a real cute call (and almost everytime I have trouble figuring out just what his call really is) I turn the dial just a little more and pick someone that I have no trouble understanding. — *R. B. Hannah, W5ACC, Junction, Texas.*

AGE LIMITS?

Ⓞ Many foreign countries set minimum ages for amateur licensees, usually at 15 or 18 years. I think this policy is in error. Generally people become interested in radio earlier than this. Thus such minimum age rules discourage those who would be otherwise interested.

In the past year of operating I have asked Novices, at random, their ages. It turned out they are either very young or are middle-aged. Many of these Novices would have been excluded under these age rules.

The IARU should make a further study of this situation and work to eliminate any age restrictions on amateur licensing. — *Nick Leggett, WB2UEQ, Somers, New York.*

Building Fund Progress



Here's our Honor Roll of League divisions which have achieved 100% of quota in the Building Fund drive:

- | | |
|------------|----------------|
| Canada | New England |
| Dakota | Northwestern |
| Delta | Pacific |
| Hudson | Roanoke |
| Midwest | Rocky Mountain |
| West Gulf. | |

DURING November the West Gulf Division reached 100% of its quota in the Building Fund Drive, thus becoming the 11th division to achieve success. A concerted autumn effort, spurred on by the offer of a group of amateurs in Houston to match dollar for dollar the money contributed by other members of the division, brought the drive to a climax in the states of Texas and Oklahoma.

Will the Central Division be next? It's not far behind!



On behalf of the Houston Chapter of QCWA, Hal Sears, K5JLQ, presents a matching-fund check to Director Best, W5QKF, to swing the West Gulf Division over the top in the ARRL Building Fund drive. L to r., W5HZ; WASBWV; W5QKF; K5JLQ; W5AIR.



January 1942

... When this issue went to press, everyone knew the war was on and hams were off the air, but good. Too bad there is an unavoidable time delay in getting out the magazine. Let's see, though, what was going on.

... Plans for the utilisation of amateur radio by the Office of Civilian Defense are being put down in writing. OCD will rely primarily on the wire services and nothing definite about hams has so far been forthcoming. KBW suggest that, in view of the outstanding success of f.m. on u.h.f. radiotelephone, we might pursue this matter to advantage.

... George Grammer, W1DF, has a comprehensive article on vibrator power supplies for emergency equipment. He describes in detail several types, capable of giving 100 ma. at 300 volts. This article is directed to those hams who do not have or will not be able to acquire the necessary boughten parts. ... The Navy is looking for hams to enroll in RADAR schools. At last the magic word appears in

print! The War Department has openings for 200 men to operate high-speed circuits. The Civil Service needs a large number of amateurs for Radio Mechanic-Technicians. Pay is up to \$2600.

... Hygrade-Sylvania announces a new line of u.h.f. tubes good for up to 750 Mc. These new tubes have the lock-in base with the tubes mounted inside. ... Using standard tubes, Byron Goodman, W1DX, has developed a line of 112 Mc. receivers for use in emergency work. These little boxes are super-regens and superhets. As usual, they have metal chassis with the tubes mounted on top. I sort of like this construction, even today. Tubes get plenty of air!

... Nice description of Fort Monmouth's ham station by S. Gordon Taylor, W2JCR. Although government owned and equipped, this rig is used solely for communication with other amateurs. The transmitter is a Hallcrafters HT4 operating at 425 watts c.w. and 325 phou. One of the receivers is an NC200.

... As I get further along in this issue, there is a last-minute addendum on yellow paper that reads "WAR COMES." FCC's order No. 87 is printed in full. All ham operation is suspended but the door is left open for subsequently authorizing certain amateurs to engage in directed activities. These must apply through channels ... federal, state or local authorities who must also have a need for such services. "Let it be our high resolve that we shall never be found wanting." — W1ANA

Hamfest Calendar

California — The joint meeting of the Northern California and Southern California DX clubs will be held in Fresno, California at the Del Webb Town House Motor Hotel, January 21 and 22. This meeting is open to all members of the Two Clubs and their invited guests. For more information write Bob Thompson, K6SSJ, 4135 El Camino Way, Palo Alto, California.

Indiana — The Lake County ARC announces the 14th Annual Banquet which will be held at Teibel's Restaurant which is located at U.S. Highways 30 and 41 (Schererville, Ind., near Gary) at 6:30 p.m., CST, February 11. There will be entertainment and speakers. Tickets \$4.00 each from Herb Brier, W9EGQ, 385 Johnson St., Gary, Indiana 46402.

Nevada — The Second Annual "SAROC" Sahara Amateur Radio Operator's Convention, hosted by the Southern Nevada ARC, P.O. Box 73, Boulder City, Nevada 89005, will be held January 5, 6, 7, and 8 at the Hotel Sahara, Las Vegas, Nevada. Send your QSL card to get on the mailing list for details.

Ohio — There will be a ham auction, Friday, February 3, at the Naval Armory, Ashland Rd., Mansfield, Ohio. The affair will start at 7:00 p.m. EST. For more information write Kenneth Portz, WA8QNP, 345 Ruth Ave., Mansfield, Ohio 44907.

QST

COMING A.R.R.L. CONVENTIONS

January 21-22, 1967 — Florida State, Miami
 April 22-23, 1967 — New England Division, Swampscott, Massachusetts
 May 27-28, 1967 — Dakota Division, Minneapolis, Minnesota
 June 30, July 1-2, 1967 — ARRL National, Montreal, Quebec
 July 7-8, 1967 — Central Division, Milwaukee, Wisconsin

RTTY BULLETIN

It was with deep regret, recently, the RTTY fraternity learned that Merrill Swan, W6AEE, had found it necessary to relinquish the editorship of the *RTTY Bulletin* — which he founded some 14 years ago.

Added responsibilities in the research laboratory where Merrill is associated made the mounting demands of the editorship increasingly difficult for him to meet on a spare-time basis. Arrangements have been made with Franklin "Dusty" Dunn, W8CQ, to carry on publication of the *Bulletin* after January 1, 1967.

Merrill Swan has been one of the pioneers in amateur RTTY since its inception soon after WWII. In about 1946 he and a group of friends in the Pasadena-San Marino area obtained a dozen surplus Model 12 machines from Southern California Edison, and soon thereafter formed a RTTY net using a.f.s.k. on the 2-meter band. The operation created so much local interest that it led to several related events — the formation of the RTTY Society of Southern California, the pioneering agreement with Pacific Tel. & Tel. to obtain their obsolete machines, and finally — in January, 1953 — the *monthly publication of the Bulletin* under Merrill's editorship. Soon after the first issue appeared, the long-awaited FCC authorization for f.s.k. on the lower frequency bands took place. RTTY was off and running.

The original RTTY 2-meter net is still going strong, and has not missed a weekly session in almost 20 years. Also, the RTTY Society of Southern California alone has distributed more than 5,000 surplus machines made available by various telephone companies. How many more have been placed in amateur hands by other societies, MARS and Western Union is unknown; but the total is now believed to exceed 20,000.

The *RTTY Bulletin* under Merrill's editorship — ably assisted by his wife Margaret — has had a wide influence on the development of amateur RTTY. New technical approaches to keying methods, terminal units, filters and operating techniques were pioneered in its pages. In many instances they have found their way into accepted commercial practice, and once again amateurs have been able to lead the way by unique contributions to communication.

All of us who have watched the development of amateur RTTY are grateful for Merrill's modest, conscientious and competent leadership. While we will miss his editorial direction, we can perhaps look forward to seeing him a bit more frequently on the air.

To Dusty, W8CQ, we wish the very best of success in carrying on this most worthwhile activity.

— W6ZII

Seasons Greetings From the Hams of the ARRL/QST Staff

Roland B. Bourne	W1ANA
F. E. Handy	W1BDI
Pete Chamalian	W1BGD
Doug DeMaw	W1CER
Jean DeMaw	W1CKK
Bob Rinaldi	W1CNY
Laird Campbell	W1CUT
Charles Utz	W1DEF
George Grammer	W1DF
Bill Smith	W1DVE
Byron Goodman	W1DX
Sam Harris	W1FZJ
E. P. Tilton	W1HDQ
Helen Harris	W1HOY
Lewis G. McCoy	W1ICP
R. L. Baldwin	W1IKE
J. A. Moskey	W1JMY
John Huntoon	W1LVQ
Lance Johnson	K1MET
George Hart	W1NJM
A. M. Wilson	W1NPG
Murray Powell	W1QIS
Don Mix	W1TS
Perry F. Williams	W1UED
L. A. "Pete" Morrow	W1VG
R. L. White	W1WPO
C. R. Bender	W1WPR
Walter Lange	W1YDS
Ellen White	W1YYM
Miriam Y. Knapp	W1ZIM
Lillian M. Salter	W1ZJE
Stan Israel	WA2BAH
Bill Dunkerley	WA2INB
Louise Moreau	WB6BBO
John Troster	W6ISQ
Rod Newkirk	W9BRD
Maxim Memorial Station	W1AW
ARRL Headquarters	W1INT
Operators Club	

How's DX?

CONDUCTED BY ROD NEWKIRK,* W9BRD

How:

This new year promises more than the usual abundance of DX blessings. One we're going to miss, though, is the wonderful work of the late W1CJD. Gil's masterful Jeeves productions have served as a zestful springboard for *QST*'s monthly DX commentaries since he and W1DX got together on the idea back in the '30s.

Ham radio, as evident in his spirited output, was truly a fun thing for W1CJD. Close contact didn't immunize Gil against a nip or two by the DX bug. He would admit to an occasional nocturnal prowling in search of VKs and ZLs on 80 c.w. when wee hours found him wakeful.

Many are the half-baked gag ideas that W1CJD turned into *QST* classics with artistic wizardry. OM Gildersleeve had that magical knack common to all the great ones, the virtuosity in any field. He made it look so easy.



Well, we've declared our usual new year's resolution to try to get fewer calls and addresses wrong in 1967. With a little bit of luck we may decrease the inevitable percentage.

Overseas licensing authorities could help. Like not giving the same call to different licensees without a few years' lapse between issuances. And how about returning to the proposition that

* 7862-B West Lawrence Ave., Chicago Ill., 60656.

a prefix's fundamental function is identification? This prime geopolitical purpose is negated when prefixes become mere promotional gimmicks, especially with scant advance notice. Special QSLs ought to suffice, anyway.

Another growing problem: You gadabouts who perform so admirably as guest operators at DX stations should take care that you don't become misidentified as QSL managers for other QSOs by those stations. Much wasted mail and lost QSLs ensue.

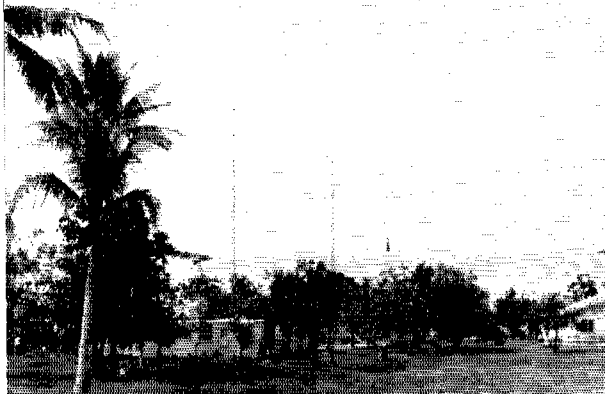
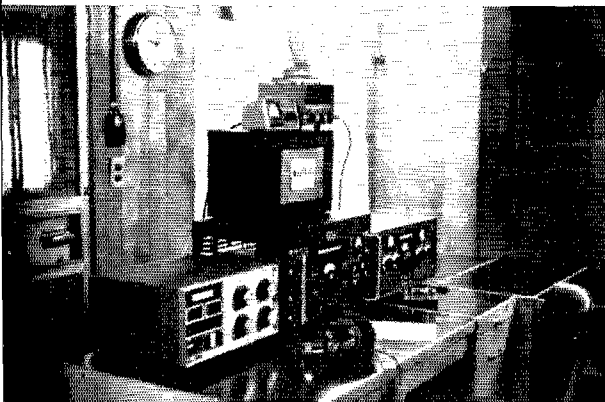
We should all resolve to operate more carefully in '67, with particular attention to accurate QSL work. Plenty of "new countries" go unconfirmed because call signs aren't logged correctly, often because they aren't transmitted clearly. Let's stamp out *slopperating!*

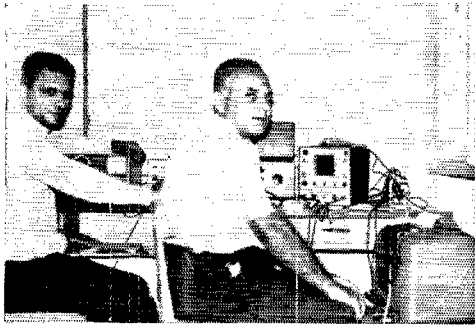
What:

DXdom's rotary flame-throwers steamed up the Indian Ocean in late '66 as W9WNV, CR7GF and others continued separate DXpeditionary pressures down that way, sometimes running challenge pile-up matches a few kilocycles apart on 20 and 15. Desroches, Farquhar, Aldabra, Glorieuses, the Comoros and other rarities risked consummate defoliation as the bands played on. If those guys ever head for the ice caps we'd better patch up our canoes. . . . The comeback of ten meters made the biggest DX news, however, and QRP-with-dipole lads are ordering more log-books. Somewhat shocking to hear old 20 almost deserted at times while 15 and 10 stack 'em in the aisles. This is a multiband month for the "How's" Bandwagon — let's hit the DX road. . . .

10 phone, as we said, greets the new year with ankle-deep DX QRM for reporters Ws ICNY 4YOK 8YGR, Ks 6TXA 0JFJ 0JPL 0RWL, WAs 1DBR 2VFA 40YW 4WIP 5MUE 8GGN 8OMF 9MQI 9SKQ, WB2LDX, G3IDG, IIER and P. Kilroy who deal with the 28-Mc. voices of GEs 3JM* 2000 GMT, 3PI* (28,460 kc.) 21, 3TV* 22, 4WG* 21, 6EW 17, CN8s CD* 17, FF, CO8RA* 21, GRs 6AM 6DX 15-16, 6HF 18, 7DS* 16, 7ER*, CTs 1KT 14, 18W* 17, 3AM* 17-18, a dozen CXs, DJ8RR 15, DLs 1KB* 8RL, EAs 7ID 20, 8AE (490) 13, 8AH 13, 8DV 20, ELs 2AA 16, 2AF 2AK 20, ET3s AC 8, WH (650) 11, F3KW (535) 14, FH8CD (620) 18, 1 fistful of Gs,

W0GTA/8F4 brings a long missing country back into the DX fold with this Indonesian installation. The exterior view includes two-element beams for 10 through 40 meters, inverted vees for 40 and 80, on 70- and 95-foot towers. The group photo shows Bob at center, army communications Capt. Moeljono to his left, and valued assistants. W0GTA/8F4 has been most active on 14,140-kc. single-sideband, listening near 14,225 kc. at times, around 1400 GMT. He's handy with c.w., too, and you may have worked him as 9V1LP. (Photos via W1WPO)





11s AMP/M1 and SGS/M1, left and right, scored a first in September with their RITY DXpedition to San Marino. Many W/K keyboarders were contacted. (Photo via W2FX)

GBs 2USA 3CSG, GC2FMV, GI3IBJ/9HI, GM5HBN, GW3s AHN 14, NWV, G5ABG/KIUSO 15, HC8 1EL* (590) 23, 6GM 19, HI8XAL, HR8 1JR 19, 1KS* (943) 22, 2CK, JAs 1RJO (590) 22, 8PD*, K7WRR/KL7, KA2RJ (620) 1, KB6CZ 23, KH6s EOQ FRI FRT* LJ 22, KL7s EBY EDY 22, KP4s ACK AEB* (676) 21, CQW CRD CQZ*, KS6BT (620) 23-1, KW6DS, KX6BU (580) 22-23, KZ5s CD* 20, MB* 21, OV, fifteen LUs, MP4s BEU 8-11, TBC (592) 10, OAs 1BW 4PQ 20, OD5s BU* 12, CS* 13, EL (570) 14, OX3BX, PJ2s AP* 21, CR M1, plenty of PYs, SM7ANY* 20, SV6WL (595) 11, TF3AB (630) 17, TG8s KCJ (600) 14, 9DX* 22, 9HU* (678) 1, T12LA, UA9WJ 11, UP6VA*, VKs 2ABW (555) 21, 3VL* 22, 6CF 6GH 8-10, 6RU, VO1HL, VPs 1VP 2AA (580) 17, 2KJ 17, 2KR* 22, 5RS 8CW 18, 9B1A, VS8s 6AJ 9AJC (605) 11-16, 9ARV 9ATW (875) 14, W5MTX/KH6, XEs 1SSG 2DDZ*, YN1s MAV* 20, RK* (680) 19, YS1HKE* (645) 4, YVs 1AJ 1HA 1LA 5AGM 5BPJ 5KP 19-20, ZB2AJ 13, ZC4s CI (570) 10, CN (610) 15, KK* 12, MO 12-17, RM 14, SS 8, ZD8SK1, ZEs 1AA 8, 1BR* 10, 2JA* 12, 3JO* 17, 5JS, ZLs 1AK 1G (600) 22, 2ABP* 23, two dozen ZSs including 3HT 8L (610) 13, 9C* 18, 4M5A (620) 21, 4U1SU 10, 4X4s HQ 11 12, 4ZH1Q (480) 12, 5As 1TY 15, 2TR 16, 3TN 10, 5N2s AAF (611) 14, AAW, 7X0LA, 9G1FF, 9H1s A 10, AF* 12, B* 12, 9J2s BK 8, DT* FK MM 17, 9Q5s BD (594), FV 18, JW 18, 9X5MH 17, 9Y4s LF and VS* 19, the asterisks denoting non-s.s.b. specimens.

10 c.w. is fun for Ws 3DPR 8YGR 9CVZ, K3FKU, WAs 1 DBR 5MIUE 5NOM 8OMF 8QYK, Wb2s LDX THB and G3IDG because of GRs 6DX 16, 6H1 (44) 17, 7AD (87) 16, 7IZ 16, 7LU (63) 17, CT3AS (92) 16, DJS 1TS 2GL 2RE 8IQ, DLs 3BJ 3XK 6NR 6JK, DM2CO, EA8EO 13, EI9J (35) 15, F5s EP FV, FH8CD, seals of Cs, G83SXG, HB9DD, HG2KRD (47) 14-16, JAILXU 20, 3K, KA9AK (38) 22, KG4CX, KH6FQJ, KV4CI, LUs 3HBZ 18, 4DM, LZ1AG (60) 15, MP4BFK 8, OAs 1F 16-18, PF, OD5EJ, OK2BLX, PAOs AAJ FLX NG QU, PJ2ME (43) 17, enough PYs, SP3AJJ, UA9s FN 10, OK 11, WHT 11, UG6AB, UH8AY, UI8CD, UL7YL 10, UM8AP 11, VK2EO 8-12, VPs 2AA 2SJ (58) 17, 6PJ, VR2DK (17) 23, W0GTA/8F4 9, YO2BA, ZB2s AM (19) 17, AP (50) 15, ZC4s GB (57) 15-17, JU 10, ZDs 7IP 10, 8IP 8J 16, ZEs 1As 10-12, 1CK 10, 2JE 16, 3JO (81) ZSs galore including 8L (30) 13, 4X4s UL (88) 14, VF WF 10, XM (84), 5N2AAF 12, 6W8DD 17-18, 7X0AH 12, 9H1s A AB (52) 16, AF (66) 16, 9J2s BC 9, MM, 9Q5s HJ LJ 16 and 9X5SA (10) 19. We'll probably have a little midwinter slack on 10 now but watch out for another upsurge around ARRL DX Test time!

15 phone bids fair to take over 20's position as DX wheelerhouse for mike men. Ws 2DY 31NKK 8MLX 8YGR 9LNQ, Ks 1ZJA 2KMI 6TXA, WAs 1DBR 4WIP 8G4GN 8MGD 8QJK 9QYJ 9NXP 9SXQ, Wb2s JYM LBJ LDX SCK, VP7DJ and Mr. Kilroy offer this stall list: CE3s AG CZ DM 22, OE* 23, TS 17, CN8s AA 21, FC 20, FF, COs 5PP* 8MN* 8XW* 22, CPs 1 EK IEN 5BK (325), SAU 8BC, CRs 5CA 6ES 6EW (335), 7GF 17, CTs 1CT (300) 23, 1GE* 1IW 1J 18, 1LJ* ISO 16, 1SX* 18, 3AS* CXs 3UF (350) 22, 3UV 6AD* 8AAW (385) 19, 9AA 9AA* 9CO, DM3OZ, EA6s 6AX* 8AH (370) 12-13, 8ES* E1BS, EL2s A AF AK (375) 22, O R 19, EP2BQ 9, ET3s AC (420) 11, GB RB WH (370) 20, FL8AC, FM7WQ (397), FO8s AB* 8, BR* 3, GCs 3MLR 3PLX (318), 8HT (334) 15, GD3s RPK (326) 14, TTU 16, GM5ABN/KP4BNY, HA5KQJ 15, HC8 1BY 1NX 1PB 1SP (300) 23, 2IF* 21, 6GM 21, HI8s 3NAAI* (259) 21, 3VC* 21, 7AGH 18, 8NTB 8RBG 0, 8RRM 14, SXFS, HKs 2KL 3LT* 8AI 4, HPs 1HC* (130) 23, 2JO,

HR38C 0, HZIAB (30V) 11-12, ITIYL, JAs 1DDZ 1PQE (300) 18, 1MIN 1OYV 1PKU (399) 2, 2GJU 3EMD 3JXJO, 4DLP (359) 2, 6ATL 7BXS 7UJ 21, 8PD, JX6XF, KA2DO (337) 23, KB6CZ 4, KGs 4AN (375) 23, 6AA, (415) 10, KL7WAH 0, KM6BI, KR6TB (230) 9, KSs 41C 19, 6BT (365) 0-1, 6BV 23, KV4s CX ES (435) 1, KW6DS, KX6DS, KX6s HQ BU (430) 3, EA (440) 0, KZ5s HK LD MB* 21, QM 22, SSS* SY, LZ1WD, MP4s BBW (395) 15, BEU (210) 11, MAW TBQ (388) 9, OAs 1AH 3L 18, 4EP* 4PQ 23, 4UO (290), 4VE (310), 4WI 17-18, 6BL 7L 8AE 18, 8M 16, OD5s BZ 15, FC (371) 17, OXs 3LP 3WX 13, 4FC (382) 21, PJ2s AQ 21, MI 19, PZ1BX (431) 1, SL7AZ 14, SV1s AE (340), AH 15, TF-2WAE (328) 16, TIs 2GXV (415) 22, 8LH, TN8AA (395) 18-20, TU2AE* 18, UD6BI (310) 13, UI8MN (340) 12, UP2KNP, UO5PK, UR2AR, VEs 1AED/SU 1, 8BZ* VKs 2ABW 4YP 8KK, VPs 1PV (394) 21, 2JA 2AZ 2DDA* (288) 22, 2GLE 19, 3HAG 17, 3JR 0, 5AR (354) 21, 5RB (355), 6AQ 6BW* 7DJ 9BDA 9DF 9FR, VQs 8AV (350) 15-16, 9EF (390) 18-22, VS9s AJC (399) 19-20, ARV (363) 18, ASP*OC, VU2CQ (330) 11, W0GTA/8F4 (370) 9, Wb2VJD/CE0 (375), XEs 2WH* (235) 20, 3JD (385) 22, XP1AA, XW8AL (402) 15, YALDAN 17, YN8s 1JAD 19, 6BS 9BJM 16, YSs 1DHE (395) 20, 1GEC 23, 1HK6 (405) 19, 1LBE 1MCG (338) 8, 1RCP 2CEN (320), YU3FC, YVs ISA* (187) 17, 3CN (230) 23, 40A*9AA (390) 11, ZB2s AJ (377) 21, AO, ZC4JU (400) 20, ZDs 3E 8IF 8JES (350), 8LZ 21, 8RB 8SKI 8WZ 20, ZEs 2JJ 19, 6JL* (300) 18, ZF1GC (390), ZLs 1CA* 1KD 10, 1KG 2BE, ZP3AL, many ZSs including 8L 17, 4U1SU, 4X4s BL (322) 14, CJ 15, QYC VB, 4ZH1Q (380) 11, 5As 1TZ 2TZ 20, 3TN (357) 14, 5H3s JH JL 20, JR, 5N2s AAe (350) 20, AAW AAX (380) 22, AVH (380) 11, 5Z4s AA (292) 9, JW (387) 19, 6Os 1PF (390) 20, 6BW, 6W8AG* 22, 7Q7s BN* 20, BS RM (360), 7X0s AH (310) 8, LE (215) 16, 9G1s DM (210) 11, ED E2* (357), FK FL* MJ RW (410) 20, 9H1s A 14, AG 14, AI* AU (367) 17-18, 9J2s BK 20, DT FA (360) 19, GR WR, 9M2s LO (360), OV, 9Q5s BD DA DL EA FF IA IC* (250) 19, LB QR SS WE, 9U5s BB 19, DL 21, KU* UP, 9V1s ON MY 12, 9X5s AV and MH (370) 20, the stars for straight-a.m. types.

15 c.w. is a lark for Ws 1BGD 1CNY 1CNU 2BAI 3FNK 3JZJ 9Y 8IBX 8YGR 9LNQ 9CVZ, Ks 1ZJA 3PKU 3UMM 5MHG/6 6TXA 9UIY 9PJF 9RWL, WAs 1EYF 5EQA 5NOM 6JDT 8G4GN 8MCO 8MGD 8OYF 8QJK 9MQU 9NXP 9SXQ 9QCI, Wb2s 2JYM 2LBJ 2LDX 2RS 2TH 2UHZ 6IEK, G3IDG and VE8AG thanks to CE8 1AV 23, 6EF, CMs 1AR 2BL/CO4, CN8s FC MI, GO2s BB BO (40) 12, GRs 3AD 6AL 6AR 6CK (20) 11, 6DX (65) 18-21, 6FA (90) 18, 6JA 18, 7AN (18) 17, 7IZ (30) 18, CTs 1CV (55), 1DJ 3AS (33) 16, CX1JLM (86) 2, DMs 2ABB 18, 2ARD 2ATH 2BKK 2BTO (45), 3KOG 3VGO, EA8s BO (62) 18, FF (73) 10-11, ELs 2AH (35) 15, 2AM 2D 6B 18, 9NB 20, EP2RV (82) 12, ET3RF, FB8XK (65) 10, FG7XX (30) 17, FL8RA (50) 13, FM7WD (70) 20, FO8BJ (45) 8, FR7ZD (85), FY7YG (65) 21-22, GC3PLX, HAs 1SD 4KYB 5DA 5KDYQ 15, SKCI 8UH, HG1s BW 19, JQ (62) 21, HI8s IBC (30) 13, XAL (28) 12, HL9TH (87) 9, HMs 1BB (35) 23, 1DE (33) 8, 1DM (44) 2, 9BZ, HP1AC, HR5LE, IS3CB (64) 18, ITIAGA, oodles of JAs including 4CDY 4DLP 5AB 5BIN 5BQT 9A1H 9AMJ 9BA 9AF 9BES 9BKX, JH1AAV also of Japan, KG6s AQA IG (40) 23, NAA (50) 11, KL7FKW (30), KR6AQ (35) 10, KV4s CI (20) 12, CX (80) 10, KX6DC (35) 23-0, KZ5s EX FX, LX1LF (15) 17, LZ1s BK KPZ (20) 14, MP4BDF, OA4s FA (25) 12, KF 10, PF UV (48) 17, OD5s ED (100) 7, EJ (17) 8, EL (17) 16-17, ET FC (84) 8, OH0NM (60) 13, OX3BX (30) 12, PE2EVO (25) 12 of Holland, PZ1CM (32) 20, SLs 5CX 15, 6BH 15, SUI1D 50 10, TAI1AV (40) 20, T2RKL, TN8BG (75) 18, UB5s KFF (55) 15, KKM, UL7AA (117) 10, UM8AP 4R 7, UO5PK (70) 12, UP2KBC 16, UT5PX 19, VKs 6RS (14) 10, 78M (48) 11, 8HA (80) 20, 9CJ (60) 5, 9CC (36) 12, 9GN 9GW (55) 6, 9VM (72) 12, 9XL, VPs 2AB 2AZ 2GLE 2KJ 16, 6PJ 8HJ (35) 17, 8IY 9RC (82) 12, VR2s DK (40) 9, EK (72) 7, VSs 6EN 9APW 9ARV (30) 10, 9ASP, VU2s FB TZ (48) 10, WB (75) 12, WA2TBQ/KP4, WH6FST, WP4CPJ (160), WV4EY (120) 22-2, YOs 2CD 16, 3AR 20, 3WJ (58) 22, 9HH, YS2OB (43) 15-18, ZB2AP, ZC4TX (10) 9-10, ZDs 8BUD 0, 8J (52) 21, 8RB 23, SWK 0, 8WZ 9BE (43) 18, ZEs 1AS (43) 18, 1CK 1CS 1JL (50), 3JJ (25) 20, ZSs 3AH (53) 18, 8L (70) 18, 9P, 4SD7A (70) 11-12, 4U1TU (35) 12, 4X4s NZG (105) 14-16, QA 19, QV VB, 4Z4HQ (42) 12, 5N2ABF (42) 11, 5A3TE 19, 6W8As DD 1Q (40) 19, 6Y5MLJ, 6O6BW (25) 14, 7Q7LC (20) 13, 7X0AH (30) 15, 9H1s AB (85) 10, AG (34) 16, AI AK, 9J2s IE (115) 17, WR, 9Q5s HD (55) 12, KL (65) 8, LJ (46) 19, 9M2OV, 9V1s LP (20) 14, MY NV (65) 16-17 and 9Y4VU 21.

15 s Novice gang, led by WNs 2VRK 4BVK 4BVS on 5Y5RM 12, CE8 2CR 3PJ, GM1AR, GN8FF 22, CO6MD, CT1DJ, CX2FD, DJS 2NN 4AZ 4JZ 5VQ 5YQ 7CX 7PW 8GJ 9QH 9TQ, DLs 1MI 1QD 2M1 2SQ 8VA 8VF 9KP 8SN, DMs 3KOG 4UG, EAs 5HR 8ET 23,

EL2D), Ps 2LG 2NB 3BV 3XN 5EF 8PI 9VZ, FG7XT 15, Gs 2KO 3IEP 3HDA 3JVP 3PBB 3RJV 3PYZ 4RDT 38R 3TJD 3WV 3VIP 5AAJ 5CP 6FF 6SD 6DL, G13AXI, GMs 3CSM 4PM, 6W3KGD, HB9ABX, H13JRF 0, HK7s X1 15, YB, HMI, DM, HSF, JAS, ICFU, IBEK, IFAF, IIGK, IIPX, IJKV, IKTU, INUH, IOTX, IQVN, IRNH, ISWA, ISWL, IWVQ, J2DU 23, 2GNR 2HLX 2WB 3AYU 3BCC 3D4Z 3KEV 3LEU 4DND 5BQT 5VBV 6ANT 6BXE 6CNM, 6G1C 7AOU 7CDV 8AXL 8CKK 8JL 9BEX, KA2DJ, KGs 4GX 6AA (105), KL7s FMM FRM, KP4s BBN CZB CRD CRS, KZ5s LKN OVN, LU8 6ABX 6DIX 8DR 8EY 9FDK, OEs 2IG 25LX, OHS 2TI 3MF, OKIAEN, ON5KL, OY3SL 23, OZ1W, PA0s FF FR 14, GF VDR, P15BV, PYs 21DN 2PU 2RT 3AKG 23, 3BVI 5ASN 5BA, 5BAQ 6ML 710 7NJ 78 (102), SL7AZ 13-16, SMs 3C0L/11, 4CMG 6CAV 7DQC, SPs 3AJJ 7QT 8AJK, TG9DX, V22BUJ/SU, VK2BKAM (114) 22, V61W, VP2s DAH DK, VR2DK, WA2TEG/KP4, WH6s GAV GDO, W4PCQ, W44BY, XE1s JY AMU 1, YO2SI 23, YU2HI 22, YV5BPJ, ZE1JL, ZLs 2GH 3JO 23, 4XIs NYY NZG 23, 5N2ABP, 9G1FY 21, 9J2s IE 21, W, 9Q5KL and 9Y4VU. Know a more interesting way to learn c.w.?

40 c.w. maintains its DX appeal for Ws 1AYK 2JBL 3DPR 3HMK 8QXQ 8YGR, Ks 1ZJA 2MFY 3FKU 4TWJ 8YSO 9UIY, Was 5NOM 8GNN 8MCC 8QJK 8RQ 9SXQ 9GQI 9JTB, Wbs 2LDX 2R8S 2U1H 2YVZ 6OLD and KL7WEE/W1 due to C69AS, GM2s LF 1, QN (5) 23, CN8FS, C0s 2BB 2BO/C0 1 2DR (36), 2KG (5) 4, 3CS 6, 5EG 5FS 2, 2HC, CXs 1OP 2DLG (10) 5, DK1AA 3, EA8s RN (25) 4, EY, EL9NA (6) 0, ET3GB (10) 7, FG9NA (20) 5, FO8BJ, FP8s CA CS (14) 11, GC-3PLX (30) 2, 3UQM (10) 23, SHT (12) 7, GD3TNS, G18OQR, HAs 4KYB 4KXZ 8KUC 9KOB (23) 1-2, H17NRK (40) 5, HK3s AOW ASJ (17) 4, HPIAC (5) 0, HR5LB (10) 5, IT1s AGA (3) 5, AQ, JAs 1AFA 1BPM 1HSL 1LIT 1OHV 1OYT 1PSW 1QNX 1QZR 1THL 1UII 1UPS 1WVZ 2EPW 2HLX 3BRW 3ODK 3CST/1 3CWV 3DKQ 3FGJ 3KYU 4CLR 5AGO/3 5CP 5PL 7AGO 7CUA 7XF 6BCO all around breakfasttime U. S. A., KG4CX 2, KL7TI 3, KP4TIN, KZ5FJ, LAs 1K 7QL, LU8 2ZG 6ZC 5, LZ1s KZD KPW KSD (30) 1, SP, MP4BDF (1) 22, OA4VE 10-11, OHS 2AM 3TH 6NH (27) 22, ON4HC (20) 5, OKs galore, OY2J (5) 3, PJ2ME (16) 1, PYs 1PC 5ASN 5BAJ 7AHA 7AJQ 0, 8EL (30) 4, SL5ZL, SPs 1AGE (30) 7, 1AH 2BAM 2JS 3BHG 3ZSW/3 5ANL, TF57P (0) 19, T1ERK (12) 4, UA0PY (26) 23, UB5s IF (10) 2, KAA (20) 1, PG (23) 3, RR (10) 2, UC2CE (18) 2, UP6s AO LA (7) 2, UL7CD (15) 23, UP2KBA (5) 2, UT57C (40) 2, numerous VKs including 7GK 11-12, 7SM, VP6s 6AK 1-2, 6YF 8IY 9CD 4, VR2s DK ER (7) 10, XEs 10E (4) 4-5, 2PMK, YO3s 2KAM 3AC 4XZ 8GV 8OK 8YF, YUs 2AA 2BE 3NY, YS1s CN RK (10) 11, YVs 1AD 3FB 5CET 8CXY, ZB2s AZ 19, U (25) 22, ZD7IP (5) 23, ZE2KL, ZLs 1ACW 1AIR (15) 11, 2BDA 7, 3ABV ZS6OS, 4UHTU 0, 4X4s WN (11) 1, XM (17) 20, 6Y5s FH MJ 2, WJ (7) 4-5, 7X0AH (4) 4, 9J2IE (22) 4, 9Y4s DS (10) 10, RA (2) 23 and TU. . . .

Novice 7-Mc. diggers WNs 5PUQ 7FLR and 9PQY come up with KH6EXJ (173) 10-11, KL7FOT (162) 8 and WL7FQC (155) 8-9 among the SWCB noise generators.

40 phone, battled valiantly by WAGGNN, WBS 2R8S and 5OLD, surrenders DJAS, DK0AA 1, EA7GF 3, G2PU, GC2KN (65) 11, GD3GMH* (58) 11-12, G18OQR, H18XJG, HK2AQF, JA2BAY (45) 20, JX6XF (45) 1, KC4USV, KG4BB, KX6BU, MP4BBW (46) 19, OA4VE, PA8GMU 4, PE2EVO (42) 0, PJ2CE 11, UD6BR (46) 20, VKs 2AHT 2ID 3BM 3OZ 7SM 11, VP6s 2AA (46) 21, 9BDA 3, W1PZJ/KP4, W6GTA/8F4 (43) 18-19, XE1CCW (80) 7, YO9CN 3, YU3BC 3, YV9AA (46) 0, ZD8ARP (46) 20-21, ZSs 1JA 6AJH and 9V1LP (46) 18, the specks for carrier a.m.

75 phone's season is opened by K1ZJA, KL7WEE/W1 and tuner Kilroy with GC2FMV 6-7, GI6TK 4, H18XAL 4, ON4UN 5, SMs 4SD 7, 7XV 6, VE0MY 0, VP6s 7EA 5, 9BW 0, ZL4LM 11 and 6Y5EM. . . . At the other end of the band on 80 c.w. W1SWX, Was 5NOM 6SLU 8MCC and 9MCI get the DX ball rolling with DJ1BE, E19J (10) 1, G18OQR, GM3KKO, KL7PI, KP4CQ, KZ5s CQ MY, OKs 1WC 2HL, ON4TN (9) 1, OZ5EU, PA6DC (10) 6-7, SM6DHU, SP7GH, UA2CD, VRZDK, YU3EYZ, ZD8J, ZLs 1PL 2ANT 3BV and 14E. . . . 160 festivities commenced with pursuit of

KL7FRY, VK5KO, some Caribbean and European early birds in the lower 1.8-Mc. segment. Don't forget those 160-Meter Transatlantic & World-Wide DX Tests scheduled for the 1st and 15th of this month (details on p. 101, November QST). Results of last month's opening week ends are just rolling in and it appears that increasing sunspot activity is separating 160-meter DX men from the boys.

Next month's column will swing our DX spotlight back on 1-Mc. goings-on described by (phone) Ws 2DY 3LE 4YOK 8YGR 9LNUK, K9UCR, WAs 8GNN 9SXQ, WB2RSS, VE8AG; (c.w.) Ws 2JBL 3DPR 3HMK 4YOK 5YGR 9LNUK 9NN 9CZV 9KAW, Ks 3FKU 3UXY 4YUJ 6TXA 9UGR 9RWL, Was 6JDT 8GNN 8MCC 9SXQ 9GQI, WB2ESS and VE8AG, plus added reporters now slaving at their mills. How's your DX?

Where:

HEREABOUTS — When you encounter a strange prefix that does not appear on your Countries List, try the "Operating a Station" chapter in your latest ARRL *Radio Amateur's Handbook*, International Prefixes table. There you will find the 3BA-3FZ block labeled "Canada" (see p. 102, November's "How's"), for details on those 3B-3C calls: 1Z4 for Israel, 8AA-8IZ Indonesia, etc. Doubtless we'll be hit by a fresh batch of tricky tags this new year.

Here are your "QSLers of the Month" — CE2CR, CTs 2BO 3AR, DJ5HT, DLs LA 5IO 8VV 6ITU, EA8EY, EL2D, FG7XT, FP8CA, FR7ZD, G2KW, GD5ACI/WB6QEP, HBs 9KC/P 9ND 9AAL, IC8RT, JAs ICWZ 8QK, KG4ALW, KH6GB, K84, 8SBR, LUIDAY, LZ1CW, M1B, OEs 3GV 5PWL 6LND, OHS 2BBL 3MH 3WV 4PX, OKs 1ABP 1APJ 1LD 2PO 3CAU 3KFW, PA6LOU, PY7ACQ/0, SMs 5DXL 7IA, SV8WLL, UAs 4IW 9RH, UG6KA, UH8DH, UM8AP, UR7KAW, VK6MI, VP6s 2GTL 7DJ, VQ9EF, XW8BS, YO4CT, YUs 1DP 2RAK, ZCs 6F KF, ZL3JO, 6W8BF, 7G1A and 9J2IE, as well as QSL tenders Ws 2CTN 4FCI 6RGG 7PHO, Ks 1ERT 2OJD, VEs 3ACD and 4OX — all honored for efficient QSLing in dispatches from "How's" correspondents Ws 7VRO 8YGR, Ks 1LMS 9CVO, 1 6WJ, WAs 5MUE 8GNN 9SXQ 9GQI, WB2BAM and W.P. Kilroy. Any candidates for such honorable mention in your log?

ALP! W1s 8GD and CNY search for a QSL route to Z89P; W2JBL is thwarted by ZDSJ and 9Y4LT; K6JPJ is mmm on YJ1DL; WB2MBQ is frustrated by W2VCZ/11 and curious YJ1CJSE; G13DG pin for postals from CT2AL '62, GC3MII/H '61, KG1CD '61, KV4CG '59, OX3AB '69, UP6KA '59, VP6KL '57 and 3A2CZ '59. Any notions or magic potions? . . .

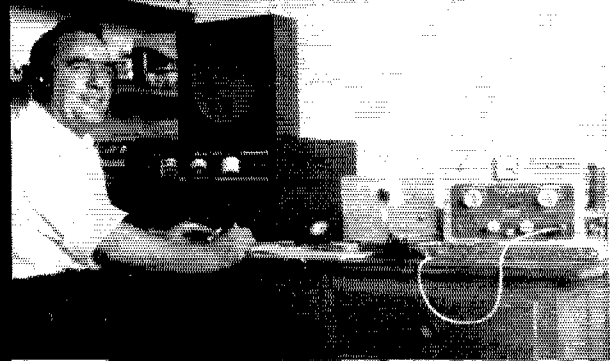
WA4OYW and WB4BIZ add their availability as QSL aides to overseas DX operators in need of Stateside assistants. . . . OX5AR (W6IIM) corrects our November suggestion for confirmation of OX5BO contacts between July 27 and August 25, 1966. The address should be CMR Box 2102, APO, New York, N. Y., 09023. OX5BO QSOs on other dates should be QSL'd via the appropriate *Callbook* address. "I do QSL 100 per cent in response to cards received," guarantees OX5AR. . . . VP5BP pleads "Point out that the VP5 prefix now includes only Grand Turk and Caicos Islands. Cayman is ZF1, Jamaica 6Y5. A source of more confusion is that I was assigned VE3CJ's old Cayman call, VP5BP, for use here on Grand Turk." . . . "Happiness," says W48GNN, "is your postman wondering about all those fancy foreign post cards with the big letters and numbers on them."

ASIA — Efforts by W7s SFF and VRO haven't panned out but WA2EFN of L1DX's *DX Bulletin* will try to help with overdue JTI QSLs. Bill needs your own card, five International Reply Coupons, a 15-cent U.S. airmail stamp, a self-addressed stamped envelope and a few months wait to attempt the job. . . . "I'll discontinue handling QSLs for 487s DA and NE effective January 1, 1967," announces W5VA-W5AI, very busy with VS5IC QSL chores. . . . K1QBP understands that AP4BCC may be of service in confirming QSOs with MP4MAM and VS9OSC. . . . W7VRO is rounding up all OD5EE logs including those for QSOs preceding his appointment as QSL tender last June. "Tell the fellows to be patient till I get the records." Dick hears that OD5EE's AP4QBB plans fell through because of a single missing signature on equipment transportation papers. . . . WA6JDT heard J11AAV displaying the new supplementary Japanese prefix on 21-Mc. c.w.

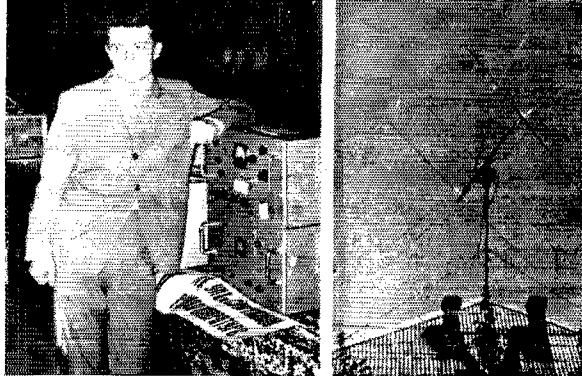
AFRICA — "I have all FL8AC logs," declares W4NJF, "and all cards received have been answered. The operation ran from October 29th through November 1st, I

9L1TL enjoyed last year's ARRL DX Contest with this Njala layout but his log (1334 contacts!) arrived too late for listing in the October QST write-up. W1YWM of Hq. hopes all participants in this year's Competition will post their entries early, preferably with photos attached.

QST for



UA9OH speaks for amateur radio at a recent exhibition in Novosibirsk. At right is the 3-element quad that punches great holes in 20-meter c.w. QRM for Vlad's neighbor, UA9PP. (Photos via W1YYM)



am also QSL manager for 9J2MM. As soon as logs are received I'll commence business, s.a.s.e. required. By the way, it's obvious that many QSLers fail to synchronize their shack clocks with WWV or other accurate time sources. I see QSL entries more than an hour off the mark. . . . "I'm now handling cards for ZS1s TP and TZ, formerly the duty of the late K4MYZ," notifies W1CRA . . . REF secretary F9OE advises that F88YY should be QSLd via his society's bureau, FB8WW via K2MGE, FB8s XX and ZZ via FR7ZD. DX Club of Puerto Rico's DXer says the latter began issuing FB8ZZ cards in October . . . Sorry — W7VRO has no ET3 QSL arrangements . . . "I'm QSL manager for ZD8WK," announces WASCXU. "Have logs from September 1, 1966; s.a.s.e., if you please." . . . Noted in LIDXA's perceptive DX Bulletin: W2GHK still digs for VQ9G logs. . . The 9J2BB address in the listings to follow should be good till May. . . 5R8AM may be Malagasy's most reluctant QSLer. . . CR7GF still offers QSLs for his CT2GF-CR3GF '65 QSOs, s.a.e. and IRCs required.

EUROPE — F9OE gives the new REF QSL bureau address as B.P. 70, Paris 12, France. . . . "As of October 1, 1966, I am ZB2AP's QSL manager for W/K/VE QSOs," states WA8QJK. "Others should QSL him direct. I'll answer those requests including s.a.s.e. and GMT." . . . OY7ML, WB2CGW and VP9H agree that OY calls still are mighty popular among the Lunatic party fringe. In addition to usurpations of listed Faroe call signs, OYs 2AW 2G 3BB and 7U are recent sickies. Somebody, as they say, needs professional help. . . . LIDXA's WA2EFN has encouragement for those with U.S.S.R. toughies overdue. "Send a courteous letter to Central Radio Club, Box 88, Moscow, with three IRCs and explain the situation. You'll get back an answer in Russian, and the QSLs should arrive via the bureau in a few months."

SOUTH AMERICA — "Please indicate that I will act as QSL manager for CX4DT," writes W3LE. "The usual s.a.s.e. or s.a.e. plus IRC applies." For W/K/VEs this will surely beat the two weeks normally required for roundtrip airmail. A letter from CX4DT confirms the arrangement. . . . Reminder: 4M and 5J prefixes belong to Venezuela and Colombia, respectively. . . . Now let's dash through the krapevine's individual QTH specifications, being mindful of the fact that each item is necessarily neither accurate, "official" nor complete. . . .

ex-CN8GU-W9FJY (to W8GDX)
CP5BK, I. Pettigrew, P.O. Box 514, Cochabamba, Bolivia
CP6GO, Casilla 642, Santa Cruz, Bolivia
CX3BD, c/o U.S. Embassy, Montevideo, Uruguay
CX4DT, G. Cottin, Box 1657, Montevideo, Uruguay (or via W3LE)
DJ6QT/LX (via W2GHK)
DJ0PH, Gartenstrasse 14, 5321 Lissesm, W. Germany
DL2VR, Radio Club, c/o JSB, BFPO 40, via London, England
EI6AY (via GI3TJJ)
EI2D (via K3JXO)
FB8WW (via K2MGE)
FB8s XX ZZ (via FR7ZD)
FB8YY (via REF)
FO8BO, P.O. Box 374, Papeete, Tahiti
GB3WJ, Wiltshire International Boy Scout Jamboree, Ogbourne, St. George, Marlborough, Wiltshire, England
HC1MF, Box 15, NASA, U.S. Embassy, Quito, Ecuador
HK2DP, F. Bravo, P.O. Box 1083, Santa Marta, Colombia
HZ1RR, P.O. Box 20, Riyadh, Saudi Arabia
IS1ALX/G (to I1ALX)
KAZDO, P.O. Box 2029, APO, San Francisco, Calif., 96394
KR6BL, Co HHD, 173rd SPT Bn., APO, San Francisco, Calif., 96331
LU6ZC (via RCA of Argentina)
MP4DAN, H. Puffer, c/o Schlumberger, Das Island via Bahrain, Arabian Gulf (or via DJ3BB)
OD5FC, P.O. Box 1217, Beirut, Lebanon
OX4FR, Box 121, APO, New York, N.Y., 09121
OX5AN, Base R, Director, APO, New York, N.Y., 09023
OX5AR (via W6FKH)
OX5BO (see preceding text)
PY8s GU IA, Box 305, Manaus, Brazil
SP9ZW/G, G. Kupka, Box 4, Wroclaw 11, Poland
TAZAC, (via K1AMC)
TJ2ED, Box 3310, San Jose, C.R.
TJ5ST, P. Antonio, S. minario Acares 3, Heredia, C.R.
TJ1QO (via W4DQS)
TU2BK, Box 54, Port Bouet, Ivory Coast
TY4ATC/mm (to W6NMC)
VEIASJ/VEI (via W2CTN)

VE8AG, R. Schoonover, c/o Federal Electric, Hangar 9, Winnipeg Intl. Airport, Winnipeg, Man., Canada
VE8ZZ, Box 332, Frobisher Bay, N.W.T., Canada
VP8IK (via G3DHB)
VQ9AA/f (via W4ECD)
VR2FF, Box 184, Suva, Fiji Islands
W5MTX/KH6, E. Pierce, 99139 Heen, Aiea, Hawaii
W5YBF/KG6 (to W5YBF)
W6FHM/DU (to W6FHM)
W0PAN/KH6, L. Shima, Box 373, Pearl City, Hawaii, 96782
WB2VID/GE6A (via K5GOT)
WB6HXQ/KH6/KX6, J. Lewis, c/o Federal Electric Co., 2990 Koaopaka St., Honolulu, Hawaii, 96817
YO3ZA, D. Antoni, Box 8, Bucharest, Roumania
YS2CEN, C. Elenanieto, P.O. Box 133, Santa Ana, El Salvador
ZB2AP (via WA8QJK; see preceding text)
ZD8AR, c/o BBC, Ascension Island
ZD8ES (via ZD8AR)
ZD8WK (via WASCXU)
ZS1s TP TZ (via W1CRA)
ZS4JB (via K2BUD)
3C2ARC (to VE2ARC)
487s DA NE (see preceding text)
4Z4HQ (via IARC of Israel)
5A1TY (via HB9ADP)
5J4RCA (via LCRA of Colombia)
5N2AAF (via W7VRO)
5N2s ABF AVH, P.O. Box 2469, Lagos, Nigeria
6Y5VV, 2c Island Dr., Kingston 8, Jamaica
7Q7EG, E. Canaday (W5GIQ), P.O. Box 207, Zomba Malawi (W/Ks to W5GIQ)
7Q7s PH PS (via W1MRQ)
7X0PO, Box 59, Bechar, Algeria
9G1FF, P.O. Box 1387, Kumasi, Ghana
9G1s FL RW, Box 151, Tema, Ghana
9G1FY, Box 194, Accra, Ghana
ex-9J2BB, 32 Leslie Pl., New Rochelle, N.Y.
9J2MM (via W4NJF)
9L1TL (via G3USF)
9Q5FV, Box 117, Luluabourg, R.C.
9Q5PT, APO, New York, N.Y., 09662

For this collection thanks go to **Ws** 1WPO 1YYM 2CHT 2DY 2BJL 3DPR 3GJK 3LE 4EMP 4PJG 4YOK 7VRO 9GFF 9LNG 9NN, Ks 9CVO/1 9OTB 9UCR 0PJ, WAs 1DJG 4OYW 8GGN 8QJK 9SXQ 9GQL, WB2s JYM R8S, F9OE, KL7FEF/W1, SV6WG, W.P. Kilroy, DARC's DX-MB (DLs 1EP 3RK), DX Club of Puerto Rico DXer (KP4RK), Far East Auxiliary Radio League News (KA2LL), Florida DX Club DX Report (W4MVB), Japan DX Radio Club Bulletin (JA1DM), Long Island DX Association DX Bulletin (WA2EFN), Newark News Radio Club Bulletin (L. Waite, 39 Hannum St., Ballston Spa, N.Y.), Northern Eastern DX Association DX Bulletin (KI1MP), Northern California DX Club DXer (Box 608, Menlo Park, Calif., 94025) and VERON's DXpress (PA6s FX LOU TO VDV WWP). Come again and often!

Whence:

AFRICA — 7Q7EC (W5GIQ) is frustrated by third-party traffic restrictions in Malawi, especially when he hooks a station in his home town. "My best contacts into the states have been long path. I'm on almost daily, 1330 GMT, and watch 14,200 kc. at 1130-1430, weak ends. With improving conditions I think we'll be able to work W/Ks on the short path around 1800 and 0430-0530 GMT. I operate c.w. as well as s.s.b. and occasionally try 21 Mc. There are several other amateurs working in Malawi, all British or American. A number of natives are trained as operators and technicians for Malawi Broadcasting Corporation which has stations located throughout the country. I'm inclined to believe they would be interested in becoming amateurs." W1MRQ adds, "7Q7PH of Dedza is from Guernsey where he hopes to become a GC3 in a year or so. Peter uses a KW-2000, dipoles and a Heathkit

receiver." W4SGGN says TY4ATC/mm was rover W6NMC returning Stateward from recent African travels W4NJF learns that KL2AT's 14-Mc. spinner crashed a-building, and that ET3AC took time out for turkey in Virginia W7VRO finds ZS1XR concentrating on rare U.S. counties with his 100-watt and new quad K4FWJ notes Benghazi's 5A4TV regularly active around 14,200 kc. at 1200 GMT 5N2AAF, W7VRO's new QSL client, sports 150 watts of sideband and c.w. with a TA-33 jr. at Zaria. Mike formerly signed 5N2JKO and is G3JKO back home Hepatitis landed 601AU (W8HMI) in a German hospital instead of Jordan, according to W8YGR African addenda via the clubs and groups: TR8AG's most likely c.w. spots are 14,020, 14,040 and 14,060 kc., with straight-a.m. work on 14,190, and Guy sometimes tunes for W/K sidewinders around 2300 GMT. PY2PE assisting. . . . 5U7AK appears on 14,230 kc. at 1930 GMT or so, Tuesdays and Fridays. . . . HK1QQ now displays his high-grade c.w. as TJ1QQ and expects a two-year Cameroun tour. . . . W6KG and XYL W6QEP scheduled a Stateside sojourn after successful sorties as CTs 3AU and 2YA. Rarer African stops may follow. . . . The first International EL DX Competition will be held on January 14 and 15 starting at 0000 GMT on the 14th and ending at 2400 GMT on the 15th. All modes of operating will be used on all bands, 80 through 10 meters. Contest exchanges will consist of a 5 or 6 digit number which will be the RS or RST report plus a contact number starting at 001. Three points are given for each Liberian station contacted, and one point for any other contact. Multipliers will consist of the total number of EL prefixes worked on all bands. Entries may be single band, single operator; or all band, single or multi-operator. Certificates will go to the high scoring station in each country with more than 300 points. Logs must be signed by the operator or operators, and mailed not later than 28 February to the Liberian Radio Amateur Association, P.O. Box 1477, Monrovia, Liberia.

ASIA — "His Royal Highness, AC3PT, has had equipment for some time now but it's not in working order," regrets W3LE, a personal acquaintance of the Chogyal "OD5EE (W5LAK), his middle east job terminated, headed for home in late October," reports W7VRO "Those Novosibirsk boys seem to have the best signals from Asiatic Russia," muses W4SGGN. "UA9s OH PP and UW9OU are heard most often." "Ran into G3VCS in the South China Sea last September," remarks W6YZD. Ham radio makes it an even smaller world Among overseas WAS-hunters W9KAW finds VU2GW yearning for Nev., Wyo. and Utah QSOs plus a QSL from KH3land. "I supplied first Col. for UA9RC yesterday but he still needs Ark., Del., Miss., N. H., Va. and Wyo." W4GJDT finally caught a real Korean HM1DM on 15 c.w. Next night John tripled his score with HM1s BB and DE. It's DX feast or famine as a rule Oriental oddities via clubs literature: Former ET3USA stalwart K1QHP must content himself with s.w.l. status in Vietnam for the present. . . . Pakistan's AP gang vainly strive to regain hamming privileges after last year's border troubles. . . . VU2WB active on 10 and 15 meters at 0700-0900 GMT, is also HB9TK. KA9MF 2TJ 2DW 2DJ 8HC 2USF and 2RJ finished in that competitive order in FEARL's '66 Field Day-a-go-go, the winner scoring 600 QSOs with 86 band-countries. KA2WF departed Japan and v.h.f. buff KA2RJ will follow. New or renewer FEARL memberships are held by KAs 2DO (K6GID), 2EP (K2QGC), 2MP (W7FHL) and 2TY (WA3DBX).

OCEANIA — "Ten is open!" exclaim ops Lee and Hal of KG6IG in the Bonins. "On October 11th-14th we had 95 contacts with 29 states and five countries on 28 Mc. using a KWM-2A, 30L-1 linear and TH-6 beam. We were doing so well we didn't swing the antenna out of the northeast to see what was coming in from other directions." VK3NR and W1YYM confirm that kidney trouble caused a quick QRT for Macquarie's VK0MI in October. Col was rushed to Melbourne by naval transport for treatment. . . . "I have over a thousand contributed dollars banked for the widow of the late ZL2AWJ," reported Thorpe fund manager W4NJF in November W5YBF/KG6 claims a 103/90 worked/confirmed countries tally for 20-sideband DXing last September and October from Guam W4CHA tells ARRL Assistant Communications Manager W1YYM he leaves San Francisco for Sydney on the 10th of this month toting a KWM-2 and 75S-3. Ellen understands, "After three months on Norfolk he hopes to visit Lord Howe isle, Nauru and Christmas. Watch 7005, 14,065 and 21,065 kc." KW6s DS and EJ keep twenty Wakeful on c.w. and sideband.

EUROPE — WA1DJG hears regularly from DX friends in Poland. SP7GH has much DX fun on the low edge of 80 c.w. where his vertical easily works into the eastern U.S.A. Tom's goal is to contact our west coast on 3.5 Mc. . . . SP6AAT already has a hundred countries with his newly homebrewed sideband outfit. Transmitting around

14,190 kc., he tunes the Yank phone band at 1800-2000 GMT. . . . SP3AJJ nears the 200-country mark with 100 watts, a 15-tube inahaler and a TH-4. Ted plans on 813s in an s.s.b. line-up now nearing completion K4OLQ calls attention to S8S, a Czech operating award with a WAC slant, details available from Central Radio Club, Box 69, Prague. And DJ8CR can provide specs on the new Worked All Westfalia (WAWA) sheepskin for which W/K/VE/VOS must collect fifteen appropriate German QSLs OY7ML says OY2J is the only Faroese s.s.b.er at present, a station sometimes operated by OYs 3SL and 7S. "We also work sideband from club station OY6FRA from time to time." G3IDG observes 28 Mc. hotting up fast, 46 countries heard on the band in the first two weeks of November Continental cuttings in the club press: UW4HZ/UV4 has a display station at a November exhibition in Kuibyshev. . . . SV9s WL and WU, Crete and Rhodes respectively, are pursued by the s.s.b. crowd on 10, 15 and 20. . . . Preliminary WAE DX Contest returns show WB2CKs with 57,584 claimed points. W2MEL 51,420, W91OP 51,035, W2PCJ 43,859 and WA4XP 26,260. DJ2YA, EP2BQ, H8XAL, 1IKDB, OD5BZ, SM2BJL, VS9OC and 4X4HF also submitted early whoppers.

SOUTH AMERICA — LU6ACU comments on Argentine S hamming: "Most LUs operate homebrew rigs, a common configuration being parallel 1625s modulated by push-pull 1625s. We can now import commercial gear from other countries but prices are very high in U.S. dollars. Single-sideband becomes more and more popular. My own 35-watt a.m./c.w. rig comprises a Gelofo v.f.o. driving a 61-46 final modulated by 1625s." Carlos is in our country for an accounting course and can be reached % H. B. Fuller Co., 1150 Eustis St., St. Paul, Minn., 55108. . . . Contacting any one of PYs ABK AJJ BD FX KGX MAC MDR MIGQ MHT MHY MT NDP NFX NG OL OR PN and SO may qualify you for the *Acco em Jubileu* (Steel in Jubilee) diploma sponsored by the Brazilian National Steel Co. with details available from C.S.N., Caixa Postal 2736, Rio de Janeiro, Brazil Squibs via club news-hawks: CE9AO threatens a Juan Fernandez flap. . . . PYs 1BYK 7ZS and others talk up Atol de Rocas as a DXpeditionary objective, plus more St. Peter & Paul doings. . . . WB2VJD/CE9A gives Easter hunters brief breaks between schedules on 21,300 kc. at 2100 GMT, 14,300 at 0200.

HIERABOUTS — PJ5s BC and BD (K6s GZN and H GZO) will be workable from Saba isle again over a three-week stretch beginning late this month. KWCZN remarks, "We should sail from New Orleans on the 12th and be operational around the 20th. Last year we had over 2500 contacts. We'll use Swans 240 and 350 to a H-Gain on 10, 15 and 20. Forty meters is out because SWBC stations in the area make it impossible to copy anything." VP5s BP NK RB and RS keep Grand Turk perkin'. VP5BP writes, "My own pleasure in ham radio is to get on and rag-chew once in a while, c.w. or s.s.b. With the calls I've held since 1959 — VPP7B, ZDR8H and now VP5BP — this hasn't been easy, but I'm KCC for all three. I realize that a lot of people want to work VP5-land and I do try to oblige them as time permits. I do wish DX hounds would respect my hobby, too, and not break up my QSOs with ill-timed calls." From VESAG up north: "Been hamming for nine years but the DX bug didn't leave his mark until I moved into the Arctic. Now I'm a confirmed addict scouring the bands for new countries, 20 phone and 15 c.w. So far 28 Mc. hasn't been good here but this should change as time goes on. Working rotating shifts cuts into my contest work. I've been hearing K4AUSN and hope to work him soon for a pole-to-pole QSO" KL7WEE/W1 QSYs to become KL7WEE/V5 in Texas ZF1EP, manned by W4s KET PJG, K4CAH and WA4WIP on October 20th-23rd, piled up more than 5000 QSOs OX5AR (W6IIM) writes from Thule AFB: "I'll be operating from here with the USAF till about May, mostly week ends on 15- and 20-meter phone. Thirty-four states so far. Others active here are OX5s AC AN AP and MARS station OX5BO-XPIAA Former WIA pres. VK2VN recently visited ARRL Iq. W1YYM says Morrie enjoys traveling for Qantas Air. Ellen also reports WIRAN top brain in the DX Quiz at November's New England DXCC shebang QSL rep. W3HNK recovers from a nearly fatal head-on auto smash After capturing DXCC memberships on each coast, W6LER and K1MLL W9KAW has applied for No. 3 from Colorado Springs. "Conditions here are surely different from either coast. It's a 6500-ft. mountain-side location. Heavy winds brought down my triband quad leaving me with a 3-el. 14-Mc. yagi for the winter. Going to miss 15 and 10!" "Feel like a kid with a new toy, starting from DX scratch in this new QTH," observes W3DFR of Baltimore, formerly W8IBX. "Six weeks of casual activity with 250 watts and a 135-ft. wire brought in 67 countries." W4BRQQ claims giant-killer status Grade A, working 7-Mc. VKs and South Americans with an Ameco 10-watt and dipole. All told Eddie has squeaked 1400 QSOs and 675 QSLs out of that middle rig. [QST]

YL news and views

CONDUCTED BY LOUISE RAMSEY MOREAU,* WB6BBO

Contests: The Yardstick of Skill

CONTEST operation takes a heap of doin' whether we are wading through the eight-layer QRM of a Novice Roundup, where many of us get our feet wet and our tastes sharpened for this type activity, or the easy informality of YLRL Howdy Days. It is here, when we peel off the hustle, or the fast-paced exhilaration of competition that we uncover a real yardstick of our ability. There is nothing like a contest to show us just how poor or how good our skills really are, for, whether we submit a formal log or not, contests are an excellent place to make our operating techniques grow up. They are, in a sense, the 'qualifying run' of skill and know how, where the quality of the equipment takes a second place to the quality of the person behind the mike, or key, or keyboard.

Gwen, VE3AYL is an outstanding example of RTTY Contest operating ability. Up to two years ago her special liking was c.w., with some phone operation, and then she and OM, VE3GK were bitten by the RTTY bug. Since then, according to Gwen, her operating time has been spent "presidigitating the verdant keys." Her greatest thrill is working RTTY-DX contests, and, not happy with being just another call on the list of participating stations, she finished among the top ten in the Spring 1966 RTTY Contest sponsored by the British Amateur Radio Teleprinter Group. October 1966, also saw her taking part in the Sixth World-Wide RTTY Sweepstakes, with a total of 115 stations, and 25 countries contacted. Again Gwen was active in the second edition of the Alexander Volta RTTY DX Contest sponsored by the SSB and RTTY Club of Como, Italy.

Gwen received her license in 1930, just six months after OM, Sid, VE3GK, and has the distinction of being the first Canadian YL to hold an Amateur Radio License. In those days they were issued for Advanced Operation. She has held her original call ever since. Among other really outstanding awards to her credit is the QCA Certificate awarded by the B.A.R.T.G., which was a "double first" because Gwen was the first YL and the first Canadian to receive this honor. She is a member of the ARRL, and also belongs to the Ontario Trillium Club, the (you guessed it) first Amateur Radio YL Club in Canada.

As might be expected, Gwen and Sid are not the only members of the Burnett family who hold

* YL Editor, QST. Please send all news notes to WB6BBO's home address; 1036 East Boston St., Altadena Calif. 91001



VE3AYL, Gwen Burnette.

amateur radio licenses, their daughter, Corrine, received the call VE3DYL while she was still in her teens, and is now married to VE3DSW.

What does this amazing young lady do in her spare time? Her hobbies are: dressmaking; painting oil portraits; gardening; and, not only playing both piano and organ, but composing scores for their dual Concert Hammond Organs!

Sid and Gwen have a station at their cottage at Lake Simcoe, and are planning on adding RTTY to the gear there next year. Maybe then she will be able to find that elusive Asian contact, the only one she needs to complete her WAC-RTTY.

YL-OM Contest

TIME:

	Phone	
Sat. February 25, 1967		1300 EST (1800 GMT)**
Sun. February 26, 1967		1300 EST (1800 GMT)
	c.w.	
Sat. March 11, 1967		1300 EST (1800 GMT)
Sun. March 12, 1967		1300 EST (1800 GMT)

** NOTICE THE TIME CHANGE THIS YEAR! It has been changed to two 24 hour periods to give all areas one daylight and one night time operating period.

ELIGIBILITY:

All licensed OM, YL, and XYL operators throughout the world are invited to participate.

OPERATION:

All hands may be used. Crossband operation is not permitted.

PROCEDURE:

OMs call "CQ YL," YLs call "CQ OM."

EXCHANGE:

QSO number, RS, or RST report, ARRL section or country. Entries in log should show band worked at time of contact, time, date, transmitter, and power.

SCORING:

(a) Phone and c.w. contacts will be scored as separate contests. Submit separate logs.

- (b) One point is earned for each station worked. YL to OM, or OM to YL. A station may be contacted no more than once in each contest for credit.
- (c) Multiply the number of QSOs by the number of different ARRL sections and countries worked.
- (d) Contestants running 150 watts input or less at all times may multiply the results of (c) by 1.25 (low power multiplier).
- (e) a.s.b. contestants running 300 watts p.e.p., or less, at all times may multiply the results of (c) by 1.25 (low power multiplier).

LOGS:

Copies of all phone and c.w. logs showing claimed scores, and signed by the operator must be postmarked no later than March 20, 1967, and received no later than April 10, 1967, or they will be disqualified. Please file separate logs for each section of the contest. Send copies of logs to:

Marte Wessel KØEPE
P.O. Box 756
Liberal, Kansas. 67901

AWARDS:

1st Place Phone: YL — Cup, OM — Cup.
1st Place c.w.: YL — Cup, OM — Cup.
The winner of the Phone Cup is also eligible for the c.w. Cup. Certificates will be awarded to high place c.w. and phone winners in each ARRL district and country.

NO LOGS WILL BE RETURNED. BE SURE THE COPY OF YOUR LOG IS LEGIBLE.

YLRL Howdy Days Results

YLRL's most casual, and because of its very informality, most delightful contest, Howdy Days, is simply YL's meeting YL's to say "hi," with a touch of contest flair by submitting logs for judging. This get together more or less ends the summer doldrums, and starts the fall activities.

"Unfortunately," says Edie, K1EKO, YLRL President, "very few YLs who participate, bother to submit a log. Guess it is just that kind of contest, slow and easy, and for fun."

The following logs were submitted:

1st Place — Ivy Smythe, VE3EZI 152 points
Other logs submitted:

Jan Burgess, VE3BII	150 points
Bobby Lemon, WA8ARJ	94 points
Doris Palmer, K2YMJ	58 points
Thelma Zwayer, K8TVX	56 points
Thelma Schrontz, WA8ENW	45 points
Ardell Vanderveel, WA9MIR	38 points
Carol Iams, W8WRJ	28 points
Helen Maillet, W7GGV	18 points
Bea Dietz, WA2GPT	15 points
Jan Fontana, WB2JCE	7 points

"Dixi" WA7DXI

Formally christened Charlene, WA7DXI is most often (and most appropriately) called "Dixi" on the air. But, on c.w., she is also found answering to the sign "LF."



WA7DXI, Dixi, and son Randy, WA7BZU.
Picture courtesy W7PE.



Colorado YL Club's new officers. Left to right: WAØEXX, Betty Lindsay, Pres.; WØKEK, June Feller, Treas., KØZUW, Janice McGrath, Secy, WØHEM, Elaine High, V. Pres. Picture courtesy WØESD, Publicity Chairman.

Dixi got into radio, as many mothers have, through the influence of her son Randy, WA7BZU. Curiosity over his activity lured her into his shack, she stayed to keep his records straight, and finally, as she tells it "When I got to the point of asking 'what did he say?' every few minutes, I was hooked." Randy insisted she learn the code and copy them herself, and, in August 1965, received her Novice ticket.

Along with all the official visits that are a part of the duties of the district president of the VFW Auxiliary, Dixi still managed to learn the theory, and, thanks to the Code Practice Net, passed her General Class exam in April 1966.

A member of W.A.R.T.S., Noontime Net, Evergreen State Net, MINOW Net, and Columbia Basin Net, WA7DXI is not a call heard on fone only. On c.w., she works the traffic nets: WSN, the Northwest Slow Speed Net, RN7, and recently has gone up to join the cream of traffic people on area net level. Since last December she has been manager of the Code Practice Net, where W7LEC regularly turns out top-level c.w. operators.

While her principal interest has been traffic, both fone and c.w., with several BPL to her credit, Dixi's first love is helping others with c.w. Her call is often heard on the novice frequencies working with the newcomers to amateur radio answering questions, giving suggestions, in general helping them get started.

Dixi is the mother of three children who are also quite outstanding. Randy, now 16, is the only one who is actively sharing his mothers interest in radio, but Karl, age 12, will soon have his Novice License. All share the hobbies of "rock-hounding" stamp-collecting, and visiting historical spots around the country. Daughter, Karen, and the OM, Gordon, join them in their family quintet which is well known throughout the Inland Empire, and all three children have appeared on TV during the past ten years.

If ever there is a "Long Suffering OM" award presentation, Gordon, Dixi's husband deserves first crack at it. A State Farm Agent, he has absolutely no interest in Amateur Radio.

Plan Ahead!

The West Coast YL Fun-Fest will be sponsored in 1967 by BAYLARC, at El Rancho Motel, in Millbrae, California, on March 31, April 1, 2, 1967.

Coming a week after Easter, this should be an excellent time for YL's to take time out for this annual frolic. BAYLARC is planning an outstanding series of "fun" things to do which includes an "Eyelash Party," an OM trip on Saturday, and a YL-OM Banquet.

If you have been to a Fun-Fest just remember the dates, if not, write them down, in either case PLAN AHEAD for this one.

The YLRC of Los Angeles will hold their annual Valentine Banquet for the OM's on Saturday, February 11, 1967, at the Petroleum Club in Long Beach, California. YL's from all clubs are cordially invited to attend. PLAN AHEAD for this one too.





CONDUCTED BY SAM HARRIS,* W1FZJ

November Leonids — Shower of a Lifetime

ALMOST everyone who has watched the night sky at all has seen an occasional "shooting star." Some of these meteors are mere rocketing pinpoints of light. Others glow with heavenly fire, trailing sparks comet-like behind them. But to witness a major meteor shower is an unforgettable experience. From shepherds, sailors, sentries and other night people have come a record of such celestial events almost as old as the history of man.

Generations of night-sky watchers have known that meteor displays can be expected at certain times of the year, and that some showers follow long-term cycles as well. The August Perseids and the December Geminids are probably the best known of the yearly visitors, but the November Leonids have a long recorded history, periodic sightings of them having been traced back to at least 585 A.D. Their long period, roughly 33 years between major peaks, has been known widely for more than 100 years.

In 1799 a brilliant Leonids shower was observed in the West Indies and the Gulf of Mexico. Ship captains and observers in Europe and Asia described large displays occurring Nov. 13, 1831 and again on Nov. 12 and 13, 1832. The shower of Nov. 12, 1833, one of the most spectacular on record, is generally credited with having triggered off the modern scientific study of meteor astronomy.

Hourly counts in the 1866 Leonids ran as high as 5000 on Nov. 13, and 1000 per hour were recorded on this date in 1867 and 1868, but the shower failed to live up to its reputation on its next round, in 1899. This drop-off, at a time when many people were looking for a major display, caused much disenchantment with astronomical predictions of that day, though it should be pointed out that there had been some cautious hedging. Astronomers calculated that the swarm might pass sufficiently close to the orbit of Jupiter to deflect them out of the earth's orbit.¹

Meteor counts in 1899 were only 30 to 50 hourly. There was some comeback in 1932, notably in Europe, where up to 250 per hour were sighted, but nothing like the spectacle of 100 years earlier. The Leonids were relegated to minor-shower status until 1961, when they produced counts approximating those of the old reliables, the Perseids and Geminids. A

report to this effect in *Sky and Telescope*² magazine encouraged the writer to post a warning to the growing army of v.h.f. meteorers in *QST* for August, 1962, citing the predicted major peak for November 1965.

"The World Above 50 Mc.," January, 1966, *QST*, makes it clear that the Leonids of 1965 were the most exciting meteor event in 144-Mc. history, up to that time. Between this report and advance publicity in the news media, there was no lack of activity on the 2-meter band during the small hours of the mornings of Nov. 15, 16 and 17 this year. Literally hundreds of skeds were being kept from about 0700 GMT on, each morning, but they were largely unproductive until after 0900 Nov. 17, when things started to happen in a big way.

By 1100, contacts were being made over distances up to 1400 miles, in the whole area from the Plains States eastward. Later the mania was to spread over the entire country, with stations in the central states hearing both coasts. Bursts overlapped and strong pings were superimposed on almost continuous weaker signals. Hundreds of contacts were made by calling CQ, or by breaking stations when their skeds were completed, as most were in the first minute or two of prearranged calls.

A remarkably long and stable weather front lay along the northern tier of states, and this may have contributed something to the occasion, but it is significant that signals were in only when the meteors were putting on their show. Listed below are some of the avalanche of reports that descended on ARRL Headquarters following the shower. Just the calls mentioned here show activity in 45 states by several hundred stations. Not bad for a show that started in the wee small hours of the morning!

Where a "new state" was mentioned by the reporting operator, it is shown with an asterisk in the tabulation. No attempt has been made at this writing to update the 2-meter states-worked box, but this will be done shortly. Be sure that your new standings (states, call areas and best DX worked) are on file, as there will be a major revision coming up.

We are particularly interested in any evidence of 144-Mc. communication or one-way work over distances in excess of 1400 miles. If you have a recording of a signal from beyond this distance, will you please send the undersigned a copy,

* P.O. Box 1738, Arecibo, Puerto Rico 00612.

¹ *Sky and Telescope*, Nov. 1966, p. 251. *Natural History*, Nov., 1966, p. 43.

² *Sky and Telescope*, Feb. 1962, "Leonid Meteors Give Unexpected Display."



Meteors appear to be falling out of the Dipper, at a rate of 1 per second, in this 43-second exposure during the height of the Leonid shower on November 17. The picture was taken atop Kiti Peak Arizona with a Pentax (50 mm.) at f/2 on Tri-X developed for 12 minutes in D-19. (Photo courtesy David R. McLean)

giving the time of the reception and any other information that might be of interest? Thanks to the many fellows who sent in reports so promptly. It was quite a morning! — *W1HDQ*

K1ABR, Cranston, R. I. — Worked *W6DQY** (s.s.b.) *W91FA W0LER* W5UGO**. Heard *K4EJQ K4IXC W4NUS K5TQP (?) W6QDH*.

W1AZK, Chichester, N. H. — Worked *W0CUC**. Heard *W0LER W0NXF W91FA W9WDD* (s.s.b.).

W1HDQ, Canton, Conn. — Worked *W0LER* K0EMO* W4AWS W4CKB K4IXC*. Heard *K0MQS K9VZY* (s.s.b.) *W4VHH W5UKQ W5WAX*.

K1HTV, Thompsonville, Conn. — Worked *W0CUC* K4EJQ* W0LER* W4VHH* W4CKB K0EMO* K0MQS W9WDD* (s.s.b.)*. Heard *W4AWS W4NUS W4TLC (?) K4IXC W8PT W8TIU W8QOH W91FA W9MAL W9QOP (?) W0BFB* (calling *W6*) *W0DQY (s.s.b.) W0NXF*. Total 20 states, 8 call areas, 38 stations.

W1JDF, Methuen, Mass. — Worked *K0MQS WA9DOT* W9MAL*. Heard *W4FJ W4LTU W4AWS K4EJQ W4CKB W4NUS W4TLC (?) W5RCI W5UKQ W5WAX K5WXX (?) W8PT W91FA W9MAL W9QXP W0LER W0CUC W6NXF K0EMO VE3DIR*.

W1JSM, Waltham, Mass. — Worked *W0CUC* W0NXF* K0EMO K9AAJ W9WDD (s.s.b.) K9GZY (s.s.b.) W5UGO**. Heard *W4CKB W4VHH W4NUS K4IXC W8TIU W5UKQ W9QXP W91FA K9SGD K0MQS*.

K2HLA, Cutchogue, L.I., N. Y. — Worked *K4EJQ* W4NUS* W5WAX* K9AAJ K0EMO* W0LER**. Heard *W4MNT W4CKB W4TLA W4VHH W4AWS W5UGO W5UKQ*.

W3GKP, Silver Spring, Md. — Worked *W5UGO**. Heard *W4WS, Orlando, Fla.* — Worked *W1HDQ W2AZL W4LTU* K0MQS* W0CUC**. Heard *K2IFK (?) K2HLA K3CFA K4QIF W5UKQ W5UJO (?) W0NXF*.

W4IH, N. Augusta, S. C. — Worked *W0CUC* W0LFE* K0MQS* K1HTV K1BKK* W5UKQ* W0NXF**. Heard *W1JSM K5WXX W5WAX*.

W4LTU, Springfield, Va. — Worked *W4AWS W4CKB W91FA W0EOZ W0CUC*. Heard *W1AZK W1AJR W5UGO W28FK W5RCI K4IXC W5UKQ W0NXF*. Nil on skeds with *W0IC* and *W7JRG*, though *K0MQS* reported hearing both ends of *W4LTU-W7JRG* sked!

W4MNT, Orlando, Fla. — Worked *K1BKK* K3CFA*. Heard *W1AJR W1AZK K3CFA W3GKP W4NUS K4QIF K5WXX W9MAL*.

W4CKB, Lake Placid, Fla. — Worked *W1HDQ K1HTV W2AZL W3BDP W3GKP W4LTU W4NUS K4EJQ K4QIF W5UKQ W0NXF*. Heard *VE3DIR*.

W4FJ, Richmond, Va. — Worked *W0EKZ* W0LFE* K0EMO* W0NXF**. Heard *W1AJR K1ABR W4AWS W4CKB W4MNT K4IXC W4HJQ W5UGO W5UKQ W5WAX*.

K4Q1F, Salisbury, N. C. — Worked *W4CKB W5WAX K5WXX W9MAL W0NXF K0EMO W0LFE*.

W4VNH, Elizabethton, Ky. — Heard *W1BKK W2AZL W4AWS W4CKB W4MNT W4RMU W4VHH W4NUS K4IXC W5PZ K5TQP-WA5MPZ W5UGO W5WAX K5WXX W0BFB W0DQY W0ENC W0ENG (?) W0EOZ W0EYE W0IC K0JIN W0LFE W0MOX W0NXF VE3DIR*.

K5WYZ, Garland, Texas — Worked *K4Q1F W9QXP VE3DIR*. Heard *W2AZL W3GKP W4CKB W4FJ W4VHH K4IXC*.

W5UGO, Sand Springs, Okla. — Worked *K1ABR W1JSM W2AZL K2GUG K6HAA*. Heard 32 states, all call areas and *VE3DIR*.

W5HAX, Muskogee, Okla. — Worked *K2HLA W3GKP K4Q1F K4IXC W4RMU*. Heard *W1AJR W1HDQ W1JSM W2AZL W4AWS W4FJ W8SDJ W8QOH W9SXG (?) W0NXF VE3?*

K5TQP-WA5MPZ, Tijeras, N. Mex. — Worked *W8QOH W9QXP WA9DOT W6NXF W0EOZ*. Heard *W5UGO W7JRG K7NII W8PT K9AAJ K0SGD W0BFB W0YMG*.

W6GDO, Rio Linda, Calif. — Worked *W7MQW W7RQT W7UFB* (40 watts!) *W7MFP W0EOZ W0ENC W4YMG*. Heard *K5WXX W5FAG (s.s.b.) K7BBO (a.m.) W0EYE K6JYO W0MOX W0IC W0VYZ K7ICW*.

W6KAP, Woodside, Calif. — Worked *W7UFB K7BBO K7MKW W7RQT K7NII*. Heard *W7JRG W0EOZ W0IC W0ENC W0YJC W7MFP K6HAA*.

W6HCP, San Jose, Calif. — Worked *W7OKV K7ZIR* (both s.s.b.) *K7BBO W7MFP*. Heard *W7MKW K6JYO W5UJF*.

K6HAA, Twin Peaks, Calif. — Worked *W5UGO W7RQT W0YMG W0BFB* (making 10 call areas for *W0BFB* on 14!). Heard *K7BBO W7UFB K9AAJ W0NXF W0IC W0MOX W0EKZ W0EYE W5UGO* calling *K2HLA!*

K6GCD, Redlands, Calif. — Worked *W0EYE W7RQT*. Heard *W5UKQ K7ZIR W7FS W7OKV K7BBO W7UFB W7MFP W5FAG W0MOX W0IC*; N. Cal 6s, first time, via backscatter.

W7FS, Redfair, Wash. — Worked *K6JYO*. Heard *K6MBY W6BKAP W6GDO K6LCP K6TSK W7RQT K7ICW*.

K7ICW, Las Vegas, Nev. — Worked *W0NXF*. Heard *W5RCI W6GDO K6HCP W7FS W7RQT W0EOZ W0EKZ W0BFB W0LCN*.

K7NII, Scottsdale, Ariz. — *WB6KAP W7UFB W0EOZ W0YMG*. "Band like 20 in a DX Contest!"

W7RQT, *Providence, Utah* — Worked W6GDO K6GCD WB6KAP K6HLA K6OSY K6TSK. Heard K7BBO K7NII W0ENC W0EKK W0EYE K2HLA (8-second burst, recorded).

K7ZIR, *Beaverton, Ore.* — Worked K6TSK W6DNJ K6JYO K6KCP. Heard W6GDO WB6KAP.

K7BBO, *Tacoma, Wash.* — Worked K6IBY WB6GKK W6DEE K6JYO K6MBY K6TSK W6QWN K6HCP K6RIL WA6STS WB6KAP.

W8QOH, *Cincinnati, Ohio* — Worked W4CKB WA5MFZ W0ENC W0EOZ W0WYZ.

W8PT, *Waterliet, Mich.* — Worked W0EYE. Heard K5TQP K5WXX W5UGO W0MOX W0ENC. No results on 220-Mc. skeds.

W9QXP, *Crystal Lake, Ill.* — Worked K4IXC K5TQP-WA5MFZ K5WXX W0MOX. Heard W7JRG.

W3MAL, *Peoria, Ill.* — Worked W1HDQ K4QIF. Heard W1AJR W1AZK W1JDF W1VYF W2AZL W2SFK W4VHH W5RCI W7JRG.

W9WDD, *East Alton, Ill. (s.s.b.)* — Worked W3BDP* W3GKP* W1BXM*.

K0EMO, *Hiawatha, Iowa* — Worked W1JSM K1HTV W1HDQ W2SFK K2HLA W4FJ K4QIF. Heard W2JIL WA2VAI W1AJR W8PT W8QOH.

K0MQS, *Cedar Falls, Iowa* — Worked W1JDF K1HTV W2AZL W2SFK W4AWS W4VHH VE3DIR. Heard W1HDQ W1AZK K1ABR W4LTU W4TKV K4IXC K4QIF W7JRG.

W0ENC, *Rapid City, S. Dak.* — Worked W8QOH W6GDO.

W0EYE, *Boulder, Colo.* — Worked W2GUG* K6GCD K7MKW* W8BK1 W8PT K9AAJ. Heard WB6KAP W6GDO W6WSQ K7ICW W9AAG (s.s.b.) WA9DOT K0EMO W0BFB W0NXP W8QOH.

W0LER, *Minneapolis, Minn.* — Worked K1ABR* K1HTV* W1HDQ K2HLA W2HXK W4LTU W4NUS W0MOX. Heard W1JSM W4MNT W7JRG K7ICW W0BFB K0MQS.

* New state for reporting station.

144 Mc. and Up

Each month we receive a few reports concerning operation and building of equipment for the 1215-Mc. band, and Jack Ross, K4NTD, is one of the active ones. Says Jack: "Working up to 125 miles on 1296 Mc., using the *Handbook* converter (by K0AXN) and the varactor tripler by W1WID, from the *V.H.F. Manual*. Can't seem to get anyone on from farther away, to see how 1296 actually will do. We get good ducts occasionally, and signals from 100 miles or so run S9-plus, even with only 2 to 4 watts output. Seems that the higher in frequency you go the stronger the signals get, under good conditions." So, the rest of you 1296-Mc. boys out that-a-way please get in touch with Jack and see if his 125-mile range can't be extended.

WB6IOM suggests that the 1296-Mc. gang get hold of the TIVO5 diode (to be used in the mixer) for a marked improvement in reception. He sez that in his case it works out almost as well as the fifty-dollar transistor preamp. W0/AHU/K6HIJ is still working on development of the 144-432-1296-Mc. solid-beacon, and among a number of other projects has started construction of a crystal-controlled test transmitter for the 10,000 to 10,500-Mc. band WB6SAJ will soon be operating on 1296 Mc. with 13 watts. Present operation at that (YTH is on 432 Mc. where attempts to make QSOs running 50 milliwatts has so far been unsuccessful. WB2TOM tells us that his surplus converter for 420 and 1215 has arrived and he is working on power requirements.

K1YLU at Leominster, Mass., reports on progress of equipment for the 420-Mc. band. Forty-eight elements have been added to the original sixteen-element beam and a two-transistor preamplifier has been completed. The present transmitter is a varactor tripler but a new cavity amplifier is "in the works." From Lagrangeville, N.Y., K2BGU

writes that the improvements and shakedown involved with a new home have been completed and now he is looking forward to homebrewing some new equipment and more activity on the v.h.f. bands. Planned projects are a mixer linear for 432 from 50 Mc., probably using 4X150s and a two-meter transmitter. Existing 220-Mc. gear is due for an overhaul and being put back on the air. John also sez that the Mid-Hudson VHF Society is currently working on individual, homebrew-transistor converters for 432 Mc., and future projects will be 432-Mc. transmitters.

The building goes on and on with the 420 gang. W3AEQ is working on development of an Oscar system including converters for 50, 144 and 420 Mc.; kw. linear for 144 Mc.; c.w.-f.m.-RTTY driver on 144 Mc.; and advanced tracking facilities. Jon sez his on the air activity was limited during October and from the foregoing we can see why. WB2VFX is working on rigs for 420 and 220 Mc.; WB2RVE is working on ATV gear. W3IHA is working on a video modulator for 440 ATV with center frequency at 440 Mc. He'll probably be operational by the first of December. WA2ICW and W3IHA have all equipment working except the video modulator.

220- and 420-Mc. STANDINGS

220 Mc.		420 Mc.	
W1BU	14 5 600	K2UUR	9 3 230
W1HDQ	12 5 150	K2ACQ	8 5 525
W1AJR	13 4 480	WA2HQE	8 4 280
K1JLX	11 4 615	K2HQL	8 4 250
K1UGQ	9 3 400	W7PUA/2	7 4 500
K2CBA	16 7 660	K2YCO	6 5 500
W2AOG	15 5 530	W2YPM	6 3 300
W2SEU	12 5 450	WA2DTZ	6 3 200
W2DZA	12 5 410	WAZTOV	5 3 140
W2NTY	12 5 300	K2GGA	4 4 383
K2DZM	12 5 400	W3MMV	11 5 410
W2LWI	12 4 400	W3RUE	10 5 470
K2KIB	12 4 300	K3CLK	9 4 280
K2HTQ	11 4 265	W3FEY	8 4 296
K2ITP	11 4 300	K3IUU	8 3 310
K2AXQ	9 3 240	W3SZD	5 4 300
K2JVT	6 3 244	W3UJG	4 2 350
K2UUR	6 3 210	W4HHK	10 4 550
W42BAE	6 3 200	K4SUL	7 4 368
K2DDG	4 3 140	W4GJO	6 2 1000
W3FEY	11 5 350	W4TLV	6 2 500
W3RUE	10 5 480	W4BYR	6 2 420
K3IUU	10 3 310	W4G00	6 2 115
W3LCC	10 3 300	W4RFR	5 2 665
W3YLL	8 4 295	W4TLV	4 2 500
W3JZL	4 3 250	K4QIF	4 1 285
W4TLC	5 1 315	W5RCI	16 5 725
K4QIF	4 2 600	W5AJG	7 3 1010
W5AJG	3 2 1050	W5SWV	7 3 525
W6GDO	2 2 100	W5HTZ	5 3 440
K7ICW	4 2 250	W5ML	5 1 350
W7AGO	2 1 160	W5TKQ	4 2 500
K8AXU	11 5 1050	W6GDO	2 2 493
W8PT	11 5 660	W6PZA	1 1 280
W9OVL	6 3 475	K6GTG	1 1 180
W9JCS	6 2 340	K7ICW	3 2 165
VE3BPR	3 3 300	W8PT	11 7 600
		W8YIO	11 6 560
		W8TYY	9 5 580
		W8TFX	8 5 470
		W8WFP	6 4 450
		K8REG	6 4 275
		W8JLQ	6 3 275
		W8RQI	6 3 270
		K8AXU	5 3 660
		W9AAG	10 4 600
		W9HUV	9 6 460
		K9AAJ	9 5 425
		K9ULF	9 5 390
		W9GAB	9 4 808
		W9BKT	7 3 310
		W9OJL	6 3 330
		W2BLV	13 5 460
		W2DZM	10 4 390
		W2OTA	19 4 300
		K2CBA	9 7 320
		W2VCG	9 4 280
		W2EGZ	9 4 260
		WA2EUS	9 4 220
		W3AIB	5 4 450
		VE3BQJ	5 4 447
		VE3BPR	4 4 600

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

RECORDS

Two-Way Work

50 Mc.: LU3EX — JA6FR
12,000 Miles — March 24, 1956
144 Mc.: OH1NL — W6DNC
5250 Miles — April 11, 1964
220 Mc.: W6NLZ — KH6UK
2540 Miles — June 22, 1959
420 Mc.: KH6UK — W1BU
5092 Miles — July 31, 1964
1215 Mc.: W1BU — KH6UK
5092 Miles — August 9, 1962
2300 Mc.: W1EHF/1 — W2BVU/1
170 Miles — July 1963
3300 Mc.: W6IFE/6 — W6VTX/6
190 Miles — June 9, 1956
5650 Mc.: WA6KKK/6 — WB6JZY/6
117 Miles — Sept. 25, 1965
10,000 Mc.: W7JIP/7 — W7LHL/7
265 Miles — July 31, 1960
21,000 Mc.: W2UKL/2 — WA2VWI/2
27 Miles — Oct. 24, 1964
Above 30,000 Mc.: W6NSV/6 — K6Y YF/6
500 Feet — July 17, 1959

"In the works" are the following: 432-Mc. converter at K3LLR; Removal of TV birdies from 432 converter at the mountain QTH; and a cavity preamp at K4EJQ; 32-element colinear completed and being tested at K4SUM; construction of RTTY control system for new installation at K6BPC; modulation system for 432 Mc. at W8CVQ; a.b.f.m. rig and a.f.s.k. at W8EFK; a.f.s.k. and new 40-foot tower at W8KRH; flying spot scanner at W9HWQ; 420-Mc. tripler and final for 144-Mc. f.m. mobile rig at WA0ARL. We "slipped" a couple of months ago and told you that W0YMG and WA0DEA were converts to amateur TV. These boys are not as yet on 432 but are getting ready and have faesimile.

"Tropo conditions were above normal on 432 Mc. on October 2, 8, 9, 16, 22, 23 and 30." sez Paul, W4HHK, and he emphasizes that the 8th was extremely good. On that date Paul worked W5HPT, W5AJG and W5LDV with the band open to Dallas all day and signals very strong. October 2 was the day that Paul nabbed state-number ten on 432 Mc. with other end of the contact being W5UKQ in Louisiana (325 miles). W5AJG (450 miles) is heard or worked almost every weekend on one or the other skeds (Saturday morning, 0700; Sunday evening 1900). All 432-Mc. work done at W4HHK was using the 18-foot dish, 275 watts output, c.w. and the 75A3 converter. At Alexandria, Virginia, K4SUM also noted 432 in fair shape on a number of occasions during October with stations worked in 2, 3 and 4 lands on October 3, 9, 13, 14 and 23.

K7ICW reports that crossband work with W6DQJ (144 and 420 Mc.) on a tropo-obstacle gain path of 225 miles produced signals on 432 on October 25 from W6DQJ. However, attempts at a QSO were blocked by heavy radar interference.

"Several periods of quite good conditions during the month," says W8CVQ concerning 432 Mc. Walt had QSOs with WA9HUV and W9OKB on the 5th of October and with W8PT on the 27th. He also mentions having heard a number of weak carriers with little or no modulation. W8FAZ also mentions a number of weak carriers with little or no modulation. Jo also tells us that W8EKJ at Oberlin,

Ohio, new on 432 Mc. is running 300 watts into a 36-element colinear.

WB2RVE reports conditions on 220 Mc. only fair during October with no good openings noted. Bob is working on ATV gear and has the receiving end all set to go. From W2SEU we hear: "Got back on 220 and was unable to put up the 88 elements. Had to settle for 44. Running 500 watts, phone, into the 4X150s. Still working on X-band gear and hope to get more than 50 feet." Welcome back, Fred! WA5HTL is working on transmitters for 220 and 432 Mc., and WA5OUD is modifying a TU-10 transverter for 220 Mc. operation. W9OVL writes to inform us that he is still on the air on 220 Mc. and recently worked W0YZV in Omaha, Nebraska, on 220-Mc. phone. However it was a cross-band contact with W0YZV coming back to Ben on two meters.

On two meters during October, consensus of opinion seems to be that the 15th was the date noticeable for good conditions. WA1DPX, K1FJM, W3BDP, K4EJQ, K4SUM and W4HJZ, all report good conditions on certain days during the month, with four of the six stations reporting the 15th as the best. The 1s were hearing 1s, (all New England), 2s and an occasional 3 and 4. W3BDP worked W1JSM in Massachusetts and W1AZK in New Hampshire and heard W8WEN. On the 31st, Sam worked W1HDQ in Connecticut who had an S7 signal.

At Bristol, Tennessee, K4EJQ worked a number of 8, 9 and 0 stations on the 15th and 16th using 50 watts a.m. Jim sez he has been hearing a number of novice stations to the southeast but has been unable to attract their attention. He wishes they would tune down the band a bit more. The 500 watt, 144-Mc. transmitter has been completed at K4EJQ after a long delay in obtaining parts. Next project is erection of 140-foot tower which Jim "hopes to get up nerve to erect soon." Four 8-element beams for two meters will be on top when it does go up.

K4SUM reports two meters open to New York on the morning of the 4th of October and also mornings of the 8th and 9th when a number of stations were worked in New York and New Jersey. W4HJZ reports a good tropo opening on the 10th of the month when W4VIII (South Carolina) worked W5CKY in Mississippi and K5WXXZ in Texas. WA5EQP tells us that he and W5ZCJ have been very successful in constructing a crystal filter for s.s.b. Tom is presently working on the transmitter with receiver soon to follow. WA6FWU is also building two-meter equipment with the converter about finished and transmitter under construction. K3ADS and K7HEN are on the verge of going to f.m. Larry (K3ADS) sez his two-meter f.m. gear runs 30 watts on 146.950, and Mack (K7HEN, Ogden, Utah) sez that the Ogden area hams on two meters are looking forward to a new type of activity with the recent acquiring of f.m. equipment.

WA9ABI reports that it isn't true that "nobody will run c.w. on two meters and especially above 145.0." Sez Ray, "Out of a total of 15 QSOs for October, 10 were c.w. only. On four occasions QSOs resulted when stations heard the chicken tracks and hung around 'til they could get in." He also reports good ground wave on October 3 on 144 Mc. Out in Lincoln, Nebraska, W0NXF is running 600 watts input on two, is open for meteor-shower skeds, and wonders if there is anyone on two meters in Idaho.

K7ICW reports on the Orionids: "Main activity this month was dedicated to the Orionids meteor shower, which on my chosen schedule and path

times appeared extremely poor compared to the last four years. Sporadic reception of others on non-shower skeds was also poor, except for the usual tropo path to the southern California area. More use of s.s.b. on the tropo path is possible due to circuit parameter improvements by certain stations regularly worked." (144 Mc. of course)

Report on the same shower from K7NII gives much the same information. Tom had a number of skeds during the shower with good reports both ways on only one contact, that with K6HAA on the 27th via s.s.b. Tom also reports that well equipped stations in southern California have been putting in regular signals that are quite loud on c.w. and 20 to 30 per cent copy on s.s.b. Skeds were held on 220 Mc. during the shower by W8PT, with W0EYE and W1AZK. Several pings were heard on W0EYE but nil on W1AZK. Jack did work W4CKB on 144 Mc. on the 23rd but sez that "conditions were very poor and activity very low on all v.h.f. bands."

50-Mc. DX

We received the following from Jack Gregory, K4OCK. "Had a really excellent opening to the south last evening (October 17) on 50 Mc. Worked PJ2CH, PJ3CH, PJ2CZ all on Curacao. All the PJs had excellent signals here in Miami running 5 7 to 9 most of the time with little or no QSB. Herman, PJ2CZ, says he is on every evening from 0000 to 0100 GMT at 50.250 Mc."

"To round out an excellent evening of DX, I worked PY5GK in Brazil, a path of over 4000 miles. This was the first transequatorial signal heard in a long, long time. Conrad's signals were Q5 with characteristic TE flutter." Many, many thanks for this good news, Jack. It ought to put all of us on our toes.

50 Mc.

K4PQF/1 wrote to tell us of his six-meter operation as a beginner on v.h.f. "I recently went on the air mobile with a Heath Sixer and a Saturn Halo. While operating in the New London area I have had solid QSOs with stations in northern New Jersey and northern New England. To top off the list today (Oct. 18) I had a solid ten-minute QSO with WA0GHW in Kansas with Al's signal well over S9 and mine at S7 plus. As a beginner in v.h.f. with my first rig I am really enjoying myself." Congratulations, Steve! You're doing right well "for a beginner." Another station from 4 land who is portable I also wrote us. K4GGI/1 at Cambridge, Mass., writes that he undertook to get W1MX back on the v.h.f. bands this past summer. On 50 Mc. the W1MX rig is running about 300 watts input and a 5-element Yagi, A1 and A3, and frequencies are 50.27, 50.4 and 50.55. On 144 Mc., 95 watts input and an 11-element Yagi, A1 and A3, 144.32, 144.63, 145.47 and 145.8. Glad to hear it, Steve. It must sound like old times again with the M.I.T. club W1MX, back on v.h.f.

Although six-meter skip is at a low level at this time we are receiving a few skip reports. K6BPC and WA6WKF both report hearing stations in Denver on October 9 and W4ISS reports an opening to the west on October 16. Frank (W4ISS) heard or worked K5GRV (Mississippi), W4WIA (Alabama), W4HYO (Alabama), W4DEN (South Carolina) and W4FVV (South Carolina). Rig at the QTH runs six watts out to a 6-element Yagi at 35 feet. K5GRV has 12-over-12 skeleton slots up at 150 feet, and the Alabama stations were both using 32-element colinears.

WA4FJO, WA4WZZ, WA5GHK, WA8KRH and WA9FIH all caught skip on October 26. Fred

50 Mc. WAS

Table listing call signs and numbers for 50 Mc. WAS stations, including VE7CN, K17AU, VE1EF, VE4HS, XE1GE, VE2AOM, KH6UK, etc.

Table listing call signs and numbers for 49 states and 50 states, including VE7CN, K17AU, VE1EF, VE4HS, XE1GE, VE2AOM, KH6UK, etc.

(WA4FJO) added the 27th and 28th to his good days and says the band was open to Massachusetts, New Jersey and Pennsylvania. Ken (WA4WZZ) did not have any luck with the skip but heard stations 15 miles east and 25 miles west of him getting good results. WA5GHK sez the opening was fair to good with stations worked in northeast Michigan and in 2 land. WA8KRH sez there were good openings on both six and two meters on October 25 and 26 but doesn't tell us what he heard or worked; and WA9FIH sez the only opening was on the 26th for about ten minutes when it was open to New York and New Jersey. K3JHE, WA4YXK and K8AQA all report good ground wave conditions throughout the month of October on 50 Mc. Bob (K3JHE) sez that on October 15 he was able to work Maryland, Virginia, New York, Connecticut and New Hampshire all with better than average signals and all on s.s.b. WA4YXK tells us that ground wave has been good between his location (Annandale, Virginia) and Delaware, and that W4YEB has had some luck working the boys in Pittsburg since they have been running kilowatt transmitters with multi-element beams. From K8AQA: "Extended ground wave throughout most of the month up to a maximum of about 200 miles. Also some extremely short sporadic openings to mostly 3 and 4 areas throughout most of the month." W6BNT reports good to excellent tropo conditions during most of the month of October.

EST



With Canada's Centennial Year, a new RTTY net is scheduled to start operation. First formal operating will be at 8 p.m. EST (0100 GMT) Jan. 1, 1967, connecting Quebec and Ontario points on 3630 kc. The net is ARRL registered. Operation is to be Tuesday and Thursday nights at 7:30 p.m. EST. It is hoped to expand traffic and emergency operations to a 5-day operation later. VE3GK reports that application has been made to DOT for the call VE3RTT for the CARTG club station which may act as OBS. Net participating stations are: Que.: VE2BYZ. Ont.: VE3DX, VE3COL, VE3WQ, VE3FHQ, VE3QG, VE3AYL, VE3GK.



Operating News



F. E. HANDY, WIBDI, Communications Mgr.

LILLIAN M. SALTER, WIZJE, Administrative Aide GEORGE HART, WINJM, National Emergency Coordinator
ROBERT L. WHITE, WIWPO, DXCC Awards ELLEN WHITE, WIYYM, Ass't. Communications Mgr.
GERALD PINARD, Club Training Aids PETER CHAMALIAN, WIBGD, Communications Ass't.

Op Man. *The Radio Amateur's Operating Manual* is just hot off the press. Even those very latest ARL/MTX texts were included in the final put together. There's this and *much more* . . . all right up to date. The book is a reference work for newcomers and old timers alike. The text gives in expanded detail not only the information on net operating, traffic and public service work, but also sound operating procedures relating to contests, rag chewing, logging, DX work, message handling and emergency organizing. Unless you got one of the very first copies you will be needing this so you have instant reference to the questions that are constantly coming up as you operate.

Lessons from Inez. Some excerpts from a Texas RACES bulletin will be of interest, especially to Emergency Coordinators and RACES Radio Officers. "Impetuous Inez set a course for the Brownsville-Port Isabel area. The nets operated 7 A.M. Sunday until hurricane warnings were lowered 10 A.M. Monday. . . . In the disaster turned exercise we had solid radio communications throughout and were all set to provide emergency service if other communications failed. The net with W5KR/5 had arrival reports from evacuees for local delivery, handled weather bureau information when long distance was clogged up, and on one occasion got information for the telephone company when it couldn't get through to the Brownsville office."

W5TQN's bulletin cites the following lessons:

- (1) Get ready now for next time.
- (2) Each emergency station should have simultaneous capability 80/40 and 2 meters.
- (3) Extra receivers for monitoring and searching are needed, to leave primary equipment on the nets.
- (4) List all equipment each of the group will make available.

Time to Train Before Emergency Strikes.

Keen capabilities demonstrated in some areas such as above are in sharp contrast to other kinds of reports. In proof of this statement we quote the following, from an entirely different section of the country. *Could it be yours?* "Our network in county has had no training in message handling and circuit procedures. Should there be an emergency I am very much afraid it would be a mess on the air. Our net is check-in, check-out, some small talk with no instruction or practice of any kind. It is my firm belief that the time to train the members is *before an emergency.*"

Advance Preparations a Must. The great services we amateurs can render in the public service field are notably greatest (1) where we have *advance* registration of each amateur operator in AREC or RACES, and (2) where a Radio Officer and/or Emergency Coordinator has developed and tested plans, the EC having consistently accomplished the several numbered-assigned functions, as set forth on page 8 of *Operating an Amateur Radio Station*. Also it is important (3) to have held meetings for specific planned training and procedural exercises and (4) to have had critiques following test deployments, use of groups in parade monitoring, community drives or other highly interesting challenges to our radio capability.

Personal Capability? Let us all find ways to take part and push for action along the above lines. May we additionally suggest making *personal operating capability* one of your aims in the New Year? Engage in and support some net operating, if you are not so engaged. This has the benefits of both pleasure and self-training as we create radio-coverage by such means.

Aim to use emergency power whenever possible — that is, with your radio capability entirely independent of commercial mains. This will come in handy for next Field Day, and be vital should there be a power blackout or unexpected (but always possible) disaster. Finally, may we point out that unless you register your capability and willingness to serve in some AREC/RACES/NTS capacity, you are not making maximum use of your potential. It adds to the overall evaluation of our disaster capability, if you will only sign up and *participate*. Act on these suggestions; we feel you will enjoy and broaden your own amateur horizons.

Jan. 1: Time for a New Number Sheet.

With the new month and the New Year each amateur station should make it a point to start a new *number sheet*. For those not up on the technique of the communicator we perhaps should explain that the number sheet is for recording consecutive message identifying numbers as you originate traffic at your amateur station . . . and assign consecutive numbers. Each ARL logbook comes to you complete with a number sheet (CD-3) bound in. Anyone without one can get one free, if a CD-3 is requested by radiogram to the League. The ARL fixed-text message list and an explanation of precedences are part of the same form you will receive. Each

of licensee. Only thus can each amateur keep abreast of techniques, and also work for the next upward rung in the amateur-licensing ladder.

ARRL Helps to Clubs. A suitable newspaper announcement, when you get a club class plan ready to go, should give your club prestige and bring out a good group of prospective amateurs and present amateurs who want a refresher to your meetings. All local operators normally find it enjoyable to meet and work with other amateurs and share in club benefits, auctions, technical pow-pows, Field Days. An aggressive program makes a strong club. For the new man, much ham know-how (beyond even license requirements and operating results) starts out with those beneficial discussions of technique within "licensing classes" and continues to all the things beyond.

SUGGESTIONS FOR A RADIO COURSE (CD-86 outline) is available (to clubs only) from ARRL on a request basis. Clubs presenting code-practice may ask for our CD-158, FCC Code Examination Standard's and for copies of S-45, Certificate for Volunteer Examiner. There

are Club Award Code Proficiency Certificates for higher level club encouragement.

About Club Affiliation. All local non-commercial amateur radio societies in the United States and Canada having kindred aims and purposes with ARRL, if not already affiliated, are cordially invited to request the forms and information. The purpose in affiliation is to strengthen our common aims. There are no dues or costs entailed in becoming affiliated. The Board does require, to show that your club is truly "amateur," that 51% of your voting members be licensed amateurs, also that 51% of your voting members be full or associate ARRL members. There's only one exception. A *high school* club with a 51% licensed amateur club membership may make a showing of one voting member who is a Full Member of the League. As mentioned here individual amateurs can do much to enhance their own pleasure and success in amateur radio by belonging to an active up-and-doing club. There are specialist groups that have a chief interest in v.h.f., DX, contests etc. But the larger number of the groups have a cross-section of all amateur interests. ARRL has a library of visual Training Aids films, and tapes and slides as well that is exclusively for loan-booking by *affiliated* clubs. Such clubs also receive a progression of amateur letters and bulletins throughout the year. For clubs *not* affiliated . . . we invite your inquiry.

Ideas for Extending Operating Aims. If you have the slightest tendency to get bored in one facet of Amateur Radio it may be time to find a new challenge. At any rate, why not put in some *extra* effort. You get more *out*, much more, when you put something in. What about v.h.f. or h.f. netting? Get our Net Directory or make local inquiry. The steps in "belonging" to a net are generally very simple. The latch string is always out to welcome new reporters. When stations show signs of becoming regular, the calls are added to rosters. If you've never done it, start a radiogram, on a net, in proper form. Try a new band or mode. Get acquainted with others. Seek an ARRL Appointment from your SCM. Join a radio club, if possible. But don't stop at joining, add something to the club or whatever group you join. Fellows write us who have had a long and varied amateur career and but recently got into a club group. Many of them have found a new happiness in getting into the swim of making new hams and helping others. One may thus never lack a friend or have a dull moment.

SCMs and other ARRL Leaders: Please extend the invitation to all amateurs you contact when attending conventions, hamfests, and club or group meetings to *get into things*. Both pleasure and progress come through *participation*. We can extend our *coverage* for traffic and our liaison ties between nets (v.h.f. and h.f.) by finding a place and status-position (appointment) to suit the qualifications held by many amateurs not yet getting the most out of their amateur radio. Let's aim to invite the amateur not already in things, whether Technician, Novice, General or

ARRL ACTIVITIES CALENDAR

(Dates in GMT)

- Jan. 5: CP Qualifying Run — W6OWP
- Jan. 7-8: V.H.F. Sweepstakes (rules last issue)
- Jan. 14-16: CD PARTY (c.w.)
- Jan. 17: CP Qualifying Run — WIAW
- Jan. 21-23: CD Party (phone)
- Feb. 3: CP Qualifying Run — W6OWP
- Feb. 4-5: DX Competition (phone)
- Feb. 4-19 Novice Roundup
- Feb. 10: Frequency Measuring Test
- Feb. 15: CP Qualifying Run — WIAW
- Feb. 18-19: DX Competition (c.w.)
- Mar. 4-5: DX Competition (phone)
- Mar. 18-19: DX Competition (c.w.)
- June 18-19: V.H.F. QSO Party
- June 24-25: Field Day

OTHER ACTIVITIES

- The following lists date, name, and page reference of *QST* issue in which more details appear.
- Jan. 7-9: Ark. QSO Party (p. 99, this issue).
 - Jan. 7-9: Va. QSO Party (p. 116, last issue).
 - Jan. 8-9: Sask. QSO Party (p. 134, this issue).
 - Jan. 14-15: EL DX Competition (p. 80 this issue.)
 - Jan. 22-23, 28-29: VE1 Contest (p. 132, this issue).
 - Jan. 28-29: La. QSO Party (p. 100, this issue).
 - Feb. 5, 9: 160 Meter Tests (p. 101, Nov. *QST*).
 - Feb. 10-12: QCWA QSO Party (p. 71, this issue).
 - Feb. 11-12: Me. QSO Party (p. 108, this issue).
 - Feb. 26: Tenn. QSO Party (next issue.)

whatever class, to try operating and organizational things new to him. As you set and revise your Section goals, follow new programs or start men reporting on a net or participating in other activities you will have contributed to making the lives of other amateurs more worthwhile and interesting. Swap dollars, as they say, and you still have but a single dollar. But swap ideas, organize new networks and arrange communications links between them! Both the individuals and overall amateur organization have made permanent and worthwhile progress and gains through Amateur Radio. — F. E. H.

Ever wonder what that GO & CD is all about every Jan., Apr., July and Oct.? Why not check with your SCM (p. 6 QST) and apply for an ARRL Appointment along the lines of your natural operating interest. An additional "fringe benefit" is this get-together with the cream of the operating crop every three months.

OCTOBER CD PARTIES

Would you believe two new records? On c.w. the savvy W6RW crew broke 300-K by a very comfortable margin to establish both a west coast record and c.w. high. On phone, K2EIU/5 (for the first time by anyone!) turned in over 100-K. Ken's phone secret was a borrowed transceiver and faster band changing with notable band improvements on 10 and 15. It's no secret though to see how often Ken has topped both phone and c.w. CD tabulations, regardless of gear! A fine phone party, with many c.w.-type scores. Totals were so high that once again our high-claimed cut-off point has been advanced, this time to 15-K. In case you've forgotten, in the Oct. 1965 Party, only 36 broke 20-K on phone while 36 did it this October, this in spite of many of the faithful attending the Hudson Division convention that weekend. As press time approaches for this issue of QST, we can tell that the Oct. CD try-outs for the annual SS paid off — tremendous results evidenced by the CD gang! FB, OMs!

The following are high-claimed scores, numbers of QSOs, sections and operating times, with final corrected results to appear in the *January CD Bulletin*. — W1YYM

BRASS POUNDERS LEAGUE

Winners of BPL Certificate for Oct. Traffic:

Call.	Orig.	Recd.	Rel.	Del.	Total
K6BPL	6622	2418	2250	168	10458
W3CUL	412	2769	2714	40	5935
K5TEY	18	1488	1483	5	2994
K6ONK	118	989	977	36	2130
W7BA	9	273	689	10	1581
W6LGG	17	775	710	10	1512
W1PEX	113	656	575	33	1377
K6EPT	8	636	584	52	1280
W7HMA	19	629	604	14	1266
W6RSY	127	591	378	163	1259
K7TCM	27	569	481	59	1133
WA4CK	38	534	504	10	1086
W6GYH	58	523	487	8	1076
W3EML	80	546	443	1	1070
W6LCX	29	517	500	17	1063
W6RYP	51	425	381	49	906
W1BBBO	35	412	383	9	849
W6BOT	47	424	422	0	846
W7ZIW	12	402	378	8	800
W6QXY	21	378	369	30	798
K6MCA	14	370	370	6	760
W1BGD	15	384	172	180	746
W7DZX	11	384	342	9	746
W6BGF	23	347	344	29	743
K6AJU	26	344	336	5	711
W0ZWL	2	410	5	262	679
W6VNW	42	320	302	1	665
W6YBV	9	311	301	19	640
W6OHH	23	306	295	8	632
W4TXL	23	310	271	26	629
W2SEL	23	299	293	8	623
K3MYS	23	317	287	9	616
K2EIU/5	4	301	292	8	605
WA4RQR	19	290	256	32	597
WA0MLE	39	257	247	17	581
W6RPH	6	281	245	34	566
WA2GPT	31	260	213	39	543
W6VR	74	243	214	6	537
W4KPMN	39	273	192	29	533
K6IOV	6	291	231	2	530
W6BHZY	36	245	212	31	524
W6DYH	36	240	247	13	522
W6JUK	17	301	201	0	519
WA4DXJ	69	179	248	15	511
W6JFO	56	225	160	60	501

Late Reports:

W6TYM (Sept.)	27	248	243	3	521
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More-Than-One-Operator Station

W0EEE	172	200	128	69	569
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BPL for 100 or more originations-plus deliveries

WA4BMC 306	W3TN 128	W2PYY 108
W6JXK 224	K1RCO 126	W2RBA 108
K4LGA 188	W2BY 121	W4RCXY 107
W4SPH 167	W0HVJ 121	W0EO 106
K7CPT 163	W2RUF 119	W1TXL 105
W4PQP 158	WA5NTI 119	K2SJM 105
W4LE 155	WA6TWS 118	K3VY 104
WA6GA 153	W8AMI A11 7	W6NMT 104
W6WPF 152	W6TKJ 115	W6SJP 102
K6HLR 152	WA3ATQ 113	W6GUD 101
K6ZCJ 149	WA4AJY 112	W6ZSK 100
WA6KGD 146	WA4HJM 112	K4LMB 100
WA7CFN 140	WA6KIL 112	Late Report:
WA4AGH 139	W3ZRQ 109	K6LRN (Sept.) 108
WA9EDN 136	WA8QND 109	

More-Than-One-Operator Station

W4DV/4 255	K4CG 152	W1AW 132
W0ZLN 173	WA9DWZ 152	W2SZ 128

BPL medallions (see Aug. 1954, p. 54) have been awarded to the following amateurs since last month's listing: WA4TPB, WA5KQN, W6MLE, WA5FSX.

The BPL is open to all amateurs in the United States, Canada and U.S. Possessions who report to their SCM, a message total of 500 or a sum origination and delivery points of 100 or more for any calendar month. All messages must be handled on amateur frequencies within 48 hours of receipt in standard ARRL form.

C.W.

K2EIU/5	265,650-763-69-20
W1BGD	257,600-729-70-17
W0YT (K9ZMS, opr.)	
	244,300-691-70-19
W1EOB	233,970-702-66-19
K2KTK	233,640-701-66-20
W0RQM	225,790-667-67-18
K4VFY	211,480-615-68-18
K2AJA	192,960-641-65-18
K2DXV	203,940-612-66-19
K6OCX	192,960-570-67-17
W4DVT	187,335-536-69-19
W1MX (K3QDD, opr.)	
	181,500-609-60-17
K2KNV	184,000-569-64-19
W6EGP	182,650-555-65-18
W4YGY	176,150-535-65-20
K1ZND	165,005-534-61-18
W9LNQ	159,075-500-63-14
W8AEB	157,740-473-66-18
W3EIS	154,025-499-61-17
W2OHHK	153,720-488-63-19
K0AZJ	153,720-500-61-17
W0INH	150,300-494-60-13
W4HJS	148,480-458-64-19
WA8GYT	147,925-478-61-17
K1WJD	145,800-479-60-8
W0EEE (K0VXU, opr.)	
	144,000-477-60-20
K6BPC (K6QPH, opr.)	
	142,350-433-65-17
W4YE	140,745-504-59-14
K3HNP	129,600-427-60-13
K4UWH	129,200-376-68-17
W0VYJ	127,490-411-61-12
W2SEI	107,010-362-58-16
K4BAI	105,900-346-60-8
WA5KUD	105,270-358-58-19
K0GDF	105,020-349-59-14
W5DTR	104,960-324-64-20
K4BSS/4	102,900-337-60-12
K0YIP	103,230-326-62-18
K3OAE	101,520-376-54-16
W1YYM	101,500-343-58-6
WA9NPB	101,175-351-57-14
W4OWE	100,320-345-57-18
W6RW (K2PHT, W6RW, K9ELT)	319,470-926-69-19

PHONE

K2EIU/5	100,300-333-59-19
W0YT (K9LBQ, opr.)	
	90,475-322-55-16
W6EGP	83,310-282-58-20
K2QDD	65,230-252-51-15
K2AJA	63,750-248-50-14
W6DOB/9	62,140-233-52-15
W2CXM (W2CPV, opr.)	
	58,880-256-46-20
W1FJF	58,800-234-49-12
W7DTR	56,200-221-52-20
W8AEB	52,675-210-49-15
W0RQM	52,210-220-46-13
W9LNQ	51,695-206-49-13
K6BPC (K6QPH, opr.)	
	50,875-180-55-17
W1PYM	49,725-316-45-18
K1YSD	37,840-171-43-17
K4TTN	37,030-161-46-17
K6YIP	36,895-150-47-16
K4VFY	36,120-166-42-12
W0VYJ	33,880-147-44-9
K5ZCJ	32,250-147-43-7
V2EAE	31,200-156-40-11
K1BBS/4	30,660-140-42-9
K6GVS	30,140-132-44-10
W3KJJ	29,045-151-37-10
W6MOB	29,610-141-42-8
WA4JY	27,930-133-42-18
K1ZND	25,715-132-37-10
K1KND	25,150-130-37-10
K0LQJ	24,800-121-40-7
W1BGD	24,700-123-38-3
W0AQW/9	23,560-124-38-11
WA4KWC	22,755-123-37-12
W8VPC	22,610-112-38-8
W6MIE	20,700-111-36-7
W1JYH	20,300-100-38-11
K0YVQ	20,000-98-40-6
K4BAI	19,890-110-34-4
W1ZM	19,795-100-37-4
W6AQW	18,620-94-38-5
WA9AUM	18,240-108-32-5
K6MDC	17,680-104-34-3
W0UCX	16,380-85-36-5
W8VCW	15,640-87-34-9
K2DXV (K2s DXV UFT)	
	73,935-272-53-14

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 WIAW will be made Jan. 17 at 0230 GMT. Identical tests will be sent simultaneously by transmitters on listed c.w. frequencies. The next qualifying run from WGOWP only will be transmitted Jan. 5 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 Jan. 17 becomes 2130 EST Jan. 16.

Any person can apply. Neither ARRL membership nor an amateur license is required. Send copies of all qualifying runs to ARRL for grading, stating the call of the station you copied. If you qualify at one of the six speeds transmitted, 10 through 35 w.p.m., you will receive a certificate. If your initial qualification is for a speed below 35 w.p.m. you may try later for endorsement stickers.

Code practice is sent daily by WIAW at 0030 and 0230 GMT, simultaneously on all listed c.w. frequencies. At 0030 GMT Tuesday, Thursday and Saturday, speeds are 15 20 25 30 and 35 w.p.m.; on Monday, Wednesday, Friday and Sundays, speeds are 5 7½ 10 13 20 and 25 w.p.m. For practice purposes, the order of words in each line may be reversed during the 5 through 13 w.p.m. tests. At 0030 GMT daily, speeds are 10 13 and 15 w.p.m. The 0230-0320 GMT runs are omitted four times each year, on designated nights when Frequency Measuring Tests are made in this period. To permit improving your list by sending in step with WIAW (but not on the air!) and to allow checking strict accuracy of your copy on certain tapes note the GMT dates and texts to be sent in the 0230-0320 GMT practice on those dates:

Date Subject of Practice Text from Nov. QST

- Jan. 4: *It Seems to Us*, p. 9
- Jan. 10: *Low-Level Blocked-Grid Keying*, p. 11
- Jan. 13: *Building a Simple Crystal V.F.O.*, p. 18
- Jan. 18: *A Converter for 144 Mc.*, p. 25

Date Subject of Practice Text from *Understanding Amateur Radio*, First Edition

- Jan. 25: *The Oscillator*, p. 59
- Jan. 30: *R.F. Amplifiers*, p. 60

SUGGESTED OPERATING FREQUENCIES

RTTY 3620, 7040, 14,090, 21,090 kc.
WIDE-BAND F.M. 52.525 146.94 Mc.

GMT CONVERSION

To convert to local times subtract the following hours:

ADST -3, AST -4, EDST -4, EST -5, CDST -5, CST -6, MDST -6, MST -7, PDST -7, PST -8, Hawaiian -10, Central Alaska -10.

A convenient GMT conversion card is available, free of charge, from the ARRL communications Department, 225 Main St., Newington, Conn. 06111.

FD Feedback

Tops in 4-A in last June's Field Day was the Seven-Eleven ARC and the call should have appeared as K2ZSS/2. In Class 1-B, the two-man portable operation of WN6TJM should have been shown as WN6TJM, aided by his Dad K6QHZ. Sorry Kurt, and good luck under that fine new WB6TJM call!

NEW FILM AVAILABLE

The Training Aids Library has obtained *Though the Earth Be Moved* for its affiliated clubs only. This film in part shows how amateur radio and RACES were utilized during the Alaskan Earthquake. It contains some of the rare shots made by amateur photographers who were on the scene at the time of the disaster. This is a well-produced film with excellent coverage of what took place at the time of the earthquake and what was done to help the people of Alaska. This is a 16-mm. sound film and runs for 45 minutes. An excellent film for building up a weak program and for mixed groups.

WIAW SCHEDULE, JANUARY 1967

The ARRL Maxim Memorial Station welcomes visitors. Operating-visiting hours are Monday through Friday 3 P.M.-3 A.M. EST, Saturday 7 P.M.-2:30 A.M. EST and Sunday 3 P.M.-10:30 P.M. EST. The station address is 225 Main Street, Newington, Conn. about 7 miles south of Hartford. A map showing local street detail will be sent upon request. The station will be closed January 1 and 2.

GMT*	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
0000	RTTY OBS ^{3,7}	.....	.....
0030	Code Practice Daily¹ 10-13 and 15 w.p.m.					
0100	C.W. OBS ¹	C.W. OBS ¹	C.W. OBS ¹	C.W. OBS ¹	C.W. OBS ¹	C.W. OBS ¹
0120-0200 ⁴	7.080	3.555	7.080 ⁶	3.555 ⁶	7.080
0200	Phone OBS ²	Phone OBS ²	Phone OBS ²	Phone OBS ²	Phone OBS ²	Phone OBS ²
0205-0230 ⁴	3.945	50.7	145.6	1.82	3.945
0230	Code Practice Daily¹ 15-35 w.p.m. TThSat., 5-25 w.p.m. MWFSun.					
0330-0400 ⁴	3.555	7.080	1.805	7.080	3.555
0400	RTTY OBS ³	.....	RTTY OBS ³	RTTY OBS ³	RTTY OBS ³	RTTY OBS ³	RTTY OBS ³
0410-0430 ⁴	3.625	14.095	7.045	14.095	3.625
0430	Phone OBS ²	.....	Phone OBS ²	Phone OBS ²	Phone OBS ²	Phone OBS ²	Phone OBS ²
0435-0500 ⁴	7.255	3.945	7.255	3.945	7.255
0500	C.W. OBS ¹	.....	C.W. OBS ¹	C.W. OBS ¹	C.W. OBS ¹	C.W. OBS ¹	C.W. OBS ¹
0530-0600 ⁴	3.555 ⁶	7.080 ⁶	3.555	7.255	3.555
0600-0700	7.080	3.945	3.555	7.255	7.080
0700-0800	3.945	7.255	3.945	3.555	3.945
2000-2100	14.280	21/28 ⁵	14.095	21/28 ⁵	14.280	.....
2100-2200	14.100	14.280	14.100	14.280	14.100	.....
2300-2345	7.255	21/28 ⁵	21.19	21/28 ⁵	7.255	.....

¹ C.W.OBS (bulletins, 18 w.p.m.) and code practice on 1.805, 3.555, 7.08, 14.1, 21.075, 50.7 and 145.6 Mc.

² Phone OBS (bulletins) on 1.82, 3.945, 7.255, 14.28, 21.41, 50.7 and 145.6 Mc.

³ RTTY OBS (bulletins) on 3.625, 7.045 and 14.095 Mc. 170/850 cycle shift optional in RTTY general operation.

⁴ Starting time approximate. Operation period follows conclusion of bulletin or code practice.

⁵ Operation will be on one of the following frequencies: 21.075, 21.1, 21.41, 28.08 or 28.7 Mc.

⁶ WIAW will listen in the novice segments for Novices on band indicated before looking for other contacts.

⁷ Bulletin sent with 170-cycle shift, repeated with 850-cycle shift.

Maintenance Staff: W Is QIS WPR NPG. *Times/days in GMT. General operating frequencies approximate.

DX Century Club

The following list contains the calls and country totals of holders of DX Century Club

Award who have submitted confirmations to ARRL Hq. for the period from October 1, 1964 through October 31, 1966. New Members in DXCC for the period from October 1, through October 31, 1966 will appear in next month's listings. DXCC Members qualifying for the Honor Roll appear in the Honor Roll list below. Since the necessary space to run the complete DXCC Roster is not available, (the total number of DXCC certificates issued as of September 30, 1966 was 12,050) this list contains only the calls and totals of those who have shown an active interest in their DXCC rating over the indicated 25-month period.

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. All totals shown represent submissions received through October 31, 1966.

G3FKM 321/337	K6EVR 318/334	W7ENW 317/340	W1FH 315/340	K6EC 313/326
W3GAU 321/343	W1CLX 318/340	W7GBW 317/340	W1HZ 315/332	V87ZM 313/336
W6AM 321/345	W2FZY 318/336	W8RN 317/334	W2LV 315/333	W1ME 313/335
W7JY 321/343	W2TF 318/326	W8Y 317/337	W2VW 315/331	W1ZM 313/328
W8BF 321/341	W2WZ 318/340	W9BMO 317/329	W3EGR 315/331	W2RDD 313/326
W8VWS 321/344	W4LRN 318/329	W0ELA 317/339	W3LMA 315/336	W2UVE 313/330
DL1IN 320/335	W4OPM 318/332	W0MLY 317/332	W3WGH 315/329	W3CGS 313/331
DL3LL 320/338	W4PLL 318/332	W0NLY 317/332	W3RBU 315/332	W3JNN 313/336
HB9J 320/343	W4TM 318/339	CE3AG 316/339	W5MMK 315/335	W4GYP 313/329
OE8R 320/343	W5CY 318/336	DL3RK 316/332	W5OLG 315/335	W6GZL 313/328
W1MV 320/336	W6QUO 318/342	FT1AL 316/331	W6QYV 315/332	W6LDD 313/333
W2AGW 320/343	W7PHO 318/335	LU6DJX 316/339	W8HGW 315/339	W6NJU 313/326
W2JT 320/338	W8DAW 318/341	ON4DM 316/334	W8NGO 315/331	W6TJD 313/333
W2ZX 320/338	W8POO 318/334	PA0FX 316/335	W9SFR 315/328	W8LKH 313/332
W3GHD 320/345	W9YFV 318/341	W1GKK 316/340	DJ1BZ 314/331	W9AMU 313/329
W5ABY 320/336	W8DU 318/339	WA2IS 316/332	DJ2BW 314/330	W9GIL 313/329
W8KIA 320/343	G0SYK 318/345	W2FXN 316/329	DL9OH 314/324	D17AA 312/333
W8MPW 320/337	W4MJ 317/333	W2OKM 316/333	K3UPG 314/337	ZL700 312/329
W9NDA 320/343	K2LWR 317/329	W2TQO 316/334	K4AIM 314/327	G3AAM 312/335
W9RBI 320/344	K4TJL 317/325	W2YTH 316/333	K4ICK 314/325	G3HDA 312/323
W0QYZ 320/340	K4TWF 317/322	W4LIT 316/338	K4LNM 314/327	I1AMU 312/330
G8KS 319/336	VE3CFG 317/330	W4DQS 316/322	K4RKP 314/322	K8LGG 312/329
HB9MO 319/335	VK3KB 317/339	W5AFX 316/340	W1ZW 314/330	W1FZ 312/330
K6ENX 319/335	W1BAN 317/329	W51GJ 316/333	W2YD 314/332	W2FXA 312/324
W1JYH 319/341	W1BIB 317/340	W5POA 316/333	W2ADJ 314/331	W2MES 312/319
W2BXA 319/342	W1HX 317/336	W6BZE 316/335	WA2ELS 314/318	W2PGJ 312/328
W2HTI 319/335	W2BOK 317/335	W6VY 316/335	W2LPE 314/334	W2RCV 312/327
W2LAX 319/335	W2CTO 317/336	W8BA 316/338	W3LMO 314/326	W5LGG 312/331
W2NUT 319/334	W2SUC 317/333	W8DMD 316/337	W3RNO 314/331	W6HOC 312/324
W2SSC 319/334	W2ZGB 317/332	W9HUZ 316/335	W4BJ 314/325	W6ID 312/330
W4ML 319/338	W3KT 317/340	W9LNM 316/338	W4BYU 314/331	W6RKP 312/324
W4VPD 319/335	W4GXB 317/337	W0OGI 316/331	W4MR 314/333	W6UOV 312/325
W5LUV 319/335	W4LKY 317/336	4X4DK 315/335	W6GPP 314/334	W7CMM 312/322
W6EPZ 319/339	W4OM 317/338	DL6EN 315/329	W6VQ 315/330	W8KMI 312/323
W7AC 319/342	W5KC 317/339	G2PL 315/337	W8WZ 314/335	W9YSX 312/328
W8JBI 319/337	W5OK 317/327	G3HT 315/325	W9BFB 314/331	W9AJY 312/325
W8JIN 319/343	W6OSU 317/328	K2BZT 315/331	W0PNO 314/335	ZL1HY 312/335

Radiotelephone

W3RIS 321/345	W7PHO 318/335	W9NDA 316/335	W2VZ 314/322	W9RBI 313/335
W8BF 321/341	G3FKM 317/339	ON4DM 316/334	5Z4ERR 314/335	W0JYW 313/332
W2ZX 320/338	PY4TK 317/333	W1BAN 315/326	G8KS 313/326	DL1IN 312/327
W8GZ 320/342	W2HTI 317/330	WH8GW 315/336	W2TP 313/318	W1FH 312/332
W2JT 319/332	DL3LL 316/331	4X4DK 315/332	W3GHD 313/330	W4PDL 312/321
W2BXA 318/339	W6PY 316/335	K4TJL 314/322	W3JNN 313/333	W0QVZ 312/326
W6AM 318/341	W8YQ 316/332	K8RTJ 314/322	W9JFN 313/329	

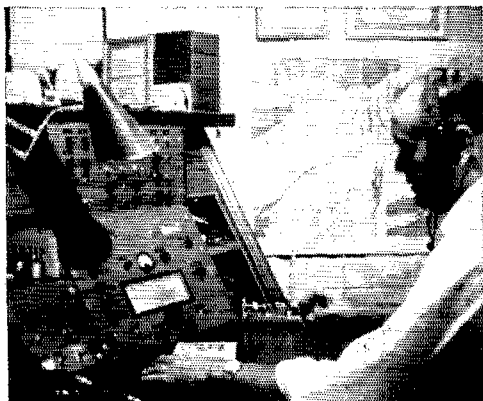
332	W6IBD	W0AHH	W9FFC	W5OGS	317	W2LRV	W0LW	K6LGF	W6ULS	W9FVU	W1WDD	K5AAD	SM5CCE
W6KEV	W8KPL	W0BHV	W5PNS	K6RWO	W0LW	W0J11	K9EFC	W7A8	W9KXX	W5FFW	K7LPI	VE2YU	
	5Z4AQ	W9PGI	W6ANN	K6VVA		HB0FO	ON4NC	W7DLH	W8SNL	W6UHA	SM7QY	VE6JR	
331			G3DO	W6CHV	W1CKA	313	K4ASU	W1Y8A	W7HKT	Y5BX	W2GKZ	W1BGW	
VK2ADE	327	324	VE2NV	W7CNM	W1LAS	K8IKB	OK1FF	W1MQU	W8CLR		W4BFR	W1BPW	
W2QHH	K2DCA	W5CE	W2BQM	W8ONA	W5HDS	K0RAL	VE2BY	W1OJR	W8JSU		W4HUE	W1KXU	
W6FUU	W2CR	W6TS	W2MJ	W8PHZ		KH6CD	VE3BWY	W1VG	K8ONV	307	W4KFC	W1RAN	
	W3NKM	W8ZCQ	W9GFF	W9DWDQ		VE2WW	W1NVY	W2AEB	W8QJR	303	SM0CO	W8KNW	
330	W5EGK		W9JUV	W9HB	DL1KB	W4ZRZ	W2ZKQ	W2BBS	W9LW	307	JA1BK	W8QYV	
LA7Y	W8PUD	323		W9UXO	DL7EN	W6LNM	W3ZAO	W2ESO	W9MQK	303	LA5HE	W8YCP	
OH2NB		K5BGB	320		W1CBB	W46SD	W4N1F	W2MXH	W9RCJ	306	W8Y1O	W2CWK	
W2QYB		W2SHC	CR6BX	319	W2DXX	W7ADS	W4NDJ	WA20JD	W0NVZ	DL1BO	K9CJL	W3KBC	
W4LVV	DL17A	W6B8Y	G2BYN	HB9EU	W7BTH	W0TJ	W5PM	W2P1D		K2PC	ON4FU	W3PN	
W0NTA	HB9TL	W6CYI	JA1DM	W1GYE			W6MVL	W3GRS	309	VR3RE	DL7AB	W4BKR	
	LU4DGM	W6GJ	K2SHZ	W1GFE	315	312	W6NCA	W3MVC	W4EPA	305	W2BMK	G3AIZ	W4EFC
329	W1BIL		K2UVU	W4CFD	K2MGE	F3YR	W1NVY	W2AEB	W5WZQ	305	W2GQN	G8JM	W4CMC
W2GUM	W2GNQ	322	K8RDE	W6CAE	W2TQR	W2EQS	W9VYB	W4PAA	W7UMJ	305	W3INH	I1ZL	W5EJT
W3EVV	W2TVR	G1B1V	PA0LU	W9FID	W3KQ/2	W2JAE	Y5AB	W5BRR		308	W2KIR	K2ZKU	W1SQU
W6FOZ	W9QDF	K9EAB	W1AZY		W4SSU	W2WFM		W51YU		308	W6GOOP	W6YMV	W6KG
W9KOK		SM3BIZ	K2JUV		W6BVM	W3AFM		W6DQH	DJ3KR	308	W8GLK	K4HNA	W6REH
		VK2DI	W2ZY8	318		W4RLS	DL3BK	W6HGY	W3GJY	308	W8KBT	K4NDA	W6TGL
328	K20EA	W2GLF	W31YE	K4RID	314	W5PWV	K1SHN	W6KSM	W3KDP	304	W8KBT	K6CJC	W6TXL
G8FXB	W4AAU	W2GT	W3OP	W1RB	G6XL	W6WX	K4SCT	W6KUT	W6HX	304	W100S	KP4RK	W7EJD
G3AAE	W9WHM	W7AQB	W4AVY	W0BTD	K7GCM	W8SZS	K6KII	W6OME	W6SQP	301	K4HYL	P21AX	W8CUT

W6HJ W6JSN 4X4HK	155 DU2IB K9RNO K0AJA OK1ADP OK2KOS SM3BHT SP3AJ UB5DQ VE3AU W3VQE	YU6FA D1G7CT HB97E H1HL K1UDD K4KPR K4KJD K4KLR K4OA K4XSD K4TFA K5QHZ K6TZX K8BFX K8INA K8PYD K9CZV K9KUK K9TRP K0HWB K0YIP K0P4RJ SM5RFJ SM0UW T9G9Z U4AGMF U4O6H U4U8L VE2HY VE3RXY VE3FKL VE3FCK VE4SK W1BDI W1CSP W1DDO W1DYE W1RFO W1AIBW W2A1J W2B0T W2R1R W2TKT W2A1JH W2A2ZKO W2B2AL W2B2YD W2B2YJ W2B2YK W2B2POH W3KJK W3MHR W4L1U W4MFE W4Z5H W4KXCK W6SUD W7OEB W8Q3Q W8A1FX W8A2FX W8A3FX W8A4FX W8A5FX W8A6FX W8A7FX W8A8FX W8A9FX W8A0FX W8A1FX W8A2FX W8A3FX W8A4FX W8A5FX W8A6FX W8A7FX W8A8FX W8A9FX W8A0FX	OK2BBJ UF6KPE 5B4TX	129 K5SSZ K7YUU OH3ND OK2PO UD5BW SM2CXU VE3DBB VETAC W4W5F W62QA W73UH W7A7BOB XW8AS	136 F3SM ON4PQ ON4QC W1OQP YU1AA YV2AH	135 H1NT K4R5Y K7BZW K0M1K O5D5X OH5SS OK1GA ON54X ON54CU W6LYC	128 DJ4KU JA101O K2HOE LA7WI OZ3KE PY2BPE SM3FY UBSKJE W1BU W4HZI W6BRW/1	134 DM2AFC K0BUU SM3CJ VE2ATU W2AZKH W2ASN W2O7J W8CWD W8MCR	127 DL4GS K0WTF W420TJ W5RY	126 DJ0NX JA2A JA5A K1VSK MP4BEQ VE4ZX W1WSN W6KNE	125 DJ6W HB9ABN HB9P JA1GTF K3ICA K5LMG LA4LE OH2MK VE3CZC W4G0TU W8RCR W9CFE W0MPW	132 JA4XW K2DQJ SM5BAS SV1AA UA3FU VO2NA W3ZAQ 9K2AN	131 DL3VR DL8AJ HA5KQD F8TK G3JFE K4RCS K8YTY KH6FJL OE3SGA SL6BU UB5TU W3GQF W3HNC W86FYW W7YBX W9S9CI Q95TJ	130 CR7FN DJ9KG EA31H G3E1A HB9ADD HB9ADP IR1L H7ZBS JA9BB K1MRP K2CHS K2RNN K9YBC LA66P OK4ADM OK3CW K0QYD W1LEL W1ODI W4DLA W4TXE W5KHP W5ZVU W6ZER W6B7JY W49BT W4RLL W4VPM W4X5Y DL9EM DM3SMB EL2S W9PLS H45AW	124 DJ7MI EA1FD F8TK G3JFE K4RCS K8YTY KH6FJL OE3SGA SL6BU UB5TU W3GQF W3HNC W86FYW W7YBX W9S9CI Q95TJ	123 JA9BB K1MRP K2CHS K2RNN K9YBC LA66P OK4ADM OK3CW K0QYD W1LEL W1ODI W4DLA W4TXE W5KHP W5ZVU W6ZER W6B7JY W49BT W4RLL W4VPM W4X5Y DL9EM DM3SMB EL2S W9PLS H45AW	JA2XI K1ZHG K2NJK K4JVI WA2KAZ WA2LGX WA2PLZ WB2HJL WB2PBL WB2PXU W41A W41SIZU W4NML W4WFK W4WHN W4HEND W6CZP W6WJK W6BHG W6WJD	WA2CYQ D480 D48NS D46S1 DL0BT DM2B2L G4JYP G3POR H1AVD H4FAZ K5VLO K6PUB OK3CBN OK3EM UT5BP W4FAZ W4ZFE W4HS W5GKJ W9E1G W1NTG ZD4AM	113 D480 D48NS D46S1 DL0BT DM2B2L G4JYP G3POR H1AVD H4FAZ K5VLO K6PUB OK3CBN OK3EM UT5BP W4FAZ W4ZFE W4HS W5GKJ W9E1G W1NTG ZD4AM	112 D480 D48NS D46S1 DL0BT DM2B2L G4JYP G3POR H1AVD H4FAZ K5VLO K6PUB OK3CBN OK3EM UT5BP W4FAZ W4ZFE W4HS W5GKJ W9E1G W1NTG ZD4AM	111 D480 D48NS D46S1 DL0BT DM2B2L G4JYP G3POR H1AVD H4FAZ K5VLO K6PUB OK3CBN OK3EM UT5BP W4FAZ W4ZFE W4HS W5GKJ W9E1G W1NTG ZD4AM	110 D480 D48NS D46S1 DL0BT DM2B2L G4JYP G3POR H1AVD H4FAZ K5VLO K6PUB OK3CBN OK3EM UT5BP W4FAZ W4ZFE W4HS W5GKJ W9E1G W1NTG ZD4AM	109 D480 D48NS D46S1 DL0BT DM2B2L G4JYP G3POR H1AVD H4FAZ K5VLO K6PUB OK3CBN OK3EM UT5BP W4FAZ W4ZFE W4HS W5GKJ W9E1G W1NTG ZD4AM	108 D480 D48NS D46S1 DL0BT DM2B2L G4JYP G3POR H1AVD H4FAZ K5VLO K6PUB OK3CBN OK3EM UT5BP W4FAZ W4ZFE W4HS W5GKJ W9E1G W1NTG ZD4AM	107 D480 D48NS D46S1 DL0BT DM2B2L G4JYP G3POR H1AVD H4FAZ K5VLO K6PUB OK3CBN OK3EM UT5BP W4FAZ W4ZFE W4HS W5GKJ W9E1G W1NTG ZD4AM	106 D480 D48NS D46S1 DL0BT DM2B2L G4JYP G3POR H1AVD H4FAZ K5VLO K6PUB OK3CBN OK3EM UT5BP W4FAZ W4ZFE W4HS W5GKJ W9E1G W1NTG ZD4AM	105 D480 D48NS D46S1 DL0BT DM2B2L G4JYP G3POR H1AVD H4FAZ K5VLO K6PUB OK3CBN OK3EM UT5BP W4FAZ W4ZFE W4HS W5GKJ W9E1G W1NTG ZD4AM	104 D480 D48NS D46S1 DL0BT DM2B2L G4JYP G3POR H1AVD H4FAZ K5VLO K6PUB OK3CBN OK3EM UT5BP W4FAZ W4ZFE W4HS W5GKJ W9E1G W1NTG ZD4AM	103 D480 D48NS D46S1 DL0BT DM2B2L G4JYP G3POR H1AVD H4FAZ K5VLO K6PUB OK3CBN OK3EM UT5BP W4FAZ W4ZFE W4HS W5GKJ W9E1G W1NTG ZD4AM	102 D480 D48NS D46S1 DL0BT DM2B2L G4JYP G3POR H1AVD H4FAZ K5VLO K6PUB OK3CBN OK3EM UT5BP W4FAZ W4ZFE W4HS W5GKJ W9E1G W1NTG ZD4AM	101 D480 D48NS D46S1 DL0BT DM2B2L G4JYP G3POR H1AVD H4FAZ K5VLO K6PUB OK3CBN OK3EM UT5BP W4FAZ W4ZFE W4HS W5GKJ W9E1G W1NTG ZD4AM	100 D480 D48NS D46S1 DL0BT DM2B2L G4JYP G3POR H1AVD H4FAZ K5VLO K6PUB OK3CBN OK3EM UT5BP W4FAZ W4ZFE W4HS W5GKJ W9E1G W1NTG ZD4AM
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NEW 2-METER MOONBOUNCE RECORD

*K2MWA/2 and VK3ATN Communicate
10,300 Miles on 144 Mc.*

The long-continued moonbounce efforts of T. R. Naughton, VK3ATN, Birchip, Australia, paid off on Nov. 28, 1966, when a QSO of some 6 minutes duration was completed with K2MWA/2, the station of the Crawford Hill Radio Club, Colts Neck, N. J. Signals at VK3ATN peaked some 18 db. over receiver noise, while his 100-watt signal just managed a unity S/N ratio in the 300-cycle-bandwidth receiver at K2MWA/2. Antennas were the large stacked rhombic at VK3ATN, and a 60-foot commercial-experimental dish at K2MWA/2. Present at the New Jersey end were W21MU, W2FZY, K2MWA, W2JIB, and British worker and observer Roger Abson.



This completely home-designed and built station belongs to W2SEI, Liverpool, N. Y. The set-up includes a console, 23-tube double-conversion superhet, and 250-watt transmitter.

Remember the article, "A One-Tube Two-Meter Rig with Transistor Modulator," in *QST* June 1957? The author, R. J. Schlesinger, K6LZM, has now come up with a completely transistorized station, transmitter and receiver, for use on the 80-meter c.w. band. The transmitter (right) has a v.f.o. and requires 18 volts at 70 ma. to power the



K6LZM's transistor station

2N696 final. Power output is approximately 1 watt. The receiver is a converted b.c. receiver with a b.f.o. added.

K6LZM uses the station almost every night to handle traffic on the Golden State Net and has also done some DX work with the flea-power rig; he worked KL7PI and is now trying for a WAS.

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A.R.R.L. QSL Bureau

The function of the ARRL QSL Bureau system is to facilitate delivery to amateurs in the United States, its possessions and Canada of those QSL cards which arrive from amateur stations in other parts of the world. All you have to do is send your QSL manager (see list below) a stamped self-addressed envelope about 4¼ by 9½ inches in size, with your name and address in the usual place on the front of the envelope and your call printed in capital letters in the upper left-hand corner. Changes are shown in heavy type.

- W1, K1, WA1, WN1 — Providence Radio Ass'n., W1OP, Box 2903, Providence, Rhode Island 02908.
- W2, K2, WA2, WB2, WN2 — North Jersey DX Assn., P.O. Box 505, Ridgewood, New Jersey 07451.
- W3, K3, WA3, WN3 — Jesse Bieberman, W3KT, RD 1, Valley Hill Rd., Malvern, Pennsylvania 19355.
- W4, K4, — F.A.R.C. — W4AM, P.O. Box 13, Chattanooga, Tennessee 37401.
- WA4, WB4, WN4 — Richard Tesar WA4WIP, 2666 Browning St., Sarasota, Florida 33577.
- W5, K5, WA5, WN5 — Hurley O. Saxon, K5QVH, P.O. Box 9915, El Paso, Texas 79989.
- W6, K6, WA6, WB6, WN6 — San Diego DX Club, Box 6029, San Diego, California 92106.
- W7, K7, WA7, WN7 — Willamette Valley DX Club, Inc., P.O. Box 555, Portland, Oregon 97207.
- W8, K8, WA8, WN8 — Paul R. Hubbard, WA8OXY, 921 Market St., Zanesville, Ohio 43701.
- W9, K9, WA9, WN9 — Ray P. Birren, W9MSG, Box 519, Elmhurst, Illinois 60126.
- W0, K0, WA0, WN0 — Alva A. Smith, W0DMA, 238 East Main St., Caledonia, Minnesota 55921.
- VE1, 3C1 — L. J. Fader, VE1FQ, P.O. Box 663, Halifax, N.S.
- VE2, 3C2 — John Ravenscroft, VE2NV, 135 Thorncrest Ave., Dorval, Quebec.
- VE3, 3C3 — R. H. Buckley, VE3UW, 20 Almont Road, Downview, Ontario.
- VE4, 3C4 — D. E. McVittie, VE4OX, 647 Academy Road, Winnipeg 9, Manitoba.
- VE5, 3C5 — Fred Ward, VE5OP, 899 Connaught Ave., Moose Jaw, Saskatchewan.
- VE6, 3C6 — Karel Tettelaar, VE6AAV, Sub. P.O. 55, N. Edmonton, Alberta.
- VE7, 3C7 — H. R. Hough, VE7HR, 1291 Simon Road, Victoria, British Columbia.
- VE8, 3C8 — George T. Kondo, VE8RX, % Dept. of Transport, P.O. Box 339, Fort Smith, N.W.T.
- VO1, 3B1 — Ernest Ash, VO1AA, P.O. Box 6, St. John's, Newf.
- VO2, 3B2 — Goose Bay Amateur Radio Club, P.O. Box 232, Goose Bay, Labrador.
- KH6, W116 — John H. Oka, KH6DQ, P.O. Box 101, Aiea, Oahu, Hawaii 96701.
- KL7, W17 — Alaska QSL Bureau, Star Route C, Wasilla, Alaska 99687.
- KP4, WP4 — Joseph Gonzalez, KP4YT, Box 1061, San Juan, Puerto Rico 00902.
- KV4, WV4 — Graciano Belardo, KV4CF, P.O. Box 572, Christiansted, St. Croix, Virgin Islands 00820.
- KZ5 — Ralph E. Harvey, KZ5RV, Box 407, Balboa, C. Z.
- SWL — Leroy Waite, 39 Hanum St., Balston Spa, New York 12020.

NOTE: Foreign and U.S. Possessions Bureaus were listed in *IARU News*, December 1966 *QST*.

¹These bureaus prefer 5 × 8 inch manila envelopes.

• All operating amateurs are invited to report to the SCM on the first of each month, covering station activities for the preceding month. Radio Club news is also desired by SCMs for inclusion in these columns. The addresses of all SCMs will be found on page 6.

ATLANTIC DIVISION

DELAWARE—SCM, Roy A. Belaire, W8IYE—SEC: K3NYG. RM: W3EEB.

Net	Freq.	Local Time	Day
DFPN	3905 kc.	1800	Sat.
DSMN	50.4 Mc.	2100	Tue
Dover 6 & 2	50.4 Mc.	2000	Wed
KGEN	3905 kc.	1300	Sun

New appointment: W3FPJ as Official VHF Station. Renewal: K3GKF as 00, John M. Thompson, W3HC, will be Delaware's SCM for the next term. Welcome and good luck, John. K3OCE is chairman of HamQuest 67 for the Kent County Radio Club. W3PK was assistant to W3PM for the Oct. SET. Traffic: W3EEB 301, K3NYG 29, WA3-DYG 27, W3EKS 16, W3BKN 6, WA3CRU 3, W3IYE 3, WA3DUM 2.

EASTERN PENNSYLVANIA—SCM, Allen R. Breiner, W3ZRQ—SEC: W3ELL. RMs: K3YVG, W3CBH, W3-EML. PAMs: W3SAO, W3FGQ. The EPA CW Net had QNI 360 and QTC 425. The PTTN Training Net had QTC of 291. The EPA Emergency Fone and Traffic Net had QNI 736 with QTC 402. K3MSG is now General Class. The Pottstown RC has classes for General and Extra Class under the direction of K3NUM and W3BIP. K3RND, now at Kansas U., will bring his QSLing up to date if you drop a card to P.O. Box 26, Orrtanna, Pa. Being manager of the football team cuts into WA3AJT's traffic work. K3-MHD now is stationed at Pensacola, Fla., and taking up communications. WA3CFU finally got Miquelon Islands on 40. WA3FNW is now General Class. WN3FUF is operating from the Hoffman Orphanage. EC WA3BBI is moving to Trenton, N.J. Any amateur interested in filling his shoes as EC from Snyder, Union or Northumberland Counties is asked to drop your editor a line. W3MPX added a tr. switch to the shack. W3FGQ is now OVS and has most of his v.h.f. antennae erected again. K3WEU has been appointed v.h.f. Coordinator for the 1st Army MARS for the Mid-Atlantic area. New officers of the Cumberland Valley ARC are K3SWZ, pres.; K3WEB, vice-pres.; WA3BKK, secy.-treas. WB3BB, ex-W3WRE, visited W3CUL and W3VR. K3SME, a graduate of Philco Tech. Institute, plans to activate his station in the Philadelphia area. If we owe you some operating aids or a reply to a letter, perhaps you forgot to place your return address on the letter. Want to try again? A new QCWA chapter is being formed in the Lower Anthracite area. Interested amateurs should contact W3KJJ or W3PVY. In case you have forgotten, it's just a little over a year now that we had the Northeast Blackout. How about giving the ole emergency generator a workout now—just in case! Do it today, tomorrow may be too late. Traffic: W3CUL 5935, W3EML 1070, K3MYS 616, W3VR 537, W3AEG 408, WA3CTP 379, K3P1E 375, W3ZRQ 335, K3MVO 330, W3-ATZ 306, K3YVG 295, WA3ATQ 229, W3FGQ 188, K3WEU 112 066, K3YVG 295, WA3ATQ 229, W3FGQ 188, K3WEU 144, W3JKX 131, W3KJJ 130, W3ELI 119, W3CBH 118, WA3BFR 98, W3OY 90, WA3AFT 89, W3MPX 78, W3VAP 64, WA3BSV 62, WA3BBI 58, K3KTH 51, K3RXT 48, W3-FAF 46, K3ATNL 40, K3WAJ 31, WA3FVT 29, W3RV 27, W3NNL 25, W3BUR 20, K3KEO 20, K3HHB 19, K3QUL 19, WA3CFU 16, K3PWW 16, K3MDG 11, W3PVY 10, K3-MHD 9, W3ADE 8, W3BFF 8, K3HKV 6, W31D 6, WA3-AJT 3, W3EU 3, WA3BJQ 2, WA3EMY 1, K3YVP 1.

MARYLAND—DISTRICT OF COLUMBIA—SCM, Bruce Boyd, W3QA—SEC: W3CVE. RMs: K3JYZ, K3-

OAE, W3PRC, W3UE. PAMs: W3JZY, K3LFD. The SET exercise appears to have been very successful this year. WA3BTA, WA3ERL, W3MCG, K3NCM and W3TN also expressed satisfaction with SET operation. W3TN also made the BPL in October. The September FMT also had an excellent showing with W3AEA, WA3BDK, K3CYA, W3ECP, WA3NEM, W3LUL, W3TIK and W3TMZ reporting. W3TMZ had the closest measurement with a 2.1 p.p.m. error. WA3BDK and W3LUL tied for second with 2.3 p.p.m. MEPN had 21 sessions and handled 135 messages for a 6.4 average. *Clubs and nets:* The Maryland Two-Meter Terminate Net is an active organization with 55 members and meets twice a week, Mon. and Thurs. on 145.206 Mc. at 8:30 P.M. EST. WA3EWT has organized a radio club at St. John's College High School in Washington. WA3EOP is busy on v.h.f. from the University of Maryland Radio Club station, W3EAX. W3RKK is working to promote cooperation between the Baltimore Amateur Radio Club and the Red Cross. WA3CFK, although busy with low-band traffic, school work and the MDD Flyer, also keeps the Cumberland Valley Traffic Net running on 145.602 Mc. WA3ELA has organized a radio club at his school (Good Counsel High) in Rockville. *Equipment:* K3LLR is experimenting with a turnstile antenna on 6 and 2. W3EOV is debugging his RTTY gear. *Other:* K3JYZ spent too much time in California to run up his usual high traffic total. W3JZY is rushing to get the outside work done before his mountaintop is snowed in. W2N1Y/3 is recovering from the flu. K3CYA reported some unusual wide-band QRM on 20 meters. Traffic: (Oct.) W3TN 252, WA3CFK 191, W3LBC 168, K3LFD 166, K3OAE 161, W3PQT 159, WA3EQ 146, W3BDK 103, K3MZ/3 101, W3MCG 86, K3GZK 84, WA3ERL 71, WA3BTA 52, W3EOV 44, K3NCM 38, WA3CVM 33, WA3-CEK 30, K3JYZ 16, WA3DWF 9, WA3EOP 6, K3LLR 2, WA3EXJ 1, (Sept.) W3EOV 25.

SOUTHERN NEW JERSEY—SCM, Edward G. Raser, W2Z1—Asst. SCM: Charles E. Travers, W2YPZ. SEC: W2BZJ. RMs: WA2KIP, WA2UPC, W2RG. PAM: NJPN Net Mgr. W2Z1. The Oct. SET was the best ever. SEC W2BZJ has issued a fine AREC Bulletin, to all members in 21 counties and reports 28 messages handled in the SET. WA2KIP is the new NJN Mgr. K2JQX and W2BBH made good scores in the Sept. FMT. NJPN reports traffic 170, QNI 419, 31 sessions and 84 traffic in the SET. W2BBS received a QSL card from Barry Goldwater. W2Z1 has returned from a 3000-mile trip down the Mississippi River on a "Mark Twain" era packet boat to New Orleans and return. The NJN Annual Meeting was held Nov. 5 at Red Cross Hq., New Brunswick. W2AEJ did a swell job as last year's mgr. We lost K4RAD/2 as an OO, but gained K2BG. W2LVW did an outstanding job during the SET for Gloucester Co. W2RVE is working on ATV gear and sends in a nice report as OVS. W2YPZ has been appointed as Asst. SCM. K2CPR resigned as OO. WA2UPC is the new Asst. NJN Mgr. The DVRA is participating in AR-RL's "HamQuest 67" campaign. W2CUC is working on the Intruder Watch. W2ZEW is a new traffic man in Bordentown. K2SHE returned from a trip to the Southwest and Mexico. W2YCI received the CP-25 award, and is 2RN representative Wed. night. W2VFX is ANCS on the new SNJ V.H.F. Net. W2BEI added a 30L-1. W2BAY is working the PMRC Net on 29.493 Mc. daily. W2HAZ is a new NJN member. W2GTE is a new traffic station. K2ARY reports progress in Salem Co. Traffic: (Oct.) WB-2CYI 118, WA2KIP 112, W2Z1 95, W2RG 79, W2BZJ 41, W2YPZ 28, K2SHE 26, K2JJC 19, WA2DVU 17, W2BEI 10, W2ZEW 10, WA2KAP 7, W2RSD 7, W2GTE 3, W2-VFX 3, K2BG 2, W2VFW 1, (Sept.) WA2KIP 65, K2SHE 28, W2TEN 12, W2BZJ 6, K2JJC 3.

WESTERN NEW YORK—SCM, Charles T. Hansen, K2HUK—SEC: W2RUF. PAM: W2PVI. RMs: W2EZH and W2FEB. NYS C.W. Net meets on 3670 kc. at 1900. ESS on 3590 kc. at 1800; NYSPTEN on 3925 kc. at 2200 GMT; NYS C.D. on 3510.5 and 3993 kc. (s.s.b.) at 0900 Sun. and 3510 kc. at 1930 Wed.; TCPI 2nd Call Area on 3970 kc. at 0045 and 2345 GMT; NYS County Net on 3510 kc. Sun. at 1400 and 2345 GMT Mon. Congratulations to W2SEI, W2OE and W2RUF on making the BPL. Happy New Year! Let's all resolve to improve our operations and be aware of opportunities to perform public service through amateur radio. W2EUP was elected pres. of the newly-formed Buffalo Amateur Radio Repeater Assn. (BARRA). Other officers include WA2ZZZ, K2-GUG, K2ISO and K2HUK. Cornell ARC, W2CXM, has

become active again. Members include WB2CPV, WB2-CPU, WB2FGA and WA4OQL/2. W2FVI has been appointed OBS in the Hudson Falls area; W2RHO is an OVS. Endorsements: K2DNN as Chemung Co., EC; K2DNN as ORS; W2CXM and W2RQF as OFSs; W2KBK as OO. WB2UHK reports that new hams in the Hornell area are WN2YFG, WB2YWS and his sister WB2ZAQ. W2RUF and K2KQC are starting AREC clubs in the Buffalo area. Traffic-handling in emergency situations will be stressed. The Chemung County AREC Assn. elected WB2-HSK, pres.; WA2HFL, vice-pres.; and WA2ZBD, secy.-treas. K2CC is the new call of the Clarkson College ARC, replacing W2TAB. WB2CAL built a 20-meter beam and put it up 20 feet for a total cash outlay of \$3.57 not including the feedline and it works! WB2NZA got a TA33 beam and ham-m rotor. The NFDXA now has K2LWR, W2-FXA, W2PDB, W2PZL, W2SSC and W2UVE with over 300 countries confirmed. W2RAMB spoke on RTTY at a recent Chenango Valley ARA meeting. The NYS C.W. Net needs outlets in the Rochester-Monroe county area. The RARA has eight members active since 1938-39. They are W2GB, W2CSK, W2BGN, W2ICE, W2PZU, W2TBL, W2RGA and W2RIS. K2RUM won a recent ARATS transmitter hunt. The Utica ARC held an auction. The GRAM is running a contest to find the most active members of the club, both in operating and DX. Many thanks to those of you who participated in the SET. Traffic: (Oct.) W2SEL 623, W2OE 330, W2RUF 267, WB2GAL 170, W2GVH 112, W2FEB 112, K2DNN 58, K2RYH 53, WA2-IHP 29, K2MQN 29, K2OFV 29, K2IMI 27, WA2OYE 26, W2FCG 20, WA2HSB 16, WAQKE 13, WB3OMY 23, W2-DNW 12, K2CC 10, WB2UHK 9, K2BWK 8, WA2GLA 4, WB2NZA 4, K2PBU 4, WA2PZD 4. (Sept.) W2GVH 94.

WESTERN PENNSYLVANIA—SCM, Robert E. Gawryla, W3NEM—SEC: K3KMO. PAM: K3YPI (v.h.f.). RMs: W3KUN, K3SOH, W3MFB, W3UHN. Traffic nets: WPA, 3585 kc. daily at 0000 GMT and KSSN, 3535 kc. Mon. through Fri. at 2330 GMT. Nominating petitions will be accepted until January 31, 1967 for the William G. Walker, W3NUG, Annual Memorial Award. The award is given annually to a deserving amateur radio operator in Western Pennsylvania. Nominations may be submitted by any individual amateur or club. The nominating petition should contain the name of the amateur nominated, call and full address, also a brief outline of the nominee's radio amateur activity or activities which prompted the petition. Mail in triplicate to John F. Woitkiewicz, W3GJY, 1400 Chapin St., Conway, Pa. 15027. The Etna Radio Club reports via the *Oscillator* the following new officers: K3LKP, pres.; K3VYO, vice-pres.; W3-OJM, secy.; W3TZW, treas.; K3GWX, director. Congratulations and good luck, men. Also, W3TZW is the new editor of the *Oscillator*; K3GWX copied the Armed Forces Day RTTY communications perfectly; W3RSB and K3SMB have new HE-410s. W3LCI is now operating a new SB-300 and SB-400 and new Henry 2K on 14 Mc. WA3BGE had his first experience as NCS on WPA and representative to 3RN. K3EXE has returned from a two-week trip to Greenland where he operated as OX5BO. The WPA SCM and SEC had a very enjoyable visit with the Johnstown and Elbensburg Radio Clubs at a joint meeting in Johnstown Nov. 3. Traffic: W3NEM 327, W3-KUN 275, K3PYS 140, W3BLZ 111, W3LOS 82, K3SOH 68, WA3AKH 63, K3RZE 61, K3HKK 50, K3KMO 49, WA3AKB 47, W3LOD 42, W3SMV 30, WA3BGE 22, W3-OEO 17, W4ZAU/3 12, W3YA 9, W2KAT/3 7, W3ELZ 7, W3RUL 7, W3GJY 3, W3KNQ 3.

CENTRAL DIVISION

ILLINOIS—SCM, Edmond A. Metzger, W9PRN—SEC: W9RYU. RM: WA9GUM. PAMs: W9VWJ, WA9-CCP, W9KLB (v.h.f.) and WA9RLA (v.h.f.). Cook County EC: W9HPG. Net reports.

Net	Freq.	Times	Days	Tfc.
ILN	3760 kc.	0000Z	Daily	214
NCPN	3915 kc.	1300Z	Mon.-Sat.	207
NCPN	3915 kc.	1800Z	Mon.-Sat.	306
ILPON	3925 kc.	1700 CST	Mon.-Fri.	436
ILPON	50.29 Mc.	2000 CST	Mon. & Thurs.	14
ILPON	145.5 Mc.	2000 CST	M-W-F	67
Chgo TNT	145.55 Mc.	2100 CST	Sun.-Fri.	178

W9WYB, K9WMP, W9JUV/K9OSO, W9HPG, K9IFE, W9GFF, W9KEZ, W9HSD/K5VHE, W9GEG, K9AUD, K9WEH, W9RWD, W9RSP and W9REC participated in the recent ARRL Frequency Measuring Test. K9AUD is a student at the U. of I. at Champaign. K9FHV's new QTH is Granite City. W9NWK has been elected manager of the Interstate Single Sideband Net. W9ACE and his XYL, W9KMD, have been notified that their son has received a General Class license and is now WB6SJT. WA9NRI, WA9LFR, WA9QMR, W9PYG, WA9HM, W9QKE, WA9AJF and W9OKI were elected officers of the York Radio Club, Inc. The Milwaukee Amateur Radio

Club has announced tentative plans for a Central Division ARRL Convention which will be held July 7 and 8 in Milwaukee, Wisc. K9ZPP is chairman, assisted by W9GPI, W9ROM, W9DHW and W9LVR. This section and all the DXCC gang wish W9RBI a very speedy recovery from his illness. New appointments include W9-NWK as OPS and ORS, K9WDY and W9HSD/K5VHE as OOs, K9CDM is with the Army in Germany. WA9-OYR was named Ham of the Month by The Tri-Town Radio Amateurs Club, Inc. K9KDI is back on the air after his honeymoon. WA9KHR has gone mobile. K9BZY is the proud parent of a male harmonic. A new General heard was W9RSP. W9LDY has a new 10-15-20-meter dipole and is bringing in the hard ones on DX. WA9HSK has a new Valiant. W9UHD installed a Swan 350 and TA-33 Sr. beam in his shack. W9PZD is back after serious abdominal surgery. W9OJL/WB2LZE is doing graduate work at Northwestern University. This section's sympathy is extended to the widow and family of Illinois State Senator George Drach, who recently passed away and was indeed a friend of the amateurs. Traffic: (Oct.) K9KZB 367, W9EJV 346, WA9NFS 239, WA9SEO 200, WA9HUI 193, W9AXR 178, W9NXG 158, W9DOQ 121, W9JXV 91, W9EET 83, W9NRSN 77, W9ELL 66, W9N-SPA 66, W9CGC 58, WA9RIA 55, K9BTE 46, K9HSK 41, WA9PPA 36, W9UHD 31, WA9GUM 30, K9TV 30, W9-IDY 25, WA9QL 23, WA9KCN 21, W9HOT 20, W9PRN 20, K9ADQ 12, W9HJM 11, W9PVD 10, W9LNQ 6, K9SNC 5, WA9FIH 4, WA9HSZ 2, K9IDQ 2, K9RAS 2. (Sept.) WA9CNV 251, W9EET 174, W9JXV 74, W9CGC 69, K9-WMP 4. (Aug.) W9EET 138, W9CGC 80, K9WMP 76.

INDIANA—SCM, Mrs. M. Roberta Kroulik, K9IVG—Asst. SCM: Ernest Nichols, W9YXX. SEC: K9WET.

Net	Freq.	Time	Oct. Tfc.	Mgr.	
IFN	3910	1330Z Daily	2300 M-F	295	K9IVG
ISN	3910	0300Z Daily	2130 M-S	408	K9CRS
QIN	3656	0000Z Daily		169	W9HRY

W9PMT, mgr. of the Hoosier v.h.f. nets, reports Oct. traffic of 158. K9DHC, mgr. of RFN, reports Oct. traffic 60. K9EFY, mgr. of PON nets reports Oct. traffic 198. W9QLW, RM of 9RN, reports Indiana was represented 100% in Oct. QIN Honor Roll: K9VHY 24, W9ZYK 24, K9HYV 22, K9RLW 19, W9HRY 19, WA9FTQ 17, K9-DHC 15, K9VWJ 15. The Tri-State ARC provided communications for the Womens National Air Race. K9KTL is now W7DQS in Wickenburg, Ariz. New officers of the HAWKS: W9RTH, pres.; W9LYU, vice-pres.; WA9BWT, secy.-treas. Indianapolis ARC is sponsoring a class for Extra Class licensees. There is a new male harmonic at W9HRY's home. New officers of the Michigan City ARC: W9TWL, pres.; K9UIA, vice-pres.; WA9HQP, secy.; K9DZE, treas. W9FJ reports the Gibson ARC held several successful drills. Congratulations to WA9QOF, WA9-LFV, WA9AXF, WA9REY and WA9FAA on passing the General Class exam. Welcome to new Novices W9NTHI and W9N2TD. WA9AOT has a new linear. Lake Co. ARC is busy with plans for its annual banquet to be held Feb. 11. *Amateur radio exists because of the service it renders.* W9JUK made the HPL. Traffic: (Oct.) W9JUK 519, K9IVG 485, W9HRY 461, W9ZYK 432, WA9OYI 314, W9QLW 301, WA9ADG/2 261, WA9FDQ 195, W9VAY 157, K9FZX 123, K9RLW 120, K9HYV 118, WA9BGI 95, W9UB 94, W9SNQ 76, W9AII 70, K9VHY 64, K9CRS 62, WA9BWW 57, K9RWQ 48, W9GFS 47, WA9JHI 42, WA9-GKF 39, WA9KAG 39, K9EYF 38, W9CC 34, W9VYX 31, W9DOK 30, W9PMT 30, WA9LUG 24, WA9GJZ 22, K9-BSL 20, W9CFL 19, K9EOH 18, WA9NGN 18, WA9BHG 15, WA9CHY 15, K9ILK 15, W9PU 15, W9RTH 15, WA9-CFV 11, W9DGA 11, K9LZJ/9 11, W9HNSX 10, W9EJV 10, W9PWH 10, K9PLJ 10, WA9KOH 9, WA9RNT 9, K9UFO 9, K9WET 9, WA4RQ/9 8, K9GBR 8, WA9LGQ 8, W9DZC 7, WA9FSZ 7, W9NSIF 7, W9DKR 6, W9LG 6, K9IQY 5, WA9MVF 5, WA9JX 4, W9BPD 3, K9LMI 3, K9YPT 3. (Sept.) K9RLW 55, WA9KAG 29, WA9CFR 26, WA9RBQ/9 20, WA9BNX 11, K9JQY 7. (Aug.) W9VAY 65. (July) W9VAY 34. (June) W9VAY 46.

WISCONSIN—SCM, Kenneth A. Ebnetter, K9GSC—SEC: K9ZFP. RM: WA9MHO. PAMs: K9IMR, K9HJS and W9NRP.

Net	Freq.	Time	Days	Sess.	ONI	OTC	Mgr.	
BEN	3985 kc.	1300Z	Mon.-Sat.	25	264	88	W9NRP	
BEN	3985 kc.	1800Z	Daily				K9HJS	
WSBN	3985 kc.	2315Z	Daily		31	1079	445	K9IMR
WIN	3962 kc.	0115Z	Daily					WA9MHO
SWRN	59.4 Mc.	0200Z	Mon.-Sat.	25	319	1	W9JZD	

Net certificates went to WA9CJ and WA9RYT for SWRN, WA9FKL, WA9HOI and W9JKM. New appointments: K9WXS as EC for Dane County. Renewed appointments: W9RQM as ORS/OPS; K9MTC as OO; K9DBR, W9EWC, W9PFC, WA9FMQ, K9FPJ, K9FWF, K9GSC, W9HWQ, WA9JFM, K9LBQ, WA9PBW, WA9-

QMP, W9RQM and W9YT as OVSs. FMT results: W9-BCY 1, W9GXD 2, W9KCR 18.0 and W9CBE 38.7 p.p.m. error. K9GDF led the OOs with 13 notices sent. Wisconsin will host the Central Division Convention in Milwaukee next July. WA9NBU is at school in Michigan. New club officers: Manorad Radio Club—W9HPC, pres.; K9EOS, vice-pres.; W9BZU, secy.-treas. West Allis ARC—W9-RTF, pres.; W9TPO, vice-pres.; WA9IAT, secy.; K9-BTQ, treas. W9KCR is building a binary counter for use in the FMTs. WA9IHZ is starting a Southern Wisconsin Two-Meter Relay Net daily at 0230Z. 9 12N certificates were earned by W9KQB, W9RTP and WA9NDV. The gang at W9YT assisted several Peruvian students in contacting their families following the Peruvian earthquake. Traffic: WA9NPB 322, W9KQB 288, K9IAR 255, W9DYG 247, WA9DWZ 154, W9DND 142, W9SUP 74, WA9QMP 73, W9JRM 67, W9CBE 57, K9PHI 55, WA9NFG 55, W9ONI 55, W9NRP 51, W9IFS 43, K9GDF 38, W9YT 35, W9HWQ 32, K9UTQ 32, WA9OMO 26, W9AYK 25, WA9PKM 24, W9SWQ/9 24, W9VNY 21, W9HPC 16, WA9KFL 15, W9-OTL 15, W9IRZ 12, WA9LJY 10, W9RQM 10, K9QKU 9, W9HQT 6, WA9NDV 5, K9GSC 3, WA9NBU 2, K9ZMS 2.

DAKOTA DIVISION

MINNESOTA—SCM, Herman R. Kopischke, Jr., W0TCK—SEC; WA0IEF, WA0S, W0LSJ, WA0EPX, PAMs: K0QBI, WA0JKT, R0Hs: WA0DWM, MSN meets daily on 3595 kc. at 0030Z. MJN meets M-S on 3595 kc. at 0100Z. Noon MSPN meets M-S on 3820 kc. at 1805Z and Sun. at 1500Z. Evening MSPN meets M-S on 3820 kc. at 2400Z. MSTN meets M-F on 50.4 Mc. at 0430Z and Sat. at 0200Z. The PO Net meets Sun. on 3812 kc. at 1830Z. Appointments renewed: WA0FUR as EC for Ramsey Co., W0BUO as OPS. It is with deep regret that we report the passing of W0AA, one of the old-time operators in Minneapolis. The QCVW held its Oct. meeting at NW Airlines and toured the dispatch and communications facilities there. OO W0TIV observed six stations operating out of the band in Oct. K0CXJ, Moorhead, is now active on 2-meter s.s.b. with a 6360 PA. WA0QAK is a new General in Austin. WA0MOX/0 now is operating under his new call, W0PVF. A large number of ARPSO groups participated in the Annual SET again this year. With the Belmont, Iowa, emergency fresh in our memories we are reminded of the importance of these regular drills to keep prepared for proper business-like operation that may be needed without warning. This emergency again reminded us why formal type of messages are an absolute necessity in handling third-party traffic. WA0EDN qualified for the BPL award this month. Traffic: (Oct.) W0YC 260, WA0EDN 184, WA0JKT 150, WA0EPX 149, WA0BYO 135, W0SJS 55, W0PET 43, WA0AQT/0 42, WA0AKM 40, K0QBI 35, K0ZRD 28, WA0JPR 26, W0TCK 26, K0FLT 25, K0IGZ 23, K0ICG 22, W0HEN 21, WA0-KQU 21, W0BUO 20, WA0MMV 19, W0UMX 19, W0-ATO 13, W0KYG 11, K0ZKM 9, WA0DPT 7, K0LWK 7, W0MFW 4, W0KLG 3, W0SZJ 3. (Sept.) W0BUO 21, K0QBI 20.

NORTH DAKOTA—SCM, Harold L. Sheets, W0DM —SEC; WA0AYL, OBS: K0SPH, The Bark Club of Bismarck meets at K0EOP's shack. WA0EWW is on now with a Galaxy 3. K0PHC is back at the Veteran's Hospital at Fargo. WA0OVT is on with a Pacemaker. W0PQW has returned from that goose-hunting trek to Canada. He took along a new Swan 350 to use mobile. W0MSJ and WA0AOT have HT-32s on the air. W0VWL is back on the air now. WA0BIT and the gang on 2 meters in Grand Forks were in the SET. W0NPPK is on 15 meters and working plenty of states when he can use the OM's antenna and a borrowed 75-A3. K7CCM/0, a Great Northern Auditor, is on 75 meters now. K0IVQ, who recently went to the West Coast, has undergone major surgery and is recuperating nicely. His dad, W0-TUF, is getting an Elmac station out to him. WA0KSB is putting the finishing touches on a new Eico rig. WA0-MND is back home much improved in health. She and WA0GRX will soon be calling the Weather Net. While in Fargo attending the Teacher's Convention W0DM visited WA0GRX and W0OVB. W0BIB is back in Aneta. WA0LLI/0 is headquartering in St. Thomas for the winter. He has a dipole up for three bands and is running a Galaxy 5. K0TTY reports a new SB-301 and SB-400 on the air. K0OVE is back on with the SB-34. WA0AYL has returned and is available for phone traffic into Grand Forks. WA0ACQ and W0AEW have departed from N.D. and are now "7s." N. Dak RACES reports 16 sessions, 519 check-ins and 116 traffic. The PO Net had 10 sessions, 115 check-ins and 38 traffic. Traffic: K0ITP 124, WA0MSJ 13, W0DM 8.

SOUTH DAKOTA—SCM, Seward P. Holt, K0TXW —SEC; W0SCT. Please mail your AREC applications to Lester Lauritzen, W0SCT, Centerville, So. Dak., if you cannot locate your EC. W0ZWL reports the best QNI for Oct. of any year of operation of the WX Net, a

daily QNI of 20.8. W0RWX has moved to Sturgis. Mitchell ARC has available some very fine So. Dak. directories. Anyone interested write to Box 62, Mitchell, S. Dak. Price 1.50. The So. Dak. C.W. Net reports 65 QNI, 11 QTC, So. Dak. S.S.B. Net reports 1178 QNI, 239 QTC. W0CUC has 500 watts on 6 meters. Traffic: W0ZWL 679, WA0AOY 195, WA0LLG 71, W0SCT 69, K0VYV 64, WA0LYO 56, K0GSY 48, W0DVB 34, K0BMQ 25, W0DJO 25, K0AIE 22, W0ZAL 16, K0YQZ 13, W0HOJ 10, W0RWX 8, WA0FUZ 3, K0JGM 3, K0TNM 3, WA0BMG 2, WA0CKH 2, K0KOY 2.

DELTA DIVISION

ARKANSAS—SCM, Don W. Whitney, K5GKN—SEC; WA5KTX, PAM: WA5GPO, RA1: K5TYW, NMs: WA5HS, WA5HNN, WA5MJO, K5LPS, W5RIT reports that he has installed a new 50-ft. vertical and is having excellent DX results. The North Arkansas Amateur Radio Society of Harrison announces its Second Arkansas QSO Party and invites all amateurs to participate. Thanks to all nets and individual stations who worked in and assisted our SEC, WA5KTX, in the recent SET. The Southeast Arkansas Amateur Radio Club has elected WA5HHG, pres.; WA5LUW, vice-pres.; and W5CAM, secy.-treas. Net reports for Oct.:

Net	Freq.	Time	Day	Sess.	QTC	QNI	Net Time
RN	3815 kc.	0001Z	Daily	31	130	758	340 min.
AFN	3885 kc.	1200Z	Mon.-Sat.	26	41	847	1744 min.
OZK	3790 kc.	0100Z	Daily	27	64	154	604 min.
APON	3825 kc.	2130Z	Mon.-Fri.	21	165	369	630 min.

Traffic: W5MJO 205, W5NND 157, WA5KEF 91, K5TYW 60, W5CAF 56, W5YM 44, K5EDH 32, WA5LKB 7, WA5-KUD 1.

SECOND ARKANSAS QSO PARTY

January 7-9, 1967

The North Arkansas Amateur Radio Society of Harrison announces its second Arkansas QSO Party and invites all amateurs to participate.

Rules: 1) The time will be the 30-hour period from 2200 GMT January 7 to 0400 GMT January 9, 1967. 2) No time limit or power restrictions. 3) Arkansas stations score 1 point per contact and multiply by the number of states, Canadian provinces and foreign countries worked during the contest period. Outside stations score 5 points for each Arkansas station worked and multiply the total by the number of counties in Arkansas worked during the period. 4) Stations may be worked once on each band and each mode. 5) A certificate will be awarded to the highest-scoring station in each state, Canadian Province and foreign country (with 100 or more points). 6) General call: "CQ ARK". Arkansas c.w. stations should identify themselves by signing de (call) ARK K. Phone say "Arkansas calling." 7) Suggested frequencies are a.m. 3825 7225 14,225 21,220 28,560; c.w. 3525 7025 14,025 21,025 28,025; s.s.b. 3975 7275 14,325 21,425 28,650; Novice 3735 7175 21,110. 8) Arkansas stations send QSO number, RS(T) and county, all others send QO number, RS(T) and county, province or country. 9) Logs and scores must be postmarked no later than January 30 and sent to the North Arkansas Amateur Radio Society, c/o Don Anderson WA5GVG, 508 North Robinson, Harrison, Arkansas, 72601.

LOUISIANA—SCM, J. Allen Swanson, Jr., W5PM—RA1: W5CRZ V.H.F. PAMs: W5UQR, WA5DXA.

Net	Freq.	Time	Days	QNI	QTC	Mgr.
Delta 75	3900	1230Z	Sun.	29	18	WA5EVU
LAN	3615	0030Z	Daily			WA5PNB
PON	3870	1300Z	Sun.			W5KC

W5BVK is back chasing those elusive DXpeditions when time from his OO chores allow. W5CQS is a new OVS. K5VJZ is OVS and ORS. W5PQT is busy handling traffic on LAN. WA5IGX is interested in forming a La. college net. WA5LQZ had the Scouts from Troop 86 over for a scout jamboree on the air. WA5QVN is a newcomer from Georgia. For the fourth consecutive year W5AJY was the high phone station in the La. section in the 1966 DX Contest. WA5RI operated recently from the top of the new International Trade Mark Building in New Orleans on 6 meters. W5UK/5, GNARC station, participated in the SET. W5JFB operated 6 meters aero-mobile aboard

a DC-3, W5EA spent a nice vacation of four weeks long-
ing. W5BSR has moved back to LC for the winter. W5-
CEW still haunts the middle portion of 75. W5PM is chas-
ing DX again with a 319 c.f.m.d. W5NQR writes a very
nice DX column for LARK. W5EDK is interested in
selling or trading a rack panel. W5MHM operated port-
able in Texas during his recent vacation. W5AXU and
his XYL are off again to the Carolinas in their airstream
trailer. The Cen. La. ARC puts out a fine paper called
Spark. The GNOARC is changing its net frequency to
29.750 Mc. Your Director is ably pushing around the sec-
tion for great efforts to be made this coming year in
operation HamQuest 67. Write to W5LDH or myself if
you need any assistance. The OARC of Slidell had a laser
demonstration put on by W5OJY. In a recent copy of
QRM W5PBQ presented an article on how to easily and
cheaply construct a 80-10 inverted trap antenna. Traffic:
W5KRX 317, W5PGT 242, K5OKR 163, W5FNB 126,
W5BJG 101, W5MXQ 97, W5A1QZ 96, K5VJZ 69, W5AJY
26, W5PM 17, W5UXK 5 13, W5DXA 10, W5QVN 9,
W5KC 8, W5HGX 7.

db. on the 20th during the aurora sessions; Oct. as 4.2 db.
on the 18th and 5.0 db. on the 20th. K4EJQ wishes Caro-
lina Novices would listen for his calls on 145 mc. K4PZT
reports on superior noise figures of 7308 over 6BQT or
6922. He and K4EJQ fear Educational TV channel 2 com-
ing on the air the first of the year. East Tenn. TVI
committees note, TSSB is looking for net controls and
TN for RN5 reps. W4PQP again made the BPL on organi-
zations. Traffic: (Oct.) W4OQG 201, W4FX 244, W4PQP
188, W4SQE 180, W4AYDT 152, W4AYEM 145, K4UWH
59, W4WBK 72, W4DIF 67, W4UVP 49, K4UMW 44, W4-
PFP 35, K4COT 29, W4ANEC 28, W4KAT 27, W4ANUJ
24, W4RUC 22, W4TCZ 22, W4BCDE 20, W4FLW 16,
W4AEWV 12, W4ATGK 11, W4TZW 11, W4FEP 8, W4A-
ZBC 6, W4AQOL 4, W4VTS 4, K4MQI 2, W4AWYP 2.
(Sept.) K4MQI 11.

GREAT LAKES DIVISION

KENTUCKY—SCM, Lawren F. Jeffrey, W4AKFO
SEC: W4OYL. Appointments: W4JSH and W4YQE as
ECs. Endorsements: W4ADH as OVS/OPS/OBS; W4A-
AGH as OBS/OPS; K4DZM as OVS; W4GSH as OVS;
K4QIO, W4YYI and K4YZU as OPSs.

Net	Freq.	Days	EST	Sess.	QNI	QTC	Mgr.
EMKPN	3960	M-F	0630	21	415	81	K4KIS
MKPN	3960	Daily	0830	31	434	90	W4AKFO
KTN	3960	Daily	1900	31	798	292	W4IAGH
KYN/KSN	3600	Daily	1900/1700	51	360	500	W4BAZ
KPON	3945	Sat.	1300	5	144	60	W4AVV

WICER, from ARRL, represented Headquarters at the
Louisville Ham Convention and gave a fine talk on solid
state devices. W4BCV is to be commended for his FB job
as chairman of the whole affair. K4PNA is Wilderness
Road ARC pres. and plans have been started by the club
to get a 2-meter net going. K4DZM and K4QCQ repre-
sented Kentucky at the Great Lakes Convention. W4ISF
has a new tower and beams and is going s.s.b. mobile
soon. W4KKG handled Lima earthquake traffic. K4FPW
has a new v.h.f. antenna system and is building RTTY
equipment. W4RHZ took the code speed honors at the
Convention and W4AIN and W4AWWT got 31-w.p.m.
certificates in the contest. W4WNVH has moved to a new
QTH. Traffic: (Oct.) W4AWWT 455, W4AAGH 376, W4A-
VUE 298, W4BAZ 286, W44DYL 267, W4AKFO 169, K4-
DZM 144, W4AHJA 130, W4YQO 105, W4RCE 88, K4-
MIAN 80, W4AGMA 65, K4NHY 65, W4AIN 53, W4OYL
50, W4NBZ 48, K4KJP 47, K4HOE 44, W4AGHQ 42, W4A-
SON 28, W4CDA 26, W44IBZ 23, W44UAZ 22, W4KKQ
17, W4AZIR 17, K4VDO 15, K4UMN 12, W4BTA 11, K4-
FPW 11, W4ISF 6, W4ABZS 5, (Sept.) K4UMN 5.

MICHIGAN—SCM, Ralph P. Thetson, W8FX—
Asst. SCM: K. E. Stecker, W8SS. SEC: K8GOU. RMs:
W8ELW, K8QLL, W8EU, K8KMQ, P.A.M.s: W8CQU, K8-
LQA, K8JED. V.H.F. P.A.M.s: W8CVO, W8YAN. Ap-
pointments: W8CUTL, W8PLW, W8AGBN, K8MLK, W8-
UCG as ECs; W8FWQ, K8JJC, W8AOR, W8PBO as
ORSS; W8ACZJ, K8EYF, W8LRC, W8OQH as OPSs;
W8LSW, K8JJC, W8OTD, W8OQH, W8TMO as ORSS;
W8DHP as OVS, W8MTI as OO. Silent Keys: Ex-
8AB/W8AC, W8DBX, W8OSI. New officers of the Motor
City RC are K8ZJU, pres.; W8OPJ, vice-pres.; W8-
TML, secy.; W8SKC, treas. Net reports: 11.P. Evening
Net, daily, 3920, sessions 31, QNI 723, traffic 106; Mich.
PON C.W. Net, Mon. through Sat., 3645, 000Z, sessions
26, QNI 165, traffic 53; Mich. 6-Meter Traffic Net, daily,
sessions 26, QNI 250, traffic 50; Mich. PON V.H.F. Net,
Mon. through Sat., 50.7, 0000Z; W8SB Net, daily, 3935,
0000Z; Mich. (QNI) Traffic Net, daily, 3663, 2300Z, ses-
sions 31, QNI 944, traffic: Monroe County AREC Net,
Mon., 50.4, 0300Z, sessions 5, QNI 75, traffic 5; Mich.
AREC Net, Thurs., 3935, 0130Z; Mich. PON Fone Net,
Tue., 3860, 2300Z; Mich. Daytime PON Fone Net, Mon.
to Sat., 3860, 1600Z; Mich. PON V.H.F. Net, Mon., 0100Z,
50.4, PON secy, W8LMR; Genesee County Emerg. Hos-
pital Net, Wed., 2 and 10, 0100Z; 29ers. Sun., 29610, 1500Z.
All net data should contain name, days, frequency, time
(GMT), sessions, QNI and traffic per month. If con-
nected with NTS and/or AREC, send it in. The N.E.
Mich. V.H.F. Hamfest at E. Tawas was attended by 120
hams. K8PPO got a new car, but the 'TR-3 won't fit.
K8LPH graduated from MSU. W8MGG moved to Ohio.
W8ZCF went to Colorado for the USAF, after buying
K8OHP's Clegg Zeas. The Schoolcraft College Club is
"go" with new gear. The Mich. 6-Meter Club ran "Op-
eration Veteran's Hospital" again, on 50.250, with the call
W8ARD. The Eye Bank Net, daily, 3970 at 8 A.M. and
8 P.M. has transferred nearly 1500 eyes in the last two
years and 10 months. Here is a net that really gives us
hams some status. Traffic: K8KMG 406, W8RPT 364,
W8OQG 228, K8LTH 252, W8STQ 275, W8RFT 246,
W8AMAM 204, W8CQB 201, K8PBA 128, W8OQH 121,
W8HQL 116, W8EUI 115, W8AVL 113, W8ARPT 106, W8B-
ELW 105, W8AQF 86, W8ACW 82, K8ZJU 77, W8A8OQ

LOUISIANA QSO PARTY

January 28-29, 1967

The Second Annual Louisiana QSO Party spon-
sored by the Lafayette Amateur Radio Club will
start at 1800 GMT Saturday January 28 and end
at 2200 GMT Sunday, January 29, 1967. All
bands may be used, c.w. and phone (phone
classified as both a.m. and s.s.b.). The same
station can be worked and counted for QSO
points on each band and each mode. Louisiana
stations score 1 point for each contact (including
contacts with other Louisiana stations). All
others score 1 point for each contact with a
Louisiana station. Louisiana stations multiply
total QSO points by number of different states,
Canadian Provinces and countries worked. All
others multiply total QSO points by the total
number of different Louisiana parishes worked.
Louisiana stations give QSO number, RS(T) and
parish. Others give QSO number, RS(T) and
state, province or country. Suggested frequencies
are: 3600 3910 7105 7230 14,100 14,300 21,100
21,405 28,105 and 28,700. In Louisiana, certifi-
cates will be issued to the 1st, 2nd and 3rd place
scorers. Other stations outside Louisiana will
be issued certificates for highest scoring stations
in each state, Canadian call area and each coun-
try. (Note that a minimum score of 50 points is
needed to win). Logs must show dates, times,
stations worked, exchanges sent, exchanges re-
ceived, bands, modes and scores claimed. Logs
must be postmarked no later than February 28,
1967 and sent to the Lafayette Amateur Radio
Club, 612 Harding Street, Lafayette, Louisiana
70501.

MISSISSIPPI—SCM, S. H. Hairston, W5EMM—
SEC: W5JDP, W5HTV has a beautiful signal with the
complete SB line. W5BW really has his family net going
strong. K5WUX is making Lubertown famous. W5WZ
makes that 813 produce a fine signal to pass lots of traf-
fic. W5JDO is very happy about his success so far on
2 meters. W5CAAI built an SB-100 and got his 50th
state for WAS. K2DEM/5 did a remarkable job in the
FMT with a 75-A4, BC-221, etc. W5JDF is now running
two rigs, 80 through 10 meters, a.m. and c.w. We need
more qualified OOs to help keep our frequencies clean.
Thanks for your vote of confidence in me as SCM. Will
try to make the next two years the best yet. Check into
our nets: Gulf Coast Sideband, 3888 kc, daily 1815 CST; "Miss"
Mississippi Sideband, 3888 kc, daily 1815 CST; "Miss"
C.W., 3647 daily 1854 CST. Traffic: W5JDF 276, W5WZ
147, W5BW 65, W5OKI 37, W5HTV 21, W5JWD 15,
K5WUX 6.

TENNESSEE—SCM, William A. Scott, W4UVP—

Net	Freq.	Days	Time	Sess.	QNI	QTC
TPN	3980 kc.	M-Sat.	1245Z	31	1159	259
	3980 kc.	Sun.	1409Z			
TSSB	3880 kc.	Tue.-Sun.	0020Z	24	1165	136
FTPN	3980 kc.	M-F	1140Z	21	397	37
TN	3635 kc.	Daily	0100Z 0220Z			

Sorry to learn of the passing of W4BS of Memphis. The
Southern Missionary College Club is looking for 6-meter
gear to join the local nets. W4ZBQ, W4AYEM and W4-
WBK scored high in the Sept. P.M.T. K4VAJ, formerly in
Memphis, now is active in Martin. W4HHK reports Sept.
sun noise from 3.0 db. with 5.3 db. on the 16th and 5.6

74, W8FX 73, WA8JDF 69, WA8LXY 60, W8BZF 51, K8-QLL 51, W8YAN 51, W8UFH 46, WA8NICQ 43, WA8LRC 42, W8RTN 40, WA8GTM 39, WA8CZJ 33, K8VDA 33, K8GOU 29, WA8ORC 24, WA8SLP 22, K8TTYK 21, W8-PB0 20, W8FWQ 18, WA8PWF 18, W8SVC 16, K8JED 14, W8SIB 13, W8AUD 6, W8DSE 6, WA8OLD 3.

OHIO—SCM, Wilson E. Weckel, W8AL—Asst. SCM: J. C. Erickson, W8DAE, SEC: W8HNP. RMs: W8BZX, W8DAE and K8LGB. PAMs: W8VZ and K8UBK. W8-EFW is improving every day and W8KC put up a tri-band beam for him. W8LT says the club held an auction in Ohio State football stadium. W8BZX says that Miami County RC held an auction. K8ONQ has added teaching duties at U. of Cincinnati to his work. K8BXT says W8HLX has a new Swan 350 and is operating mobile. WA8ABE and WA8KIG built a new house. K8SFC is a Silent Key. K8RMO moved to Warren. WA8OUE and W8ZVS are new amateurs in Warren. K8DHJ is back on 10-meter mobile. Please correct the time of the Ohio Slow Net to 6:25 EST (2325Z). K8UBK drove your SCM to the Great Lakes Division Convention at Muskegon, Mich. About 3200 attended, including W8FX, Michigan SCM, and WINJM, ARRL National Emergency Coordinator. Toledo's *Ham Shack Gossip* tells us that WA8YK, WA8RZR, WA8SAE, WA8SFF, WA8SYF, WA8TDK, WA8UUL, WA8UUR, and WA8VQ received their General Class licenses. WA8UVC is a new Tech., WN8UTH, WA8-UTQ, WN8UYA, WN8UZI and WN8UZAI are new Novices. K8IQL was in the hospital. WA8CHK moved to Texas. K8LVR received his private pilot's license and K8KOM visited his son in Va. Miamiaburg Wireless Association's *The Spectrum* informs us 1967 club officers are W8FLR, pres.; Pete Drake, vice-pres.; WA8PA, secy.-treas.; WA8PLZ and W8GGE trustees. The club started its code and theory classes and W8PGF moved to Ill. From W8BAH's column, *Ham Radio*, in the Cleveland *Plain Dealer* we learn that amateur radio played a part in the Boy Scout on the Air Ambrose and WA8TKW received his General Class license. WA8SNX has a Lafayette HA-350 receiver. Greater Cincinnati ARA's *The Mike & Key* says that WINJM spoke on Amateur Radio Emergency Communications. Steubenville Area ARC's 1967 officers are K8APH, pres.; W8CVY, vice-pres.; W8DYF, secy.; K8LQM, treas.; K8VBH, Radio Officer. Parma RC's *P.R.C. Bulletin* tells us the club saw two color films, "Hawaii Calls" and "Busch Gardens." Fire destroyed W8WEG's barn and corn crib. A bulletin was received from the South Shore RC called *Mike Talk* which informs us the club meets at East Cleveland YMCA at 8:30 p.m. the 2nd and 4th Thurs. of the month. WB2-TNC/8 received his General Class license and WN8s TLB, TLC, TNU, TPV, UNA, UNC, UND, UTZ, UUC, UUD and UUF received their Novice licenses. Ohio traffic nets did a bang-up job in the Oct. SET. W8YRP, W8UPH, WA8PMN, WA8CXY and K8LGA made the BPL in Oct. From Springfield ARC's *Q-Match* we are told the club's 1967 officers are W8HQX, pres.; WA8NNV, vice-pres.; WA8HYK, secy.; WA8QNI, treas. Inter-City RC's *IRC News Bulletin* informs us that K8UGA is the proud father of a new baby boy. W8OQ has been on s.s.b. and is back on c.w. and WA8MHO vacationed in Florida mobiling with his new Eico transceiver. Lancaster & Fairfield County ARC's *The Rag Chover* says that WA8RTH and WA8CUP were hospitalized and the club has started classes in code and theory. The Six Meter Nomads mobiles helped the police of Broadview Heights in the Goblin Patrol and during a parade with K8AJG, W8CWL, K8-JSE, K8PXR, K8VGF, K8VII, K8SRA, WA8GEO, WA8-GFV, WA8NIL and WA8PWF taking part.

Net	QNI	OTC	Sess.	Ave.
OSSBN	1755	1255	57	22.4%
BN		540	45	12.
OLN		172	29	6.

Traffic: (Oct.) W8RYP 906, W8UPH 566, WA8PMN 533, WA8CXY 380, WA8FGX 363, K8LGA 363, WA8CFJ 334, W8CHT 334, W8NAL 278, WA8OCG 273, W8BZX 225, WA8PZA 189, WA8GYT 176, WA8LAM 173, WA8NL 165, W8DAE 156, WA8LAG 154, WA8AUZ 131, W8GOE 123, WA8HTR 110, W8FQG 96, WA8PQL 96, K8UBK 93, W8OE 85, WA8JXM 80, W8OZK 80, K8LGB 78, W8TV 65, W8PMJ 62, W8OUU 53, K8HKB 52, K8DDG 40, K8EZJ 37, WA8MHO 23, WA8AJZ 27, K8TVX 26, WA8PKD 23, W8LT 21, WA8SHP 21, W8ETO 20, WA8LOW 20, W8DQD 19, K8DHJ 16, K8LFI 14, W8WEG 14, WA8RWK 8, W8-LAG 7, WA8AJD 6, K8BXT 5, WA8OVC 4, WA8KPN 3, W8LZE 3, W8EPW 2, W8GXQ 2. (Sept.) WA8RWK 23, WA8AJZ 20, W8LT 9.

HUDSON DIVISION

EASTERN NEW YORK—SCM, George W. Tracey, W2EFU—SEC: W2KGC. RM: WA2VY. PAM: W2IJJ. Section nets: NYS on 3670 kc, nightly at 2400 GMT; NYSPTEN on 3925 kc, nightly at 2300 GMT; ESS on 3590 kc, nightly at 2300 GMT. Congrats to our three BPL

winners for Oct. traffic: W2SZ, K2SJM and WB2HZY. Among those receiving General Class licenses are WB2-VUK, WB2VVS, WB2VVT and WB2WUS. Also our congrats. New officers of the Union College Club, W2UC, include K1OQQ, pres.; WA2RTO, vice-pres.; WB2CNC, secy.; WA3FTB, treas. Appointments: W2UC as ORS and OPS; WB2KOY as OBS. Endorsement: WA2HYA as ORS. The RPI Club, W2SZ, reports 65 members on campus including 48 with licenses. A new DX-60 is on the air at the Yorktown H.S. ARC and new officers are WB2OZN, pres.; and WB2UHZ, secy.; who also is Asst. EC for the Bronx-Westchester AREC Net on 6 meters. WA2ZPD is a charter member of the "Termite Net," which meets each Sat. on 145.60 Mc. at 9 p.m. Among those participating in the Sept. FAIT were K2UTC, WA2-RXK and WB2NBY. October was Auction Nite at the Albany Club, which reports a new General, WB2VIAI. Congrats. New officers of the RPI Club include WA2PJI, pres.; WAODEV, secy.; WA2KIZ, treas. Slides of past V.H.F. Parties were shown at the Communications Club of New Rochelle. Sorry to report W2KCN as a Silent Key. K2BPP, of Squire Sanders, was the speaker at the Schenectady Club. Observer K2UTC sent out 45 infraction notices in Oct. Traffic: WB2HZY 524, K2SSX/2 186, WB2UHZ 183, W2SZ 173, WA2VYS 110, W2UC 84, W2ANV 43, WB2VJB 41, WB2JYV 26, WB2FOA 24, WB2DXL 20, WA2WGS 14, K2HNV 12, WA2ZPD 11, WA2JWL 2.

NEW YORK CITY AND LONG ISLAND—SCM Blaine S. Johnson, K2IDB—Asst. SCM: Fred J. Brunjes, K2DGI. SEC: K2OVN. Section nets:

NLI	3630 kc.	1915 Nightly	K2UFT	—RM
VHF Net	145.8 Mc.	2000 TWTh	W2EW	—PAM
VHF Net	146.25 Mc.	1900 P8SAm	W2EW	—PAM
NYCLIPN	3932 kc.	1600 Daily	WB2DXM	—PAM
NLS (Slo)	3630 kc.	1900 Nightly	WB2SLI	—RM

NYCLI AREC nets: See Dec. 1965 column for skeds.

BPL certificates were awarded to WA2GPT, WB2RBA, W2EW and WB2PYI. WA2GPT, has been playing with the DXers and County Hunters since putting up the new T43 beam. K2UBG reports that the folks of the Mike Far Net did themselves up proud in assisting the interception of a man in need of rabies preventive treatment last Oct. 29. WB2PYI has turned the chair of the 2nd District VLRL over to WB2JCE, who is now looking for all of your YLRL-type news! WB2OJX reports the Op-positions sponsored a v.h.f. contest. WB2MBU has gone RTTY on 2. Word leaked out that WA2UWA, WB2DXM, WB2EAIJ, WB2FAJ, WB2RBA, WB2SLH and WB2UQP joined WB2SRN in his faithful old open tonneau touring special for a week end of fun and frolic at the HARC Convention. Although each was obviously enamored by WB2UHZ at the banquet, reliable sources confirmed the attributes of WB2PIV were not unnoticed. Net reports reflect all had a good time. WB4PN operates out of the Brooklyn Naval Air Station occasionally. WB2UGP replaced the BC-348 with an HQ-110C and picked up a CP-25 sticker besides. WB2NGZ reports his two jobs are slowing down his traffic work a bit. W2DBQ built a SB-610 monitor-scope and scared himself looking at some of the signals on our bands (will work up to 11 meters slowly). WB2DVK is on 432-Mc. TV with a vidicon camera, a modified u.h.f. TV tuner and a homebrew 100-watt TV transmitter. Odd that you should ask, but WA2PQU and WA2RAR are putting their TV station together right now. WB2PFY operated mobile in the SET with WA2-JPH. Every Mon. at 2000 it's Queens AREC-s.s.b. on 29.4 Mc. and AREC-am. on 29.5 Mc. All interested amateurs in Queens are urged to drop a card to W2IAG, EC 10 meters. WB2UNJ put up a new eleven-element beam and you should hear his signal in the V.H.F. Traffic Net now, boy! W2PF reports that he and some of the Brooklyn old-timers are trying to reactivate the venerable Radio Club of Brooklyn, Cardinal Hayes HSRC, WA2THR, says that three of its members have just passed the Novice exams. It is rumored that the 80-meter rig over at W2BCB has expired and so a modernization program is about to begin. New officers of QRP I are WA2JKX, pres.; WA2HYV, vice-pres.; WB2NTY, secy.; WB2TYM, treas. W2LKG went to his first QCWA Dinner and had a good time with his buddies. The ARC of Canarsie meets at the Issac Bidersee JES in Brooklyn at 2030 the 1st and 3rd Fri. TARCOM members are using their spare time to repair talking books for the Lighthouse of the Blind. How's that for some good old amateur spirit? Traffic: (Oct.) WA2GPT 543, WA2UWA 426, WB2RBA 291, W2EW 273, K2UBG 269, WB2DXM 286, WB2OKJ 223, WA2RUF 168, WB2PTS 131, W2GKZ 121, WB2PYI 108, KUAT 70, WB2TCS 66, WB2RQF 60, WB2UQP 57, WB2HLX 55, WB2OJX 49, K2UFT 47, WB2DZZ 42, W2TKS 35, K2IDB 33, WB2AIBU 32, WB2EMJ 25, WB4APN/2 23, WB2AEK 20, W2EC 19, WB2UGP 19, WB2NGZ 13, WA2RAR 16, W2DBQ 13, WB2DVK 13, WB2PFY 13, WB2UUV 10, W2IAG 9, WB2UNJ 9, W2GP 6, W2PF 6, WA2THR 4, WB2AVX 2, K2DGI 2, WB2-TOM 1. (Sept.) WA2GPT 198, WA2QJN 12.

NORTHERN NEW JERSEY—Acting SCM, Louis J. Amoroso, W2LQP—Asst. SCM; Edward F. Erickson, W2CVW. SEC: K2ZFL. ARPSC section net schedules:

NJN	3695 kc.	Daily	7:00 P.M.	W2BVE	RM
NJ Phone	3900 kc.	Ex. Sun.	6:00 P.M.	W2PEV	PAM
NJ Phone	3900 kc.	Sun.	9:00 A.M.	W2ZI	PAM
NJ 6	51,150 kc.	M-W-Sat.	11:00 P.M.	K2VNL	PAM
NJ 2	146,700 kc.	Tue.-Sat.	10:00 P.M.	K2PTZ	Mgr.

All times shown are local in effect. AREC net skeds are available from K2ZFL. New appointments: WA2ASM as EC for Plainfield and vicinity; W2BVE as RM for NJ. On behalf of everyone in the NNJ section I would like to say "thank you" to W2CVW, our Retiring SCM for an outstanding job during the past 3½ years. Ed, as you know, gave his all. He has promised to stay around for a time as Asst. SCM. We also would like to thank WB2AEJ for his work as RM of NNJ during the past year. The heavy load of school work forced him to resign. K2RDX is looking for other 432-Mc. stations in Ocean County. WB2FYB, WB2JYM and WB2SPD are all running 1-watt rigs on 7 Mc. WN2YXV has worked 15 states after a month and a half of operating. WB2LAM is home following surgery. W2MTP is a new member of the 2-Meter Gouyague Net. K2IEF is building Ted Crosby's HBR-13 receiver. WB2WNH and his XYL, WN2YOZ, took in the recent Hudson Division Convention with their harmonies. We wish to congratulate the following groups in NNJ for winning their Field Day class. Morris RC, Seven-Eleven RC, Tri-County RC and the Englewood Amateur RA. The Nutley Amateur Radio Club's officers are W2TJD, pres.; W2R2US, vice-pres.; W2BVPB, secy.; and W2JYF, treas. K2KFP moved to a new QTH and plans a quad atop the new 55-ft. tower. W2PBZ still is chasing s.s.b. DX. Hudson Division Director W2TUK, Vice-Dir. K2SJO and SCM W2LQP spoke at the Nutley Amateur Radio Club on HamQuest 67. The group is available to all clubs in the area. The Fairlawn ARC conducts code classes for beginners before all meetings. If any other clubs have this worthwhile project going please let the SCM know. It will appear in this column. Your SCM, his staff and all who help out wish to say Happy New Year to all and may "67" be your best. Traffic: (Oct.) W2BQKH 632, W2B5KD 276, WA2TEK 159, WB2VWH 117, K2KDG 96, K2ZFI 84, W2RWZ 54, W2CVW 51, WB2-VUI 45, W2PEV 43, W2QNL 40, WB2UCS 40, W2LQP 38, WB2IYO 20, W2IGL 18, W2DRV 13, K2MPX 12, WB2-QG 11, K2JTU 10, W2TFM 10, WA2TAF 9, K2EQP 7, WA2TBS 7, W2BVE 6, K2DEL 6, W2BGFY 6, WB2RSS 5, WN2YFQ 5, WA2CCF 4, WB2KTO 4, K2SLG 4, WB2-VHG 4, WB2UFV 3, W2ABL 2, W2NYON 2, W2CFB 1, WB2ICH 1. (Sept.) W2QNL 23.

MIDWEST DIVISION

IOWA—SCM, Owen G. Hill, W0BDZ—Asst. SCM; Bertha V. Willis, W0LGG. SEC: K0BRE. In late October a severe tornado struck the town of Belmond and the Iowa amateurs set up operations almost immediately and maintained communications for several days. During this time the 75-Meter Net was in special sessions with QNI 300. QTC 500. W0OCS and WA0INC reported SET activity. W0JAQ sends Official Bulletins Mon.-Wed.-Fri. at 1900 GMT on 3850 kc. W0USL reports that he is moving to Indiana. We are losing a fine OO and traffic man. The Iowa 160-meter emergency net reports QNI 640, QTC 8 in 31 sessions. The Iowa 75-Meter Phone Net reports QNI 1250, QTC 275 in 25 sessions. Traffic: W0LGG 1512, W0LCX 1063, WA0JFG 227, WA0MIH 138, K0ASR 79, K0BRE 68, W0YFS 29, K0EXN 84, WA0IYH 23, W0USL 20, WA0NEH 24, WA0JUT 23, W0LJW 22, K0KQD 21, WA0DYV 18, WA0INC 16, WA0AFY 14, K0KAQ 13, WA0AJA 10, K0TDO 10, W0NGS 9, WA0-MIT 3, WA0MIW 2, K0DYS 1.

KANSAS—SCM, Robert M. Summers, K0BXF—SEC: K0EMB. RM: WA0JL. PAM: K0JHF. V.H.F. PAMs: W0HAJ, WA0KSK, W0HRB is now a Silent Key. K0MZZ reports the repeater in Salina about to be put into operation. WA0CCW still holds his many skeds on 2 meters. WA0MLE is now using a new HA-1 keyer. WA0JFV reports QKN still could use some new QNI. 3735 kc., 1600 CST Sun. K0JMF reports Sun. KPN QNI 137, QTC 51 and week-day KPN, QNI 155, QTC 32; K8BN, 26 sessions, QNI 536, QTC 266. WA0HMZ sends Official Bulletins on 145.350 Mc, Tue, at 9:30 P.M. CST, Sat, at 8:30 P.M. CST, Sun, at 7:30 P.M. CST. HBN reports QNI 485, QTC 250 and Operator of the Month on HBN, W5MJO and W0EEE tied. W0FII completed the Automatic CQ sender, per Oct. '63 QST. K0EMB transmits OBS on 3920 kc. Tue, and Wed, at 1755 CST on 145.350 Mc, Sat, at 2055 CST. WA0LLC is the new net mgr. of the Kansas Weather Net. Kansas WX Net reports QNI 637 for Oct, with QTC 16; Zone 10 QNI 44 in 4 sessions of the AREC Net; Zone 11 averages 79 QNI a month on 3900 kc. Sun, at 1230 CST, and 42 QNI a month on the 2-Meter AREC Net; Zone 13 QNI 56; Zone

15 QNI 61, QTC 20 on the 3910-kc. Net 0930 CST Sun. The C.W. Net Zone 15 and 6-Meter Net are very active, with QTC 44 on the 6-Meter Net. QKS reports traffic 128 29 sessions, 192 QNI, W0BYV is back on the air. The Kansas Pi Net had QNI 115, QTC 71 in 10 sessions. Kansas AREC had 578 members as of Oct. 31. Traffic: WA0-MLE 581, K0GZP 207, K0EMB 140, K0JMF 135, WA0-JII 128, K0UVH 123, WA0LCA 109, K0MZZ 93, K0MIRI 85, WA0GKZ 81, W0INH 76, WA0CCW 69, K0GII 61, W0AVX 54, W0QQQ 52, K0KED 48, K0LPE 39, K0-BXF 34, W0FII 2.

MISSOURI—SCM, Alfred E. Schwaneke, W0TPK—SEC: W0BUL. K0WJB was appointed EC for Dunklin, Butler and Pemont Counties upon the resignation of W0YHT. WA0KNW moved to Brunswick and is Chertown County EC. Other appointments: W0EEE as OPS/ORS/OBS; WA0JRP, WA0ITU, W0HHG and K0G0B as OVSS. Appointments renewed: WA0FLL as OBS; W0KJK as ORS; WA0PKD as RM; K0JWN as OVS; K0RPH as ORS/OPS. New officers of the MSM RC (W0EEE) are WA0UW, pres.; K0DJG vice-pres.; W0BCG, treas.; WA2LLG/O, secy.; K0JXI/O, sta. mgr.; WA0AHM, act. mgr.; K0VXU, tic. mgr. K0-ONK visited with K0JTW and spent a week end on the U. of Nebr. campus. The K.C. RACES handled communications for the American Royal parade, and 8 mobiles with Reserve Police patrolled K.C. on Halloween. W0AIB organized these two service activities and K0-ORB acted as NCS for both. K0JPL worked Z8 on 40 s.s.b. K0AXU was located in the Red Cross Building during the NET. K0RPH is active again with an NCX-3, 80-40-20 dipole and 50-ft. tower. WN0PCG, WA0FLL, WA0ENI, K0YTP and K0GSV participated in the Sept. FMT. OO reports were received from K0JJP, W0QWS and K0GSV. OVS reports were received from W0JTD, WA0ITU, WA0JRP and K0JWN. Net reports for Oct.:

Net	Freq.	Time	Days	Sess.	QNI	QTC	Mgr.
MEN	3885	2345Z	M-W-F	15	205	55	W0BUL
MON	3580	0100Z	Daily	31	234	232	W0WYJ
MNN	7063	1900Z	M-Sat.	25	71	23	W0UUD
MOSSB	3063	2400Z	M-Sat.	26	543	350	K0CTB
MaPON	3810	2100Z	M-F	21	334	375	W0WYJ
MTTN	3940	2500Z	M-F	20	207	100	WA0BLM
QMO	3580	2200Z	Sun	5	17	17	WA0PKD
MSN	3715	0500Z	Daily	31	60	26	K0ONK
PBD	50.4	0130Z	Tue. (GMT)	5	73	2	WA0FLL

Traffic: K0ONK 2130, W0EEE 569, K0AEM 380, W0-HVJ 333, W0ZLN 247, K0YGR 211, WA0KBZ 166, W0-ODU 147, K0RPH 129, WA0FMD 110, W0TER 104, K0AXU 66, WA0JIE 60, K0JPL 56, WA0ELM 53, WA0PYJ 45, K0CTB 43, W0BAZ 38, K0VXU 38, W0-BUL 35, WA0LYE 34, K0ENH 23, W0RTO 28, K0JPS 21, W0GBJ 18, WA0KYB 17, W0GQR 14, WA0FLL 13, K0ORB 13, WA0IHV 9, WA0CHH 7, K0JJP 6, WA0-HQR 5, WA0JZK 4, WA0BGU 2, W0BVL 2, WA0FKD 2, K0G0B 2.

NEBRASKA—SCM, Frank Allen, W0GGP—SEC: K0OAL. Appointments: K0OAL as SEC and WA0JUF as PAM. Net reports for the month: Nebr. Emergency Phone Net, WA0GHZ, QNI 1580, QTC 102. Nebr. AREC C.W. Net, WA0EEI, QNI 10, QTC 2. Nebr. C.W. Net, WA0GHC, 1st session QNI 90, QTC 38; 2nd sessions QNI 93, QTC 49. Nebr. AREC Phone Net, W0RZ, QNI 188, QTC 6. Dead End Net, WA0MCX, QNI 424, QTC 54. Nebr. Morning Phone Net, K0UWK, QNI 1036, QTC 68. Nebr. Storm Net, WA0KGD, (Sept.) 1st. session QNI 982, QTC 94; 2nd session QNI 803, QTC 73; (Oct.) 1st session QNI 842, QTC 89; 2nd sessions QNI 1061, QTC 115, 160 Meter Net, WA0CBJ, QNI 407, QTC 7 (meets at 6:30 MST, 1995 kc. daily.) West Nebr. Phone Net, W0NIK, QNI 588, QTC 35. We were saddened by the death on Oct. 31 of K0JCH, of Cambridge. He was a loyal member of many nets and will be missed by us all. Traffic: WA0GHC 468, WA0HRW 220, WA0KGD 169, W0LOD 88, W0GEG 74, K0UWK 57, WA0AES 44, W0AGK 37, WA0CBJ 33, W0GGP 32, K0RRL 26, W0-BFV 25, WA0LOY 23, W0VEA 23, WA0IB 21, WA0-KHE 18, K0IXY 17, W0NIK 17, WA0GVJ 16, WA0LQ 16, W0ZIF 16, K0JFT 15, K0VTD 15, W0WPK 15, K0JFN 14, W0FVY 12, WA0MOB 12, K0QKW 12, WA0EEI 10, K0FRU 9, WA0JAV 6, WA0OHO 6, K0-DGW 5, WA0LZ 5, WA0JUF 5, W0QB 5, K0HNT 4, W0HOP 3, W0WZR 3, WA0LRP 2, WA0PFJ 2, W0-RAM 2, WA0KFP 1.

NEW ENGLAND DIVISION

CONNECTICUT—SCM, John J. McNassor, W1GVT—SEC: W1PRT. RM: W1ZFM, PAM: W1YBH. Net reports for Oct.:

Net	Freq.	Days	Time	Sess.	QNI	QTC
CN	3640	Daily	1845			
CPN	3680	M-S	1800	32	508	261

Technical Notes from RAYTHEON

This, the January 1967 issue, marks the initial appearance by the Raytheon Company in a particular page that has long served to present QST readers with ideas of men in industry concerned with designing and producing better electronics equipment.

It seems appropriate at this time to discuss the unique dual power supply that is built into the well known Raytheon SB-34, SSB transceiver. Many months went into designing a supply that would operate both on 117V AC and 12V DC and also fit into a housing only 5" high, 11¼" wide and 10" deep that already contained 21 transistors, 20 diodes and 3 tubes! Ultimately it was done—and we think ingeniously—and with little compromise. For some time though it appeared that the complexity and attendant costs of switching from one power source to another would nullify the painstakingly-achieved savings in the rest of the equipment. Happily, switching was eliminated entirely by terminating the normally-switchable power supply leads at the pins of a plug located on the rear of the SB-34 chassis. Matching plugs on the respective AC and DC power cable sets (both are furnished) are strapped so that circuit changes are made automatically when the proper cord set is used. It's simple, low in cost. The actual power supply works out like Figures 1 and 2.

A single power transformer with 3 primary windings is used. When on DC, two of these windings comprise part of the circuitry for a common-emitter transistorized power-type

oscillator which operates from 12V DC. This oscillator generates a square wave voltage which is stepped up, rectified and filtered and applied to RF driver and output linear amplifier. The other 21 transistors in the equipment require only the 12 volts available (through an L/C filter) from the storage battery. The entire job is done with minimum parts and wiring labor.

In AC operation, the 117V AC is applied to the third winding of the power transformer. Oscillator frequency and several other factors are design-set so that comparable high voltages are obtained with either AC or DC power sources. Significantly, switching complications are avoided by also using the two transistors in AC operation; the base/collector junctions serving as full wave diode rectifiers to supply 12 volts for transistor operation and heater voltage for the 3 tubes with feedback and collector transformer windings connected essentially in series. (This saves an extra winding—lowers transformer costs—keeps down size.)

This power supply is rugged, dependable—requires minimum components and labor, maintains selling price of equipment with built-in dual supply at levels unmatched by other equipment. There are no moving parts—no relays here (or anywhere else) in the SB-34—nothing to wear out. The transistors used throughout will last for years.

For further information, write:
SBE, 213 East Grand Avenue,
South San Francisco, Calif. 94080.

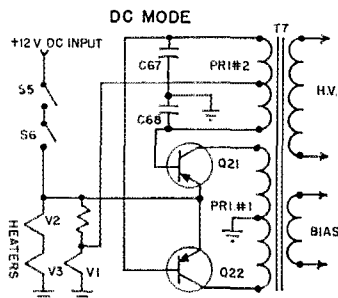


Figure 1.

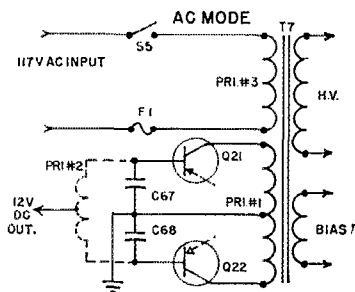
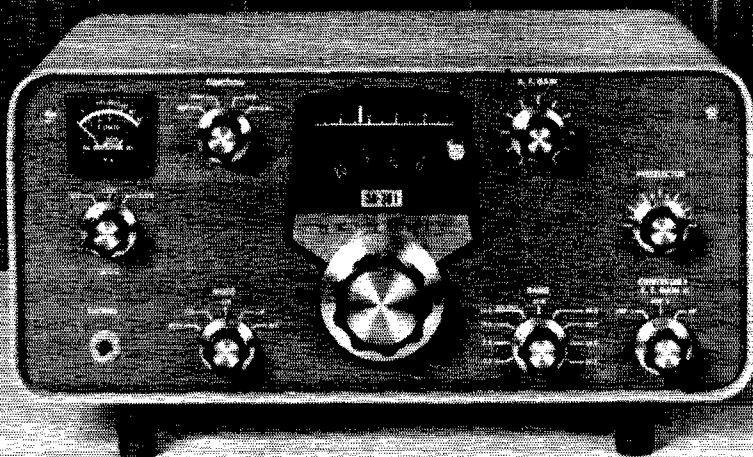


Figure 2.



EXCELLENCE IN ELECTRONICS

Now A Flip-Of-A-Switch Selects Transceiver Or



New HEATHKIT® SB-301 amateur band receiver

With These New Extra-Performance Features

- RTTY position on mode switch — SB-301 is a fully capable RTTY receiver • 15 to 15.5 MHz coverage for WWV reception • Built-in switch-selected ANL • Front-panel switching for control of 6 and 2 meter plug-in converters — enables complete 80 through 2 meter amateur band coverage • Improved product detector and audio circuitry • Simplified assembly procedure through "sub-pack" packaging and assembly techniques

Plus These Pace-Setting Features That Have Already Made The SB-300 Famous In Amateur Radio

- 80 through 10 meter AM, CW, & SSB reception with all crystals furnished • Crystal controlled front-end for same rate tuning on all bands • Famous Heath factory-assembled & tuned LMO for the ultimate in high stability and linear tuning • 1 kHz dial calibration — 100 kHz per dial revolution • Bandspread equal to 10 feet per megahertz • Tuning dial to knob ratio approximately 4-to-1 • The unequaled satisfaction of using a truly high-performance receiver you have assembled yourself

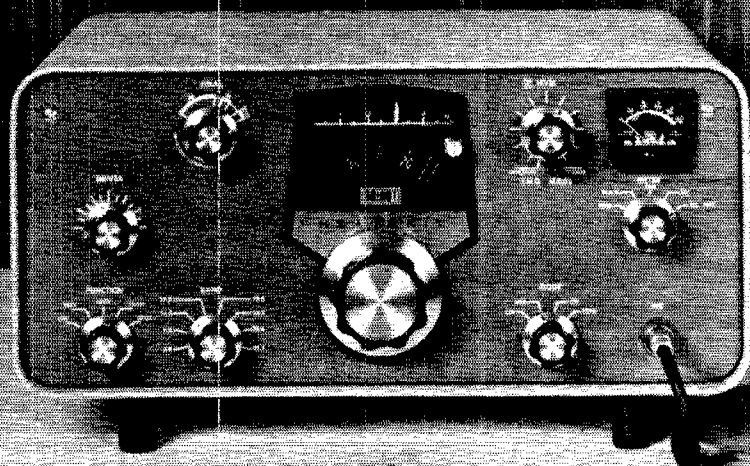
THE NEW SB-301 SETS "THE STATE OF THE ART" FOR AMATEUR BAND RECEIVERS. The new 15 to 15.5 MHz tuning range enables the most accurate attainable frequency check with the built-in 100 kHz crystal calibrator and WWV ... and as you read the specifications, notice the Heath pre-built LMO surpasses the tuning characteristics of every other receiver on the market. What's more, if your QTH is a high noise location, you'll appreciate the new ANL, providing excellent impulse noise rejection.

NEW "SUB-PACK" PACKAGING & ASSEMBLY SPEEDS CONSTRUCTION TIME. Components are packaged separately for each phase of construction ... saves you time in selecting components ... lets you see your progress more clearly as each phase is completed. Order the new SB-301 for unmatched value in a deluxe AM, CW, SSB, and now RTTY amateur band communications receiver.

Kit SB-301, Amateur Band Receiver, less speaker, 23 lbs.....	\$260.00
SBA-301-1, Optional AM crystal filter (3.75 kHz), 1 lb..	\$20.95
SBA-301-2, Optional CW crystal filter (400 Hz), 1 lb....	\$20.95
Kit SBA-300-3, 6-Meter Plug-in Converter, 2 lbs.....	\$19.95
Kit SBA-300-4, 2-Meter Plug-in Converter, 2 lbs.....	\$19.95
Kit SB-600, Communications Speaker, 5 lbs.....	\$17.95

SB-301 SPECIFICATIONS — **Frequency range** (megahertz): 3.5 to 4.0, 7.0 to 7.5, 14.0 to 14.5, 15.0 to 15.5, 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 megahertz. **Frequency stability**: Less than 100 Hz per hour after 20 min. warmup under normal ambient conditions. Less than 100 Hz for $\pm 10\%$ line voltage variation. **Visual dial accuracy**: Within 200 Hz on all bands. **Electric dial accuracy**: Within 400 Hz on all bands after calibration at nearest 100 kHz point. **Backlash**: No more than 50 Hz. **Sensitivity**: Less than 0.3 microvolt for 10 db signal-plus-noise to noise ratio for SSB operation. **Modes of operation**: Switch selected; LSB, USB, CW, AM, RTTY. **Selectivity**: RTTY; 2.1 kHz at 6 db down, 5.0 kHz at 60 db down (crystal filter supplied). SSB; 2.1 kHz at 6 db down, 5.0 kHz at 60 db down (crystal filter supplied). AM; 3.75 kHz at 6 db down, 10 kHz at 60 db down (crystal filter available as accessory). CW; 400 Hz at 6 db down, 2.0 kHz 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 Hz nominal at 6 db, AM; 200 to 3500 Hz nominal at 6 db. CW; 800 to 1200 Hz nominal at 6 db. **Audio output impedance**: Unbalanced nominal 8 ohm speaker and high impedance headphone. **Audio output power**: 1 watt with less than 8% distortion. **Antenna input impedance**: 50 ohms nominal. **Muting**: Open external ground at Mute socket. **Crystal calibrator**: 100 kHz crystal. **Front panel controls**: Main tuning dial; function switch; mode switch; AGC switch; band switch; AF gain control; RF gain control; preselector; connector & ANL switch; 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) 6AU6 Heterodyne mixer; (1) 6AB4 Heterodyne oscillator; (1) 6AU6 LMO osc.; (1) 6AU6 LMO 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 Hz, 50 watts. **Dimensions**: 14 $\frac{1}{8}$ " W x 6 $\frac{1}{2}$ " H x 13 $\frac{3}{8}$ " D. **Net weight**: 17 lbs.

Independent Operation On This New SB-Combo



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SB-401 SPECIFICATIONS — Emission: SSB (upper or lower sideband) and CW. **Power input:** 170 watts CW, 180 watts P.E.P. SSB. **Power output:** 100 watts (80-15 meters), 80 watts (10 meters). **Output impedance:** 50 to 75 ohm — less than 2:1 SWR. **Frequency range:** (MHz) 3.5 — 4.0; 7.0 — 7.5; 14.0 — 14.5; 21.0 — 21.5; 28.0 — 28.5; 28.5 — 29.0; 29.0 — 29.5; 29.5 — 30.0. **Frequency stability:** Less than 100 Hz per hr. after 20 min. warmup. **Carrier suppression:** 55 db below peak output. **Unwanted sideband suppression:** 55 db @ 1 kHz. **Intermodulation distortion:** 30 db below peak output (two-tone test). **Keying characteristics:** Break-in CW provided by operating VOX from a keyed tone (Grid block keying). **CW sidetone:** 1000 Hz. **ALC characteristics:** 10 db or greater @ 0.2 ma final grid current. **Noise level:** 40 db below rated carrier. **Visual dial accuracy:** Within 200 Hz (all bands). **Electrical dial accuracy:** Within 400 Hz after calibration at nearest 100 kHz point (all bands). **Backlash:** Less than 50 Hz. **Oscillator feedthrough or mixer products:** 55 db below rated output (except 3910 kHz crossover which is 45 db). **Harmonic radiation:** 35 db below rated output. **Audio input:** High impedance microphone **Audio frequency response:** 350-2450 ± 3 db. **Power requirements:** 80 watts STBY, 260 watts key down @ 120 V AC line. **Dimensions:** 14 $\frac{1}{8}$ " W x 6 $\frac{3}{8}$ " H x 13 $\frac{3}{8}$ " D.



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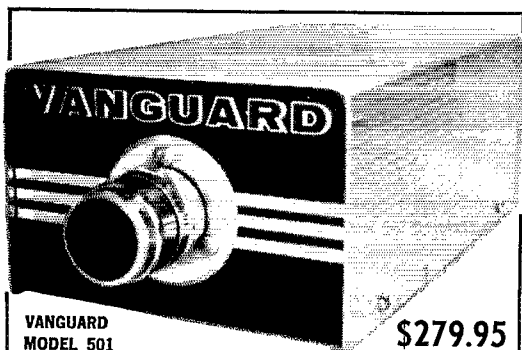
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CPN high QNI: WA1EEJ and W1GVT 31, W1ULH 28, W1HBB and W1YBH 25, K1E1C and K1SRF 24, WA1GBA 21, WA1DEAI, K1DGG and W1MPV 19. With regret we note W1CJD added to the roster of Silent Keys. QST cartoons by "Gh" will be long remembered and missed by all. Amateur radio has lost a most understanding friend. SEC W1PRT and W1GVT attended the Hartford County ARA meeting. The SET provided a considerable increase in traffic—this could be as interesting as Field Day! EC was provided by Halloween Goblin Patrols. Reports were received from K1SRP, W1ADW, K1QPM, K1QQG and W1WHR. Club reports: Danbury CARA via W1ADW—The Conn. QSO Party was very successful. The club made high scores in the FD Contest. The HCARA holds code and theory classes Thurs. p.m. at ARRL. The Conn. Council, via W1W1Q requests monthly club reports via any of the traffic nets. The Southington ARA was active in the Scout Jamboree on the air via K1CSY, W1DNJ and K1EUW. Eastern Conn. ARA, via W1ADWE—N.E. high scores in the FD was made by K1MUH/1. Nets are active on 30.5 and 28.6 Mc. with a certificate offered. W1LXV, U. of Conn. and W1YU, Yale University, are active on traffic nets. W1KAM invites all to join the Slo C.W. Net at 6 p.m. on 3748 kc. Congratulations to W1BGD and K1RQO on making the BPL in Oct. and to K1LMS on the 30-w.p.m. sticker. Many more OOs are needed for 10, 6 and 2 meters. Contact your SCM. Suggestions for New Year's Resolutions: Join a traffic net, improve your c.w. speed, build some piece of equipment, get a higher class license! My sincere thanks to all for your help. Good Health, Good Luck and a Happy New Year to all! Traffic: W1BGD 751. K1LMS 495, W1EFW 486, W1AW 288, K1RQO 284, K1QQG 226, K1STM 190, K1UDD 182, WA1CYV 179, W1BDI 135, W1GVT 135, WA1FNP 128, W1KAM 88, K1SXF 78, W1YBH 66, W1MPW 47, K1SRF 40, W1PRT 39, W1LVQ 35, WA1DEM 32, W1LXV 28, WA1ELA 27, W1KUO 23, W1CTI 20, W1QV 19, K1QPN 16, K1DXE 12, W1ZL 12, K1YGS 11, W1OBR 6, W1BNB 4.

EASTERN MASSACHUSETTS—SCM, Frank L. Baker, Jr., W1ALP—SEC: W1AOG received reports from K1s ERO, W1VW and DZG. W1s RM, EHT, QMN and K1PNB took part in the SET. W1s PLJ, BGW, WAJ, K1QDR, K4GGI/1 and A.G. Gann took part in the Sept. FMT. W1ALB writes from London. W1KAN now is in Ashland; W1ARO/MP in Scituate. Ex-W1GFEF is getting the bug again. W1OTN had an operation. W1NF has a sked with W1OY Wed. nights. The 6-Meter Crossband Net reports 21 sessions, 302 QNIs, 22 traffic. W1DECE/DED mobilized to Ohio via 6 meters. The South Shore Club will hold an auction at 7:30 p.m. Thurs., Jan. 19, at the Viking Club, 410 Quincy Ave., Braintree. W1AKY will be auctioneer. Silent Keys are W1KNO, Terrill Smith, formerly of Medford, W1HPW, W1RTP and W1AAJ. W1BGW rebuild his frequency measuring equipment. The EM2AIN held 21 sessions, 195 QNIs, 180 traffic. W1BLT says that there are 10 operators in Gloucester on 6 and 2 and asks the gang to point their beams that way. W1HIL is keeping his skeds. The QRA auction was very good. K1OJQ is working on a rig for 432 Mc. and says he and W1s AYG, BV, WK and K1FFE are on s.s.b. on 2. W1EKG is working DX with the rig in his car. New officers of the Barnstable Radio Club are K1BIF, pres.; W1PX, vice-pres.; K1LIE, secy.-treas.; W1BNC, K1s GAZ, LEK, ZFL, directors. The club conducts theory and code classes at the W. Yarmouth Community Bldg. W1IH's rig blew up. W1ADDO has a sixteen-element skeleton slot on 2. K1WYS is with the Air Force in Montana. W1O-GSA/1 took part in the SET. W1BFD worked 43 states in the Mass. QSO Party. W1CED worked some JAs. W1PEX and W1O-GSA/1 made the BPL. K1GPH is on again after antenna troubles. W1AOG was on 2, 6 and 75 for the SET. W1UIR is on 75 again. W1DAL has a new keyer. The Needham Emerg. Net meets on 51.75 Mc. Sun. at 1930. W1AFS, trying to work her dad in England (G5-ACU/W2AXL), has an SB-301. W1DJC is going after WAS now. W4JYB/1 is secy. of the MIT Radio Society. W1MX, W1OFK is modifying the RC-342. K1CTK/DU writes from Clark Air Base in the Philippines. W1ALP attended a meeting of the Seacoast ARC in Newburyport. K1BGG has the beam for 2 meters 76 feet up. W1BVP now is on a Coast Guard Cutter. K1s OJQ and OWM are new OVSs: W1AEVY is a new ORS. W1AOG has been endorsed as SEC and OBS. W1AIFQ is on 2 with a 522. W1N1s GUF and GZV joined the Somerville "Y" Club. K1VOK is helping Novices to get their General Class tickets. K9AQP/1 has built a transistor s.s.b. exciter. W1HGT has gone back to BU. K1EJM worked W2s and W3s on 2. W1BB and his XYL are on a cruise in the Pacific until Feb. W1ADPX worked W2s on 2. W1FON says there are 17 Army MARS stations in Vietnam. W1EAE spoke at the Wellesley ARC on traffic work. Officers of the Roxbury YMCA Radio Club are W1DXM, pres.; W1QLC, vice-pres.; W1ENUU, secy.; W1EEX, treas.; W1AQV club mgr. W1s BVP and WLZ went to Nantucket Isle at W1OHF's QTH for the Mass. QSO Party. Traffic: (Oct.) W1PEX 1377, W1EMG 406, W1O-GSA 262, W1OJMN

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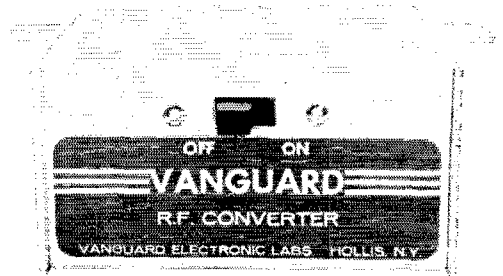
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	301-Q	144-148	14-18
	301-R	144-148	7-11
	301-S	143.5-148.5	30-35
6M	301-B1	50-51	.6-1.6
	301-B2	51-52	.6-1.6
	301-C1	50-54	7-11
	301-C2	50-54	14-18
	301-J	50-52	28-30
20M	301-G	13.6-14.6	.6-1.6
CB	301-A1	26.5-27.5	.6-1.6
	301-A2	26.8-27.3	3.5-4.0
40M	301-K	7-8	.6-1.6
CHU WWV	301-L	3.35	1.0
	301-H	5.0	1.0
Int'l. Marine	301-I1	9-10	.6-1.6
	301-I2	15-16	.6-1.6
	301-M	2-3	.6-1.6
Aircraft	301-N1	118-119	.6-1.6
	301-N2	119-120	.6-1.6
	301-N3	120-121	.6-1.6
	301-N4	121-122	.6-1.6
	301-N5	122-123	.6-1.6
	301-N6	123-124	.6-1.6
Fire Police VHF Ma- rine etc.	301-P1	154-155	.6-1.6
	301-P2	155-156	.6-1.6
	301-P3	154-158	7-11
	301-P4	154-158	104-108
	301-P5	156.3-157.3	.6-1.6
Weather	301-W1	162.55	1.0
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215. WALEY 154, WIDOM 124, K1GPH 94, W10FK 90, K1CLM 87, W1AOG 85, W1UIR 71, W1DAL 66, K1VPI 60, W1AET 53, W1ADPX 33, W1AIEV 33, W1KBN 31, K1GKA 26, K1RCD 26, W1ZSS 26, W1CTR 18, W1FDN 18, W1AIF 16, W1MX 15, K1VOK 10, W1ALP 9, K1LCQ 6, K1OKE 6, W1ADJC 2, W1AFHJ 2, K1YUB 2. (Sept.) W1OJMI 95, W1AJYB 4, W1BVP 2.

MAINE—SCM, Herbert A. Davis, K1DYG—SEC; K1-QIG. PAMs: K1WQI, K1ZVN, RM: K1TZX. Traffic nets; Sea Gull Net, 1700 to 1800 and 2000 to 2100 Mon. through Sat. on 3940 kc. Pine Tree Net, daily on 3596-ke. c.w. at 1900. Tribute to a Silent Key: W1UUG, Calvin L. Davis of Machias, passed away. He was active on most of the bands and very well known by many. He will be sadly missed by all who knew him along the way. K1JKT reports that the PAWA meets every Tue. at 7:30 p.m. at 227 Spring Street, new headquarters. W1KVI will be on 80- and 40-meter c.w. Code and theory classes will be conducted. W1GKJ is putting bulletins on both 6 and 2 meters on RTTY. W1GIU, W1GKJ, K1LAM, W1YTW and W1WHI are all on 2-meter RTTY. W1A1TX is handling lots of traffic on 2 meters. Traffic: W1GU 61, W1NND 49, K1WNC 2.

MAINE QSO PARTY

February 11-12, 1967

The contest period is from 1600 GMT February 11 to 0400 GMT February 13. The general call is CQ Me on c.w. and CQ the Maine QSO Party on phone. Exchange number, RS(T), ARRL section, county or country. Out-of-state stations multiply by Maine counties and Maine stations multiply by ARRL sections and countries worked. A station may be worked once per band/mode. Suggested frequencies are 3596 3940 7050 7255 14,150 14,250 21,150 21,350 28,500 29,500 50.5 144,720 and 145,078. Certificates will be awarded to high scorers. Send all logs before March 12 to the Maine SCM, Herbert A. Davis, K1DYG, RFD #1, Franklin, Maine 04634.

NEW HAMPSHIRE—SCM, Robert C. Mitchell, W1SWX/K1DSA—SEC; K1YSD. PAM: K1APQ.

Net	Freq.	Time	Days	Sess.	QNI	QTC	Mgr.
GSPN	3842	2330Z	M to F	26	750	188	K1APQ
GSPN	3842	1430Z	Sun.	—	—	—	K1APQ
VTNHN	3685	2330Z	M to F	22	73	27	K1UZG
NHPON	50.82		M to F				K1BGI
MVAREC	50.82		Mon.				K1DWK
CBP	28.6		Thurs.				W1JB

Endorsements: K1APQ as PAM: W1HIQ, K1QES, K1MKN and W1DAO as ECs; W1EVN as ORS; K1AEG as OO. The ARRL SET has come and gone and K1YSD did a fine job. W1DYE is operating from his new QTH. K1PCY and K1PCZ did a fine job for the recent GSPN Dinner. W1HTE was active in the Conn. and Md./D.C. QSO Parties. New Asst. ECs are W1ALE, W1AIDK and W1EVN. K1MVA is active in Air Force MARS. W1BPW is looking for a good DX location in N.H. W1PZA is chasing DX on 80 meters. New hams: W1NHAT, Hillsboro; W1AHAD, Lincoln. The VTNH Net held two special sessions during the SET. W1ARE is chasing DX. K1NBN is getting ready for the 160-meter season. Traffic: W1ALE 77, K1PQV 27, K1YSD 23, W1MHX 16, K1BGI 13, W1SWX 9, K1PCY 1.

RHODE ISLAND—SCM, John E. Johnson, K1AAV—SEC; K1LII. PAM: W1TXL, RM: W1BTV. V.H.F. PAM: K1TPK. Endorsements: W1POF as EC, K1PAM as OO and OBS, K1LII as SEC. RISP reports: 31 sessions, 509 QNI, 175 traffic. It was with deep regret that I accepted the resignation of W1YNE as Rhode Island SEC. W1YNE did much to set up the AREC organizations in the state but because of the demands of his new position he felt that he could not adequately perform the duties of SEC. I have appointed Chester P. Tammany, K1LII, 119 Owen Ave., Pawtucket, as the new SEC. If your EC appointment has lapsed, contact K1LII or the SCM to have it updated. The Roger Williams V.H.F. Society of Providence provided mobiles for the Columbus Day Parade recently. Those taking part were K1PNI, W1CFT, K1CPL, W1ADPF, K1VOW, W1A1BS, K1UXS, K1NTJ and K1VYC. The club had six mobile units along the parade route with K1PNI acting as control. W1CFT provided hot coffee for the club. During the SET W1YKQ acted as liaison between IRN and the RISP Nets. W1BTV was net control of the First Regional Net for two hours. Traffic: W1TXL 441, W1YKQ

423, W1BTV 158, K1VYC 103, K1NJT 62, K1TPK 57, W1AEEJ 49, K1YEV 43, K1YVN 31.

VERMONT—SCM, E. Reginald Murray, K1MPN—SEC; W1VSA. RM: K1UZZ. Oct. Net reports.

Net	Freq.	Time	Days	QNI	QTC	NCS
Gr. Mt.	3855	2130Z	Dy & S	490	17	W1VMC
Vt. Phone	3855	1300Z	Sun.	184	—	W1UCL
VTNH	3685	2330Z	M-F	73	27	K1UZG
VTCO	3990½	1400Z	Sun.	42	8	W1AD
VTSB	3909	2230Z	M-Sat.	717	20	W1CBW
		1230Z	Sun.			

Note the new time for the VTSB Net (5:30 p.m. local time). Welcome to new Generals W1AGYG (N. Pomfret) and W1AGYS (Springfield). Catamount Club's new officers are K1SVW, pres.; K1NLD, vice-pres.; W1ADV, treas.; W1UXX, secy. The CVARC will sponsor the Vt. QSO Party next Feb. 18-19. Glad to hear K1BQB back on the air. Seasons greetings to all. Traffic: K1BQB 119, W1AD 73, K1UZZ 22, W1FRT 21, W1IDM 8, K1LLJ 6, K1MPN 6, K1EQI 4.

WESTERN MASSACHUSETTS—SCM, Percy C. Noble, W1BVR—SEC; K1IJU. C. W. RM: K1IJV. The Valley Amateur Radio Club of Springfield reports that it handles three distinct theory classes: The Extra Class every Tue. and Thurs. evenings at individual QTHs, General Class every Thurs. evening at Chet's shop on Hamburg Street, Novice Class by W1ADCH at his QTH. These are open to club members. Officers of the Massachusetts Club are W1FKT, pres.; K1ZDX, 1st vice-pres.; W8-FXX/1, 2nd vice-pres.; W1VBT, treas. K1KJV, bulletin editor. A total of \$210 was spent for goodies at the annual auction of the Hampden County Club. In the June Field Day competition the Hampden County Club won over the Tri-City Club by a score of 8740 to 7780. For the month of Sept. RM K1IJV reports The West. Mass. C.W. Traffic Net (W1MN) handled 63 messages with the following in attendance in order of activity: W1DWW 25 sessions, K1IJV 19, K1VZY 15, W1BVR 12, W1DWA 8, K1SSH 7, W1MNG 3, W1EOB 3, W1YK 1, W1ZPB 1. W1MNG has left the Springfield Army and is now teaching at the West Springfield High School. (Welcome to the fold, Art). For the very few of you who apparently read this column, please get your neighbor hams to send in items to me for this column. Or, maybe nobody reads this column. Sometimes I think so! Traffic: (Oct.) W1DWA 241, W1BVR 52, W1DWW 10. (Sept.) K1IJV 90.

NORTHWESTERN DIVISION

ALASKA—Acting SCM, John P. Trent, KL7DG—KL7BTP and his bride-to-be were in an auto mishap the day before their wedding but neither was injured. KL7AGU is QRL winter overhaul of the State of Alaska communication equipment. KL7FLS relayed NARC messages from Chitna on c.w. W1TFPX is working KL7IS 250 miles distant on twoer using a beam and Mt. McKinley 2-meter bounce. W17FON is boning up for his General. KL7FNM (YL) was the first to work KL7 "Dreadful Ghost" at Chitna. KL7CAH is doing a wonderful job with the Sourdough Net, which meets nightly on 3892 kc. at 0400 GMT. The Polar Amateur Radio Club of Anchorage (YL and XYLs) had a nice all-hands party in late Oct. KL7FDG teaches General theory classes every Tue. night for the NARC: Kay Anderson handles the Novice section Mon. nights. The NARC has applied to the Alaska Centennial Commission to represent Anchorage for Amateur Radio Operators during the 1967 Alaska Centennial Year.

IDAHO—SCM, Donald A. Crisp, W7ZNN—The Idaho FARM Net convenes Mon. through Fri. on 3939 kc. at 0200 GMT. W1WU visited W6EBK at Baldwin Park, Calif. The Lewiston-Clarkston Club is sponsoring a code and theory course. K7HLR has been appointed ORS. W1AIEWV has been appointed OBS for the Lewiston Area. Applications are solicited for SEC and for EC, OVS, ORS, OPS, OO and OBS appointments. If interested, contact your SCM. W1AETO is active with MARS traffic from Viet Nam. K7CPC is instructing a code class at the University of Idaho. FARM Net report for Oct.: 19 sessions, 603 check-ins, 96 traffic handled. Traffic: K7HLR 414, W7GGV 19, K7OAB 8, W1AIEWV 6, W7ZNN 4.

MONTANA—SCM, Joseph A. D'Arcy, W7TYN—Asst. SCM/SEC: Harry Roylance, W7RZY. OBSs: K7EGJ, K7UPL.

Montana Traffic	3910 kc.	1800 MST	M-F
Montana PON	3885 kc.	0815 MST	Sun.
Montana RACES	3995.5 kc.	0900 MST	1-3 Sun.
Great Falls AREC Net	3910 kc.	0930 MST	Sun.
Billings AREC Net	3895 kc.	0915 MST	Sun.
Missoula AREC Net	3895 kc.	0900 MST	Sun.

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If you're a club member, and your club is not already embarked on HamQuest 67, you should request a club promotion kit from HamQuest 67, ARRL, Newington, Conn. 06111. Individual members and the club alike can earn prizes as they add members to the club and the League rosters.

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Endorsements: W7CJN and W7JRG as OVSSs. Most of the ECs in the state held SET drills during Oct. K7OEK and K7SIK will be on soon with new SB-100s. K7SMT is back in school in Bozeman. Both the Butte and the Anaconda Amateur Radio Club's code and theory classes are in full swing. W7PX made a short trip to the NPBA Hospital for some dental surgery. WA7DMA has a new 20-meter beam. W7CJN and his XYL spent their vacation in KP4-Land. W7FL has been on portable from Hot Springs with a very good signal. K7TZZ has his mobile working with the 1R-3. W7ROE has a new trap antenna up at Columbia Falls. W7OIO has his converted 2-meter station on at Butte and is putting out a fine signal in the tri-county area. We still need a station to check into RN7. The Kalispell/Columbia Falls group will sponsor the hamfest at Apgar this year. Season's Greetings from your League staff here in the State of Montana. Traffic: K7LDZ 118, K7DCH 64, K7EGJ 41, K7ZIX 4, K7TZZ 3.

OREGON—SCM, Everett H. France, W7AJN—SEC: W7AJN. RM: W7ZFH. SET reports: WA7APD, Multnomah County AREC station permanently located in the Red Cross Building, was operated by WA7AWJ, WA7-DLE, WA7DCC, using Communicator IV on 2 meters. A total of 17 stations and 7 mobile units participated. W7-DEM, EC of Josephine County SET, reports using his station as control point, with emergency power; 21 stations participated in the exercises. They received a nice write-up in the local Grants Pass paper. WA7AHW, net manager of Oregon AREC Net, reports 31 daily sessions, total attendance 491, maximum counties per session 14, contacts 47, QST 3. Also 22 Section Net certificates were issued by SCM W7AJN to participants. New Novices in the Grants Pass area are WN7GKB and WN7GKC. K7-NXX-DL4EY is back from Germany. W7OPH is C.D. Radio Officer for Josephine County; W7ADF is assistant. W7WHY has his new linear in operation, also his antenna back up to 40 feet after difficulty with city engineers. K7DVK vacationed in B.C. and had a talk with VE7-AAT. Traffic: K7IFG 240, W7ZB 92, WA7BYP 46, W7-DEM 17, W7WHY 16, WA7CLP 13, W7AJN 8.

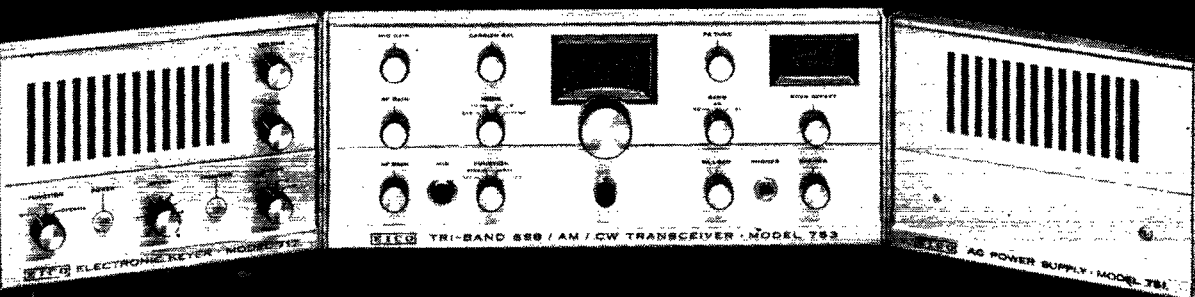
WASHINGTON—SCM, Everett E. Young, W7HMQ—SEC: W7UWT. RM: W7OEB. FAMI: W7LEC. Section nets:

WSN	Daily	2535	0230Z	QNI	383	QTC	601	Sess.	31
WARTS	Ex. Sun.	3970	0200Z	QNI	1049	QTC	122	Sess.	27
NTN	Daily	3970	2130Z	QNI	1061	QTC	730	Sess.	31
NSN	Daily	3700	0300Z	QNI	539	QTC	180	Sess.	29

All Washington section nets were active in the SET and get a big "E" for effort. WSN is deserving of the highest commendations. Of the 8495 traffic count, over 3300 were in or out of ARAB country. Two gals make the BPL, RN7 and TCC, along with QNB to P&N, were ready and get our thanks. W7ZIW is a new ORS and a member of ARAB. W7PL, WSN recorder, has CD-3 forms in all member shacks. W7CEX and K7CYC visited W7BTB. The N.W. Weather Net again is active on 3800 kc. at 1330Z Mon.-Fri. K7EAM is MC. K7VNB goes from 25 watts f.m. to point 25 watts. K7ZVA totaled 19 hours in the SET. Kitsap County AREC-RACES holds drills the 1st and 3rd Mon. at 0430. K7VNV is the new vice-presy of the Richland ARC, which is setting up code and theory classes at Benton County airport. The Rattlesnake Mountain repeater has in at 52.525 and out at 53.290 kc. f.m. W7GYF made 150 contacts in the CD Party and managed CT2YA on 10-meter c.w. W7AIB is back from a Nevada vacation. W7RXH is sporting a new Tri-bander. ORS W7AXT also is Asst. EC and RACES is active in Bremerton. WA7CSK operates a Marauder on 40-15 and is a new OBS. K7MGA has converted the handy-talkie to 6 meters. K7CHH racked up 80K in the C.W. CD Party. W7BX was honored at Centralia by the Lewis County ARC for fifty years in amateur radio. WA7BDF made Extra Class. Mary Ann, W7FWR, was honored at Olympia for "loyalty and service above and beyond the norm for amateur radio in general." Certificates went to 35 winners of the 1st Washington Section QSO Party. ARAB meets the 1st and 3rd Wed., Room 104H Olympic College. WN7FUF is secy. of the Radio Club of Tacoma. The Puget Sound Council of ARCs held its fifth annual banquet in October. Reported participants in the Boy Scouts Jamboree in Oct. were W7OS, W7KKG, K7AMJ, W7DNU, K7VCX, W7UAM, W7WVW, W7BUN. K7CYZ still is looking for a deer with at least a dipole on its head. The Code Practice Net (CPN), under the direction of WA7-DXI, is on 3728 kc. Mon.-Sat. Traffic: (Oct.) W7BA 1531, W7HMA 1266, K7TCY 1133, W7ZIW 800, W7DZX 746, WA7DXI 629, W7JEY 417, W7OEB 344, K7CTP 336, W7-PI 300, W7BTB 161, WA7CFN 152, W7KZ 93, W7APS 92, W7JHA 90, K7VNB 78, K7ZVA 72, W7MCW 46, W7HMQ 45, WA7CXD 39, W7AMC 22, W7GYF 23, W7AAO 22, W7AIB 22, W7RXH 15, W7AXT 9, WA7CSK 4, W7EVV 4, (Sept.) K7MGA 41, W7LEC 18.

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PACIFIC DIVISION

EAST BAY—SCM, Richard Wilson, K6LRN-WB6QNE is a new QNI to NCN. He is in Pinole and operates a KVM-2. W6UB reports activity is slow on 6. W6TYM is attending school from 1830 to 2200, which interferes with his ICC skeds. W6CBF and others missed the CD Party as it fell on the same week end as the Greater Bay Area Hamfest. W6ICR has a Swan 350 and W6DJK a Clegg 22-cr. WA6QZA and WA6PTU have left the East Bay section for the sun and sand of Yucca Valley in the Orange section. WA6OJR and K6PXT are improving their stations. K6SPP has taken an assistant editor for the HRC's *Cheved Itag* and a new XYL. Congrats, Larry, on the XYL that is. WB6NUI has an NCX-3 but seldom finds time to operate. K6TFT is back from active duty in the USNR and has been reinstated as EC for Vallejo/Napa County. W6IHW has moved to Oakland. Traffic: (Oct.) W6IDY 522, W6TYM 472, K6LRN 162, W6YKS 141, WA6JKB 54, WB6QNE 8, W6CBF 4, WB6LJF 2, (Sept.) W6TYM 521, K6LRN 326, W6IDY 125, K6TFT 42, WB6LJF 3.

HAWAII—SCM, Lee R. Wical, KH6BZF—Asst. SCM/SEC: Ernie J. Kurlansky, KH6CCL. PAM: WOPAN/KH6. RM: Considering all offers. V.H.F. PAM: KH6-FEM.

Net	Freq. (Mc.)	Time (GMT)	Days
League Appointees	7.290	0700Z	Wed.
Friendly Net	7.290	2030Z	M-F
No Ka Oi	7.290	2230Z	Sat.
50th State	3.895	0500Z	Thu-Sat.
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KH6KS and KH6AFC, closed shop in Hawaii after 32 years here and are now in 7-land. Their address is c/o 6735 Fruitland Ltd.; Salem, Ore. KS6BR/KH6 is active in the Pacific Interisland and Samoa Nets. KH6IJ reports that he's just completed a "Homeward Grain-Oriented 4 kvolt compact transformer for his final." KL7WH/KH6 and his XYL are leaving the islands. KH6s BZF, EEM, ECE, GDR, MIM, DE, BB, FLN, FON, SP and others were on 10 during the last openings. WOPAN/KH6 finally worked DXCC and received his WAS and A-1 Operator Club certificates. KH6EPW's entire tower collapsed because of a snapped cable. Only the Telrex Stacked Monobanders were ruined. KH6FRO has applied for OPS appointment. KH6AX will not work on the TRANSPAC Race this upcoming season. KH6DXB, KH6BH, KH6BZF and KH6BWT, are just a few of the local KH6s active in the AUTODIN program. KH6AIO and his gracious XYL have moved to Haiku Plantations on the Windward side of the island of Oahu. Trav Wood, ex-KH6EWD, writes from Trinidad and sends his hellos to all the KH6 clan. Write him at Omega Station; U.S. Naval Station; F.P.O., N.Y. 09555. Trav is now WB4-DWB. Traffic: (Oct.) K6SBR/KH6 54, KH6BZF 16, KH6FRO 1, WOPAN/KH6 1, (Sept.) KH6IJ 2.

NEVADA—SCM, Leonard M. Norman, W7PBV—SEC: WA7BEU, WN7EGW and WN7FZH are new Nevada amateurs. K7ICW is active on v.h.f. and u.h.f. and now is looking at m.f. with a Drake T4X and an R4A. The Nevada Emergency Net, on 3825 kc, s.s.b. Mon. and Thurs. at 1900P is doing a fine job. W7PRM, an OVS, reports failure on all experiments. WA7EPT has a new quad and RTTY gear. K7OHX says the restaurant business is keeping him busy but he reports some traffic. W7PBV and WA7BEU attended the Director-called meeting in Oakland. The Southern Nevada f.m. group's repeater receives on 146.94 and transmits on 147.5 Mc. W7ZT is providing communications to Viet Nam. K7ZAU is doing an FB job with the *W.C.A.R. Sentinel*; also W7YKN and HE2PR with the *Ragchee*, W7BF, K7NYU and K7RKH kept things rolling in the SET. WA7ARZ has a very nice QSL card. K7YXX is active on 15 and 20. Watch for the new Nevada Worked-All-Counties Certificate put out by the Reno NARA gang. Traffic: WA7ECT 69, K7OHX 16, WA7CFS 15, WA7BEU 13, K7RKH 9, W7PVB 6, W7KOI 2, W7YDX 2.

SACRAMENTO VALLEY—SCM, John F. Minke, III, W6JDT—SEC: WB6RWB. ECs: WB6MXD, K6RHW, W6SMU, WA6TQJ. RM: W6LNZ. ORSS: WB6HAW, W6LNZ, W6OPK. OPSS: WB6EAG, K6IKV, WB6IAE, WA6TQJ. OBSs: W6AF, WB6PHQ, WA6TQJ. OOs: WB6MPP, W6ZJW. OVSs: WA6CXB, WA6FWMU, W6GDO. WB6MPP is a newly-appointed OO in Carmichael. WA6SLU is resigning as OBS to go into the Navy. September participants in the Sept. FMT were W6GDO, W6KDJ, W6TZK, W6WLI and W6ZJW. It was interesting to notice that all 11 of W6GDO's readings had an error of zero! We welcome newcomers W6KDJ and W6TZK to the FMTs. The RAMS held its Annual Dinner Dance Oct. 15. WN6RSY is now WB6RSY and is QNI to NCN from

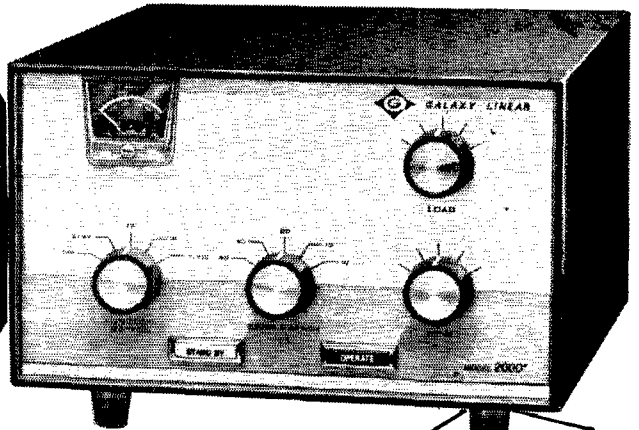
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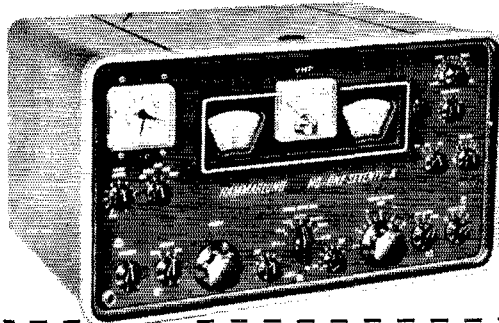
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Redding, W6BGX is having success working Europe on 80-meter c.w. WA6FWU is an Asst. EC for Nevada County on the eastern end. The Sacramento Valley Net has been suspended because of lack of activity. The Oroville ARS has applied for a station license. W6LNZ and W6HAW are organizing training sessions for SCEN so as to be effective in the event of an emergency. WB6MAE has been out of town working in Eureka. K6CB presented his homebrew S.S.B. exciter (Jan. '63 QST) for viewing at the Sacardep RC. New officers of the Sacardep are K6TWE, pres.; WB6HLL, vice-pres.; W6BRIM, secy.; K6JJK, sgt. at arms; W6CLB, training officer. Traffic: (Oct.) W6LNZ 191, WA6TQJ 42, WB6EAG 30, WB6RSY 12, K6IKV 7, WA6JDT 5, WB6MAE 2. (Sept.) WB6MAE 10, WA6SLU6.

SAN FRANCISCO—SCM, Hugh Cassidy, WA6AUD—SEC; W6KZF. WB6GVI reports finding 10 meters opening more and was active in the Sweepstakes. WB6LDGJ reports on plans for a 2-meter repeater in the Eureka area. WB6QGF has a new SR-150 and was working into Siberia on 20 meters with it. The Tamalpais Radio Club was asked by the Novato Police Department to help with its annual "Spook Patrol." A new call in Marin is WN6ULW, from Novato. W6OPL has been inactive during recent months because of the press of business problems. W6WLW, W6HSA and W6GQA were active in the Oct. CD Party. W6WLW made the NCN luncheon at Livermore. A new ORS certificate was sent to W6JAK, while WB6QGT is a new v.h.f. appointee. WA6STS worked San Jose, some hundred miles or so, on 432 Mc. with 100 mw output and now is working on a kw final for 432 Mc. W6UDL, W6BIP, W6JXK and W6JWF were active handling SET traffic into the Western Regional Headquarters of the Red Cross in San Francisco. K6JGX put up a beam and found out that there is a K1H-Land. WA6QXV is on a long vacation that started in Nov. WA6JUV was at the hamfest and talking with the other active v.h.f.s. WN6TBC took his Conditional test in Eureka and expects to move up to new frequencies soon. W6BWV was in San Diego to visit his son and grandchildren in November. WB6DGJ is moving an 80-ft. Vesto tower to his QTH. WA6MGG continues to check into the section net from Sunnyvale. WB6JOX continues as N/C on the Section Net with a strong s.s.b. signal. The net meets Mon. and Fri. at 1830 local time on 3900 kc. W6CYO reports 65 countries confirmed since the first of the year. WB6AIS is looking for a drive unit for a Boehme automatic keying-head to perfect a new method of learning high-speed c.w. Public Service Awards were issued to K6OVV, K6RAO, WB6AIS and W6CYO for action reported in Jan. 1966 QST. The Marin Club held its Annual Christmas Dinner at the Deer Park Villa Dec. 10 while the San Francisco clubs were at the New Tivoli. W6BCM and WB6IMO were at the Western Single Sideband Luncheon at the San Francisco Airport in Oct. WN6MLV got his General Class license and ended up with the call WB6UGO. WA6AUD and W6GPB worked VQ-9AA. Don Miller, from Farquhar while W6CYO had to figure out a correction on his GMT time for Heard Island. Traffic: W6JXK 462, W6WLW 255, W6KVO 138, W6UDL 72, W6BIP 50, K6TWT 32, WA6AUD 19, K6TZN 18, WB6GVI 10, W6CYO 8, WB6LDGJ 5, WB6IMO 2, WN6TBC 2, WB6QGF 1.

SAN JOAQUIN VALLEY—SCM, Ralph Saroyan, W6JPU—K6AJU made the BPL for the first time with a total traffic count of 711. W6VKS got his Code Proficiency award for 30 w.p.m. W6VKS has ordered an SB-300 and an SB-400. WB6NCJ has a 75A-1 and an HT-37 and is active on 40 and 20 when no school activities. WB6PCQ received her 25-w.p.m. Code Proficiency award and is happy. WB6GJG is OBS and is active on several nets. W6HKV has a 20-meter beam up and is on 20. W6UBK has moved closer to town, next door to W6KOK who is active on 40 meters. The Turlock ARC had a 2-meter hunt with good results and participation. K6IXA is working on a 2-meter repeater. The Delta Amateur Radio Club meets the 3rd Fri. of each month at the Jr. Museum. All are invited to attend. W6RRN is having rotor problems. WA6UAA is attending Fresno State College. WB6IGD participated in the Sept. V.H.F. Contest and had a good time. W6IPU reports that he still has his call, even though you won't find it in the Fall Call Book. WB6MZU is active handling traffic. WA6FTJ is experimenting with ham TV. W6OWL is looking for some equipment for his MIG sedan. The Fresno Amateur Radio Club meets the 2nd Fri. of each month in the Power Building, downtown Fresno. Send in those reports, men. Any activity in Bakersfield? Traffic: (Oct.) K6AJU 711, WB6HVA 341, WB6PCQ 296, WA6ADB 270, WB6GJG 12, WA6SCE 7, WB6NCJ 2. (Sept.) WB6MZU 35. (Aug.) WB6MZU 251.

SANTA CLARA VALLEY—SCM, Jean A. Gmelin, W6ZRJ—Asst. SCM; Ed Turner, W6NVO. SEC; W6VZE, RM; W6QMO. W6VZE, our new SEC, did a bang-up job in organizing the section activity in the SET. Charlie has

ANTENNA BREAKTHRU IN PERFORMANCE, VALUE, QUALITY, PRICE, AVAILABILITY

Answers to frequent questions on the 10-15-20 Cubical Quads: the shipping weight is 28 lbs; complete sets of wires are included (all Gotham antennas are complete); SWR is 1.1:1 or better at resonance; spreaders are high-strength aluminum alloy tubing—this is the strongest quad we have ever made; our 13 years plus in QST is your guarantee of integrity and value, so order with confidence.

ALL-BAND VERTICALS

QUALITY MATERIAL

Brand new mill stock aluminum alloy tubing with Aluminate finish for protection against corrosion. Loading coils made by Barker & Williamson.

ALL-BAND OPERATION

Loading coil not required on 6, 10, 15 and 20 meters. For 40, 80, and 160 meters, loading coil taps are changed manually except if a wide-range pi-network output or an antenna tuner is used; in this case band changing can be done from the shack.

EASY ASSEMBLY

Less than two minutes is all you need to put your vertical together. No special tools or electronic equipment required. Full instructions given.

SIMPLE INSTALLATION

Goes almost anywhere. On the ground, on the roof, or outside your window.

AMAZING PERFORMANCE

Hundreds of reports of exceptional DX operation on both low and high power. You will work wonders with a Gotham vertical.

"All band vertical?" asked one skeptic. "Twenty meters is murder these days. Let's see you make a contact on twenty meter phone with low power!" So K4KXR switched to twenty, using a V80 antenna and 35 watts AM. Here is a small portion of the stations he worked: VE3FAZ, TI2FGS, W5KYJ, W1WOZ, W2ODH, WA3DJT, WB2FCB, W2YHH, VE3FOB, WA8CZE, K1SYB, K2RDJ, K1MVV, K8HGY, K3UTL, W8OJC, WA2LVE, YS1MAM, WA8ATS, K2PGS, W2QJP, W4JWJ, K2PSK, WA8CGA, WB2KWY, W2IWJ, VE3KT. Moral: It's the antenna that counts!

FLASH! Switched to 15 c.w. and worked KZ5IKN, KZ5OWN, HCILC, PY5ASN, FG7XT, NE2I, KP4AQL, SM5BGK, G2AOB, YV5CLK, OZ4H, and over a thousand other stations!

V40 vertical for 40, 20, 15,
10, 6 meters \$14.95

V80 vertical for 80, 75, 40,
20, 15, 10, 6 meters \$16.95

V160 vertical for 160, 80, 75,
40, 20, 15, 10, 6 meters . . . \$18.95

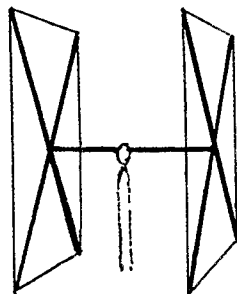
HOW TO ORDER: SEND CHECK OR MONEY ORDER. WE SHIP IMMEDIATELY UPON RECEIPT OF ORDER BY RAILWAY EXPRESS, SHIPPING CHARGES COLLECT.

GOTHAM, 1805 Purdy Ave, Miami Beach, Fla. 33139

QUADS

NEW! NEW! NEW! CUBICAL QUAD ANTENNAS

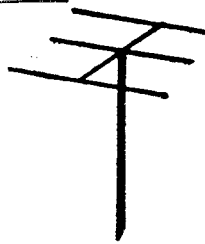
— these two element beams have a full wavelength driven element and a reflector; the gain is equal to that of a three element beam and the directivity appears to us to be exceptional! ALL METAL (except the insulators) — absolutely no bamboo. Complete with boom, aluminum alloy spreaders; sturdy, universal-type beam mount; uses single 52 ohm coaxial feed; no stubs or matching devices needed; full instruction for the simple one-man assembly and installation are included; this is a fool-proof beam that always works with exceptional results. The cubical quad is the antenna used by the DX champs, and it will do a wonderful job for you! Now check these startling prices — note that they are *much lower* than even the bamboo-type:



- 10-15-20 CUBICAL QUAD \$35.00
 - 10-15 CUBICAL QUAD 30.00
 - 15-20 CUBICAL QUAD 32.00
 - TWENTY METER CUBICAL QUAD. 25.00
 - FIFTEEN METER CUBICAL QUAD. 24.00
 - TEN METER CUBICAL QUAD 23.00
- (all use single coax feedline)

BEAMS

Compare the performance, value, and price of the following beams and you will see that this offer is unprecedented in radio history! Each beam is brand new; full size (36' of tubing for each 20 meter element, for instance); absolutely complete including a boom and all hardware; uses a single 52 or 72 ohm coaxial feedline; the SWR is 1:1; easily handles 5 KW; 5/8" and 1" aluminum alloy tubing is employed for maximum strength and low wind loading; all beams are adjustable to any frequency in the band.



- | | | | |
|-------------------|------|-------------------|-----------|
| 2 E1 20 | \$16 | 4 E1 10 | \$18 |
| 3 E1 20 | 22* | 7 E1 10 | 32* |
| 4 E1 20 | 32* | 4 E1 6 | 15 |
| 2 E1 15 | 12 | 8 E1 6 | 28* |
| 3 E1 15 | 16 | 12 E1 2 | 25* |
| 4 E1 15 | 25* | | |
| 5 E1 15 | 28* | | *20' boom |

A word from Ward . . .



"CAVEAT EMPTOR!"

A friend of mine—a much brighter scholar than I am—told me that Latin phrase, "Caveat Emptor!" had its inception at a Thieves' Market which flourished in ancient Rome many years ago. "Caveat Emptor!" means simply, "May the buyer beware!"

What a wealth of shady practices that slogan brings to mind! I can almost see a fly-by-night operator, with a name like Polonius Maximus, conning a customer in fast-talking Latin. "Oh, worthy friend," says Polonius, "look at this genuine, super de luxe, guaranteed Arabian camel! Look at its teeth! By the brow of Jupiter, I swear this noble beast was last owned by a kindly old lady in Pasadena—and isn't even broken in yet!" Naturally, the noble beast dropped dead at the city gates

Well, sir, the trouble with that emptor was that he just didn't caveat sufficiently!

At old Adirondack Radio Supply your guard need never be up. To make sure we searched long and hard for an active energetic young man who felt as strongly about integrity and good old fashioned honesty to the customer as we do. We found him in Glen Fadden, W1ZQA/2 who is now manager of our Ham Department.

Glen will continue our tradition of paying the very highest prices for traded gear consistent with good business practice. He agrees with our image that we have worked for and earned since our beginning back in 1936—YOUR GOOD WILL IS OUR MOST IMPORTANT INVENTORY—

Have we heard from you lately? If not, kindly answer in English. Glen doesn't know enough Latin to put in your eye. But about Trades, Ham Gear and Hamming he's right in there with the best.

Next month look for "Gleanings from Glen".

Thanks for everything but not goodbye.

73,

Ward J. Hinkle W2RJK

Be sure to write for latest used list c/o Dept. G!
Before you buy or trade, wire, write,
call or drop in to see Glen, W1ZQA/2

ADIRONDACK RADIO SUPPLY

185-191 W. Main St., Amsterdam, N. Y. 12011
Phone: 518-842-8350 Ward J. Hinkle, Owner

been busy making plans for an EC meeting to be held in South San Francisco. W6RSY and W6YBV made the BPL; both are active on the NTS nets. Your SCAM attended the Bay Area Hamfest with W6HC, WA6OXE/6, in San Mateo, is active on the West Coast Emergency Radio Service and Mission Trail. K6GK had difficulty with RTTY (QRAI on NCN, but managed to make most sessions. W6SAW attended the BAHamfest and is busy with OBS. Herb also is active on ARRL Intruder Watch. WB6LZF sports a new three-band two-element quad and was busy with the Boy Scout Jamboree on the air as well as the SET. W6BVB is building a Q-Multiplier and reports operation in the CD Party. W6AUC is busy as OO, OPS and ORS. W6RFF is busy building a 2-meter transistor converter. K6YKG now has an SX-25. K6PJW reports for the San Mateo AREC Net. W6YHM is busy with changes in his shack, mostly involving TTY gear. WB6NXX is working DX on 15 and 10 as well as handling NCN duties. Jim is a junior at Fremont High School in Sunnyvale. W6DEF reports for several AREC and traffic nets and says that activity was down during the SET this year, but the gang still was active. Hal also had a story on working the amateur who took his first FCC test with him in 1934. The PARA's November meeting included a talk by W6SAI. The SCCARA held an auction in October. The Santa Cruz Radio Club held a joint meeting with the West Valley Radio Club in Campbell Oct. 20. Guest speaker at the meeting was K6TWF. The Santa Cruz Club also held an auction at its Oct. meeting. The Foothills Club had an auction in October. The club puts out a fine bulletin, *FARS News Notes*, edited by K6RTU and WA6NLL. K6DYX is active as OBS on RTTY and c.w. W6ZRJ also is sending both the ARRL and Pacific Division Bulletins Wed. at 8 p.m. local time on 3635 kc. Speed is 20 w.p.m. for Extra Class code practice. The SCARS held its annual auction Oct. 24. Nominations of officers was the main order of business at the NPFC Oct. meeting in South San Francisco. Guest speaker was Capt. Ellison, who spoke on transistors. Traffic: (Oct.) W6RSY 1259, W6YBV 640, WB6NXX 230, W6DEF 124, W6ZRJ 73, K6GK 65, W6SAW 49, W6VZE 48, WB6LZF 24, W6RVB 15, W6AUC 12, W6RFF 8, K6YKG 5. (Sept.) K6YKG 8. (Aug.) WA6OXE/6 306.

ROANOKE DIVISION

NORTH CAROLINA—SCM, Barnett S. Dodd, W4-BNU—Asst. SCM: Robert B. Corns, W4FDV. SEC: W4-MFK. RMs: WA4ANH and K4CWZ. PAMs: W4AJT and WA4LWE. V.H.F. PAM: W4HJZ. WA4QLP is off to college and hopes to have a station set up there soon. WA4KWC is adding a WRL Duo-Bander 84 transceiver to his station equipment. K4EO says 15 meters is having some very good openings. K4ZKQ says the 2-meter link in Greensboro between the different nets has been working out fine. WA4NUO reports 10 meters has been wide open to Europe and Africa lately. WA4ZLK says the Wilson County Civil Defense RACES Net meets at 7:30 p.m. each Thurs. on 2 meters, W4IRE now has his Model 15 and TD running.

Net	Freq.	Time	Days	QTC	Mgr.
NCN(E)	3573 kc.	2330Z	Daily	218	K4CWZ
THEN	3865 kc.	0630Z	Daily	127	K4ODX
NCN(L)	3573 kc.	0300Z	Daily	83	WA4ANH

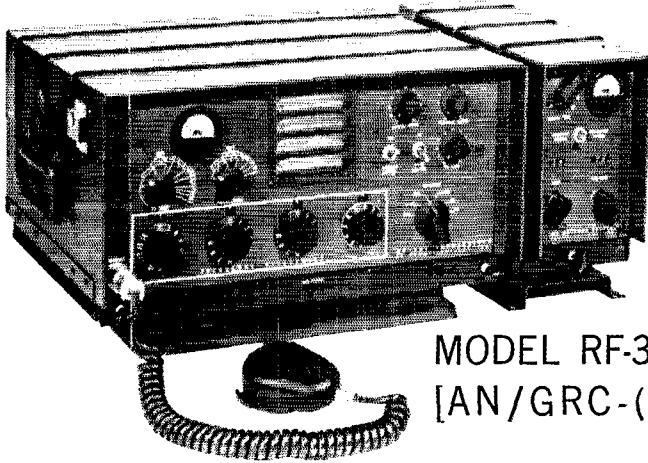
Traffic: (Oct.) W4HJS 429, WB4BGL 310, W4EVN 303, WA4UFQ 281, K4CWZ 174, W4IRE 98, WA4LWE 69, W4-RWL 69, WA4ZLK 69, WA4NUO 58, WA4FJM 54, WA4-UVH 50, WA4VNV 48, W4BNU 38, K4ZKQ 33, WA4ANH 32, K4EO 17, WA4VTY 13, K4VQD 11, WA4GMB 10, W4NAP 8, W4ACY 7, K4TTN 7, W4UWS 7, WA4KWC 5, WA4QLP 2. (Sept.) K4HZP 44.

SOUTH CAROLINA—SCM, Clark M. Hubbard, K4-LNJ—SEC: WA4ECJ. Asst. SECs: W4WOM, WA4EFP. RM: K4LND. PAM: WA4RUB.

SCN	3795 kc.	Daily	0000Z/0300Z	
SCSSBN	3915 kc.	Daily	0000Z	Oct. Traffic 331

K4LND is back getting the C.W. Net going with the help of W4PED and the regulars. K4EIB is working the night shift. W4NTO is continuing with long reports of violations from Oling. Stations over the state are experimenting with 2 meters to determine ways and means of the state-wide 2-Meter Net. W4GPX will work 2 meters from Paris Mountain, 2-meter operation is spirited by RACES. GPX reports 300 to 400 miles with good reception. A quarterly net meeting of the SSBN was held in Greenwood Nov. 13 with a picnic lunch. W4ZIZ and W4UFV cover the Eyebank Net daily. W4HMG is state representative in the Selective Service Net, which still is looking for more s.s.b. stations to check into the C.W. Net for liaison. K4EUIH is back on the air with a new NCX-3. WA4UYT, from the Georgia section at Clemson University is checking in as studies will permit. Traffic: W4PED

NOW--FROM R F COMMUNICATIONS, INC. A NEW HF SSB TRANSCEIVER



MODEL RF-301A
[AN/GRC-()]

For Army Tactical Communications Applications

GENERAL. The RF-301A [AN/GRC-()] was designed by R F Communications specifically for Army Tactical Communications applications. It is a rugged and very reliable modern Single Sideband Transceiver that can withstand the rough usage normally expected in the field army. The RF-301A includes in a single unit features usually found in transceivers costing two or three times as much.

This transceiver is compatible with all military type HF, SSB and AM equipment currently operational, and is now in full production.

PROVEN BY OPERATIONAL USE. The RF-301A [AN/GRC-()] is a revised Army version of the widely used RF-301 (AN/URC-58) SSB Transceiver. This unit has been sold to military users in the United States and in 14 other countries. It has been used extensively in the field under tactical conditions and has proven to be a highly reliable and dependable radio set.

FOR FULL MILITARY APPLICATIONS. The RF-301A can operate under severe shock and vibration. It is designed for use at extreme temperatures and high humidity. The unit is fully splashproof and can be used in vehicles, transportable shelters, or in fixed station applications.

FULL FREQUENCY FLEXIBILITY. RF-301A transceiver includes a fully transistorized synthesizer that can be set to any frequency in one kilocycle steps between 2 and 15

megacycles. Standard stability is 1 part in 10^6 which is suited for normal voice SSB, AM, CW and wideband FSK communications. In addition, continuous tuning with resolution of 100 cycles over the entire 2 to 15 Mc frequency range of the transceiver is provided.

This is the only transceiver available with both synthesizer and continuous tuning in both receive and transmit.

FULL COMPATIBILITY. The RF-301A transceiver is an extremely flexible unit, fully compatible with all high frequency SSB and AM equipment used by U. S. Defense agencies and by commercial organizations throughout the world. Operating modes include SSB (upper and lower sideband), AM, CW and FSK (with external adapter).

HIGH RF POWER OUTPUT. 100 watts PEP and average r.f. power output. The RF-301A transceiver can operate continuous duty, keydown, at 100 watts output at a temperature of $+50^{\circ}\text{C}$.

UNIVERSAL POWER INPUT. Operates from 110/230 volt, 50/60 cycle power. In addition, a small module can be added within the RF-301A cabinet which makes it possible to use the transceiver on DC power as well as AC. Modules are available for either 12 or 24 volt DC operation.

TRANSISTORIZED. Fully transistorized except for P.A. and receiver R.F. input stage.

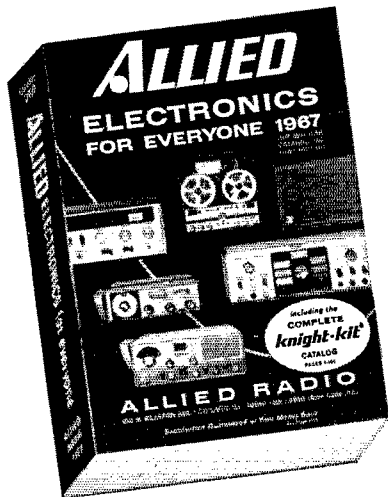
• For further information, please request a copy of our brochure on the RF-301A and its accessories.



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134, W4WQM 74, K4LND 72, K4LNDJ 45, K4OCU 30, W4JA 29, W4NTO 29, W4PFH 28, WA4QKQ 14, K4EIB 11.

VIRGINIA—SCM, H. J. Hopkins, W4SHJ—SEC: K4LAIB. RMs: K4LJK, WA4EUL, PAM; W4OKN. It is with regret that we report the passing of another of our valued members: K4GRZ has joined the Silent Keys. When active he held EC, RAI and QRS. A very interesting and colorful booklet is available outlining *The Navy in Tidewater*. It is free if you contact the SCM or W4NJJ direct. WB4AHT is a new 13-year-old General in Richmond. W4JUF, W4KFC and W4SZT have new s.s.b. equipment. W4KFC and W4PTR have improved their beams. W4IA is back and active in the section after a long overseas assignment. SEC K4LMB is looking for qualified ECs for many areas of the section. Traffic totals were much higher during Oct., probably because of the SET. There were three BPLers: K4LMB, K4CG and WA4DXJ. Traffic: (Oct.) WA4DXJ 511, WA2UT/4 475, W4DVT 318, W4SZT 242, K4CG 227, W4ZM 198, K4ASU 188, K4LMB 171, W4NLC 153, K4LJK 146, W4RHA 144, K4ITY 139, W4TE 135, K4QIY 123, W4ZMT 119, W4URN 117, W4KFC 108, WA9JKR/4 97, W4SHJ 86, W4OKN 73, W4JUF 55, K4KNP 48, W4KX 48, WA4PBG 33, K4FSS 32, W4BWF 30, WA4UMX 29, K4SDS 27, W4WG 23, K4YCH 15, WB4DRB 12, W4IA 12, WA4QC 12, K4VCY 12, W4MK 8, W4PTR 8, K4MXF 5, W4LK 4, K4PK 4, K4YEE 1, (Sept.) K4KNP 83, K4QIY 59, W4BZE 3, (Aug.) K4QIY 19.

WEST VIRGINIA—SCM, Donald B. Morris, W8JM—SEC: W8SSA. PAMs: K8CHW, W8YD. RMs: K8TPF, W8LMP. Phone Mgr: WA8RQB. C.W. Mgr.: W8HZA. Congratulations to the following clubs on their fine Field Day activity: W8COE, Kanawha ARC; WA8UCB, Monongalia Wireless ARC; W8VA. Tri-State ARC; W8MOP. East River ARC; WA8FSE, Peopon Amateur Society. It is with deep regret I report the passing of W8NLI. WA8QND made the BPL and is now Upshur County EC. WVN CW Net held 27 sessions, 120 stations and 86 messages, passing 12 messages during the SET. WA8AKU is on 29.6 Mc. f.m. from St. Albans. WVN FON reports 13 sessions, 187 stations, 69 messages handled. WA8RQB is a new OPS. WVN Phone Net with 21 sessions and 812 stations, passed 193 messages, plus 17 in the SET. WA8ANS, K8ZPR, K8AON, W8IRN and WA8HPE renewed their EC appointments. West Va. needs more OBSs and OOs. Traffic: K8TPF 291, WA8QND 140, WA8POS 82, K8BIT 76, W8HZA 76, K8MQB 73, WA8RQB 55, W8IMX 29, W8CKX 24, K8VWV 15, WA8PXF 14, W8AY 10, WA8QZO 10, K8CHW 9, W8JM 8, K8VMQ 4, W8CRW 2, W8CUL 2, W8CZT 2, K8ELH 2, W8GUL 2, W8YD 2, W8LAL 2, W8ANDY 2, WA8RHT 2, K8SOR 2, W8YI 2, K8ZDV 2, W8ALI 1, WA8BUM 1, K8CNB 1, W8EEO 1, W8ETX 1, WA8FCZ 1, WA8FIE 1, W8FRN 1, K8KFL 1, WA8KMZ 1, WA8OPM 1, W8ORT 1, WA8PWN 1, K8QYG 1, W8SSA 1, W8Y8X 1.

ROCKY MOUNTAIN DIVISION

COLORADO—SCM, Donald Ray Crumpton, K0TTB—Asst. SCM: A. E. Hankinson, WA0NQL. SEC: W0SIN. The following traffic nets are listed for information and to encourage participation by section members.

Columbine Net	0200Z	3989 ke.	Daily
Colorado Code Net	0130Z	3780 ke.	Daily
High Noon Net	1900Z	3895 ke.	Daily

Every club, every population center (10 or more people) should have a representative meeting one of these nets. K0SPR, EC for Pueblo, reports activity in Pueblo in the SET. Note the increased traffic reports from individuals. Please continue forwarding monthly traffic reports via the traffic nets to WA0NQL, Littleton. Personal items and comments can be sent by mail. As of Nov. 1 Ham-Quest 67 had produced at least a 5% increase in section membership. The Arapahoe Radio Club is the leading recruiter as of this writing. Thanks to W0AIMI and W0KAU for their help. Code classes are being given by W0OUI of the Denver RC. W0FA. Skeds will be sent on request. Traffic: K0FDH 187, WA0JEV 79, K0ZSQ 54, K0DCW 45, K0ZLI 28, W0ENA 21, K0TIV 10, W0LEK 7, K0GOT 6, K0IGA 4, K0FBM 2.

NEW MEXICO—SCM, Bill Farley, WA5FLG—W8BZY/5 reports that he made first place in the New Mexico section of the Tennessee, VE/W, Missouri and Massachusetts QSO Parties. K5TQP, on OVS, reports that he had a fine trip to the Sooner State and a good get-together with our former SCM, K5IQ. Fred says he has a full kw. on 2 meters and is continuing work on his 432-Mc. antenna and transmitters. Glad to hear that our PAM WA5MCX can stop worrying about his XYL. She is doing fine now. The power and light company in Alamogordo has gotten its new noise-locating equipment. Seems every active ham in town has asked them to check out their noise factors. Good cooperation has been the key word



6 METERS NEVER SOUNDED BETTER!

than with a SWAN-250 6-METER TRANSCEIVER

6 Meter Band Openings Increase! With sun spot activity now on the increase, 6 meters is rapidly becoming one of the most interesting bands to operate, and the next few years will undoubtedly see tremendous activity on this band. Sporadic E openings are occurring several times each week over all parts of the country, making excellent contacts possible from Coast to Coast and over intermediate paths. With long F2 skip and trans-equatorial propagation to look forward to, plus the consistent ground wave and tropospheric scatter contacts made possible with the power of the Swan 250, there is practically no limit to the operating pleasure you can find in the VHF world above 50 mc.

The Swan 250 is at its best in the SSB mode, for which it was primarily designed. With 240 watts PEP input and an average

beam antenna, its talk power does an outstanding job. To work your AM friends you simply insert carrier to 75 watts input, and they will read you loud and clear. AM reception is provided for by the receiver function switch. Also, a noise limiting circuit is effective on both AM and SSB.

The Swan 250 is engineered to provide the same excellent voice quality which has become the trademark of all Swan transceivers. And, naturally, the same customer service policy, second to none, applies to our VHF models.

If you are seriously interested in working 6 meters, see the new Swan 250 at your dealer. We are delivering now, but the back order list is getting longer, and we suggest you place your order soon.

73 Herb Johnson W6QKI

SPECIFICATIONS:

- ★ 240 watts P.E.P. input on single sideband, 180 watts cw input, 75 watts AM input with carrier insertion.
- ★ Two 6146B tubes in Power Amplifier.
- ★ Complete band coverage, 50-54 mc.
- ★ Velvet smooth vernier tuning covers 500 kc, calibrated in 5 kc increments.
- ★ Transmits and receives on Upper Sideband.
- ★ 2.3 kc bandwidth with crystal filter at 10.7 mc.
- ★ Single conversion design for minimum image and spurious.
- ★ 40 db unwanted-sideband suppression, 50 db carrier suppression.
- ★ Receiver noise figure better than 3 db.
- 6HA5 triode R.F. amp., 6HA5 triode mixer.

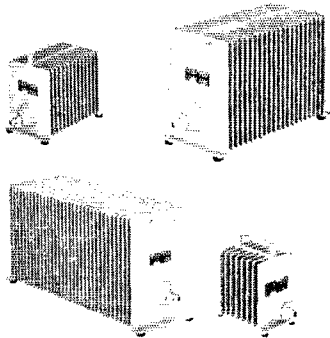
- ★ Separate AM detector.
 - ★ Automatic noise limiter.
 - ★ Separate AF and RF gain controls.
 - ★ Audio response essentially flat from 300 to 3100 cycles.
 - ★ Pi output coupling for matching wide range of load impedances.
 - ★ Meter indicates either cathode current or relative output for optimum tuning and loading.
 - ★ Provisions for adding 500 kc calibrator, or plug-in Vox unit.
 - ★ Dimensions: 5½ in. high, 13 in. wide, 11 in. deep. Weight: 17 lbs.
 - ★ Price, amateur net: Swan-250\$325
- External VFO for separate transmit-receive control available soon.

117XC AC Power Supply\$ 95.00
 14-117 12 Volt DC Power Supply\$130.00
 500 kc Calibrator Kit\$ 19.50
 Model VX-1 Plug-in VOX\$ 35.00

MARK VI 50 mc LINEAR AMPLIFIER
 2000 Watts P.E.P., two 3-400Z tubes. Includes Power Supply.
 Price, less tubes\$475.00

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Both! You get exceptionally stable power-dissipating performance from Sierra Model 160B Series 50-ohm coaxial loads at 150, 300, 600 and 1000 watts. They feature non-leak, cast-aluminum housings (no bellows, no air vents), and long-life, non-carbonizing silicon fluid as the dielectric. They're approximately 1/3 smaller than comparable loads.

Sierra 160B's make ideal dummy loads for transmitters operating to 5 Gc. and effective terminations for bi-directional power monitors functioning from DC. All use Sierra "Twist-Off" connectors for fast field changes.

Now look at them as dollar savers. Prices of \$70 (150w), \$95 (300w), \$155 (600w) and \$265 (1000w) speak for themselves. For full details, mail coupon below to Sierra/Philco, 3885 Bohannon Drive, Menlo Park, California 94025.



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and everyone concerned has been made happy. WA5FJK and his intrastate delivery service will no longer be in service since he has been sent back to the home office. W5ALL has been appointed as SEC. Let's give him our best support. If you are an EC please send in your monthly report. Traffic: WA5FJK 116, W5WZK 79, W5UBW 28, K5VXJ 27, W5DMG 20, K5ONE 19, K5GAX 17, WA5JNC 5, W5NUI 5, WA5BLI 5.

UTAH—SCM, Gerald F. Warner, W7VSS—SEC: W7WKF, RM: W7OCX. Section nets: BUN, daily on 7272 kc. at 1930Z. UARN, Sat.—Sun. on 3987.5 kc. at 1500Z. Reports seem to indicate that the '66 SET went somewhat better than last year. New stations reporting: WA7DEL and WA7DIL, of Cedar City. Congratulations to W7OCX, who has been reelected as Rocky Mountain Division Vice-Director. WA7ADK has a new home-brew 2-meter transceiver. Welcome to traffic man WA7EBR, ex-KL7DEAL, who recently moved to Monticello. Club station WA7FOC is now in business at the Intermountain School in Brigham City, with K7EZR as trustee. The Utah ARC again has won first place in the Utah Council of ARC 1A Field Day competition. New EC: WA7ADK for Davis County. K7QPE sports a new electronic keyer. Traffic: (Oct.) W7LQE 215, W7OCX 119, WA7BME 80, WA7ADK 41, WA7EBR 37, WA7FOC 18, W7VSS 9, K7CLS 8, K7ERR 4, K7QPE 2, K7LIEN 1. (Sept.) W7BAJ 250.

WYOMING—SCM, Wayne M. Moore, W7CQL—SEC: W7XWE, RM: WA7CLF. PAMs: W7TZK, K7SLM. OBSs: W7TZK, K7SLM, K7ZHT, WA7DNZ. Nets: Pony Express, Sun. at 0830 on 3920; YO, daily at 1830 on 3610; Jackalope, Mon. through Sat. at 1215 on 3920. Notice that the YO Net has gone to a daily basis and is looking for more state coverage and relay stations. WA7DNZ was in a serious auto accident but is recovering rapidly. K7KMT is now in the service stationed at Ft. Bliss, Tex. W7NNX is back on the air after not being heard for a couple of years. At last count there were about 7 hams in Green River and the same number in Evanston. Traffic: WA7CLF 67, WA7DKZ 25, K7ITH 20, K7AHO 12, W7TZK 8, K7BTE 7, WA7BPO 6, W7NKR 5, WA7EUX 4, WA7EC 2, K7LOH 2, K7OWT 2, K7VWA 2.

SOUTHEASTERN DIVISION

ALABAMA—SCM, Williams S. Crafts, K4KJD—Asst. SCM/SEC, William C. Gann, W4NML, RM: WA4EXA. PAM: K4WHW. K4WHW has been elected our new SCM, as of Dec. 26. Oct. net reports (times in GMT).

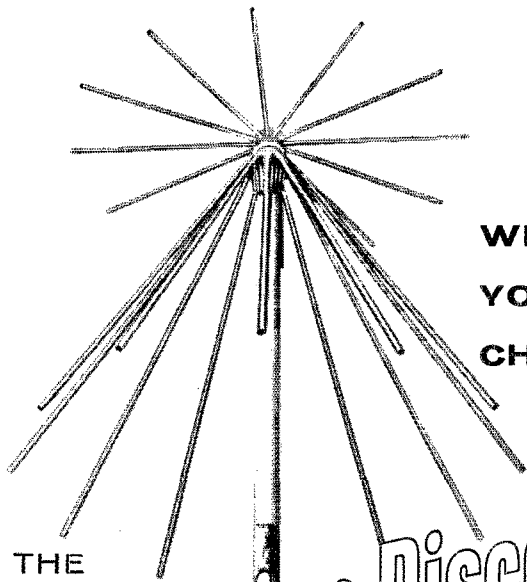
Net	Freq.	Time	Days	Sess.	Ave. T/c.	Ave. QNT
AENB	3575	0100	Daily	45	1.7	3.0
AEND	3725	2400	Daily	30	1.0	5.0
AENH	50.7	0200	Sun./Tue.	10	5.0	20.5
AENM	3965	0030	Daily	31	5.25	47.5
AENO	50.55	0115	T/T/Sat.	13	.3	13.0
AENR	50.52	0115	Wed./Fri.	10	5.6	19.0
AENT	3970	2230	Daily	34	2.0	5.7

New officers of the Springville Club are K4NUW, WN4-ETC, K4WSK, W4HSU and WA4AZL. W4NML received DXCC and WAC. certificates. K4IKR, WA4WAO, W4NML and WA4GCS were active during the DX Contest. GCS worked 94 countries on 15 meters during the contest week end. WB4BLX is a new General. K4TUT has a new 70-ft. tower and four-element beam. WA4DBQ has a new antenna. WA4PUX again is active. WA4QVQ has a new HT-41 linear. Traffic: K4NUW 283, W4NML 233, WA4-UXC 136, W4USM 132, WA4EXA 91, K4AOZ 70, K4BSK 69, K4WHW 69, W4FVY 63, WA4EEC 43, K4KJD 41, WA4FYO 33, WA4GGD 33, WA4PIZ 31, WB4BNO 30, WA4VKT 29, WA4WLD 23, K4AVI 22, WB4BLX 22, K4UEC 20, K4TUT 15, K4UUC 14, WA4DBQ 11, W4-WGI 10, W4YRM 9, K4ADK 7, WA4YYV 4, WA4BTA 3, WA4QVQ 3, W4HON 1.

CANAL ZONE—SCM, Mrs. Lillian C. Smith, KZ5TT—Asst. SCM; Russell Oberholzer, KZ5OB, SEC: KZ5-MV. The CZARA Nov. meeting had visitors ZK1AA, Stuart Kingan, and Tony Utonka, members of Cook Islands Radio Club, who are en route to Lima to study propagation phenomena caused by eclipses. The Crossroads Club meeting featured color slides by KZ5SS and KZ5SN of their mobiling trip through Central America. KZ5UR retired Dec. 1 and will be KOMHY. New KZ5s include Generals KZ5EH, KZ5WL, KZ5FH and KZ5CW (who is ex-KL7BXJ, K6GALG, K6BCN, KW6EF), Novices KZ5WFN and KZ5GRN. KZ5TW reports working 40 countries on 10-meter phone during a recent DX Contest. HPIJC's new two-element 40-meter beam did all the good during the same contest. KZ5RW is on the air with a new TR4. Ex-KZ5s heard from during the month: KZ5HL—K4HRA; KZ5GD—K5MRT; KZ5HO—WA4QXI. Traffic: KZ5SS 33, KZ5SN 21, KZ5FN 18, KZ5FX 11.



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Cat. No. 396-509 Discone Antenna is a skeletonized discone in which the disc element is fabricated of twelve 1/4" diameter solid brass rods. The cone element consists of twelve 3/8" heavy wall brass tubes. Feed point insulator is fabricated of polycarbonate resin. The antenna assembly is mounted on a 4 ft. 1 in. IPS galvanized steel pipe. Cat. No. 396-509 is supplied with RG8A/U internal feed line terminated 18" below the support pipe with a Type N male connector and neoprene weather-proof housing.

***ELECTRICAL**

NOMINAL INPUT IMPEDANCE	50 OHMS
MAXIMUM POWER INPUT	500 WATTS AT 150 MC 150 WATTS AT 470 MC
VSWR	2.0:1 MAXIMUM
BANDWIDTH	150-470 MC
LIGHTNING PROTECTION	STARGAP

***MECHANICAL**

ELEMENT MATERIAL	BRASS
DISC DIAMETER	20"
CONE—MAXIMUM DIAMETER	23-1/2"
SUPPORT PIPE	1-5/16" DIA. GALVANIZED STEEL
RATED WIND VELOCITY	100 MPH
LATERAL THRUST AT RATED WIND	24.5 LBS.
BEND. MOMENT 6" BELOW CONE	37.0 FT. LBS.
WEIGHT	16 LBS.

Specifications

NOMINAL INPUT IMPEDANCE

VSWR

BANDWIDTH

LIGHTNING PROTECTION

ELEMENT MATERIAL

DISC DIAMETER

CONE—MAXIMUM DIAMETER

SUPPORT PIPE

RATED WIND VELOCITY

LATERAL THRUST AT RATED WIND

BEND. MOMENT 6" BELOW CONE

WEIGHT

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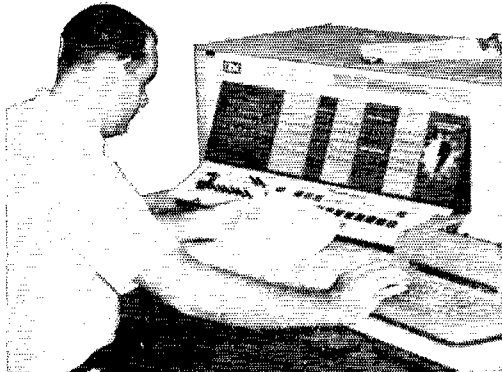
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EASTERN FLORIDA—SCM, Albert L. Hamel, K4-SJH—SEC: W4Y1T, RM C.W.; W4LUV, RM RTTY; W4RWAL, PAM S.S.B.; W4OGX PAMs: W4SDR, W4-TUB, V.H.F. PAM; WA4BMC. Sorry to see that this month the news is as scarce as it was plentiful last month. By this time I hope that W4SDR, our congenial and highly efficient manager of FMTN, has recovered sufficiently to start giving his nurses a hard time. Hi, I have seen some very good clubs in the past few years but I must take my hat off to the Jacksonville gang, both clubs. Their EC, W4GUJ is not to be sneezed at either. Sure we have many other fine clubs but I have only so much space here. Hope you all are taking advantage of HamQuest 67. You are missing a good bet if you do not and you *could* be discouraging a lot of hard-working staff members up at ARRL Hq. who are trying real hard to please you folks. Hope to see you-all at the Ham-bor-Convention at Miami in January. Traffic: (Oct.) WA4SCK 1086, W4ARQP 597, W4DFU 444, W4LE 375, W44BMC 363, WB4AJV 271, W44NEV 235, W41JH 186, K4SJK 151, W4FP 137, W4TUB 109, K4BY 77, W4AKB 75, K4BNE 74, K4KDN 74, W4GJ 73, W4PWF 69, WA4MRK 68, W4OGX 68, W44HDE 65, W4SMK 65, W4-EHW 60, WB4ATW 58, K4ILB 55, W44WZZ 54, W4NUH 53, K4DAN 52, W44DEL 44, W4GMI 42, WB4CAP 41, W4BJD 35, W44WOW 35, W4YPK 35, W44CQ 34, W44-IVE 34, W44BWE 33, W44FGH 33, W44OHO 30, W4-DVO 28, K4LPS 26, W44VZD 25, W44DDO 22, W4VWL 22, W4BKC 21, K4LEX 21, K4LNE/4 20, W44TXV 19, W4GDK 18, K4BILL 16, W4MYB 16, K4MTT 14, W4TJM 14, K4ENW 13, W4VPQ 13, W4QBY 12, W44ZEY 12, W4-BAY 11, W44YRU 10, W4VDC 9, K4EBE 8, W44LRW 8, W44DHB 7, K4FQP 6, W4LVV 5, (Sept.) W4DFU 218, W4BJD 68, K4ENW 20, K4EYV 18, W44CBM 10, W4LVV 3.

GEORGIA—SCM, Howard L. Schonher, WARZL—Asst. SCM: James W. Parker, Sr., W4KGP. SEC: W4-DDY, RM: W4CZN, PAMs: K4PKK, W44JSU, K4GHR, W44WDE, W4LRR is planning f.m. mobile. K4HAV has returned to Georgia after two years at Penn State Graduate School for Masters in EE and a tour in the service. Welcome home, Jim. W4DV/4 reports on activity at the Augusta Exchange Club Fair. W44JSU added a Swan 240 to the station for mobile work. W4HYW was active in the NET, CD and Calif., Ald., Conn. and W. Va. QSO Parties.

Net	Freq.	Time	Sess.	ONI	QTC
GSN	3595	0000 & 0300 Dy.	62	767	568
GTN	3718	2200 Dy.	30	219	70
GTAN	3855	1600 Sat. 2130 Wed.	9	69	51
GPSN	3975	1730 Dy.	31	141	62
GSSN	3975	0100 Dy.	31	950	263

Cobb. Co. AREC 145.8, NEGEN 52.250, CSC Net 145.350. The Georgia Cracker Mobile Net meets on 3995 kc, Sun. at 1800Z, K4NFP and W4AGY are active from Young Harris College. New officers of the Ga. S.S.B. Assn. are W4JCA, pres.; W44WQU, vice-pres.; W4SLP, secy.-treas.; W44JSU and W44MOC, members of the board. Traffic: W4CZN 419, W4POE 330, W44WQU 295, W4DV 271, WB4HDG 218, W4PTM 216, W4RZL 210, W44RAV 194, W4DDY 184, K4BAI 174, W44WDE 151, W44NMU/4 133, W44AJY 112, W44JSU 59, W4HYW 48, K4UUM 41, WB4DTN 30, K4NFP 29, W4HBS 20, W4VVF 13, WB4-AYP 12, W44JES 7, W44BVD 4, K4TXK 4.

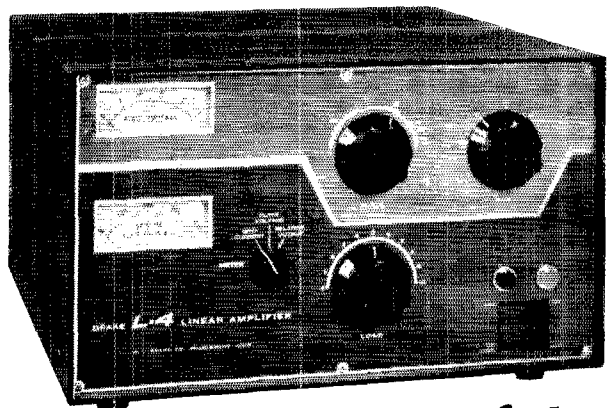
WEST INDIES—SCM, Albert R. Crumley, Jr., KP4-DV—KP4WT and KP4ANH were active during Hurricane Inez and were almost continuously passing traffic to and from H18HV in Santo Domingo. KP4ID and its operators, KP4JM and KP4BBN all contributed their efforts and stations for aid to that hurricane-ridden republic. KP4CNX, of FAA, said the side-effects of Inez, which passed about 60 miles south of Puerto Rico, resulting in winds of up to 50 m.p.h. in the San Juan area, wrecked his tower and beam. KP4ES and son kept the emergency generator prepared for possible loss of commercial power during the hurricane. KP4RA, of Arecibo, is looking around Florida and W4-K4-Land for a possible change of QTH since he has retired from the Social Security Administration. KP4TL called in San Salvador from July 30 to Sept. 8 using the call YS1ASE, KP4BQQ/O is T/Sgt. Carlos R. Hernandez, ex. KOQFL, with a QTH of 2308 B South Cyprus Drive, Grand Forks AFB, N. Dak. 58201. Traffic: KP4WT 285.

WESTERN FLORIDA—SCM, Frank M. Butler, Jr., W4RKH—SEC: W4MLE, PAM: W44FJ RM: W4BVE. Section net reports:

Net	Freq.	Time	Days	Sess.	ONI	QTC
WFPN	3950 kc.	2300Z	Daily	31	536	219
QFN	3851 kc.	2330/0300Z	"	62	---	---

The section was pleased to have W4LVV, ARRL S.E. Division Director, visit clubs in Pensacola, Panama City

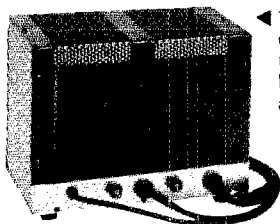
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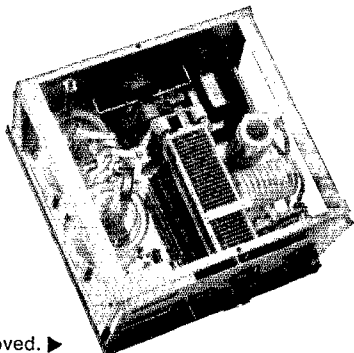
Output Impedance: Adjustable Pi-Network matches 50 ohm line with SWR not to exceed 2:1.

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Tubes: Two 3-400Z or two 8163.

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and Tallahassee. Tallahassee: LA2AD, from Norway, is a Research Associate in the Physics Dept. at FSU this winter. Chibley: W4IKB has a second station on 145.2 Mc. with antenna 150 feet high. WA4ZIM is on 2 meters. Defuniak Springs: W4COD is aiding every active ham in town to get on 2 meters. So far, K4VWE, WB4BYO and WA4IZS are on; W4APXR and W4JQZ will be soon. Panama City: The PCARC had an FB annual dinner and installed W5MPK/4, pres.: W4YUT, K2SBV/4, K4YQJ and K4MZA. Tyndall MARS members are working on 2-meter f.m. gear. K4VYF applied for DXCC. WA4FLJ operated as SVOOVR recently. Ft. Walton/Eglin AFB: W4BVE has assumed the job of QFN Net Manager. WA4IZM is now stationed at Eglin. W4AQN and W4UXW are on 2-meter f.m. W4ZGS renewed OHS, OVS and V.H.F.-PAM appointments. Pensacola: K4COE has joined QFN. K4SOI is working DX regularly on 10-meters. WN4DLX passed the General test. Traffic: (Oct.) K4VYF 414, W4BVE 139, K4RBS/4 137, WA4EOQ 85, WA4LMC 58, W4IKB 40, WA4JIM 28, WA4FLJ 19, (Sept.) K4VYF 284, K4PMO 6, K4SOI 2.

SOUTHWESTERN DIVISION

ARIZONA—SCM, Floyd C. Colyar, W7FKK—SEC: K7NII. PAM: W7CAF. RM: K7NHL. K7RUR and K7OIX are busy with OO work. K7HQI is the proud new owner of a 70-ft. crank-up tower. K7NII is building an FET 144-Mc. converter. Congratulations to W7TLG on becoming a new member of the DX Century Club. K7-UJU and K7UJV were the winners of the 75-meter transmitter hunt sponsored by the Arizona Amateur Radio Club. K7VOR, K7PLO, K7UJV, K7CEH, W7UXZ and W4DSW are doing an excellent job in getting members in the ARRL HamQuest 67 membership drive. Seven lucky winners of teletype machines awarded by the Arizona Amateur Radio Club are K7NOS, W7KYM, K7UXG, K7VOR, K7ZRC, W4TDZV and K7NNL. W4TEGZ received his General Class license. Most of the information for this column is gleaned from club bulletins and newsletters. If you or your group would like to be represented here, please send information to W7FKK. Traffic: K7RUR 10, W7DQS 4, W7FKK 3.

ARIZONA QSO PARTY

January 28-29, 1967

The first Arizona QSO Party, sponsored by the Saguaro H. S. AR Society, and approved by the Arizona SCM, will take place as follows:

Rules: 2100 GMT Saturday January 28 to 2100 GMT Sunday January 29. All W/VE amateurs are invited to participate and only single transmitter class, both single and multioperator, will be considered for awards. Arizona stations count one point per QSO multiplied by the number of states, provinces and countries. Out of state stations count five points per contact with all Arizona stations ONLY, multiplied by the number of Arizona counties worked. Exchange contact number, signal report and state, province and country. Arizona stations send signal report and county. An extra 100 points bonus will be given to each station is substantial proof of ARRL membership can be provided. (This bonus will be added on at contest Headquarters). A certificate will go to the top two scorers from each state or province and to the top four from Arizona. Logs must show date and time in GMT as well as contest number signal report and location. Totals must be made on the last log sheet for credit. Suggested frequencies: c.w.; 7025 7075 7160 7180 3750 3665 14010 14005 21105 21110 28010 28100; a.m. 3880 7285 14220 21300 28500; s.s.b. 3900 3995 7225 7245 14275 14325 21350 21400 28600 29000. Reports must be sent promptly to WA7CNP, c/o The Saguaro H. S. AR Society, 6250 N. 82nd St., Scottsdale, Arizona, 85251.

LOS ANGELES—SCM, H. G. Garman, W6BHG—Asst. SCM/SEC: W. R. Calkins, W1KUX/6. RMs: W6-BHG, W6QAE, W6BBO. PAMs: K6MTDD, W6MLZ, W6ORS, BPLers for Oct.: K6EPT, K6IOV, W6GYH, W6-TXJ, W6VPE, W6ATWS, W6BBO, W6BKIL, W6QUD, W6QXY, W6QNY got a Seneca 642 transmitter for his birthday. K6IOV is rebuilding for 2 through 160 meters including a half-gallon linear. W6BTV is constructing an antenna for 2 meters. W6AEL received his WAS certificate. W6HUJ is assembling a Heathkit SB-100. W6-NAA is working on the mobile ham-shack/house car. W6CXC is busy arranging his round-the-world trip for next year with possible M/M operation. Newly-elected officers of the So. Calif. Chapter, QCWA, are W6PIF

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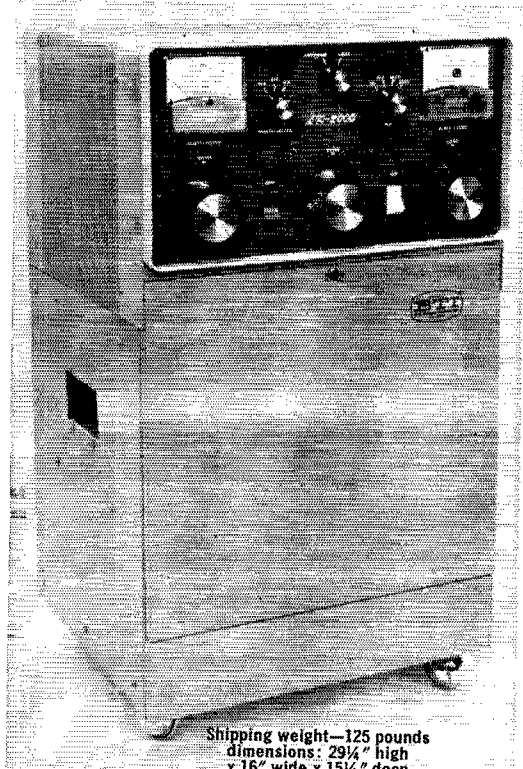
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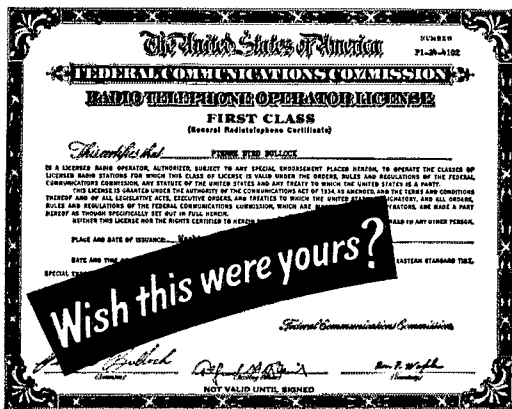
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chairman; K6GMA, vice-chairman; K6GIL, secy.-treas.; W6GH, historian; K6HV, director-at-large. K6HV operated aeronautical mobile in a single engine airplane, Los Angeles to Miami and return. The Inglewood Club is sponsor of the LA Board of Education teaching Amateur Radio in Space Museum, Exposition Park. W6QRS is mobile on 40 meters. W6PUZ is building toward the next Oscar launch. W6SRE is QRL traveling. W6LLI has converted the APX-6 on the 1215-Mc. band. W6GAG is busy with a new QTH. W6ZLO operates 1.8 through 1215 Mc. all bands and has gear ready for the 2400- and 10,000-Mc. bands. W6SLG is attending LA Valley College full time. Amateur Radio in Experimental Satellites (ARIES) is submitting for a corporation status, non-profit. Mailing QTH-ARIES, Inc., Box 3083, Van Nuys, Calif. 91407. W6OZ is at RCA Coastal Station KPH, Point Reyes, Calif. after getting his radiotelegraph 2nd-class license. Anyone wanting contact with W6OZ should try 7255 kc. during daytime hours. W6YKP is studying for the radio-telegraph 2nd-class license. Support your section level nets; EBN, Mon. through Fri. at 1615Z and Tue. through Sat. at 0230Z on 50,500 kc.; SC5, daily at 0230Z and 2000Z on 50,400 kc.; SCN, daily at 0300Z on 3600 kc. Net Managers of these nets are EBN, K6MDD; SC5, W6OFJ; SCN, K6IME. Traffic: (Oct.) K6EPT 1280, W6GYH 1076, WB6BBO 849, WB6QXY 798, K6IOV 530, W6WPF 488, WA6TWS 376, W6QAE 321, K6-MDD 200, WA6KZI 170, WB6KIL 167, W6TXJ 157, W6FDM 140, WA6KWV 139, WA6WKF 135, K6CDW 121, WB6QGM 118, WA6UCR 112, K6BPC 110, WB6OUD 109, WB6HG 95, K6ASK 59, WA6VFM 55, WA6TYR 53, W6BTY 48, W6DQX 42, WB6AEL 32, WA6WJT 21, WB6GK 20, WB6QMF 16, W6HUJ 16, W6NAA 14, W6PCP 11, WB6-GGL 9, W6LVQ 8, W6USY 8, W6TN 7, W6MLZ 5, W6-DGH 4, K6UMV 4, W1KUX/6 3, K6EA/6 3, W6QJW 3, WB6QJW 3, K6LJ 2. (Sept.) WA6WJT 5.

ORANGE—SCM, Roy R. Maxson, W6DEY—RM WA6ROF reports full participation in the NTS during the SET. EC W6TAG reports a successful SET with RACES and the Red Cross. SEC W6WRJ and EC WB6-QAK advise that for SET purposes 6 mobiles and one portable station furnished communications for the Tustin Tiller Days Parade Oct. 15. W6BAM, W6WRJ, WB6NRB, W6NCP, K6JWS/8, K6JBG, W6FMI and K6BYE all made a good showing in the recent FMT. W6EOO is the new call of ex-W7SMB/6. WA6EWM, MC of the Little Acorn Net, 7243 kc., is touring the Midwest, courtesy of WA6-FKU and WA6GS. Very informative OVS reports were received from K6HJJ and WB6PHO. Asst. SCM, W6JQB and his XYL attended the Fall QCWA Dinner at Long Beach. WA6QMI is rebuilding the shack. Many Orange section hams plan to attend the S.A.R.O. The AREC Net meets Sun. at 9 a.m. local time on 3965 kc. EC WB6QAK invites all section members and interested amateurs to attend sessions. PAM WA6LDN's new QTH is Fullerton. W6DEY and W6PJJ attended the 28th Anniversary of the Inglewood ARC. Traffic: K6MICA 760, WB6JFO 501, WA6ROF 337, K6IME 198, WA6QQM 101, WA6TAG 32, W6WRJ 25, WB6MVU 16, WB6NGE 12, K6YVN/6 3, W6PQA 2.

SAN DIEGO—SCM, Don Stansifer, W6LRU/WA6-VUI—Here follow the ARRL appointments effective in the section as of Dec. 1: SCM: W6LRU/WA6VUI. Asst. SCM: W6BEU. SEC: W6SK. Asst. SEC: W6VNM. ECs: San Diego County CD and RACES, W6MHY; North County, W6NDH; Eastern District, W6KSA; Central District, K6KX; Imperial County, W6DLN; 2-meter a.m., WA6TAD; 2-meter f.m., WA6OSB; ARPSC c.w. nets, W6BGF; 75-meter mobile, W6TAI; 10 meters, WA6TWP. PAM: W6GMM. RMs: W6BGF, W6EOT, W6VNO, QRS: W6EOT, W6VNO, QVSs: K6BTO, W6-NZX, WA6OSB, WA6UEL, WB6NMT. OBSs: K6BPI, K6YRF, WA6TAD, WA6QAY, W6LRU. OOs: W6CAE, W6SK, W6LRU, K6EC and K6ENX. W6ID is doing an outstanding job in the ARRL Intruder Watch. The San Diego County Ham of the Year Award Dinner and Presentation will be held in February. This event is sponsored by the SOBARS in cooperation with the council of amateur radio organizations. Newest OVSs are W6NXZ and WB6NMT. WB6MPD helped on communications for the Julian Apple Day Parade. W6BKZ worked a ZL on 75 meter s.s.b. en route a vacation in Oct. WB6NMT is active in the SCS Net on 30.4 Mc. Traffic: K6BFI 10,458, W6EOT 846, W6BGF 743, W6VNO 665, WB6NMT 350, WB6SQF 103, W6BKZ 18, WB6MPD 9, W6YZD 2.

SANTA BARBARA—SCM, Cecil D. Hinson, WA6-OKN—The planned 6-meter repeater in the Simi Valley is going well with the current effort being devoted to the 432-Mc. control link. K6GOS (president of the Simi Valley ARC) and WB6GWX, using a hilltop location, have worked San Francisco on 6, 2 and 220. WB6MFF recently moved to Thousand Oaks and has joined the Simi Valley ARC. WA6KLA attends the Simi ARC even though he now lives in L.A. WB6MHL has a new Galaxy 5 on order.

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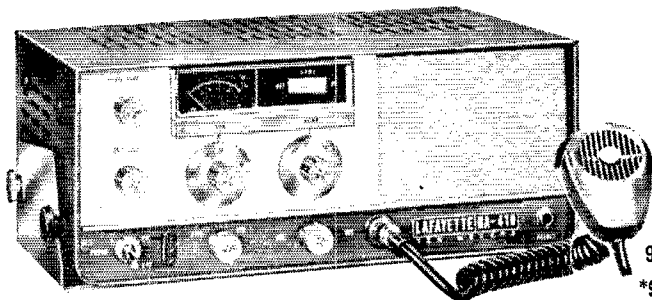
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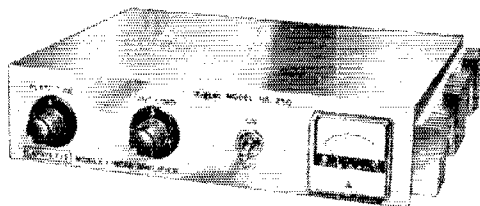
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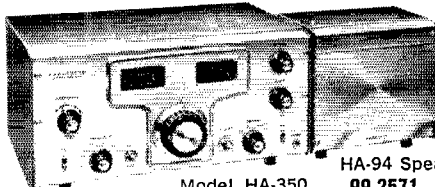
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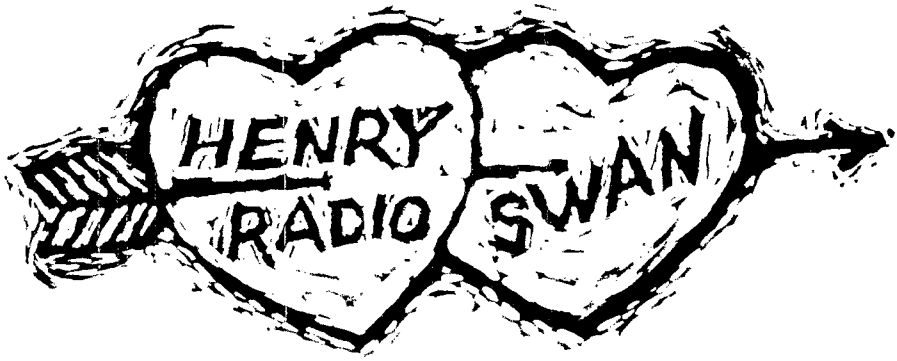
WB6IFK sent his Swan 350 back to the hospital. W6VUV is building a linear with 3-400's to pump more r.f. to the four-element quad. WB6MPJ is leaving for Viet Nam. The Satellite ARC has designed a plaque to honor the memory of J. C. Lewis whose call, W6AB, is now the club call. New appointment: K6GOS as OVS. Cancellation: WB6DRY as ORS. Traffic: W6AMH 16.

WEST GULF DIVISION

NORTHERN TEXAS—SCM, L. L. Harbin, W5BNG —Asst. SCM: E. C. Pool, W5NFO. SEC: W5PYI. PAM: W5BOO. RM: W5LR. On Oct. 20 I attended the meeting of the Waco ARC and was pleasantly surprised at the attendance. This is an old club that has been doing things and has the support of the city in that they have a club house and equipment furnished jointly with the civil defense organization. New club officers are W5OMQ, pres.; K5KVE, vice-pres.; K5MBB, secy.; W5GLY, treas.; K5ZYQ, chairman of the ARRL membership drive. On Oct. 30 I attended the Brownfield Annual Swapfest. More than 500 attended with plenty of gear swapping and eye-ball QSOs. W5PYI was very active in recruiting the following ECs for this West Texas area: W5DXT for Bailey County. W5DJW for Hale County. W5TUW for Lubbock County. W5SHL for Ector County. K5AVG Swisher County and K5RZN for Lamb County. To the amateurs in these counties: Please give these appointees your full cooperation. Arlington ARC members took part in a Spook Patrol and received the thanks of the City of Arlington for their help. The Arlington ARC is holding its annual Novice school and has 16 students. The Dallas ARC held an Old-Timers Night Nov. 1. W5-QKF, West Gulf Division Director, attended. Traffic: K2FIU/5 605, K5DBJ 203, W5ADH 201, K5LGU 76, K4UBR/5 66, WA4PDM/5 37, WA5PBN 15.

OKLAHOMA—SCM, Daniel B. Prater, K5CAY—Asst. SCM: Sam Whitley, W5WAX. SEC: K5ZCJ. RM: W5-QMJ PAM-75: W5BTOQ. PAM-6 Meters: K5VFR. PAM 2-Meters: W5LBI. There was a very good turnout over the state as a whole during the SET. Reports were good on the different area activities and traffic was heavier than any year in the past. Thanks to the many ECs who worked out in the test and held the SET. W5MFX is doing fine after surgery again. W5KZA is mobile with an Eico 758 now. W5QXY is on the air with the help of K5OOV. K5TEY is using a Galaxy III now. The Aeronautical Club at City worked with the FAA in the communications test with good success. W5KNR is back from Thailand and operates from Moore with a new T-4X and 2-B. W5QMJ put out a very informative traffic bulletin recently for operators who work 3682.5. Congratulations to K5KHA and K5INC on their FMT report of 3 to 19 cycles. W5WAX has his 432 antenna up and is looking for contacts. W5HXK is back on the road to recovery after a heart attack. Traffic: K5TEY 2994, K5ZCJ 338, WA5NTI 140, WA5KZA 99, W5QMJ 87, W5PALL 69, W5-MFX 55, K5DLP 54, W5UYQ 47, K5CAY 38, W5FEC 33, WA5IMO 33, WA5OHX 28, K5OCX 18, WA5FVJ 16, K5-WPP 16, W5PKL 13, WA5DZP 8, WA5MDN 7, W5EHC 6, K5OOV 6.

SOUTHERN TEXAS—SCM, G. D. Jerry Sears, W5-AIR—SEC: K5QQG. PAM: W5KLV. K5ANS formerly an RM, has moved to the West Coast. A new RM is needed for this section. A great deal of activity in Southern Texas was centered around the southern area when Hurricane Inez moved in. TEX as State RACES and the Gulf Coast Hurricane Industrial Networks were in operation, along with other emergency nets on an alert if needed. PAM W5KLV expresses appreciation to all stations not participating in the hurricane emergency for their help in keeping the frequencies clear. He says, without exception, they were perfect gentlemen. W5KTC passed weathercasts to the SS *Iniges*. K5OID, a San Antonio Police Patrolman, helped with communications to Peru during the recent earthquake. Many Southern Texas clubs had their SET plans changed when Hurricane Inez threatened Brownsville, and immediately turned to the real thing rather than a Simulated Test. The San Antonio Club is holding code and theory classes at the Red Cross Chapter House. The club recently expanded for civil defense and now has 140 students. EC W5DAA advises that the Kingsville ARC was ready for Inez. Best of health to the fellows just out of the hospital, W5VW, W5EMW and WA5-CPW. The Houston ARC and Southmost ARC both had enjoyable hamfests late in Oct. and early Nov. New OPSs are WA5BSD, W5VCE/W5OBC, K5QQG, K5WYN and K5GJQ. WA5AUB has a new Swan 350 and is collecting gear for a 2-meter repeater. The TEX Traffic Net is perk'ing up some. Come on in, fellows, on 3770 kc. at 1900 and 2200 CST. Old-timers in the Houston area have a dinner meeting at the GEO Club the first Wed. of each month. All are members of the QCWA. You old-timers, join us. Traffic: K5HZR 230, W5BGE 171, WA5MXY 166, WA5KMY 106, K5QQG 101, W5AIR 54, W5HWY 39, W5-KLV 59, W5AQN 36, W5TFW 22, K5HMF 17, WA5LAV 13, K5LQJ 13, W5ABQ II, W5JKB 10.

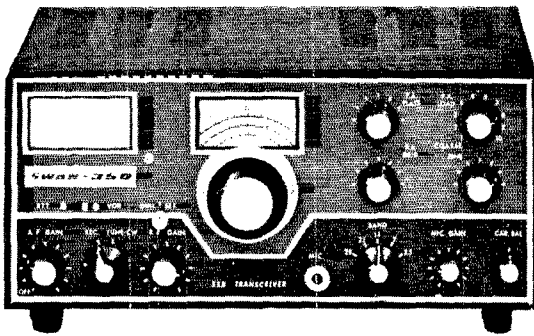


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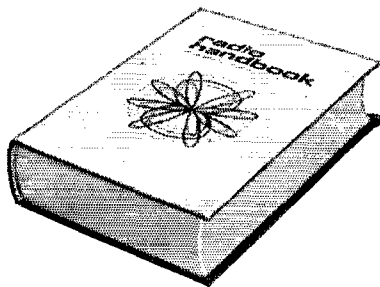
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ALBERTA—SCM, Harry Harrold, VE6TG—SEC: VE6PK, PAM APN; VE6ADS, PAI S8BN; VE6ALQ, ECs: VE6SA, VE6SS, VE6XC, VE6AFQ, ORSs: VE6BR, VE6ATH, VE6ATG, OPs: VE6HM, VE6SS, VE6ADS, OOs: VE6HM, VE6TY, VE6AKV, OBSs: VE6HM, VE6-AIF. It is with regret that we mention the passing of KYL VE6AFQ. Calgary has a 2-meter net going now, and also will give lessons on traffic-handling. Look for the Vulcan gang on its 2-meter net Sun. at 2230 MST. Liaison is working with NWSBN and the NW Eye Bank Net very well. City Police in Lethbridge and Calgary thank the boys for their support on Halloween. APN and ABSN are doing very nicely these days. Our two new ORSs are working out very well, so keep it up, Donez and Cal. VE6OW still is busy mobiling around the country. VE6-XC is busy chasing around for EMO, he may drop in on some of you. VE6AAI is checking the nets quite regularly on c.w. What happened to the phone ticket Emma? Traffic: VE6ATH 14, VE6NC 134, VE6PK 80, VE6HM 50, VE6AKV 14, VE6SS 9, VE6AKD 8, VE6AKQ 7, VE6-AFQ 6, VE6AKA 6, VE6KS 6, VE6SA 6, VE6TG 5, VE6-WN 4, VE6AFJ 2, VE6AHV 2, VE6AOO 2, VE6FS 2.

BRITISH COLUMBIA—SCM, H. E. Savage, VE7FB—VE7BLO has been keeping schedules with our WX ship *Stonehouse*. VEOMC, VE7QF did very well in the Sept. FMT. Nanaimo ARC is preparing for a busy winter session. Powell River ARC also is setting things into motion for code and theory classes. RM VE7QQ has changed jobs. West Kootenay ARC's monthly news letter shows good club activity. The club holds a net the 1st Tue. night on 3745 kc. North and West ARC has a very nice certificate, "Centennial 1967." To obtain this B.C. amateurs must work ten club members. Outside of B.C. you need work only five. Send proof of work to VE7BQN. VE7KY now is active on 2 meters. Chilliwack ARC's new officers are VE7BTF, pres.; VE7RS, vice-pres.; VE7-BHG, secy. The club's s.s.b. exciter is completed. VE7-BFZ up and married and moved away. VE7BEN and VE7BOK have each wired an *Eico 753*. For QSL cards, Centennial issue, fifty per amateur, mail an envelope with postage to Jim Smith, c/o Burnaby ARC, P.O. Box 83, South Burnaby, Vancouver. ARC's officers are VE7AGX, pres.; VE7FB, vice-pres.; VE7APU, secy. The Slow-speed Net meets on 3650 kc. at 0300 GMT. Here is the beginning of your entrance into traffic-handling. Have no fear of errors or speed. This is open for you to start. Please come and join us. Our Net Manager, VE7ASY, welcomes all comers. Traffic: VE7ASY 339, VE7BLO 111, VE7BAV 43, VE7BCJ 20, VE7SE 5, VE7BOQ 3.

MANITOBA—SCM, John Thomas Stacey, VE4JT—MTN was active during the SET but RM VE4EI reports that the traffic volume was low. The Flin Flon gang, headed by VE4NW, carried out a very successful simulated emergency test of its own serving Red Cross, EMO and various town departments. VE4PW is getting tower and antennas in shape for winter operating. OVS certificates have been issued to VE4RE and VE4HI. VE4SC is on the mend after surgery and reports the DX was never better. VE4LI is busy stringing antennas and working DX at 3 A.M. from the RCAF barracks. VE4NE is active in the Inter-Provincial S.S.B. Net at 0200Z on 3770. VE4-EL has an Adventurer on the air. The Brandon ARC has applied to DOT for the call VE4QD to perpetuate the memory of Barney, who recently became a Silent Key. VE4DQ is manager of the Central section of the Trans-Canada ARPSC Net and VE4XN is active in the same net as NCS. VE4DQ has returned from Japan where he reported eye-ball QSOs with several JAs. MTN reports sessions 32, QNT 204, QTC 180. The use of the new Centennial call 3C4 will start Jan. 1, 1967. Remember, that is 0801Z and not 0001Z. Traffic: (Oct.) VE4JT 182, VE4LG 130, VE4NE 111, VE4EI 91, VE4SC 32, VE4CN 24, VE4-RW 14, VE4QJ 11, VE4DL 10, VE4XN 9, VE4CS 6, VE4-AN 2, VE4EG 2, VE4QJ 2, VE4OL 2, VE4TE 2, VE4MK 1. (Sept.) VE4GN 12.

MARITIME—SCM, J. Harley Grimmer, VE1MX—Asst. SCM: R. P. Thorne, VO1EL, SEC: VE1EJ. This is my first report as SCM and I wish to thank those who nominated me. I will do my best to further amateur radio and ARRL activities in our section. On behalf of all members in the Maritime section I offer our sincere thanks to VE1WB for a job well done over the past ten years. All VE1s are minded of the VE1 Contest to be held Jan. 21-22, 1967. VE1WL has a new 30-ft. tower for his three-element tribander and five-element 2 meter beams. Your support of APN is requested daily on 3653 at 0000Z. Recent visitors to Newfoundland were VE3DTX and VE8PZ. VO1AW is now operating on board the M.V. *Lief Eriksson* as VE0MD. Traffic: VE1RT 87, VE1DB 51, VE1AAX 30, VE1OM 17, VE1PZ 10, VE1AAW 9.

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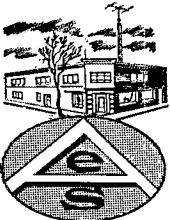
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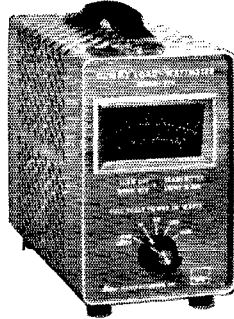
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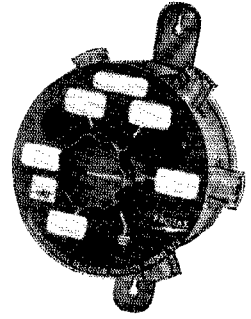
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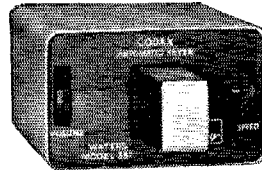
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THIRTEENTH ANNUAL VEI CONTEST

Jan. 21-22 and 28-29, 1967

All VEI amateurs are invited to participate in a contest sponsored by the New Brunswick Amateur Radio Association. The contest is divided into two sections, phone and c.w. The highest scoring contestant in each section will be awarded permanent possession of an engraved cup, the NBARA Trophy. A special certificate of recognition will be issued to any participant submitting logs showing 25 or more valid contacts.

RULES: 1) The c.w. contest will begin at 2400 GMT Saturday, Jan. 21 and end at 2400 GMT Sunday, Jan. 22. 2) The phone contest will begin at 2400 GMT Saturday, Jan. 28 and end at 2400 GMT Sunday, Jan. 29. 3) Any and all amateur bands may be used but only c.w. to c.w., or phone to phone contacts will count. Any contestant may participate and be eligible for awards in both sections. 4) The same station may be counted but once for credit (in each section) regardless of band used. Mobile, portable, and home stations covered by the same station license constitute the same station. 5) The general call is "CQ VEI." 6) Exchange signal reports, county, province, and operator's name. Local QTH is not required. 7) Logs should show band, type emission, signal reports, country, province, time, and date. Logs not showing this information IN FULL will be disqualified. 8) Score one point for information received and one for information sent and confirmed. Multiply total points by the number of individual counties worked in the three provinces to determine final score. For contest purposes Sable Island will be classed as part of Halifax County. 9) Decisions of the contest committee will be final. Logs must be postmarked not later than Feb. 6 and should be in committee hands not later than Feb. 14. Forward all entries to: Contest Committee, P. O. Box 366, St. Stephen, N. B., Canada.

ONTARIO—SCM, Richard W. Roberts, VE3NG—The recent SET was a great success. Messages were passed to all SCMs in the U.S.A. and Canada. A message was passed to our Prime Minister in Ottawa, to President L. B. Johnson in Texas and to General U. Thant of the United Nations in New York. Receipts have been received by mail. Many more messages were passed from Red Cross officials, some EMO, and from our own operators to ECs and the SEC. VE3AKL is now in Toronto. VE3ATI, on behalf of the North Shore ARC of Oshawa, was host to the local scouts during the On-the-Air Jam-boree. The Grey Bruce ARA sent eight delegates to the Ontario Division Convention held in Sept. at Niagara Falls. When writing this column I have to think ahead as there is quite a lapse until you read it. The Trilliums complained that they were not mentioned for their FD effort. Ladies, to be sure you were. See page 154 Nov. QST. Ontario news. VE3CU is now QTH Barrie. The London ARC published some FB pictures in its Oct. club paper. These were taken at the club's recent picnic. Renfrew ARC visited the RCA Victor plant in Renfrew recently. We regret the passing of VE3EUH, of Kitchener. He was president of the K-W. ARC. The Lakehead gang is a busy group although we do not hear too many of the members on the air down here in the southeast. We learn from the Peel ARC that VE3SG is in the body shop. Hurry back, Fred. The Nortown ARC has a snappy new cover for its paper. *Nortownics*. The Hamilton ARC held its annual picnic early in October. Happy Holidays. Traffic: VE3BWM 303, VE3DU 158, VE3GCE 143, VE3NG 140, VE3DPO 132, VE3ATI 115, VE3GI 93, VE3AWE 91, VE3EAM 90, VE3CYR 83, VE3EBH 72, VE3DGB 63, VE3EBC 53, VE3FHV 40, VE3CCB 39, VE3ETM 38, VE3AUU 35, VE3BLZ 35, VE3DVE 30, VE3DBG 29, VE3BUR 20, VE3DMU 19, VE3EHL 17, VE3FGV 15, VE3VD 6.

QUEBEC—SCM, J. W. Ivey, VE2OJ—SEC: VE2-ABV, RM: VE2DR. A Happy New Year to all; a year filled with such good things as the ARRL National Convention and the Worlds Fair in VE2-Land. Montreal EC VE2ANH did a fine job during a disastrous explosion at a chemical plant. With the help of VE2KAL, VE2BWS, VE2BML, VE2XO, VE2DCS, VE2BQP, VE2BOQ, VE2-AYD, VE2BAIS, VE2SH communication was maintained. For all traffic-minded, as well as ARRC-minded, amateurs, let's have all the ideas about next year's SET he-



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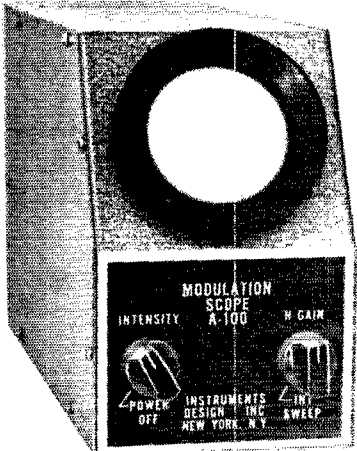
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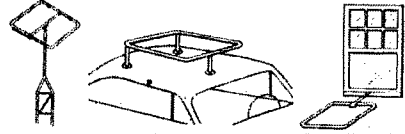


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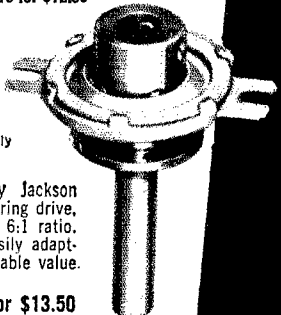


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fore it is too late. VE2VV is doing a big job for Ham-Quest 67 and our hopes are for many new League members. A recent meeting of the MARC included a good talk on high-frequency cooking by VE2DAY. Ex-VE2YA has returned from VE1-Land and is now VE2AJ. For those who may be strangers to 2 meters you will find VE2BZH (a regular QVS reporter), VE2BK, VE2JO, VE2BTS and VE2AGK with a new mobile. VE2TT, VE2OK, VE2CK, VE2ALE and VE2BZH helped test the Ottawa 2-meter repeater from Mt. Rigaud. The repeater at Three Rivers, VE2CTR, is in full operation. Le nouveau bureau de direction du Radio Club de Quebec, Inc.: VE2AYN, pres.; VE2BEP, vice-pres.; VE2DBF, secy.; VE2AAG, treas.; VE2GF, VE2NK, VE2AB, VE2IM and VE2ASU, directeurs. VE2's loss is VE3's gain—VE2TY is now VE3GML in Toronto. Traffic: VE2DR 137, VE2AGQ 127, VE2BRD 75, VE2OJ 57, VE2BGJ 30, VE2EC 20, VE2NT 7.

SASKATCHEWAN QSO PARTY CELEBRATING CANADA'S CENTENNIAL

January 8, 1967

All radio amateurs are invited to participate in the Saskatchewan QSO party sponsored by the Regina Amateur Radio Association.

Time: 0001 GMT January 8 to 0001 January 9, 1967. Call: CQ VE5 (or 3C5) or CQ Saskatchewan.

Exchange: Saskatchewan stations will send a QSO number, report and QTH. Outside stations will send QSO number, report and state or province.

Scoring: VE5/3C5 stations count one point per outside contact and multiply by the number of states and provinces worked. Outside stations count 3 points per Saskatchewan contact and multiply by the number of different QTHs worked.

Phone (a.s.b. or a.m.) counts as a separate contest. Only one contact per band with the same station is permitted. There are no power restrictions.

Awards: Certificates will be awarded to the top scoring station from each state/province. The top five Saskatchewan stations will also receive certificates.

Frequencies: 3560, 7050, 14075, 21050, 28050, 3850, 7250, 14250, 21300, 28550. Entries: All entries shall be sent to: 2117 McPherson Avenue, REGINA, Saskatchewan, Canada. Closing date is January 31, 1967.

A Two-Tube 75-Watt Transmitter

(Continued from page 38)

length of 50-ohm coaxial line. The transmatch should be adjusted as outlined in the above-mentioned article. The reflectometer built into the rig is used for indicating the correct transmatch adjustments. Once the transmatch is adjusted so that the rig "sees" a 50-ohm load, the meter can be set in the forward position and R_2 adjusted so that the meter reading is about half scale; then C_6 and C_7 should be adjusted for maximum output. The greater the meter reading, the more output.

This, of course, leads us up to the point of maximum input for a Novice, 75 watts. Check the plate current from time to time as you make the adjustments to C_6 and C_7 , to make sure that you are not exceeding the legal input. (Input is figured by multiplying the plate current by the plate voltage.) TV transformers will vary as to output voltage, but it should be somewhere between 350 and 450 volts. If you find you cannot get below 75 watts input—and this is possible—change V_4 to a 0B3/VR90. This will lower the screen voltage on the amplifier and reduce the input. Of course, after you get your higher-grade license you can run as much as the

(Continued on page 138)

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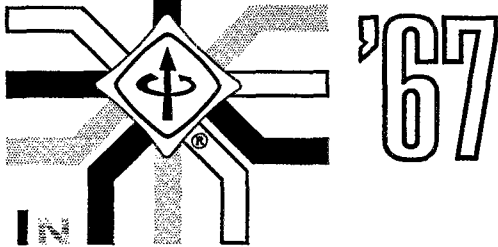
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Silent Keys

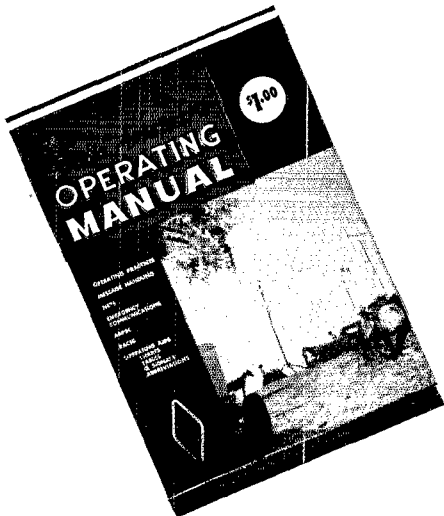
It is with deep regret that we record the passing of these amateurs:

- W1BD, Roy L. Gale, Barre, Vt.
- W1CFE, George W. Korper, Woodbridge, Conn.
- W1CJD, Philip Gildersleeve, Portland, Conn.
- W1DWT, Clyde F. Smith, Bristol, N. H.
- ex-W1HPW, William T. Smith, Medford, Mass.
- W1IK, Thomas F. Keena, Farmington, Conn.
- W1KNO, Joseph C. O'Shea, Saugus, Mass.
- K1LDA, Albert W. Armstrong, Clinton, Mass.
- W1UL, George D. Preston, East Stoneham, Me.
- ex-W2AOI, John Eichman, Jr., Buffalo, N. Y.
- W2CPH, Frederick C. Winter, Oradell, N. J.
- W2EAO, Edward Klarfeld, Newark, N. J.
- WB2CT, James Sheely, College Point, N. Y.
- K2PGI, Lester Ludwig, Fords, N. J.
- K2UFG, Leroy Burke, Schenectady, N. Y.
- WN2VUA, James T. LeGrand, Clementon, N. J.
- W2ZAA, Robert C. Lunik, Port Washington, N. Y.
- W2ZM, Ralph G. Barber, Locust Valley, N. Y.
- WA2ZWM, Elwood Shafer, Oswego, N. Y.
- W3PBW, Richard L. Dolecek, Washington, D. C.
- W4BS, Nobel W. Guthrie, Memphis, Tenn.
- W4CAK, Claude A. Pennington, Ben Hur, Va.
- W4DEK, Peter B. Nold, Delray Beach, Fla.
- K4GRZ, Charles H. Belcher, Christiansburg, Va.
- W4IYR, Alvah N. Cole, Norfolk, Va.
- W4JQJ, Harvey J. Warner, Pompano Beach, Fla.
- W4NAS, George R. Wilson, Evergreen, Ala.
- W4OED, Donald L. Purcell, Burlington, N. C.
- W4SNZ, Andrew J. Jones, Hendersonville, Tenn.
- WA5DNJ, Clifford B. Rial, Belden, Miss.
- W5EPT, Eugene B. Davis, Jackson, Miss.
- W5FYO, Alton C. Heske, San Antonio, Texas
- WA5KSZ, William H. Wiggins, Batesville, Miss.
- W6BOG, Harvey A. Drake, Redding, Calif.
- W6ETI, Loren H. Nelgen, Hesperia, Calif.
- K6EXX, Charles F. Lord, Panorama City, Calif.
- W6KK, George G. Glade, Tujunga, Calif.
- W6JJK, Robert W. Michael, Sacramento, Calif.
- W6LPC, Robert H. Meyer, Oakland, Calif.
- W6NS, Paul Hair, Campo, Calif.
- W6NYS, Joseph A. Pierce, Sunnyvale, Calif.
- WA6SHU, John E. Azbill, Paso Robles, Calif.
- W6TUL, Mike M. Strbova, Lawndale, Calif.
- W7IKM, Paul E. Grass, Bainbridge Island, Wash.
- W7IOA, Edgar N. Simpson, Avondale, Ariz.
- K8CQJ, John J. Thornton, Cleveland, Ohio
- WA8NLI, Edwin A. Quarnstrom, Charleston, W. Va.
- W8WMO, Oakie R. Hess, Pratt, W. Va.
- W9BGC, Joseph C. Juel, Wonder Lake, Ill.
- K9BOF, Loren J. Keller, Anderson, Ind.
- K9FLJ, William E. McNely, Champaign, Ill.
- W8AA, Arthur C. Andersen, St. Paul, Minn.
- W8RVN, Henry L. Perkinson, St. Louis, Mo.
- W8SQN, Theron G. Pedrick, Ottumwa, Iowa
- DJ1HU, Otto Gerspacher, Waldprechtsweyer, Germany
- DL3JJ, Hans Plisch, Viernheim/Hessen, Germany
- VE1AOT, Fred F. Welsford, St. John, N. B.
- VE2BYO, Jacques Tardif, Saint Michel, Que.
- VE3BF, Lou W. Lodge, Scarborough, Ont.
- VE3EUH, John Lubenkov, Elmira, Ont.
- VE3PW, E. E. Thompson, Willowdale, Ont.
- VE7FG, H. John Locking, Kelowna, B. C.
- VO1AU, George Tucker, St. Johns, Nfld.

Because of the need for accuracy in our "Silent Keys" listing, please send all notices to the ARRL and include both name and call of the deceased.

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rig will take, probably something more than 100 watts input.

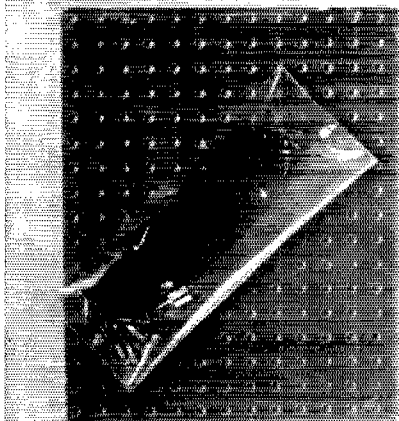
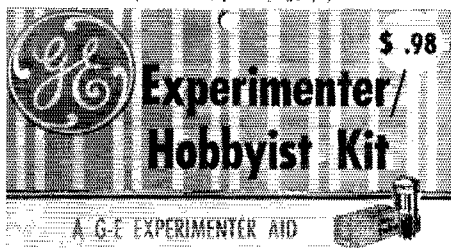
In weak signal areas it may be necessary to install a low-pass filter in the line feeding the antenna system. The low-pass filter will serve to attenuate any harmonics that otherwise might reach the antenna. A simple inexpensive filter is described in *Understanding Amateur Radio*.⁴

QST

⁴ *Understanding Amateur Radio*, page 215.

New Apparatus

(Continued from page 49)



The terminal board kit, model ETR-4288, is available for less than \$1.00 from most General Electric component distributors.

— W1YDS

Novice Roundup

(Continued from page 55)

3) **QSOs:** Contacts must include certain information sent in the form as shown in the example. QSOs must take place on the 80-, 40-, 15-, or 2-meter bands. Crossband contacts are not permitted. C.w. to phone, c.w. to c.w., phone to phone, phone to c.w. contacts are permitted. Novices work any amateur stations eligible; non-Novices work only Novices. Valid points can be scored by contacting stations not working in the contest, upon acceptance of your number and section and receipt of a number and section.

A Novice may operate in the Novice portion of the competition until he receives his General Class License, then must operate as a non-Novice entry.

4) **Scoring:** Each exchange counts one point. Only one point may be earned by contacting any one station, regardless of the frequency band. The total number of ARRL sections (see page 6 of this QST) worked during the contest is the "section multiplier." Yukon-N.W.T. (VE8) also counts as a multiplier. A fixed scoring credit may be earned by entrants who hold ARRL Code Proficiency certificates. If an entrant does not hold a CP award he can apply for credit by attaching to his Roundup report a copy of quali-

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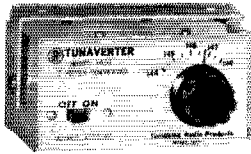
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6 meters	504	49.5-54.5 mc	1500 kc	\$29.95 ppd	
2 meters	1450	144-150 mc	1500 kc	\$29.95 ppd	
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fying run from W60WP, January 5, or February 3, or from W1AW, January 17 or February 15. CP credit equals the w.p.m. speed indicated on the latest certificate or sticker held by the entrant. The final score equals the "total points" plus "Code Proficiency credit" multiplied by the "section multiplier."

5) *Reporting:* Contest work must be reported as shown in the sample form. Reporting forms and a map of the United States will be sent gratis upon request. Indicate starting and ending times for each period on the air. All Roundup reports become the property of ARRL and must be post-marked not later than March 3, 1967.

6) *Awards:* A certificate award will be given to the highest-scoring Novice in each ARRL section.

7) *Disqualifications:* Failure to comply with the contest rules or FCC regulations are grounds for disqualification. ARRL Contest Committee decisions are final. **QST**

Recent Equipment

(Continued from page 46)

current are beyond the maximums mentioned the HD-10 can be used to control an external relay or keyer tube, which in turn can key the transmitter.

The power supply is built-in and operates from the 115-volt line. An isolation transformer is connected between the line and the rectifier diodes, preventing the keyer chassis from being common to one side of the a.c. line. One of the rectifier diodes is connected to provide — 16 volts while the remaining rectifier furnishes + 19 volts to the circuit. A battery pack can be used to operate the HD-10 by connecting a 45-volt battery (with 22.5-volt tap) to the terminals provided on the rear of the keyer, or two 22.5-volt batteries can be used.

Some of the Features

The slide switch on the front panel has three positions. The left-hand setting turns the power supply off. The center position places the keyer in the OPERATE mode. When the switch is all the way to the right, HD-10 is in a HOLD condition, enabling the operator to tune up the transmitter.

Wiring instructions are given which show how to connect the circuit for either right- or left-hand operators. Also, the keyer can be changed over for automatic-dot and manual-dash operation by changing jumper connections on the rear terminal block. This permits simulated bug-key operation.

The color scheme of the cabinet matches that of the newer Heath equipment. The panel is finished in light green and the outer cover is painted dark green. Because the case is made from heavy-gauge steel stock, the assembly is quite heavy and will not creep about on the operating table as most keys are prone to do. Rubber feet, mounted on the bottom of the case, aid further in keeping the HD-10 anchored to one spot on the table.

Operation from 230 volts a.c. is possible by opening up one side of the a.c. line cord and inserting a 0.068- μ f., 600-volt capacitor in series with the line. This lowers the input voltage to the keyer to 115 volts at the primary of the HD-10's power transformer. — *WICER*

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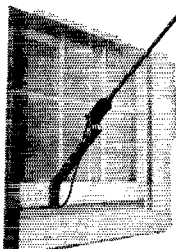


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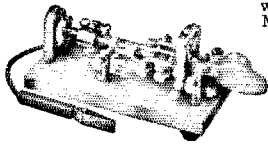
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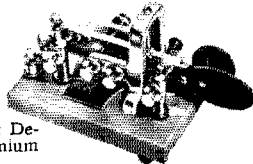
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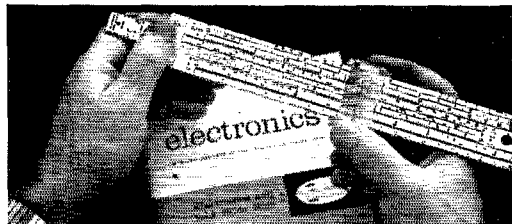
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Modeling Radiation Patterns

(Continued from page 33)

plane model does agree fairly well with the scale model. Indeed, the standard deviation of the measured points was 1.2 db. for both the normal and tilted conditions.

Conclusions

The radiation patterns of a 1/4-wave ground plane model have been employed to approximate the patterns from a mobile whip in the 10-20 meter range. For these bands the operating experiences of several mobile hams indicate that the field strength over the car body is on the average 3 to 6 db. stronger than the field in the opposite direction. This magnitude and direction are confirmed by the model. The model also predicts that the patterns are more directive when the soil conductivity increases, when the contact is by means of a short skip, or when the whip curves back from the normal at high speeds. Low angle DX work is less sensitive to ground-plane orientation. Large variations from the patterns could arise from field distortions produced by nearby objects, poor electrical contact over various parts of the car body, and a bumper mount instead of a deck mount. A tilted ground plane instead of a horizontal ground plane would be a more accurate model in this latter case. The net effect would reduce the fields over the ground plane and increase the fields in the opposing quadrant.

In addition to the references listed, helpful ideas are gratefully acknowledged from two other sources: first, from conversations with K8MBV and a number of other mobile hams, and second, from the pleasant and informative hours spent in assembling, testing, and operating mobile equipment with WA4KQO.

DXCC Listings

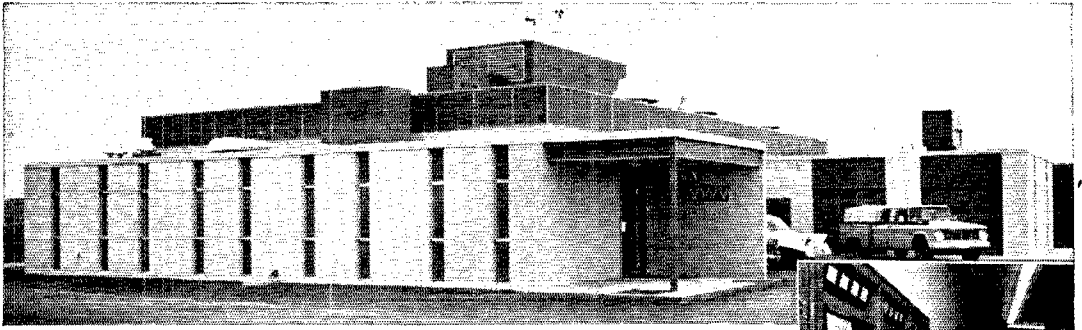
(Continued from page 95)

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K1SWG	K60ZV	0E3H0W	V23CB	W3KHW	W7YBI	W0PJF
K2BKU	K7IU/6	0E8RT	V89AM	W3QBK	W8AFN	W0R9U
K2BYX	K7JCA	0K1KMM	VIAGP	W4DII	W8BTX	W0Y1I
K2MYR	K7KBN	0K1NH	W1CT	W4CJV	W80UU	W0B8GU
K2PKH	K7QXG	0K2KGE	W1DMD	W4E1I	W8TN	W0B8SZ
K2PZF	K7RJK	0K2KZC	W1ETV	W4EPM	W8CGZ	W0B8HX
K3AHN	K8CSW	0K3CAU	W1RFW	W4LDC	W8EZW	Y03CM
K3LEC	K8EDQ	0Z5KU	W1YCH	W4SSM	W8LST	Y03UA
K3KMO	K8EOP	SM2OZ	W2QJT	W4TJM	W8NQC	Y07DO
K3MUB	K8POJ	SM5BPZ	W2ARM	W4UOE	W9CRW	Y08DD
K3QVY	K9GEL	SP8RY	W2FPT	W45AT	W9HTF	Y02YG
K3SGE	K9SPO	TF2WBZ	W2GHW	W8HCX	W9JCV	Y03BUV
K3SMN	K9VQK	UA1TL	W2HJU	W6QFU	W9JQE	Y03EC
K3TRZ	K9WMM	UA3BK	W2LRI	W6QXP	W9MG	YU3JS
K3WNL	K6ARS	UA3BS	W2ATHY	W6WAW	W9OYG	YU3NP
K4BP	K9GML	UA6KAF	W2WEE	W66AY	W9SCD	ZS6BL
K41LW	K9YRX	UA9KSC	W2WLN	W66ON	W9SKR	4X4HC
K4KSB	K6GATU	UA9SH	WB2CN	W68SB	W9A1B	4X4NJ
K4MYO	L42Q	UA9EK	WB2OLN	W68ZW	W9AJDT	606BW
K5IAN	L22FN	UV3BX	WB2OQU	WB6KIL	W9CRY	9L1NI
K6CAA	L22VB	UV3CS	WB2QJ1	W7AST	W9DCP	

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Mr. Peter Viezbicke, Bureau of Standards' Installation Engineer, adjusts one of TMC's 40 kW transmitters shortly after the first signals were broadcast from the new Ft. Collins facility at 0000 GMT, 1 December.



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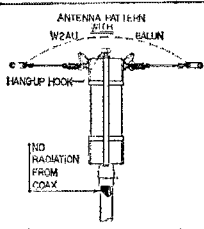
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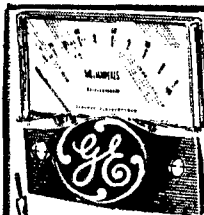
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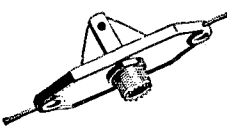
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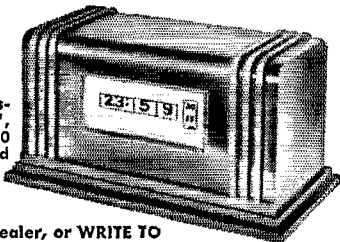


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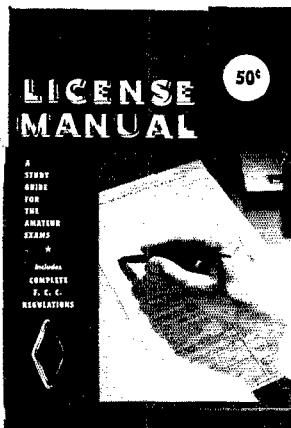
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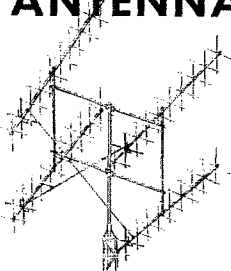
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232 K6TJW W8BFB	219 K60HJ VE3RE W8HDB W9Z5Z	204 DJ7AA Q4M3BCJ K7CHT K8TKB VE5JV W1KID W4L	5 SM7ACB PY3BAD W7AUS W9GXH	196 W8BQH	167 K6WKE WA2OJD	157 UA9HA
231 G9WW VE3ETU W8HDB W9Z5Z	218 E3UZY K3YBR K4FTZ W46L MWG	203 DJ7AA Q4M3BCJ K7CHT K8TKB VE5JV W1KID W4L	193 SM5MC VE1AFY W2J5X W45BV ZL3CS	194 G4JZ	166 K4GXB VE2RO W1BAB W1BPM W1PNR W2M0F W1JVT W5EUT W5OPL W46GLD W86GOV W8GUZ W8WUO W9W10	156 VE3UR WA5IEV YV5BJV ZS6VZ
230 DL7EN K20EA K6BEX K6HZP	217 W42VOH DL3EA W3JJA WA6ZIQ	202 DJ7AA Q4M3BCJ K7CHT K8TKB VE5JV W1KID W4L	192 SM5MC VE1AFY W2J5X W45BV ZL3CS	195 W1DBM	165 DL7DE LA5TD OK1VK VF3CBY W1BFA W2NQR W20WL W3TMZ W7UZA W40GSW W9DIB	155 CR1AU K1DRN VE5GF W2R8K
229 DL3EA W3JJA WA6ZIQ	216 W9Q9N YV2CJ	201 DJ7AA Q4M3BCJ K7CHT K8TKB VE5JV W1KID W4L	190 CB3WN DL5AO D85X J18AN K2ISB W2ARB W2IWC W6CEK	197 J1LAG K1HWV O44PH SP9KT VE6AAV W44LYQ W6GUV	164 W1HVV W8ROC	154 W2NQR W20WL W3TMZ W7UZA W40GSW W9DIB
228 K6PPX PY3AHJ W4CRP	215 O3XJV PA0BEM SM5RK	200 DJ7AA Q4M3BCJ K7CHT K8TKB VE5JV W1KID W4L	189 W8JXY	198 J18AN K2ISB W2ARB W2IWC W6CEK	163 CR6DB K4WMB K9JJR	153 DL1BS K5WOT K9RANQ
227 OZ3SK W3BRTI W2CPI	214 DL3BK W9EGQ	199 CB3WN DL5AO D85X J18AN K2ISB W2ARB W2IWC W6CEK	188 W44VY W8ROC	196 W6GUV	162 EP2AU F2FO KH6BB W1MQV W2PDB W3EPV	152 K2YIY K9IFL VE3EDR
226 W1RO	213 DJ0IK W1FAB W1GOX	198 DJ7AA Q4M3BCJ K7CHT K8TKB VE5JV W1KID W4L	187 W8JXY	197 J18AN K2ISB W2ARB W2IWC W6CEK	161 K31VI W5GLG W5WLD YV6BS ZS1DC	151 K5BNS VE10C 5X6TU
225 W4EEO W8EKV W8NXF W6HX	212 W6TGB W46L QWN	197 DJ7AA Q4M3BCJ K7CHT K8TKB VE5JV W1KID W4L	186 W8JXY	196 J18AN K2ISB W2ARB W2IWC W6CEK	160 EP2AU F2FO KH6BB W1MQV W2PDB W3EPV	150 CR1AJ DJ2MM DJ3VE F8HA G3PTN IS1VA K2IDF K4BMS O2BEA VE2TJ W1LTY W1MRQ W6WNN W9KXX W9P9Y
224 DL3AA K4BYO W5EGY	211 P8SK K2JMY VE5LM WA4GCS	196 DJ7AA Q4M3BCJ K7CHT K8TKB VE5JV W1KID W4L	185 W8JXY	195 J18AN K2ISB W2ARB W2IWC W6CEK	159 EP2AU F2FO KH6BB W1MQV W2PDB W3EPV	149 CR6DU DL6LW K1INO K4HIF W43ATP W92WH
223 VE1WL WA6TG W8WC X2EFL 9M2DQ	210 Q4M3CIX K9COS VE3ACD W31CO W41JOS W6MAF K6J8N ZL6BO ZS5PG WA4WIP	195 DJ7AA Q4M3BCJ K7CHT K8TKB VE5JV W1KID W4L	184 DL1PM HT1BU	194 J18AN K2ISB W2ARB W2IWC W6CEK	158 EP2AU F2FO KH6BB W1MQV W2PDB W3EPV	148 K1CBA K6LJI W8KPT W5KTV ZL2UW
222 SM5BPI W2YTH W308D W4RXG WA4WIP	209 W2IOT W3GRS W6TXL W8JFD	194 DJ7AA Q4M3BCJ K7CHT K8TKB VE5JV W1KID W4L	183 W49NUQ	193 J18AN K2ISB W2ARB W2IWC W6CEK	157 EP2AU F2FO KH6BB W1MQV W2PDB W3EPV	147 DJ2ZJ K9JJS
221 E44GZ K3HHY SM5RY VK2DI W1R1Y W3QMG W4BSP	208 J1AIM I1CWN J1PP	193 DJ7AA Q4M3BCJ K7CHT K8TKB VE5JV W1KID W4L	182 I1TRA K3MVP K4PQV PY2QT W6ALD W63RKL W9EUV W2HQL W45LOB W6ABA W8GLK	192 J18AN K2ISB W2ARB W2IWC W6CEK	156 EP2AU F2FO KH6BB W1MQV W2PDB W3EPV	146 I1CBA K6LJI W8KPT W5KTV ZL2UW
220 DJ5AA DJ5LA FG7XL HK3AFB HK4HR HK5AOH K69YQ Q2EGL PY2CYK VE2BCT W2CES W2FXA W28NI W1EFX W6PWW	207 F8CW ON4BX W2GT W2MVR W9JUV VE2BCT W2CES W2FXA W28NI W1EFX W6PWW	192 DJ7AA Q4M3BCJ K7CHT K8TKB VE5JV W1KID W4L	181 FP3RO VE6SF W2MM V04KRL W6LZZ X2EWH	191 J18AN K2ISB W2ARB W2IWC W6CEK	155 EP2AU F2FO KH6BB W1MQV W2PDB W3EPV	145 W1MZB W8LUZ YV3DV

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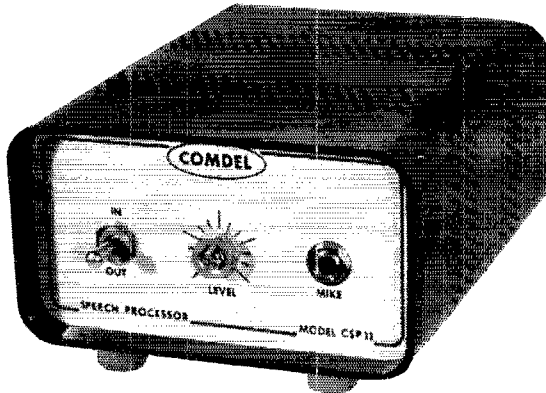
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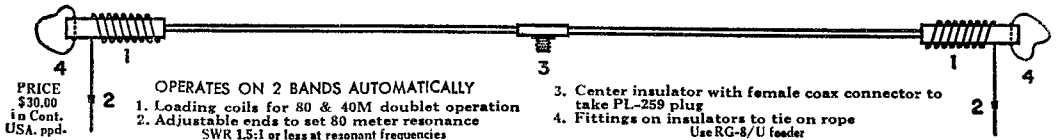
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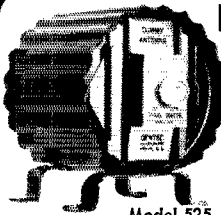
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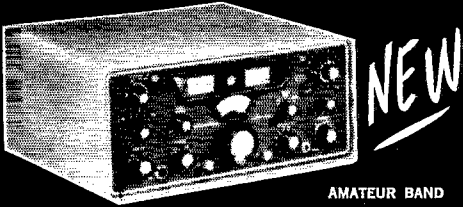
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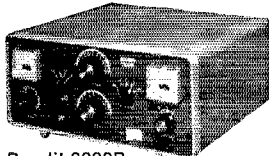
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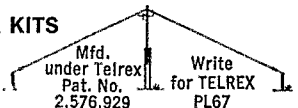


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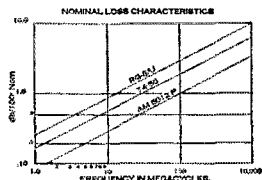
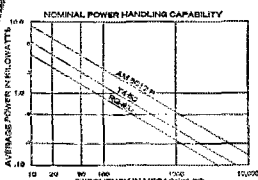
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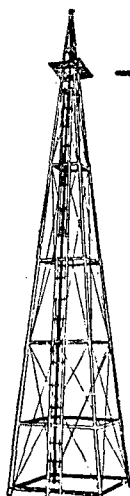
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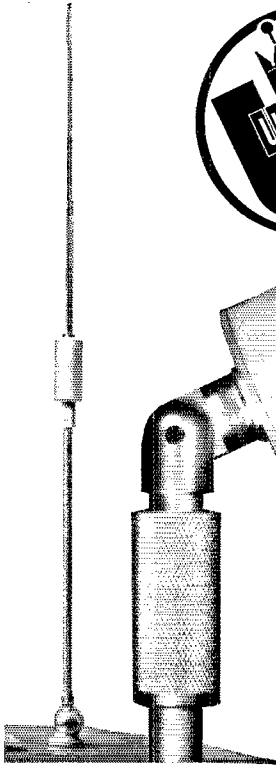
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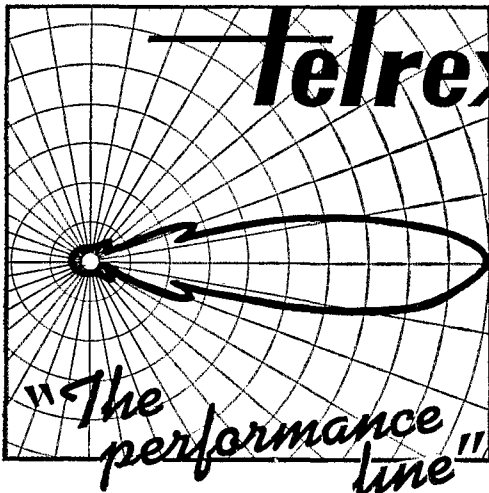
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QS-167



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(Please see the other side of this page for an application for membership in ARRL and 12 issues of QST)

THE AMERICAN RADIO RELAY LEAGUE, INC., NEWINGTON, CONN. 06111

HAM-ADS

- (1) Advertising shall pertain to products and services which are related to amateur radio.
- (2) No display of any character will be accepted, nor can any special typographical arrangement, such as all or part capital letters be used which would tend to make one advertisement stand out from the others. No Box Reply Service can be maintained in these columns nor may commercial type copy be signed solely with amateur call letters. Ham-ads signed only with a box number without identifying signature cannot be accepted.
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- (4) Remittance in full must accompany copy, since Ham-Ads are not carried on our books. No cash or contract discount or agency commission will be allowed.
- (5) Closing date for Ham-Ads is the 20th of the second month preceding publication date.
- (6) A special rate of 10¢ per word will apply to advertising which, in our judgment, is obviously non-commercial in nature. Thus, advertising of bona fide surplus equipment owned, used and for sale by an individual or apparatus offered for exchange or advertising inquiring for special equipment, takes the 10¢ rate. Unless an advertiser is charged for, except there is no charge for zipcode when you furnish it. 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 (3), apply to all advertising in this column regardless of which rate may apply.
- (7) Because error is more easily avoided, it is requested copy, signature and address be printed plainly on one side of paper only. Typewritten copy preferred but handwritten signature must accompany all authorized insertions. No checking-copies can be supplied.
- (8) No advertiser may use more than 100 words in any one advertisement, nor more than one ad in one issue.
- (9) Due to the tightness of production schedules, cancellation of a Ham-Ad already accepted cannot be guaranteed beyond the deadline noted in paragraph (5) above.

Having made no investigation of the advertisers in the classified columns except those obviously commercial in character, the publishers of QSL assume no liability for their integrity or for the grade or character of the products or services advertised.

DAYTON Hamvention April 15, 1967. Dayton Amateur Radio Association's 16th Annual Hamvention, Wampler Arena Center, Dayton, Ohio. Participate in the technical sessions, forums, banquet, hidden transmitter hunt. Bring XYI, for best in women's activities. For information write Dayton Hamvention, Department B, Box 44, Dayton, Ohio 45401.

INVITATION: New York Radio Club cordially invites New York City area hams and SWLs to its regular monthly meetings. Second Monday of each month at George Washington Hotel, 23rd St. and Lexington Ave., promptly at 8 P.M. All are welcome. W2ATT, New York Radio Club.

OLD Old Timers Club now over 650 members with verified 2-way contacts before 1926. Life membership \$15.00. Bi-monthly "Spark Gap Times" \$2.50 annually. Roster free to members. Write Secretary, W5VA, Box 840, Corpus Christi Texas 78403.

MOTOROLA used FM communication equipment bought and sold. W5BCO, Ralph Hicks, 815B No. Federal Hwy, Fort Lauderdale, Florida.

WANT Callbooks, catalogs, magazines, pre-1920 for historical library. W4AA Wayne Nelson, Concord, N.C. 28025.

WANTED: all types of aircraft or ground radios. 17L 618F or S388, 390, GRC, BKC, 51 IRVX, Collins linear amplifier, Type 294. Especially any item made by Collins Radio, ham or commercial. Also, large type tubes and test equipment in general. For fast cash action contact Ted Dames W2KUW, 308 Hickory, Arlington, N.J.

SELL, swap and buy ancient radio set and parts magazines. Laverty, 118 N. Wycomb, Landsdowne, Penna.

WANTED: Military and commercial laboratory test equipment. Electronicraft, Box 13, Binghamton, N.Y. 13902.

SAVE On all makes of new and used ham equipment. Write or call Bob Grimes, 89 Aspen Road, Swampscott, Massachusetts: 617-598-2530 for the gear u want at the prices u want to pay.

WANTED: 2 to 12 304TL tubes. Callanan, W9AU, 118 S. Canton, Chicago 6, Ill.

TOPPING All offers for any piece of aircraft or ground radios, tubes or test equipment. In a hurry? Cash-in-advance arranged. Turn those unused units into money. Air Ground Electronics, 64 Grand Place, Kearny, N.J.

TUBES Wanted. All types, highest prices paid. Write or phone Ceco Communications, 120 West 18th St., N.Y. 11, N.Y. Tel: 242-7359.

MANUALS for surplus electronics. List. 10¢. S. Consalvo, 4905 Roanne Drive, Washington, D.C. 20021.

WANTED: Collins Parts, BC-610, GRC-2, Antodyne, Bethpage, L.I., N.Y.

TELETYPE: Buy 28s, sell parts. W4NYF, Schmidt.

MICHIGAN Hams! Amateur supplies, standard brands. Store hours 0830 to 1730 Monday through Saturday. Roy J. Purchase, W8RP, Purasart Radio Supply, 37 E. Hoover St., Ann Arbor, Michigan. Tel. Normandy 8-8262.

RTTY Gear for sale. List issued monthly, 88 or 44 mhy toroids, five for \$1.75 postpaid. Elliott Buchanan, W6VPC, 1067 Mancana Blvd., Oakland, Calif. 94610.

TUOOBES: 6145B, \$4.00; 6CW4, \$1.40; 417A, \$3.95; 6360, \$3.45; 6146, \$2.55; 5894, \$15.50. All new, boxed guaranteed. No pulls, seconds or JAN. Catalog of many other types, free. Vanbar Distrib., Box 444Z, Stirling, N.J. 07980.

QSLs?? SWLs?? America's Finest! Made-to-order! Samples 25¢. DeLuxe, 35¢. Sackers, W8DED, Box 218, Holland, Michigan 49423.

QSL's, samples 20¢. OSL Press, Box 281, Oak Park, Ill. 60303.

QSLs "Brownie" W3CJL, 3111 Lehigh, Allentown, Penna. Samples 10¢. Catalog 25¢.

C. FRITZ For better QSLs! Bringing hams greater returns for over a quarter-century. Samples 25¢ deductible. Box 1684, Scottsdale, Arizona 85252 (formerly Joliet, Ill.)

QSLs: Movers Printing, 846 Rising Sun, Telford, Penna. Samples, stamped envelope.

QSLs-SMS, Samples 10¢. Malgo Press, Box 373, M.O., Toledo 1, Ohio 43601.

DELUXE QSLs Petty, W2HAZ, P.O. Box 5237, Trenton, N.J. 08638. Samples, 10¢.

QSLs. See our new "Eye-Binder" cards. Extra high visibility. Samples, 3¢. Dick, W8VXK, 1944 N.M.-18, Gladwin, Mich. 10¢ Brings free samples. Sims Advertising Service, 32227 Missouri Ave., St. Louis, Mo., 63118.

QSL Specialists. Distinctive Samples, 15¢. DRJ Studios, 2114 N. Laverge Ave., Chicago, Illinois 60639.

QSLs, finest, YLRL's, OMS, samples 10¢. W2DJH Press, Warrenton, N.Y. 13885.

QSLs, SWLs, XYLoms (sample assortment approximately 9¢) covering designing, planning, printing, arranging, mailing, eye-catching, comic, sedate, fabulous, DX-attracting, prototypal, snazzy, unparagoned cards (Wow!) Rogers K0AAB, 961 Arcade St., St. Paul 6, Minn.

3-D OSL cards add prestige with spectacularly different glittering colors and raised designs. Samples 25¢ (refundable), 3-D OSL Co., Monson 2, Mass.

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QSLs 300 for \$4.35. Samples 10¢ W9SKR, George Vesely Rte. #1, 100 Wilson Road, Inglewood, Ill. 60041.

QSLs, Radio Press, Box 17112, San Diego, Calif.

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. Samples 15¢. Agent for Call-D-Call decals K2VOB Press, 31 Argyle Terrace, Irvington, N.J.

QSLs-100 3-color glossy \$3.00; silver globe on front, report form on back. Free samples, Rusprint, Box 7575, Kansas City, Mo. 64116.

QSL Stamp and call brings samples. Eddie Scott, W3CSX, Fairplay, Md.

RUBBER Stamps \$1.15 includes tax and postage. Clint's radio W2UDO, 32 Cumberland Ave., Verona, N.J.

QSLs \$2.50 per 100. Free samples and catalog. Garth, Box 510, Jutland, N.J.

QSLs—Free samples. Attractive designs. Quick Service, W7IIZ, Press, Box 183, Springfield, Ore.

ORIGINAL EZ-IN double holders display 20 cards each in plastic, 3 for \$1.00 or 10 for \$3.00 prepaid and guaranteed. Free sample to dealers or clubs. Tapabco, John K4MNT, Box 198T, Gallatin, Tenn. 37066.

OSL Cards, Quality printing. Samples 15¢. Sargent Press, 19 Glen Ave., Lynn, Mass.

QSLs Glossy coated, 3 and 4 colors, 100-\$2.00. Samples dime. Bob Garra, Lehighton, Penna.

SINCE 1937. QSLs by W1LMS, Sheehan Press, 23 West St., Stoneham, Mass. 02180. Samples 10¢. Catalog, 25¢.

QSLs: Quality with Service. Samples free with zip. R. A. Larson Press, Box 45, Fairport, N.Y. 14450.

AWARD Winning QSLs. Very artistic. Very colorful High gloss colors including glow in dark type. Samples 10¢ or \$4.95. Colorful QSLs, 510 Riddle Road, Cincinnati, Ohio 45220.

PICTURE OSL Cards for your shack, etc. Made from your photograph, 1000, \$14.50. Also unusual non-picture designs. Samples 20¢. Raum's, 4154 Fifth St., Philadelphia, Penna. 19140.

OSLs. Fast one day service. Free samples. Bolles, W5OWC, Box 9363, Austin, Texas.

RUBBER Stamps. 3-line address \$1.50. J. P. Maguire Company, 448 Proctor Avenue, Revere, Massachusetts 02151.

OSL Cards. Free samples. Send stamped envelope to George, WA4OKD, Box 282, Valparaiso, Florida 32480.

QSLs. Your personal combination from a large selection, glossy reds, blacks, Calypso, Pincraft, etc. Silver, Gold, Rainbow inks. Many card styles, types, cuts, photos. Fast service. Samples 25¢. Ray, K7HLR, Box 1176, Twin Falls, Idaho 83301.

QSLs. 30 sharp samples. Catalog, 10¢. Filmcrafters, Box 304X, Martins Ferry, Ohio 43935.

OSL Rubber Stamp 3" x 5", \$5.00. Other ham stamps, \$1.00 up. Set sample impressions 5¢ Postage. Wes's, W1FP, RFD Amesbury, Mass. 01913.

HUNDRED OSLs, \$1.00. Samples, dime. Holland, R3, Box 649, Duluth, Minnesota. 55803.

OSLs Glossy coated 3 & 4 colors, 100 \$2.00. Samples dime. Bob Garra, Lehighton, Penna.

DON'T Buy OSL Cards until you see our free samples. Wilshire Printing, Box 292, Crowley, Texas 76036.

BEST Quality rubber stamp or 10000 address labels, \$1.25 postpaid. Joe Harms, 905 Fernald, Edgewater, Fla. 32032.

CANADIANS: Best used gear list in Canada. Free list. ETCO, Marv, VE2ANN, Box 744, Montreal 3.

CANADIANS: HT-44, SX-117 transceiver, mint. VE3PV, 462 E. 36th Hamilton, Ont., Canada.

CANADIANS: New Bud deluxe cabinet 21" x 13" x 15" deep. Partially completed transmitter to fit, new 814; 19 set Ham and 762 plate transformer; QSTs, CQs 1958-1961. Sell anything. Best offer. VE7CA, 3636 West 17, Vancouver 8.

SELL: New Heathkit SB-610, VE2AJQ.

CASH Paid for your unused Tubes, and good Ham and Commercial Equipment. Send list to Barry, W2LH, Barry Electronics, 512 Broadway, NYC 10012. Call 212-WAER-5-7000.

WANTED: Tubes, all types, write or phone W2ONV, Bill Salerno, 343 Harrison Avenue, Garfield, N.J., Tel: GARfield Area code 201-471-2020.

NOVICE Crystals 80-400, \$1.30 each. Also other freqs. Free list Nat Stintette WA4XY, Umatilla, Fla. 32784.

RTTY Channel Filters, octal mounted, 2125/2975 cps, \$5.95 pair, 88 mhz toroids, uncase, 5 for \$2.50. Herman Zachry, WA6JG, 3232 Selby Ave., Los Angeles, Calif. 90034.

SELL: CQ, QST, Handbooks, old IRE Proceedings, any quantity. Buy: Old radio gear and publications. Erv Rasmussen, 164 Lowell, Redwood City, Calif.

WANTED: For personal collection: OST, May 1916; Learning the Radiotelegraph Code, 3rd edition; How to Become a Radio Amateur, Edition 10; The Radio Amateur's License Manual, Edition 7, 11, 12, 15 and 16. W1CUT, 18 Mohawk Dr., Unionville, Conn. 06085.

HEATH HO-10 signal monitor completely wired and in perfect operating condx. Cabinet in A-1 shape. Will ship to first offer over \$60.00. Send check or money-order to Pete Chabot, W1BGD, Vista Buena, Vista Road West Hartford, Conn. 06107. (Shipping Continental U.S. and Canada only).

TOROIDs, 88 mh, uncase, 5/\$2.50. Postpaid. Humphrey, WA6FKN, Box 34, Dixon, Calif.

COLLINS Owners! AM wired kit, \$5.00! No soldering! Holes! Chassis Removal! Switch In-Out! (State Model). Kit Kraft, B-763, Harlan, Ky.

SELL: Eimac 4X250B tubes. Guaranteed gud condx. \$6.50 each, \$10,000 paid prepair in U.S.A. Send check or m.o. Everett Stidham, Jr., WSLO, 722 So. 30th, Muskogee, Okla.

HAM Discount House, Latest amateur equipment, Factory sealed cartons. Send self-addressed stamped envelope for lowest quotation on your needs. H D H Sales Co., 170 Lockwood Ave., Stamford, Conn. 06902.

STAINLESS Steel Hardware. Small quantities. Send SASE for list, Arlington Stainless, Section B, Box 2641, Baltimore, Md. 21215.

SALE! Invader 2000. W4SD.

SB-300, \$225.00; Ham-M rotator with control box, \$65.00; Tri-Ex THD-354K, 54 ft. tower with all guy-wires and accessories needed for installation; \$125.00, plus shipping. HP-13 power supply, \$45.00. Write WA2SZJ, 215-28 Spencer Avenue, Queens Village, L.I., N.Y. 11427.

EICO 753 and AC supply. Excellent condition, with original cartons and warranty cards. \$250.00. Unaltered BC-348Q, \$60.00. Charles Cranfill, W3VCN, Worton, Maryland.

SELL: New SB-34 with microphone, \$345.00. W6BLZ, 528 Colima, La Jolla, California 92037.

ESTATE Liquidation offers. Best list, Paradd Engineering Service, 284 Rte. 10, Dover, N.J. 07801.

DRAKE 2A, 2AC, 2AO, SRI, SH-175, V-10, PSA-63. All for \$250.00 or best offer. K9BWL, Box 43, Cedarburg, Wis.

FOR Sale: HT-46 Hallicrafters Transmitter in sealed carton, won 2nd prize at the Foundation Hamfest. Best offer. W3DOJ, F. Gartrell, 281 Washington Road, Westminster, Maryland 21157. Phone 848-4028.

FOR Sale: 2 cl. 3-band quad Skylane with steel boom, Fibre-line arms, \$75.00. W2UGM, 66 Columbus Ave., Closter, N.J. Tel: 201-768-1884.

WANTED: Heavy duty oil filled capacitors 2-100 mfd. at 2500-6000V. Also need 25-30 A Variac. State price in your first letter. Bill Smitherman, WA4YFI, 2705 Riverside Dr., Knoxville, Tenn.

FOR Sale: In excellent condition: Drake Model 2-B receiver, Drake Model 2-BO "C" Multiplier; Johnson Vikings Adventurer transmitter with key and 40M-80M crystals. All for \$350.00. Will sell separately. Write Wayne Banks, 1207 Loch Lomond, Ct., Richmond, Va. 23221.

WANTED: Model #28 Teletype equipment. R-388, R-390A. Cash or trade for new amateur equipment. Alltronics-Howard Co., Box 19, Boston, Mass. 02101.

WANTED: Military, Commercial, Surplus, Airborne, Ground, Transmitters, Receivers, Test sets, Accessories, Especially Collins. We pay cash and freight. Ritco Electronics, Box 156, Anandale, Virginia. Tel: (703)560-5480 collect.

HEATH Test equipment: RF signal generator IG-102, \$20.00; professional laboratory R.F. generator LG-1, \$30.00. Regulated power supply, \$35.00. VFM, IM-11, \$18.00; laboratory AC VFM, 1122, \$20.00. B&K Model 60 "Dyna-quick" tubestest, \$40.00. WR2GKF, Stan Nazimok, 506 Mt. Prospect Ave., Clifton, N.J. 07012.

COMPLETE Mobile Station, NCX-3, NCX-D. EV 727 microphone, heavy-duty stainless steel mount, extension and whip with coil stock loading coil. First \$300 certified check or money order takes it. Express collect. Oron Schmidt, W5OMB, 904 Rosewood Drive, Dickinson, Texas.

JANUARY Specials: Free! One AC supply with the purchase of a TR-4, Galaxy V, Swan 350 or T4X-RAA Combo-RG/8-U, 111/M Hustler 10% off on two or more. Hy-Gain 12% off. Save every day at Evansville Amateur Radio Supply, 1306 Division, Evansville, Indiana. Tel: 812-422-4551. William Ogg, WA9RMO, Corrected price listing of RAA, T4X, \$340 instead of \$330 in last ad; SB-34 for \$325 instead of \$225 in last ad.

FOR Sale: SB-100, SB-200, SB-300. Wanted: Any kit to wire and repair, preferably Heathkit. Most Heathkits in stock. Business ref. on request, Lan Richter, 131 Florence Dr., Harrisburg, Penna. 17112.

FOR Sale: Bound volumes of CQ-1948 to 1960 and QST 1948-1960. Best offer. W20XR, Reuben E. Gross, 79 Howard Ave., Staten Island, N.Y. 10301.

SELL: Eico #720 transmitter, Johnson VFO-122 with power supply, low #720 filter. Heathkit high fidelity stereo amplifier pre-amp Model SA-2 stereo AM and FM tuner, Model AJ-10 Multiplex adapter, \$100. Jack Katz, WA2HZU. Tel: EX2-4723.

A Fond Farewell to some fine equipment: Drake 2B, 2BO with 500 Kc calibrator, \$185.00; Johnson Viking 11 plus V-122 VFO, \$100.00; Heath Warrior KW Linear, \$150.00; all freight collect. Want: Drake R4A, T4X, Heath SB-200, approx. 50 ft. crank-up tower (local deal only). Cleo Kolon, WB4BKK, 703-256-9424, 3721 Rodes Ct., Mandeville, Va. 22003.

FB Condition, SX101 MK II, G SB-100, GSB-101, plus other ham needs. All \$475. WA2QEK, RN3-0591.

FOR Sale: NC 740D, with matching speaker, \$65.00. RME Prescaler, \$22.10. Federal tel. 1105 cycl. band-pass filter, \$6.00. Victor Soens, 922 South 12th St., Edinburg, Texas.

SELL: Moving to an apartment. Complete SSB station, SX-101A, HT-44 with ACPs, Johnson Matchbox, Heath keyer. Original owner. All like new condx. Asking \$500 for package. WA2OZO, Rosenberg, Northfield, N.J. 08225.

SWEEP Generator, TV-FM, Eico Model 360, Excellent condx. \$25.00. Tom Benewicz, 11 Montrose, Allendale, N.J. WA2OBT.

SALE: Heathkit GR-54, \$70.00; Eico 720, \$60.00; Heathkit HR-10 with spkr, \$100 Kc. xtal calibrator, \$60.00; Heathkit HG-10 (VFO), \$25.00 with manuals. WA1EUF, 295 Union St., Manchester, N.H. 03103.

SELL: Drake 2-A receiver, O-Multiplier-speaker, crystal calibrator, in good condition, \$175.00. Roger A. Guillemetter, K1GOH, 32 Westminster St., Manchester, N.H.

WANTED: Electronics Instructor, Generally indispensable, Theory and workshop, Science Camp, Lake Placid, New York. Write Epstein, 440 West End Ave., N.Y. 24.

TRANSMITTER Wanted: SSB-T4X, SB400, HT-37, HT-44, HT-46, HX-50. Must be in working order. Louis Marko, W2CVY, 70 Beech Terrace, Wayne, N.J.

DIODES: 500 Ma, 600 pwr, 12/\$1.00; 3-5A 400-600 pwr, 15A, 6146s, \$1.00; 6197/6C1E, \$1.00; OA2s, OB2s, 15s; 616s, 10s. Rotron muffin fans, \$4.00; capacitors 500 mfd 310 vdc, 50s; 1000 mfd 410 vdc, \$1.00; Simpson Model 29 meter 500 vdc, scale, \$3.00. Running-time meter, \$3.00. All plus postage. SASE for list. Dell Thomas, WB2NBY, 15 Creek Bend Rd., Poughkeepsie, N.Y. 12603.

TV Cameras, Vidicon-Orthicon, Industrial, new and used lenses, Vidicons, Pan, Tilts, Zooms, Industrial Suppliers camera reconditioning and repair. Closed circuit T.V. Center, Inc., Rte. 46, Little Falls, N.J. Tel: 201-256-7379.

FOR Sale: Hallicrafters HT-32, \$225.00; Heathkit Warrior, \$140; Ameco TX-62, \$120.00. All in excellent condition. Ronald Mason, 278 E. North Ave. East, Palestine, Ohio 44413.

FROM The Estate of W3JDP: C-E 200V, \$395.00; Viking II with 122 VFO, \$95.00; SX-71 (Covers 80-6), \$75.00; B&W SSB receiving adaptor, \$33.00; 275W Matchbox, \$30.00; Heathkit SWR Bridge, \$10.00; Ameco SWR Bridge and indicator, \$16.00; Ameco Model CN-6 meter converter, \$30.00; Command sets: Two 493.3 transmitters, one 1-6 receiving one 6-9-1 receiver, \$6.00 each; homebrew 80 and 40 transmitter, all items F.o.b. Write K3BYJ, 111 Elm Ave., Morrisville, Pennsylvania 19067.

CLEGG Zeus and Interceptor with Allbender 3-31 Mc. Converter-speaker. Like new condx. \$650.00. WB6PDN, 7800 Brentwood, Stockton, Calif. Tel: 209-477-0536.

FOR Sale: Drake R-4A receiver with speaker, late model, in excellent condition, \$295.00. F.o.b. Laver, 8512 Fox Run, Potomac, Maryland.

FOR Sale: RME DB-23 Prescaler, \$30.00; HM-11 SWR Bridge, \$12.00; HO-10 Monitor scope, \$30.00; DX-40 transmitter, \$40.00. UTC 50 plate transformer, \$35.00; S-44 plate transformer, \$20.00; 24-hour clock, \$4.00. WA2ALA, 1040 Roxbury Dr., Westbury, N.Y. 11590.

RANGER I, \$83.00; R-100A w/all accessories, \$63.00; HA-5 VFO, \$45.00. WA9NDU, 5248 Arcadia, Skokie, Illinois.

SELL: Collins 75S-3B, Serial N. 15544. All filters. Can't be told from new. Write to W7GYO, 98270.

COLLINS 75S-3 Serial No. 12652 and control unit 312B-4 Serial No. 53058. Both are in mint condition and will ship in original cartons for first certified check of \$25. Jim Rabil, K4GVV, Box 1111, Rocky Mount, North Carolina.

WANTED: Heath Twer HW-30. Write, giving condition and price F.o.b. Chicago. W9GVA, 6760 N. Ionia, Chicago, Ill. 60646.

SHAWNEE HW-10, vv gud condx. \$145.00. Will ship prepaid first certified check. WA8LTJ, 131 Pepperidge Lane, Battle Creek, Mich. 49015.

MAY 13th-14th, W.N.Y. Hamfest and East Coast V.H.F. Conference at Rochester, N.Y. See future OSTs for additional information.

D-104 mike w/stdn, immaculate. High output, \$8.00. Howard Robb, Bird Island, Minn.

SIX Meter Heath Shawnee, 6, 12, 110V supply. Make an offer. Bill, K4AJF, 3521 3rd Ave., Tuscaloosa, Alabama 35401.

MOVING To Arizona? Have 3 bedroom 1 3/4 bath, double carport home in Scottsdale, on a 75' x 105' lot, with 6 ft. colored block fenced back yard. Home has electric heat (Honeywell Electronic Precipitron wonderfuser for allergies), thermostat in each room; also 3 tone refrigerator, large patio, 6 ft. sliding doors to a 10 x 15 lam shack, electric heat, 1/2 ton refrigeration; Collins S/U line, including 30L-1, 71 foot self-supporting Tri-Ex motorized tower with Telrex Triband beam, Ham-M rotor. Yard has sprinkler system, complete, wonderful landscaping. Priced in low 20s, small down payment. Sell furnished, K7A-W, Tel: 945-0250. 6714 East Sheridan St., Scottsdale, Arizona 85257.

APACHE TX-1, perfect, make an offer. Trout, W4MLF, P.O. Box 6143, Alexandria, Va. 22306.

WANTED: National HRO-60 coil set AB, and NFM-83-50 narrow band FM adaptor. Also proportional temperature controlled 100 KHz freq. standard "stability" three parts in ten to the ninth per day or better. Bill O'Brien, 14 Laurel St., Rockville, Conn. 06066.

SELL: Hammarlund HQ-170AC, matching speaker, manual plus 300-12-meter converter all new condx. \$265.00. Knight T-150 transmitter with EV-729-SR mic. \$60.00. Wes's, W1FP, RFD Amesbury, Mass. 01913.

SACRIFICE: Knight T-150A and R100A with xtal cal., spkr. S-meter, \$150.00; Heath PT-1 AM-FM tuner, \$50.00, P-2 SWR, \$10.00. DK60-G2C 115VAC, \$15.00, 454C mike, \$10.00. Separately or all for \$225.00 plus postage. WA3CFW, R.D. #1, Box 332-A Rehoboth, Del. 19971.

HEATH Marauder transmitter, HX-10, \$225.00; Hallicrafters SX-115 receiver, \$325.00; both in excellent condition. Will deliver 100 miles, W4NI, 3600 Old Vineyard Rd., Winston-Salem, N.C. 27103.

INTERESTED in low power? Join ORP International ARC-NYC Chapter #1. For information contact: WA2PHY, Paul Smolaz, Jr., 78-35 85th St., Glendale, N.Y. 11227.

TRANSMITTERS, Receivers repaired by Radio Engineer, Lab Equipment, J & J Electronics, Windham Rd., Canterbury, Conn. Tel: 203-546-9126.

XVL Says clean out excess gear! Plug in and you're on the air with beautiful signals; top grade suppression, keying and stability, fractional kc. readout and resetability. Perfect pair to hear and work DX. Heathkit SB300 with individual SSB/CW/AM filters (\$250) and SB400 (\$285), or first \$500 takes both. Also Eico 730 modulator, needs minor repair, \$25.00. Electro Yoice 600 Hz dynamic mike and chrome floor stand, \$20. Pick-up, or will deliver within metropolitan NYC area only. W3JDL, 82 Boston Ave., Massapequa, Long Island (Phone nights 516-541-9355).

SURPLUS Giant new catalog of equipment and parts, 25¢. Capitol Surplus, Box 891, Springfield, Ill.

MERCURY Relays for HA-1 keyer, etc. \$5 postpaid. K3MNI, HW-12, 6 months old, absolutely perfect, \$79.00 prepaid to your door. K3ZIH.

SELL: NC-190 receiver, \$140.00; HQ-129X, \$90; BC-453 with power supply, \$15.00; 19 OST Binders, \$38.00, OST, 1930 through 1949, \$80.00; 73 Magazine, October 1960 through September 1964, \$16.00; CO, 1945 (8 months) through 1959, \$60.00, Dow-Key coaxial relay, \$8; LP Filter, \$4.00; Heath 0-11 scope with probe, \$55.00; Heath scope applications course, \$10.00; 12 inch table rack, \$5.00, 24 hour wall clock, unused, \$5.00, Aluminum chassis, \$2.00 each, 832-B tube, \$3.00, 3 1/2" round meters, \$3.00 each, George Ruffus, Jr., K1FTR, RFD 1, Rte. 113, Sebago Lake, Maine 04075. Tel: 207-642-2442.

HA-14 and HP-24, assembled, tested, in mint condx. with all necessities, \$175.00 or you make offer. WA3CBL, 900 Stony Lane, Gladwyne, Penna. Tel: (215) LA5-7581.

AMECO Navistor preamp, Model PCLP, \$25.00, WA8IYL.

LA FAYETTE 10-meter 20W, transceiver, mike, 12VDC 120VAC, hot performer, absolutely mint condx. \$49.00; Heath 90W fone/c.w. transmitter, bandswitching VFO, 80-10M, factory-calibrated, never used, mike, AC supply, \$49.00. Two tubes, two 8065 1/2 inch p-paid, \$12.95. Harold Greene, 377 Oldham, Pembroke, Mass.

SELL: NC-155, \$85.00; DX-100B, \$80. D. Schellens, Hotchkiss School, Lakeville, Conn.

COLLINS 75S-3B, \$450.00, in mint condition. Marine Radar Sperry Five, one and five mile range 12 or 32 VDC, like new condx. new, \$400. Arthur Brown, Box 32B, RT1, Troy, Virginia.

BC-453 or BC-348 with AC supply wanted, in gud condx. W3PKR, J. Armstrong, 7 Long Lane, Malvern, Penna. Tel: N14-4387.

TUBES Wanted: All types, de Forest spherical audion, Marconi, Telefunken, Telefunken, Monrothead, Phillips, Brighton, Welsh, QZ3, JX221, UV203, W9EWK, 610 Monroe Ave., River Forest, Illinois 60305.

GOING Mobile, trade perfect KWS-1 Serial 1491, Collins realigned November 1966 for KWM-2 and 516F-2, W7BIF, 107 Wyoming, Boulder City, Nev. 89005.

FOR Sale: Eico 753 SSB transceiver, \$150.00; HX-50 SSB transmitter, \$200. Wanted: 14AVQ/12AVQ, vertical Heath HG-10 SFO, Eico 720 transmitter, K3KMO, RD Box 390A, State College, Penna. 16801.

CINE special, other professional 16 or 35mm cameras or lenses, video recorders wanted for cash or trade. Ted, W2KUW, 64 Grand Place, Arlington, New Jersey.

QST 1937 thru 1946 complete, \$30.00. P. D. Stark, WB2MAV, 246 Lucerne, Millington, N.J.

SWAN Mark I linear, 2 Kw, new in March 1966, few hours use still in warranty, with brand new spare 3-4002 tube, \$395. Shipped prepaid. Send check or money-order. W6MCS, Rte. 1, Box 666, Arroyo Grande, Calif. 93420.

SX-101A receiver, \$165.00. Excellent condition. Priced for fast sale. Les Moskowitz, WB2RSW, Tel: 212-H15-0241 between 5 and 10 PM.

WANTED: Manual for CV 357/A RTTY converter. W1CNY, 228 Hockory Hill Lane, Newington, Conn. 06111.

FISHING Stops my humming. For sale: Collins 328-1 xmtr, 75S-3 revr, 312B-4 control console, Filter, cable, 44 ft. tower, Mosley T-33 beam; Astatic mike, etc., etc. Cost me \$1900+. Sell for \$1200. Mint condition, W4GJK, Box 150, Rte 1, Stuart, Fla. 33494.

WANTED: Heathkit Models XC-2 and XC-6 2 M and 6 M converters for Mohawk, H. S. Waites, VE7FL, Marystville, B.C., Canada.

DRAKE 2B with calibrator, \$175.00; Johnson 275 W Matchbox, \$39.00; PMR-6, AF67, complete mobile installation, \$95; 2 meter Comm IV, \$185.00. SASE for list. W2FNI, 18 Hillcrest Terr., Linden, N.J. 07036. Tel: 201-486-6921.

WANTED: IMA Esterline Angus 424 pen motor. Also other makes, any fair condition. WA9KKW, 123 W. Daphne Rd., Milwaukee, Wis. 53217.

CONSET SSB 2 M and 6 M Sidewinder transceivers, w/o p.s., \$239.00 each. John Boyd, WA0APY, 918 7th Ave., Brookings, So. Dak. 57006.

WANTED: SB-10, WB2RJL, 52 Further Lane, Riverhead, N.Y. FOR Sale: SB-300 with AM crystal, \$255.00; SB-400, \$310.00. Both for \$550.00. In excnt condx. Used about 20 hours. W6NRE.

SELL: National NC-270 receiver, \$120.00; Eico 730 modulator, \$35.00 Heath SB-10, \$50. K3OKF.

WANTED: 2100, 500 cycle filters for 75A4, W7PGX, Rte 1, Box 1063, Scottsdale, Arizona.

COLLINS 30S-1, Serial 10184, \$795. Mint condx. D. Leddin, Richardson, Texas 75080. Tel: (214) 441-4756.

HEATH HX-20, HR-20, HP-23, like new. Plug-in station, \$250.00. Fred Sanborn, Box 669, Eagle River, Wis.

SELL: NCX-3 Adcom DC supply homebrew AC supply base/mobile mikes, speaker, Hustler with 80/40 meter coils, cables and manuals; \$315.00. WA5EUL, Bill Holland, 1412 Mediterranean Avenue, Virginia Beach, Va. 23451.

KNIGHT R100A with S-meter, \$65.00; T150A, \$60.00; P-2 SWR bridge, \$10.00. All assembled professionally and in excellent condition. DK60G, \$10.00, Turner 454X, \$10.00; OST Transmatch, \$8.00. W0DKX, 533 3rd St., West Des Moines, Iowa.

APACHE SB-10 combination, Mint condx. \$175.00. Need T/M AN16-30 USM 25, 1 & 2 for OS4A/AP scope. J. J. Slomenda, K3PZU, 4971 Parkvue Dr., Pittsburgh, Penna. 15236.

FREE Catalog, Loads of electronic bargains. R. W. Electronics, Inc., 2244 So. Michigan Ave., Chicago, Ill. 60616.

WILL Trade Drake TR-3 DC power supply for AC or \$80.00. T. S. Cliff, W9ET, 807 North 14th, Terre Haute, Ind.

TR-4, \$480.00; AC-4, \$83.00; DC-3, \$123.00; R-4A, \$330.00; T4-X, \$330.00; MS-4, \$17.50; RV-4, \$83.00; factory-sealed boxes, warranted, sell separately. Mel Palmer, K4LGR, Box 10021, Greensboro, N.C.

BARGAINS: Novice receiver, transmitter \$25.00. Adventure, 7F-1 6m converter, dirt cheap. K4JCX, Box 162, Oak Ridge, Tenn. 37830.

FOR Sale: Have complete set of unused, repeat unused, equipment as follows: Hallicrafters SR-150, 12 VDC power pack, Mosley D4-BC-A antenna, V-4-6 80 meter coil, Hallicrafters speaker, Shure mike and other accessories. Contact Don Mosley, Box 1552, Waco, Texas. Telephone SWift 9-2491.

BUYING Transceiver: Must sell SX-111 in good condition; \$139.00. Mike Wollitz, WA5OAU, 2413 East Austin, Hartlingen, Texas 78550.

SUMMER Counselor as ham instructor for N.H. boys' camp, 19 years age or over, with General Class ticket. We have complete operating/training equipment. Write Camp Cody for Boys, 99 Park Avenue, NYC 10016 or call 203-226-4389.

FOR Sale: DX-60 fone es CW very good for a beginner; \$75.00, with xtals; Johnson Matchbox, \$45.00; B&W low-pass filter, \$15.00. Call or write M. Theodorou, 16 Fane Ct., Brooklyn 11229 N.Y. Tel: TW1-3714.

SACRIFICE: KWM-2 mint condx, \$659. "Factory installed", Noise Blanking \$69.00; mobile supply, \$49.00; mobile mount, \$64.00; A.C. supply, \$65.00; 30L-1, \$319.00; Heath HO-10 Monitor scope, \$54.00; Hy-Gain full size 3-el. 20M beam, \$35.00. Fred Bredbart, 1725 Broadway, Brooklyn, N.Y. GL5-2222.

DON'T Pass this up! SBE-33 transceiver, SB1-LA KW linear, B&W VOX, Shure mike, all cables, plus 6 new linear tubes. Save 33%. Only \$495.00. Bank financing available. 200 mile free delivery. Send photo. John Green, VQ6TX, University Trailer Court #55, Carbondale, Ill. Phone 618-549-3535.

WRL's Bluebook saves money. These prices, without trades, cash or charge: S81-R, \$449.00; HI-32, \$251.00; HT-37, \$233.10; SR-9 \$85.05; SX-101, \$161.10; HX-10, \$267.10; Champ 350, \$170.00; King 500A, \$206.10; HQ-170C, \$179.10; Ranger, \$89.95; NC-400, \$269.95; SB-34, \$269.95; Galaxy 300, \$161.10. Hundreds more. Free list, WRL, Box 919, Council Bluffs, Iowa 51501.

WANTED: Johnson K. W. Matchbox; Heath SB-10, Write or call Dick Wrobel, W4HLI, 4019 Brookhill Road, Tuscaloosa, Ala. Tel: 553-5349.

CLEANING House, List free. K2IKZ/7, 8556 Elm St., Fairchild AFB, Washington 99011.

WANTED: NC-183-D or equal general coverage receiver in excellent condition. Paul Stitzel, K8OHK, 3130 Park Drive, Stow, Ohio 44224.

FOR Sale: DX 60, \$55.00; HG-10, \$25.00. Mint condition. Ship prepaid, insured, 50% down, balance c.o.d. W. B. Dodge, 300 Wayneridge Rd., Waynesboro, Va. 22980.

EXCELLENT condition: NCX-3, plus power supply, \$225.00 takes both. Call Jack Siegel, 914-769-7500.

HALLICRAFTERS SR-150 transceiver, AC supply w/speaker, DC supply, station mike and stand, mobile mount, mobile mike and speaker, Hustler mast and bumper mount w/75, 40.20 resonators; \$550.00. R. W. Fanus, WB4CPR, 411 Hibiscus St., West Palm Beach, Fla.

FOR Sale or trade, NCX-3, AC and DC power supplies, mike, whip ant. and SWR Bridge, \$350.00 cash or trade for competition pistols with like value. P. Linnear, WASH1U, 4912 Century, El Paso, Texas, 915-75-4141.

FOR Sale: Heath HR-20 receiver and Heath GP-11 mobile power supply. Both in very good condition. \$70 firm for receiver, \$10 firm for mobile supply. May consider trade for VHF equipment. First check takes. Will ship freight collect. Tom Hamilton, WA3PGX, 520 Bloomingdale Road, Itasca, Ill. 60143.

SELL: Galaxy 2000+linear amplifier. Guaranteed perfect in mint condition. Guaranteed 1200 watts PEP output on all bands! 2000 watts PEP. Includes AC power supply and cables. The finest lines for the price of only \$365.00. Call or write K3MVP, 8258 Brittany Place, Pittsburgh, Penna. 15237.

DRAKE R4, barely used, \$300. KOCHB, 1207 St. S.E., Cedar Rapids, Iowa 52403

MOVING. Must sell in total QST, CQ, Radio or Rider's lots only. Make offer on QST 1932 to 1957 inclusive, 4 missing, 308 copies. CQ 1953 to 1957 inclusive and 12 earlier copies, 72 copies. R-9/Radio Jan. 1936 to Dec. 1944, 27 missing, 81 copies. All above in good to fair condition, Rider's Radio Manuals #1 through #17, mostly new in original wrappers. W5EDX, H. Frank Jordan, 2334 West Mulberry, San Antonio, Texas 78201.

SELL: LPA-1 linear and PS, mint, best offer. WOHNA.

WANTED: Collins VFOs, Richard Mann, 430 Willmot Road, Deerfield, Ill. 60015.

NOVICES! Complete station! Must sell! Write WA7EEP, Rte 2, Box 216C, Gresham, Oregon.

HAMMARLUND HQ-180 general coverage receiver SSB, CW and AM (just rechecked at factory) \$295.00. Clean, sharp, Hallcrafters HT-37 transmitter, \$225.00. Take both for \$480. 8411 - 110 Park Lane, Decatur, Georgia 30033, Phone 634-7768.

SELL, or trade: Link FM near, 146.94 Mc. Model 1907 base, \$125.00. Model 2210 12-volt mobile, \$60.00; both for \$150.00. Joe Moomaw, WAFZG, 304 Valley View, Staunton, Virginia. Phone 703-866-1428.

ALL in one, New Mexico Amateur Radio Directory with counties listed after each address. Albuquerque hams also by name with phone. PP, \$2.00. Electronic Parts, 222 Truman, N. E., Albuquerque, New Mexico 87108.

FOR Sale: National NCX5 all latest factory modifications. NCXA power supply/speaker, VX501 VFO console, with xtal calibrators. Seven months old, like new \$650.00. Also Model 5002 1000 watt, 100 C. Cummit VFO with 32 filters. Road, Cedar Grove, N.J. 07009. Phone Days: 201-239-6200. Nights: 201-239-2805.

COLLINS 32S-3, 516F-2, Immaculate, \$600.00. Eldico SSB-100F, 80-10M xmt with Dow antenna relay, filter type rig with 1-inch monitor scope built-in, 100 W. output on SSB, perfect, \$250.00. Lee Richmond, WB2OSF, 166 Floral Ave., Plainville, L.I., N.Y. 11803. Tel: (516)GE3-8663.

FOR Sale: HO-150 receiver with product detector, xtal calibrator and speaker, \$125.00. Central Electronics 106 exciter with VFO, \$50.00. Donald R. Traub, K6DMG/1, 106 Upland Ave., Newton Highlands, Mass. 02161.

EXCELLENT Condition, ART-13 including low-frequency broadcast band tuning unit. Complete all tubes and crystals. Famous Collins rig, still \$35.00, express collect. W4FPO, Box 467, Greenville, N.C. 27834.

B&W 6100 SSB xmt, Original factory condition. \$400.00. Bill Bruges, K6ANV, 1930 Euclid Avenue, El Cajon, Calif. 92011. Phone: 714-442-1760.

FOR Sale: Excellent condition: Johnson Courier 500-watt all-band amplifier, \$100.00 plus shipping. Hoke Francisus, Carlisle, Penna. W3FLV.

BEST Offer over \$100 takes flawless SX-101, Mk III, F.o.b. Chicago. K9DNR, Box 183, Cicero, Ill. 60650.

SBF-33 with 12-volt power supply, excellent condition: \$220.00. W1AOL, Box 172, Milton, Mass. 02187.

EICO 723 xmt, factory-wired, \$40.00. K2ITO, 1935 83 St., Brooklyn, N.Y. 11214.

HC-610E complete with instruction books. Open to any type offer. All letters answered. East Coast Electronics, 123 St. Boniface Rd., Checktowago, N.Y. 14225.

INCENTIVE Licensing? You need Posi-Check, Amateur Extra and General Class FCC type exams, complete in detail and style, even to the thumb type answer sheets, very good aid to learning and MUST in preparation for FCC Amateur exams. General Posi-Check consists of 297 questions and explained answers for only \$2.98. Extra Class, 115 questions and diagrams with explained answers, \$2.00. 139 questions of the 297 in the General Posi-Check apply directly to Extra Class also. Get both for only \$4.50 postpaid. Posi-Check, P.O. Box 3564, Urbandale Station, Des Moines, Iowa 50322.

QUAD Owners, get improved single feedline operation of any two, three or five band Quad with Tenna Switch (kilowatt rated remote switching system), \$15.95 PPD U.S.A. Cubex Company, P. O. Box 131, Altadena, Calif. 91001.

SELL Back copies of Radio. All clean and with covers. 1936: April, May, June, July, Oct., Nov., Dec. 1937: Jan., Feb., Mar., Apr., May, June, July, Oct., Nov., Dec. 1938: Jan., Feb., Mar., Apr., May, June, July, Oct., Nov., Dec. 1939: Oct. 1940: Jan., Feb., Mar., Apr., May, June, July, 1941: Jan., Apr., May, June, July, Oct., Nov., Dec. 1942: Jan., Mar. 50¢ each copy. R. L. Baldwin, Walden, 26 Ridge Rd., Simsbury, Conn.

FOR Sale: Johnson Viking 500 transmitter, 500 watts c.w., FSK, plate-modulated AM, SSB with external exciter. Separate power supply and modulator unit would be excellent for VHF use. Original Canadian price was \$1500. Will sacrifice at \$350 American or Canadian funds or highest offer. Will deliver in Ontario, Quebec or Northeastern U.S.A. Also sell: SB-10 and power supply, \$50. Contact VE2UN, 3480 McTavish St., Montreal, Quebec, Canada.

HW-32, HB supply, good condition. \$100. WB2VIN, Jacob Yellin, 315 Rogers Ave., Brooklyn, N.Y. 11225.

NEW and excellent reconditioned equipment at lower prices. Terms: Collins 75S-1, 72S-3, KVMA-2, Drake 2-B, 1-4X, Gonset CSB-101, CSB-201, G-30; Hallcrafters SX-110, SX-111, SX-101A, HT-37, SR-160, SR-150; Hammarlund HQ-150, HQ-170, HQ-170A; National HRO-60, NC-303, NCX-3, NCX-5, NCL-2000, HRO-500. Much other equipment. Write for price lists. Henry Radio Co., Butler, Mo.

STUDENT in Argentina must sell NCX-5/NCX-A, Mark I factory modified to Mark II, \$529.00. Shipped prepaid, or best offer. All answered. WA1FEO/LUSDGQ, c/o Siddall, Box 44, Hyannis, Mass. 02601.

SELL: Collins 75S-1 receiver, serial 2668, sharp condition, \$250.00. W9NRT, Ethingam, Ill.

COLLINS 32S-1 transmitter and power supply used less than eight hours. \$375.00. Dynamic Astatic microphone with push-to-talk stand, \$15.00. W1FA, 33 Lee St., Marblehead, Mass. Tel: 617-631-0755.

GONSET Comm. III 6 mtr., asking \$125.00 or best offer. In perfect working condx. WA1COA, 142 Marion Ave., North Adams, Mass. 01247.

HT-37 SX-101A package deal, \$410.00. Will not ship. Pick-up at Roslyn, L.I., N.Y. Rodin call 9 to 5 (516) IV-1-9844.

HC-342 receiver w/manual, \$50.00; BC-1031B Panadapter, w/manual, \$50.00; G5T-1987, 1958, 1959, 33 v. Make offer on AR. Handbooks 1933, 1941. All F.o.b. WB6JWR, 22214 Shadycroft, Torrance, Calif. 90505.

COMPLETE SSB Station, Apache, SB-10, SX-100 (with product detector installed). All excellent. \$350.00. K2GKU, BA9-2738.

4X250B, \$10 pair; 4X150A, \$5 pair; 4CX250B, \$12 pair, used, new, \$20 pair p.p.; 4-65 new \$7.50 pair; 811A, new, \$5.50 pair. Powerstat variac new 0-250V, 1.5 KVA, \$23.00; excellent BC-640, 811A, modulator and power supply, \$45.00. C. M. Pruett, Star Rte C, Flamingo Bay, Ft. Myers, Fla. 33901.

DRAKE R-4A revr. Never used, \$300. NC-303 with xtal calibrator very good condition, \$200. Ranger II with Dow-Key relay and low-pass filter 1995, S. Partyska, 141 Waite Ave., Chicopee Falls, Mass. Tel: 413-592-2952. Call person-to-person, pls.

HEATH SB-300 receiver, perfect in operation and condition. Sacrifice for \$195.00. Reason: assembling new SB-100 transceiver. J. C. Lockner, W2RRB, Willow Drive, Rome, N.Y. 13440. Tel: (315) 437-0643.

WANTED: Big Thru-line wattmeter plug-ins: 1000 watt and 100 watt, 2-30 Mc. Also 1000, 500 and 250 watt, 200-500 Mc or 400-1000 Mc. Buy \$10 or trade for Collins mechanical filters. K4GYO, 43 Island Beach, Merritt Island, Florida.

CRYSTALS Airmailed: MARS, Nets, SSB, Novice, etc., custom finished etch stabilized FT-243 .01% or fraction, \$500 to \$600 \$1.90. (Five or more same or mixed \$1.70) (Nets: Ten or more same frequency \$1.35), 1700 to 3499 and 8601 to 20,000 \$2.50. Overtones supplied above 10,000 kilocycles. Add 50¢ each for .005% HC-5/ metal miniatures above 2000 add 25¢ each. Other frequency ranges and crystal types available. Write for information—include bulletin. Crystals since 1933. Add 10¢/crystal airmail return. 5¢ surface. C-W Crystals, Rt. #2, Box 22-B, Marshfield, Missouri 65706.

SELL: 75A3 with accessory plug-in product detector, \$230.00. Homebrew 80-40 c.w. 75 watt transmitter, \$15.00. Pair of Penta Lab PL-244W's, \$15.00 each. 7038 Vidicon, \$50.00 or trade. WA1CYB, 126 Farmington Ave., Bristol, Conn. 06010.

WANTED: Transmitting tubes, types 4-250A, 4-400A or PL-175A, new or used. Write or call, stating manufacturer, condition and price. F. W. Rockwood, W1I0B, 186 North Rolling Acres, Cheshire, Conn. 06410. Tel: ac, 203-272-8559.

WANTED: Collins 75S-1 receiver, Swan 350 117XC transceiver w/AC power supply, Hallcrafters HC-2742A transceiver. All may be mint. WA6JWK, 6951 San Joaquin Circle, Buena Park, Calif. 90620.

HALLICRAFTERS 33B linear, 2 kw. P.E.P., \$375.00. TRP Tunavertor 750, new, \$20.00. Instructorcraft with 8 tapes, \$22.00. All one owner. W6PLS, Rte. 1, Box 151, Halfmoon Bay, Calif. 94019.

SELL: Heath DX60A, HR-10, Q-multiplier, little used, \$125.00. Will prepay freight. Also, Drake 2B and 2B0, Q multiplier, speaker, \$225.00 W9NRZX, 4433 Huron Circle, South Bend, Ind.

ESTATE Sale: Complete, ham rig: NC-303 receiver, Johnson Viking Invader 2000 transmitter; Knight P2 SWR meter; GMT Numechron Tymeter, CDR rotor TR-44; Vibroscope Key, T234 Tri-Ex Tower; DB24 Hy-Gain beam antenna; DK-60 Dow-Key relay; all cables and misc. equipment to complete hook-up and manuals. All equipment purchased new and in excellent condition, very little use. Will ship anywhere in USA \$100.00 or reasonable offer. Marc Maury, Phone 714-626-0441 or write to 1679 Sumner Ave., Claremont, Calif.

EMERGENCY Sale: Swan 350, 117XC, purchased October 1966, 10 hours use, factory carton, \$460.00. Claude Finn, 13958 Runnymede, Van Nuys, Calif. 91405.

WINTER Specials: R4, \$285.00; 32S-1, \$425.00; HT-37, \$235.00; HT-44, \$345.00; SW250 demo; \$295.00; GSB100, \$169.00; SX-96, \$109.00; SX-100, \$139.00; 2A, \$149.00; Phasemaster II, \$119.00; A167's, \$32.50; NC-183, \$99.00; Viking II, \$79.00. Free List. Howard Radio, Box 1269, Abilene, Texas 79604.

COMMERCIAL Transmitter, used by Major Airline, Wilcox Electric Type 99A, two RF units, HF 2-18 Mc., VHF 108-132 Mc. A0, A1, A2, A3, 400 watts continuous output, all modulators, power supplies, meters. All functions may be remote-controlled by phone dial. Manual. Sell or trade for 32S-1 or SSB transceiver. Heathkit purchased new and in excellent condition. \$175.00. Heathkit scope, \$35.00; Heathkit reflected power meter, \$10.00. Shipped collect. WA5EUN, 3202 South Delaware Place, Tulsa, Oklahoma 74105.

YOU Need it, we got it! Unheard of bargains in coaxial cable, switching equipment, meters, relays, connectors, capacitors, transformers, etc. Phone or visit us! Open Monday-Saturday 11:30 P.M. Windsor Distributors, 46 Fulton St., Brooklyn, N.Y. 212-MA4-7038.

SELL: Late 75A-1 with matching speaker in perfect condition, \$150 or offer. Ameco Navistor pre-amp with built-in AC supply, \$25.00. Bill Smith, W1DVE, 102 West Street, Apt. B-6, Rocky Hill, Connecticut.

SELL: 75A4 #3739 excellent condition. 3.1 and 1.5 Kc filters \$395.00; HT-44 with matching a.c. supply. Little used, like new, \$295.00. BC-221C, a.c. supply and book, \$50.00. Johnson Matchbox 275W, built-in SWR indicator and coupler, \$50.00; Millett Grid 4c meter, \$45.00; W. T. Tabbin, W2GCV, 192-15A 69th Ave., Flushing 11365, N.Y. Tel: 454-2775.

SB-200 Professionally assembled, used very little, \$170.00. Harvey-Wells 1500 transmitter with FSK for RTTY, excellent, \$50. A. M. Hughes, 145 Pinckney St., Boston, Mass. 02114. Phone 617-742-0029.

HAM TV. Toshiba 7038 Vidicon, \$5; RCA 7735A Grade C, \$10; Vidicon socket, \$2; 15.75 Kc xtal, \$14; RCA image orth, \$8.20; \$10. WB2GKF, Stan Nazimek, 506 Mt. Prospect Ave., Clifton, N.J. 07012.

WHEATSTONE Perforator, keyboard type in mahogany case, for sale or trade. Roy Brousher, W5HPB, 4002 Levonshire Drive, Houston, Texas 77025.

E-Z Way Tower—galvanized 75 foot self-supporting crank-up tilt-over Model TORBZ 75-3c complete-stored in basement, never erected, \$990. F.o.b. W4TYC.

HY-GAIN Long John 5-element 20 meter beam. Sacrifice new 205B absolutely perfect, \$375. Mint SX-115, \$269. W4EFO, 813-595-3447 evenings.

THE Following Heath equipment is in excellent condition for sale at less than kit cost: Marauder, Mohawk, Warrior, Mohican, Michigan 49022. All inquiries acknowledged.

HALLICRAFTERS HT-41, 1 Kw linear, \$160; Heath HX-20 80-100 SSB-CW exciter, 100 W. P.E.P. \$125.00 Both for \$275.00, Tom Carney, 1727 Monte Sano Blvd., Huntsville, Ala. 35801.

LINEAR for sale: HT-33, Maximum legal power, TA-33 Tri-band, Erico 730 Modulator, Heath Twoer, Free tubes/extras with purchases. Call weekdays evenings: WB2NEE, Anthony Salzman, tel: 212-879-6369.

FOR Sale: SX-101A, R48 spkr, \$200; DX-100, coax relay, 22X mc, \$100; excellent condition, no scratches. Manuals. W2EPZ, 80-44 259 St., Floral Park, L.I., N.Y. 11004.

75A-4 500 cps filter, \$45.00; new, \$50.00; Wheatstone code perforator and Boehme keyer, excellent \$295; Eico 460, \$55.00, Federal 804, \$80.00; ADR-4, frequency counter, transfer oscillator, 5-37, W8BRM, 1910 Longpoint, Pontiac, Mich.

HAMMARLUND HQ-129X revr, V.G. xtal control, AVC, BFO, ANL, selective tuning, 8-meter, \$90.00. L. Asbell, 181 Spoonwood Road, Wilton, Conn. 06897.

AUTOTUNE ART-13, with tubes, schematic and manual, \$29.00. F.o.b. Joe Harms, W3COP/4, 905 Fernald, Edgewater, Fla. 32032.

CLEAN NC-173, \$65.00 f.o.b. Wm. Kindler, W3STV, 727 William, Trafford, Penna.

QST-All copies, January 1941 to present, Six binders, 1936 edition, "Two Hundred Meters and Down", Best offer, Dr. B. M. Chambers, 44 Broad St., N.W., Atlanta, Ga. 30303.

WANTED: Heath Chipewea linear amplifier, K3KRF, 2017 Osden St., Phila., Penna. 19130.

SELL: DX-60, in perfect condition, \$50.00; HG-10, also in like-new condx, \$25.00; AM2 reflected power meter, \$10.00. Robert L. Frie, W2EWS, 17 Sedgwick Road, Trenton, N.J.

SELL: DX-60 and VF-1; BC348 receiver, SS-3 Q multiplier, "Bonus" 15/10 converter, \$163.00 takes all, Write Don Ross, W2JMZ, Mossy Brook Road, High Falls, N.Y.

WANTED: December 1941 issue of QST, Also photos, etc. of Gallups Island, R. Taylor, R. 32, W1QCO.

QST Library January 1951 through 1966. Like new, \$30.00. F.o.b. W9BGE, 10516 Wisteria, St. Louis, Mo. 63126.

FOR Sale: Heathkit HW-12 with Dynalab conversion 75-40-20 with manual, \$95.00; HA-14 Kw Compact linear, \$95.00; HP-14 linear mobile power supply, \$85.00. All kits lab wired and tested, never used. K4NI, W. Bickmeyer, 137 Bahama Blvd., Cocoa Beach, Fla. 32931.

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SELL: 239 issues of QST, 1933-1958, good condition. 15 complete year run, best offer over \$30.00. W2GPO, William Asbury, 185 Soundview Rd., Huntington, N.Y. Box 697.

WANTED: DM-35 dynamotor, No modifications, Mosley Tri-band beam, 5 Mc. xtals. WA9HJY, 439 N. Henderson St., Galesburg, Ill. 61401.

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WANTED: SX-71 receiver. Must be late model with black dials and 15 meters calibration. Will pay top dollar for good unit. Write details and price wanted to M. M. Ward, 16 Sunset Drive, Cherry Hill, N.J. 08034.

HEATH: SB-300 revr. A-1, \$200; SWR bridge, new, \$12; TTO keyer and Nikey, A-1, \$30. Lot \$250.00, WA3CKZ, 328 Castle-gate Rd., Pittsburgh, Penna. 15221.

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WANTED: Plug-in coils for National SW-3 and FB-7 receivers, Leland W. Smith, W4YE, 1147 Houston, Mill Road, NE, Atlanta, Ga. 30329.

WANT: Collins 516F-2 power supply, K5DUE, 700 West Acheson Street, Denison, Texas, 75020, 214HOS-6278.

SELL: Heath Seneca in wkg condx. As is, \$70. K2ARO, 177 Roosevelt Rd., Hyde Park, N.Y.

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W2HF wants instruction manual for Hickok Model 604-AF 'scope. All mail answered.

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FOR Sale: Heath HQ-10 'scope, exc. condx, \$57.50. Top shape NCX-3, NCX-D, NCX-A Power supplies \$300.00. Will consider trade for 6 mtr. Heath SB-110, John F. Strough, Rte #4, Marshall, Mich. Tel: 1-616-781-2715.

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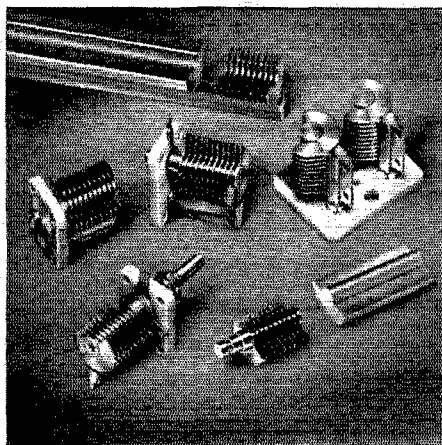
WANTED: 700 watt homebrew linear, WA3EMR, 1102 3rd Ave., Brackenridge, Penna. 15014.

WANTED: Operating service manual, Sylvania tube tester Model 220. Will photostat. K0RHK, 13312 Inverness Road, Hopkins, Minnesota 55343.

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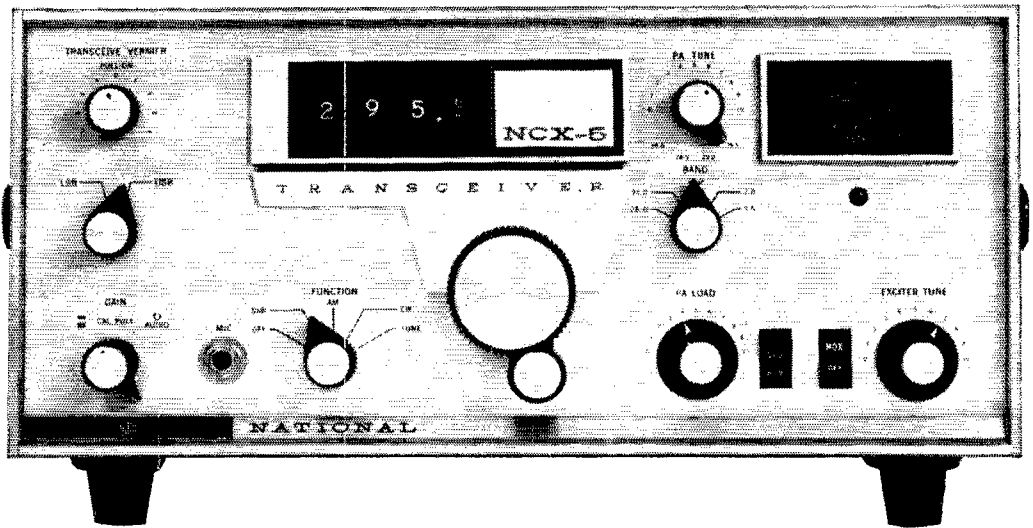
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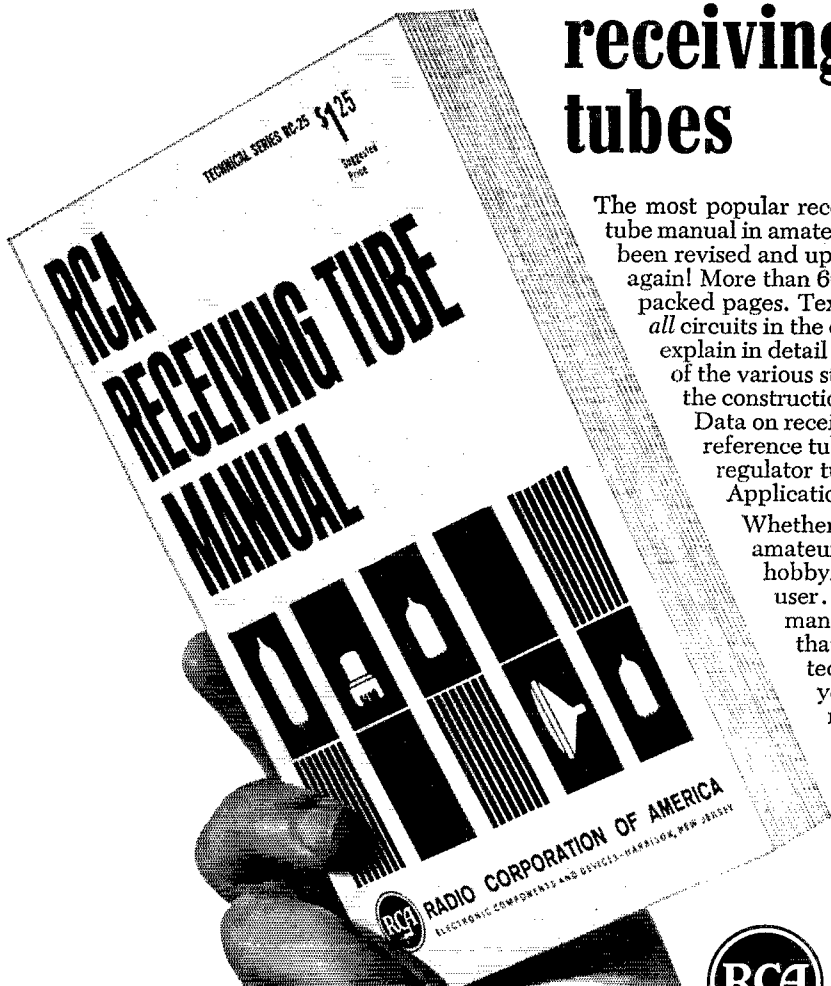
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