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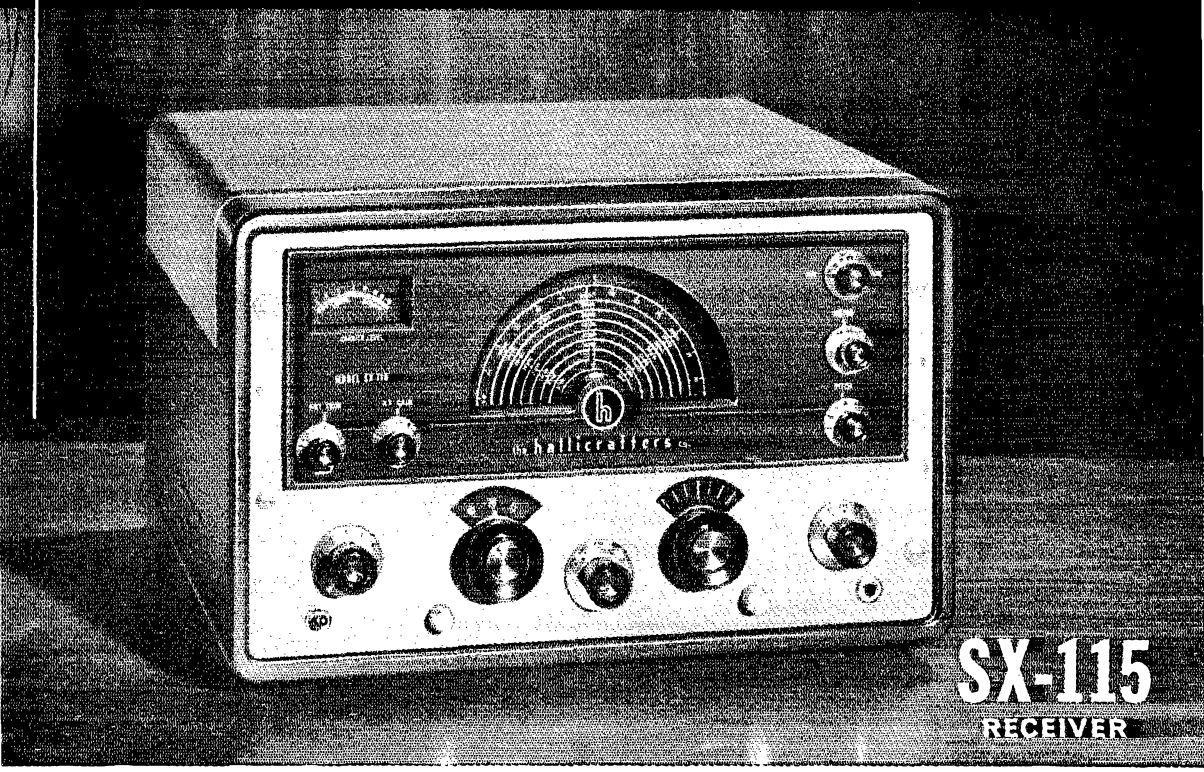

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QST

OCTOBER 1961

VOLUME XLV • NUMBER 10

PUBLISHED, MONTHLY, AS ITS OFFICIAL ORGAN, BY THE AMERICAN RADIO RELAY LEAGUE, INC., WEST HARTFORD, CONN., U. S. A.; OFFICIAL ORGAN OF THE INTERNATIONAL AMATEUR RADIO UNION

OFFICES

38 La Salle Road
West Hartford 7, Connecticut
TEL.: ADams 6-2535

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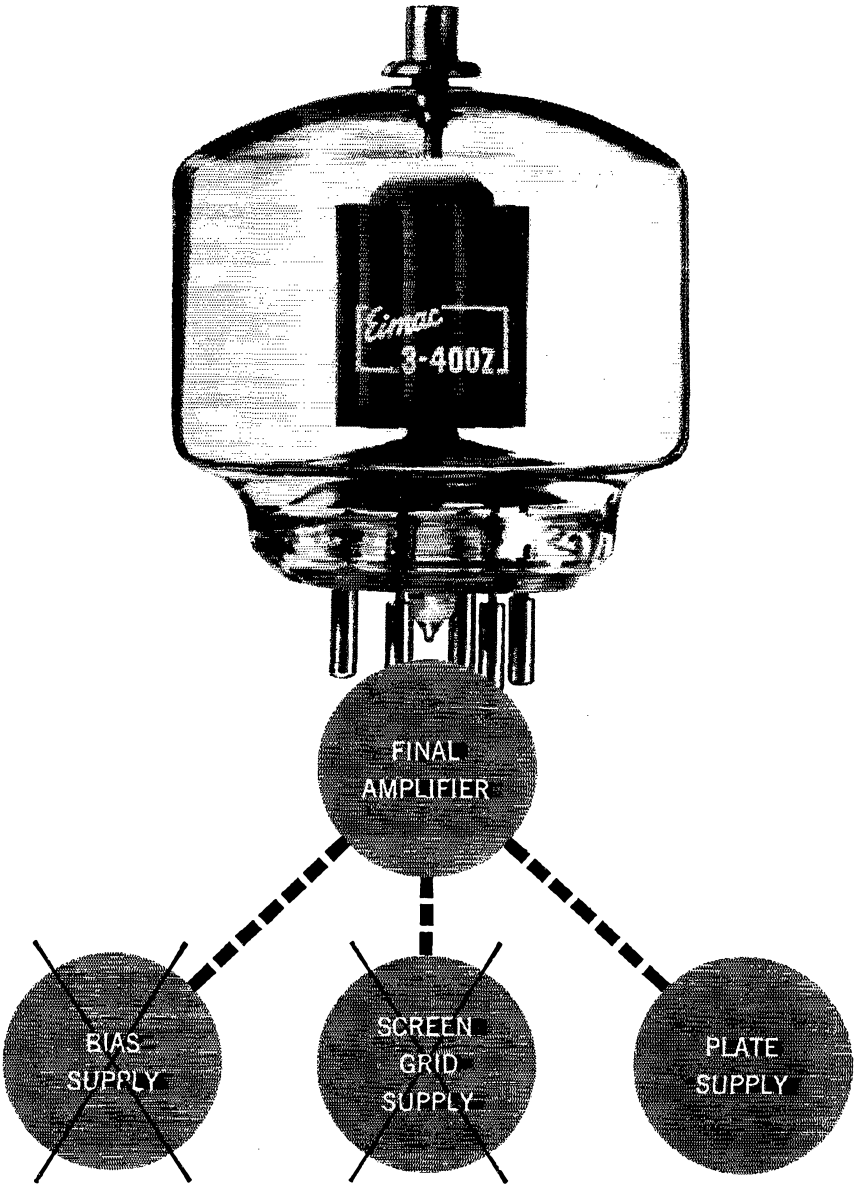
—CONTENTS—



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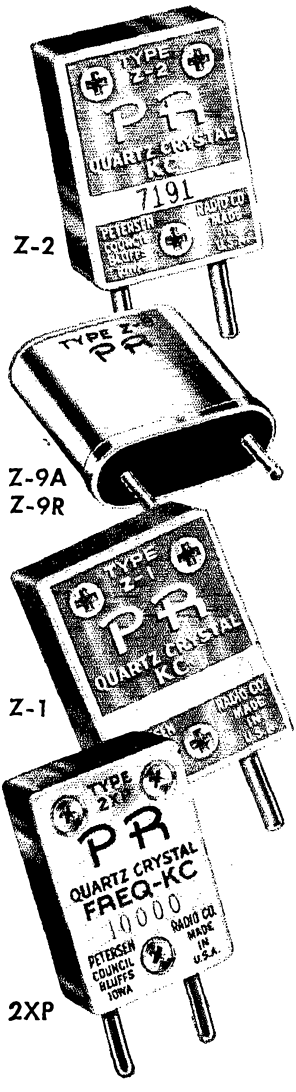

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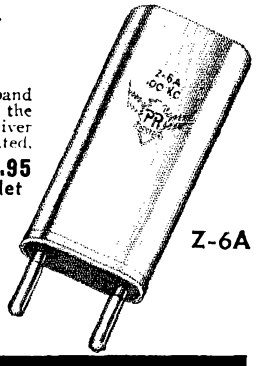

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Section Communications Managers of the ARRL Communications Department

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

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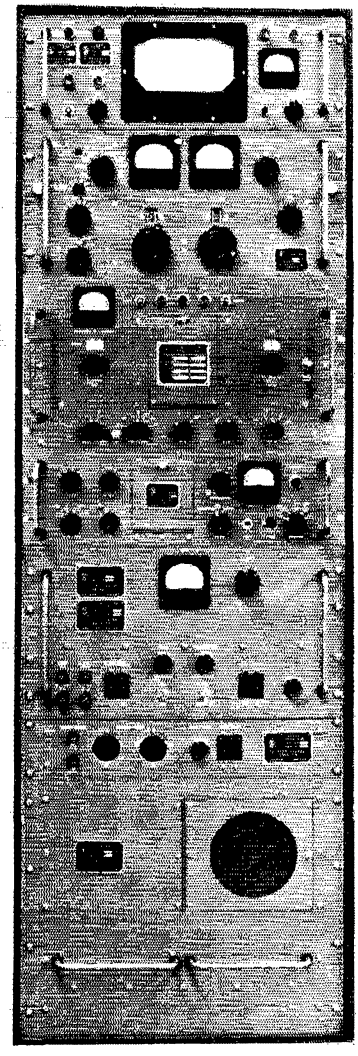

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is a noncommercial association of radio amateurs, bonded for the promotion of interest in amateur radio communication and experimentation, for the relaying of messages by radio, for the advancement of the radio art and of the public welfare, for the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

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

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

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

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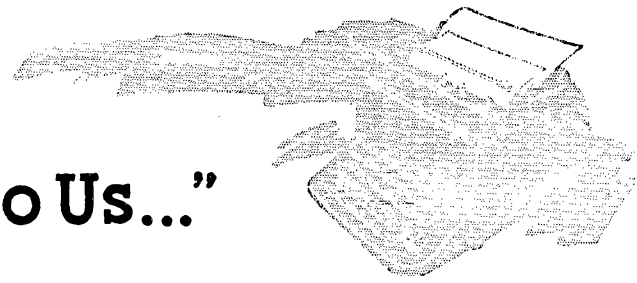


"It Seems to Us..."

RECIPROCAL LICENSING

SENATOR Barry Goldwater, ex-6BPI, of Arizona, and Senator Andrew F. Schoeppel of Kansas have introduced a bill into the Congress which would authorize the Federal Communications Commission to issue amateur licenses to citizens of other countries, provided such countries extend similar courtesies to U.S. amateurs when in their domains. The bill, S.2361, is printed in full on page 73 of this issue.

Purely as a courtesy, several dozen countries have been issuing amateur licenses to visiting U.S. hams. Many more withhold such privileges because the U.S. does not issue licenses to *their* citizens visiting here. In recent years there have been several attempts — by the League, by individual amateurs, and even by a member of Congress — to secure a favorable Government attitude toward reciprocal licensing, but all have been stalemated. At the Southwestern Division Convention in Phoenix this year, however, League officials found a champion for our cause in Senator Goldwater, who promised to investigate the matter upon his return to Washington. This bill to amend the Communications Act is the result.

Now it is up to us, the amateur body, to carry on. If no appreciable interest is expressed, the bill will surely die unnoticed in committee. But if Senators and Representatives are made acutely aware of the importance this bill has to all 220,000 of us and its goodwill effects internationally, the measure will certainly be carefully studied and sincere attempts made to iron out policy and administrative difficulties which have been obstacles in previous considerations.

Individually-composed letters, we are told, are most effective. Form letters and letters in petition or resolution style signed by a number of amateurs are of course useful, but they don't carry quite as much weight. It is quite likely that the first session of the present Congress will have adjourned by the time you read this issue. The individual Congressmen continue their work during the recess, however, and therefore the letters should be sent now so that action can be forthcoming during the early part of the next session, before the bill gets put aside for more-burning issues.

Do *you* want the United States to join with Canada and most other countries of the world in granting amateur operating privileges to foreign visitors? Then — *today* — communicate your views to the Senators and Representatives from your state, and to the members of the Senate Committee on Interstate and Foreign Commerce, listed on page 73.

GOT YOUR BALLOT?

DURING the first week of October, ballots will be mailed to approximately 40,000 League members, comprising those in divisions selecting directors and vice-directors for the coming two-year term. In past elections only about two-thirds of our members have taken the time and trouble to mark and return their ballots. While this figure is perhaps comparable with some political elections, it really ought to be much higher. The men selected will be your representatives in League government the next two years. Watch for your ballot in the next couple of weeks, then, and mark and return it promptly.

OPERATING AID

ONE of *QST*'s many responsibilities is to keep League membership posted with up-to-date information to assist in legal, efficient operating. Most members are reluctant to cut up their issues of *QST*, however, and so they may have to hunt through several issues to find information they need in a hurry.

As a convenience to our readers, *QST* this month includes a tear-out card with some of the data amateurs should have quickly available at their operating positions. Hang it on the wall, or clip it to the front of your ARRL logbook. As occasional changes or additions are announced, correct the listings to keep them up-to-date.

If you find this new ARRL service as helpful as we hope it will be, please let us know — together with suggestions for subjects which might be usefully included in future such cards.

QST

COMING A.R.R.L. CONVENTIONS

October 7–8 — Midwest Division, Omaha, Nebraska.

October 13–14 — Great Lakes Division, Cleveland, Ohio.

October 13–15 — West Gulf Division, Kerrville, Texas.

October 28 — Kentucky State, Lexington, Kentucky.

GREAT LAKES DIVISION CONVENTION

Cleveland Ohio — October 13-14

The 1961 ARRL Great Lakes Division Convention, presented by the Cleveland Amateuradio Convention, Inc., will be held on October 13-14 at the Sheraton-Cleveland Hotel, "Cleveland's largest and finest". A single sideband dinner will start off the convention at 1800 EDST on October 13, followed by open house and hospitality gatherings at 2000. At 2359 a Royal Order of the Wouff Hong initiation will take place.

Saturday, October 14, will feature numerous displays; technical talks; a DX session featuring Bob White, W1WPO, DXCC Awards; meeting of the Ohio Council of Amateur Radio Clubs; Army MARS session; and a YL forum. Special attractions will include the Army MARS communications trailer and an exhibit about the modern trend of space technology presented by the Lewis Research Center of the National Aeronautic Space Administration. General Class amateur exams will be conducted by the FCC at 0930 Saturday, October 14.

The convention concludes with a banquet at 1900, October 14, in the Grand Ballroom. Convention registration is $2.00 per person; banquet tickets are $5.00; single sideband dinner tickets are $5.00 and YL luncheon tickets $2.00. Pre-registration closes at midnight, October 11. All requests should be mailed to Cleveland Amateuradio Convention, P. O. Box 5167, Cleveland 1, Ohio.

WEST GULF DIVISION CONVENTION

Kerrville, Texas — October 13–15

The West Gulf Division Convention will feature a varied program of speakers on DX, s.s.b., semiconductors, Civil Defense, Army and Air Force MARS, Naval Reserve communications, v.h.f., and special sessions on printed circuitry. Convention site is the Kerrville Municipal Auditorium — Friday, Saturday and Sunday, October 13–15.

A code-speed contest is planned with the contestant to have the option of using his own favorite bug or electronic keyer. Three transmitter hunts are scheduled — one each day of the convention, on 75 and 6 meters. An FCC representative will be on hand to give amateur exams.

Guest speakers include Don Stoner, W6TNS; Durward J. Tucker, W5VU of Longhorn Electronics on s.s.b.; Gus Browning, W4BPD, DX; Irving S. Seligmann, W5UB, printed circuits; Frank Cox, Texas CD Director, and Bill Broman on Civil Defense, plus other notable speakers.

There will be a special program, including a breakfast, for YLs. Unlicensed XYLs and harmonics will be treated to a variety show and a bus tour of the Texas hill country. Wayland "Soupy" Groves, W5NW, is in charge of the Royal Order of the Wouff Hong ceremonies.

Convention pre-registration fee is $10.00, which includes the entire program, plus a pre-convention barbeque Friday night, a Saturday evening dance and the Sunday banquet. A special pre-registration for hams under sixteen is $3.50, which will admit them to all technical sessions. Pre-registration deadline is October 10. Registrations and requests for information should be sent to the Kerrville Radio Club, 800 Water Street, Kerrville, Texas.

KENTUCKY STATE CONVENTION

Lexington — October 28

The first annual Kentucky State ARRL Convention is to be held at the Phoenix Hotel in Lexington with convention activities beginning shortly before midnight, with initiation ceremonies for the Royal Order of the Wouff Hong.

Noted local and national figures are to conduct group meetings on such subjects as DX, antennas, v.h.f., MARS, Novice Corner, c.w., and phone nets, s.s.b., and TVI.

An ARRL Forum will be conducted by Dana Cartwright, W8UPB, Director of the Great Lakes Division, assisted by Perry Williams, W1UED, of the ARRL Headquarters staff, Elmer G. Leachman, W4BEW, newly-elected SCM, and others.

A full day for Saturday is planned with many exhibits. Ladies activities will include a tour of horse farms and other points of interest in the Blue Grass area. The banquet is set for 6:30 P.M. Talk in transmitters will operate Friday night and Saturday on 75 and 6 meters.

Hotel reservations should be made with the Phoenix Hotel, 120 East Main Street, Lexington. Convention pre-registration is $2.25, until midnight, Friday, October 27. After midnight, registration will be $2.50. Banquet will be $5.00 per person. Make all checks payable to "The Blue Grass Amateur Radio Club" and address all inquiries to Dix E. Newton, K4KJQ, Secretary-Treasurer, 103 Devine Avenue, Lexington.

OUR COVER

Summer and fall are busy seasons in the ARRL lab, with the gang working on various pieces of equipment for the *Handbook*. This candid (hah!) shot shows W1JKS at his bench. It'll give you an idea of how we protect the edges of gear with masking tape, and how neat the underneath side of something *can* look. Neat bench, too, eh? See also the photo on page 174 of this issue.

A 25-tube receiver may sound like a major undertaking. It is. But the unitized assembly described here does much to dispel any aspects of tedium. While there will be perhaps not many who will want to duplicate the complete system, almost everyone will find interest in one or more of the attractive units that go to make up the whole.

Sectionalized Communications Receiver

Triple-Conversion Superhet Covering 80 Through 10

BY R. V. McGRAW, W2LYH, *9 Peg's Lane, Riverhead, L. I., N. Y.*

THE true member of the amateur hacksaw-and-file fraternity can never be content with equipment except that which he has built himself. He is not concerned with such things as "resale value," but only with taking whatever parts are at hand, mixing them with a few of his own ideas, and trying to create something useful. Here is a description of a receiver built following this principle, which I hope may encourage others to discover for themselves the satisfaction of operating with their own "custom-built" receivers.

The set is made up of three rack-panel units: a tuner, a crystal-controlled converter, and an i.f. amplifier. Each unit was built as a separate project, which is a lot easier than building a complete receiver all at once. This method of construction allows changes to be made easily without disturbing the whole setup, and also permits you to use or test any unit with other gear that might be available. For instance, the converter can be used ahead of any receiver that tunes 3 to 4 megacycles; the tuner might be used with a low-frequency ARC-5 receiver serving as the i.f. amplifier; or the i.f. unit could be connected in place of the regular i.f. stages of a receiver.

The Tuning Section

The tuner (circuit diagram shown in Fig. 1) is built inside a 3 × 17 × 7-inch chassis, with a 3½-inch panel. It consists of an r.f. stage, mixer, and oscillator, tuning the range of 3 to 4 megacycles in two steps of 500 kc. each, with an i.f. output frequency of 500 kc. It tunes the 80-meter band by itself, and serves as a tunable first i.f. amplifier on the higher-frequency bands, thus giving the same tuning rate and stability on all bands.

The main objectives in building a tuner are

The three main units that make up this triple-conversion receiver fit into a standard rack. The crystal-controlled converter is at the top. Controls, from left to right, are for r.f.-stage peaking, two controls for mixer peaking (on either side of the converter in/out switch), crystal switch, and r.f. gain.

The intermediate section contains the tunable i.f. amplifier (used alone for 80-meter reception) which covers the 3- to 4-Mc. range in two 500-kc. steps. The two large controls at the left are for r.f.-stage peaking and gain. The small controls below are for the switch that selects one of the two 500-kc. tuning ranges, and a mechanical calibration corrector. The main tuning knob is to the right of the slide-rule scale. A digital counter provides a logging scale.

The bottom section contains the 500-kc. i.f. amplifier and two complete 110-kc. i.f. amplifiers (broad and sharp), a.m. and s.s.b. detectors, audio, b.f.o. and tuning-meter circuits. Controls along the bottom, from left to right, are for 500-kc. i.f. gain, gain for each of the two 110-kc. i.f. amplifiers, audio gain, detector selector, and i.f. (broad/sharp) selector. Balancing the tuning meter on the panel is the b.f.o. frequency control.

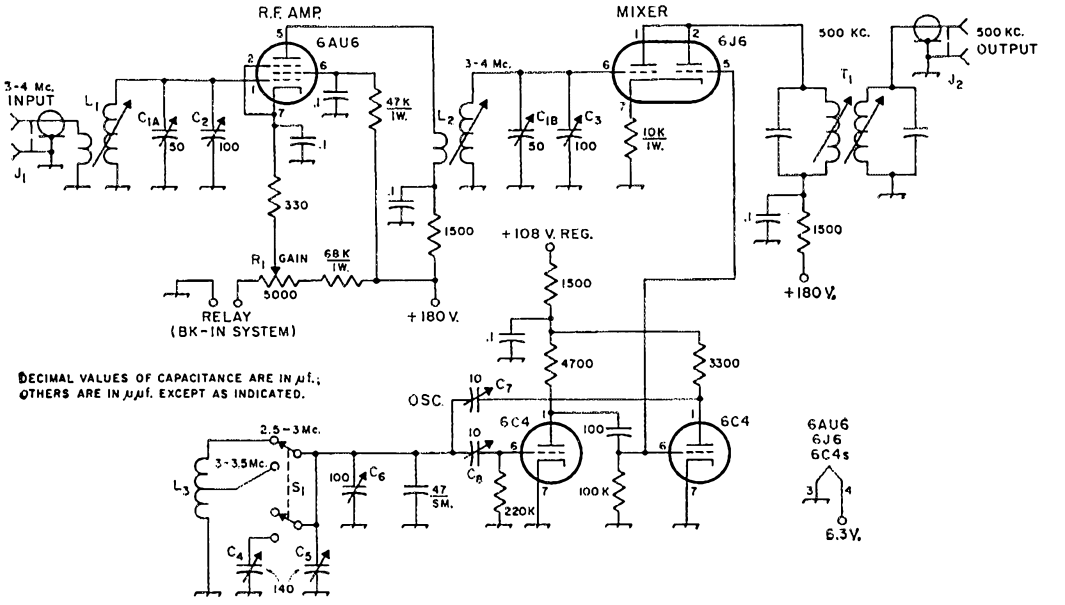


Fig. 1—Circuit of the 3-4-Mc. tuning section. Resistances are in ohms and resistors are ½ watt, unless otherwise indicated. Fixed capacitors less than 0.1 μf. are mica (SM- silver mica); others are paper or ceramic.

C_1—Midget dual variable (two Johnson 50J12/157-4 or similar units ganged).
C_2, C_3—Variable air padder (Johnson 100J12/157-6 or similar).
C_4, C_5—Variable air padder (Hammarlund APC-140 or similar).
C_6—Tuning Capacitor—100-μμf. variable (see text).
C_7, C_8—Air trimmer (Hammarlund HFA-10B or similar).
J_1, J_2—Coaxial receptacle (SO-239 or Jones S-101).
L_1—Approx. 30 μh.—50 turns No. 30 enam., close-wound on ⅜-inch iron-slug form, 6-turn link.
L_2—Same as L_1, 10-turn link.
L_3—Approx. 20 μh.—35 turns No. 24 enam., 1¼-inch diam., 1½ inches long, tapped at 18 turns from ground end.
R_1—Wire-wound control.
S_1—D.p.d.t. ceramic rotary.
T_1—455-kc., i.f. transformer (retuned to 500 kc.).

oscillator stability, accurate calibration, and smooth tuning. Two 6C4s are used in the Franklin oscillator circuit. This circuit has the advantage of using very loose coupling between the tubes and the tank circuit (only a few μμf.), which minimizes frequency variations caused by tube heating. However, oscillator stability is as much a matter of materials and mechanical construction as anything else. With this in mind, the oscillator components were solidly mounted on an aluminum plate, with ceramic insulation used throughout, and the coil was wound on a ceramic form. Openings are provided directly above and below the oscillator tubes for ventilation.

The tuning mechanism, built as a separate subassembly, contains a precision variable capacitor and worm-gear drive taken from a surplus BC-375 tuning unit, a gear train for driving the slide-rule-dial pointer, and a 3-digit counter which is used as a logging scale. The worm-gear drive, which has a 50:1 ratio, is coupled to the tuning-knob shaft through two gears having a 2:1 ratio, giving an over-all ratio of 100:1 with no detectable backlash. The counter, which is

Front panel of the 3-4-Mc. tuner unit with cover removed. The digital counter at the right is driven from the tuning shaft by means of small bevel gears. The turning shaft has a ball bearing at each end, and the knob has a built-in friction drive to prevent damage to the gears if the shaft is turned to the end of travel. The mechanism at the left shifts a masking strip that hides the frequency scale not in use. Another shaft and arm shifts the position of the frequency scale to correct the calibration as needed.

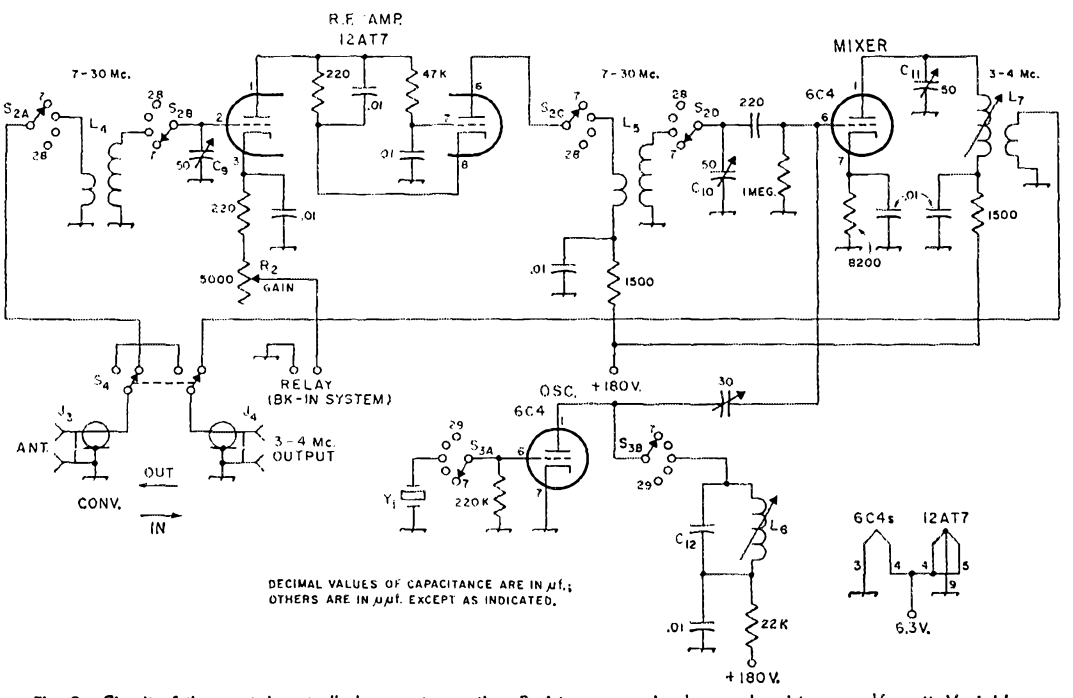
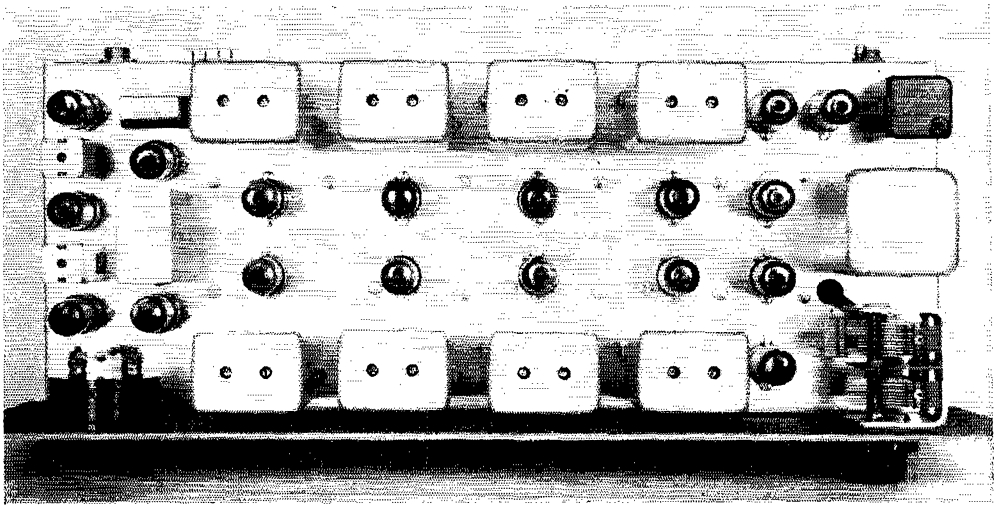


Fig. 2—Circuit of the crystal-controlled converter section. Resistances are in ohms and resistors are ½ watt. Variable-oscillator coupling capacitor (30 μμf.) is a compression type. Fixed capacitors less than 0.01 μf. are mica; others are ceramic.

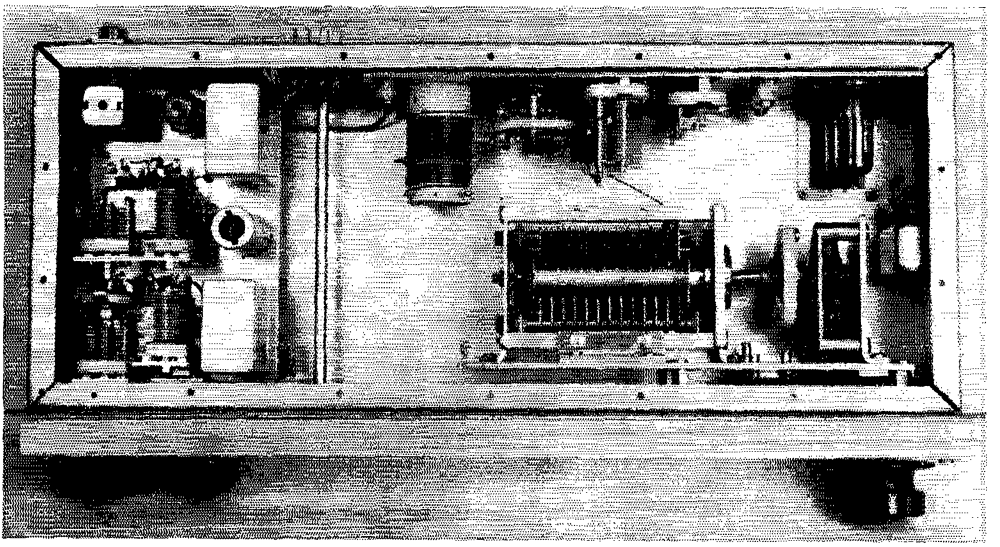
C_9, C_{10}, C_{11}—Midget variable (Johnson 50R12/149-3 or similar).
C_{12}—Fixed mica capacitor (see coil table).
J_3, J_4—Coaxial receptacle (SO-239 or Jones S-101).
L_4–L_8, incl.—See coil table.
L_7—Approx. 40 μh.—80 turns No. 30 enam., close-wound on ⅜-inch iron-slug form, 6-turn link at cold end.
R_2—Wire-wound control.
S_2—4-section 4-pole 4-position ceramic rotary switch.
S_3—1-section 2-pole 5-position ceramic rotary switch.
S_4—1-section 2-pole 2-position ceramic rotary switch.
Y_1—See coil table.

driven from the tuning-knob shaft through small bevel gears, has proved to be a very convenient type of logging scale. When you tune across a rare DX signal, just make a note of the counter reading and you can come right back to it later.

The oscillator tunes 500 kc. lower than the signal frequency in two ranges of 2.5 to 3.0 and 3.0 to 3.5 megacycles. The dial has a separate



The i.f. amplifier unit. This chassis includes the circuits of Figs. 3, 4 and 5. The 500-kc. amplifier, mixers and crystal oscillator are at the left end, and the b.f.o., detector, meter and audio sections occupy the right-hand end. In between are the two (broad and sharp) 110-kc. i.f. strips. The variable capacitor at the right tunes the b.f.o.



The 3-4-Mc. tuner. The r.f. and mixer circuits are in the subassembly at the left. All oscillator components, except the main tuning capacitor, are included in a second subassembly running along the right rear side of the chassis. The oscillator range switch S_1, to the right of the coil, is operated by mechanical linkage from the panel control. Screened openings above and below the oscillator tubes provide ventilation. The main tuning capacitor and driving mechanism also form a separate subassembly.

scale for each range and the scale not in use is covered by a movable mask which is linked to the band-switch knob. A calibration control is provided which shifts the dial scales a small amount to left or right. This effectively shifts the whole tuning range to compensate for any inaccuracy in the converter-oscillator frequency.

The r.f. amplifier and mixer are built on an

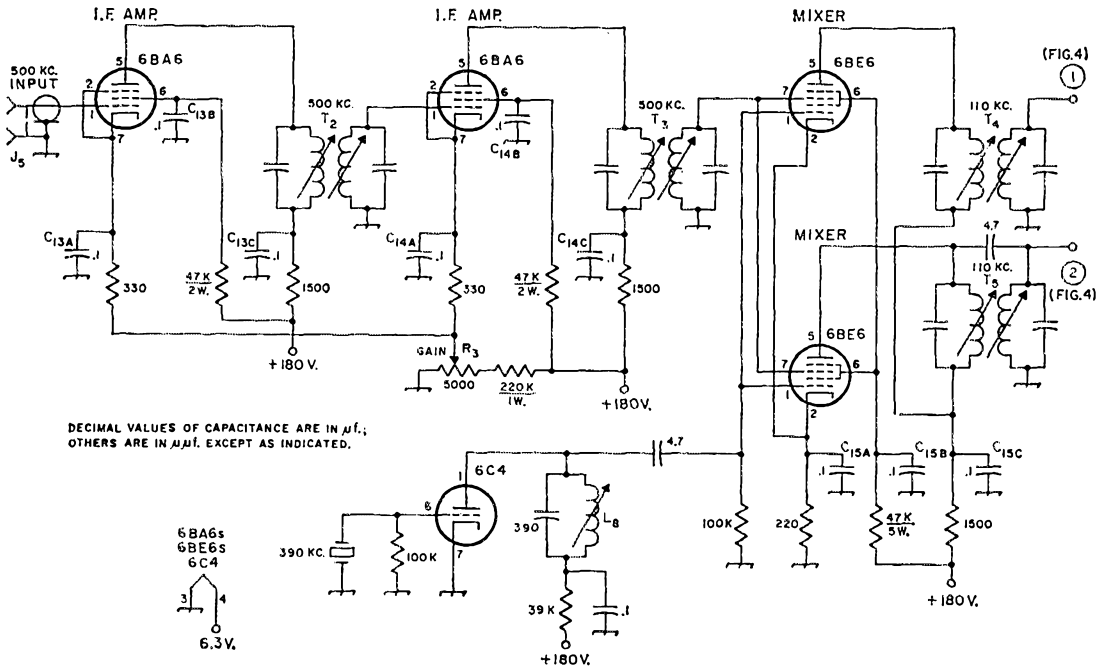


Fig. 3—Circuit of the 500-kc. section of the i.f./a.f. unit. Resistances are in ohms and resistors are ½ watt unless indicated otherwise.

C_{13}, C_{14}, C_{15}—Triple-unit fixed capacitor.
J_5—Coaxial receptacle (SO-239 or Jones S-101).
L_8—Slug-tuned coil—approx. 400 μh.
R_3—Wire-wound control.
T_2, T_3—Midget 455-kc. i.f. transformer (retuned to 500 kc.).
T_4, T_5—110-kc. i.f. transformer (Miller 1890-P1, or see text).

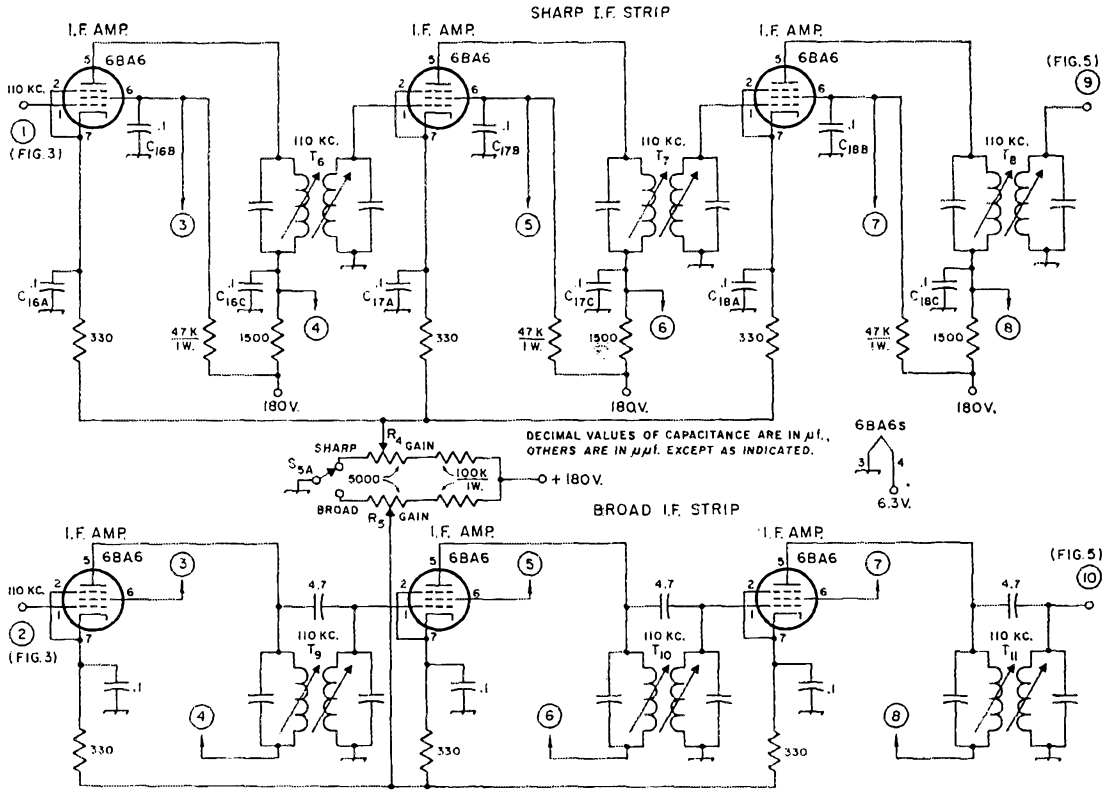
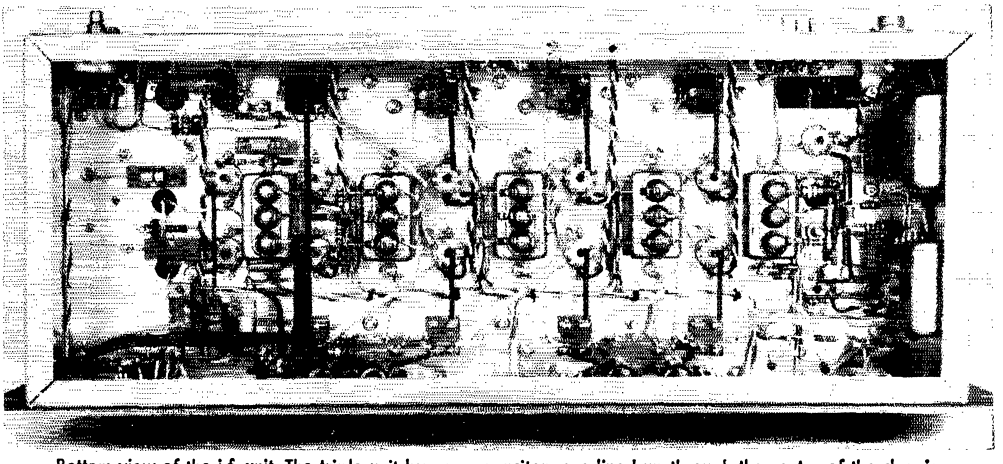


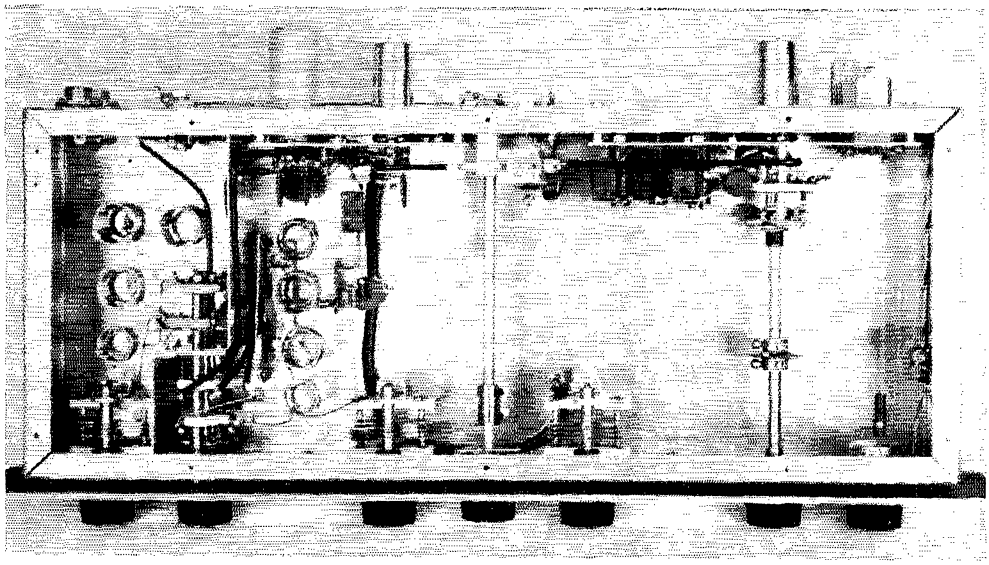
Fig. 4—Circuit of the 110-kc. section of the i.f./a.f. unit. Resistances are in ohms, and resistors are ½ watt unless indicated otherwise.

C_{16}, C_{17}, C_{18}—Triple-unit fixed capacitor.
R_4, R_5—Wire-wound control.
S_5—1-section 2-pole 2-position rotary switch (see Fig. 5 for second pole).
T_6–T_{11}, incl.—110-kc. i.f. transformer (same as T_4 and T_5).

aluminum plate shown at the left side of the chassis. A 6AU6 is used in the amplifier and a 6J6 in the mixer circuit. The amplifier grid and plate circuits are tuned by C_1 which consists of two ganged units with the shaft brought out to a panel knob. The simple dual-triode mixer circuit was the best of several types tried. The midget 455-kc. i.f. transformer T_1 is tuned to 500 kc., which it reaches easily without any modification. It is connected to the i.f. unit through coaxial cable, the cable capacitance forming part of the secondary tuning capacitance.



Bottom view of the i.f. unit. The triple-unit bypass capacitors are lined up through the center of the chassis.



The crystal-controlled converter. The r.f.-stage grid coils are to the left of the band switch and the plate coils to the right. A small subassembly, in rear left of the chassis, includes the r.f. and mixer tubes (protruding through holes in the rear of the chassis) and the shielded mixer output coil. A similar subassembly to the right contains the crystals and h.f.o. tube (both also protruding from the chassis), the oscillator plate coils and their padders, and the crystal-oscillator switch. The rear end of the shaft at the center is linked mechanically (outside of the chassis) to the shaft of the converter in/out switch at the rear of the r.f.-coil compartment.

Converter

In the converter, Fig. 2, the 40-, 20-, 15-, and 10-meter bands are heterodyned into the 3-to-4-megacycle range for tuning. Crystal frequencies are chosen so that each band starts at 3.0 megacycles on the tuner dial. The use of this high first-i.f. frequency makes it easy to obtain a good image ratio, since the image is always at least 6 megacycles away from the signal. Two crystals are provided for the 10-meter band, since the tuner covers only a one-megacycle range. A 12AT7 cascode amplifier feeds a 6C4 triode mixer, with another 6C4 as the crystal oscillator.

B & W Miniductors were used for making the signal-frequency coils. The links are wound on small pieces of bakelite tubing which fit inside the Miniductors, and are held in place with Duco cement. The antenna-input links were adjusted to match 50 ohms with an s.w.r. bridge.

Tracking problems are avoided by the use of separate tuning controls for the r.f.-amplifier grid circuit, and the mixer grid and plate circuits. There is no inconvenience in this method, since these controls need only to be peaked up for the low, middle, or high portions of a band. A separate switch gang, S_3, with an extra position for the second 10-meter range, is provided for the crystal oscillator.

The oscillator is coupled to the mixer through a compression-type trimmer. The amount of coupling is not critical, and good results are obtained on all bands with one setting of the trimmer.

For tuning to 80 meters, switch S_4 is thrown to the "out" position, which connects the antenna directly to the tuner. The converter is built in a chassis of the same size as the tuner, with a 3½-inch panel.

I. F. Unit

The i.f. unit is built on a 3 × 17 × 7-inch chassis, with a 7-inch panel. It contains a two-stage 500-kc. amplifier (Fig. 3), two three-stage 110-kc. amplifiers having different bandwidths (Fig. 4), and the detector, audio, and tuning-meter circuits (Fig. 5). The 500-kc. signal from the tuner is first amplified, then converted to 110 kc. by mixing it with the output of a 390-kc. crystal oscillator in the two 6BE6 mixers, each of which feeds one of the 110-kc. amplifiers. The 110-kc. transformers were obtained as surplus and are the type used in radio-compass receivers. One amplifier has its transformers peaked at 110 kc., giving a bandwidth of 380 cycles at 6 db. down, with steep sides, which seems to be just about right for c.w. The other amplifier is stagger-tuned, with a small amount of top coupling added to each transformer. This strip has a bandwidth of 3 kc. at the 6-db. point, which works out well for s.s.b., or for picking off one sideband of an a.m. signal. Only one of the 110-kc. amplifiers operates at a time, as selected by the "broad-sharp" switch, S_5, which also connects the 6BE6 product detector and the 6C4 diode amplifier to the chain in use.

The d.c. output voltage of the diode detector operates the tuning-meter bridge circuit. A zero-setting adjustment is provided at the rear of the chassis. R_8 is selected so that the meter reads full scale with the meter-amplifier tube removed from its socket. The meter operates at all times, and is quite useful for tuning or aligning the receiver,

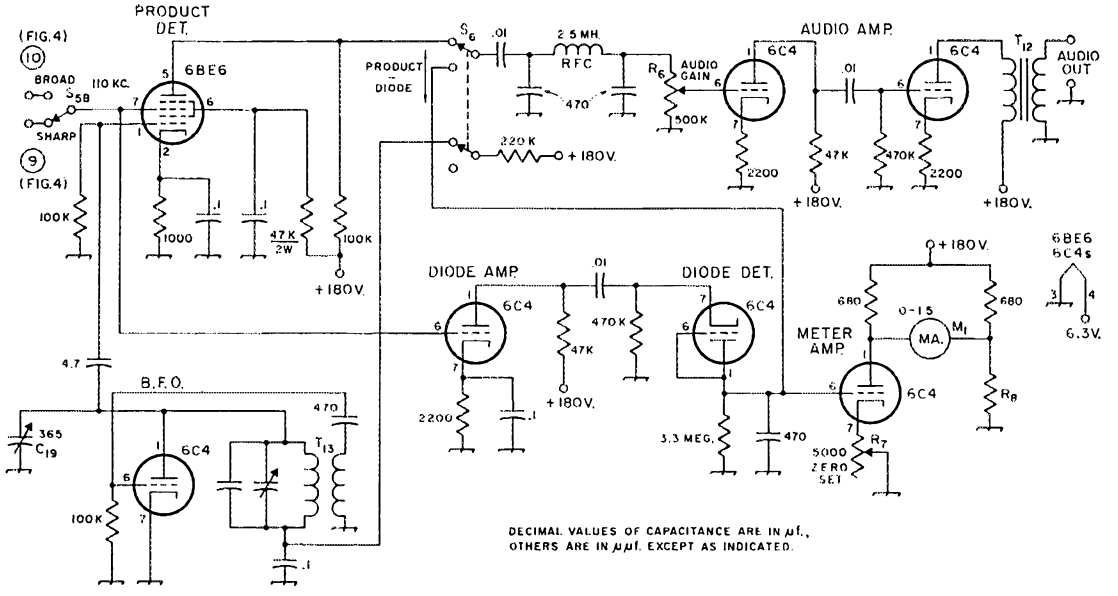


Fig. 5—Detector, audio, b.f.o. and tuning-meter circuits of the W2LYH receiver. Resistances are in ohms and resistors are ½ watt unless indicated otherwise.

C_{19}—Padder for T_{13}, broadcast replacement type (see text and T_{13} below).
M_1—D.c. milliammeter.
R_6—0.5-megohm control, audio taper.
R_7—Wire-wound control.
R_8—Nominally 56,000 ohms (see text for adjustment).
S_{5B}—See Fig. 4.
S_6—D.p.d.t. rotary switch.
T_{12}—Plate-to-line transformer.
T_{13}—110-kc. b.f.o. unit (see text). Miller 612-M5 132-kc. unit may also be used with more padding capacitance.

for giving comparative signal reports, or even for tuning the transmitter. However, it is not an S meter, because I sincerely believe that S meters are a lot of nonsense, especially since they have degenerated to the ridiculous "db. over 9" variety.

For flexibility, a separate gain control is provided for each of the three i.f. amplifiers. In normal operation, the 500-kc. amplifier gain control is used mostly. No provision is made for a.g.c., since I have never found any use for a.g.c. in ham operating. In fact, the use of carrier-derived a.g.c. is directly responsible for many mistaken ideas about such things as "audio punch" and "supermodulation." Switch S_6 selects audio from either the product detector or the diode detector. Two 6C4 audio stages supply plenty of audio, unless you like to use your receiver as a p.a. system.

The b.f.o. transformer T_{13} is a junk-box item marked 239 kc., padded down to reach 110 kc. A midget variable capacitor with built-in reduction drive, taken from a defunct broadcast receiver, gives smooth tuning of the b.f.o. frequency. The panel control is calibrated in kc. above and below the i.f. center frequency. Of course, 12AU7 twin triodes can be used instead of 6C4s. However, separate tubes do make the wiring a little easier

Converter Coil Table

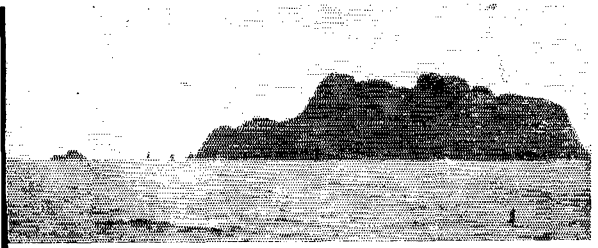
Freq. (Mc.)	Y_1 (Mc.)	Coil	L (μh.)	Wire No.	Turns	Diam. (In.)	Length (In.)	B&W No.	Link** (Turns)	C_{12} (μμf.)
7–8	4	L_4	9	24	28	¾	7/8	3012	2	
7–8		L_5			same				10	
7–8		L_6	10	28	45	⅜*	c-w.			150
14–15	11	L_4	3	20	17	¾	1	3011	2	
14–15		L_5			same				8	
14–15		L_6	7	28	20	⅜*	c-w.			22
21–22	18	L_4	1.5	20	11	¾	⅝	3011	2	
21–22		L_5			same				6	
21–22		L_6	2.5	28	18	⅜*	c-w.			22
28–29	25	L_4	1.1	20	9	⅝	⅝	3007	2	
28–29		L_5			same				4	
28–29		L_6	1.3	28	9	⅜*	c-w.			22

29–30 26 Same coils are used at L_4 and L_5 as for 28–29 Mc. At L_6 the coil is a duplicate of its coil for 28–29 Mc. with a slightly different slug adjustment.

* Close-wound on ⅜-inch iron-slug form.
** Links are at low-potential ends of associated coils, see text.

Conclusion

For a ham-band receiver the crystal-converter tunable-first-i.f. approach seems to me to be ideal, having the advantages of freedom from drift, high image ratio, and equal tuning rate on all bands. Perhaps the idea of constructing the set in several "building-block" units will make the thought of constructing your own receiver seem less formidable. QST



Malpelo Island, looking west. The rocks to the left are called "South Rock," and a similar group lies on the north side of the island. The high peak just to left of the island's center was scaled. The view from there is absolutely breathtaking.

Waging War on Malpelo Island

BY MAC REYNOLDS,* W9EVI

Back in the early 1700's, a lone Spanish ship bumbling about in the eastern Pacific Ocean stumbled upon an imposing basalt rock island 310 miles off the west coast of Colombia. It was named Malpelo, meaning "Bad Hair" in Spanish, and was the scene of a recent 2½-year struggle to install its first amateur station.

Background

In 1927, Scripps Institute of Oceanography landed on the island's north coast, now a sheer cliff to 600 feet; and it failed in a second attempt in 1936. The following year a Vanderbilt expedition successfully put ashore to look things over. In 1953 a Colombian naval officer, after waiting three days for a decent surf, finally got on in a rubber boat. But way back forty years ago a ship loaded with silver bars plowed mercilessly into an off-shore rock and disappeared from knowledge in 300 fathoms of salt water. Treasure hunters still search occasionally but no poor men have ever risen rich from that ocean bottom.

The late HK7AB and a few W's were, in 1958, dreaming of a trip to Malpelo, each group unknown to the other. When the facts were discovered, it was decided to make it a joint venture.

By September, 1959, HKØTU was issued to an insatiably curious group and in May, 1960, a year and a half later, a group composed of HKs 3LX, 5BZ, 5EV and Ws 4CVI, 6HAW, and 9DUB loaded a mountain of gear onto the Colombian naval ship *Ciudad de Quibdo* and sailed for Malpelo. Timing was perfect: 1960 was the 150th anniversary of Colombian independence. By mid-May and with almost heroic effort, two men and a 300-lb. generator were deposited on a 25-foot rock jutting out from the eastern shore of the island. But the Pacific Ocean churned up a storm and the group decided to withdraw rather than face further needless risks.

By this time it was impossible to give up, and another attempt was planned for 1961, now armed with good solid knowledge of what to expect and what to do about it.

The "experts" gave 50-50 chances of success and offered professional landing advice ranging from a black-powder harpoon gun of intolerable dimensions to floating hydraulic extension ladders, and even the prize idea of floating through the air from an off-shore ship to the island suspended by mammoth balloons.

Beginning in June, 1960, the Colombian lads performed miracle after miracle and by March, 1961, HKs 1QQ, 2YO, 3LX, 4OC, and 5EV and Ws 4DQS, 6HAW, 9EVI, and 0NWX were signed on. Boots Olsen, W6HAW, lined up a mysterious insurance policy in the name of the "DXpedition of the Century to Malpelo Island" and the Second Battle of Malpelo was begun.

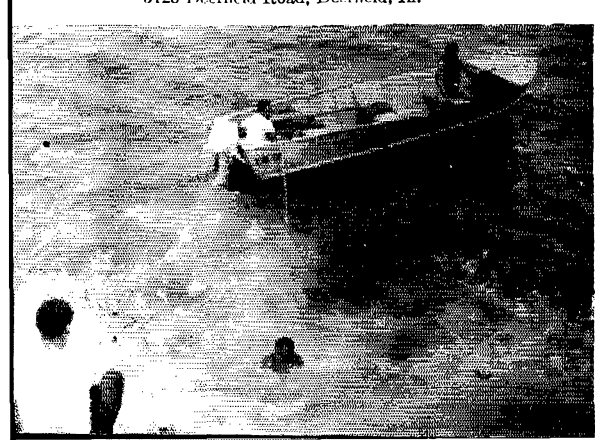
The Task

A division of labor was ordered. Ed Quinones, HK3LX, arranged through the Ministry of War for the *Ciudad de Quibdo* (182 feet) and a C-47 to fly lads and equipment across Colombia. Herman Olarte, HK1QQ, somehow transported 1400 lbs. of gear from Miami to Colombia, the Ws lined up most of the radio equipment, and Carlos Valencia, HK5EV, took care of the heavy equipment and the secret landing plans. The Colombian League obtained final clearance for us to set up shop on Malpelo, while dates and frequencies went out over W1AW, and to various DX clubs around the world. After 2½ years of work and planning, things looked really quite good for a successful trip.

Getting the Show on the Road

On March 26, with the gear and Ws in Barranquilla, Colombia, HK1QQ threw a welcome feast and the boys were huddled off to Bogota. Luis Caicedo, HK3AO and president of the

* 3120 Deerfield Road, Deerfield, Ill.



Jaimie is seen coming ashore, assisted by ship's crew. The sea was much calmer here than during the 1960 attempt to land.

Colombian League of Radio Amateurs (LCRA), opened his home to a gracious dinner party. It seemed as though every ham in Colombia was there.

The following morning, Ed met us at the Air Force Base outside Bogota to catch a C-47 flight to Buenaventura via Cali. We left early with a load of Boy Scouts as co-passengers (plus a large piano), all to be replaced in Cali by 10 fierce-looking banditos and their armed guards. It was what you might call a nervous ride, but somehow we lumbered over the Andes at 19,000 feet without pressure or oxygen, half frozen and short of breath, and landed on a field the size of a piece of chalk in the jungle near Buenaventura.

Carlos met us at the field with three overloaded trailers of landing gear for the island. Fourteen hours later the gang put the last piece of equipment on the *Quibdo* and sailed at 9:30 P.M. on the 28th of March.

The Sail and How to Land

The Pacific Ocean lay at its quietest but began to stir up a bit of fuss as we neared Malpelo. Carlos and his two sons had carefully planned two ways of making a landing:

1. A 4000-lb. Kontiki-type raft, 20 × 68 feet, was fashioned on board ship with a bundle of balsam logs at one end and steel drums at the other. There was even a catwalk down the middle and a hand railing. Very plush. The idea was to pitch the whole thing overboard, tow it to shore, tether it to the rocks, and Presto! a floating dock. Sounded like a dream.

2. If that plan didn't work out, eight large galvanized steel drums with crank-sealed tops were along. All the radio gear had been chosen to fit inside these barrels. If all else failed, the HKs had four huge innertubes and two inflatible rubber boats for special situations — whatever that means. The plans seemed well thought out and looked to be the answer to the fervent dream of putting Malpelo Island on the air. We crossed our fingers and grinned at each other.

Somewhere during the 40-hour sail, the 6-cylinder diesel dropped to 3-cylinder function and speed slowed to 3½ knots. Carlos stripped to the waist and shortly emerged from the engine room with news of success. We were elated. Porpoises and flying fish abounded. Sharks were used for target practice and the *Quibdo* hummed along.

The Island

Thursday at dawn proved a perfect job of navigating: the island lay ahead in the calmness of a cold moonlight, so penetrating a picture that no one cheered or spoke; we just leaned on the railing and smoked in silence.

Malpelo Island is a solid rock with absolutely no vegetation. It rises to four peaks of which the highest is 846 feet. It looked immense. The *Quibdo* took an excursion at dawn, showing only one spot looking like a possible beach head. The rest of the coastline is vertical up to heights of 200 to 800 feet. At the waterline, the island is about ⅜ × 1⅜ miles in diameter. There is no

Looking down toward landing spot, while some of the gang are pulling in the equipment. The vertical distance between the men on shore and those in the outboard was about 15 feet. A shark (arrow) shadowed the outboard. Only one barrel broke loose in the landing, and luckily it floated.

anchorage because the cliffs extend straight down hundreds of feet below the surface. A spot on the east side about 1000 feet from the southern tip showed a small 40° sloped shelf rising from 15 feet above the high-tide mark to a point about 60 feet inland. From there the cliff rose on an average slope of about 70° to the 600-foot level, where it leveled out or rose straight up.

The sharks, largely blues and hammerheads, rode in grinning packs of 10 to 80 and at times were an arm's length offshore. The rifle fire at these intruders was enough to tick off WW III, had it been heard around the world.

Shortly after dawn on Friday, March 31 (HK Time), the captain of the *Quibdo*, Carlos, and his sons, Enrique and Carlitos, explored in detail the landing spot in an 18-foot aluminum outboard motor boat. The sea was heavy but a far, far cry from the year before. The report was simple — forget the Kontiki raft (it would have been smashed into toothpicks against the rocks) and concentrate on the barrels. We rubbed our rabbit's foot and swallowed hard.

The Landing

The outboard was skillfully run at high tide right up to shore. At the proper moment and with a crest of a large wave at hand, Enrique jumped on shore and scampered up the slippery rocks. Had he slipped and fallen into the surf, there was not very much that anyone could have done to

The operating area was about 130 feet above the sea. The top of the island, another 500 feet up, is obscured by a lava ridge above the tents. W6-land lies on the other side.

Looking north to the kitchen—the Malpelo cafeteria. The cliff in the background is in line with the Mississippi river, India is the other way, while Africa is a clear shot to the right. The several huge lava rocks in the foreground teetered dangerously.

help him. Pure guts. With a rope tied to a steel pin driven into the island and the other end dangling in the surf, we had only to take the outboard to a point 20 feet offshore, jump in the surf, and pull ourselves up the lip of the island in mountain-climber fashion. Crude, yes; but it presented no casualties except a badly crushed finger on Enrique's hand. The gear came next in the barrels. Block and tackle coupled with five hours of manpower took care of that by 3 P.M. Friday.

HK0TU Opens for Business

Malpelo was ours. We rested and explored a bit. Apparently thousands of years ago the top of the island had erupted, sending porous lava down to the sea and covering the sparse red soil that once supported plant life. Occasionally the lava had frozen and formed "caves" with protective lips of lava overhanging. We chose three of these caves for the c.w., a.m., and s.s.b. stations. They were only 30 feet apart but required up to 20 minutes climbing time between them. A kitchen area and relief area were chosen, tables and benches were brought into place, and the stations set up. It was nearly dark and very windy. The antenna crew under Jamie Restrepo, HK2YO, had been at work stringing 130-foot long wires and returned after a 7-hour job. It looked bad for transmitting west. This was the understatement of

Boots smiles as the 20-meter c.w. pileup turns into a frenzy after a fast SK BK. Fiddler crabs would crawl down the rock behind operator, causing those many "waits" you heard. The tables and benches were floated ashore and left in place.

the year because of a huge cliff rising another 600 feet west of the operating positions.

By 0300 GMT on the morning of April 1 (10 P.M. EST) the three rigs on three modes were somehow ready, with the Borg-Warner Zeus generator running like a top. That everything worked was amazing. We turned on the three receivers and listened on our appointed frequencies. The band chatter was something for the books. The Ws and South American stations seemed to vie for signal honors. Once in a while some innocent soul would call CQ on our expected frequency only to be hammered into oblivion by an angry wolf pack waiting for our grand appearance. I admit the temptation was too strong at this point; we tested for a few minutes and then listened. The silence was deafening. The c.w. boys called a CQ signing HK1QQ/P and worked one lad who is just this instant discovering what he worked that evening. HK1QQ and Ws 4DQS, 6HAW, and ØNWX operated c.w. The balance of us operated various forms of phone. Bob doubled in brass by working a little relief phone.

Finally, at 0300 GMT on April 1, three stations (all on 20 meters!) opened up on a mediocre band and the third battle of Malpelo was on. Between the frantic calling and inter-station interference, it was sheer bedlam. By dawn the gang had somehow knocked off 1700 QSOs. Not much DX and few W6s and 7s. Not once that night did we have to work to start a pile-up. The international DX grapevine had alerted the gang. A touch of the key and we were besieged with r.f.

The Days on Malpelo

Early the next morning Boots and Flavio took the last 1000 feet of antenna wire and started a climb to the top, figuring that if just a few feet of wire could be laid within an open shot in all directions, we would have the world in our pocket. They returned at 4 P.M. announcing they had run out of wire 150 feet from the top, but the wire was laid that far. It was a dud and we felt downright persecuted. A beam was out of the question as were antenna balloons and kites. Then Jaime, Flavio, and Harold decided a complete station should be taken to the top — eight hours away. This failed because it rained. Malpelo lies in a world area where a low-pressure, rain-bearing front oscillates back and forth producing plenty of downpours and instantly-reversing winds. Only two varieties of lizards, a few insects, many fiddler crabs and large sea birds live on the island. The latter have covered the island with guano that becomes slippery as gelatin when wet. In fact, the whole place smells like an old hen house when it rains. A climb to the top with a load of gear was out of the question.

Time Rolls On

The thousands of fiddler crabs were a constant menace, eating everything in sight, and preventing any real uninterrupted sleep. Specimens of the two lizards were brought back to the Lincoln Park Zoo in Chicago: *Mariquana Agassizi* and *Diploglossus Millipunctatus*, the only ones in

captivity. The white and black sea birds were as large as a turkey and given to diving dead-stick at breakneck sped from 800 feet down to the sea in a long whoosh sounding like a 707 jet.

Great caution had to be taken at all times not to loosen the crumbling lava and start a landslide. The walkways were lighted at night with 40-watt bulbs strung all over the place. Harold assumed the full responsibility of keeping lights and generators running 24 hours a day. Eduardo, Enrique and Carlitos performed the many tasks necessary to keep the stations running and the operators fed, fat and sassy.

The equipment held up marvelously. The 32V-75A-4-TO keyer on c.w., the 200V-Drake 2A, and the Valiant-Drake 2A all hummed along. QSOs were made in Spanish, English, French, German and some unknown language with a 5U7.

The Bands and Operating Notes

As I said earlier, the bands were mediocre, flipping between the fair and the miserable. An exception was 15-meter a.m., with excellent openings. We heard many DX stations on 15 telling each other that they had sat up all night on 20 and didn't hear us and "where in tarnation did we go?" Some fun! 15 s.s.b. was a flop but c.w. on that band was superb. 10 was all but closed down. 40 c.w. was top drawer in the middle of the night but too many boys go to sleep at sensible hours, I guess. 20 on all modes was magnificent except that it was hard to keep the boys off the s.s.b. frequency. To move sideband below 14,200 is not sportsmanlike and only aggravates a bad situation on that band.

Bob tried 160, but the r.f. stayed on the island and results were zero. 80 c.w. was surprisingly good, but not enough DX activity on that band. It was open all night, but it was hard work and took a lot of CQs. 40 and 80 are the bands to watch as the sunspots decline. As an observed tip: when there is a DX station operating in your hemisphere on a 24-hour basis, break out the coffee and stay up very late on 40 and 80. Any signal at all will be welcomed by the DX, I assure you.

Our operators were slowed down a bit at times by the "Listen for my friend on phone" business and the ever-present "Good 'Ol Charlie Brown's." But as a refinement of technique, if signals are reasonably readable (R4 or R5), don't send "HKØTU HKØTU de W1XXX W1XXX R R RST 599 599 PSE QSL 73 HKØTU de W1XXX K". It takes too much time, and lost time when the band is good means contacts never made with deserving stations. Instead, try, after—your original call is acknowledged and the DX breaks to you — "BK de W1XXX 599 BK" or something similarly speedy. To call or continually mention HKØTU is superfluous and only wastes time and irritates the pack and the DX operator. Similar procedure is dictated on phone. There is here a growing tendency to include your state in your report. Except in certain contests, you can easily make a manic-depressive out of the DX operator with this procedure. Phonetics are something to

L. to r: Harold, Flavio, Jaime, operating a.m. from a cluttered table. This station accounted for a phenomenal number of contacts.

behold. The ARRL list can't be misunderstood.

One W1 (or W8?) wanted to act as our master of ceremonies, promising to line up the boys by serial number, like those given out in a hardware store. We laughed over that one for two days. What a way to work DX!

Anything you can do to speed things up and make it clean for the DX operator is always appreciated by him, and above all, by the pack waiting for their turns. These are some observations taken on the island, and we all hope they will be of some value to you in getting on the Honor Roll.

A few tape recordings were made on Malpelo and they are family heirlooms. We rotated operators from band to band and mode to mode to offer different languages to all.

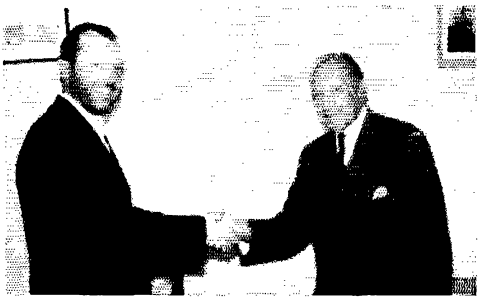
1961 was the year to work Malpelo lots of times. One lad is in the log 14 times on the same mode. A new Candidate for Rod Newkirk's "DX Hog of the Year." May he sizzle in the Aldabras.[1]

Early Sunday morning, Harold, Enrique, Eduardo and Carlitos planted the Colombian National Flag at the 800-ft. level together with the flag of the Cali Fire Department and a bottle containing all our names.

The *Quibdo* had been circling the island for five days and the time was up. HKØTU was closed down early in the morning of April 4 after 4400 QSOs in 66 countries. The next landing party

[1] Newkirk, "How's DX?", *QST*, May 1961.

Luncheon time at the Malpleo cafeteria. L. to r: Eduardo, Dale, Boots. The slope of the island's shore is clearly visible. If one were caught here in the rain, it was necessary to wait till the slippery rocks were dry before proceeding.



The Brass meet in Bogota. Luis Caicedo, HK3AO, president of the Colombian League (right) meets WØNWX, ARRL Midwest Division Director, in Sr. Caicedo's home.

on Malpelo Island will find a ready supply of tables, benches and antennas left there — out of sheer courtesy, naturally!

The Return

The trip back to Buenaventura was a beauty. The ocean was as calm as could be, without a ripple, and with large sea turtles as common as the porpoises playing off the bow. No one caught the grippe and the superb Colombian beer flowed in remarkable quantities. It was a distinct paradise except that the 13 of us were probably the dirtiest 13 persons in the world. Unshaven, covered with bird droppings, salt, mud and peeling skin, we itched our way across the Andes to Cali where we spirited our filthy selves into that beautiful city under the benevolent cover of darkness.

After a party to end all parties in Cali, the gang was flown in another C-47 to Bogota where we were met by HK3AO and family. The Ws threw the dinner that night and we ended up at HK3QV's for a final victory celebration that would shame Bacchus. Finally, with the HKs in their respective cities, it was time to return to the U.S. We flew to Barranquilla with Herman. From there to Miami.

Finally . . .

All of us of HKØTU must thank not only the stations contacted for their help in making the Malpelo Island DXpedition a success, but also the many persons and agencies that were responsible for providing so fine an experience.

This was a trip to Colombian soil, transported by Colombian Military Forces, and licensed and approved by the necessary Ministries and agencies of that government. Without their help and the astonishing personal drive of the Colombian amateurs, this trip could never have been consummated. The bigger the challenge, the more they enjoyed it, and full credit is due them.

The open friendship and hospitality offered us in Colombia was pure and honest. If you should ever be there under similar circumstances, *you* will never forget it, either. QST

Hamfest Calendar

New York — The 7th Annual V.H.F. Roundup, sponsored by the Syracuse V.H.F. Club, Inc., will be held on Oct. 7. As previously, it will be at the Three Rivers Inn, Route 57, north of Syracuse, N. Y. Noted speakers, ladies' program, awards presentation to Eastern and Western New York winners in the ARRL June V.H.F. Party. Steak dinner, and floor show with top talent. Price $5.50 in advance; $6.00 at the door. Tickets and information from Dick Benjamin, K2YFY, 211 Marilyn Ave., North Syracuse 12. Motel reservations from Earl Witt, K2QWD, 129 Sunstruck Drive, Syracuse 6.

Pennsylvania — The annual banquet of the Mahonoy Valley Brass Pounders' Club will be held on October 28 in the Hometown Fire company hall, on Route 45, one mile north of Tamaqua, Pa. Talk-in frequency will be 50.64 Mc. The FCC will be on hand at 1600 to give General Class examinations. A Pennsylvania Dutch-style ham and turkey dinner will be served promptly at 1830, followed by professional entertainment. All registrations ($4.00 each, including banquet) *must* be made in advance and prior to October 20. There will be no seats sold at the door. Send all inquiries and registrations to Jim Miller, K3KNP, 98 Railroad Street, Giardville, Pa.

Pennsylvania — The 15th annual hamfest sponsored by the Radio Association of Erie will be held from 1100 to 1800 on Saturday, September 30, at the Cesare Battisti Club, 1602 East 38th St., Erie. Registration (including ham or chicken dinner if paid in advance) is $3.00 for adults and $2.00 for children. There will be 6- and 10-meter hidden transmitter hunts, an auction, a DX contest, women's entertainment, and mobile judging. Info and registrations available from Hank Schneider, W3KPJ, 1806 Water St., Wesleyville, Pa.

25 Years Ago this month

October 1936

. . . On the technical front twenty-five years ago we had a medium-power, three-band transmitter by Grammer, a 5-meter crystal-control rig by John Reinartz, a crystal filter and noise silencer for a superhet by Grammer, a kw. rig by Eitel and McCullough, and more on a test oscillator by DeSoto. In addition there were articles on Class-B modulation, a vertical antenna for 7- and 14-Mc. operation, multitube oscillators for the ultra highs, use of the "magic eye" tube, and the usual hints and kinks.

. . . It was announced that W9ERU (who is still around and using the same call) won the code speed contest at the Central Division convention, copying 52.2 w.p.m. The runner-up was W9KJY, who is now better known as W1LVQ.

. . . Results of the 4th annual Field Day were published. The high-scoring club made 143 QSOs. It appears that some 387 hams were in the field.

. . . This issue twenty-five years ago carried the original announcement of the publication of *Two Hundred Meters and Down*.

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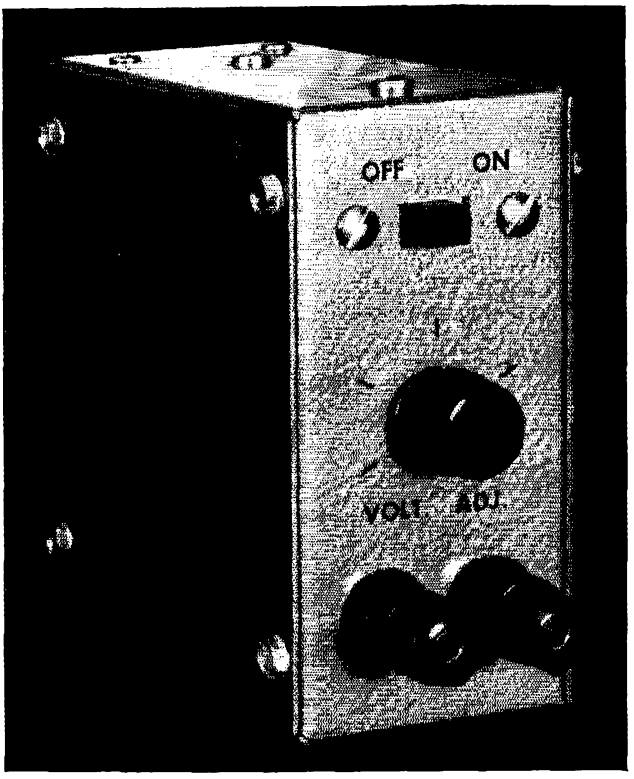
Two Hundred Meters and Down, by the late Clinton B. DeSoto, is a 184-page history of early amateur radio (to 1936) which has been out of print for about ten years. The League arranged for reproduction, through a photographic process, of a limited number of copies of this book and has a few still in stock at a price of $2.00, approximately our cost. Address ARRL Hq., West Hartford, Conn.



This regulated supply for use with transistors is enclosed in a 4 × 4 × 2-inch aluminum utility box.

The Design of Regulated Low-Voltage Power Supplies

BY J. R. GOUGE, JR.,* W3RXI

Batteries, fixed low-voltage supplies, and bleeder networks on high-voltage supplies designed for use with vacuum tubes all have obvious shortcomings when used by the experimenter to power transistor circuits. A variable, regulated, low-voltage power supply eliminates the problems associated with the above sources. This article deals with the general design of such devices and a specific example which can be duplicated at a very modest cost with reliable results.

THERE is no difference between the principles involved in voltage-regulated power supplies using vacuum tubes and those upon which similar circuitry using transistors operate. The only differences lie in the components used and the voltage levels involved. The block diagram of Fig. 1 shows the essential elements in a series regulator of conventional type. To analyze the operation of this circuit, consider first that the supply is operating at a preset output voltage and, for one reason or another, this voltage decreases. The voltage comparator senses the change in output voltage by comparison with a stable voltage-reference element, producing an output signal related to this change which drives the d.c. control amplifier. The control amplifier in turn amplifies this signal and, by its output, controls the resistance of the series element (in this case reducing it) to restore the output voltage to its original value. If for some reason the output voltage should increase, the same sequence of events would occur, except in the opposite phase. This will result in an increase in the resistance of the series element with a corre-

* 5940 89th Ave., Carrollton, Hyattsville, Md.

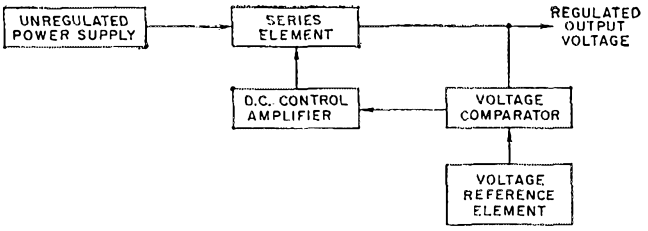


Fig. 1—Block diagram showing the essential elements of a voltage-regulated supply.

sponding decrease in the output voltage to its original value.

Since a change in output voltage is required to produce a change in the resistance of the series element, this type circuit cannot completely compensate for output changes. However, the greater the gain of the loop consisting of the voltage comparator, d.c. control amplifier, and series element, the greater will be the compensation. The upper limit of the gain usable in this loop is determined by stability considerations. If an attempt is made to use too much gain without compensating for phase shift at the higher frequencies, the circuit will become regenerative and oscillations will result, making the supply useless for most applications. The frequency response of this feedback loop normally extends well beyond the attendant ripple frequency of the unregulated power supply, hence the output voltage from this type of regulator is extremely smooth and ripple free.

Zener Diode as Reference

A more detailed description of a transistorized regulator can be made using the circuit diagram of Fig. 2. Although most low-priced regulators will use p-n-p transistors, Fig. 2 has been drawn with n-p-n units to facilitate the discussion and to make it easier for one who is more familiar with vacuum-tube circuits to make the transition. A 1-to-1 correspondence exists between the circuit elements of Fig. 2 and the blocks of Fig. 1. The reference element is the zener or breakdown diode, CR_1. When subjected to a reverse voltage greater than its breakdown potential, Vz, a diode of this kind maintains a constant terminal voltage which is relatively independent of the current which passes through it. Thus its action is much like that of the familiar VR tube with the important exception that its breakdown and operating voltages are one and the same as opposed to the VR tube which requires an ionizing voltage considerably greater than its operating voltage. As in the case of the VR tube, its operating current range is rather restricted. The limiting factor in determining the maximum current through a zener diode is its maximum allowable dissipation, typically 200 to 500 mw. for the pigtail variety. For maximum stability it is important not to operate these diodes near their power limit since they are temperature sensitive and the heat produced by their own power dissipation will affect the breakdown potential.

Transistor Regulator

The comparator circuit is the base-to-emitter junction of transistor Q_2, the control amplifier. The controlled series element is Q_1, normally a power transistor. R_2 and R_3 are used as a divider across the output voltage so that the regulator can be adjusted for an output greater than the zener voltage of CR_1.

In the following theory of operation two particular approximations have been used. First, that the base-to-emitter drop of Q_2, normally on the order of 0.2 volt, is negligible and, secondly, that the base current of Q_2 flowing through R_2 does not produce a significant voltage drop. The latter will be true for all intents and purposes provided that the bleeder current through R_2 and R_3 is several orders of magnitude greater than the base current of Q_2.

In operation, the voltage at the base of Q_2 is the zener voltage of CR_1. Taking into account the divider action of R_2 and R_3, the output voltage will then be found from

$$E_O = Vz\left(\frac{R_2 + R_3}{R_3}\right) = Vz + \left(\frac{R_2}{R_3}Vz\right).$$

Thus, by varying the ratio of R_2 to R_3, the output voltage can be adjusted between a lower limit of Vz and an upper limit determined by the unregulated input voltage and the voltage ratings of the circuit components.

If the output voltage of Fig. 2 were to increase because, for instance, of a decrease in load current, the base current of Q_2 would necessarily increase, resulting in an amplified increase in the collector current of Q_2. This increased current

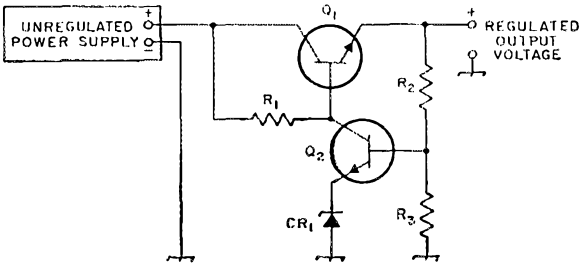


Fig. 2—Regulator circuit using transistors. Circuit designations are for text reference purposes.

flow through R_1 causes a drop in the base voltage of Q_1 and a corresponding increase in the effective resistance of the collector-to-emitter circuit of the series element Q_1. The end result would be a reduction in the output voltage to its preset value. An analogous series of events will occur to raise the output voltage to its original value should something, say a decrease in line voltage, cause it to be lowered.

Transistor Protection

The most serious shortcoming of a regulator of this sort using a power transistor as the series element is the possible destruction of Q_1 by an accidental overload or short circuit of the output. If the output terminals are shorted in the circuit of Fig. 2, practically the only impedance to the flow of current through Q_1 will be the internal impedance of the unregulated supply, usually a matter of ohms, probably resulting in the almost immediate destruction of Q_1. It should also be noted that an output short would instantaneously apply the full output voltage of the unregulated supply from collector to emitter of Q_1. Thus, if the voltage rating of Q_1 is less than the output voltage of the unregulated supply, the chances of the survival of Q_1 are just about nil. Because of the inherent time lag of fuse elements and circuit breakers they can offer protection only from overloads of the regulator which are still within the ratings of Q_1.

Many sophisticated circuits have been devised to protect the series transistor, but most of these add seriously to the complexity and or cost of the basic regulator. A simple yet extremely reliable means of protecting Q_1 from being destroyed by current overloads or output shorts is to increase the output impedance of the unregulated supply by connecting a power resistor between the unregulated output and the collector of Q_1. The decrease in circuit efficiency and regulation can be considered negligible when compared to the resulting circuit protection. This device has been used with gratifying results in regulators rated as high as several amperes. This technique will not protect Q_1 from voltage overloads. The simplest expedient here is to select a transistor with a voltage rating sufficient to withstand the full voltage of the unregulated supply.

There are two criteria used in selecting the value of the protective resistance. First, it should be large enough to limit the current through Q_1 to a safe value in the case of a short across the output of the regulator. Secondly, it should be small enough so that under the conditions of maximum rated regulator output voltage and current, and minimum line voltage, the valleys of the voltage waveform at the collector of Q_1 are at least 2 volts higher than the output of the regulator. The latter is necessary to maintain regulator action throughout the complete cycle of input voltage.

Practical Regulated Supply

The circuit of a versatile yet simple regulated power supply that can be duplicated for less than twenty dollars at mail-order prices is shown in Fig. 3. This circuit varies only in detail from the basic circuit of Fig. 2. The current-limiting resistor, R_5, discussed above, has of course been added between Q_1 and the unregulated supply. R_6 has been added to supply current to CR_1, the zener diode. If this supply were to be used at a fixed output voltage of about twice the zener voltage or higher, better regulation would result by connecting the left-hand end of R_6 to the negative output terminal of the regulator rather than to the unregulated supply voltage. In this case, R_6 should be of such a value as to provide about 5 or 6 ma. to CR_1. Q_1 and Q_3 are connected in what has come to be known as a Darlington pair. As a first approximation, Q_3 can simply be considered as a current amplifier which also raises the base input impedance of Q_1 as seen by the collector circuit of Q_2. C_2 and R_4 have been added to eliminate a high-frequency oscillation which occurred due to phase shift within the feedback loop. C_3 helps to improve the transient response and R_2 has been made variable to provide a means for adjusting the output voltage. C_4 reduces the ripple voltage across the reference diode and hence the ripple in the regulator output. The addition of R_7 prevents Q_3 from being cut off at low output currents.

TABLE I

E_O *Volts*	I_O[1] *Ma.*	E_{AC}[2] *Mv. R.M.S.*	E_1[3] *Mv.*	E_2[4] *Mv.*
7.5	300	3.3	75	25
10.0	250	4.2	85	30
12.5	230	4.6	95	35
15.0	170	5.0	100	45
17.5	135	5.3	100	55
20.0	100	6.0	100	65
22.5	90	8.0	110	90

[1] Maximum load current with 115 v. a.c. input.
[2] Output ripple voltage at maximum load, 115 v. a.c. input.
[3] Change in output voltage as output current is varied from no load to full load with constant 115 v. a.c. input.
[4] Change in output voltage with a constant load corresponding to one half that of Column 2 as the line voltage is varied from 105 to 125 volts.

Construction

The only precautions to be observed in constructing this and similar regulators are that the heat-producing elements, such as R_1 and Q_1, are not in a position to cause heating of the low-power transistors, Q_2 and Q_3, or the zener diode CR_1, and that Q_1 is mounted to an adequate heat sink. Several of these units have been built completely within 2 × 4 × 4-inch utility boxes with heat sinks of only 2½ × 1½ × ¼-inch aluminum with completely satisfactory results. The characteristics of one of these units are shown in Table I.

Other Output Ratings

Changes in the output voltage and/or current ratings of the circuit of Fig. 3 can readily be made. As previously mentioned, the lower limit

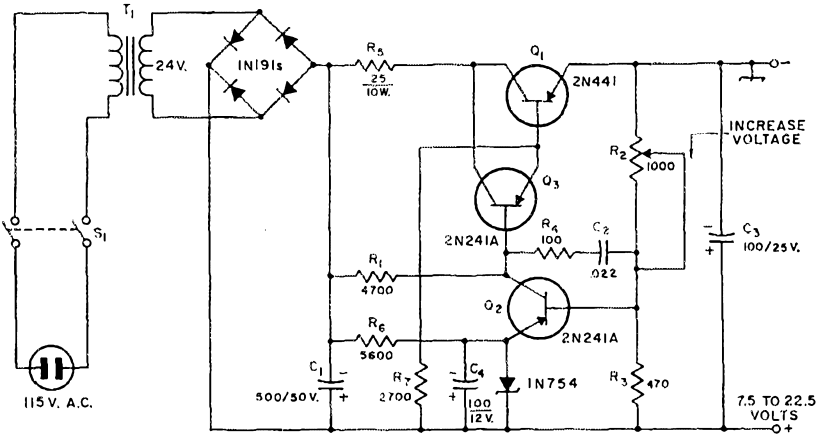


Fig. 3—Circuit of the transistor-regulated supply. Capacitances are in μf. and capacitors marked with polarity are electrolytic. Resistances are in ohms and resistors are ½ watt unless indicated otherwise. Except as listed below, circuit designations are for text reference purposes.

CR_1—1N754 zener diode (Texas Instruments). 6.8 volts, 400 mw.
Q_1—2N441 (Delco).
Q_2, Q_3—2N241A (G.E.)
R_2—Wire-wound control, linear taper.
S_1—D.p.s.t. slide switch.
T_1—24-volt 0.3 ampere filament transformer (Burstein-Applebee cat. No. 601, part No. 18B506).

of the output voltage is determined by V_Z, hence lower output voltages would require a zener diode with a breakdown voltage of several tenths of a volt less than the minimum output voltage required. If this minimum is less than 4 volts, a battery with its negative terminal connected to the emitter of Q_2 can be substituted for the zener diode. This is necessary because zener diodes with a breakdown voltage less than about 3.5 volts are not available. If this substitution is made, R_6 and C_4 may be deleted. The use of a battery in place of the zener diode is, of course, not restricted to extremely low-voltage supplies, but is an expedient that can be used at any voltage level to reduce cost by a couple of dollars or so. If drastic changes in the voltage range are contemplated, changes in R_1 and R_6 may be required. R_6 should be selected to supply in the neighborhood of 5 ma. to the zener diode. A value of R_1 should be determined that will keep the collector current of Q_2 in the 1- to 5-ma. range.

If the current ratings of the regulator are to be increased much beyond those indicated in Table I, Q_1 should be fastened to an adequate heat sink and Q_3 should be changed to a medium-power unit. The current rating can be further increased by paralleling Q_1 with another similar unit. If this is done, it is a good practice to include equalizing resistors in each of the Q_1 emitter circuits. The value of this resistor is selected to drop about 1 volt under full load.

Transistors

The choice of transistor types used in the circuit of Fig. 3 is not at all critical. Practically any low-power entertainment-variety transistor with sufficient voltage rating can be used at Q_2 and Q_3 unless an output current in excess of 200 or 300 ma. is desired, in which case a medium-power unit should be used at Q_3. Q_1 should, of course, be a high-power unit in any case. One word of caution regarding the substitution of other transistor types: R_4 and C_2 may require adjustment if the gain-frequency characteristics of the feedback loop are materially affected. QST

28th ARRL Sweepstakes—Nov. 11-13 and 18-20

Next month *QST* will have the complete announcement of the Sweepstakes Contest. This early announcement is for the benefit of amateurs in remote ARRL sections who will not have received the next issue before Sweepstakes. Refer to November 1960 *QST* for contest details. The rules are the same as last year's contest.

If you are anywhere in the League's field-organizational territory (see page 6, this *QST*) you are urged to take part in this popular contest activity. Although not an ARRL section, Yukon-N. W. T. (VE8) counts as a section multiplier in the contest. There are two separate contests, phone and c.w. The total operating time allowed each contestant in either contest is 40 hours. There are section awards, and special Novice awards as well. The week-end periods start Saturday afternoon (2300 GMT) on the 11th and 18th of November.

Contest reporting forms will be sent free to anyone requesting them by mail or radiogram. *Get your requests in early.* Check the full details in next month's issue of *QST*. Good luck.

"- - - - 499X es Pse QSL QSL - -"

BY JOHN G. TROSTER,* W6ISQ

WHEEEEE, what a pile-up. Who they calling?" "EP1ZZ de W4 — K3 — K1 — WA — W5 — K7 — K-K — K-"

"Most everybody signed. Where is he? Must be him under that W1 who's calling. If that's the EP he's about a 444 here. After that W1 gives up we'll see. There now —"

"QTH Isfahan — QSL OK. W4JIK de EP1-ZZ."

"Maybe that 4 can hear him a little better on the east coast."

"EP1ZZ de W4JIK — ur RST 579X in Florida. Pse QSL — 73 —"

"Pow, the roof fell in. Guess he signed. Must be 40 stations piled on. Wonder how the EP reads anything. Now if that W8 will give up — ever hear of a t.r., ya DX clobber — sign 17 times — good boy — Ahhhhhh, our EP —".

"— ur RST 569X. QTH — name — 10 watts m.o.p.a. QSL OK — 73 — W5XXX de EP1ZZ K."

"Wonder if that 5 hears him any better than the 4? He's still only about S4 here."

"EP1ZZ de W5XXX — RST 589X — QTH — name — PSE QSL QSL —"

"Pow — hit him again. Bigger pile-up than before. But 589X — wow. Must be an ionospheric funnel from EP to W5. Or maybe some of these yahoos just want to be sure to get that QSL — Gee! Now who's he got?"

"— de EP1ZZ ur RST 599X in Isfahan. QSL OK. W6YYY de EP1ZZ".

"W6YYY??? My gosh! Old Gus in the next town. We're getting close to home. How ya read him, Gus?"

"EP1ZZ de W6YYY. Tnx. RST 599X in Calif — PSE QSL QSL —"

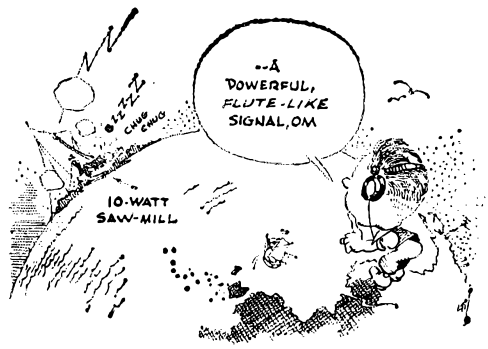
"599X! What kind of new listening gear ya got over there tonight? I've heard better notes yelling at umpires. And ya can just barely hear him here! Oh well — let's get aboard. Snap on the old Pulverizer and here we go. — EP1ZZ — de W6ISQ —"

"Whoops, guess I signed too soon. Ten guys still calling. Ahhh, must be him under that K9 — good solid 444!"

"— RST 559X in Isfahan. QSL OK — W6ISQ de EP1ZZ."

"ME??? — my gosh. What'll I do now? Never worked through a pile-up like that. What'll I tell him? Anyone breathe and I'll never hear him again. I'll never even hear him acknowledge — so make it good."

"EP1ZZ de W6ISQ. Tnx el. — ur RST — (careful now, mate! You want a QSL or not? YYY gave him 599X. Maybe the beam isn't pointing just right — maybe one of the elements dropped off — maybe bad tubes in receiver — no one ever gives S4! And who ever heard of T4? —



that note can't be that bad. B.f.o. could be a little fuzzy — maybe atmospheric or something. Maybe a funny heterodyne. Only a little ten-watt m.o.p.a. — you used to have one of those things, remember? Little breadboard lashup — must be worth at least a 578 — besides you need that EP card — never even heard one before — Maybe without all that QRM — Ahhhh, that's it — QRM — he's not 100% readable! —) — UR RST 499X FB SIG HR NR SF — PSE QSL-QSLQSLQSL 73 — That'll make him feel good. Now if he'll make me feel good with that QSL —"

"— RST 579X Isfahan — QSL OK — W1AW de EP1ZZ."

"EP1ZZ de W1AW. Tnx — RST 455 in Conn — QSL OK EP1ZZ de W1AW."

"What's the matter with those guys? Must have the wrong rhombic cranked in — or trying out one of those 'beginner' two-tube receivers. Or maybe W1AW already has their EP QSL! My gosh — that was the loudest EP I heard on the band all day!" QST

* 45 Laurel Street, Atherton, California.

Strays

W9MS is celebrating 50 years of being a radio amateur.

—···—

The July 19 edition of the *Air Force Times* carried a 4-page listing of some 1000 radio amateurs serving with the U. S. Air Force.

—···—

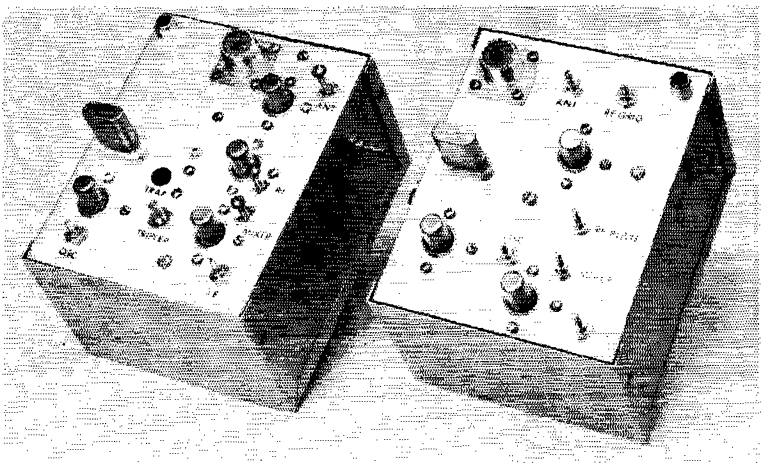
K3MLI says that a good cleaner and polisher for aluminum is a mixture marketed under the trade name MET-ALL. It's a West German import.

—···—

W0LZL is interested in collecting books describing old-time and little-known electronic devices.

—···—

K5YPP and K0YPP are both named Jim Roberts.



The 50- and 144-Mc. converters are built in standard aluminum boxes, and fitted with plugs that line up with the power connectors in the tuner of Part I or the power unit of Part III. The 50-Mc. converter is at the right.

A Complete Two-Band Station for the V.H.F. Beginner

Part IV—Crystal-Controlled Converters for 50 and 144 Mc.

BY EDWARD P. TILTON,* W1HDQ

THUS far, we have described a simple tuner that will enable the v.h.f. newcomer to get started without a communications receiver, two transmitter r.f. assemblies, a modulator and power supply, and a standing-wave bridge. This final article of the series presents easy-to-build converters that are capable of exceptional v.h.f. performance. They work nicely with the tuner of Part I, and when the builder can afford the step to a good communications receiver, these converters will give him 50- and 144-Mc. reception that will equal almost anything that money can buy.

Noise Figure and Signal-to-Noise Ratio

First, let's talk about v.h.f. reception generally. The above expressions describing receiver performance are often confused. Noise figure is a mathematical statement of the degree to which a receiver is less than perfect in the amount of noise generated within it. This quality is independent of receiver bandwidth. Signal-to-noise ratio is a measure of the receiver's ability to respond to weak signals. It is directly related to receiver selectivity, as well as to noise figure. Thus, for optimum v.h.f. reception we need both low noise figure and high selectivity. These converters will give noise figures as low as can be obtained with relatively simple circuits at reasonable cost, but to achieve the best possible signal-to-noise ratio with them requires the highest selectivity that is usable for the mode of operation involved. Our simple tuner is deficient in this respect, obviously. It will give you a good start at low cost, but a good communications receiver that tunes 14 to 18 Mc. will be necessary before you get the full benefit of the fine performance of these converters.

We use a converter to change the very high signal frequency to a lower frequency, where amplification can be done more effectively. This is also done in communications receivers, where a 14-Mc. signal, for example, is converted to 455 kc. or lower frequency, where most of the amplification takes place. Because few communications receivers cover the 50-Mc. band and none cover the 144-Mc. band, we need converters to extend the frequency range of the receivers used on lower amateur bands. Frequency conversion is accomplished by feeding in r.f. energy that will beat with the incoming signal in a mixer stage. The output of the mixer is either the sum or the difference of the signal and injection frequencies. Our 50-Mc. converter has a 36-Mc. crystal oscillator which beats with the signals in the range between 50 and 54 Mc., giving an intermediate frequency (i.f.) of 14 to 18 Mc. Amplification and detection can take place at this frequency, as in our simple tuner of Part I, or the i.f. output can be fed into

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

a communications receiver capable of tuning 14 to 18 Mc.

In most v.h.f. converters there are one or more r.f. amplifier stages that work at the signal frequency. These are the principal source of the receiving system's sensitivity, as they determine the noise figure of the entire system if they are working properly.

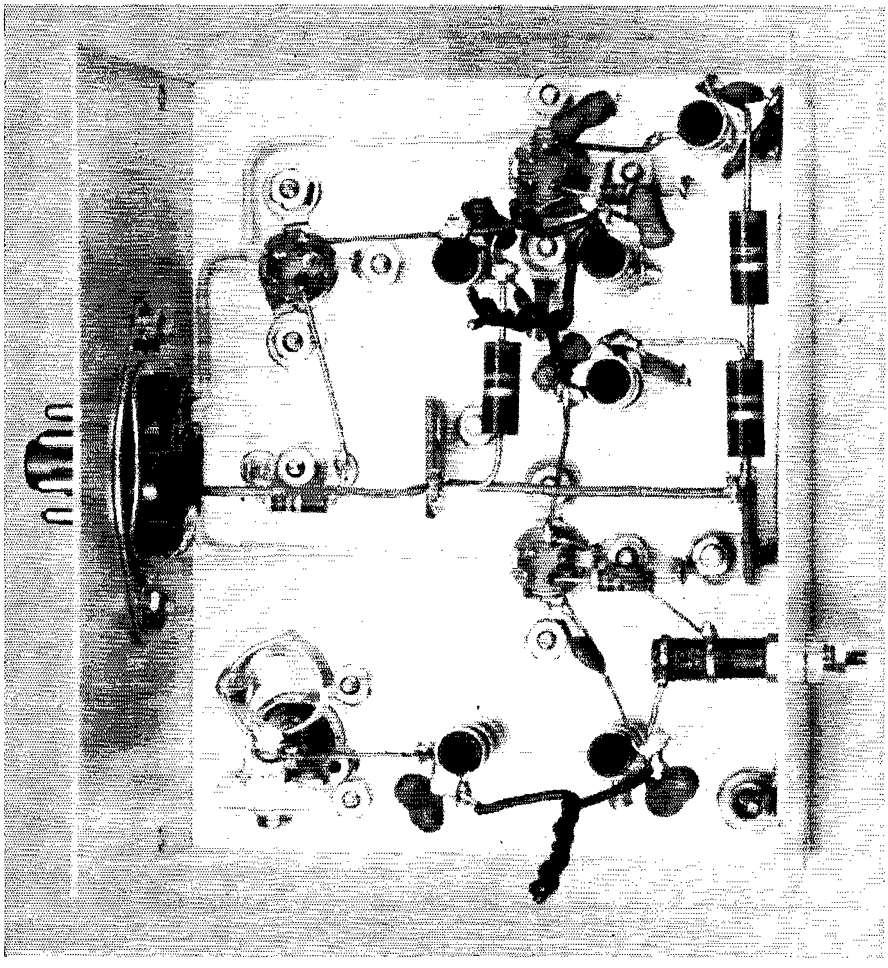
One more basic point before we get to the converter construction. At 50 Mc., noise coming in on the antenna is a limiting factor in receiving ability, even in the quietest locations. Such "antenna noise" is much lower at 144 Mc. This is one reason why we have two tubes in the r.f. amplifier of the 144-Mc. converter and only one in the 50-Mc. model. The latter has more sensitivity than you ever will be able to use, even with a single amplifier stage. The 144-Mc. converter with its two stages just about reaches the point where antenna noise becomes a limiting factor in weak-signal reception.

Both converters use a new type of miniature tube called the Nuvistor, capable of high-gain low-noise amplification in the v.h.f. range. The 6CW4 Nuvistor is also well suited for use in the other stages of the converter, and it is inexpensive and small in size, so we use it throughout both units.

The 50-Mc. Converter

In the first photograph the 50-Mc. converter is at the right. Three 6CW4s are used. The first, a neutralized r.f. amplifier, is in the upper center portion of the picture. At the bottom right is the mixer tube, and to its left is the crystal oscillator. The 36-Mc. crystal is in the left center, and above it is the antenna connector.

Turn now to the circuit diagram, Fig. 7. The tuned circuits L_2 and L_3, with the small coupling capacitor, C_2, are used to give some selectivity in the r.f. amplifier grid circuit. The tuning screws for the coils are visible at the top of the first photograph. Similar circuits are used between the amplifier plate and mixer grid (L_5, L_6 and C_3) and these are at the right side of the top view. The oscillator coil, L_8, is in the lower center The mixer plate coil is in the lower right corner.



Bottom view of the 50-Mc. converter, rotated vertically from the top view. The antenna connector and trap circuit are in the lower left corner.

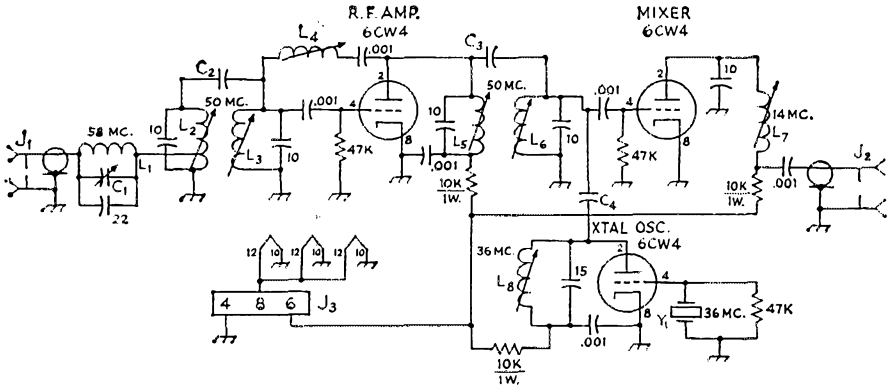


Fig. 7—Schematic diagram and parts information for the 50-Mc. converter. Resistors ½ watt unless specified. Fixed capacitors are ceramic; decimal values in μf., others in μμf.

C_1—3–30-μμf. mica trimmer.

C_2, C_3 — No. 22 insulated hookup wires 2 inches long, twisted together for approximately 1¼ inches.

C_4—Same, but 1-inch wires twisted for ½ inch.

J_1—Coaxial connector, SO-239.

J_2—Phono jack.

J_3—8-pin plug (Amphenol 86-RCP8).

L_1—5 turns No. 18, ½-inch diam., 8 t.p.i. (B & W No. 3002).

L_2—10 turns No. 28 enam., close-wound on ¼-inch iron-slug phenolic form, tapped at 3 turns; 0.65 to 1.3 μh. (Miller form No. 20A000RBI).

L_3, L_5, L_6—8 turns No. 28 enam., close-wound on ¼-inch iron-slug phenolic form. Range 0.43 to 0.85 μh. L_3 set for 0.64 μh., L_5 for 0.66, L_6 for 0.73 μh. (Miller coils No. 20A687RBI). L_2 and L_3 are ⅞ inch apart c. to c. L_5 to L_6 is ¾ inch; L to L_8 is ⅞ inch.

L_4—No. 32 enam., close-wound ⅛ inch on ¼-inch iron-slug phenolic form; 3.8 to 8.5 μh., set for 6.9 μh. (Miller coil No. 20A686RBI).

L_7—Universal-wound coil, 4.7 to 10 μh., set for 7.9 μh. (Miller coil No. 20A826RBI).

L_8—8 turns No. 32 enam., close-wound on ¼ inch iron-slug phenolic form; 0.67 to 1.25 μh., set for 0.94 μh. (Miller coil No. 20A106RBI).

Y_1—36-Mc. crystal (International Crystal Mfg. Co. FA-5).

The neutralizing coil, L_4, is mounted horizontally, with its adjusting stud coming out of the side of the box. The i.f. output connector is in the upper right corner of the top view.

The trap circuit, L_1C_1, is optional. Its purpose is to absorb Channel-2 video signals that might cause interference to 50-Mc. reception, as the result of the second harmonic of the oscillator (72 Mc.) beating with a Channel-2 TV signal. (72 − 14 = 58) Unless you are near a Channel-2 TV station you will not need the trap, and the connection from J_1 can be made directly to the tap on L_2.

The bottom view of the converter is inverted vertically from the top view. The antenna connector and the trap circuit are in the lower left corner. To the right are the coils L_2 and L_3, and the i.f. output connector. Near the middle is the r.f. amplifier socket, and in line with it at the top is the mixer socket. The crystal oscillator tube socket is at the upper left. The oscillator plate coil, L_8, and the mixer grid coil, L_6, are in the same plane to the right. Directly below L_6 is the r.f. plate coil, L_5. The i.f. output coil, L_7, is in the upper right corner, connected through a shielded lead to the output connector in the lower right. The neutralizing coil, L_4, is just above the latter, with its tuning screw projecting through the side of the box.

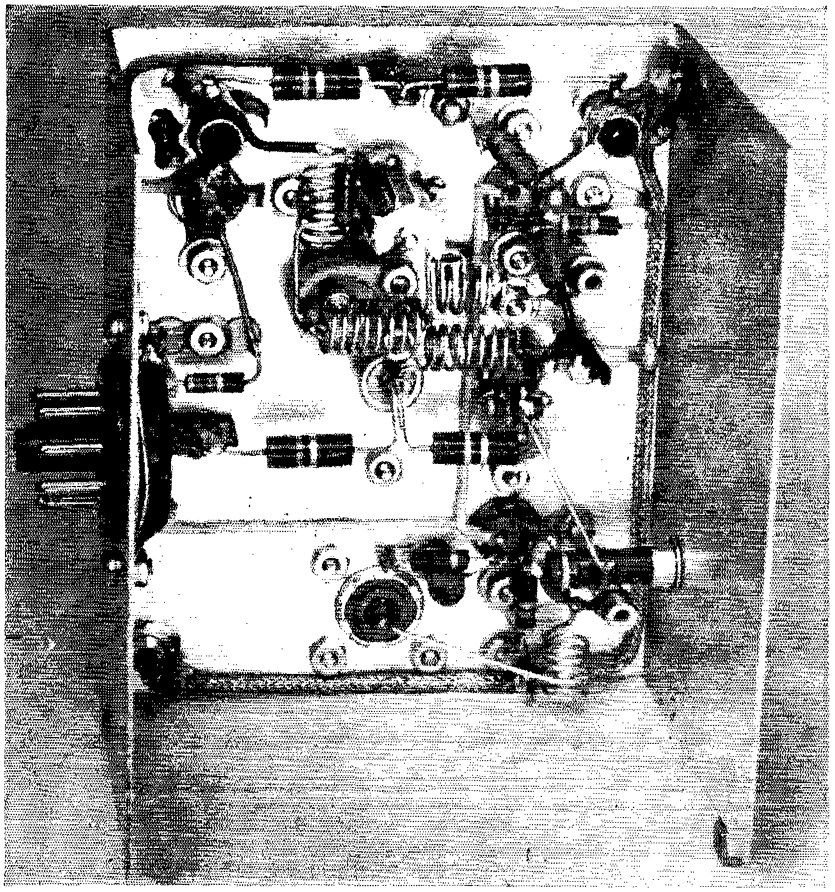
The coupling capacitors, C_2, C_3 and C_4, are made by twisting insulated wires together to form small capacitances where needed. This is a convenient and inexpensive way of doing the job, and since the values are not particularly critical, the twisted wires serve just as well as would a fixed or variable capacitor of conventional design.

Power is taken from the 150-volt and 6.3-volt sources in the power supply described last month. The 8-pin power plug, J_3, is mounted in the side of the converter case. It should be positioned so that it will line up with the socket on the side of the tuner, or the similar socket on the modulator, if the tuner is not used.

The 144-Mc. Converter

The 144-Mc. r.f. amplifier uses two 6CW4s instead of one, and an oscillator-multiplier system is needed for developing the injection voltage for the mixer. Hand-wound coils are used in the r.f. circuits, instead of slug-tuned coils. The first amplifier is a neutralized triode stage, as in the 50-Mc. converter, but is followed by a grounded-grid stage, in the manner of the familiar series-cascode v.h.f. amplifier. The crystal oscillator works on 43.333 Mc., and drives a crystal-diode frequency tripler to 130 Mc. This injection frequency beats with signals at 144 to 148 Mc. in the mixer, producing an i.f. of 14 to 18 Mc., as before.

Looking at the top view we see the r.f. amplifier and mixer tubes in line vertically at the right side of the converter. The crystal oscillator is at the lower left. The capacitor C_5, which tunes the diode tripler circuit, is in the lower center of the picture. Just above is a grommet inserted in the hole over the trap capacitor, C_1, of which more later. The antenna connector is in the



Interior of the 144-Mc. converter. Details of parts arrangement are given in the text. The i.f. output from the mixer plate coil, L_5, is brought through a shielded lead from the upper right corner, down the side of the picture and across the bottom, to the output connector, J_2, at the lower left.

middle of the top portion, and the i.f. output connector is in the upper left.

The bottom view was made by rotating the unit vertically, so the antenna connector appears at the bottom. The first amplifier grid circuit, L_1C_1, is in the lower right corner. Above it is the neutralizing coil, L_2, mounted on the side of the box. The two tinned-wire coils side by side just above and to the right of center are for the amplifier plate, L_3, and mixer grid, L_4. To their left is the trap circuit, C_4L_9, tuned to the second harmonic of the oscillator, 86.67 Mc. The coil with its axis at right angles to these is L_8. It is tuned to 130 Mc. by C_5, which appears in the upper center of the picture. The oscillator plate coil, L_6, and the mixer plate coil, L_5, are in the upper left and right corners, respectively.

The Diode Multiplier and Trap Circuits

Frequency multiplication with crystal diodes may be new to many readers, but it is a simple and effective way of developing injection voltage in the v.h.f. range. Diodes do the job easily, and at less cost than a vacuum tube. The crystal works at low impedance, so it is connected between a loop (L_7) around the oscillator coil and a tap on the tuned circuit L_8C_5. The latter should be fairly high-C, so that the desired harmonic, in this instance the third, will be accentuated, and other harmonics of 43.3 Mc. suppressed.

There will be some energy at unwanted harmonic frequencies passed on to the mixer grid circuit. The trap, L_9C_4, is inserted in the lead to L_4 to suppress the second harmonic, 86.6 Mc. As with the Channel-2 problem in the 50-Mc. converter, this trap circuit need be included only if local interference makes it necessary. In the Hartford area an f.m. station just above 100 Mc. rode through around 14.2 Mc. (100.8 − 86.6 = 14.2), but the trap removed the interfering signal completely when tuned to twice the crystal frequency. Removing the offending harmonic from the mixer circuit was the best way of handling the problem. A trap in the antenna circuit to absorb the interfering signal was tried but it resulted in a slight deterioration of the converter noise figure at 144 Mc.

Construction

The converters are built in aluminum Mini-

boxes, 3 by 4 by 5 inches in size. The Nuvistor sockets have small metal tabs that are bent down against the underside of the chassis to provide grounding. These are clamped under washers by 4-40 screws and nuts on opposite sides of the sockets. The socket hole should be ½-inch diameter, with small notches filed out for the tabs. The ceramic trimmers in the 144-Mc. converter, C_1, C_2, and C_3, also require notched holes.

Leads in r.f. circuits should be as short as possible. Power wiring can be placed for neatness, but keep insulated power leads close to the chassis. Use terminal strips for holding resistors in place, and lugs bolted to the chassis for grounding.

Adjustments

The crystal oscillator is checked first. The meter in the bridge unit described last month, or any other 1-ma. meter, may be used to measure oscillator plate voltage, or a voltmeter will serve if you have one for the 100-volt d.c. range. To use a 1-ma. meter, connect a 100,000-ohm resistor in the positive lead and ground the negative lead. It is not important for this purpose that the 1000-ohm resistor shown in Fig. 6, Part III, be included.

Working on the converters is easier if a 3-wire power cable with suitable plugs is used, rather than plugging the converters directly into the tuner or power unit. Tests may be made with all tubes in their sockets, as the dropping resistors in the plate leads prevent excessive current. Apply power to the converter. Touch the free lead of the 100,000-ohm resistor to the B-plus end of the oscillator plate coil. The meter indicates 100 volts d.c. for full scale. The voltage reading obtained will depend on whether the tube is oscillating or not. The oscillator current runs through a 10,000-ohm resistor, so the more current the tube draws the lower the voltage will be. When

[1] Templates for drilling the principal surface of each box are available at no cost from the ARRL Technical Department. Please send a stamped self-addressed envelope and state which templates you want, giving the equipment and the issue of *QST*. Templates are also available for the tuner, Part I, and the two transmitters, Part II, described in the July and August issues of *QST*, respectively.

Tape the template to the surface of the chassis and center-punch the holes. Sizes are given for all the holes, but it is well to check the parts you have to be sure that they require holes of the sizes given on the template. Different makes from those used in the original way may require minor changes in hole shape, size or location.

Glossy prints made from the original negatives can be supplied for any equipment built in the ARRL laboratory, at a cost of $1.50 per print. Be sure to give the issue and page number of the photograph needed.

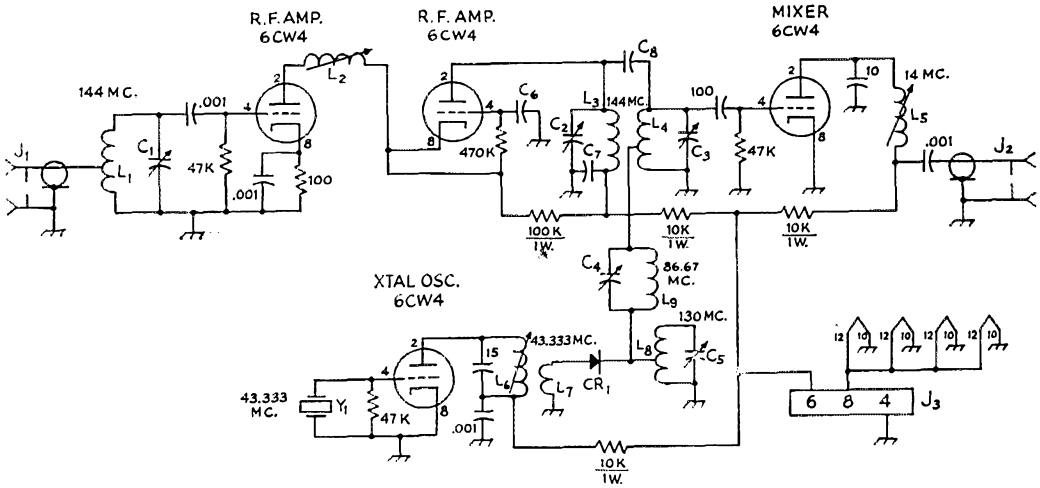


Fig. 8—Schematic diagram and parts information for the 144-Mc. converter. Resistors ½ watt unless specified. Fixed capacitors are ceramic unless specified. Decimal values in μf., others in μμf.

C_1, C_2, C_3—1-7.5-μμf. ceramic trimmer (Centralab 829-7).

C_4—4-30-μμf. ceramic trimmer (Mallory ST-554-N).

C_5—20-μμf. miniature variable (Hammarlund MAC-20).

C_6, C_7—0.001-μf. button-type bypass (Centralab ZA-102). Do not use disk-ceramic or other wire-lead capacitors for these points.

C_8—No. 22 insulated hookup wires 1¼ inches long, twisted together for approximately 1 inch.

CR_1—Crystal-diode rectifier. Most available types will work; DR-303, CK-710 and 1N34 tried.

J_1—Coaxial connector, SO-239.

J_2—Phono jack.

J_3—8-pin plug (Amphenol 86-RCP8).

L_1, L_3—6 turns No. 18, ¼-inch diam. ½ inch long. Tap at 2½ turns.

L_2—5 turns No. 28 enamel, close-wound on ¼-inch iron-slug form. Range 0.24 to 0.41 μh., set for 0.33 μh. (Miller coil No. 20A337RBI).

L_3—6½ turns No. 18, ¼-inch diam., ⅝ inch long.

L_4—5 turns like L_3, ½ inch long, tapped at 2 turns. L_3 and L_4 are parallel, ⅜ inch apart, c. to c.

L_5—Universal-wound coil, 4.7 to 10 μh., set for 7.9 μh. (Miller coil No. 20A826RBI).

L_6—9 turns No. 28 enamel, close-wound on ¼-inch iron-slug form. Range 0.58 to 1 μh., set for 0.82 μh. (Miller coil No. 20A827RBI).

L_7—1½ turns insulated hookup wire around L_6.

L_9—8 turns No. 18, ¼-inch diam., ⅝ inch long.

Y_1—43.333-Mc. crystal (International Crystal Mfg. Co. FA-5).

the circuit oscillates, plate current drops, and the indicated voltage rises.

Use of Ohm's Law will tell you what the plate current is, though this need not be found except as a matter of interest. With the core stud all the way up, the circuit probably will oscillate, and the meter indication will be around 0.7 (70 volts). Turn the stud into the coil, watching the meter. It will rise to around 0.9 (90 volts) and then drop suddenly as oscillation stops, to around 0.5 (50 volts). These represent actual plate currents of 8, 6, and 10 ma., respectively.

Readings may vary considerably from the above, due to differences in crystals and other parts. The important points are the gradual rise (increasing vigor of oscillation) and then the sudden dip as oscillation ceases. Set the slug for the highest reading (lowest oscillator plate current) at which the oscillator will start each time power is applied. The frequency can be checked with a calibrated wavemeter or grid-dip meter. It should be the frequency marked on the crystal, and no other.

The 50-Mc. converter is now ready to receive strong signals, as soon as it is connected to the receiver or tuner. The latter has a cable and plug for connection to the i.f. output jack, J_2. To use a communications receiver, make up a cable of any small coax, putting a phono-pin plug on one end. The other end connects to the receiver antenna terminals. This may require a coax fitting for some receivers, but most have screw terminals. Connect the inner conductor to the antenna terminal and the outer sheath to the ground terminal or the receiver chassis. Do this with the shortest possible leads, to keep down pickup of signals at 14 Mc.

Now a 50-Mc. signal is needed. This can be from a grid-dip oscillator, a nearby 50-Mc. station, the harmonic of your transmitter, or ideally, a good signal generator. For any except the last, connect some kind of antenna to J_1. A short piece of wire will do at first, and the length can be varied to suit the strength of the signal. Set the stud in L_4 at about the middle of its range. Next, peak the screws in L_2, L_3, L_5, L_6 and L_7 for maximum signal strength. Now disable the r.f. amplifier stage by disconnecting the 10,000-ohm resistor from L_5, or by removing the heater lead from Pin 12 of the socket. Adjust L_4 for *minimum* signal. Replace the heater or plate voltage and readjust all coils except L_4 for maximum signal again.

The converter should be close to optimum performance if everything has been done properly to this point. If the Channel 2 trap is used, adjust it so that no interference is heard from the local TV station. If the station is very near by, it may still be heard as long as the cover is off the converter case. It should disappear when the case is assembled. Recheck the adjustment of L_2 and L_3 after final adjustment of the trap.

Further work to improve weak-signal reception should be done with a noise generator, though satisfactory results can be obtained on weak signals if the work is done with care. The aim should be better signal-to-noise ratio, rather than merely greater signal strength. This will not be noticeable with the simple tuner, but it can be achieved with a communications receiver as the i.f. system. Using the receiver S meter, or the audio sound of a weak signal, tune for maximum signal *with respect to noise.*

Not every *QST* rig gets quite such extensive field testing, but this one went with the author on a 7000-mile field trip to the Rocky Mountain States early this summer. Several times we found 6 open, and had scores of DX contacts with nearly all sections of the country. In the June V.H.F. Party, with the help of K5TQP and K5UNK, W1HDQ/5 worked 18 ARRL Sections in all call areas except W1 and 2 from a spot near Albuquerque, New Mexico, using both phone and c.w. A communications receiver was pressed into service to deal with the heavy QRM, but the simple tuner was used during the first hour's work, just to prove that it would do the job. On 144 Mc., the entire station will outperform anything you could buy for twice the money, and some of the rig's features cannot be found in anything ready-made at any price.

As a final check, put a 50-ohm resistor across J_1. Observe the noise level. Now remove the resistor and put on an antenna system with 50-ohm feed. If the noise rises appreciably, you are hearing the external noise that limits your v.h.f. reception. The only improvement you can make from here on is to put up a bigger or higher antenna, or move to a quieter location.

Adjustment of the 144-Mc. converter is similar, except that the multiplier tank circuit, L_8C_5, should be adjusted for maximum signal. External noise may not be discernible in quiet locations on 144 Mc., and the antenna check outlined for 50 Mc. may be inconclusive. Adjustment of all r.f. circuits should be made carefully for greatest margin of signal over noise, using weak signals. The minimum-signal method of adjusting the neutralizing coil, L_2, should be followed initially, but readjustment for optimum signal-to-noise ratio (or lowest noise figure, using a noise generator) may produce a worthwhile improvement. Do not use the second-harmonic trap, L_9C_4, unless it is necessary to eliminate f.m. interference, as this circuit introduces one more variable to complicate the adjustment procedure.

In most areas 2-meter activity is spread over more of the band than is the case with 50 Mc. The converter response can be made uniform across most or all of the band by tuning the i.f. output coil, L_5, for maximum response near the high end or middle of the band. This coil affects only the gain of the converter; detuning it does not reduce the signal-to-noise ratio. The r.f.

(Continued on page 164)

Hints and Kinks For the Experimenter

PARAMETRIC AMPLIFIER FOR 432 MC.

SIMPLE modification of the 1296-Mc. parametric amplifier described in January, 1961, *QST* will make a parametric useful on 432 Mc. A small change in the dimensions of the idler cavity, and an increase in the length of the signal cavity with a corresponding change in the coupling loops of the signal tank are all that one needs for a 432 amplifier.

After one understands the construction of the 1296-Mc. parametric, he can adapt the following changes. First, the idler cavity is changed to 2.3 centimeters in length. Next, the signal tank must be changed to 9¼ inches in length by 2 inches wide and 1½ inches in depth. The center conductor is ⅜-inch brass tubing. Heavy brass is recommended for construction of the signal tank.

The coupling loops were made with about ⅞ inch of the loop wire parallel to the center conductor of the signal cavity. Provisions were also made to adjust the coupling loops. The tuning screw at the center of the signal cavity has a ¾-inch disk soldered to the end of it. There is also a ¾-inch disk soldered to the ⅜-inch center conductor. The screw and disk arrangement provides necessary signal tank tuning. The method of bypassing the half-wave signal tank center conductor at each end is the same, but the bypass plates were made larger to provide some additional capacity. The point at which the diode couples to the half-wave signal tank has been changed to 3 centimeters instead of 0.8 centimeters. See Fig. 1.

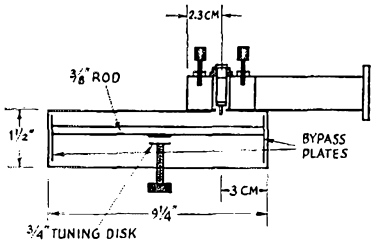


Fig. 1—Dimensions for W8UST's 432-Mc. parametric amplifier.

The same tuning procedure can be followed that is detailed for the 1296 amplifier.

Parametric amplifiers for 432 Mc. using quarter-wave signal tanks and similar design in the idler and pump cavities have also been built and may be tried by others. I sincerely hope more 432-Mc. amateurs will build parametric amplifiers for their receiving systems, as this should result in more reliable communication with stations over 200 miles away.

— *Gordon Sager, WSUST*

715B TUBE DATA

THE 715B tetrode is a popular surplus tube but little information on its base and ratings can be found. The base diagram for the tube is shown in Fig. 2. The tube requires a standard Johnson

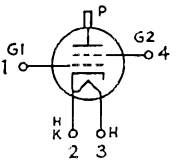


Fig. 2—Base diagram of the 715B tube.

socket (No. 124-234-1). Plate dissipation is rated at 50 watts and the filament requirements are 26 volts at about 2 amps. Typical operating voltages are plate 1500 and screen 300. The plate current should be held to 125 ma.

— *Robert L. Peck, W9MOW*

HOLE SIZE FOR TAPPING

THE article in June 1961 *QST*, by Deane concerning "Screws, Nuts and Things" failed to mention that one can find the correct drill size for a hole to be tapped by subtracting the turns per inch of the screw as a fraction from the screw size. For example, if a machine screw has a 32 threads per inch, then you would use a drill 1/32 of an inch smaller than the o.d. of the screw. This rule seems to hold true on all American screws because the threads are as wide as they are deep and it makes no difference if the threads are coarse or fine.

— *Rev. Lyall Sherred, KØDEU*

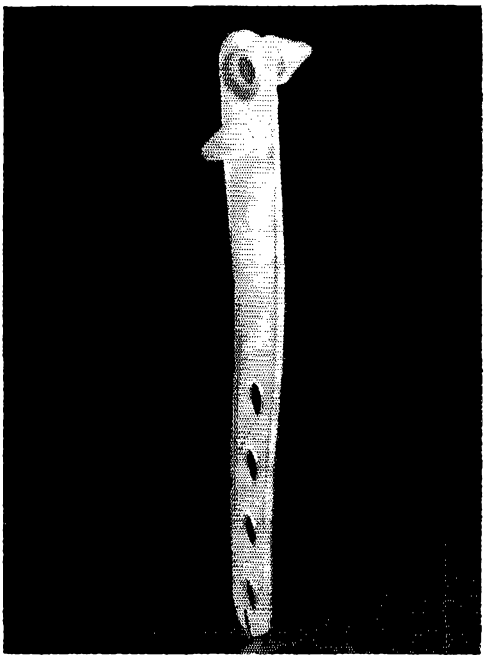
VERSATILE MARKER

A SMALL tube of quick drying ink can be used to good advantage around the ham shack. The tube has a felt wick which feeds out the ink and is shaped so that a broad or narrow line can be drawn. The ink, which is available in a variety of colors, adheres to just about any surface and so can be used for writing on chassis, color coding components, wires, etc. More elaborate combinations of ink and pen points are available at the larger office and art supply stores, so that if one has a steady hand the ink tube can be used for panel marking.

— *Alex F. Burr, K3NKX*

CABLE RETAINER

THE photograph shows an inexpensive wiring harness retainer suitable for holding down cables to wood or metal surfaces. The device was originally used to hold wiring harnesses in General Motors cars. It is only necessary to drill a hole which will accept one of the protruding tips of the strap and plug this tip into the hole. The strap is then wrapped around the cable and



snapped into place by the remaining tip. There are several holes in the strap so that various sizes of cable can be accommodated. For wood mounting, cut off one of the tips and secure the strap to the wood with a wood screw and flat washer. The retainer can be obtained from almost any General Motors dealership for about 15 cents each. The GM part number is 3750535.

— *Donald R. Klobe, K8JQN*

EMERGENCY ALLEN WRENCH

WHEN I was trying to remove the main tuning knob from my receiver I discovered that it had an Allen set screw and that I didn't have an Allen head wrench. I tried a square-point wire nail for a tool and it worked fine! When I replaced the dial, I used a pair of long-nose pliers to tighten the screw via the nail wrench.

— *Bill Jacobs, K5WTA*

EMERGENCY COAX CONNECTOR

FACED with an immediate need for a connector to mate with an SO-239 connector, I found that an Amphenol 75-PC1M microphone connector had the same thread and could be easily modified to do the job. The only thing I had to do was solder a piece of heavy wire or thin tubing to the center conductor of the microphone plug so that it would make contact with the center conductor of the SO-239. The r.f. characteristics of this connector are probably not the best in the world, but the connection is a positive one and a good scheme to remember when nothing else is readily available.

— *Drew Woloshyn, WA6NOZ*

WORK LIGHT

A SMALL useful work light for lighting up cramped quarters can be made from an old filament transformer, a plastic tube and a flashlight lamp. The sketch in Fig. 3 shows the

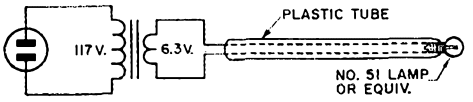


Fig. 3—A simple light powered by a filament transformer.

hookup. Although the 117-volt cord may seem a nuisance at first, it solves the problem of flashlight batteries which seem to go dead just when they are most needed. The plastic tube and the isolation transformer insure against shorts when you are on a "live" set.

— *Wilfred Tritz, K9DLD*

AIR WOUND COIL MOUNTS

THE sketch in Fig. 4 shows how to mount commercial air wound coils, such as the Miniductor and Air-Dux types. The mount uses rubber faucet washers on aluminum brackets.

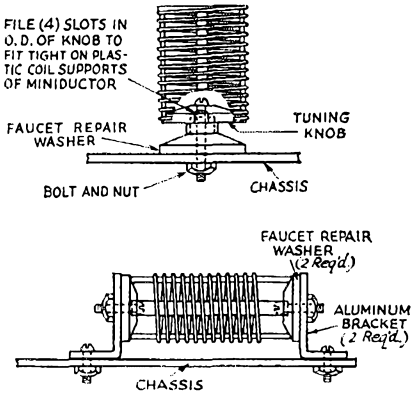


Fig. 4—Vertical and horizontal mounting of air wound coils. In the horizontal method, the brackets are bent toward each other to put the plastic strips in compression.

For vertical mounting, any old radio or TV tuning knob slightly larger in o.d. than the inside diameter of the coil is used to support the plastic strips in the coil. These methods of mounting are far superior to the conventional way, which uses the wire coil leads to support the coil.

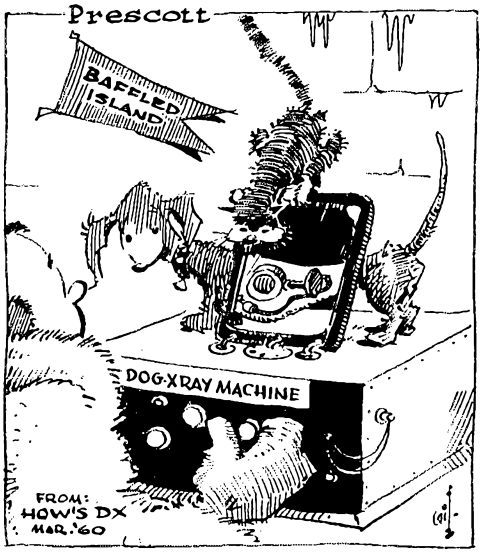
— *Ronald E. Winther, W1GWT*

Official Results — 1961 ARRL International DX Competition

THE LUSH years of the sunspot cycle are over, but DXers for sure haven't thrown in the towel. Old Sol and his sunspots didn't provide the cooperation we were beginning to get used to on the higher bands, but competition was still keen. The 10-meter letdown particularly crippled the low-power boys' chances, for there was once a time when a few watts to a bent clotheshanger would pull 'em in on that band. The less hardy of our fraternity might have tossed in the sponge, but most DXers keep right on pitching nevertheless. Ten meters on the West Coast still proved to be a godsend in many cases though, as the "Countries Worked" chart indicates. Better get those 80- and 160-meter antennas up though — pronto!

C.W. Highlights

Watching the 28-Mc. conditions W3DAO noticed: "Several times 28 Mc. was wide open, but the DX stations were few and far between. I wish the DX stations would keep a closer check on these so-called 'dead' bands, so that they can get more multipliers and the W/VEs can get more too." Two flea-powered go-getters chorused: "Your editorial (Feb. 1960, *QST*) was right. This contest can be fun with low power," from K2OFD, and from K7JCA: "My peanut whistle really surprised me." From the DX side of the fence KR6LY said: "This contest gets bigger and better every year despite the declining conditions." And the down-under contest giant VK2GW expressed that "conditions were patchy and not quite as good as last year, especially 28 Mc. Plenty of activity noted from stateside when the bands were open, and hope that will last through the thin times ahead." And PA0LOU said it for everyone with: "Watch for me next year, conditions or no conditions, I will be in there again; I can't help myself." Amen!



C.W. Call-Area Leaders

Single-Operator

W1BIH	251,262	W8FGX	443,500
K2DGT	445,341	W9NZM[2]	521,280
W3ECR[1]	547,938	WØBMM	172,881
W4YHD	510,544	VE1EK	13,677
K5DGI	171,360	VE2BV	63,648
K6VTQ	226,968	WØAIH/VE3	155,526
KH6IJ	131,760	VE6HG	4512
W7PGS	170,660	VE7CE	10,212
W9KLD/KL7	8610		

[1] W3MFW, opr.; [2] W9WNV, opr.

The big splash this year on both phone and c.w. was the Kure DXpedition, KH6ECD (full story in August *QST*). This hot tip was announced both in *QST* and by W1AW bulletin. Although the KH6 call had a lot of the gang wondering what the excitement was all about, it did count for DX in the contest. A real "nice going" applause to the KM6 boys who really livened things up with a new country on in the contest.

Random comments on the c.w. contest ran along these lines. "As I grow older I wonder why I do this. However, as 0000Z rolls around I still get the same 'spooky' feeling, and once more the competitive urge comes flying through. As always a wonderful contest." — W6IBD. "Jr. op arrived 7th March. Hope to try again next year — DX Contest, I mean!" — VR1B. "It was enjoyable being at the other end of the path. Quite different from my K7ADD days." — 4X4NJ. "My most interesting experiences were determining the identities of the stations I worked. Some of them signed their calls within ten minutes, very good." — W1VG. "At one of those rare moments when everyone on the frequency stood by at the same instant, I had the unusual experience of hearing my own signal bounced back from somewhere 'W9IHN W9IHN K' — I'm positive it was my own signal RST 539." — W9IHN. And here's a maxim by W3EPR that seems to hold a good deal of truth: "In general, your signal strength is proportional to how long you have to wait in line, i.e. the longer you wait, the weaker is your signal." Logs bear out that South and Central American participation was up again considerably on phone and c.w., thanks perhaps to our Spanish-language

contest announcements sent to our neighbors to the South in droves.

Scorewise here's the way the top 25 single-operator U. S. A. scores shaped up: W3ECR 547,938, W9NZM 521,280, W4YHD 510,544, W3GRF 501,390, K2DGT 445,341, W8FGX 443,500, W4KFC 385,236, K2DCA 322,302, W3ALB 270,600, W1BIH 251,262, W9YSX 249,893, K6VTQ 226,968, W4JAT 223,488, W4DQS 219,294, W3EIV 217,862, W3KFQ 213,244, W9ERU 213,668, W4AZK 212,625, W6IBD 206,566, W1JYH 202,182, W3MVB 192,240, W3IYE 187,278, W3OCU 178,284, WØBMM 172,881, W3VAN 172,050. WØAIH/VE3 led the Canadians with 155,526 points. These outstanding multi-operator setups really racked up the points: W3MSK 882,849, W3BES 371,250, W3AOH 560,216, K6EVR 356,723, W6RW 353,805, W3CTJ 324,564, W3MFJ 259,000.

On the DX side of the ledger, all the entrants are to be congratulated for a job well done. Thanks to all the DX stations for making the contest a success. These single operators posted the highest scores: KV4AQ 444,080, CE1AD 376,125, KP4ATV 367,629, VK2GW 309,264, KW6DG 288,672, PY4GA 247,680, VK5NQ 242,224, HK7ZT 217,179, YN4AB 207,174, CE3AG 204,600, VK3APJ 200,880, VP7NT 185,745, KP4AQY 161,650, JA1VX 160,599, PY1ADA 157,263, YV5AVS 151,146, ZL1NG 143,605, YN1AA 130,101, LU5DDF 125,734, ZL2PM 120,690, HK3AH 120,105, F8VJ 108,650, VR2DK 107,536, ZK1AR 105,612, EL4A 101,724, G2QT 100,320. And thanks to these multi-ops for really passing out the contacts: KH6ECD 336,861, G6BQ 188,265, KR6JM 128,498, ZS6PTA 103,824.

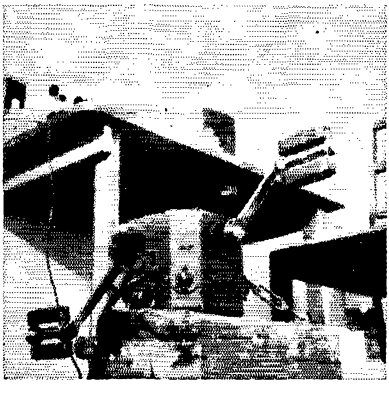
NUMBER OF COUNTRIES WORKED BY BANDS

LISTED ARE COUNTRY TOTALS MORE THAN (25 ON 3.5 Mc., 50 ON 7 Mc., 75 ON 14 Mc., 50 ON 21 Mc., 20 ON 28 Mc.)

(Lower Totals Not Listed)

CALL	3.5 Mc.	7 Mc.	14 Mc	21 Mc.	28 Mc.	CALL	3.5 Mc.	7 Mc.	14 Mc.	21 Mc.	28 Mc.
W1BIH			86	63		W5BRR					22
W1JYH			87			W5CKY				58	23
K1MLI *			90			K5DGI					23
W1VG				54		K5KBH					21
W2CYS				71		W5KC				58	
K2DCA			86	65		W5FJE					20
K2DGT		55	88	64		W8RHF/5					21
W2GGE			78			W5WZQ				53	22
K2GUN				55		W6BSY					21
W2OBX				58		W6CAE					24
W2PCJ			78			W6CHV					24
W3ALB		50		55		K6CQM					22
W3AOH*		70	100	75	29	K6EVR *		60	81		27
W3BES*		52	77	66		W6GRX					20
W3CTJ *			83	58	21	W6HOC					22
W3DAO				52		K6HOR					21
W3ECR	33	57	86	76	26	W6IBD			79		22
W3EIV				59		W6LOD*					21
W3GRF		66	89	70	21	W6RW *			87	54	28
W3MFJ *			79	55		W6SR/6*					20
W3MSK*	36	71	111	88	35	K6VTQ			83		25
W3MVB				57		W6WB					24
W3OCU			75	56		W6ZMW					21
W3VAN				57		KH6IJ			87		
W4AZK				51		K8DEO				50	
W4DQS				66		W8FGX		61	84	70	27
W4DXI				53		W8JSU			93		
W4JAT			78	60		W9ERU			83	57	
W4JNE			80			W9NZM		65	97	83	25
W4KFC			87	71	27	W9QYW				50	
K4LPW				55		W9RQM				57	
W4OM			76			W9YSX			76	76	25
W4PLL				51		WØBTD				52	
W4YHD	27	59	89	74	23	WØBMM				53	
K4ZKI				51		WØFDZ					24
*Multi-operator						WØAIH/VE3				52	

OX3NK *really* worked hard at the contest, deriving transmitter power from this FOOTGENERATOR, peddling out 584 c.w. contacts with 50 watts . . . which really takes some doing! Not only that but the receiver used 6-volt batteries charged by a Windcharger, a wind-driven gen-



erator. "Ole" modestly gasped after the contest, trying to catch his breath: "It was a hard job taking part in the contest, but under the special conditions very interesting." Want to try "cranking out" your power for 45 hours?

DX Continental Champions

Single-Operator

C.W.		*Phone*
ZS6IF.....77,520	*Africa*	EL8D.....44,496
JA1VX.....160,599	*Asia*	JA1BWA.....3180
F8VJ.....108,650	*Europe*	OE1RZ.....117,855
KV4AQ....444,080	*No. America*	KP4AVQ...293,037
VK2GW...309,264	*Oceania*	KW6DG.....55,695
CE1AD....376,125	*So. America*	HC1KA.....99,104

Though mourning the poor February week end c.w. conditions, DJ3KR led Germany on both c.w. and phone with 99,840 and 33,750 points respectively. "Jorg's" chief peeve is the guy who repeats his number three or four times after sending him a 599200.

Phone Highlights

Let's face it. In the phone section you either work sideband or you can't score high . . . that's why the ARRL DX Contest has never restricted itself to any one brand of voice work, because one never knows what will be best tomorrow. So all flavors of phone work have been encouraged . . . sideband, a.m., n.b.f.m., or whatever you choose. This seems to be the best procedure for then you can use whatever method gives you the most contacts. And right now it's definitely sideband. This year's top phone scorer K2GXI points it out with: "There is no doubt that the big news in this year's contest was the tremendous swing to s.s.b.; 75% of my 20-meter contacts being on s.s.b. — this figure floored me after determining it, almost unbelievable." Concurring comments speak for themselves: "Ninety-five per cent of contacts made on s.s.b." — W3CTJ. "All but one QSO on s.s.b." — W3LEZ. "Without s.s.b. I couldn't have made the score I did." — W3GRS. "For the first time in the DX test, there were more s.s.b. 7-Mc. phones than a.m. phone, a good sign." — W2FYT. Perhaps the luring comments in the contest announcements in December and January *QST* encouraged the use of contest s.s.b., but more likely it's just becoming the preferred method of phone work.

Other choice comments about the phone contest included: "When I have to take 59DX100 as a number twice, I am *really* digging deep." — W3ECR. It really paid off though, as Bob won EPA honors. Said K9GEL: "A big hand for the best phone operator of them all, PZ1AX. His system was most efficient and reduced QRM beautifully." "Enjoyed intense competition in my first ARRL venture. What a bedlam of DX!" — K4CRX. "What a way to work new countries." — KØQCL. "Conditions were FB on 21 Mc. March 5. During one hour of operation I worked 99 W VEs, probably a USSR record." — UR2-AR. "This is the first time I have entered an international contest. My reaction to the new experience: When is the next one coming?" — LU5DIF. Well put, Jorge . . . many share your opinion!

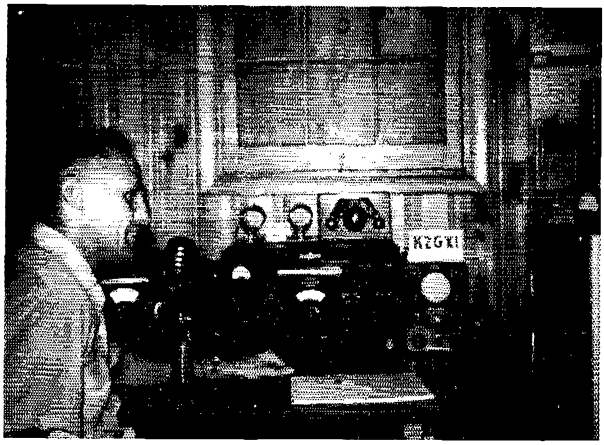
Faring out well in the score department were these single-operator W stations: K2GXI 246,078, W9EWC 196,355, W1ONK 189,761, W3ECR 164,088, W3DHM 162,837, W3CTJ 140,792, W4QCW 133,950, K6EVR 127,148, W9NZM 125,979, W9DUB 120,632, W3KFQ 119,574, W4OM 101,160, W8ZOK 101,001, W1OKG 100,772. Top Canadian scorer was VE3BOG, 47,763. Highest scoring multiple-operator stations were: W1ETF 281,239, W3BES 200,080, W8NWO 192,885, W8NGO 160,060.

Highest scoring single-operator DX stations produced these fine scores: KP4AVQ 293,037, HI8DGC 202,565, OE1RZ 117,855, HC1KA 99,104, SM5BLA 91,728, PZ1AX 79,532, UR2AR 75,424, F7BI 73,188, PJ3AI 69,600, HK4KZ 62,640, KP4AWH 60,624, LU1DAB 60,564, XE2DS 57,564, KZ5DF 56,826, KW6DG 55,695, TG5HC 54,250. KH6ECD caused the beehive bands to buzz with a multi-op score of 225,918.

CLUB SCORES

Club	*Score*	*C. W. Winner*	*Phone Winner*
Frankford Radio Club	4,534,483	W3ECR	W3ECR
Potomac Valley Radio Club	4,483,310	W4YHD	W3ZQ
Southern California DX Club	2,081,016	K6VTQ	K6EVR
Northern California DX Club	1,487,221	K6CQM	W6LDD
Lake Success Radio Club (N. Y.)	558,486	K2DGT	W2TUK
Connecticut Wireless Assn.	484,581	W1BIH	.....
Ningara Frontier DX Assn.	415,557	K2GXI[2]	K2GXI
Milwaukee Radio Amateurs' Club	357,681	W9GIL	W9GIL
Southeastern DX Club (Ga.)	261,574	W4DXI	.....
Order of Boiled Owls (N. Y.)	162,924	W2IRV	.....
Rochester DX Assn.	156,736	W2VUY	W2SNI
Order of Boiled Owls of New Mexico	149,190	W5FJE	.....
San Diego DX Club	146,667	W6CAE	.....
DX Club of Greater St. Louis	144,700	.....	.....
Westpark Radiops (Ohio)	88,929	W8YPP	W8AJW
Chicago Suburban Radio Assn.	81,391	W9DWQ	.....
Columbus Amateur Radio Assn. (Ohio)	80,310	W8JSU	.....
Waltham Amateur Radio Assn. (Mass.)	64,127	.....	.....
South Jersey Radio Assn.	15,095	W2DAJ	W2DMR
Indian Hills Radio Club (Ohio)	10,084	.....	.....
West Seattle Amateur Radio Club	4779	K7JCV	.....
Bronx High School of Science Radio Club	1261	K2OFD	.....

[1] W3MFW, opr.; [2] K2LWR, opr.



Forty phone is K2GXI's favorite hangout, but during contests Bob searches for contacts on all bands as his score soars higher . . . 443 exchanges for 246,078 this year for top U.S.A. phone score, thanks to a 40-meter 2-element rotary, stacked above a 4-element tribander, and a "V" for 75—all homebrew. Bob also credits s.s.b. for bringing up his score.

The Clubs

The race for the top spot was *ever* so close. The Frankford Radio Club beat out their Potomac Valley rivals by the thickness of this sheet of paper. Sixty-eight scores contributed to the Philadelphia-area boys winning effort, and another cocobolo gavel to the victors. Third was the Southern California DX Club, getting sweet revenge over the Northern California DX Club who beat them out the two previous years. Moving up from 26th last year to fifth this year was the Lake Success Radio Club, forging ahead of other highflying clubs. Connecticut Wireless Assn., Niagara Frontier DX Assn., and the Milwaukee Radio Amateurs' Club.

Certificates

Certificates are issued to each ARRL section leader on phone and c.w. and to each single-operator leading a country. A multiple-operator certificate is awarded to the highest scorer in ARRL section or country from which three such entries are received. Here's how many certificates are going out to happy recipients as a result of this year's fracas:

	c.w.	*phone*
Single-operator, W/VE	64	61
Multioperator, W/VE	3	0
Single-operator, DX	81	56
Multioperator, DX	4	0
Club	20	10

Congratulations to all these certificate winners.

Disqualifications

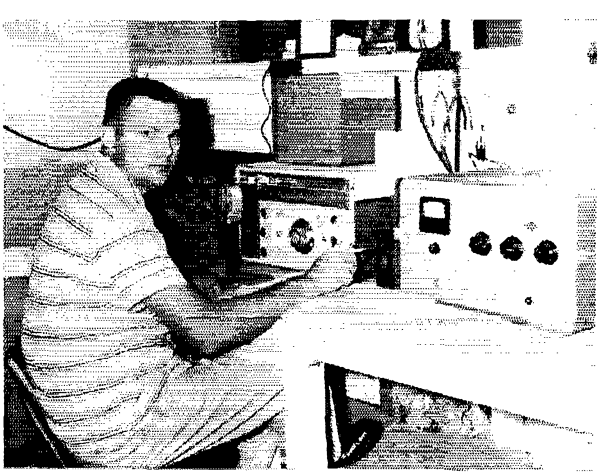
The following are deemed ineligible for score listing or awards. In each case disqualification under contest rule 14 was in view of non-observance of FCC rules as reported by at least two accredited Official Observers, or by a single FCC citation. Such violations as out-of-band operation, phone splatter outside band edges, unauthorized A2 emission, etc. were the criteria for these disqualifications: *C.w.* — W4KXV, W4MCM, W6AF, K6JT; *Phone* — K2DGT, WA2OJD, W9GAI.

NUMBER OF COUNTRIES WORKED BY BANDS

LISTED ARE COUNTRY TOTALS MORE THAN
5 ON 3.8 Mc.
20 ON 7.2 Mc.
50 ON 14.2 Mc.
40 ON 21.25 Mc.
25 ON 28.5 Mc.
(Lower Totals Not Listed)

CALL	3.8 Mc.	7.2 Mc.	14.2 Mc.	21.25 Mc.	28.5 Mc.	CALL	3.8 Mc.	7.2 Mc.	14.2 Mc.	21.25 Mc.	28.5 Mc.
K1DIR				43		W4QCW			67	57	
W1ETF *			54	60	31	K4UHF					25
W1FZ				51	27	W5AJY					27
W1OKG				49	29	W5DJH					31
W1ONK	14		64	60		K5MDX	6			48	
W2FYT		30				K6CT					30
W2GBC			58			K6EVR				53	32
K2GXI	5	32	58	60	31	K6EXO *				43	
W3BES *	7		59	59	27	W8NGO *			52	59	28
W3CTJ			58	43	29	W8NWO *	9	26	54	54	
W3DHM		22	57	49	31	W8NXF				47	31
W3ECR	9	23		51	36	W8UMR					37
W3KFQ			51	49	25	W8WT				47	
W3KT				59		W8ZOK				55	
W3MQC					26	W9DUB				53	46
W3ORU					36	K9ECE				51	
W4BVV		24		41		W9EWC	9		58	58	29
W4LIU					32	W9NZM	5			50	39
W4LMK *					40	W9YSQ				55	
W4LNE					33	WØZXX					27
W4OM				45	27	VE3BOG				41	28

* Multi-operator



Top phone DXer this year is KP4AVQ with 293,037 points via 1716 QSOs and 57 multiplier. Tom, ex-W5GVP -KG1DJ -DL4DJ, finds Puerto Rico "the best location I have seen for DX, as well as the climate being as beautiful as the senoritas." Tom also organized and participated in the May 1961 VP5CD DXpedition.

Twenty-Seventh ARRL International DX Competition

Operator of the station first-listed in each section and country is winner for that area. . . . The multiplier used by each station in determining score is given with the score—in the case of U. S.-Canada this is the total of the countries worked on each frequency-band used; in the case of non-W/K/KH6/KL7/VE/VO entries it is the total of the U. S.-Canada districts worked on each band. . . . The total number of contacts is listed next. . . . The letters A, B, and C approximate the input to the final stage at each station; A indicates power up to and including 150 watts; B indicates over 150 watts, up to and including 500 watts; C indicates over 500 watts. . . . The total operating time to the nearest hour is given for each station and is the last figure following the score. . . . Examples of listings: W3ECR 547,938-278-657-BC-79, or final score 547,938; multiplier 278; 657 contacts; power over 500 watts; total operating time 79 hours. . . . Stations manned by more than one operator are grouped in order of score following single-operator listings in each section or country tabulation; calls of participants at multi-operator stations are listed in parentheses. . . . In sections or countries where three or more multiple-operator entries appear, the top-scoring station is being awarded a certificate.

C.W. SCORES

ATLANTIC DIVISION

Eastern Pennsylvania

W3ECR[1]..547,938-278-657-BC-79
W3ALB....270,600-205-410- C-65
W3KFQ...213,244-178-400- C- -
W3OCU...178,284-166-362- C- -
W3DAO...145,545-155-313- B- -
W3DBX...136,344-152-299- B- -
W3KT....129,156-141-306- C- -
W3EQA...119,700-140-287- C-45
W3HHK...116,100-150-258- C-35
W3MWC...112,518-141-266- B-50
W3IMV....50,049- 83-201- B-20
W3QMZ....46,218- 94-161- C-48
W3ARK....34,188- 77-148- B-17
W3GHD....30,552- 76-134- B- -
W3ADZ....27,741- 68-136-AC-24
W3PN.....25,200- 70-120- B-14
W3KDF....17,523- 59- 99- A- -
W3EVW....16,704- 58- 96- C- -
W3BB.....14,229- 51- 93- C-20
W3LEZ....11,934- 51- 78- C-15
W3QLW.....9348- 41- 76- B-32
K3DPQ.....7812- 42- 62- B-30
W3DQG.....7137- 39- 61- A- -
K3JCT.....4257- 33- 43- A- -
W3SOH.....1020- 17- 20- A- 4
W3EER.....960- 16- 20- A- -
K3IPA.....945- 15- 21- B- -
K3JGJ.....648- 12- 18- B- -
K3IIA.....48- 4- 4- A- 6
W3DVC.....48- 4- 4- A- 2
K3MNJ.....27- 3- 3- A- 5
W3BES (W3s BES GYP)
371,250-225-550- C-90
W3CTJ (W3s CTJ NOH)
324,564-222-488- C-68
W3CGS (W3s CGS WJD)
182,070-170-357- C-75
W3GHM (W3s GHM NOH)
28,728- 76-126- B-20
W3GRS (K3JCT, W3GRS)
8190- 42- 65- A-18

Md.-Del.-D. C.

W3GRF...501,390-270-621- C-90
W3RIV....217,882-194-375- C-80
W3MVB...192,240-180-356-BC-87
W3IYE....187,278-182-343- C-60
W3VAN...172,050-155-370- C-10
W3MSR...156,813-167-313- C- -
W3KA.....88,536-124-238- B-29
W3ZQ.....81,600-120-235- B-18
W3RIS.....80,586-121-222- C-27
W3FRZ....72,594-109-222- C-54
W3DRD....67,332-124-181- C-30
W3TMZ....42,912- 96-149- C-19
W3QQL....42,153- 89-159- B-32
W3RNY....40,128- 88-152- C-41
K3NZV....29,160- 81-120- B- -
W3EPR.....6156- 38- 54- B-21
W3WU.....4278- 31- 46- B- 8
W3AYD....3276- 26- 42- B- -
W3AEL.....3000- 25- 40- C- 5
W3MCG....2772- 22- 42- C- 3
W3FYS.....1200- 20- 20- C- 7
W3GAU....1188- 18- 22- C- 6
W3BKE.....672- 14- 16- B-15
W3BVO.....36- 3- 4- B- -
W3MSK (7 oprs.)
882,819-341-863- C-96
W3MFJ (W3MFJ, W4TKR)
259,000-200-433- C-90
W3GQF (10 oprs.)
144,606-154-313- C- -
W3WV (K3MZY, W3s PZW WV)
53,133- 83-199- C-31

Southern New Jersey

K2DCA...322,302-216-498- C-78
K2GHM...89,154-127-234- C-80
WA2BLV...48,804- 98-166- B-30
W2QDY....19,392- 64-101- A-40
W2HDW...10,578- 43- 82-AB- 9
K2CPR.....8319- 47- 59- B-13
WA2IZS....7755- 47- 55- B-10
W2SDB.....7215- 37- 65- C-13
W2NSJ.....5439- 37- 49- - -
W2DAJ.....3444- 28- 41- B- 8
K2OEA.....2730- 26- 35- A- 3
K2JXX.....2184- 26- 28- C-25
W2BUI.....1539- 19- 27- A-11
K2BG.....1026- 18- 19- B-10
W2REB.....855- 15- 19- -12
W2FXN.....672- 14- 16- C- -
WA2IEK....630- 14- 15-AC-14
K2HBY.....147- 7- 7- A- 7

Western New York

K2GXI[2]....57,780-108-179- C-28
W2UVE....51,813-101-171-AC-32
W2PCJ....44,928- 78-192- C-45
W2VUY....41,022- 85-159- A-29
W2BJH....39,933- 87-153- C-42
WA2HUV...22,440- 66-114- A-30
WA2KMY..21,780- 66-110- A-40
W2QJM....21,216- 68-104- B-12
W2SAW....19,500- 65-100- B-16
W2TVT....17,523- 59- 99- B-55
W2PXA.....4182- 34- 41- B- 8
W2RUJ.....3960- 30- 44- A- 6
W2SSC.....3960- 33- 40- B- 4
W2PDB.....3360- 28- 40- C- 6
K2DJD.....2475- 25- 33- A- -
W2QQ.....2400- 25- 32- B-10
K2OIK.....108- 6- 6- A- 3
W2VUF.....12- 2- 2- B- 1

Western Pennsylvania

W3LOS.....2139- 23- 31- A-32
W3AOH (8 oprs.)
560,216-293-638- C-90

CENTRAL DIVISION

Illinois

W9NZM[3]..521,280-288-608- C-84
W9ERU...213,668-182-392- C-60
W9GFF....45,360- 90-168- C-50
W9CLH....35,392- 79-150- A-45
W9DWQ....34,128- 79-144- B- -
W9WIO....30,375- 81-125- B-20
W9PVA....26,670- 70-127- -32
W9KGK...26,650- 65-138- C-35
K9LSN....10,074- 46- 73- B-26
W9IVG.....7290- 45- 54- C-28
W9QQG.....6156- 36- 58- B-32
W9GMS.....4794- 34- 47- B-44
W9TKD.....2730- 26- 35- C- 7
W9DGK.....2688- 28- 32- A-43
W9MZP.....1575- 21- 25- C-10
W9FKC.....321- 9- 12- C- 3
K9CDK.....90- 5- 6- B -3

Indiana

W9YSX...249,893-203-411- C-40
W9IOP[1]....81,546-122-231- C- -
W9RZO....24,282- 71-114- C-49
K9RZV....22,902- 66-117- B-25

Wisconsin

W9RQM..136,806-151-302- C-78
W9GIL....110,160-136-270- C- -
W9QYW..106,173-141-251- B-63
W9VZP....98,532-138-238- C-62
W9MBF....53,742-106-169- B-32
W9RH.....29,151- 79-123- B-45
W9RKP....27,750- 74-125- C- -
W9KXK...25,620- 70-122-AC-38
W9JYJ.....18,318- 71- 86- C-70
W9IHN....18,126- 57-106- B-27
W9NLJ....11,544- 52- 74- C-18
K9OPF.....1275- 17- 25- A- 6
W9YT (7 oprs.)
71,826-109-218- C-53

DAKOTA DIVISION

North Dakota

WØSDN.....4140- 30- 46- A-25

South Dakota

WØBLZ....63,765-109-195- C- -

Minnesota

WØMPW...81,648-126-216-BC-44
KØIKL.....55,419- 91-203- C-70
WØJSN....11,700- 52- 75- A-45
WØVIP.....960- 16- 20- B- -
KØVTG.....363- 11- 11- B-12

DELTA DIVISION

Arkansas

W5GFT.....189- 7- 9- B- 3

Louisiana

K5DGI....171,360-170-336- C- -
W5KC.....125,208-141-296- C-46
W5BUK....82,875-125-221- C-49
K5TFG.....6048- 36-56- A-20

Mississippi

W5CKY...152,460-165-308- C-45
W8RMF/5.15,561- 57- 91- A-35

Tennessee

K4LPW...159,526-166-321- B- -
W4HOS/4....1596- 19- 28-AB- 9
K4PKO.....296- 8- 13- A- -

GREAT LAKES DIVISION

Michigan

W8UCI....19,860- 66-100- B- -
K8QJH....14,616- 58- 85- B-20
W8SCU.....6708- 43- 52- C-19
K8OCO.....5733- 39- 49- C-17
W8MCC.....2352- 28- 28- C- 8
W8SPO.....840- 14- 20- A- 8
W8YBH.....672- 14- 16- A-18

Ohio

W8FGX...443,500-250-592- C-70
W8ZJM...121,968-141-283-BC-52
W8YPT....51,102-102-167- B-34
W8JSU....50,220- 93-180- - -
K8DEO....31,416- 88-119- B-14
K8MTI....11,664- 54- 72- B- -
W8DWP....11,289- 53- 71-AC-45
W8TPS....11,076- 52- 71- A-20
K8RMK.....9636- 44- 73-AB- -
W8AJW.....7257- 41- 59- A- -
W8GQU.....6300- 36- 59- B-17
K8PYD.....4836- 31- 52- -12
W8KC.....3564- 27- 44- B-12
W8KMF....2673- 27- 33- A-10
K8HTM....2520- 21- 35- B-22
K8IPS....2310- 22- 35- A-10
W8IBX....1950- 25- 26-AB- 5
W8KZH.....945- 15- 21- A-15

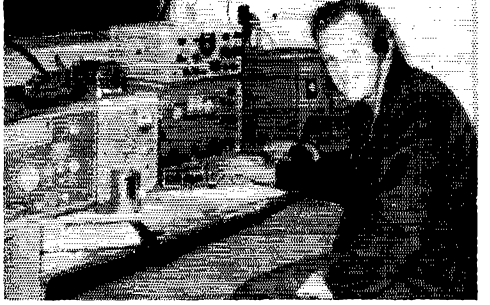
HUDSON DIVISION

Eastern New York

WA2OJD..124,785-141-295- C-69
W2HO....111,252-127-292- C-46
W2AWF....43,521- 89-163- C-38
W2IP.....960- 16- 20- B- -

N. Y. C.-L. I.

K2DGT...445,341-247-601- C-90
W2OBX...142,080-160-296- A-45
W2IRV....116,508-133-292- B-10
K3CTO/2...63,603-111-191- B-30
W2ESO....46,056-101-152- C-20
K2YOR....39,312- 84-156- C-35
W2GKZ....12,012- 52- 77- C-15



Here's Red, K3HWI, a member of the c.w. team for KH6ECD, passing out more coveted QSOs for Kure Island, which counts as a new country. A combined total of 2954 contest QSOs were made on phone and c.w. Kure proved to be the most excitement for the W/VE gang, anxious to aid both score and DXCC totals.

A 200K-plus North American score came from YN4AB, who pounded brass 55 hours to yield 1606 contacts and 207,174 score.

WA2KSD....8442- 42- 67- A-24
K2IEG.....7196- 34- 49- C- 5
WA2DES....6498- 38- 57- A-20
W2WMG....5049- 33- 51- C-12
W2CWD....4851- 33- 49- C-12
K2RTH.....3159- 27- 39- A-13
W2NCG.....1620- 18- 30- A- 7
WA2EFN....1518- 22- 23-AB- 5
K2OFD.....1216- 16- 26- A-12
W2JB......360- 8- 15- B- 6
W2KOY.....360- 10- 12- C- 3
W2NHH.....60- 4- 5- A- 8
W2TUK.....48- 4- 4- A- 1
WA2ECN....27- 3- 3- B- 5
WA2KSJ....18- 2- 3- A- 1

Northern New Jersey

W2GGE...168,324-166-338- C-60
K2GUN...156,408-168-313- C-73
W2CYS....38,766- 71-182- C-30
K2KPF....20,025- 75- 84- B-18
W2EHN....13,770- 54- 85- B-30
W2GKE....2818- 21- 30- A-18
WA2IDM....1674- 18- 31- A- 5
W2EQS.....855- 15- 19- - -
K2SBW.....810- 15- 18- A- 6
WA2DEC....702- 13- 18-AB-10
WA2MYB....48- 4- 4- A- 6

MIDWEST DIVISION

Iowa

WØFDL...76,500-125-204- C-53
WØHNA...40,230- 90-149- C-47
WØBSY....1071- 17- 21- A-12
WØYTQ (5 oprs.)
59,800-104-193- C-88

Kansas

WØDAE...63,315-165-201- C-37
WØVBQ....32,370- 83-130- C-28
KØMNO...27,303- 74-123- C-52
WØVFE....10,293- 47- 73- A-18

Missouri

WØBMM..172,881-171-337- C-80
WØBTD....93,976-136-231- A-58
WØMCX...22,572- 66-114- C-35
KØOJC.....450- 10- 15- B- 3

Nebraska

KØMRS....1512- 18- 28- B-10

NEW ENGLAND DIVISION

Connecticut

W1BIH...251,262-198-423- C-52
W1VG[3]...118,535-157-255- C- -
W1AW[5,6]...21,600- 72-100- C- -
W1IKB....15,582- 53- 98- C-20
W1AJO....12,705- 55- 77- B-27
W1OJR.....5400- 40- 45- A-11
W1OPB.....960- 10- 20- A-19
W1BDI[5].....75- 5- 5- B- 3
K1MLI (4 oprs.)
265,200-171-400-BC-78

Eastern Massachusetts

K1PNN....49,500-100-165- B-46
W1EHT....30,003- 73-147- B-33
W1LJO....25,773- 71-121- A-20
W1KXP....24,426- 59-138- A-24
W1NJL....16,470- 61- 90-AB- -
W1NS.....16,218- 53-103-BC-13
K1MEM....10,878- 49- 74- B- -
W1TQS.....4200- 28- 50- C-11
W1PLJ.....1890- 21- 30-AB-15
W1NBN/1....972- 18- 18- - 3
W1MRQ.....630- 14- 15- B- 5
K1DIR (K1s CLT DIR)
181,506-169-358-BC-65
W1PCY (K1HVV, W1PCY)
147- 7- 7- - 2

Western Massachusetts

W1JYH...202,182-186-363- C-50
W1AEW...34,632- 74-156- B- -
W1DGT.....7812- 42- 62- B- 9
K1OOV.....3105- 27- 39- C-14

New Hampshire

W1FZ.....164,160-160-342- C- -

Rhode Island

W1AWE.....7560- 36- 70- -14
K1LDK.....2688- 28- 33- A- 8
K1JTL.....1425- 19- 25- B- 3

Vermont

W1QMM...74,865-115-217- C-44

NORTHWESTERN DIVISION

Alaska

W9KLD/KL7.8610- 35- 82- C- 8
KL7DEM....1014- 13- 26- A-11

Montana

K7ABV.....1638- 21- 26- A- 5
W7EWR.....18- 2- 3- A- 4

Oregon

W7PLI.....4495- 31- 49- A-22
W7DLR.....756- 14- 18- C- 8
K7KCZ.....90- 5- 6- A- 4

Washington

K7KGP.....6726- 38- 59- B-30
W7CAB.....5760- 32- 60- B-16
K7JCA.....3312- 23- 48- A-10
W7MH.....2856- 28- 34- B-20
W7ZVY.....621- 9- 23- A-10
K7HTZ.....450- 10- 15- A- 5
W7EJD.....3- 1- 1- C- 1

PACIFIC DIVISION

Hawaii

KH6IJ....131,760-144-305- C-65

Santa Clara Valley

K6CQM...129,822-154-281- C-68
W6HOC...125,928-159-264- C-50
W6KEV...109,344-136-268- C-56
W6ZMW...62,088-104-199- C-55
W6FYM...80,280-120-233- C-65
W6ATO...70,620-107-220- C- -
W6CBE...50,400- 96-175- C-28
K6HOR...41,328- 84-164-BC- -
W6WX.....24,156- 66-122- C-17
K6IEC.....21,924- 58-126- C-10
K6BWX...21,576- 62-116- C-17
W6QDE...21,204- 62-114- C-21
K6JC.....17,304- 56-103- B-22
W6ISQ....13,350- 50- 89- B-20
K6UYZ.....9964- 47- 71- C-27
WA6HRS....2691- 23- 39-AB- -
W6CLZ.....828- 12- 23- B- 5

East Bay

W6BSY....68,640-110-208- C-52
W6PQW....15,810- 48-110- C- -
WA6BBJ....11,160- 45- 84- A-18
W6IPH.....5247- 33- 53- C-15
W6FLT.....1530- 17- 30- C- 8
W6LDD (W6s JHV LDD)
154,605-165-313- C-92
W6GEB (K6TKU, W6GEB)
5616- 26- 72- A-10

San Francisco

W6WB....103,740-133-260- C- -
K6ANP....32,760- 84-130- C-80
W6MSM....29,190- 70-139- C-51
W6ERS....23,595- 65-121- C-60
K6PJT.....1920- 20- 32- C-14
W6WLV.....408- 8- 17- A-14
W6SR/6 (W6s CQK SR)
102,180-130-262- C-96

Sacramento Valley

W6ONZ...111,240-135-276- C-55
W6GRX...95,356-124-257- C- -
W6SIA....52,020-102-170- B-48
W6BIL.....1053- 13- 27- C-17

San Joaquin Valley

W6UJ.....90,573-133-227- C-18
W6BVM...41,738- 82-171- - -
W6KJS....39,845- 87-145- C-30
W6UDR...25,728- 64-134- C-27
W6QQW.....7035- 35- 67- C-20
W6AFH.....2592- 24- 36- C-18

ROANOKE DIVISION

North Carolina

W4PLL...132,342-161-274- C-38
W4LMK[7].....793- 13- 22- A-10

South Carolina

K4YYL....29,925- 75-133- B-33

Virginia

W4YHD..510,544-272-626- C-92
W4KFC...385,236-246-522-AC-52
W4JAT...223,488-192-388- C-72
K4GMX...147,393-159-309- C-80
K4ZKI....132,240-115-304- B-58
W4OM....111,792-136-274-
ABC- -
W4RQR....94,962-133-238- C-30
W4QCW...94,815-147-215- C-48
W4NUC....82,584-124-222- C-50
W4JNE....68,640-104-220- C-38
W4WBC...55,929-103-181- C-36
K4MXF....15,243- 99-153- C-50
W4NO.....37,674- 91-138- C-20
W4GF.....18,144- 63- 96- B-35
W4JFE....11,985- 47- 85- A-18
W4IUO....10,626- 46- 77- B-15
W4RIM.....7080- 40- 59- A-26
K4TFL.....6594- 42- 53- B-25
VE2BX/W4...912- 16- 19- A-12
W4ZM.....495- 11- 15- A- 5
K4WQZ.....60- 4- 5- A- 5

West Virginia

W8UMR...38,505- 85-151- A-17
K8PJC.....243- 9- 9- B- 5

ROCKY MOUNTAIN DIVISION

Colorado

WØEWH...77,604-116-223- C-57
WØTW.....8178- 47- 58- A-29

Utah

W7POU.....1938- 19- 34- A-18
W7BAJ.....1500- 20- 25- A- 9

New Mexico

W5FJE....88,560-123-240- C-71
W5CK.....54,417- 97-187- C- -
K5STL.....7605- 39- 65- B- -
K5UYF.....6156- 36- 57- B-10
W5LEF.....3105- 23- 45- C-16

Wyoming

W7PGS...170,660-161-354- C-57
W7PSO....20,355- 59-115- C-20

SOUTHEASTERN DIVISION

Alabama

K4BQU.....2310- 22- 35- A-10
K4HAE (K4s HAE HBD)
900- 15- 20-BC-15

Eastern Florida

W4DQS...219,294-186-393- C-45
W4AZK...212,625-189-375- C-61
W4FZW....58,195-103-189- A-38
W4YK.....28,413- 77-123- C-18
W4CHA.....4590- 30- 51- B-15
W4OTK.....3330- 30- 37- B-11
W4EEO.....1452- 22- 22- - -

Western Florida

W4OSD....23,310- 74-105- C-35
W4HQN.....1704- 32- 49- C-25

Georgia

W4DXI...164,850-175-317-BC-84
W4BFR....64,975-115-189- C-42
K4HRG....19,008- 64- 99- C-22
W4HYW....7035- 35- 67- C- 8
W4BHG.....105- 5- 7- B- 3

SOUTHWESTERN DIVISION

Los Angeles

W6IBD...206,566-179-386- C- -
W6FSJ....104,130-130-267- C-58
WA6HQR...79,677-117-227- C-62
W6ANN...61,388-103-200- B-52
W6FWQ....56,856-103-184- - -
K6CTV....51,300- 95-180- C-28
W6APH....14,280- 90-164- C-58
K6KII.....40,836- 84-164- A- -
W6BUD....33,777- 81-139- C-20
W6GHM...32,802- 77-142- C-14
W6DQH....29,346- 73-134- C-58
W6OES....26,331- 67-131- C-55
W6WWQ...24,840- 72-115- C-34
K6LEB....18,300- 61-100- C-40
W6NKR....10,731- 49- 73- C-31
W6NEX.....8820- 42- 72- B-27
W6ID.....6156- 36- 57- C-11
WA6KMF...4653- 33- 47- A-47
W6UYE....2001- 23- 29- C-15
K6UFX....1377- 17- 27- C- -
W6OEO....1278- 18- 24- B- 8
W6WNR.....660- 10- 22- A-21
K6JBP.....363- 11- 11- B- 5
K6CQF.....90- 5- 6- B- 2
K6EVR (4 oprs.)
356,723-233-511- C-85
W6RW (W6s BXL 1XK RW)
353,805-229-515- C-87
W6NJU (K6LKG, W6NJU)
21,978- 66-111- C- -
WA6HTJ (WA6s HTJ IRB)
897- 13- 23- B-10

Arizona

W7ENA....10,164- 44- 77- A-33
K7CLA....2952- 24- 41- A- 9

San Diego

K6VTQ...226,968-193-392- C-59
W6CAE....82,467-119-231- C-36
W6CHV....39,516- 89-148- B-40
W6PLK....25,938- 66-131- C- -
W6CUQ....22,134- 62-119- C-30
K6EC.....20,085- 65-103- B- 9
K6MSK....12,015- 45- 89- B-40
W6JH.....4959- 29- 57- B-20

Santa Barbara

W6ULS....63,600-106-200- C- -
W6YK.....56,600-100-190- C-70
W6GTI....35,109- 83-141- C- -
W6RRR.....1581- 17- 31- - -

WEST GULF DIVISION

Northern Texas

K5KBH....96,078-134-239- C-50

K5BDX.....1860- 20- 31- B-10
K5QWR.....396- 11- 12- B- 8
K5YAL.....324- 9- 12- A- 6

Oklahoma

K5VTA.....8536- 44- 67- B-15
W5EHY.....1071- 17- 21- B-11

Southern Texas

W5BRR...152,568-156-326- C-46
W5WZQ...149,124-172-289- B-60
W5MCO...20,088- 62-108- A-42
W5LJT....13,650- 50- 91- A-40
K5LLJ.....168- 7- 8- A-20
W5ACL.....18- 4- 4- B- 4

CANADIAN DIVISION

Maritime

VE1EK....13,677- 47- 97- A-20

Quebec

VE2BV....63,648-104-204- B-38

Ontario

WØAIH/VE3
155,526-161-322- B-40
VE3ES.....8142- 42- 67- A-12
VE3DBB....6810- 38- 60- B-20
VE3BOG....5967- 39- 51- C-10
VE3PE.....2232- 24- 31- B- 8
VE3UOT (VE3s AYR BFA)
462- 11- 14- C-11

Alberta

VE6HG.....4512- 32- 47- A-38
VE6TP.....3146- 26- 37- C- 5

British Columbia

VE7CE....10,212- 46- 74- B-25

AFRICA

Principe, Sao Thome

CR5AR.....8964- 18-166- B- –

Canaries

EA8CG....27,835- 35-269- A- –

Spanish Morocco

EA9AP.....37,231- 31-401- A-16

Liberia

EL4A.....101,724- 49-692- A- –

Northern Rhodesia

VQ2CZ....27,918- 33-283- A-24
VQ2MS....21,546- 27-272- A- –

Mauritius

VQ8BM....28,188- 27-354- A-54

South Africa

ZS6IF.....77,520- 38-682- A-18
ZS1O.....17,820- 33-180- A- –
ZS6DZ.....3375- 15- 75- A- 7
ZS6AVP....2484- 12- 69- A- 4
ZS6PTA (6 oprs.)
103,824- 42-824- A-65

Swaziland

ZS7R.....20,262- 22-307- A- –
ZS7M.....4035- 15- 91- A- 3

Nigeria

5N2IJS....12,576- 16-262- A-13
5N2GUP....1815- 19- 85- A- 5

Republic of the Congo

SM5KV/9Q5 2088- 8- 87- A- –

ASIA

Korea

HM1AP.....900- 5- 60- A-10

Thailand

HS2M.....6- 1- 2- A- –

Saudi Arabia

HZ1HZ....18,468- 27-228- A-16

Japan

JA1VX....160,599-51-1052- C-55
JA7AD....17,400- 20-290- A-25
JA8LN....13,872- 16-289- A-13
JA1YL.....8835- 19-155- A-15
JA1CO.....8154- 18-151- A-10
JA5FQ.....7060- 20-118- B- –
JA1CJN....5026- 14-122- A-20
JA7KY.....3468- 16- 71- A-12
JA1BWA....3300- 10-110- A-11
JA2WB.....2268- 9- 84- A- –
JA5HD.....1584- 9- 60- A- –
JA1DIC....1056- 8- 44- A- –
JA6QA.....777- 7- 37- A-17
JA1BTH.....144- 4- 37- A-15
JA1CZG.....372- 4- 31- A-14
JA1LN.....360- 6- 20- A-10
JA1DUH....240- 4- 20- A- 8
JA3AG.....180- 6- 10- A- 2
JA8GR.....172- 4- 15- A-10
JA7OJ.....171- 3- 19- A- –
JA7JU.....126- 3- 14- A- –
JA1EM.....117- 3- 13- A- –
JA1BLS.....63- 3- 7- A- –
JA1CUM.....18- 2- 3- A- –
JA2DN.....18- 2- 3- B- 1
JA8AAC.....14- 2- 3- A- 1
JA9KA.....8- 1- 3- A- 1
JA6IX.....6- 1- 2- A- –
JA2YAB (multi-op.)
3627- 13- 93- A- –

Ryukyus

KR6LY.....7260- 16-156- A- 9
KR6JM (KR6s JM LJ)
128,498- 47-914-BC-68

Asiatic Russian S.F.S.R.

UAØKZB...11,760- 16-245- B- –
UAØAG.....3876- 12-109- B- –
UAØTN.....1890- 9- 70- A- –
UAØAW.....1809- 9- 67- A- –
UA0JU.....1269- 9- 47- A- –
UA9VN.....777- 7- 37- A- –
UAØKDA (5 oprs.)
11,424- 14-272- A- –
UAØKCA (4 oprs.)
16,540- 17-208- B- –
UAØKYA (3 oprs.)
3618- 12-103- A-24
UA9KOG (UA9s KOG OF ON)
2450- 14- 60- B-17
UAØKUA (2 oprs.)
1010- 10- 35- B- 9

Uzbek

UI8AD.....594- 9- 22- A- –

Kirghiz

UM8KAB (3 oprs.)
1050- 10- 35- A- –

India

VU2MD.....132- 4- 11- A- –

Burma

XZ2TH.....816- 8- 34- A- –

Israel

4X4NJ.....8043- 21-128- A- 6

EUROPE

Germany

DJ3KR....99,810- 40-832- B-41
DL7BQ....11,571- 29-133- B- –
DM2ATL...7106- 22-108- A-14
DL5DU.....4669- 19- 71- B-16
DL9PR (DJ2AA, DL9s PR ZN)
54,205- 37-489- B- –

Spain

EA4CE....50,160- 38-440- A-37
EA3LB.....2976- 12- 83- A-15

Ireland

EI6D.....82,216- 43-638- A-49
EI9J.....14,652- 22-222- A- 7
EI9F.....1050- 7- 50- A- 5
EI5G.....205- 5- 16- A- 2
EI5F.....168- 4- 14- A- –

France

F8VJ.....108,656- 50-725- A-39
F8ZF.....53,238- 38-484- A-33
F2PO.....11,484- 22-174- A- –
F8TQ.....6233- 23- 91- A- 8
F8TM.....6210- 23- 90- A- –
F2SQ.....2961- 13- 76- A- –
F9BB.....1071- 9- 40- A-
F9DW.....24- 2- 4- A- 2

England

G2QT.....100,320- 44-760- A-50

Tuning in to answer another caller is VQ8BM, who skillfully keyed to 354 QSOs in his first ARRL DX Contest venture. Rig is an HRO and home-brew 100 watts to a longwire. We'll be looking for this Mauritius DXer as a contest regular from now on.

G2DC.....82,570- 46-603- A- –
G3EYN....51,051- 43-419- A-37
G2RO.....17,276- 28-208- A-49
G3KHT.....2142- 17- 42- A-45
G6BQ (G3MXJ, G6BQ)
188,265-55-1141- A-90
G3OOU (G3s NWD OGE OOU)
8234- 23-123- A-22

Isle of Man

GD3FBS.....2403- 9- 89- A- 7

Northern Ireland

GI3OQR...33,760- 32-353- A-50

Wales

GW3JI.....88,836- 44-677- A-86
GW3MLU...30,300- 30-338- A-31

Hungary

HA5KFR (3 oprs.)
94,248- 33-952- B- –
HA1KSA (3 oprs.)
63,010- 40-746- A- –
HA8KCU (2 oprs.)
4224- 16- 88- A- –
HA5KDQ (3 oprs.)
1089- 11- 33- B- –

Switzerland

HB9JG.....11,836- 22-182- B-11
HB9DX.....6912- 16-144- A- –
HB9UD.....2856- 14- 69- A-50

Italy

IT1AGA....22,596- 28-270- A-33
IT1TA1....16,920- 24-237- A- –
I1BLF.....14,214- 23-206- A-10
I1ER.....3195- 15- 72- A-18

Norway

LA5HE....31,200- 26-400- A- –
LA4IC.....6912- 16-144- A-28
LA6U.....5346- 18-101- A- –
LA6UB.....2464- 14- 60- A- 8
LA4LG.....132- 8- 18- A- 4
LA1K (LAs 3EG 5UF TWG)
4080- 17- 80- A- –

Austria

OE1RZ.....88,830- 42-705- B-51

Finland

OH2LA....27,786- 22-421- B- –
OH3TE....16,095- 29-185- A- –
OH7NF.....9152- 16-192- B-516
OH6AA.....6006- 14-113- A- –
OH1VA.....2145- 15- 55- A- –
OH2PO.....616- 8- 26- A- –
OH2PT.....294- 7- 14- A- –
OH2QO.....72- 3- 8- A- –
OH5NB.....3- 1- 1- A- 1
OH2AA (OH2s KH KK)
3276- 12- 91- A- –

Czecho-Slovakia

OK1ZL.....54,210- 39-465- B-50
OK1RX....17,370- 30-196- A- –
OK1ADM....5610- 20- 94- A- –
OK1EV.....4720- 20- 83- A-15
OK1GT.....2145- 13- 55- A-10
OK3IR.....2123- 11- 65- A- –
OK2ABU....1584- 8- 67- A- –
OK3KGI....1344- 12- 38- A- –
OK1AAA....1270- 10- 43- A- –
OK1WD.....1053- 9- 39- A- –
OK1NK.....612- 6- 35- A- –
OK1KB.....609- 7- 29- A- –
OK2ABU.....408- 8- 17- A- –
OK1AAA.....198- 11- 6- A- –
OK2KMB.....75- 5- 5- A- –
OK1TW.....12- 2- 2- A- –
OK3KAB (5 oprs.)
10,770- 53-700- B-50

Belgium

ON4LX...106,785- 45-791- A-34

Faroes

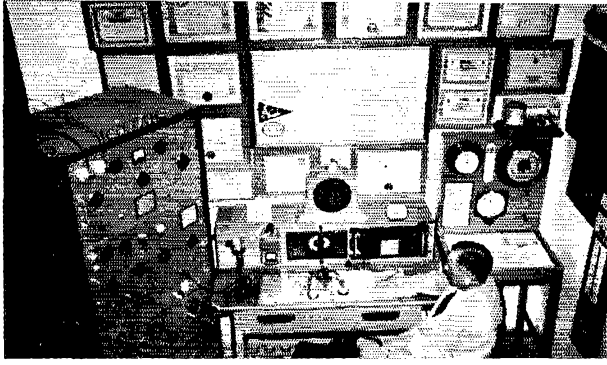
OY8RJ.....1104- 18- 76- A- –

Denmark

OZ1W.....39,330- 38-349- A- –
OZ7G.....29,145- 29-336- A-32
OZ4H.....15,132- 26-194- A-60
OZ2NU.....4836- 13-124- A-14
OZ3SN.....2925- 13- 75- A-30
OZ7KV.....2346- 17- 46- B- –

Netherlands

PAØLOU...65,601- 42-522- A-42
PAØVB.....14,835- 23-215- A-14
PAØADP....11,454- 23-166- A-17
PAØLV.....10,143- 23-147- A- –
PAØWAC....9261- 21-147- A- –
PAØYN.....3825- 15- 85- A- –
PAØQM.....3645- 15- 83- A-20
PAØUZ.....1125- 15- 75- A-13
PAØRL.....810- 10- 27- A- –
PAØVER.....594- 11- 18- A- 6



Over-all view of CO7AH's shack where 784 c.w. QSOs were made all on 20 meters. Note the weather instruments on the right.

Sweden

SM5WI....25,372- 21-244- B- –
SM5ATK...24,420- 20-407- B- –
SM5UU.....5760- 20- 96- B- 9
SM7BVO....5328- 16-111- B- 3
SM3BYJ....4530- 15-101- B- –
SM7EH.....1377- 9- 51- A- –
SM5XX.....858- 13- 22- B-10
SM5AKP.....765- 9- 29- B- –
SM6BDS/5...600- 5- 40- B- 5
SM7AIL.....123- 9- 16- A- –
SM5BEU.....324- 6- 18- B- 2
SM5BLU.....6- 1- 2- A- 1

Poland

SP6FZ.....31,484- 37-311- B-23
SP8MJ.....3906- 21- 62- A-17
SP1KBT....2871- 11- 87- B- –
SP8HR.....480- 10- 16- A- –
SP9ADU.....18- 2- 3- A- –
SP7WZ.....12- 2- 2- A-16

Greece

SV0WR.....6579- 17-134- B- –

Iceland

TF3AB.....38,637- 27-477- A- –

European Russian S.F.S.R.

UA1NA.....3165- 15- 71- A- –
UA4KHN....1332- 9- 50- A- –
UA3RO.....396- 6- 22- A- –
UA4SM.....36- 3- 4- A- 2
UA1DH (UA1s DH DX) 22,950- 27-285- B- –
UA3KWA (3 oprs.) 3315- 17- 65- B-96
UA4KSA (3 oprs.) 16- 2- 3- A- 6

Kaliningradsk

UA2AC....40,581- 27-509- B- –

Ukraine

UB5EF.....4725- 15-106- B- 7
UB5KED (3 oprs.) 42,143- 37-382- B- –
UB5KFF (3 oprs.) 10,800- 25-144- A-29
UB5KBA (3 oprs.) 3598- 14- 87- B-15
UB5KAI (UB5s OA OB OC OD) 3030- 15- 68- A- –

Azerbaijan

UD6AM.....192- 4- 16- B- 4
UD6GF.....84- 4- 7- A- 4
UD6KAB (3 oprs.) 120- 6- 8- B- 5

Armenia

UG6AW....11,320- 20-190- B-17

Moldavia

UO5AA.....3179- 17- 63- A- –

Latvia

UQ2KAA (4 oprs.) 1980- 10- 67- B-24

Estonia

UR2BU.....1936- 16- 42- B-13
UR2KAE (2 oprs.) 5700- 15-127- B- –

Rumania

YO3AC.....300- 5- 20- A- 2

Yugoslavia

YU1SF.....130- 5- 9- A-25

NORTH AMERICA

Cuba

CO7AH....37,632- 16-784- B- –

Haiti

HH2OT.....84- 4- 7- A- –

Panama

HP1SB.....39,984- 42-322- A-14
HP1AC.....2873- 13- 74- A-12

Puerto Rico

KP4ATV..367,629-67-1829- A- –
KP4AQY..161,650-50-1090- A-35

Virgin Islands

KV4AQ...444,080-70-2115- A- –

Canal Zone

KZ5DF....35,850- 25-478- A-11

Greenland

OX3NK....68,172- 39-584- A-45
OX3DL....36,372- 28-433- A-20
OX3LLD....1032- 14- 96- A- –

Bahamas

VP7NT...185,745-61-1015- A-17

Mexico

XE1H.....24,900- 25-332- A- 5
XE1MB....12,488- 14-299- A-14

Nicaragua

YN4AB..207,174-43-1606- A-55
YN1AA...130,101- 51-853- A-15

OCEANIA

New Caledonia

FK8AH....31,488- 32-328- A-14

Netherlands New Guinea

JZ0PO.....23,840- 32-249- A-15

Kure

KH6ECD (K3HWI, KM6s BQ CB) 336,861-63-1813-AB-90

Wake Island

KW6DG..288,672-62-1589- C-26

Australia

VK2GW...309,264-68-1516- A-70
VK5NQ...242,224-56-1452- A-57
VK3APJ...200,880-54-1240- A-84
VK7SM....52,542- 42-417- A-33
VK2APK...26,676- 36-247- A-30
VK4FH....10,300- 25-139- A-36
VK4XW.....1875- 13-127- A-21
VK5JT.....4050- 15- 90- A- –
VK2YC.....3600- 12-100- A-12

Gilbert and Ellice Islands

VR1B.....1584- 11- 48- A- 2

Fiji Islands

VR2DK...107,536- 52-700- A-44

Cook Islands

ZK1AR...105,612- 52-677- A-41

Niue

ZK2AD.....840- 7- 40- A- –

New Zealand

ZL1NG....143,605- 55-871- A-40
ZL2PM....120,600- 54-745- A-37
ZL1AFW...26,202- 33-266- A-16

SOUTH AMERICA

Chile

CE1AD...376,125-59-2125- B- –
CE3AG...204,600-62-1100- C-30

Bolivia

CP3CD....18,144- 16-378- A- –
CP3CN.....4131- 17- 81- A- –

Uruguay

CX6CB....25,885- 31-279- A-13

Colombia

HK7ZT...217,179-59-1227- A-56
HK3AH...120,105- 51-785- A-77
HK3TH....42,105- 15-945- B- –
HK4JC....14,880- 20-248- A- –
HK1HV.....1890- 9- 70- A- –

Anarctica

KC4USB.....5712- 14-136- C- –

Argentina

LU5DDF..125,734- 49-880- A- –
LU6PK....56,204- 28-412- A-27
LU1ACF...20,203- 23-287- B-27
LU7CW.....4230- 15- 95- A-10

Peru

OA4BR....95,400- 53-602- B-12

Brazil

PY4GA...247,680-61-1295- B-43
PY1ADA..157,263- 57-920- B-19
PY5HJ....14,592- 16-307- A- –
PY2BZD....9435- 15-211- A-15
PY4AXN....7239- 19-127- B-10
PY4AYO....6930- 15-154- A- –
PY1FM.....3504- 16- 75- A-10
PY4ADC....2706- 11- 82- A- 8

Fernando de Noronha

PY7LJ.....91,112- 56-544- A-20

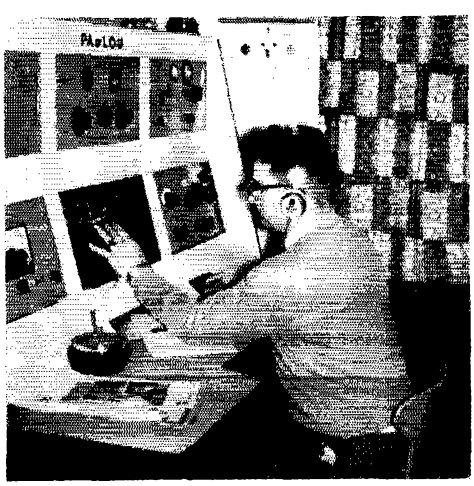
Venezuela

YV5AVS..151,146- 54-935- A-49
YV5AGD...87,084- 59-492- B-39
YV1EM....39,228- 42-330- B-14
YV1BH....39,134- 34-388- A-36

Paraguay

ZP9AY.....92,310- 51-608- A-30
ZP5LS.....13,851- 27-171- B- –

[1] W3MFW, opr. [2] K2LWR, opr. [3] W9WNV, opr. [4] W9VW, opr. [5] Hq. staff — not eligible for award. [6] W1WPR, opr. [7] W4PTD, opr.



PAØLOU is a pretty familiar call, because just about everyone at one time or another has run across Lou on c.w. This year this extraordinarily neat operating position logged 522 contacts for 65,604 points.

Phone Call-Area Leaders

Single-Operator

W1ONK.....189,761
K2GXI.....246,078
W3ECR.....164,088
W4QCW.....133,950
W5KC.....58,212
K6EVR.....127,148
KH6IJ.....87,453
W7FIN.....2280
K1IFS/KL7.....8103
W8ZOK.....101,001
W9EWC.....196,355
KØIKL.....31,950
VE1PQ.....11,952
VE2UI.....13,432
VE3BOG.....47,763
VE4SD.....16,560
VE6TP.....5664
VE7BBG.....6888

Beaming satisfaction and enthusiasm after competing in first contest of any kind, HI8DGC notes 1233 QSOs for 202,565 score, second high DX phone score in the contest . . . a pretty good first try to be sure! An HQ170 and a Viking I to a homemade tri-band cubical quad did the honors.

PHONE SCORES

ATLANTIC DIVISION

Eastern Pennsylvania

W3ECR....164,088-159-344- C-47
W3DHM...162,837-163-333- C-63
W3CTJ....140,792-144-331- C-49
W3KFQ....119,574-126-317- C- –
W3KT.....76,956-103-242- C- –
W3OCU....39,591- 83-159- C- –
W3ALB....28,956- 76-127- C-48
W3IMV....26,532- 67-132- B-20
W3EQA....26,412- 71-126- C-29
W3CGS....16,038- 54- 99- C-26
W3MQC....6903- 39- 59- C-15
W3GHD....6534- 33- 66- B- –
W3HHK....6438- 37- 58- B-20
W3ORU....6372- 36- 59- B-24
K3DPQ....1932- 23- 28- A-15
K3LBJ....1064- 19- 19- B-20
W3LEZ.....768- 16- 16- A- 8
W3KDF.....540- 12- 15- A- –
W3QLW.....540- 12- 15- B- 8
K3KCT.....468- 12- 13- C- 7
K3JGJ.....390- 10- 13- B- –
K3IPA.....90- 5- 6- A- 2
W3BES (W3s BES GYP)
200,080-164-408- C-90
W3GRS (K3JCT, W3GRS)
9849- 49- 67- A-23

Md.-Del.-D. C.

W3IYE....42,394- 94-151- C-35
W3ZQ.....30,240- 80-126- B-34
W3JTC....11,718- 42- 93- C-15
W3DRD....6837- 43- 53- B-15
W3AYD....6765- 41- 55- B- –
W3MCG....4284- 28- 51- C- 5
K3CBW....2929- 29- 35- A-19
W3NNX....1980- 22- 30- A-18
W3BVO.....75- 5- 5- B- –

Southern New Jersey

W2FXN....17,400- 58-100- C- –
WA2IZS....10,764- 46- 78- B-17
W2QKJ.....8073- 39- 69- B- 8
W2DMR.....4386- 34- 43- C-16
W2FYT.....3990- 30- 45- C-32
WA2IEK....3131- 31- 35- A-19
K2HBY.....1476- 18- 28- A-15
W2SDB.....588- 14- 14- A- 7

Western New York

K2GXI....246,078-183-443- C-88
W2QWS....38,160- 80-161- C-40
WA2BYJ...18,432- 64- 96- C-40
W2SNI.....7448- 38- 66-BC- –
W2UVE.....5160- 40- 43-AC- 8
W2RUJ.....945- 15- 21- A- 4
W2SAW.....672- 14- 16- B- 7
W2VUF.....270- 9- 10- B-15
W2PDB.....189- 7- 9- C- 2

Western Pennsylvania

W3LPF.....3726- 27- 46- C- 9

CENTRAL DIVISION

Illinois

W9NZM...125,979-147-287- C-72
W9PVA....15,486- 58- 89- B-32
W9IVG....10,530- 54- 65- C-27
W9JJV....4698- 29- 54- C-21
W9TKD....2880- 24- 40- C-10
W9BBF....1848- 22- 28- B- 6
W9WIO.....648- 12- 18- B- 4
W9CRN.....585- 13- 15- A-12
W9FKC.....252- 6- 14- –
K9LSN.....189- 7- 9- B- 2
K9QMJ.....105- 5- 7- A- 1

Indiana

W9YSQ....70,290-110-213- C-43

The 100-watt rig on the left and the high-band double conversion receiver for 10 and 15 meters coupled to net VQ4HX 238 phone contacts and a certificate for Kenya. A.m. phone on 28 and 21 Mc. are favorite bands with occasional visits to 14 and 7 Mc.

K9ECE....55,728-108-172- A-65
K9GMD...14,905- 55- 91- A-50
W9LKI.....4200- 35- 40- B-23
K9GEL.....900- 15- 20- A-16
W9GUX.....810- 15- 18- B-19

Wisconsin

W9EWC..196,355-173-379- C-76
W9DUB...120,632-136-301- C-58
W9GIL...40,977- 87-157-ABC- –
W9QYW...17,670- 62- 95- B-27
W9MBF...11,178- 54- 69- B-17
W9RH.....9180- 51- 60- C-30
W9NLJ.....5108- 37- 46-AB- –
W9YT (K9LBQ, W9SZR)
1680- 16- 35-AC- 8

DAKOTA DIVISION

Minnesota

K0IKL.....31,950- 71-150- C-55
W0VIP.....918- 17- 18- B- –

DELTA DIVISION

Arkansas

K5ALU.....675- 15- 15- A-17
W5GFT.....546- 13- 14- B- 9

Louisiana

W5KC.....58,212- 98-198- C-40
W5INL....25,650- 75-114- C-17
W5AJY....23,184- 72-108- A-36
K5QXR.....2340- 25- 30- B-24
K5BSL.....945- 15- 21-AC- –

Mississippi

K5MDX...53,163- 99-179- B-23
W5PWW....2871- 29- 33- A-15

Tennessee

K4LPW....48,000- 80-200- B-40
K4CRX.....6075- 45- 47- B-52
W4OGG.....1300- 20- 29- A- 9

GREAT LAKES DIVISION

Kentucky

W4EPD.....2304- 24- 32- B-17

Michigan

W8WT.....32,882- 82-139- A- –
K8OCO.....363- 11- 11-BC- 7
W8NWO (W8s NWO TWA)
192,885-167-385- C-96
W8NGO (4 oprs.)
160,050-155-344- B-90

Ohio

W8ZOK...101,001-131-257- B-60
W8NXF...98,820-135-244- B-50
W8BMX...39,732- 86-154-AC-60
W8AJW....21,420- 68-105- A- –
W8SMQ....16,287- 61- 89- B-19
K8LNI.....6000- 40- 50- B-38
W8GMK.....4725- 35- 45- A-19
K8KTL.....3132- 29- 36- A-30
W8VSJ.....945- 15- 21- B- 7
W8PJN.....810- 15- 18- B- –
W8MWE.....360- 10- 12- A- 4
K8PYD.....351- 9- 13- A- 4
W8GRY.....340- 10- 12- C-10
W8TTN.....210- 7- 10- A- –
K8RLZ.....108- 6- 6-AC- –

(Continued on page 160)

HUDSON DIVISION

Eastern New York

W2GBC....50,396- 86-200- C-40

N. Y. C.-L. I.

K2TAP.....7665- 35- 73- B-15
K2IEG.....7260- 44- 55- C- 7
W2TUK.....4608- 32- 48-AC- 6
W2DY.....1254- 19- 22- B- 9
W2NQR.....1122- 17- 22- B- 6
K2YOR.....495- 11- 15- C- 4
K3CIO/2.....216- 8- 9- A- 2
W2GKZ.....210- 7- 10- C- 5
K2LGS.....36- 3- 4- B- 1
W2CWD.....12- 2- 2-AC- 1

Northern New Jersey

W2CYX....11,516- 47- 76- C-25
WA2ABH....2784- 29- 32- A-41
W2JKH.....795- 15- 19- A- 4
W2MNW.....126- 6- 7- A- 6
WA2IDM.....75- 5- 5- A- 2

MIDWEST DIVISION

Iowa

K0QCL....19,656- 63-104- B-41
W0FDL.....147- 7- 7- C- 1

Kansas

W0ZXX....10,028- 46- 74- A-44
K0GVO.....3870- 30- 43- B-40
W0VBQ.....1188- 18- 22- C- 7
W0VFE.....27- 3- 3- A- 1

Missouri

W0NFA....29,868- 76-131- C-39
W0BTD....15,576- 59- 88- A-40
W0MCX...12,936- 49- 58- C-27

Nebraska

W0EXU.....2856- 28- 34- C-18

NEW ENGLAND DIVISION

Connecticut

W1OKG...100,772-122-276- C-69
K1MBC....30,672- 71-144- C-38
W1BIH....25,734- 72-119-AC- –
W1AW[2,3]....3120- 26- 40- C- –
K1GLL.....774- 14- 17- C- 3
W1ETF (7 oprs.)
284,239-173-549- C-96

Maine

W1AQW.....7325- 25- 99- B- 9
W1DIS.....4960- 10- 62- C-13

Eastern Massachusetts

W1ONK..189,761-113-447- C-60
K1DIR....20,876- 68-103- B-18
K1MEM....8928- 48- 62- B-16
W1EJE.....6336- 33- 64- A-20
W1NJL.....1008- 16- 21-AB-27
W1TQS.....192- 8- 8- C- 3
W1PLJ.....147- 7- 7-AB-15

Western Massachusetts

W1LIB.....5940- 33- 60- A- –
W1JYH.....5328- 37- 48- B- –
W1RF.....4928- 32- 54- A-11
W1CGY.....867- 17- 17- C- –

Announcing 1961 Simulated Emergency Test

October 7-8, 1961

You may not realize it, but about the time you read this your local ARRL Emergency Co-ordinator (if he's on the ball) will be planning his part in the annual Simulated Emergency Test exercise. This traditionally signalizes the opening of the super-active season of amateur operation in public service circles: emergency preparedness and traffic handling. Actually, there is no longer a summertime hiatus in either of these activities, but inevitably they slow down as vacations and poor atmospheric conditions arise. By October, vacations are over, conditions are improving (we hope), and amateurs are staying at home eager to do some operating.

The SET, in addition to "prying off the lid" of the active season, serves two primary purposes: first, to test our emergency potential and capability, and second, to give a public demonstration of our abilities. The former is for our own information, the latter for public information. Naturally, they follow the same order — that is, if your AREC group is poorly organized, you will not want to make a big public show of it, but if you have something of which to be proud you will want to emphasize the publicity angle.

Your local Emergency Coordinator (if any) will have received a bulletin from headquarters giving full details on what is expected of him. But he can do *nothing* without support from local amateurs. This is where *you* come in. Here's how you can participate:

(1) If you aren't already signed up in the AREC, see your local EC and get this taken care of. If you don't know who he is, inquire around of other amateurs in town, the local club, or your SCM (p. 6, *QST*). If it turns out there *is* no EC, it's time to get some of the local boys together and do something about this.

(2) Although we like to have all AREC groups conduct their SET on the Oct. 7-8 week end, it is perfectly permissible for ECs to have their tests within a month either before or after the nominal week end. Your EC may be planning some time other than the above dates, so better check with him.

(3) During the test, follow your EC's instructions. Don't foul up the procedure by being independent. If you don't like what goes on, this can be brought up during the critique *after* the test.

(4) The EC has a report to make after the test. You can help provide him with something worth reporting by showing up, going along with the spirit of the thing and showing your interest in a continuing AREC organization in your community or county.

(5) Even though you may find yourself, for any one of a number of reasons, unable to take part in your local test, you may still be useful on one or more of the National Calling and Emergency Frequencies by relaying or handling some of the traffic that may be flying around for Red Cross, civil defense and others. Give a listen, anyway.

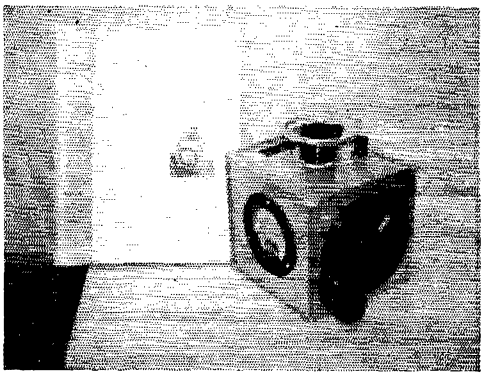
NATIONAL CALLING AND EMERGENCY FREQUENCIES (KC.)

3550	3875	7100	7250
14,050	14,225	21,050	21,100
28,100	29,640	50,550	145,350

Some big doings are planned this year by some of the Section Emergency Coordinators. We have word of extensive plans, for example, in Florida and Indiana, and watch out for statewide exercises also in Maine, Michigan, Kansas, Oklahoma and Texas, where AREC organization is at high pitch.

Mark your calendars and be with us on Oct. 7-8! — *W1NJM*. QST

Strays



Re the Stray on page 10 of June *QST* (about gear still in use which was built from articles in *QST* many years ago), WØPB sends in this photo of a wavemeter that was described in May, 1928, *QST* by former ARRL president Dr. E. C. Woodruff. It uses a Carborundum crystal detector that still works.

— • • • —

Hammy wedding. K2IUC married W2YYW's daughter. K2KXB was best man. Ex-W2JDI was the groom's father. Wedding guests included W2ABI.

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North Carolina hams interested in a source of free QSLs should contact Mr. Charles Parker, North Carolina Department of Conservation and Development, Raleigh, N. C.

A.F.C. with Silicon Capacitors for RTTY Reception

BY NICHOLAS G. MUSKOVAC,* KIRYY

This article will describe a relatively simple a.f.c. circuit designed to be used for RTTY frequency-shift keying operation. It does not use vacuum tubes, transistors, or amplifiers of any kind.

Any RTTY operator who sits with one hand on the tuning dial of his receiver will appreciate the addition of automatic frequency control. This little circuit will take care of any drift in your receiver as well as the other fellow's transmitter drift.

Principle of Operation

Fig. 1 shows a schematic diagram of the a.f.c., complete with all values. Two tuned circuits, which use 88-mh. toroids,[1] set the locking frequency. One is tuned 125 c.p.s. above and the other 125 c.p.s. below the frequency to be controlled. I chose the space frequency, 2975 c.p.s., since the Qs of the tank circuits will be higher than on the mark frequency of 2125 c.p.s. However, the circuit should operate just as well on either frequency. CR_1 and CR_2 are silicon diodes and are used in a discriminator circuit. By using a d.p.d.t. switch, the diodes can be switched back and forth so that the control will operate whether the b.f.o. is above *or* below the intermediate frequency.

The tuned filters and discriminator section can be mounted on a small board and built into or near the terminal unit. The rest of the circuit, which consists of four small components, can easily be mounted in the receiver. A shielded cable should be used between the discriminator output and the receiver in order to eliminate 60-cycle pickup. The input signal is coupled directly from the filter in the terminal unit.

C_3 and C_4 are silicon capacitors commercially

* 2408 High Ridge Road, Stamford, Conn.

[1] These coils can be obtained from John E. Pitts, jr., W6CQK, 710 Madison Ave., Redwood City, Calif., for $1.00 each. (Also available from DaPaul, Millbrae, Calif. See Ham-Ads, p. 185 this issue. — *Ed.*)

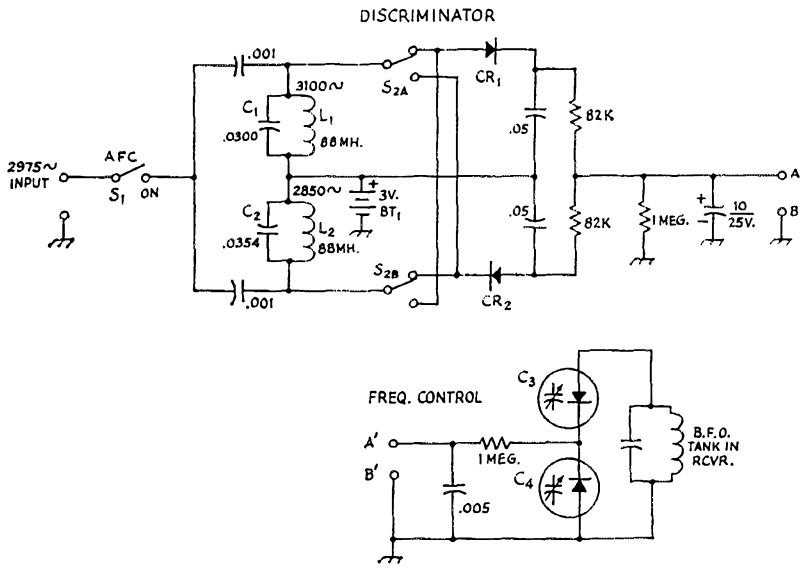


Fig. 1—Circuit diagram of the audio a.f.c. circuit. Capacitances are in μf., resistances are in ohms, resistors are ½ watt. Capacitor with polarities indicated is electrolytic; except as indicated below, others may be paper or ceramic as convenient. Terminals A-A' and B-B' should be connected by a shielded lead. Circuit in lower drawing should be installed close to b.f.o. coil in receiver. The discriminator can be external to the receiver.

BT_1—Two penlight cells in series.

C_1, C_2—Values given are calculated for 88-mh. coils. Use good-quality 0.03-μf. paper capacitors and parallel with low values to tune circuits to desired frequencies. C_1L_1 and C_2L_2 should be tuned to equal numbers of cycles above and below 2975 c.p.s., respectively.

C_3, C_4—Capacitor diodes; see text (Pacific Semiconductor Varicap type PC-113-22).

CR_1, CR_2—Silicon diode 1N2069 (Texas Instruments) or 1N1692 (G.E.).

L_1, L_2—88-mh. toroid (see text).

S_1—S.p.s.t. toggle.

S_2—D.p.d.t. toggle (for reversing control voltage).

known as "Varicaps." They are actually silicon diodes, and have the familiar forward and reverse characteristics. To eliminate conduction in the forward direction from the voltage present in the tank circuit, two capacitors are used back to back. The diodes are biased in the reverse direction by the d.c. control voltage. The capacitance decreases with increasing control voltage and increases as the control voltage decreases. It varies essentially as $1/\sqrt{v}$, when v is the control voltage.

Whenever the frequency of the input signal to the a.f.c. unit tries to change, the discriminator bridge goes out of balance and a corrective voltage is applied to the voltage-sensitive capacitors. This causes the b.f.o. to shift frequency automatically until the correct beat note is obtained.

Performance

The frequency regulation obtained with this unit has been more than satisfactory on all bands. The amount of frequency drift that it can correct is limited only by the passband of the receiver. I use the Heathkit Comanche, which has a 3-kc. passband. The other fellow's transmitter can drift 1500 c.p.s. before I lose copy on my teleprinter!

The a.f.c. is especially useful on the higher bands. While a member of a ten-meter net in Cleveland, Ohio, the author, recently K8DXV, had no trouble getting solid copy while relaxing or making a pot of coffee.

The a.f.c. unit just described can be built in less than two hours and costs about $10.00. The whole thing is powered by two penlight batteries that have to furnish only microamperes of current and should give shelf life. The Varicaps used are rated at 22 $\mu\mu$f. at 4 volts, and have a capacitance change of 3 to 4 $\mu\mu$f. per volt. Any other type with the necessary capacitance range can be used. The required sensitivity in $\mu\mu$f. per volt may differ somewhat with different b.f.o. circuits — e.g., whether the b.f.o. tank is low-C or high-C — and the intermediate frequency. However, it is recommended that the circuit as given be tried first. If more sensitivity is needed, parallel Varicaps can be used. Another possibility is to use 1.5 instead of 3 volts bias. This will move the operating point to a region where the capacitance change per volt is greater, but the capacitance itself is also greater — of the order of 40 $\mu\mu$f. In either case, the effect of the shunt capacitance introduced by the voltage-sensitive capacitors must be taken into account since it has considerable bearing on whether or not the b.f.o. can be retuned to the proper frequency after adding the capacitors. QST

• *New Apparatus*

Mobile Window-Bracket Antenna

A NEW mobile antenna that requires no holes for mounting, yet can be assembled or taken apart without tools in less than one minute has been introduced by Technical Industries, Inc., Woodbridge, New Jersey. It has a natural application for emergency, CD or temporary operation, since it can be set up in such a short time, but is easily disassembled and stored in a small area.

The accompanying photograph shows how the antenna is attached to the aluminum bracket arm which extends up and over the roof of the car. Below the arm is another aluminum fixture that clamps to any of the car's windows without hampering normal door movement. The two pieces of the clamp are held together with two thumb screws. The clamp is adjustable to fit over different thicknesses of glass, and there is no danger of cracking or scratching the glass, since the clamp is lined with soft rubber. The over-all height from the bottom of the clamp to the horizontal arm is about 22 inches. The arm reaches over the roof about 30 inches.

Attached to the end of the horizontal arm is a u.h.f. "through" fitting. The coax feed line (which is furnished with the antenna) connects to one end of the fitting and the antenna connects to the other. A quarter-wave two-meter antenna is shown in the photograph, but models for 6 meters and 1¼ meters are also available. The antenna can also be mounted on vehicles without roofs, such as convertibles, fire engines and boats, and can even be set up in a motel or hotel window. The antenna and bracket assembly weighs about 4 pounds. — *E. L. C.*

A Filament Choke for Grounded-Grid Amplifiers

Impedance measurements on various suggested designs of filament chokes for grounded-grid amplifiers showed rather poor performance on one or more bands in the 3.5-30-Mc. range. This situation prompted a bit of lab work, leading to the design shown in this article.

Optimized Design for 3.5-30 Mc.

BY KENNETH C. LAMSON,* W1ZIF

With grounded-grid linear amplifiers becoming more and more popular, there is increasing need for a good filament choke. A typical circuit configuration for a grounded-grid amplifier using a filament choke is shown in Fig. 1. The choke should offer sufficient impedance to elevate the cathode above ground potential for r.f. and, at the same time, be made of heavy enough wire so that there is negligible loss of filament voltage in the choke. This means that in a choke for tubes such as the 4-250, PL6580, PL6559, and 4-400 — which draw approximately 14 amperes of filament current — No. 14 or heavier wire should be used. Correspondingly smaller wire can be used for tubes that take less filament current. Two chokes can be paralleled in applications which require larger current-carrying capacities.

As shown in Fig. 1, a choke of this type is inserted in series with the filaments of the grounded-grid stage. The input impedance of a grounded-grid amplifier is usually in the range of 100 to 400 ohms, depending on the type of circuitry and tube being used. If the data for the tube in grounded-grid operation is available, the input impedance can be calculated from

$$Z_{in} = \frac{(\text{peak r.f. driving voltage})^2}{2 \times \text{driving power}}.$$

This impedance, which is that of the tube or tubes alone, is purely resistive when the plate circuit is properly tuned. However, it is shunted by the impedance of the filament choke, and since the choke impedance will be principally reactive, it is desirable that the choke reactance be as high as possible compared with the tube impedance. Considering the practical aspects of choke construction for a wide frequency range, such as 80 to 10 meters, experiment shows that a choke inductance of about 45 μh. is about as much as can be obtained. This is high enough for satisfactory operation on bands as low in frequency as 3.5 Mc.

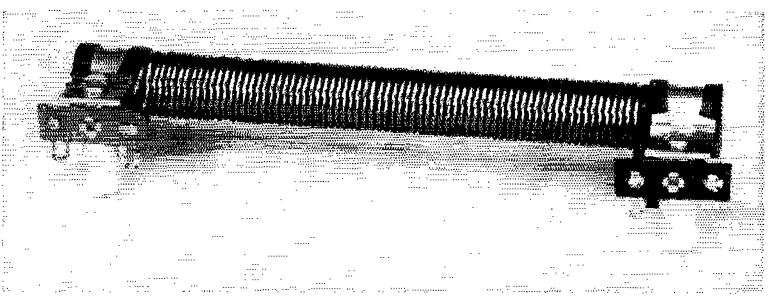
The problem is to get the required inductance with the minimum wire length. Obviously a core material with high permeability is desirable, as this yields the most inductance for a given coil. Ferrite cores lend themselves nicely to this application, as they have high permeability and are available in various diameters.[1] The choke can have a bifilar winding; that is, two wires wound side by side on the ferrite core. The enameled coating used on the wire provides sufficient insulation to prevent shorting between turns.

A well-designed wide-range choke will usually have its greatest effect on the input impedance at the lower amateur frequencies, simply because its reactance decreases with frequency. If the driving power is marginal, it may be necessary to use some type of matching network to match the output impedance of the driver to the input impedance of the amplifier. Any one of several methods can be used, the pi-network probably being the most flexible.[2]

* Laboratory Assistant, *QST*.

[1] Use of a core of the type shown in the photograph was suggested by Henry A. Voorhees, W4CPI.

[2] Orr, Rinaudo and Sutherland, "The Grounded-Grid Linear Amplifier," *QST*, August, 1961.



Bifilar filament choke using ferrite core. When mounted in place, the choke is supported off the amplifier chassis by the ceramic insulators on the ends.

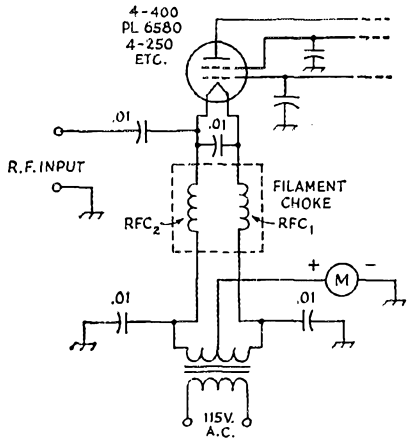


Fig. 1—Typical filament circuit for grounded-grid amplifier using a tube having a directly-heated cathode. RFC_1 and RFC_2 can be separate windings, but bifilar construction is generally more compact and gives better performance.

Construction

Construction of the choke shown in the photograph is straightforward and fairly easy. Two side-by-side 58-inch lengths of No. 14 wire are wound on the ½-inch-diameter ferrite core. The core material, available in 7½-inch lengths, is Lafayette Radio type MS-333, Catalog No. 600. An over-all length of only 6½ inches is needed. The core may be used intact, but the excess can be cut off by first scoring the complete circumference of the core with a hacksaw or file, and then sharply but gently striking the core at that point. The ferrite material should break clean. For those who are not quite so daring, the much more tedious method of sawing the core with a hacksaw is recommended. The core should be covered with a single layer of Scotch electrical tape, and then the 36 turns of wire should be wound on tightly. All that remains to be done then is to fasten the two wires to the three-lug bakelite terminal strips mounted at the ends of the ferrite rod. These terminal strips are held in place by ⅜-inch cable clamps (Allied Radio 41-H-853, Cinch-Jones CC-161-6, or Herman Smith 835). The whole choke assembly is supported by two cylindrical ceramic standoff insulators (Millen 31007) which in turn mount to the amplifier chassis.

The impedance components of the choke at various ham-band frequencies are given in Table I. This choke will have adequate impedance to raise the filament of a directly-heated tube above r.f. ground potential on all bands from 80 through 10 meters. It is the best of several designs tried experimentally. Larger inductance (more turns) will result in higher reactance at the lower frequencies, but is accompanied by a deterioration in performance at the high end. The high-frequency range can be extended by decreasing the number of turns, but at the expense of too-low reactance at 3.5 Mc. The choke is self-resonant between the 7- and 14-Mc. bands.

TABLE I.

Grounded-Grid Filament Choke Impedance

Frequency in Mc.	*Shunt Resistance, Ohms*	*Shunt Reactance, Ohms*
3.50	28K	1300 (inductive)
7.0	70K	2200 (inductive)
14.0	100K	8000 (capacitive)
21.0	100K	3200 (capacitive)
28.0	70K	2700 (capacitive)

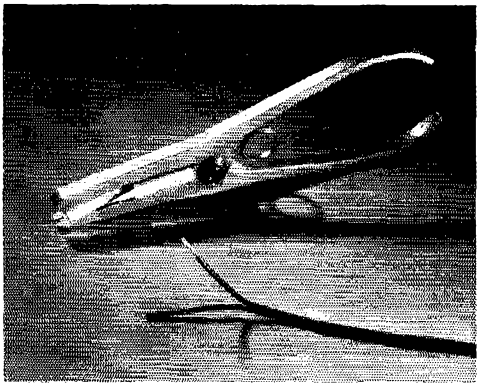
Q at 3.50 Mc. = 32.

As shown by Table I, the equivalent parallel resistance of the choke is high throughout the frequency range. This means that the actual r.f. power loss in the choke will be negligibly small, since even the smallest value of shunt resistance is of the order of 50 to 100 times the input resistance of the amplifier tube or tubes. Thus in the worst case the choke dissipates only about 1 or 2 per cent of the driving power. QST

• *New Apparatus*

Bartley Wire Stripper

THE Bartley wire stripper is a new tool which should find many applications around the ham shack. Resembling a pair of pliers, it can be used to strip wire in restricted or crowded areas where conventional strippers are useless. The wire to be stripped is positioned lengthwise in the jaws of the tool. With the jaws clamped shut by pressure on the tool handles, pulling back on the finger ring between the handles in turn pulls back a cutting blade, stripping the insulation from the wire. A spring returns the cutting blade and ring to their original positions.



The standard model will strip wire sizes 16 through 26. The tool frame is made of aluminum alloy and measures about 9 inches long. It is manufactured by the Bartley Manufacturing Co., Inc., P.O. Box 707, Rome, New York.

— *E. L. C.*

• Technical Correspondence

THE BACKFIRE ANTENNA

Electromagnetic Radiation Lab.
Electronics Research Directorate
HQ, Air Force Cambridge Research Laboratories
Bedford, Mass.

Technical Editor, *QST*:

The "Technical Topic" in February, 1961 *QST*[1], discussing novel possibilities using the "Backfire Antenna" principle for amateur work, prompted us to supply some further experimental data on this topic.

We agree with W1HDQ that there is no easy method for increasing the gain of Yagis and that the backfire method is no exception. However, it is a method that works, and we were able to increase the gain of a 1-wavelength Yagi, at 220 Mc. by 4.5 db., by placing it in front of a screen 2 wavelengths square. It must be emphasized again that you do not simply place the Yagi ahead of the screen without some modifications. This will be discussed later, but first it will be necessary to introduce a different aspect in Yagi design.

In analyzing a Yagi there are many variables that must be considered: element and boom diameters, spacing and length of elements, etc. To make an orderly investigation, it is necessary to have the least number of variables possible. This is what Dr. Ehrenspeck set out to do in his article, "A New Method for Obtaining Maximum Gain from Yagi Antennas," PGAP, Vol. 7, *IRE Transactions*, October 1959. He does this by making the element spacing constant and by fixing the length and diameter of the elements. The length and diameter of the elements are related to the length of the Yagi and to the phase velocity desired. Thus, when Dr. Ehrenspeck conceived the idea of the backfire antenna, he used data from the above report. The work discussed in this letter makes use of both "The Backfire Antenna" report, *Proc. IRE*, Vol. 48, pp. 109-110, January, 1960, and the above article.

In the design of the 220-Mc. Yagi, 1 wavelength long, a constant spacing of 0.2 wavelength was used between elements throughout, to fix this variable. Experience with another Yagi fixed the element diameter at ⅝ inch and the boom diameter at 1¾ inches. This leaves the length of the elements as the only variable. The major difference between an ordinary Yagi and the one discussed here is the addition of linear reflectors. Linear reflectors referred to here are the two reflector elements, added above and below the normal position of the reflector element, as seen in the photograph. The purpose of these is to trap the wave and cause it to be reflected back to the ground screen. The more times a wave can be reflected between the ground screen and the linear reflectors before it is launched, the greater the gain will be.

Starting with the linear reflectors and the driven element mounted in position on the boom, adjustment of the reflectors for best forward gain was made. Then directors were added and their lengths were adjusted for an optimum pattern. The Yagi was then mounted in front of the screen, thus effectively doubling its length and changing its phase velocity. This made readjustment of the directors, driven elements and linear reflector lengths necessary. The driven element was fed through a 50- to 300-ohm air-dielectric balun, mounted in the back of the screen. The balun was connected to the driven element through a pair of RG-59/U cables, using the shielding as ground and the center conductors connected to the balanced dipole. Below are dimensions of a Yagi antenna designed for 220 Mc.; the elements are ⅝ inch and the boom 1¾ inch in diameter.

λ = 53.65 inches

Driven element	.47 λ = 25.25 inches
Directors	.41 λ = 21.75 inches
Spacing	.20 λ = 10.73 inches
Reflector	.485λ = 26 inches
Linear reflectors	.485λ = 26 inches

When this Yagi was used with the screen, it was necessary to adjust the lengths of the elements to correct the phase velocity (refer to Ehrenspeck's PGAP article listed above). The dimensions for the backfire version of the Yagi are shown below:

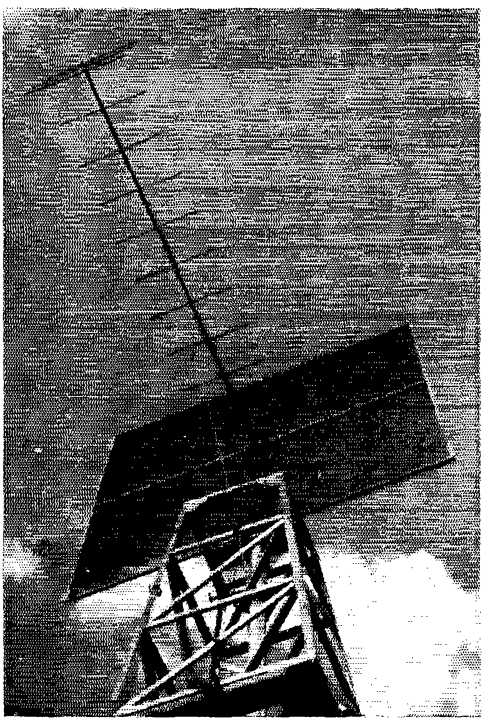
Driven element	.518λ = 27.25 inches
Directors	.35 λ = 18.75 inches
Spacing	.20 λ = 10.73 inches
Reflector	.503λ = 27 inches
Linear reflectors	.41 λ = 22 inches

Patterns, taken with the antenna alone and with the reflecting screen, show that with the screen gain increased by 4.5 db. Also, the beam width decreased from 48 degrees to 34 degrees when the screen was used. Although the first side lobes increased 6 db., the back lobe (180 degrees from peak) went from 6 db. to 19 db. below the main beam.

Some work has been done with a 2-wavelength array at 220 Mc., and as time permits, other frequencies will be tried. The photograph shows the 2-wavelength Yagi with a screen 2 wavelengths square.

— *William G. Mavroides, W1YLW*
Leon S. Dorr, W1PYT

[1] "The Backfire Antenna," *QST*, February, 1961, "Technical Topics."



Backfire Yagi for 220 Mc. tested by the authors. Extra elements are mounted above and below the normal reflector, to increase the effectiveness of the array when the backfire screen is added.

NOTES ON CRYSTAL MIXERS

14 Barbey St.
Brooklyn 7
New York, N. Y.

Technical Editor, *QST*:

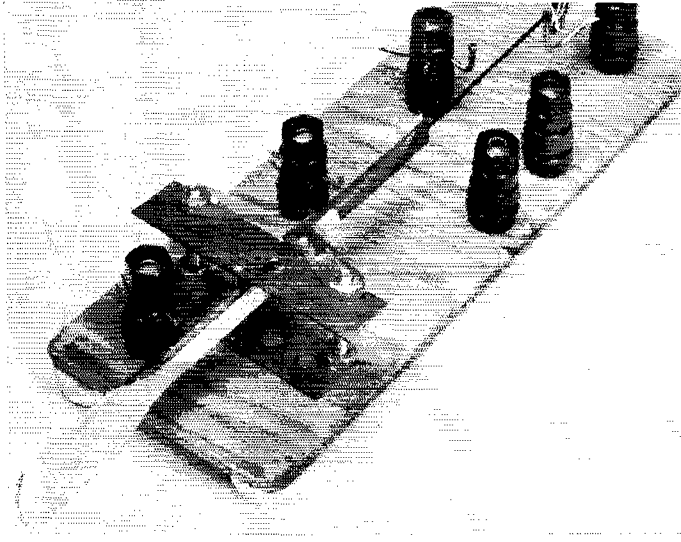
In scanning the catalogs of semiconductor manufacturers, the amateur u.h.f., worker may gain the impression that low-noise mixer crystals have made vacuum tubes obsolete at 432 Mc. and paved the way for noise figures of 6 db. at 3000 Mc. or more. On the other hand, the crystal mixer has repeatedly failed to live up to its promise of improved performance when tested under typical amateur operating

(Continued on page 176)

A Junk Key

BY KATASHI NOSE, KH6IJ

Lihue, Kauai, Hawaii



This bug was first built when I could not afford a real bug. All parts can be bought at Sears and Roebuck for 80¢ plus $1.00 worth of binding posts from a radio store. Even then, you end up with some spare parts.

Main Shaft and Spring

For about 35¢ you get eight jig saw blades of high quality steel, Sears Roebuck Catalog No. 9-2687. If these are unavailable, specifications are as follows: 0.08 inch wide, 0.010 inch thick, four inches long, 18 teeth per inch. You need only one blade, but you have to buy a package of eight, which means you have seven spares in case you are the type to break bug springs.

The plumbing department furnishes the rest of the material. For 25¢ get a piece of soft-drawn ¼-inch copper tubing 8 inches long used in toilet overflow systems. While there, get three rubber bumpers for mounting feet and a piece of soft copper ground strapping used to ground electrical systems to water pipes.

Cut off 5 inches of the tubing, insert the jig saw blade into one end pin and all, and crimp tightly with a pair of pliers. Make the trunion by pounding a finish nail or apple-crate nail through the tubing, but be sure to start the top side with a drill to prevent flattening of the tube. The soft drawn copper will grip the nail tightly without necessity of soldering. Cut off the head of the finish nail at an angle with side cutters. Scotch tape a wooden picnic spoon tightly to the copper shaft to serve as a paddle.

Bearing and Stop Arm

The bearing consists of two pieces of ground strapping. Clamp these pieces in a vise when drilling the two holes to get good alignment. At the same time make a slight dent with a center punch or nail to serve as pivots.

This bug differs from the ordinary bug in that there is no solid vibrating rod nor an offset arm for dashes. Instead, a long stop arm of No. 14 copper wire or solder is bent parallel to the spring blade to dampen excess vibration. This damper arm must top the weight directly, not the jig saw blade.

The binding posts are mounted on three-ply board which is mounted on rubber feet. Alternately, suction cups used on toy bow and arrow sets can be used for grip action.

Adjustment Hints

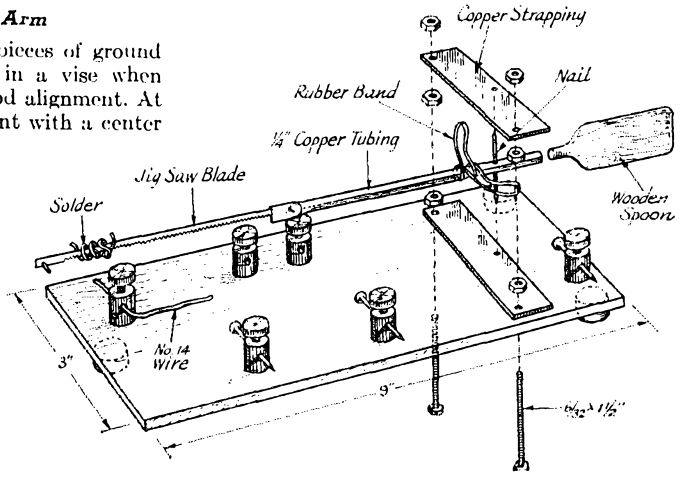
Use about three inches of ordinary rosin core solder wrapped around the blade as a weight. Be sure it is wrapped tightly as any play will ruin the action. Heavier weights are not suitable for this spring stiffness.

The return mechanism is merely a rubber elastic band wrapped around the shaft as shown in the drawing below.

Adjust all binding post stops and contacts for minimum wrist action, i.e. close spacing. In general, the object is not to see how long a string of dots can be sent but how solid the dots are. After about ten dots, the dot contact should close and stay closed until another train is started.

Try to develop a "light touch". If you find yourself chasing the bug across the table, you are working too hard. If necessary, scotch tape the whole key to the table.

Thanks to K1MMB for a newcomer's evaluation and to W1RCQ for an old timer's opinion. For less than $2.00 you can't go wrong. QST



E-Z-UP Antenna for 75 and 40

Simple Construction for Inverted-Vee Dipoles

BY JOHN C. ALLRED,* W5LST

FULL-SIZE dipoles for the 75- and 40-meter bands occupy more space than is conveniently available on the 75 by 113-foot lot at W5LST. The increasing popularity of the "drooping," or inverted-vee, dipole antenna among amateurs led us to investigate it for our somewhat crowded conditions. Based on the electrical design of Glanzer,[1] this system has performed meritoriously at W5LST. Requiring only one support, it was surprisingly easy to erect, gives a satisfactory s.w.r. over the phone bands and, importantly, the cost was less than thirty dollars complete. A plan-view sketch is shown in Fig. 1.

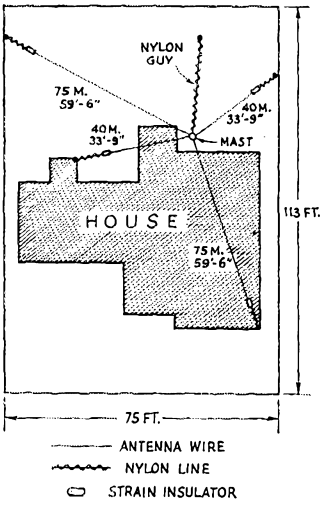


Fig. 1—W5LST's layout for effective 40- and 80-meter antennas on a small lot. The two "drooping" dipoles are fed in parallel with a single coax line. Nylon-line extensions are used to reach convenient anchorages.

The Mast

The mast is a telescoping Channelmaster, capable of 50-foot height, but extended only to 35 feet. Extending the upper sections to less than their full lengths gives rigidity to the mast, and has apparently eliminated the need for guys on each section, as recommended by the manufacturer. To date this mast has withstood gusts of 50 miles per hour without a shudder; it is yet to be tested in a real gale, however.

As shown in Fig. 2, a 9-foot length of 3-inch pipe is cast in concrete with 6 feet of its length extending above ground. Three pairs of clamps,

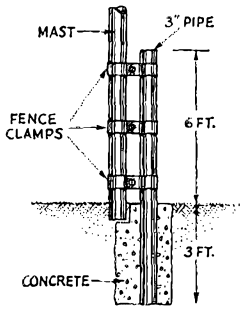


Fig. 2—The mounting for the antenna mast. The 9-foot pipe is guyed temporarily while the concrete is poured.

such as those used on chain-link fence, secure the mast to the upright standard. During erection, these clamps are loosened and all three lie at the base of the standard, so that the mast need only be lifted about 6 inches to be put in place. When the mast is in place, the clamps are raised and tightened.

Rigging

Except for the antenna conductors, all rigging is of nylon line of 500-pound test. A halyard is reeved through a pulley of suitable size which is wired securely to the top of the mast. The two ends of the halyard are made fast to a harness snap which, in turn, supports the center of the

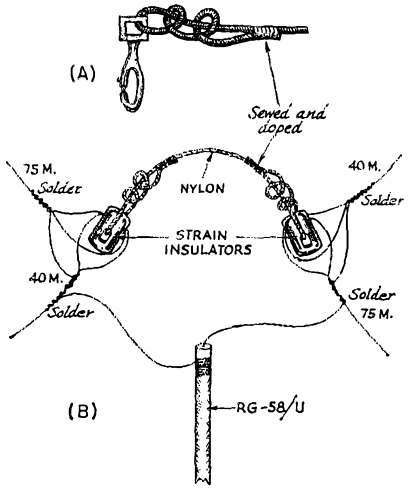


Fig. 3—The halyard and feeder arrangement. The coaxial cable is sealed securely with polyethylene tape after the connections are made. The harness snap of A at the end of the hoisting halyard engages the bridle between the two insulators in B.

* Associate Professor of Physics, University of Houston, Houston, Texas.

[1] Glanzer, "The Inverted V-Shaped Dipole," *QST*, August, 1960.

antennas. Provision of this halyard has proved to be a great convenience in permitting inspection of the antenna connections and the adjustment of tension in the wires without the necessity for lowering the mast.

Nylon line has a tendency to ravel at its ends but this problem is easily solved. Most fastenings were made with two half-hitches, followed by sewing the end of the line to itself with thread, as shown in Fig. 3A, and doping with one of the quick-drying model-airplane cements.

Some weeks after the initial installation, it became apparent that some additional stabilization of the mast against occasional strong northerly winds would be desirable. Accordingly a nylon line was run from the harness snap at the top of the mast to a convenient anchor in the back yard, which happened to be the top of the children's swing set. Experience seems to show that the antenna wires, together with the additional nylon line, stabilize the mast against aerodynamically-excited vibration, without any appreciable strain on the antennas.

The Antennas

As shown in Fig. 3, the two antennas are connected in parallel at the top of the mast. The lower ends are connected to convenient tie points so that the two legs of a given antenna are more or less in a straight line. To our great surprise, very little effect is produced by moving the ends of the antennas either horizontally or vertically. There is apparently negligible electrical interaction between them as indicated by the s.w.r. bridge.

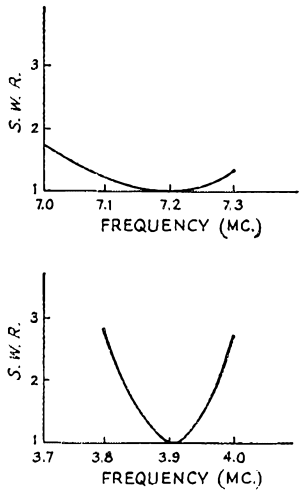


Fig. 4—S.w.r. curves as indicated by a "Monimatch"-type s.w.r. indicator.

Pruning of the antennas is, as always, desirable. In our case, the optimum lengths of each leg turned out to be 33 feet 9 inches for 40 meters and 59 feet 6 inches for 75 meters. Fig. 4 shows the performance of the antennas on 40 and 75 as measured by a Heath s.w.r. bridge. Although the antennas tune sharply, they are usable over the entire phone band in each case, and it would be difficult to imagine a better performer on the lower-frequency bands than this simple antenna system. QST

Strays

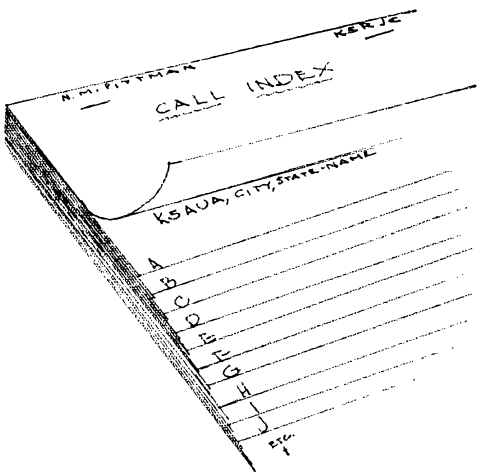
You can get a series of awards from the Old Old Timer's Club by working various numbers of their members. A Class D award is for working 25 OOTC members anywhere, while a Class AA award is for working 100 OOTC members in 50 states. Send a list of QSOs, certified by notary public, or two other hams, or a club official, to Earl C. Williams, W2EG, 507 Wayside Rd., Neptune, N. J. Include $1.00 fee.

—···—

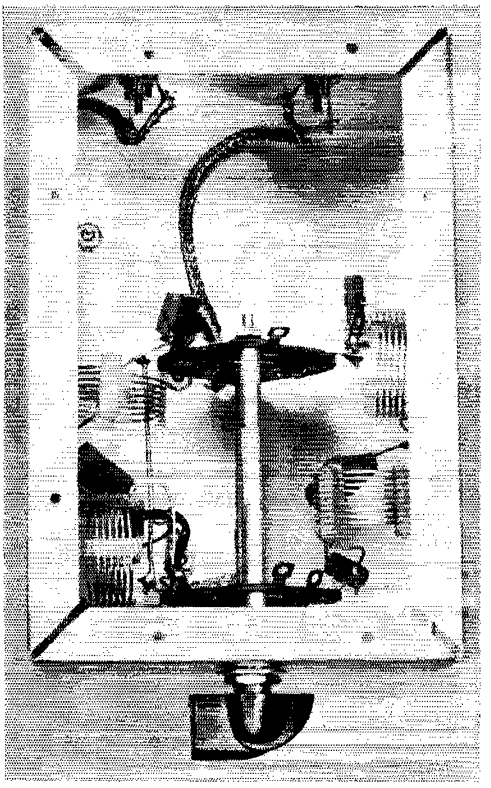
Perhaps some of you have noted the items concerning K6BX and his campaign to ship old *Callbooks* overseas. Actually, what he does is collect the names of worthy recipients, and if you tell him you have one or more fairly recent *Callbooks*, he'll give a suitable number of names to which *you* can ship the *Callbooks*. Now we have T/Sgt. Pete Smith, K9VRV/4, 1940 Richmond Ave., Petersburg, Va., who'd like to do the same thing but with ARRL *Handbooks*.

—···—

KN9ZUC perked up his code speed while away at college by maintaining regular skeds with his dad, W9YMZ.



K5RJC has fooled a lot of people into thinking he has a phenomenal memory, because when he works them the second time he is able to call them by name immediately. He uses a call index, as shown in the drawing above, the over-all size of this index being about 5 by 8 inches.



Half-wave filters for the 3.5- and 7-Mc. bands. The switch lets the user select either filter as required, and also has a "straight-through" position for cases where the filters are not needed. The two coils and three capacitors at the right are the components of the 80-meter filter; similar components at the left are for 40 meters. Note positions of coils to reduce coupling between them.

A Novice Three-Band Antenna System

Coaxial Feed with Harmonic Protection

BY LEWIS G. McCOY,* W1ICP

A SIMPLE antenna system for Novice three-band operation, 80, 40 and 15 meters, can be made up by paralleling two dipoles. The two dipoles are 80- and 40-meter half-wavelength wires both fed at the center with coaxial feed line. The antenna is shown in Fig. 1. Practically all Novice transmitters have pi-network output tank circuits and are designed to work into 50-ohm loads. This antenna system will present essentially such a load to the transmitter. If there is a mismatch, it can easily be handled within the adjustment range of the amplifier controls.

The only serious drawback to this type of system is that unless certain precautions are taken, there is always the danger of harmonics being radiated, which can result in a warning from the FCC. However, this is easily taken care of by the use of a filter inserted in the feed line. The filter requires no adjustment; it is switched in or out as required for whichever band is used.

The Antenna

The antenna is made up from a 100-foot length of open-wire TV-type transmission line. Either the close-spaced 300-ohm type or the wider-spaced (about 1½ inches) 450-ohm line can be used. The 80-meter portion is actually longer than 100 feet (120 feet over-all), but the extra length can be obtained from the wire you remove for the 40-meter antenna. When you buy the open-wire line be sure to measure the length — in the roll we bought we found that instead of 100 feet there were actually 104 feet. Cut the line in the center and scrape the enamel insulation from all four ends. Don't be deceived by the appearance of the wire; it does have an enamel covering, so be sure to remove the enamel before making any connections. When the wire ends are cleaned they can be fed through the ends of the center insulator. Fig. 2 shows the details for making the feed-line connections to the center of the antennas.

Next, remove enough wire from each side of the open-wire line so that you end up with a dipole 33½ feet long each side of the center insulator (67 feet over-all), as shown in Fig. 1. You'll find that if you use a pair of side cutters you can easily break the wire-spreader insulators of the open-wire line. However, only remove those insulators beyond the 33½-foot point. The remaining insulators are needed to keep the 40-

* Technical Assistant, *QST*.

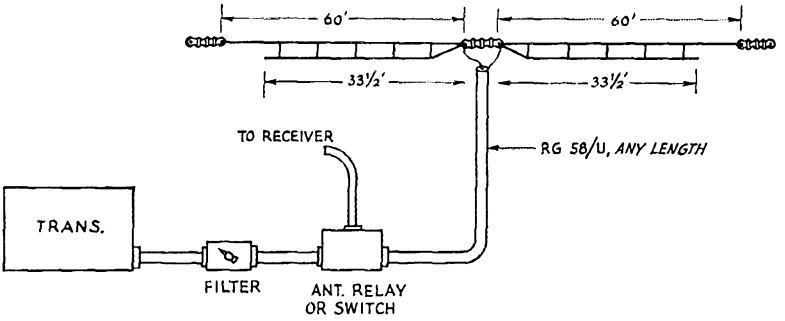


Fig. 1—Three-band Novice antenna system. The feed line, RG-58/U, can be any length. An antenna relay or switch should be installed so the same antenna can be used for receiving as well as transmitting. If a low-pass filter is needed, it should be installed between the transmitter and half-wave filter.

and 80-meter dipoles from shorting to each other. Using the wire you have removed, you can add enough at each end of the 100-foot length to make up the 80-meter dipole. This should be 60 feet long each side of the center insulator, or 120 feet over-all when completed. However, allow about six inches length at each end (121 feet over-all) on the 80-meter antenna, the extra six inches for wrapping around the end insulators. Be sure to scrape the enamel covering from the wires at the ends when you add the extra lengths. Solder all connections. Put on the end insulators and the antenna is completed.

When you install the antenna, make every effort to get it as high as possible above the ground. If possible, install pulleys to raise and lower the antenna. Nylon ¼-inch-diameter line makes excellent halyard material.

The Half-Wave Filter

The filter unit shown in the photograph and Fig. 3 consists of two filters, one for 80 and another for 40. The cutoff frequency for the 80-meter filter is approximately 5 Mc. It will attenuate any signals higher than 5 Mc. but permit your fundamental signal to reach the antenna without being attenuated. This, of course, means that 80-meter harmonics won't be able to reach the antenna and cause you trouble with the FCC. The 40-meter filter cutoff frequency is about 9 Mc., so it will take care of any spurious signals above this range. There is no point in adding a 15-meter filter to the unit because if harmonics from this band are going to be a problem, a low-pass filter should be inserted in the line. A low-pass filter usually has a cutoff frequency slightly above 30 Mc., and any harmonics above this range will be attenuated. In other words, the harmonics that could cause TVI should be handled with a low-pass filter.

Making the Filter

The filter is built into a 3 × 4 × 6-inch aluminum chassis. The four coils required for the two filters are made from a single length of Miniductor coil stock, No. 3015. When cutting the coils from the original stock, allow a couple of extra turns on each coil. These extra turns can then be unwound to provide sufficient lead length for attaching to the terminals of S_1. Two phono jacks are used for connectors on the filter. If desired, the more expensive coax chassis fittings, type SO-239, can be used.

The leads from the jacks to the terminals on S_1 are made with coaxial line, type RG-58/U, the same as used for the antenna feed line. Remove the black vinyl covering from the coax, exposing the outer braid. When making the connections from the jacks to the switch, keep the exposed inner conductor lead as short as possible. This is done in order to reduce any harmonic pickup around the filter sections. In other words, all the signal should go through the filter, with minimum leakage around it. Ground the outer braid of the coax at the jack end and also at the switch end. The switch end can be taken care of by installing a soldering lug as close as possible to the switch contact and grounding the shield

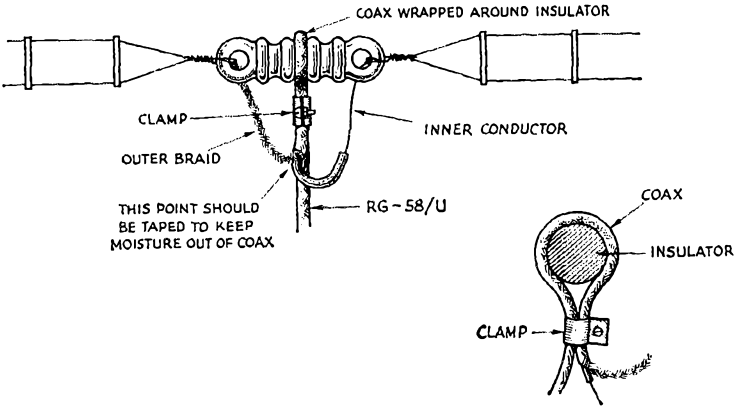


Fig. 2—Sketch showing the method of attaching the feed line to the antenna of the center insulator. Be sure to tape the end of the coax with a waterproof tape to keep any moisture from getting into the coax.

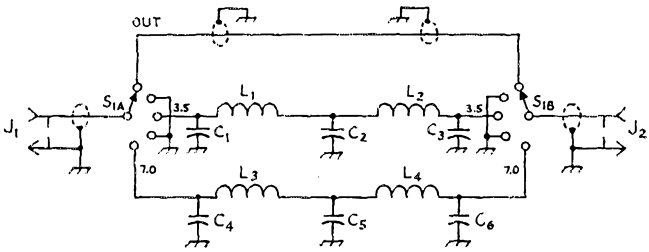


Fig. 3—Circuit diagram of the half-wave filter. For Novice power, 500-volt mica capacitors are satisfactory.

C_1, C_3—750-$\mu\mu$f. mica.
C_2—1500-$\mu\mu$f. mica.
C_4, C_6—500-$\mu\mu$f. mica.
C_5—1000-$\mu\mu$f. mica.
J_1, J_2—Phono jacks or coax chassis fittings.
L_1, L_2—2 μh.; 8½ turns No. 20, 1-inch diam., 16 turns per inch.
L_3, L_4—1.2 μh., 6 turns No. 20, 1-inch diam., 16 turns per inch. (All four coils can be made from a single length of B & W Miniductor, type 3015).
S_1—Rotary, 2 sections, 5 positions, 1 pole per section (Mallory Hamswitch type 151L).

at the solder lug. The coils and capacitors for the 80-meter filter are mounted on one side of the switch and the 40-meter unit on the other side. The coil sections should be installed as shown in the photographs in order to reduce any stray pickup between the two filters. In addition, the switch sections are single-pole, five positions each. Only three of the positions are used -- filter out, 80 meters, and 40 meters. In order to reduce any chance of pickup between the switch contacts, alternate contacts are used for the connections. In other words, the first contact is the straight-through position, then an unused contact, and then 80 meters. In addition, the unused contacts are grounded to the chassis. A bottom plate should be installed on the chassis in order to make it "r.f. tight."

Using the System

Use a short length of coax to connect the filter to the transmitter. The filter can be installed at any convenient place at the operating position. Then connect the feed line to the filter and the system is ready for operation.

Incidentally, the circuit works the same in both directions, so it doesn't make any difference which side of the filter is used for input or output.

Switch your transmitter to whichever band you want to use and also switch the filter to the same band. For 15 meters, the filter is set in the straight-through position. It is very important that you switch the filter when you change bands. If, for example, you tune up your rig on 80 with the filter switched to 40, you'll more than likely burn out the capacitors in the filter. You must remember to have the filter and transmitter on the same band!

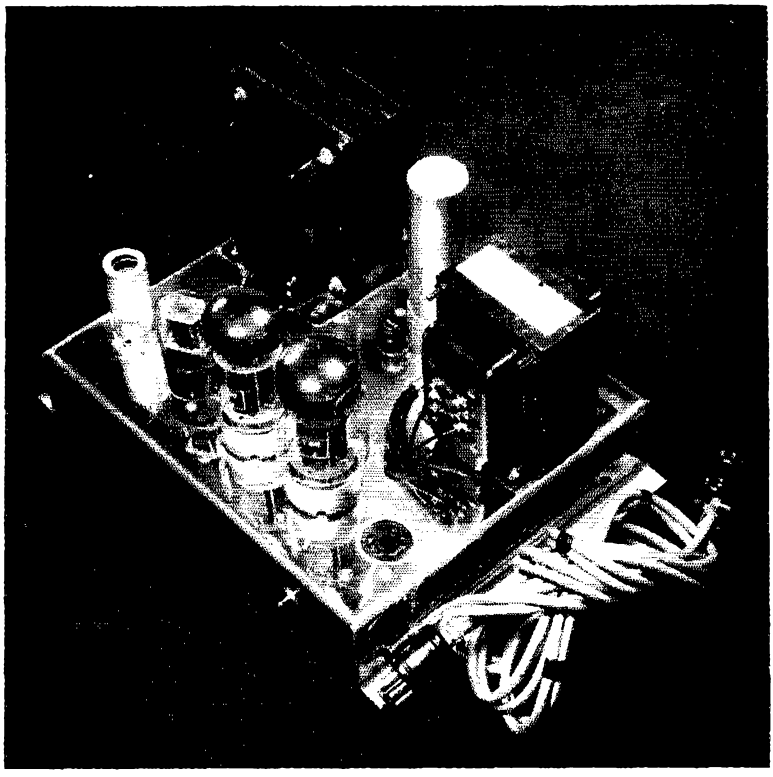
Several measurements were made on the two dipoles to see what they "looked" like on the different amateur bands. On 80 and 40 meters, the antennas were resonant in the Novice bands, using the lengths shown in Fig. 1. The standing-wave ratio was less than 1.5 to 1 at resonance on both bands and remained fairly flat across the Novice segments of the bands. On both 80 and 40, the s.w.r. rose to about 5 to 1 at the band edges (3500–4000 and 7000–7300). The s.w.r. was about 3 to 1 at the lowest point when the system was used on 15. However, this is well within the tuning and adjustment range of nearly all Novice transmitters. When you pass your General you'll find that the same antenna can be used on 10 meters, as our tests showed the s.w.r. to be no worse than 4 to 1 at the band edges, dropping to less than 2 to 1 at the best frequency. On 20 meters, the system wasn't satisfactory, as it showed a high s.w.r. (over 5 to 1) across the band.

All of the above-mentioned tests were made with the antenna 30 feet above the ground and in the clear. Thanks go to Carl Dane, W1FXK, for furnishing the refreshments, swimming pool, and his vacation time while making these tests. QST

Silent Keys

It is with deep regret that we record the passing of these amateurs:

W1VVG, George F. Boutin, Salisbury, Mass.
W2FQ, John W. Conn, Moorestown, N. J.
WA2JCW, James T. Mahy, Brooklyn, N. Y.
W2NF, William G. Mayer, Asbury Park, N. J.
W2NOC, Harold S. Schecht, Catskill, N. Y.
W2VSE, Anthony G. Noll, Niagara Falls, N. Y.
K3GJH, Woodrow W. Schier, Fort Howard, Md.
W3NOQ, James C. Landerkin, Towson, Md.
W4AP, Robert G. Carrie, Montgomery, Ala.
W4LNX, Minor C. Wagner, Norfolk, Va.
W4TMO, General E. Pilgrim, Forest City, N. C.
W4VYS, James S. Williamson, jr., Sanford, Fla.
W5DXI, Victor George, Haworth, Okla.
W5JIN, James E. Clayton, Conway, Ark.
ex-WV6BYB, Rodger D. Loop, Livermore, Calif.
W6UD, Reginald T. Dunlap, Los Angeles, Calif.
K7BYW, Arthur E. Hudson, Renton, Wash.
W8PUI, Arthur G. Hulbert, Oak Park, Mich.
K8YDA, Oscar Shore, Cleveland Heights, Ohio
W9MWI, Clarence J. Coope, Joliet, Ill.
W9YRO, William W. Vincent, jr., Kenosha, Wisc.
ex-VE1AX, Gordon M. Arthur, Halifax, N. S., Canada
VE1JE, J. E. Garnhum, Charlottetown, P. E. I., Canada
VE1KL, Gordon C. MacDougall, Antigonish, N. S., Canada
VE2KJ, P. A. LeBel, Montreal, Que., Canada



This modulator makes use of the chassis and most of the parts of a high-fidelity power amplifier, but a similar layout using regularly available components can be constructed from the circuit of Fig. 2.

An "Ultra-Linear" Modulator

The "ultra-linear" circuit, widely used in high-quality audio power amplifiers, has its uses in plate modulation, too. The circuit reduces distortion and improves regulation while retaining the high power output and sensitivity of Class AB_1 audio-tetrodes and pentodes.

Tapped-Screen Circuit for Pentodes or Tetrodes

BY ROBERT M. VOSS,* W2HTN

THE ultra-linear mode of operation has been successfully used in the output stages of high-fidelity audio amplifiers for the past decade or so. This type connection, shown in Fig. 1, has been described as a means of applying power feedback around a stage of power amplification. It is recognizable as a method of operation which is somewhere between triode and pentode. The screens are connected to a tap on the output (or modulation) transformer and — unlike pentode operation — thereby deliver some power to the load, but not as much as they would if the tube were triode connected, with the screen tied directly to plate. The connection shown in Fig. 1A is most frequently used. The separate windings shown at B are necessary if the tube requires substantially different plate and screen voltages. Transmitting tubes, such as the 6146, have been used successfully this way.

Ultra-linear operation, also known as "tapped-screen" — perhaps this term would be preferred by amateur operators — has been shown to exhibit substantial advantages over both triode and pentode operation, particularly when used with tubes designed for it. It combines the high power output of pentode operation with the

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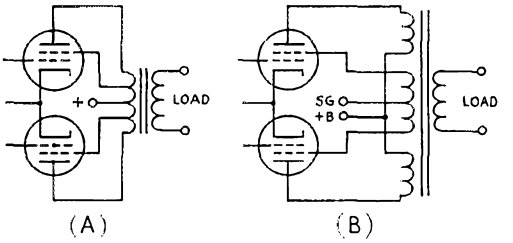


Fig. 1 – Tapped-screen power-amplifier circuit. (A) As used when the same d.c. voltage can be applied to both screen and plate. (B) As used when different plate and screen voltages must be used.

low distortion and low output impedance of triodes. In addition, compared with pentode operation it is uncritical of the load into which it works, and is somewhat more efficient over-all, since the screen is contributing power to the load and not just producing heat. Because of this, substantially higher screen voltages and maximum-signal inputs than shown in maximum rating charts for pentodes can be used.[1]

These characteristics make tapped-screen operation ideal for modulator service, and tubes are available which will deliver anywhere from 5 to 100 watts in tapped-screen push-pull. The problem, however, is finding a suitable modulation transformer, since none to the best of our knowledge has been designed for tapped screens.

Having come into possession of an old Scott Laboratories audio amplifier, with its mounted tube sockets, husky power transformer and handsome chrome chassis, and possessing an extra pair of Genalex KT88s as well, we decided to tackle the problem.

Multimatch transformers seemed the best solution, and, after investigation, it turned out that the Stancor A-3893 was perfectly suited to matching both the 4000-ohm plate-to-plate load and the 40 per cent screen-tapping requirements of the KT88s.[2] In addition, the power transformer already in the amplifier, when used with silicon rectifiers in a conventional full-wave capacitor-input circuit, delivered precisely the plate voltage required by the tubes. Of course, any other arrangement that is capable of supplying 450 volts, and has an ICAS rating of 200-250 ma., may be used.

The final circuit is shown in Fig. 2. Aside from the output stage, the circuitry is entirely conventional, with great pains taken to avoid hum and r.f. in the audio circuit. The resistor shown shielded is connected directly to the microphone connector, with its body inside the connector, and is bypassed as closely as possible to the other side of its body. The additional shunting ca-

[1] The screen input under quiescent or no-signal conditions must still stay within ratings. — *Editor.*

[2] The 40-percent figure — i.e., screens tapped across 40 per cent of the primary turns — is in the optimum region for most tubes, and except for some rather special requirements that are of interest in high-fidelity amplifiers but not in amateur communication, is not highly critical. Values between about 25 and 50 per cent will result in developing maximum power output with relatively low distortion. — *Editor.*

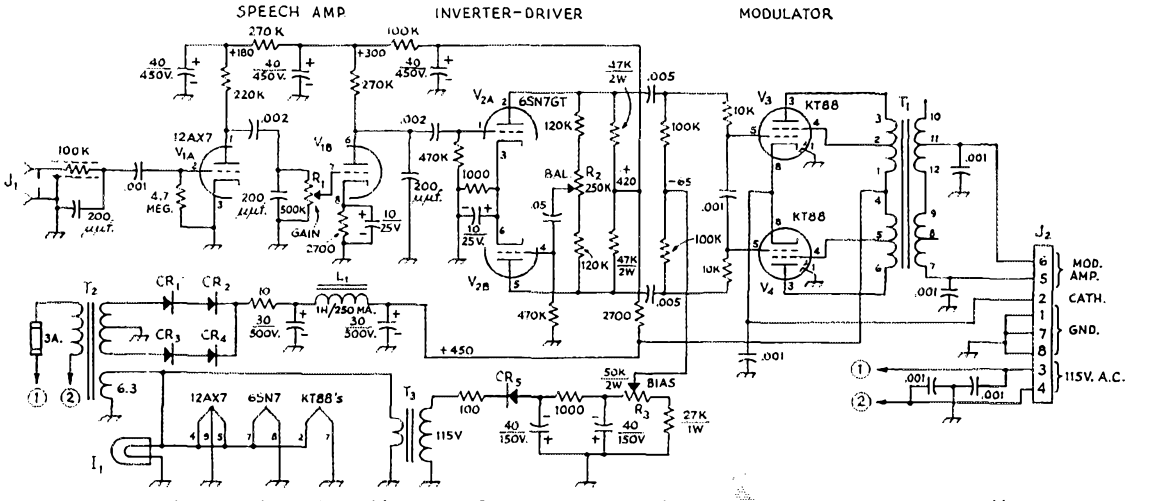
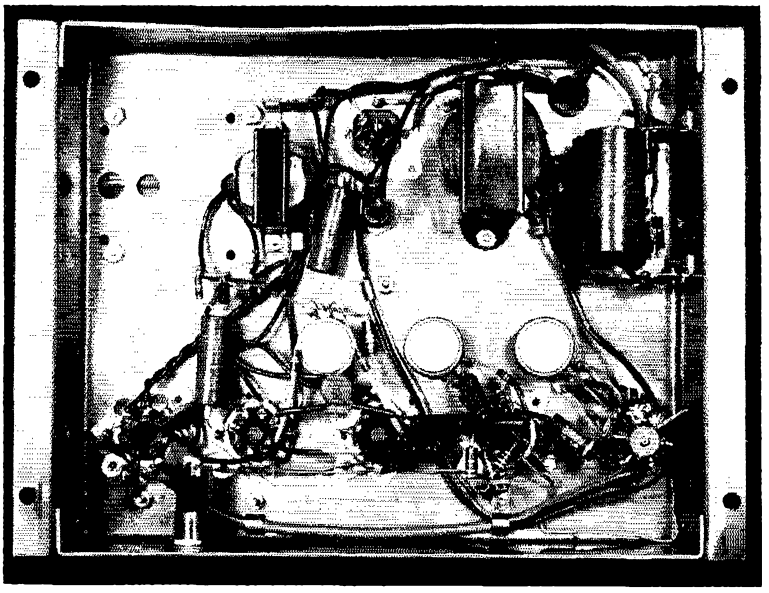


Fig. 2—Modulator and speech-amplifier circuit. Capacitances are in μf., resistances are in ohms, resistors are ½ watt, except where indicated otherwise. Capacitors with polarities marked are electrolytic; others may be paper, ceramic or mica as convenient.

CR_1-CR_5, inclusive—Silicon rectifiers, 600 volts inverse peak, 750 ma. (Sarkes Tarzian F-6).
I_1—Dial light, 6.3 volts.
J_1—Microphone connector, shielded.
J_2—Octal socket (A male connector is preferable to avoid exposed voltages on mating plug).
L_1—Filter choke, 1 henry, 250 ma. (Stancor C-2326 or equivalent).
R_1—0.5-megohm composition control, audio taper.
R_2—0.25-megohm composition control, linear taper.
R_3—50,000-ohm, 2-watt composition control, linear taper.
T_1—Multimatch modulation transformer, 60 watts. Numbers on circuit refer to Stancor A-3893 transformer. Output winding shown connected for 4000-ohm load.
T_2—Power transformer; 750-760 volts c.t., 200-250 ma.; 6.3 volts, 5 amp. (such as Stancor P-8170); 5-volt rectifier winding not used.
T_3—Filament, 6.3 volts, 0.6 amp.



Bottom view of the revamped amplifier shows that for the most part the layout may be whatever the constructor wishes. Only "touchy" part is the shielding and r.f. filtering of the microphone input, as discussed in the text.

pacitors serve both to bypass any remaining r.f. and, with the coupling capacitors, to shape the frequency response for good communications quality.

The volume, balance, and bias controls are all screwdriver-adjustment potentiometers, since it is assumed that they will be set only once. The balance control should be set for maximum output or, preferably, for equal voltages at the output tube plates with a signal of 800-1500 cycles fed to the input. The bias should be adjusted for 100-ma. total cathode current at zero output. The volume control should be adjusted for only the barest occasional plate-current flicker on loud voice peaks. (The modulator has been used quite successfully with a clipper preceding it. This increases talk power considerably.)

All power and output connections, as well as the output-tube cathodes, are connected to an octal socket at one end of the modulator. This is connected to the transmitter via a single 6-conductor cable so that the modulator need not be left on the operating table nor connected by a tangle of wires. Make sure that the leads going to the modulated r.f. stage can handle the sum of both the d.c. voltage to the final and the peak audio, which is equal to twice the d.c. At the operating position, the cathode connection may be used with a d.c. milliammeter to monitor the modulator cathode current or may be grounded by either the antenna relay or the standby-transmit switch. The transmitter's meter can be used by replacing the meter switch with one having one more position.

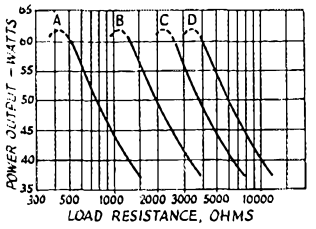


Fig. 3—Power output *vs.* load resistance for the amplifier shown in the photographs, measured at 1000 c.p.s., using multimatch modulation transformer with primary connected as shown in Fig. 2. Secondary connections as follows: A, load to terminals 7 and 10; 8 and 11 joined. B, load to 7 and 10, 7-12 and 9-10 joined. C, load to 8 and 11; 9-12 joined. D, load to 7 and 11, 9-12 joined.

Curves of output *vs.* load resistance are shown in Fig. 3. The dotted portions of the curves should not be used, since distortion will rise in these regions. The modulator will deliver 40 watts into any load from 500 to 10,000 ohms, and 50 watts into loads from 500 to 750, 1300 to 2000, and 2500 to 6000 ohms. Almost all 50-120-watt transmitters will be matched somewhere in this range.

The under-chassis view of the modulator shows a shielded cable running under the chassis from the octal socket to the 12AX7, and another shielded cable running in parallel with the output cable. After the pictures were taken, we found that we could eliminate neither the r.f. in the modulator nor the audio feedback with this arrangement, so we mounted a microphone connector right beside the 12AX7, bypassed it as described earlier, and ran a separate microphone cable.

The modulator is at present being used by WA2JYO, to whom thanks are due both for assisting in the tests and for permitting the author to modify his transmitter for plate modulation. QST

Performance Tests on the Big Wheel 2-Meter Array

Stacking Information and Results with Omnidirectional Antennas

In September *QST* W1IJD and W1FVY described a novel omnidirectional array for 144-Mc. mobile or fixed-station work. These fellows are now engaged in ice research in the Far North, and there was not sufficient time for them to complete tests on stacked versions of the antenna before their scheduled departure, so the writer gladly took up where they left off. As is usual when one tries to get to meaningful numbers in connection with amateur antennas (and by amateur methods) this turned out to be no mean task.

On-the-air results are all that really count in evaluating the worth of antenna ideas for amateurs. Precise measurement of pattern and gain are all but impossible, but if an antenna "has what it takes," protracted use of it under many differing conditions will show its superiority clearly. The "many" in the above sentence bears emphasis. Routine comparisons of various antennas can show widely different results. In fact, if they don't there is probably something wrong with the tester's methods. Reflections from ground, trees, buildings, hills, cars and the like add to or subtract from the direct signal to such an extent that "gain" figures taken by working stations and comparing signal reports show large variations from one station to the next. These

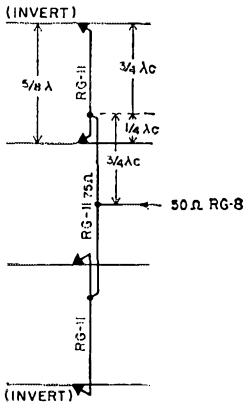


Fig. 1—Feed system for a 4-bay version of the Big Wheel 2-meter array. The two center bays are the same side up, while the two outer bays are inverted. Bays are approximately ⅝ wavelength apart physically, which permits the use of full-wave phasing sections between them. The feed points of each pair are then fed through two ¾-wave phasing sections, and a 50-ohm line at the midpoint sees an almost perfect match. The tuning stubs on the two inner bays (see September QST) are 7 inches long, while those on the outer bays are 6 inches.

are part of everyday v.h.f. communication, so the thing to do is to work many stations at various distances and directions with a given comparison setup. Then, if you want to know for sure, you set up again in a different location and work another bunch. This is time-consuming, but interesting if one keeps a detailed log of the results.

The writer spent many hours at this sort of thing with the Mellen-Milner Big Wheel. Tests at the W1HDQ home location proved inconclusive, because of a side-hill test area, and trees, guy wires and towers in the way of anything that could be worked on readily. So, after the matching problems were worked out to our satisfaction, we took the collection of antennas and masts out to some of our favorite wide-open hilltops. The single-bay clover-leaf was mounted on a 15-foot mast. Two-bay and four-bay stacked arrays were tested on a 24-foot support. All were checked against the turnstile[1] regularly used for mobile work. This put the turnstile in a seemingly unfavorable light, as it was used in its permanent position some 20 inches above and to the rear of the W1HDQ station wagon. The turnstile had established itself as an effective mobile antenna, however, so it was useful as a standard reference for checking results with the larger and higher arrays.

Results

All told, around 100 different stations were worked or logged, and their signal strengths tabulated in terms of decibels above the readings obtained with the mobile turnstile. Care was taken to see that these stations were in various directions, at all possible distances, and well distributed throughout the active portion of the band. As expected, indications from these tests varied widely, but we feel that enough of them were made so that they are valid indications of what can be expected from various versions of the Big Wheel. It should be stressed that the margin credited to the single-bay Big Wheel over the turnstile is largely the result of the former having been mounted at considerably greater height. These tests were not intended to show the relative merits of the turnstile and Big Wheel; the turnstile was used merely to provide a reference against which all other setups could be compared. The tabulation below includes only received signal strengths at W1HDQ/1. Many reports were taken from stations worked, but individual S-meter readings varied so widely that no numerically-useful data could be obtained from them.

[1] Campbell, "Turnstile for Two," *QST*, April, 1959, p. 29.

Average gain, 1-bay clover-leaf over turnstile	5.7 db.
Average gain, 2-bay over 1-bay	6.2 db.
Average gain, 4-bay over 1-bay	8.1 db.

The "gain" obtained with the 2-bay Big Wheel appears out of line, but more readings were taken with various versions of this array than any other, and we can assure the reader that the 2-bay version really does perform. Time and again, signals which could be heard only as faint whistles with a beat oscillator with a single-bay antenna jumped up to solid voice readability on the 2-bay version. These were not included in the tabulation, as the strength of the nonreadable signals could not be established readily — but they do show that a stacked Big Wheel does what everyone wants an antenna to do: it brings in signals that cannot be heard with simpler antennas. It should be emphasized, however, that these are not antenna-range measurements, and should not be interpreted as such.

The stacked versions proved to be nothing short of spectacular on signals coming from extreme distances. On one occasion a signal from a New York area station was totally inaudible on the single-bay and the turnstile, yet it was a readable S3 on the 2-bay array. This was over an indirect hilly path of some 75 miles, and the test was made around 1 P.M. on a hot summer day, when tropospheric bending was at a minimum. Tests made at night often showed the 2-meter band loaded with weak signals, fading into and up out of the noise, when either the 2-bay or 4-bay stacks were switched to the receiver. Tuning the band with the turnstile and single-bay antennas under the same conditions would show only the strong signals of locals and near-locals. Many contacts were made at distances up to 100 miles or so from locations where long experience in the past has shown that some form of beam is a must for raising stations at anything like this distance.

We worked hard at trying to make the stacking of two pairs of antennas pay off as much again as did the stacking of two single bays, but this would not quite "come off." The indicated gain from the latter is more than would be expected on the basis of stacking theory, but it was there, over and over again, in unmistakable fashion. This is probably due to the nature of v.h.f propagation, wherein lowering and narrowing of the vertical pattern pays off in surprising fashion on some paths. You get this when you begin stacking. More stacking pays off, but not so spectacularly as the first step.

But a gain of 8 db. with an omnidirectional antenna is not to be sneezed at. You'd have to put up a pretty fair Yagi to equal this — and remember the 4-bay Big Wheel gives the gain in *all directions*. This is not an unalloyed blessing, however. The stack of Big Wheels is fine for net activity and local rag-chewing, but its omnidirectional pattern and high gain can multiply QRM problems manyfold. The 2-meter band becomes a mass of heterodynes when the 4-bay stack is used in a good location in an area of high v.h.f. activity, especially when some tropospheric bending is present. Another feature on the debit side: interference from commercial signals in the v.h.f. range multiplies with an omnidirectional array of such beautifully broad frequency characteristics. We were forced to abandon work with the Big Wheels in one favorite location where there are two f.m. stations, a u.h.f. TV station, and various police and forestry-service relays. These nonamateur stations give little, if any, trouble in this fine mountain spot when a Yagi antenna is used.

The Big Wheel should prove a blessing in many types of 2-meter work, however. If you can take the jibes of pedestrians and passing motorists, a single Big Wheel should give you the best 2-meter mobile signal in your area. If you live in a spot where you can put up only one antenna, and rotators are out, a stacked Big Wheel will make the 2-meter band a lot more interesting for you than it ever was before. W1FVY and W1IJD showed how to make the individual bays, and the stacking method for two bays last month. The four-bay version is shown herewith.

Reports following the appearance of the Big Wheel in *QST* last month indicate some confusion about the construction of the antenna. Referring to Fig. 3, page 44, of the September article, each element (A) runs from the grounded plate (B) to the triangular plate (C).

These two plates are mounted one above the other, at a spacing determined principally by available insulators. Ceramic standoffs 1 to 1½ inches long are suitable. The Johnson Steatite cone, part 135-501, 1 inch long, with 8-32 threads, is good. The designers also used a bakelite block 1 inch long, with molded-in brass inserts, though we do not have a part name or number for this.

The tuning stub (D) is shown bent around a ¾-inch radius, but this is not critical. Note that the stub length is 5 inches for a single bay. For a stacked 2-bay system the stubs should be 6 inches long. In a 4-bay array the top and bottom stubs are 6 inches and the inner pair 7 inches. For a single bay mounted above a metal car top for mobile work, a 6-inch stub may be needed.

— *E. P. T.*

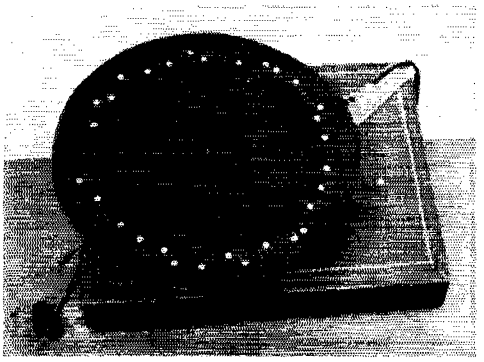
Strays

W4SXP (Ralph F. Denton, Box 740, Somerset, Kentucky) would like to hear from former ham members of the U. S. Navy Airborne Coordinating Group, active during WW II, for a possible reunion or ham net.

—•••—

Receive an award called "The Cradle of the Confederacy," given by the Montgomery (Alabama) Amateur Radio Club, by working 25 stations within metropolitan Montgomery. Send alphabetical list plus QSLs to Betty M. Collier, P.O. Box 6125, Montgomery 6, Ala. All contacts must have been made on or after July 1, 1961.

Lazy Man's CQ-er



A small portable record player is used to drive this "CQ" wheel. Light falling through the perforations in the cardboard "record" actuates a photocell which controls a keying relay.

In any contest a certain amount of CQ calling is essential, though often tedious and time-consuming. The "CQ wheel" described here relieves the boredom and leaves the hands and mind free for logging duties. An attractive feature of the simple calling device described here is that it can be used to actuate an electronic key.

Robot Calling Wheel for C.W. Contest Work

BY ROBERT R. SKUTT,* W8CJN

A REVIEW of the facilities and operating procedure of the last SS contest revealed several areas where the efficiency of W8CJN might be improved. In particular, it was noted that when short skip prevails, the rate at which contacts can be made is limited almost entirely by the length of the CQ and the time required to log the necessary data, keep the "dupe" sheet and maintain a running check on the rate at which stations are being worked. The latter is important for those who hope to end up in the "money" because it quickly reveals whether the band in use is paying off, or whether it would be advisable to shift to another band (or hit the sack).

"CQ wheels" have been suggested from time to time in the past, but most of the designs have been rather complicated and none too reliable in performance when subjected to use over prolonged periods. The one shown in the photograph is quite simple to build. Since the components are subject to negligible wear, they should last indefinitely. A phonograph motor rotates a coded perforated disk. Light passing through the perforations excites a photocell which provides a keyed output.

* 507 Ryland Court, Dayton, Ohio.

Circuit

The photocell is a Clairex type CL3-A. This cell will control a sensitive-type 5000-ohm relay directly using the simple circuit shown in Fig. 1A. Two cells may be used to actuate an electronic key of the self-completing type, as shown in Fig. 1B.

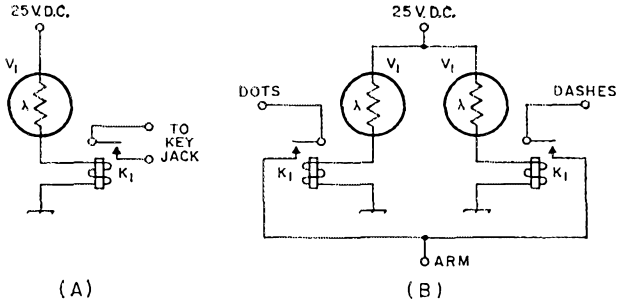


Fig. 1—Photocell circuits. The circuit of A is for conventional hand-keying systems. The circuit of B is adaptable to electronic keys. V_1 is a Clairex type CL3-A photocell. K_1 is a 5000 ohm sensitive-type relay, such as Sigma 4F-5000-S/SIL.

Disk Design

The photocell used has a diameter of ¼ inch, and a hole of this diameter was chosen for the unit character length (the length of one dot, or

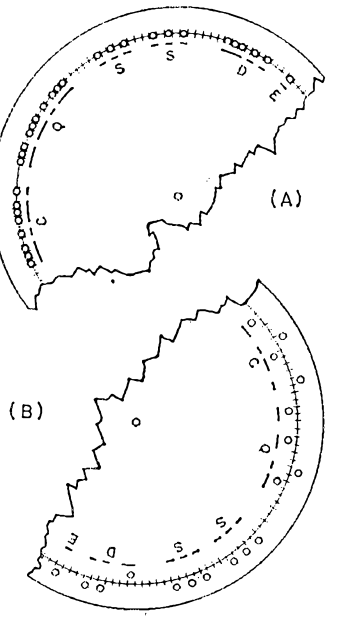


Fig. 2—A shows the disk layout and punching for direct keying, while B shows the same for use with electronic keys.

a "unit length"). Calculations showed that an 11-inch diameter would provide circumferential space for 138 units. Allowing 1 unit for a dot, 3 units for a dash, 1 unit for space between dots and dashes, 3 units for space between letters, and 5 units between words, it works out that there is room for a "one-by-one" call (CQ SS DE W8CJN), which consumes 136 units. Longer call signs will require a slightly larger disk. At first, it was thought that the short type of call might be disconcerting to some operators, but to date the results have been quite satisfactory.

A disk 12 inches in diameter was cut from fairly heavy cardboard stock, and an 11-inch circle was drawn on it. The circle was then marked off into ¼-inch segments. For direct keying (Fig. 1A), the holes should be punched as shown in Fig. 2A, punching three consecutive holes for each dash. For actuating an electronic key, the holes should be punched in two tracks — one for dots and the other for dashes — as shown in Fig. 2B. Since a self-completing key requires only an initial impulse for dashes, it is unnecessary to punch more than one hole for either dots or dashes.

To minimize the chances of making an error in punching (which are surprisingly good, by the way), the preparation of a chart similar to Fig. 3 is recommended as a guide to follow in making the perforations. The holes may be punched with the sharpened end of a piece of ¼-inch metal tubing, or with a commercial paper punch. If a mistake is made, or if it is desired to alter the "program" on the disk, unwanted holes may be masked out with black Scotch tape. Be sure that the spindle hole is at the exact center.

Turntable Speed

According to accepted standards, an average word takes 50 units. Therefore one revolution would represent about 2.75 words. Ten revolutions per minute would then represent a speed of about 27.5 w.p.m.

The original speed of the turntable was 78 r.p.m., calling for a reduction of about 8 to 1 in getting down to 10 r.p.m. This can be accomplished by inserting an 8-to-1 reducing wheel in the drive system, as shown in Fig. 4. Reduction is in direct proportion to the two reducing-wheel diameters. In this case, the desired reduction was obtained by using a 2-inch pulley having a ¼-inch spindle.

The turntable (an 8-inch one in this case) was removed to expose the driving mechanism. Fig. 4A shows the original arrangement. The drive wheel *D* is on a bracket *C* which is free to slide. The spring *E* keeps the drive wheel in contact with both the turntable rim *A* and the motor drive shaft *B*.

Fig. 4B shows the modifications. A Walsco repair kit included a wheel and spindle of the required diameters. This was mounted on a slotted bracket *F* similar to the original. The anchor pin *K* is mounted in such a position that spring *G* will cause wheel *H* to bear against the motor shaft, and spindle *I* to bear against the original drive wheel. Spring *J* is placed so that it holds the original drive wheel *D* away from contact with the motor shaft.

The Photocell

Mounting of the photocell will depend upon the styling of the turntable, and materials at hand. It should be mounted in each case so as to center the cell directly in line with the holes and with a minimum of clearance between the disk

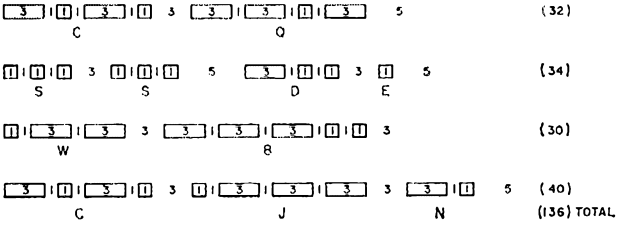


Fig. 3—Sample of the chart suggested in the text to serve as a guide in punching the disk. The numbers indicate the number of segments to be punched or left vacant. The totals at the right indicate whether or not the selected diameter will accommodate the desired "program."

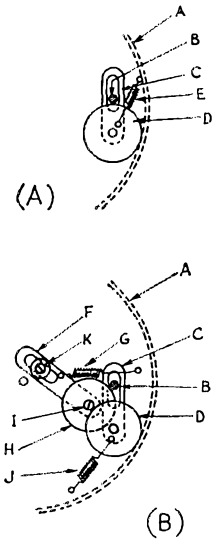


Fig. 4—A shows the original arrangement driving the turntable. B shows the modification to achieve a speed of 10 r.p.m. Lettered parts are identified as follows:

A —Turntable rim.
B —Motor shaft.
C —Original drive-wheel bracket.
D —Original drive wheel.
E —Original drive-wheel bracket spring.
F —New reducing-wheel bracket.
G—New spring for reducing-wheel bracket.
H —Reducing wheel.
I —Reducing spindle.
J —Drive-wheel spring in new position.
K —Anchor post for reducing-wheel bracket.

and the cell. The "dark" resistance of these cells is very high. When illuminated by a pilot lamp or high-brightness neon bulb, the resistance drops to 10,000 ohms or less. Normal room illumination will produce a change of similar magnitude in most cases.

Operation

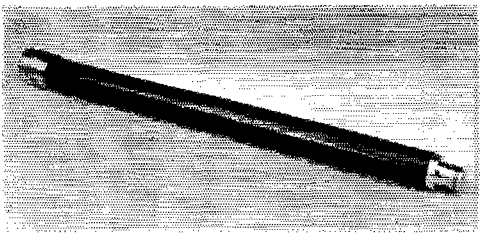
The disk is controlled by a switch in the motor circuit. The switch may be of the ordinary toggle type, or of the foot-operated variety if this type is more convenient. Because of the high reduction ratio, there is sufficient damping so that the disk stops almost immediately when the switch is opened. For most call signs, there will be a little extra space at the end of the revolution so that precise timing will not be necessary. In using the arrangement of Fig. 1B with electronic keys, it will, of course, be necessary to adjust the speed of the electronic key to suit the speed of the disk.

In usual operation, the disk is allowed to make a few revolutions and then stopped to listen for replies. If your break-in system is good enough, you can let the disk run while you listen for breakers. However, don't overdo it. An easy way to lose popularity with the gang is to let the wheel run while you're taking time out for a cup of coffee or exercising the dog! QST

• *New Apparatus*

Globar Dummy Load

THE Carborundum Company of Perth Amboy, New Jersey, has announced a new dummy load with a rated dissipation of 150 watts, although a power of about 250 watts can be dissipated without difficulty for brief periods. The load is fitted with a standard SO-239 coaxial connector and can



be conveniently mounted with clip fasteners, such as those used to mount large cartridge fuses. The 50-ohm model shown in the photograph has a d.c. resistance slightly over 49 ohms. The impedance at different amateur frequencies, as measured at ARRL, is shown in the table below:

Table I

Frequency (Mc.)	*Input Resistance* (ohms)	*Equivalent Shunt Capacitance* (μμf.)*
1.8	49.0	11.4
4	49.0	11.3
7	49.0	11.6
14	49.0	12.8
21	49.0	13.8
29	49.5	14.7
50	52.5	15.0

*Shunt capacitance required to be added to resonate the circuit at the given frequency.

The load measures 13¾ inches long by about 1 inch in diameter. Future models are scheduled to include a 72- and 300-ohm model, too. The dummy loads will probably be available through national mail-order radio-parts houses.

— *E. L. C.*

Strays

K5DJU sends along a clipping from *Reader's Digest*, taken in turn from *Today's Living*, which says that hospitalized mental patients use "I" oftener than any other word, and that as they recover these people use "I" less often and "we" more often. There are several conclusions that could be drawn from this — any one of which could get us (me) in a peck of trouble!

—•••—

K7GSG heard his call being bootlegged on 40 phone (a Novice was suspected), and so he fired up the rig and answered him. Must have been kinda disconcerting to all concerned to hear, "K7GSG calling K7GSG."

First World-Wide RTTY Sweepstakes

October 21-23

RTTY, INC. announces the First World-Wide RTTY Sweepstakes to be held from 0200 GMT October 21, to 0200 GMT, October 23, 1961. This is a competition between all stations throughout the world to determine ability in exchanging messages via two-way radio teleprinter.

Stations will exchange messages consisting of message number, check (RST), time in GMT, and state or foreign country.

Carefully check the log form, scoring sample, and complete rules which follow. Logs and score sheet must be received by RTTY, Inc., 372 West Warren Way, Arcadia, California, by December 1, 1961, to qualify. Complete results will appear in *QST*.

Rules

1) This is a competition between all stations throughout the world to determine their ability to exchange messages via two-way radio teleprinter.

2) *Contest period:* 0200 GMT, Oct. 21, to 0200 GMT, Oct. 23, 1961.

3) *Bands:* This test will be conducted in the 3.5, 7.0, 14.0, 21.0, and 28.0 Mc. amateur bands.

4) Stations may not be contacted more than once on any one band. Additional contacts may be made with the same station if a different band is used. To encourage multi-band DX operation, the same country may be claimed more than once if contacted on different bands. The same state worked on more than one band may only be claimed once.

5) *Country status:* For the purpose of this contest, KH6, KL7, and VO will be considered separate countries, in addition to the ARRL Countries List.

6) Stations will exchange messages consisting of message number, check (RST), time in GMT, and state or foreign country.

7) *Points:* (a) All two-way RTTY contacts by North American countries (including KH6) will earn a maximum of two (2) points, one sent plus one received. (b) All two-way RTTY contacts by countries other than in (a) above will receive a maximum of ten (10) points, five sent plus five received. (c) All stations receive 200 points per country worked, not including their own.

8) *Scoring for all stations:* (a) Two-way plus one-way exchange points times total states worked. (b) Total country points per band times number of continents worked. (c) Add item (a) and (b) above, for your FINAL SCORE.

9) Follow the sample score sheet and log form shown. Log the state only once, the first time contacted. Log the country the first time contacted on each band. To qualify, logs and score sheet should be received by RTTY, Inc., 372 West Warren Way, Arcadia, California, by December 1, 1961. QST

LOG, FIRST WORLD-WIDE RTTY SWEEPSTAKES

Station log of W6TPJ (call) My state or country Calif. Date 21, Oct. 1961

NR Sent	*RST Sent*	*Time Sent*	*Band*	*Station*	*NR Rcvd.*	*RST Rcvd.*	*Time Rcvd.*	*State or Country*	*Exchange Points*
1	599	0205	14	W6CG	2	589	0204	CALIF.	2
2	569	0230	14	VK3KF	6	579	0231	AUSTRALIA	2
3	559	0247	14	W6NRM	?	?	?	--	1
4	599	0300	14	W2JAV	7	599	0259	NEW JERSEY	2
5	579	0514	7	VK3KF	22	569	0514	AUSTRALIA	2

CLAIMED SCORE: (a) Exchange points 9 × 2 States = 18

(b) Country points 400 (2 × 200) × 2 Continents = 800

Add (a) and (b) = 818

FINAL SCORE

This log is correct and true to the best of my knowledge.

Signature .....

Harold Lanier, W4IFH of Fairfax, Ala., revises a Martin Gardner puzzler from the *Scientific American* to read as follows:

Radio operator A told operator B to look for him on a certain frequency some time later. When the time came op B remembered the six numbers of the frequency but he interchanged the kilocycles and the megacycles. Op B couldn't find op A on this frequency (obviously) but he tuned 5 kc. lower and read him loud and clear on the second harmonic. What was op A's frequency?

Amateur Radio Report

BY J. DON FOSTER,* W5TLL

Good public relations should always be an objective for amateur radio clubs. Here is a success story on how one group pitched in to sell ham radio to the public.

THE Lawton-Fort Sill community of southwestern Oklahoma boasts a population of about 70,000 persons, of which some 50 are licensed hams. About the only contacts the general public seems to have had with these amateurs in the past involved TVI complaints. Many such complaints, both real and imagined, have been phoned into our newsroom at Channel 7 Television.

We had been seeking a tactful way of bringing to the public's attention the causes and cures for TVI. When Governors Howard Edmondson of Oklahoma and Price Daniel of neighboring Texas proclaimed Amateur Radio Week June 18th through 24th of this year, it gave us an excuse to explain TVI and created an opportunity to report beyond the surface of amateur radio. On Sunday, June 18th, we presented a program entitled "Amateur Radio Report," projecting an image of the radio amateur not only as a hobbyist but as a person interested also in civic welfare.

We learned of the Governors' proclamations only a week and a half before the program went on the air. In the 10 days that followed, K5DLP and K5MBK shouldered the responsibility of liaison between the Lawton-Fort Sill Amateur Radio Club and the newsroom as we went about filming various aspects of amateur radio. These film clips ranged from code-practice sessions for the beginner at the radio clubhouse to the MARS installation at Fort Sill.

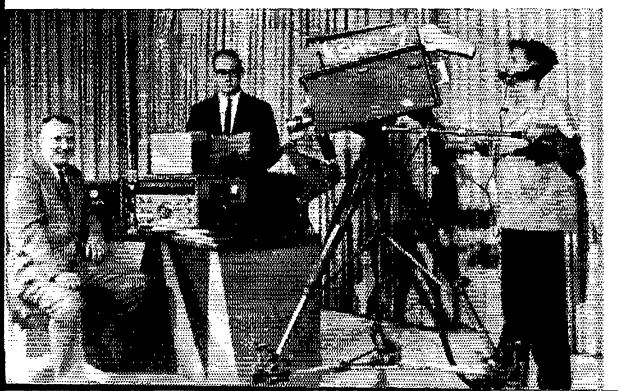
*News Director, KSWO-TV, Lawton, Oklahoma

We had a stroke of luck one day when we learned that the State Civil Defense Director was scheduled to address a Lawton civic club. Following the luncheon, State CD Director Tom Brett and local co-ordinator Warren Wolverton were whisked away to the newsroom where statements praising amateur radio for its close work with civil defense in the state and community were filmed for the program. Their remarks bolstered the image of the amateur as a citizen interested in the welfare of his community and not just one interested in experimenting with gadgets which cause TVI.

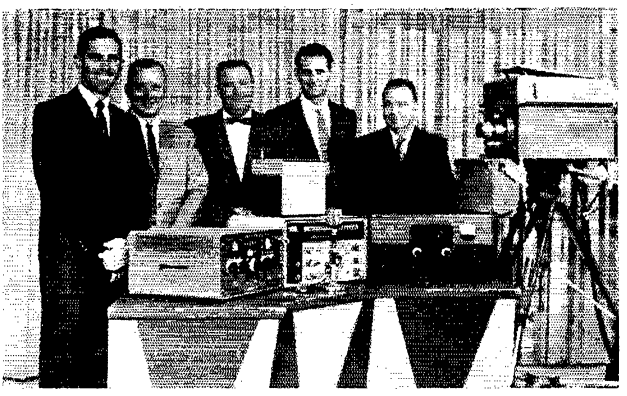
As the program neared completion, we set up an actual ham station in the studios to give a live demonstration of traffic nets and storm warning nets, further pointing out how the amateur serves the public. A Field Day antenna was strung up on the microwave relay tower behind the TV station. When we placed the club station, K5VOZ 5, on the air in the TV studio the day before the program was scheduled, we found just enough TVI to get into the sensitive control room equipment. Thus we not only caused TVI but broadcast it to all sets in the city! A few adjustments, a good ground and a low-pass filter cured the interference.

The program, which was aired between 2230 and 2300 hours, went off without a hitch. From the start of the program in which amateur radio was defined, to the finish which included a general discussion of amateur radio, local club members went through their paces before live cameras as smoothly as the announcers who face "the tube" every day. Filmed reports on code-practice sessions, an amateur engaging in a rag-chew and a ham at his workbench, portrayed the ham as a hobbyist. Studio demonstrations of an actual message being relayed from one station to another, contacts between the studio base sta-

K5VOZ/ set up in the TV studio for on-the-air demonstrations. L. to r.: Frank Phillips, K5MBK, who demonstrated message handling; News Director Don Foster, W5TLL, who narrated the program; and cameraman Jerry Hawkins, K5KBQ. Not shown is J. L. Copeland, K5DLH, who participated in the message-handling demonstration from his home QTH.



Five of the eight amateurs with mobile units who participated in the storm warning net demonstration by checking in with K5VOZ/5 from various parts of the city. L. to r.: K5QIU, K5TLE, K5REH, K5IZY, W5HFN. Also participating but not pictured were W5RDK, W5QAE, W5JBQ. Their mobile signals were heard over television as they checked in during the weather alert demonstration.



Grouped around the ham station in the TV studio are J. P. White, K5ZPM, who operated K5VOZ/5 for the storm warning net demonstration, and panelists Frank Phillips, K5MBK, Bill Pierce, K5DLP, Chuck Crawford, K5BYF, and L. O. Abshere, W5KS. The above were seen before the TV camera at various points in the program.

tion and eight mobile units observing the weather throughout the city, a film of the MARS station at Fort Sill and the statements by the CD officials portrayed the ham as a public servant.

In the general discussion which concluded the program, panelists chosen by the club discussed the TVI problems and told the audience where to turn for help. Everything from Field Day to how to become a radio amateur was covered in the remaining moments of the program.

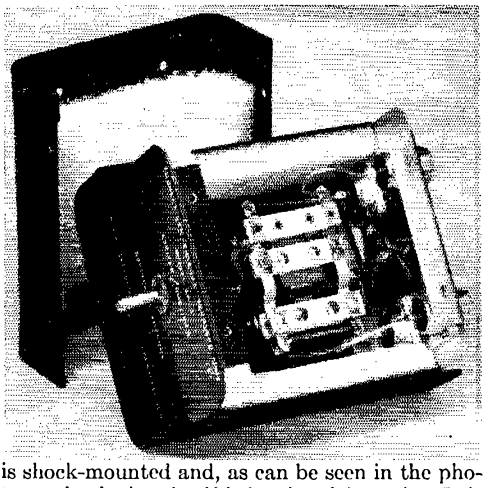
As this story leaves my desk, it's been a week since the program went on the air but the letters and calls are still trickling in, not with TVI complaints but with compliments. It even appears we may have recruited several new hams through the program in addition to presenting the true picture of amateur radio to southwest Oklahoma and north Texas.

In conclusion, I'd like to add a comment to those amateurs interested in furthering public understanding of their hobby in their own community. Aggressive TV and radio stations in cities such as your own are always interested in good feature material. If properly approached, these stations will more than likely jump at the opportunity to do a show on amateur radio. And, if in doing a similar program your club gives a news department the kind of cooperation the club here gave our department, the program cannot help but be a success. QST

• *New Apparatus*

P & H Transceiver Antenna Transfer Unit

With a station system composed of a transceiver, power amplifier, and antenna, the problem of switching between, through, and around the various components can sometimes be a headache. The model AR-1 antenna transfer unit, manufactured by P & H Electronics, Lafayette, Indiana, solves the problem and adds a few switching combinations to boot! Basically, the unit is designed to transfer the antenna automatically to the transceiver while receiving, and to switch the exciter to the amplifier and the amplifier to the antenna while transmitting. A toggle switch on the transfer unit permits manual switching, so that the exciter can operate straight through to the antenna. The unit is not restricted to transceiver applications, but can be tied in to almost any exciter-amplifier combination or used as a conventional antenna changeover relay.

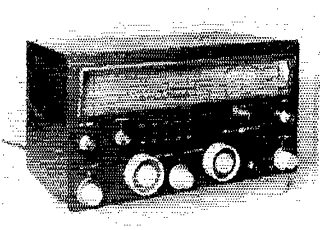


The AR-1 measures 4 inches wide, 3¾ inches high, and 5 inches deep. Four SO-239 coax connectors and two phono jacks are arranged along the rear of the box. When using the unit with a transceiver-amplifier combination, the four connections required are made to the amplifier input, amplifier output, exciter output and antenna. Controlled relay coil power (6.3 volts a.c. at 675 ma.) must also be supplied and is fed to the AR-1 by way of the two phono jacks. The internal relay is shock-mounted and, as can be seen in the photograph, the box itself is insulated for noise. It is practically impossible to hear any switching noise from the unit.

Maximum ratings for the transfer unit are 1500 r.f. watts. Included with the unit is an instruction manual which lists six different interconnection diagrams covering just about any station combination. — *E. L. C.*

• Recent Equipment —

National NC-190 Receiver



THE National NC-190 receiver, designed with special features for both the amateur and the short-wave listener, is a 10-tube general-coverage double-conversion (above 4 Mc.) communications receiver. It has a unique "dial selector" which allows the operator to select bandspread calibration for either the amateur bands or the international short-wave broadcast bands.

In some respects the receiver resembles the higher-priced ham-bands-only receiver, the NC-270[1]; cabinet size and coloring are about the same, and both receivers have flip-foot bases and ferrite-core filters which provide variable selectivity.

The NC-190 is a two-dial receiver, one for main tuning and the other for bandspread. It covers 0.54 to 30 Mc. in five ranges — 0.54 to 1.6 Mc., 1.6 to 4.0 Mc., 4.0 to 10 Mc., 10 to 20 Mc., and 20 to 30 Mc. The dial selector feature permits mechanical change of the scales appearing in the bandspread-dial window. The dial calibrations are on two separate segments of the dial and the desired scale is selected by pulling out a panel DIAL SELECTOR knob and rotating it one half turn, at which point the DIAL SELECTOR knob will snap back in toward the panel and the desired scale will appear. Bandspread tuning is through a combination planetary and pinch-rim drive giving a reduction of 60 to 1. About 26 turns of the bandspread knob are required to cover the 80-meter band, 10 turns for 40 meters, 10 turns for 20 meters, about 20 turns for 15 meters, and about 12 turns for 10 meters. The other selectable dial provides calibrated tuning for the 49-, 31-, 25-, 19-, 16- and 13-meter short-wave broadcast bands. The tuning ranges of these bands are 5.9 to 6.3 Mc., 8.6 to 10 Mc., 11.7 to 12 Mc., 14.6 to 15.5 Mc., 16.4 to 18 Mc., and 21.5 to 22.2 Mc. In every case the slide-rule main tuning dial must be set properly for the bandspread dial to read correctly. This has been simplified by coding the bandset marks and the bandspread calibrations in identical colors.

A block diagram of the receiver is shown in Fig. 1. It starts out with a single 6BZ6 r.f. stage, V_1, and 6BE6 first converter, V_2. The input stage of the receiver can be peaked up with a panel ANTENNA trimmer. Output from the first converter, V_2, is at 2215 kc. on the three high-frequency bands, and at 230 kc. on the two low-frequency bands. On the three highest bands the 2215-kc. signal is converted to 230 kc. in the second converter, V_3, which operates as a straight-through 230-kc. amplifier on the lower bands.

Selectivity in the NC-190 is provided by a ferrite filter [1] which follows the second converter.

[1] "Recent Equipment, *QST*, January, 1961, p. 47.

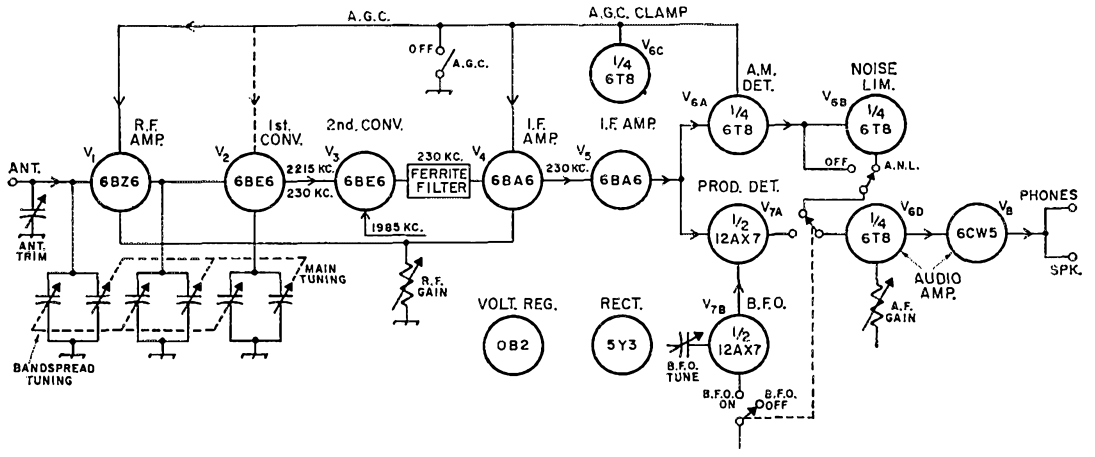


Fig. 1—Block diagram of the NC-190 receiver.

Three selectivity positions give the following degrees of selectivity: 600 cycles, 3.0 kc., and 5.0 kc., at 6 db. down.

The 230-kc. signal from the ferrite filter is fed to two stages of i.f. amplification in V_4 and V_5, both 6BA6s. The r.f. gain control circuit varies the cathode bias on the first i.f. amplifier and the 6BZ6 r.f. amplifier. Some output from the second i.f. amplifier, V_5, is rectified and provides a.g.c. voltage to control the gain of the r.f. amplifier and the second i.f. amplifier. On the broadcast band only, a.g.c. is also applied to the first converter, V_2. The a.g.c. system has its own on-off switch, and can be used for either a.m. or c.w./s.s.b. reception. A panel S meter gives a relative strength reading for incoming signals. It operates only when the a.g.c. switch is on and the r.f. gain is set at maximum. So that the receiver can operate at maximum gain with weak signals, some positive voltage is applied to the a.g.c. line to bring it down close to zero voltage with no signals. Since extremely strong signals could cause the a.g.c. line to go positive, the a.g.c. clamp diode, V_{6C}, is used across the a.g.c. bus for protection.

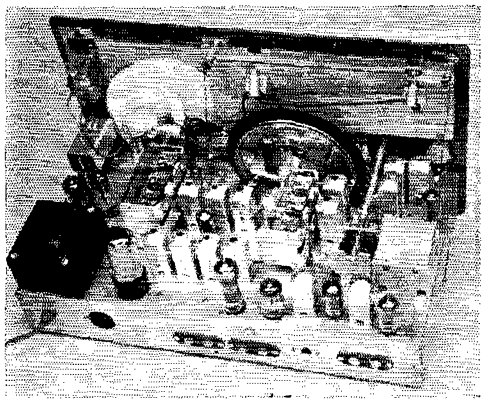
Output from the second i.f. amplifier, V_5, can be fed to either an a.m. diode detector or a triode product detector. The detector selection is controlled by the panel B.F.O. switch, which also turns on the b.f.o., V_{7B}, in the c.w. s.s.b. position. The b.f.o. frequency is adjustable. The signal from the a.m. detector can be routed through a series-gate automatic noise limiter, which operates only with the b.f.o. off.

The triode section, V_{6D}, of the 6T8 is used as an audio preamplifier, to drive a 6CW5 audio power amplifier. The audio gain control is in the grid circuit of V_{6D}. Terminals at the rear of the chassis are provided for connecting a 3.2-ohm speaker (a matching table speaker, National NTS-3, is available). A front-panel headphone jack is also provided; inserting the phone plug breaks the speaker circuit and connects the headphones.

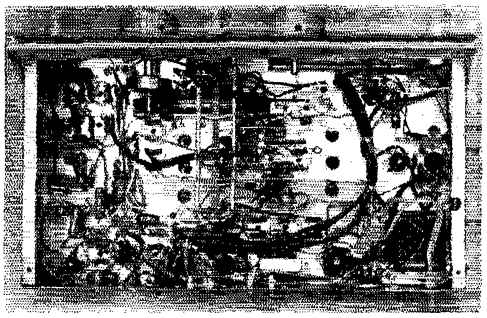
A conventional transformer-operated power supply using a full-wave rectifier powers the NC-190. Regulated voltage is used on all the oscillators to insure frequency stability.

Panel controls on the NC-190 include the previously-mentioned MAIN and BANDSPREAD tuning knobs, the SELECTIVITY switch, BANDSWITCH, R.F. and A.F. gain, ANTENNA trimmer, B.F.O. tune, bandspread DIAL SELECTOR, and five slide switches for receive-standby, automatic noise limiter, (A.N.L.) A.G.C., B.F.O., and calibrator. The receive-standby switch can be tied in with the station control circuits since terminals at the rear of the receiver are shorted when the switch is placed in the standby position. Alternatively, the switch can be left in the standby position and a remote switch used to control the receiver through leads terminating at the calibrator socket at the rear of the receiver.

Rear-apron connections and controls include a phono-jack antenna connector, terminal strip for antenna and ground (the phono jack is used with coaxial feed lines and the terminals with individual antenna-ground lead wires), speaker terminal strip, S-meter zero-adjust potentiometer, line cord, relay terminal strip and calibrator socket. A calibrator which will produce accurate 1-Mc. marker signals through the entire tuning range of the receiver is available as an accessory for the NC-190. — *E. L. C.*



The NC-190 receiver removed from its cabinet. The large black-rimmed disk in the center of the chassis is part of the main-tuning drive mechanism. Terminals arranged along the rear apron of the chassis are from right to left: Relay (for control of an external relay circuit by means of the panel standby-receive switch), S-meter adjust, antenna jack (above) and antenna-ground terminal post (below), low-impedance speaker terminals, calibrator socket (for an accessory crystal calibrator) and line cord.



Bottom view of the NC-190. Note the flywheel on the main tuning control at the top left of the photograph.

NC-190 Receiver

Height: 8¾ inches.
Width: 15¾ inches.
Depth: 9 inches.
Weight: 28 pounds.
Power requirements: 75 watts, 105-125 volts, 50-60 cycles.
Price class: $200.
Manufacturer: National Radio Company, Inc., Melrose 76, Mass.

Autronic Electronic Keyer

At first glance it is hard to believe that the small gray plastic box shown in the above photograph could fulfill all the necessary requirements of an automatic electronic keyer. Nevertheless, the Autronic keyer does have it all, and it's packed in one container — keyer, power supply, side-tone oscillator and speaker. Completely transistorized, it has an instant speed range of 8 to 65 words per minute.

The Autronic contains no relay and therefore there is no annoying relay noise; trouble-free operation is insured because there are no moving parts. In the Autronic, a transistor keys the transmitter directly. Although the keyer is designed primarily for use with transmitters using grid-block keying, it can be used with cathode keyed transmitters as long as the voltage across the keyed terminals during open circuit does not exceed 80 volts. Special high-powered keying transistors are available from the manufacturer for high-power applications.

The basic 10-transistor 10-diode Autronic circuit is represented in the block diagram in Fig. 1. Generally speaking, it is similar to the circuit described by Old [1] which uses two multivibrators to form the dots, spaces and dashes. This method insures self-completing characters that cannot be jammed, regardless of faulty timing by the operator. When the key lever is moved to the dot side, transistor switch Q_3 is turned on through CR_1 which, due to the existing polarities, conducts only on the dot side and fires the free-running dot multivibrator, Q_1Q_2. A loop from the dot side to the bistable dash multivibrator, Q_5Q_6, keeps it off during the dot cycle. Once a dot has been started, it will go to completion even though the lever is released, and the space following the dot will be included. This self-completing action is accomplished through switch Q_4, which feeds back some signal from Q_1Q_2 to keep Q_3 on until completion of the dot and space. Output from the dot multivibrator is fed to the keyer transistor Q_7, which keys the transmitter.

When the key is closed on the dash side, the bistable dash multivibrator, Q_5Q_6, is shifted to a "ready" condition since it does not receive a "stay off" signal as it did on the dot side. Also switch Q_3 is turned on and starts another dot cycle. The leading edge of the first dot from Q_1Q_2 triggers the waiting bistable dash multivibrator which remains on (and keys Q_7) until the leading edge of the second dot arrives and turns it off.

If you have been able to follow the sequence so far you will know that the dash is still one dot short of being full length. This space is filled in by the second dot from Q_1Q_2 — the same dot that turned off Q_5Q_6.

If semiautomatic operation is desired (automatic dots and manual dashes), a switch is provided to bypass the dash control circuits and key Q_7 directly.

Also contained in the Autronic circuit is an audio oscillator and audio amplifier for side-tone generation. When the keyer transistor is turned on, the side-tone oscillator is also turned on and produces a tone which is amplified and then reproduced by the speaker. A headphone jack automatically turns off the speaker when a phone plug is inserted. The audio section of the keyer

[1] Old, "Transistorized Electronic Key and Monitor," *QST*, May, 1959, p. 38.

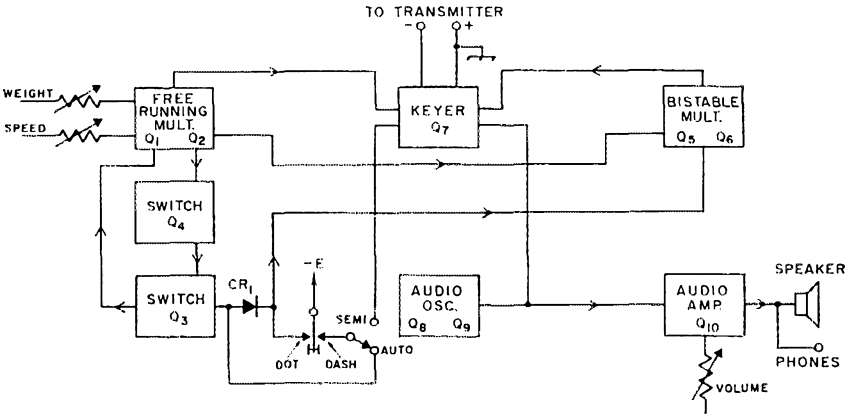
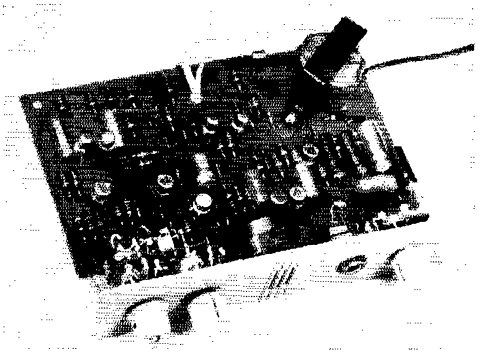


Fig. 1—Block diagram of the Autronic electronic keyer



Inside view of the Autronic keyer. The power transformer is at the upper right of the photograph. The black circular object behind the center of the panel is the miniature speaker. The front panel is arranged from left to right: VOLUME (large knob), WEIGHT (screw projecting through VOLUME knob), SPEED, speaker, PHONES, and mode switch (OFF, AUTO, and SEMI).

can also be used as a code-practice oscillator.

As shown in the photograph, the keyer circuit is constructed using printed-circuit techniques. The fused power supply consists of a power transformer and several semiconductor diode rectifiers.

All of the controls for adjusting the keyer are arranged along the front panel and include a concentric VOLUME WEIGHT control (the WEIGHT control is the screwdriver slot in the center of the VOLUME control knob), a push-pull SPEED control which is continuously variable in two positions, with an 8- to 35-w.p.m. range with the knob pushed in and a 30- to 65-w.p.m. range with the knob pulled out. A mode switch selects either fully AUTOmatic operation for both dots and dashes or SEMIautomatic for automatic dots and manual dashes. The mode switch is also used to turn the keyer on and OFF. Also provided on the panel is a phone jack and speaker for monitoring the side tone. Labels for the above controls have been rotated about 45 degrees on the panel so that they can be read with the keyer mounted in either a horizontal or vertical position.

The Autronic requires a s.p.d.t. key [2] and has three leads coming from the unit for connection to it. The line cord and two leads for connection to the transmitter also come out from the cabinet.

— *E. L. C.*

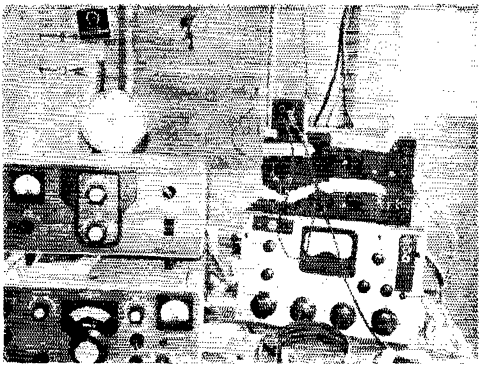
[2] "New Apparatus," *QST*, July, 1960, p. 47.

Autronic Keyer

Height: 2 inches.
Width: 7 inches.
Depth: 5 inches.
Weight: 2 pounds.
Power requirements: 3 watts, 75 to 130 volts, 60 cycles.
***Price class:* $70.**
Manufacturer: Electrophysics Corp., 2500 West Coast Highway, Newport Beach, Calif.

Strays

The sub-orbital astronaut shots earlier this year had plenty of amateurs on the job and handling communications, although not on ham frequencies. We have a rather detailed report from W2IXU, who says that among the amateurs taking part were K6DUE, W2AOB, W2DZR, W2IP, W2JKO, WA2FRM, W2UYH, W2FZQ, W2GRA. The fellows used amateur sideband gear on non-amateur frequencies assigned to them for this operation in order to provide live coverage of the recovery of astronaut and capsule. W2IXU was stationed aboard the Navy carriers, while others of the ham group were on the Bahamas, on the destroyers, and back in New York. These fellows expect to be on the job again at a later date when the next shot is made.



This photo shows the setup on board the USS *Randolph* for the second sub-orbital shot. Ham gear, although not operated on ham frequencies.

W2PF sends us a copy of "Our American Bill of Rights," distributed through the General Telephone System. Illustrating Article I, Freedom of Religion, Speech, of the Press, and Right to Petition, is an illustration of an amateur radio station.

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The latest changes in the FCC Rules and Regulations are automatically mailed to those who have purchased a copy of Volume VI of the FCC Rules. This volume covers the amateur, citizens, and disaster services. Send your check or money order for $1.25 to the Superintendent of Documents, Government Printing Office, Washington 25, D. C.

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You can make a wad, if you know how. WAD, that is. Work five stations in Deming, New Mexico, and send log info to K5IKL, P.O. Box 903, Deming, New Mexico.

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K4VLE (Stephen Johnson, 1320 Southwest Fourth St., Fort Lauderdale, Fla.) would like to hear from other amateurs who are Industrial Arts Teachers.

Happenings of the Month

Laos Off Ban List
RTTY Petition
Reciprocal Licensing Bill
Foundation Award

LAOS OFF BAN LIST

The Government of Laos has notified the United States that it no longer objects to communications between its amateurs and those in other countries. Accordingly, U.S. amateurs are now permitted to work XW8 stations in Laos, the ban having been lifted on August 24. The countries still on the U.S. list and those on the Canadian list are shown on the tear-out card elsewhere in this issue.

ARRL FILES RTTY PETITION

In accordance with the decision of the Board at its meeting in May, the League has filed a petition for rulemaking with the FCC, requesting a change in regulations to eliminate the present requirement that RTTY stations identify by c.w. as well as by teleprinter. As of this writing, the petition has been acknowledged by FCC and, we hope, will shortly become the subject of proposed rulemaking. The text of the League's petition follows:

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

In the Matter of
Amendment of Section 12.82(a)(2) of the Commission's Rules, Amateur Radio Service, to Eliminate Multiple Identification of Station Employing Radioteleprinter Emission.

PETITION FOR INSTITUTION OF RULE MAKING PROCEEDING

Pursuant to Section 4(d) of the Administrative Procedure Act and Section 1.202 of the Commission's Rules and Regulations, The American Radio Relay League, Inc., requests that the Commission institute a rule-making proceeding to amend Section 12.82(a) (2) of the Commission's Rules and Regulations to eliminate the present requirement for additional station identification by radiotelegraphy when radioteleprinter emission is being employed.

The proposed text of the said Rule, as amended, is as follows:

(2) The required identification shall be transmitted on the frequency or frequencies being employed at the time and, in accordance with the type of emission authorized thereon, shall be by either telegraphy using the international Morse Code, *or teleprinter*, or telephony. In addition to the foregoing, when a method of communication other than telephony, *teleprinter*, or telegraphy using the International Morse Code is being used or attempted, the prescribed identification shall also be transmitted by that method. (New language in italics.)

1. This request is filed pursuant to a decision of the Board of Directors of The American Radio Relay League at its meeting of May 5, 1961. As the Commission is aware, the ARRL Board of Directors is composed of amateurs nominated and elected by more than 75,000 FCC-licensed amateur radio operators to represent them in the formulation of League policy.

2. The present Section 12.82 imposes an unnecessary hardship on an amateur employing radioteleprinter emission in that Paragraph (a) 2) thereof requires dual identification of the station — once by the teleprinter mode and a second time by telegraphy using the International Morse Code. In the earlier stages of amateur teleprinter use and development, the League had no objection to this requirement because of certain practical problems which would otherwise have existed. These were:

(a) Difficulties encountered by the Commission in performing its monitoring functions in the amateur bands (such as lack of sufficient teleprinter equipment in monitoring stations) and amateur use of frequency shifts of widely different order.

(b) Undue administrative burden on the Commission in handling complaints from amateurs who, not having teleprinter equipment and not hearing a separate telegraphy identification, would erroneously conclude that amateur teleprinter stations are commercial operations improperly in the amateur band.

3. The League now believes, however, that the above difficulties either no longer exist, or are not now sufficiently valid arguments for requiring the present inefficient procedure of dual identification.

(a) It is the League's understanding that at present the Commission's monitoring stations have adequate teleprinter equipment to accomplish necessary monitoring functions of such emissions.

(b) The present rules permit any frequency shift less than 900 cycles, for experimental purposes. In practice, however, the standard frequency shift of 850 cycles is employed almost exclusively by amateur teleprinter stations.

4. It is the intention of the League, if the requested amendment is adopted by the Commission, to expand its Official Observer program, the "heart" of traditional amateur self-policing, by the inclusion of additional numbers of volunteer observers recruited from among present RTTY users. Informal discussions with individual RTTY amateurs and local societies have already determined a willingness on the part of numerous such amateurs to volunteer for such a program. The purpose would be, of course, to provide a means of identifying interloping commercial teleprinter operations in the amateur bands after the distinguishing procedure of dual amateur identification is no longer required.

5. Suitable information to amateurs in the League's publication, *QST*, will also help to avoid any potential incorrect identifications as between amateur and commercial use. Further, amateur teleprinter operations are almost exclusively conducted on, or adjacent to, specified frequencies within each amateur band where the mode is authorized. This is an additional means of broad appraisal of whether a radio teleprinter station is amateur or not.

6. Under the above proposed procedures, the League believes that no undue burden will be placed on the Commission as concerns complaints of "commercial" RTTY operations in amateur bands.

7. The present requirement works considerable hardship on amateurs employing teleprinter emission in that it requires periodic interruption of normal communication for the purpose of identification by means of an additional mode of emission. This is particularly a problem in single-frequency net operation, a common practice of teleprinter stations. Under the requirement of dual identification, the call-up of stations in such nets occupies more than double the normal amount of time. Thus an efficient means of communication is handicapped by an extremely inefficient procedural requirement. Further, during the supplementary

(*Continued on page 174*)

RECIPROCAL LICENSING

Senator Barry Goldwater, ex-6BPI, of Arizona and Senator Andrew F. Schoeppel of Kansas have introduced a bill, S.2361, to amend the Communications Act of 1934 so as to permit the issuance under certain conditions of amateur licenses to aliens whose own countries will issue licenses to U.S. citizens. The bill has been referred to the Committee on Interstate and Foreign Commerce, comprised of the following senators:

Warren G. Magnuson	Washington
A. S. Monroney	Oklahoma
Strom Thurmond	South Carolina
Claire Engle	California
E. L. Bartlett	Alaska
Gale W. McGee	Wyoming
Norris Cotton	New Hampshire
Clifford P. Case	New Jersey
John O. Pastore	Rhode Island
George A. Smathers	Florida
Frank J. Lausche	Ohio
Ralph W. Yarborough	Texas
Vance Hartke	Indiana
Andrew F. Schoeppel	Kansas
John Marshall Butler	Maryland
Thruston B. Morton	Kentucky
Hugh Scott	Pennsylvania

Amateurs interested in passage of this bill should write their Congressional representatives promptly to urge affirmative action. Letters from amateurs in the states listed above addressed to the named senators, will be especially effective. The text of the "reciprocal licensing bill" follows. For editorial comment on the bill, see page 9.

S.2361

In the Senate of the United States August 1, 1961

Mr. Goldwater (for himself and Mr. Schoeppel) introduced the following bill; which was read twice and referred to the Committee on Commerce

A BILL

To amend sections 303 and 310 of the Communications Act of 1934 to provide that the Federal Communications Commission may, if it finds that the national security would not be endangered, issue licenses for the operation of an amateur station to certain aliens for any temporary period, not in excess of three years.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That clause (1) of section 303 of the Communications Act of 1934 (47 U.S.C.303) is amended —

(1) by inserting "(1)" immediately after "except that"; and

(2) by adding before the semicolon at the end of such clause a comma and the following: "and (2) upon a finding by the Commission that substantially similar privileges are granted to citizens of the United States while in the foreign state of which an alien is a citizen or to which an alien owes permanent allegiance, the Commission may, if it finds that the national security would not be endangered, (A) issue a license for the operation of an amateur station to any such alien it finds qualified for any temporary period, not in excess of three years, and (B) revoke summarily any such license, notwithstanding any other provision of this Act relating to revocation of station licenses".

Section 2. Subsection (a) of section 310 of the Communications Act of 1934 is amended by striking out the last sentence and inserting in lieu thereof the following: "Notwithstanding paragraph (1) of this subsection, (A) a license for a radio station on an aircraft may be granted to and held by a person who is an alien or a representative of an alien if such person holds a United States pilot certificate or a foreign aircraft pilot certificate which is valid in the United States on the basis of reciprocal agreement entered into with foreign governments; and (B) upon a finding by the Commission that substantially similar privileges are granted to citizens of the United States while in the foreign state of which an alien is a citizen or to which an alien owes permanent allegiance, a license for an amateur radio station may be granted to and held by any such alien the Commission finds qualified, if the Commission finds that the national security would not be endangered thereby." QST

Strays

Anyone in the Chicago area interested in amateur television please contact K9GRH or W9AUM.

—···—

The 66-foot cutter *Nam Sang* won the 22nd biennial Transpacific Yacht Race in July. On board was W7HUM, who maintained contact with the States on 21-Mc. sideband when communication on the regular marine channels was impossible. One of his regular QSOs was K7AWI, who handled a considerable amount of important traffic.

FOUNDATION AWARD

Alexander F. Burr, K3NKX, of Baltimore, Maryland, is the recipient of the John Gore Memorial Scholarship, offered this year for the first time by the Foundation for Amateur Radio, Inc., of Washington, D. C. The Foundation is a non-profit organization of trustees representing radio clubs in the Washington-Baltimore area.

The award, a $250 scholarship, was conferred on Burr by FCC Commissioner Robert T. Bartley (as Acting Chairman during the August recess) during a ceremony held in the FCC's meeting room in Washington recently. Burr, working toward his doctor's degree in physics at Johns Hopkins University, where he is also an instructor, was chosen "due both to his activity as an amateur, and because of his high standing in his chosen field," according to a Foundation announcement.

Present at the ceremony was Major William L. Scott, W4PVR, of the U. S. Army Signal Corps, president of the Foundation. Major Scott said that the object of the scholarship was to encourage young amateurs in college who had chosen electronics or similar work as their chosen profession.

Burr is the first amateur to receive the scholarship, named in honor of John Gore, W3PRL, a former president of the Foundation and who died last year. Speaking at the ceremonies, Commissioner Bartley said today's amateur is "part and parcel of the new frontier of technological development."

Commissioner Bartley said, "The amateur radio fraternity has performed a unique function over the last half century. Many of the foremost contributors to the early history of radio were men who were amateurs, in the best sense of the word — men like Hiram Percy Maxim, or like Marconi himself. Their pioneering work resulted from a deep personal urge to explore a new and exciting world.

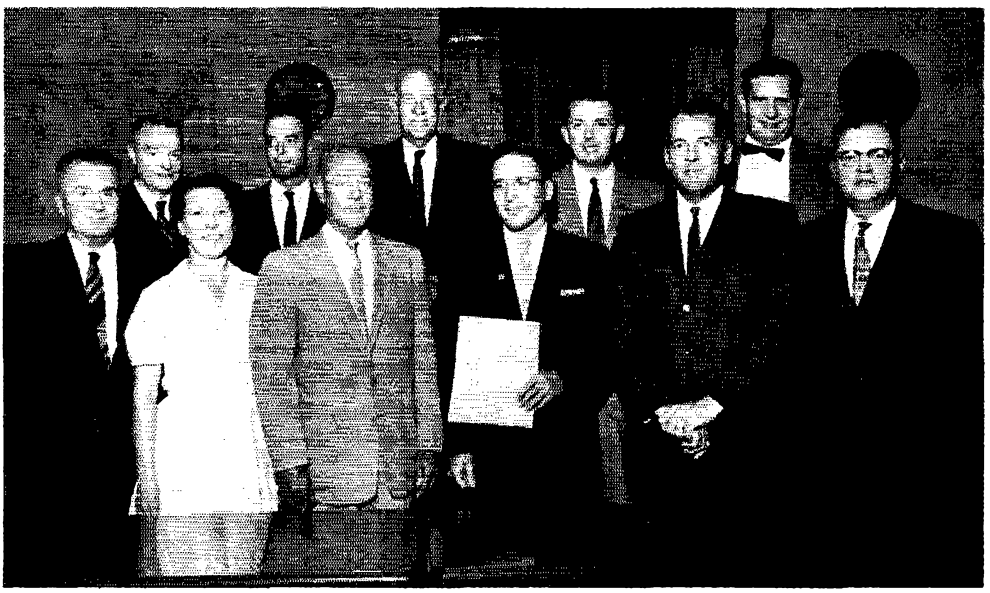
"Today we are in an even newer world — one made possible by the efforts of these and many other men of science. The amateur's place in this world has grown even more important. His responsibilities, too, have enlarged and expanded.

"Amateur radio is, by its very nature, satisfying to the individual. It gives him the wonderful opportunity of communicating with other individuals in every corner of the globe, and the pleasure of creating and experimenting as he pleases with the equipment and techniques he enjoys.

"But his talents and interests have helped swiftly to expand a great industry. And he himself has served his country and his community in times of national emergency and of natural disasters. He is now much more than an individual absorbed in a fascinating hobby. He is part and parcel of the new frontier of technological development.

"You have only to monitor the amateur frequencies to realize that these men and women are serving in the farthest-out frontiers of scientific development — for you will hear them literally from pole to pole, on ice islands and in jungles, and in practically every country in the world."

QST



Commissioner Robert T. Bartley, Acting Chairman of the Federal Communications Commission (light suit) stands with officers and trustees of the Foundation For Amateur Radio, Inc., after a ceremony in the FCC's meeting room in Washington, D. C., where Commissioner Bartley awarded the John Gore Memorial Scholarship to Alexander F. Burr, K3NKX, of Baltimore, Md. (holding paper). Others are: (front row) Tex Debardeleben, W4TE, and Ethel DeBardeleben, K4LMB, trustees; and Scotty Scott, W4PVR, president of the Foundation and Roy Hauser, W4LSC, vice president. Back row: Steve Manning, W4CAE, chairman scholarship committee; Ted Craver, W4IOQ, trustee; Van Van Deusen, W3ECP, past president; Bob Carpenter, W3OTC, secretary; Lou Croneberger, W3UCR, trustee.

How's DX?

CONDUCTED BY ROD NEWKIRK,* W9BRD

How?

How logikal! With venerative appreciation we acknowledge receipt of further communication from the precocious Extra Klass nephew of Count U.R. Kuntries. One of that lad's pet inclinations is to carry ridiculous trends to their ultimate ludicrous conclusions. Thus does he offer his latest development to a breathless DX world. . . .

Der Sheepskinner Kit

Chasen der shnazzy zertifikitten, OM? Vell, iss maken liddle zense fiddlen mit der korrespondenz und — Himmel! — risken der rarer QSL in der postbox. Zo iss rekommenden zumpin zafe und zimple vas iss gemaken der shacker wallen shparkle mit sheepskinnen outstanden: Der Sheepskinner Kit.

Iss mit der rubbershtämpen und zuperkolor zertifikitten blankers outgaben. Gethinken uppen WAX, WPZ, WAH! WOO! undzoforth, und presto! gestampen mit der rubbershtämper der fancy blankers und den geshlappenem on der shacker wallen. Inztant zertifikittens!

Ja, risken nein QSL, fiddlen mit nein ledderwriten, und der nifty sheepskinner iss obtainen. (Iss alzo gut mit signen der namer auf zum dumkopf nicht knowen 9G1 vrom der 807. Den iss zuper "official".) Wunderbar!

Ach, OM, weisenup. Zo shprecken der hepkat Amerikäners, *do-it-yourself.*

Patent possibly pending, we understand, and we'll pass along the f.o.b. Hamburg terms as soon as they're available. *Dankeschon, Freund.*

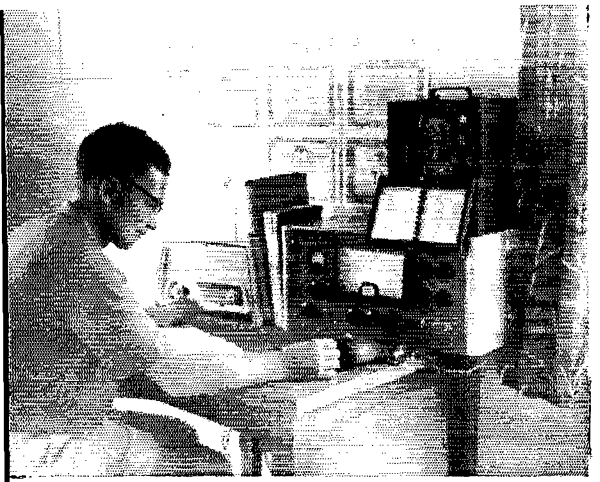
What:

"When the nights begin to lengthen, then the signals start to strengthen." (From an old DX ballad.) Sure — they strengthen till the next fadeout, then start all over again, feeble and hollow. . . . Good time to remind you that, in the band-by-band activity analyses to follow, frequencies appear in parentheses in number of kilocycles above the lower band-limit; the figures outside parentheses are GMT to the nearest whole hour. Thus "**8J1AB** (102) 13" in the 20-c.w. paragraph means that 8J1AB was active on 14,102 kc. near 1300 GMT. Let's try it. . . .

20 phone is a lively subject this time of year. W1OHJ, K1JFF, K2s TDI UYG, WA2s IAQ OVR, K3s KHK LIY, W4s IUO LJV, K4DWU, K5s ALU WSE, WA6NHO, W7MH, K8JCB, W9YMZ, K9QMJ, EL4A, KP4BCA and ZS2U document single-sideband doings by **CN8s** FU (330) 22, 2, IK (324), **CP5**EA (320), **CTIs** EV YE, **CX1**CA (314) 0, **DUs** 1GF 12, 7SV, **EL2**V (308), **HC1**KA (310) 19, **HHs** 2JT (302) 1, 2V (302) 19, 9DL (280) 22, 9DS (318) 23, HI8GA (348) 0, **HM1**AQ (330) 12-13, **HV1**CN (340) 0-19, **HZ1**AB (341) 22, **IS1**RIF (330) 23, KA2YA (317) 12, **KC4USN**, **KGs** ICF (298) 0, 1FR (345) 0, 4AE (305) 13, 4AM (333) 23, **6**FAE (338) 20, **KH6s** AIW/**KP4** EDY (275) 6 of Kure isle, **KJ6**BV (338), **KM6**BI, **KR6s** AF (344) 12, KL (321) 12, LF MH (340) 13, **KV4**AA (2 30) 13, **KW6s** CGA (267), CV (345) 5, **KX6s** AC (329) 12, BO BQ (300) 12, BU (330), DB (319) 5, **MP4s** BBW (245) 20, BCC (281) 19, **OD5**CC (310), **PJ2**AF (331) 22, **PZ1s** AP (296) 0, AX (330) 23, BF (298) 0, **SVØ**WN (342), **UAs** ICK (320) 6, 3CR (130) 5, 3FG (130) 5, **UB5**WF, **UO5**PK (312) 12, **VK8**TB (282), **VPs** 5CH (316), 7BP (290) 0, 7BV (326), 9DC (299) 22, **VQ4**ERR (348) 5, **VRs** 2AP (127) 5, 5RZ (347) 4-6, 6AC (271) 5, XE1s CV DT, **YS1**MS (312), YV4DF (328) 0, 4X4s IX (298), JT (300) 23 and **9G1**BQ (340) 0 . . . . . The straight-a.m. stylists come through with **EL4**A, **HB4**FE (220) 22, **HH5**DM (251) 12, **HKs** 1QQ 4JC, HM1AG 14, **HP1**AP, **JAs** 1BDF (107) 13, 6YG (144) 13, KA8CK (153) 13, **KG4s** AN (203) 12, AO CY, **L21**KPZ 4-8, **OA4s** DT JK (198) 3, **SP7**LA, **TI2**RKL **VPs** 4VP 5MJ 7NP 9EW 9MM 9WB, **VRs** 4CB (80) 6 6TC (165) 5, **VQ5**EK, **VK9**AM (190) of Nauru, **XE3**L, YA1BW (193) 21, YN9MQ, ZA1KFF and **ZD9**AN 16 . . . . . We again direct your attention to pp. 9-10 of the July 1961 *QST*, and p. 9 of the August issue, concerning 14-Mc. voice DX work.

20 c.w. beefs up its daytime skip at the expense of the night shift. K1s GCX JFF (92/82), KSG KSH, W2s JBL WMG, K2s JUA UYG, WA2s BWO EGK (139), IAQ KWB LOR, K3s CNN KHK MNJ, W4s HOS IUO, K4s DWU ZRA (82), K5s ALU CWR WSE, W6s MDK (153/143), RCV (105/92), K6s *CJF ROU TZX* (53/32), WA6s NHO NNJ, W7s DJU LZF MH POU (82/69), K8JCB (156/138), W9s JJN KCR, K9QMJ, KØs OSV OSW RNK, EL4A, KV4AA, ZS2U and A. Rugg give us the word on codework by **AC5**SQ (80) 12, **BV1s** US (60), USA 12, **CE0**AD (100) 5, **CN8**JF (40), **COs** 2AP (10) 21, 2WD 2WU (30) 19, 5RV (110) 20, **CP3**CN (70), **CR9**AI (44) 17, **CT1**KS (45), **EAs** 6AM (20), 8BF 8CA 8CG 7, 8DD 9CK 9DK 0AB 16, EL4A, **ET3**AZ, **FA9**UO, **FB8XX** (15) 16, **FG7s** XE (35) 12, XI (30), **FO8s** AG AK AQ (95) 6, **GBs** 2LS (30) 5, 3LY (28) 0, **HAs** 3TR 4KYB 5AW 6KNB 6NC 7PF 7WF, **HB1**FE (82) 22 of Switzerland, **HCs** IJU ILE 2AC 5CN, **HH2s** CB GR LD OT, **HKs** in quantity, **HL9**KT (10) 13, **HM1**BB 10, **HP1**IE (10), **HR1**MM (53), **HS1s** R X, **HV1**CN, **HZ1**AB (33), **IS1**ZUI, **IT1**ARI (95), **JAs** 1AQR 5FQ ØACO, **JZ0**PH (40) 14, K6EJD/**KM6** (85) 7, **KA2s** KS (45) 6, VO, **KC4s** AAC 7, USB (83) 6, USN USV 1, **KGs** 1AA 3, 1BA 1CC (98) 16, 1CW (60) 4, 1FD (37) 17, 4AN (32), **6**AIG (63) 6, **6**AJS (90) 15, **KH6s** CV/**KW6** (45) 7, EDY (9) 9 of Kure, **KJ6s** BU BV, **KM6s** BI (40) 8, CC CE (36) 4, **KR6s** MS (20), NG, **KV4s** AA (83) 2, BH, **KW6s** CGA (33) 2, DF DG (47) 7, **KX6**BC, LZs in number, **OA1**BP, **OX3**NK (12), **OY7**ML (20) 22, **PI1**KMA (72), **PJs** 2ME 3AD (44), **PY7**LJ of Fernando de Noronha, **PZ1s** BF BG (65), SM5ARQ/**9Q5** 5, **SVs** 1AA 1, ØWI 16, ØWU (45) 2, **TF2**WFV, **TI2s** DL (85) 22, ES, **TT8**AG 16, **TU2**AL 7, **UAs** 1KAE (43) 6-8, 1KAE/6, 2BD (64) 20, 2KAA (21) 20, **UA9s** FI FJ (38), FX KOG, **UA0s** CK (52) 7, EK EU GA GF IC IK JF KID (91) 17, KKD KKS (62) 8, LL 14, MO OK (40) 16, **UB5s** ES FY IT (50), JR (33), KID LC PG WF, **UC2s** AR (40) 15, AZ BL (20) 0, CS, **UD6**BB (40) 0, **UG6**KAA 17, **UH8**BO 15, **UM8**KAD, **UN1**AE 5, **UO5**AA (30), **UP2NV**, **UQ2s** AN (80) 4, DO 5, **UR2s** BV KAT 7, UT5s BN BX (45) 23, **UWs** 3ME ØFC 11, VKs 9GF 9GP 0DA (52) 7, 0TC 0VK (40) 6-7, VO1FP, **VPs** 2VJ 3MC 4TR (20) 13, 4WI (80), 5BF 5BL (22) 1, 5GT (25) 0, 6BZ 6LN (70) 12, 7BP (14), 7NQ (24) 12, 9BO (10) 17, 9EP 9EU 9EW 9G/p (24), **VQ8**BC 8, **VRs** 1A 1B (90) 6, 2DK 3L (100) 6-7, 4CV (60) 6-8, 6TC (165) 5, **VSs** 1AP 14, 1BK 1DN (63), 1ED 15,

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



5N2JKO, previously ZD2JKO, signed G3JKO from 1953 to 1958, then ST2KO in 1958–59, and continues as one of Nigeria's most active DX men. Mike scored 7500 QSOs with 180 countries and 48 United States last year, and still seeks Montana and North Dakota to clinch WAS. 5N2JKO uses 45 watts on phone or c.w. to a 6146 modulated by 6L6s, dipoles and long-wire antennas, and an Eddystone receiver. Between pile-ups Mike attends to duties as 5N2 QSL manager and maintains close liaison with amateur publications throughout the world.

1FE 14, 1FZ (40), 1JY (60), 1KZ 15, 6AJ 14, 6EP 10, 9AAO (20) 22, WA6KMT/KM6, XE2s HU JT, XZ2AD, YS1FA (20) 3, plenty of YOs and YVs, ZA1KFF (32) 15, ZB2AD (27), ZC4s AK (40) 21, CT (65) 0, SG (55), ZD7s SA SE, ZEs 3JC 5JA, ZK1s AK (18) 5, AR BS (28) 6, ZM6AF, ZP5s LS OG, 4X4s JO (20) 22, JU 4, 5A4TC (70), 5N2s LKZ (35), RSB, 5R8AB 15, 5U7AC (30) 16–22, 6O1MT, 7G1A (60) 18, 8J1AB (102) 13, 9G1s DE DT (50) 17–21 and 9M2FR 16.

15 **phone** is the scene of triumphs by WA2s FQG KWB, K3s KHK LIY, W4LJV, K4EMX, K5s ALU CWR, FKD WSE, WA6DNM, K8JCB, K9s QMJ VLQ, KØRNK, EL4A, KP4BCA, VE3PV, ZS2U and N. Shelton who omitted his call. The quarry: CEs 1 DC 2DZ 2LU 3 TN, CR4AD, CT1JJ (194) 23, EA8CK, ELs 2V 4E, FG7s XH XI, HCs 2CB 2RM 4JL 7KQ, HI8DGC, HKs 2YO 4KZ 4PX, HP1s AP BA GA, HRs 1FO 1LB 3HH, KG4s AO AV CY, OAs 4BC 4GY 4HK 8B 8I (455 s.s.b.) 0, PJs 2CK 3AD, PZ1s AW BA, SP9KJ (216) 17, TF3KA (237) 22, TG9BJ (s.s.b.), TI2s DLM PT, VE8BY, VPs 2DQ 2GAQ 3EFG 3FM 3RW 3YG 4PS 5AH 5AK 5BB (204) 22, 5L1G 6ZX 8FO 18, VQ4s ERR RF, VRs 2BC 3L, VSs 5GS 13, 9ARC 12, 9M8 of the Maldives, several XEIs, WA6KMT/-KM6 (s.s.b.), YNs LJW LLC INT 3LBV, YS3TM, YVØFG, ZD7SE, ZE2JA, ZK1AR, lots of VKs and ZLs, ZP6BB (s.s.b.), 3A2BF, 5A2TC (217) 20, 5N2AMS (250) 16, 9Q5s FO HV, 9M2GV and 9U5MC 11.

15 **c.w.** reports for the dog days registered a low ebb but K1KSG, W2WMG, WA2s FQG (103/86), KWB, K3s KHK MNJ, K4s EMX JYQ, K5s ALU CWR FKD WSE, K6CJF, WA6s DNM (39/34), NHO, W7POU, K8JCB, KØs OSV OSW RNK, EL4A, VE3PV, ZS2U and A. Rugg come through with CE1AD, CM8RM, CR6s 5AR 18, 6DA 6DS 7IZ (40), EA6AM, EL4s A YL (73), HC2CB (35), HKs 1QQ 7YB, HR1MM, KGs 1FD 4AL 4AO 4CY, MP4BBE, OAs 4BP 8D's 10-watter, PZ1AQ, SM5ZS/4U (30) 19, TN8s AF (60), AT 14, UR2KAN 13, VPs 4TR 5GT, VQ9s 3HD 3HZ 4HY (48), 5IB 5IG (50), VSs 1FF (40) 17, 1FU (112) 17, 6ET 9MB (26) 16, XE1PJ, YV3ECC, ZB1HC, ZC4SG, ZD6RM, ZE1AA (70), ZP5OG, 5As 3TQ 4TC 5TA (37), 5N2KHK, 5U7AC, 6O1MT (70), 6W8BL (55) 20, 7G1A and 9G1DT (75).

15 **Novice** news is sparse but the lads are in there pitchin', especially KN5FPU, WV6ORS and KN8UZK who report HK7s YB YC, KZ5MM, LU6PK, WP4BBV and YV4BD. Before returning to the U. S. A., WA6CYT heard WV2s ROA SRS, KN8s YJU YJV YKN YJM ZJM and KNØFRJ slipping through to England on 21 Mc.

10 **phone**'s late-summer dispatches by K5ALU, WA6DNM, K6CJF, KØs OSV OSW RNK, EL4s A and YL discussed the availability of CT2AK, CXs 4BJ 7AR, EA8CC, HC1RC, HK0AI (450), KZ5GH, TI2TP, VKs 2FU 3VL, VP2GH, VQ2JM, YV5AFH, ZE2JV, ZLs 1LY 1RI and 2UD . . . . . EL4A keeps us solvent in the 10 c.w. department, stirring up DL7JA, DM3YEO, OE5PX and SV0WL, typical north-south fare in his hemisphere. By the time this "How's" gets around those autumnal 28-Mc. openings should be producing interesting east-west results — we hope.

40 **c.w.** kept a lot of DXers entertained all through the summer, including K1s KSG KSH, K2OQA, WA2s KBE KQG KWB, K3s CNN KHK, K4DWU, K5ALU, W6s MDK RCV, K6CJF, WA6NNJ, W7DJU, W9JJN and EL4A. Wallpaper prospects are CE1EC, CMs 2RM (8) 2, 5HF 8RM, CO2s PY RC (2), CX2BT 9, DU7SV, EL4A, GC2FMV (5), HAs 1KSA (10), 3KGC (30), 5BU (10), 5GK, HKs 1FF 1QQ 3QO (4), 4JC 7YB, JA1EEB/p of Marcus, two dozen other JA1s, JA2s AHE BGH BVS, JA3s AG ASU BQH CAF CUF DAZ DBO KM, JA4BAW, JA5PL, JA6s AFL AK AOD AWM BCV, JA7s AAV AKC AQZ AS JE WE, JA8s galore, JA9MI, JA0s ACO ACX AFU NW QO RC, KC4USV (30) 8, KW6s DEN (11) 6–7, DF DG, KX6BC, LU3ZO 9 of the Argentine antarctic, LZs 1KSV 2KBA, OAs 1FHX 2C (8) 5–6, 4FM, PZ1s AP AY, UA0EU, UB5ZE, UR2KAB, UT5GT, VK0VK 11, many mainland VKs, VPs 1BS 4TR, VRs 1A 7–8, 2DK, XEs 1HV 2SS, YOs 3AC 6XI (30), a batch of YVs, ZB2AD (6) 5, ZS1A and 6O2NR 5 . . . . . Ks 3KHK 5ALU, EL4s A and YL rustled up ELs 1H 2V 4E, HK2WD, K4PGL/VP9, 6W8BF and 9G1DE on **40 phone** . . . . . In the 7-Mc. **Novice** range we find KN4NNQ (now K4NNQ) and WV6ORS (now probably WA6ORS) scrounging up HK3VV, K4JQV/VP9 and KH6ECZ, while over in England WA6CYT logged the signals of KN1s OYE QNS RHS RNS SKI, WV2s PKD QQF RFE SJH SPK TBS, KN3s MKK MVY NEC OSQ OTJ OXE PKY QZA, KN4s BIY NDR NEE NOG NTK ZVL, KN5FUN, KN8s VKC VKN, KN9s AHX CJF DVB FEN FHC/1 and FKT.

80 **c.w.**'s DX possibilities know no bounds as the summer's static fades away in our region. K1KSG, K3s JIQ KHK, W7DJU and K8OET rushed the season for EI9J, Fs and Gs, HK1DP, KV4CI, LAs 1SH/mm 6U, OKs a-plenty, PA0LZ, SM2CLM/mm, VKs 3ADG 5NQ, W4VCA/KH6, YO2BE, ZLs 1ALA 1ALS 1AMQ 3CO and 3VI.

75 **phone**, sidebands-plus-carrier version, enabled KP4AXU (W8KFY) to capture 28 countries and 49 states since September, 1960. Ed does it with a Valiant, GPR-90/DB-23A and open-wire-fed doublet between 3807 and 3860 kc. KP4AXU's chief suggestion for lower-frequency phone DX work: modulate fully and properly.

Where:

Asia — Bret Harte would have agreed that the ways of the QSL, too, are mysterious. W9YMZ concurs, reporting this pursuit sequence: "Finally received a card from HS2A. Sent my QSL direct using W2SAW's DX Stamp Service, after contact in February. Two months later I received my own card back in the self-addressed envelope, airmail, no card or explanatory note attached. The address written as the return address was the same the OM had given during contact — DMJM, Khorat, Thailand. I waited until I read that some W6 was HS2A's QSL manager; sent a card through him but nothing happened. Then in July's *QST* I read of HS2M's offer to help with HS QSLs. I sent a letter to his QSL manager, K4JEY. K4JEY said he had gotten his HS2A QSL through VE7ZM. Shipped a card to VE7ZM and received my HS2A pasteboard pronto — from W8PUD!" Man, more fun than a pile-up . . . . . KA2CM, supplanting KA2JM as FEARL QSL Bureau chief, says, "Have cards on hand for KA2s AM BD CB DM EN GW HA KF LF LT NK PC RR TB WM and YL who have recently returned to the States. I would appreciate their forwarding addresses. In the future, incidentally, cards received for nonmembers of FEARL will be returned to senders." The correct bureau address for member KAs: FEARL, Box C-5, APO 925, San Francisco, Calif.

Africa — "We are still processing QSLs for contacts with ET2s US VB and US/ET2." writes K1KOM of the ET2US staff. "Cards for ET2US may be sent to me at USA MESA, APO 843, New York, N. Y., with self-addressed stamped envelopes from W.Ks. All QSLs for ET2VB should go via ISWL of London. We have no records or logs for other ET stations, nor for MI3US or ET2US QSOs prior to February, 1958." . . . . . "9G1DT (W3OVD) requests me to relay to you that W4HUE is now his QSL manager," communicates KV4AA . . . . . You can amend last month's VE3BQL/SU QSL suggestions to read *WO2* E. C. Veale, for Elvin has graduated from S/Sgt rank . . . . . "Please advise the boys that complete logs for ZD2KHK/nc now are on hand here," writes W2CTN. Jack also holds the QSL fort for 5A4TC (ex-5A2TG-VQ4GQ-VQ1SC). Don't omit

the usual s.a.s.e., you W/Ks . . . . From K5JBW: "K9ECE tells me he will no longer be able to handle cards for EL2Q because of lack of logs. Cards on hand were shipped to EL2Q for direct disposition." . . . . WGDXC "Where" items: Sending his QSL to ZD9AM c/o K. F. Scott, 38 Upper Glengariff Rd., Three Anchor Bay, Cape Town, paid off for W5HDS. . . . W2DGW does QSL honors for the Indian Ocean stops of ex-VP2LU-VP5FP who participates in Project Mercury aboard a tracking vessel . . . . . VERON QSL notes: ZD8SC is back in the U. K. and will replace missing cards on receipt of QSLs with s.a.e. and IRCs. . . . The prefixes TD8 and TV8 are said to represent Dahomey and Upper Volta these days.

Oceania — YL VE7BBB observes that VE7ZM still handles QSLs for KH6EDY operator Jim, now Stateside, while W5QK does the job for KH6EDY's Bob . . . . . "I'm sending blank QSLs to VR1CW," advises K2UYG. "This should help clear up QSL debts outstanding since 1957. Dud assures me that all cards for genuine contacts will be answered via bureaus. By the way, VR4CW says VR4BW did not operate from the Solomons." . . . . "Six International Reply Coupons brought a most welcome and attractive airmail QSL from JZ0PH," applauds K6TZX . . . . . "VR3L QSLs 100 per cent on receipt," testifies WA6DNM . . . . . According to ISWL, ex-PK3WH was last reachable as W. Hartman, c/o Villa Wood Hostel, P.O. Leighton Field, N.S.W., Australia . . . . . WGDXC understands that ex-KS6AG, now WA6FRU, has had four changes of address since leaving Samoa. Dotty still has those juicy logs available . . . . . The Gulf gang further states that W5WW has VK0FZ's Macquarie log dating from May 27, 1961. S.a.s.e. are required from W/Ks, s.a.e. plus IRCs from other applicants . . . . . "S.a.s.e. QSLs come first," warns K6HPR of KX6BU's staff.

Europe — W2BIB affirms his status as HV1CN QSL manager, an appointment that goes back to 1955 . . . . . "Haven't heard from SP3DG since he changed QTH," notifies K1MEM, "so I won't be able to proceed with his QSL work until he comes through. There are some 25 cards on hand for him here." . . . . . W1OHJ has it that LZ1KPZ operator Paul Popov can be reached at 13 Pevtimi St., Pazardjik, Bulgaria . . . . . WGDXC reports quick F9QV/FC QSL results with a French-postage s.a.s.e.

Hereabouts — "I am TG5FJ's QSL manager and will handle cards in both directions," apprises K2DDK. "Answers will go out faster if GMT is used." . . . . . "You can now add KZ5JC to the W2CTN QSL stables," declares Len himself. "Constant requests for cards almost drove me to rereading Shakespeare." . . . . . W9KCR observes that Wilma J. Fredenburg, 3217J McMichaels, Philadelphia, Penna., may expedite your KG1BO confirmation . . . . . W7UVR figures South American amateurs take much undue blame for tardy QSL returns. Shaky mail service south of the border is often the real culprit . . . . . More nominations for your applause as "QSLers of the Month": CE1AD, HK3VV, HS1X, KX6BC, VRs 2DK 3L and YV5AXQ, *volunteered by W2JBL, Ks 5FKD 6TZX and* WA6DNM. QSL managers W2CTN and K8RFH also are deservedly lauded. WA2LKY, incidentally, offers his good offices as QSL agency for a DX station in bona-fide need . . . . . Say, W8KX would appreciate info on FM7WK, K5IKL likewise on FC7XF, and VE6IZ seeks operator Bill of HL9KS circa February, 1958. Any help? . . . . . Got proper s.a.s.e. on file with your local QSL manager? Better forward a few per instructions elsewhere in this *QST*, OM . . . . . Regarding his Trindade PY0CV operations of several years ago, PY1CV writes, "Only a few of my contacts have received QSLs because they were the only ones whose calls I could read off my watersoaked workbook after a good dunking when I tried to board the ship back. For those who claim QSOs I'll still send QSLs provided I can read their calls in my smeared log." . . . . . Hmm — we'd better duck after this one: W4NJF is positive that c.w. men QSL more dependably than phone specialists. Any assenting or dissenting opinions? . . . . . This month's roster of individual QSL recommendations comes courtesy W1s OHJ UED WPO, K1KSG, W2JBL, K2s TDI UYG, WA2s BWO EGK FQG, K3s CUI KHK MNJ, W4HOS, K4JYQ, K5s FKD JBW, W6RCV, K6s HPR TZX, WA6DNM, W7s LZF MII UVR, K8JCB, W9s JJN KCR YMZ, K9s QMJ VLQ, EL4A, KV4AA, VE7BBB, ZS2U, 5N2JKO, FEARL *News*, HARC *Ham-Gab*, ISWL *Monitor*, JDXRC *Bulletin*, KRC *Splatter*, NCDXC *DXer*, NNRC *Bulletin*, OVARA *Ether Waves*, URDXC *Universalite*, VERON *DXpress*, WGDXC *DX Bulletin* and WWDXC (W7JPC):

BV3HPT, Box 11, Taipei, Taiwan, Republic of China
CE6EZ, R. Hucke, P.O. Box 145, Temuco, Chile
CR6AC, F. Lemos, P.O. Box 2121, Luanda, Angola
CR7FM, F. Morgado, P.O. Box 852, Beira, Mozambique
CX1CA (via RCU)
DL5KM, K. McKee (W0UUW), 6901st SCG, Box 627, APO 872, New York, N. Y.
FG7XI, Capesterre, Guadeloupe, F.W.I.
FY7YI (via W3ICD)
HH2OT (via K0GZN)
HK3VV (via LCRA)
HK4PX, G. Arango, P.O. Box 1503, Medellin, Colombia
HDFG, Navy 566, FPO, New York, N. Y.
JA4YC, M. Takeku, 462 Tsujikawa, Hatabu, Shimonoseki, Japan
K6EJD/KM6, B. Bettis, Navy 3080, Box 20, FPO, San Francisco, Calif.
ex-KA2CB, C. Benjamin, K1GAA/1, 10 Hemlock Dr., Pease AFB, N. H.
KG1CW (via W2ZK)
KG4AL, C. Halsey, NAS, Box 35s, Navy 115, FPO, New York, N. Y.
KH6CV/KW6 (to KH6CV)
KH6EDY (see preceding text)
KP4BCA, B. Nielsen (K0QHF), USA Gar. & Tech. Svc., Antilles, APO 851, New York, N. Y.
ex-KR6KM-KA2KM (to DL5KM)
KR6NG, R. Shepherd, 1st Special Forces Gp., APO 331, San Francisco, Calif.
ex-KS6AG, Dotty Kellen, WA6FRU, 1836 Arthur Ave., Fresno 5, California
KX6CG, Navy 575, FPO, San Francisco, Calif.
KZ5LC (via W2CTN)
KZ5TF, Box 174, Coco Solo, C. Z.
LU6MI, J. Fulcher (W5LID), P.O. Box 50, Lujan, Mendoza, Argentina
LZ1KPZ (see preceding text)
PY2BN, M. Cardoso, Box 222, Santos, Brazil
SM5ZS/4U, B. Engren, Gaza/Palestine via UNEF Base P.O., Beirut, Lebanon
SP4JF (via WA2EFN)
SP0ZHP (via SP5HY)
SV0WU, Box 388, San Marcos, Tex. (or via W9YFB)
TG5FJ (via K2DDK)
TL8AC (via W8KML)
TT8AG (via W3KVQ)
UA1KAS, Radio Club, Fontanka 7, Leningrad D-11, U.S.S.R.
ex-VP2LU-VP5FP (via W2DGW)
VP4WI, Navy 117, FPO, New York, N. Y.
VP5BF, K. Penchoen, Box 92, Montego Bay, Jamaica, W. I.
VP5BK (via VP5RS)
VP5MJ, Dr. J. Manley, Sea View, Oracabessa, Jamaica, W.I.
VP7BP, P.O. Box 4187, Patrick AFB, Cocoa, Fla.
VP9EP (via W3INH)
ex-VQ1SC-VQ4GQ-5A2TG (to 5A4TC)
VQ5IG (via W2CTN)
VRs 1M 2AE (W/K/VEs via W1HGT; Europeans via GW3LQP)
VR4CV, Box 49, Honiara, Guadalcanal, Solomons
VR5RZ (to VK4RZ)
XE1VI (via XE1AAA)
YJ1ZA, J. Birdsall, VK2QJ, 23 Ebley St., Bondi Junction, Sydney, N.S.W., Australia
YV5AXQ, Box 8026, Caracas, Venezuela
ZC4SG (via RSGB)
ZD2KHK nc (via W2CTN)
ex-ZD8SC, S. Crow, Friarnin, Park Ave., Ingatestone, Essex, England
5A4TC (via W2CTN)
5N2AAK, A. King, Wireless Office, Nigerian Railway Corp., Ebute Metta, Lagos, Nigeria
5N2AMS, A. Murray-Stone, c/o Ministry of Works, Minna, Nigeria

EA2s CQ (left) and CA, Spain's famous XYL-OM DX team, have logged 225 and 240 phone countries, respectively. As interesting evidence of changes in hamshack styling over the past decade, compare this picture with a similar photo of Paula and Juan in the December 1952 "How's". *(Photo via W2KUW)*

Summer field days are popular amateur activities in central Europe. At left we see OK1AMS and friend striving for score in a recent CAV outing. DM3YM, on the other hand, prefers a solo effort with his one-watt portable phone-c.w. outfit for field tests in East Germany. *(Photos via K3CUI and WA2KQG)*

5N2BCF, B. Fisk, Cable & Wireless, P.O. Box 173, Lagos, Nigeria
5N2JJA, A. Mould, P.O. Box 263, Port Harcourt, Nigeria
5N2DMS (via 5N2AMS)
5N2EBL, E. Lloyd, c/o C. Zard & Co., P.O. Box 114, Ibadan, Nigeria
5N2JAF, J. Fuge, c/o Cable & Wireless, P.O. Box 173, Lagos, Nigeria
5N2KHK (via W2CTN)
5N2LKZ, O. Jackson, c/o IAL, Kano Airport, Nigeria
5N2RDG, R. Gynn, P.O. Box 173, Lagos, Nigeria
5R8AA, P.O. Box 19, Fianarantsoa, Madagascar
5R8AB, F. Cerveaux, P&T, Tananarive, Madagascar
5R8BC (to FB8BC)
6W8BF, Box 971, Dakar, Senegal
7G1A (via CAV)
9G1DT (via W4HUE)

NOTE: No assurance of accuracy and officiality goes with the preceding. Good luck, anyway — and if you encounter other previously unpublished DX QTH possibilities, pray pass the word along.

Whence:

Asia — HL9KT commentary from K2LSX at the scene: "We're operating 20 phone and c.w. on 14,150 and 14,015 kc., mostly between 1100 and 1300 GMT. Quite a few operators here besides myself, and other W/Ks occasionally drop in for QSOs. HL9KT has a half-gallon BC-610 job, an R-388 receiver and a dipole. We'll soon replace the latter with a beam. Watch for us in the contests!" K2GJS also writes from Korea where he hopes to help dish out HL9 QSOs Statesward . . . . . "Always pleased to work W/Ks," writes operator David of VS9MB to W8KX. "You boys really know how to operate in pile-ups. Our rig here might be called a plumbers' delight, a mess of wires, dog ends and coffee stains. But we manage to get around the planet, all right." . . . . . "Our club station, KA2MA, has gained five members so far," writes prexy John. "We have a KWS-1, a 35-foot-high triband beam and a 75A-4 on 20 and 15 meters at 1900-2100 local time." . . . . . JA8ABA was K6CJF's 500th Japanese station contacted. Bill still hunts two holdout JA4 prefectures . . . . . K2UYG says AC4AX is working out arrangements for a return to the air . . . . . Asian addenda courtesy WGDXC: VS1KP mentions an AP5CP of E. Pakistan. . . . XW8AL is hard at work attempting to extricate Laos from the ITU-FCC Ban List.

Africa — EL4A returned to the airwaves in July after his Stateside tour. Bob's XYL, EL4YL, caught the DX bug for 700 quick QSOs with 65 countries. They'll have a side-band kilowatt perking at any time now . . . . . "TU2AL vacationed on the Riviera for a month but now plans to keep the I.C.R. regularly workable on 20 c.w." That from K1KSG . . . . . Poor conditions plus illness in the family have kept OT ZS2U temporarily on the DX shelf . . . . . W8KX grows postally acquainted with 6O1MT. Mauro has lived in Somalia for 30 of his 47 years and works as a radio technician. "We live a satisfactory life. My wife is Italian; we have a little donkey but no family. It is, as you say, OK." 6O1MT uses a 6I5-6AU6-6V6-807 r.f. line-up, 6SJ7-6SL7-6L6-6L6s audio, Eddystone 750 receiver and dipole, 20 meters preferred . . . . . K5JBW feels that new Liberian radio regs may thin out the EL ranks for a while. There's an exam to be passed . . . . . K1ELS visited South Africa this year and found ZS4MG quite active on 10, 15 and 20, phone and c.w., in addition to discharging duties as president of SARL's O.F.S. branch. A 50-watter and HRO do the job . . . . . K2UYG hears that Tchad is added to the DXpeditionary objectives of 5N2AMS . . . . . Nigerian commentary thanks to 5N2JKO: "Practically all 5N2 activity emanates from the northern region. The work of 5N2s AMS ATU IJS LKZ and RSB, plus short bursts from 5N2s BRG JKO and RJO, about sums it up. About a dozen others hold licenses but are inactive. New ones regularly make appearances. Most 5N2s do not use beams but the decline in conditions will bring more directive antennas into use; 5N2s BRG LKZ and RSB are buying or building beams but there are fantastic difficulties in procuring materials locally. I shall probably have a wire beam on bamboo supports, or else a quad, but I'll have to wait for the rain and gales to subside. By the way, 5N2AMS is working the States on 3.5 Mc., so I'll have to put up a 260-foot wire to see what 5N2JKO can do. S.s.b. has not caught on here yet although 5N2s AMS and PJB (who is now in EA8-land) were using the mode. For the certificate hunters we are working on a "5 'n' 2" diploma attainable through working five 5N2s on two bands. More details on this will follow when we find a suitable printer." . . . . . Ex-VQ1SC-VQ4GQ writes from Tripoli, "Now very active working W/Ks on phone and c.w. as 5A4TC. I'll be here for three years and hope to be active on 40 and 80 c.w. when conditions are favorable." . . . . . KV4AA is informed that 9G1DT (W3OVD), planning a two-year Wora Wora stay, will be on from Dahomey and the Voltaic Republic this fall if all goes well. Dick recommends that 9G1DT's skeds with home not be interfered with; George likes 14,050 kc. around 2100 GMT, 21,075 at 1800 . . . . . As of July 21st, according to K1KOM of ET2US, all amateur radio operations by Americans in Eritrea were ceased until further notice. "We hope to be back on the air in the near future, possibly with new licenses and call signs." Good luck, OMs . . . . . NCDXC and VERON terminate our Africa rubric: 5N2AMS expects considerable DXpeditionary assistance from the OW who is now licensed as 5N2DMS. . . . Gabon TR8s AA and AB tantalize the faithful with ephemeral 14- and 21-Mc. appearances on phone and c.w.

Oceania — KX6BU's K6HPR writes from Kwajalein: "I arrived here a few weeks ago to carry on where departed WV6PGA left off. I'll hit 26-meter s.s.b. between 14,290 and 14,320 kc., 0400-0830 GMT regularly, 1200-1400 occasionally. Filled five log pages in two hours in one recent session with the East Coast. If all callers cooperate, KX6BU can check in many stations in a short time." . . . . . W1NJM forwarded notes on W4SHJ's recent visit to Hong Kong and the Philippines. Harry was especially impressed by club spirit out that way; meetings seem invariably well attended. W4SHJ was also struck by the pungent reputa-

tions certain W/K DX wheels are building for themselves in foreign circles . . . . . VE7BBB observes that KM6CE's Don may head for Japan soon, and that VE7ZM is stirring up FW8 DXpeditionary interest . . . . . Additional VERON and WGDXC Oceaniagrams: ZK1s AR and BS will remain to take up the DX slack as ZK1AK departs the Cook Islands for New Zealand. . . . Local QRM flourishes in the Solomons with VR4CB on voice, VR4s CV and CW on code. . . . Ex-VS1HU signs VR2EA and other calls while on geodetic survey duty. YJ1 VR1 and VR4 stops also are scheduled. . . . There's no ham radio interest among Willis Island electronics personnel this year, but watch out for 1962. . . . VR5RZ (VK4RZ) rattled 14-Mc. phone ranks in August with the first Tonga DX traffic in many a year. . . . VK9AM's homebrew-and-surplus 807s-modulated-by-807s rig makes a juicy 14,190-kc. target. A dipole and plug-in-coils superhet help Laurie handle those pile-ups around 0700-0830 GMT.

Europe — Might as well mark your shack calendar now for RSGB's 21/28-Mc. Telephony Contest on December 2nd-3rd, OM. This affair should help keep the 15- and 10-meter DX ball rolling as the sunspot crop thins out. Participation details next month . . . . . "G6VQ claims to be the only ham in England's rarest county," notes K4ZRA . . . . . ARI's Milan section has a DX competition running from August 15th to November 30th. Check with IIRR for details . . . . . W2LNP/SP3 claims to be the first Yank authorized to ham with such a call. He used an *HX-500*, *HQ-180* and *Hy-Gain* beam at the Poznan International Fair's U.S.A. exhibit . . . . . "Just received the call DL5KM," writes WØUUW (ex-KA2KM-KR6KM). "Watch for me on all DX bands with a Ranger, HQ-129X and Gotham vertical." Ken doubtless will be having many QSOs with his dad, WØYOS . . . . . W1OIIJ hears that Paul of LZ1KPZ keeps that station quite radio-active between 0000 and 0400 GMT on 14-Mc. phone and c.w. with 150 watts and a full-wave wire . . . . . WA6CYT tells us that U. S. amateurs may now participate in MARS activities in England, an encouraging development . . . . . VERON and WGDXC Continental comments: UA1KED wants to concentrate on sideband soon from F.J.L. . . . K2VQQ dropped into the Baleanes for a few EA6AZ s.s.b. sessions in August.

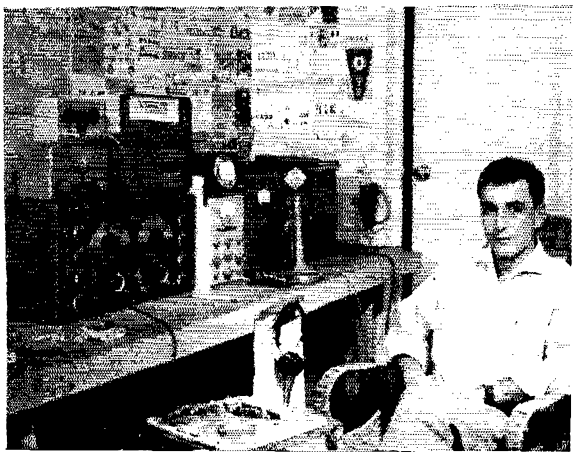
South America — PY1CV writes the interesting story of PYØCV, Trindade's first amateur station. We'll abridge for brevity: "Around mid-1957 the Brazilian Navy decided to establish an operational base on the island in conjunction with IGY activity. As an engineer I had quite a bit to do with the effort. The call PYØCV was assigned to me for convenience in communications troubleshooting and for propagation exploration. After the rig was installed and set up on Navy channels I set the ART-13 in the 14-Mc. band to send a message to PY1ALJ, my XYL. Some of the boys picked it up immediately; some LUs popped in, then CEs and CXs. I could not speak to the wife! I had to stop right then and there, for I discovered that our radiosondes were being affected by my transmissions." Improved radiosonde gear later permitted PY1CK to operate extensively as PYØNA while on naval assignment, but unfortunate PYØCV never really got going . . . . . W7UVR is convinced that it's risky business to put rare QSLs into the South American mails for award applications.

Hereabouts — W2EQS makes his annual DX pilgrimage to St. Pierre this month as FP8AS. Charlie expects to concentrate on 14,280, 14,335, 21,410 and 28,650 kc. and may keep at it till mid-October. K1MOD tabulates K1MMB's summertime FP8BR spree at 1711 QSOs with 35 countries and 40 states . . . . . WA6CYT, of Novice Amateur Radio Association renown, returns to Rte. 1, Box 207, Pasco, Wash., and hopes to hear from his gang at that address . . . . . W4KXV would like a foolproof system to keep people from confusing his call with that of W4KVX. So would we . . . . . K3KMO hopes for a European assignment that may give him DXpeditionary cracks at San Marino, Andorra and what have you . . . . . W4NJF opines that denouncing DX-band traffic work by military amateurs is somewhat like snapping at the hand that helps preserve us . . . . . After much perspiration K4ZRA finally hooked Asia (UA9IK). Naturally then quickly and easily followed UA9FI and 4X4JU . . . . . VE7BBB finds VE3CJ in agreement with the viewpoint that rare-DX operators sometimes expect a little too much in the way of clear channels and exemplary operating. Tail-ending, for instance, usually indicates an inexperienced over-anxious chap, not necessarily a rude one . . . . . K4TUA makes available a publication listing "the favorite operating frequencies and times of 4222 DX stations located in 273 countries, c.w. and phone, 40 through 10 meters." Check with John for further details on his *DXers' QSO Handbook* . . . . . K6BX reports YL KØIKL the frontrunner

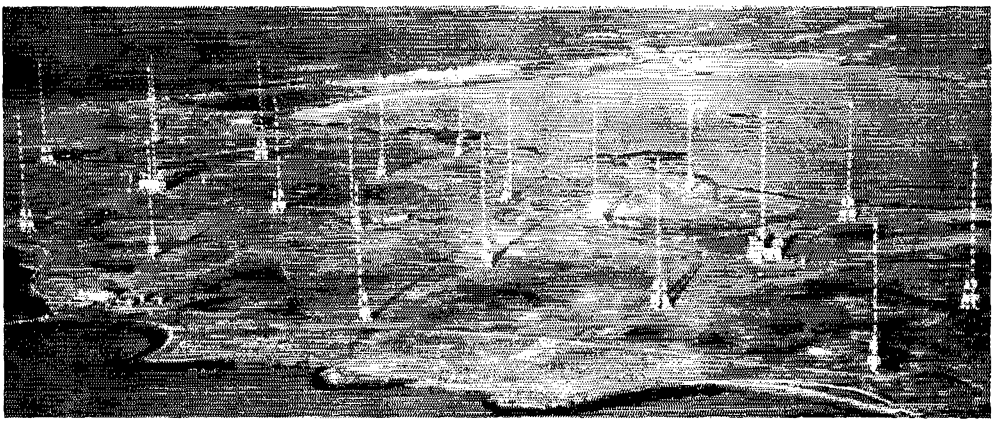
TL8AC, formerly FQ8HT, has a pair of 807s and home-brew triple-con receiver perking in Bangui. Pierre hopes to multiply the efficacy of this arrangement with some directive 21-Mc. skyhooks. (*Photo via W8KML*)

in June's Certificate Hunters Club QSO Party. Other high scorers in order: W5s PSB WZQ and W2SAW . . . . . W1FPW crossed the north Atlantic path for a personal visit with LAs 4U 5KH 7JF and 7NF. "Listening to the W/K/-VE QRM in Norway gives one an insight as to how rough it is to achieve DX results from the U. S. A." . . . . . W8KX quotes an authoritative prediction that Great Lakes smallmouth bass fishing results are expected to decline for the next few years. Sunspots? . . . . . WA2DJE, a Maryknoll missionary at Huehuetenango, Guatemala, now is active as TG5FJ with an ARC-5, and TC8-13 on 40, 80 and 75 meters. K2DDK says, "At present his antenna is just a 7-Mc. dipole. I'm trying to get him to try a monster Vee beam because his QTH is at the narrow end of a 5500-foot funnel-shaped valley aimed Statesward." . . . . . DXers may be interested in the Worked New Mexico Counties certification engineered by W5LEF. S.a.s.e. to Willy will get you the specs in a jiffy . . . . . *Yaame III* and VP2VB/mm & Co. are said to be just about set for sea.

Ten Years Ago in "How's DX?" — Your conductor disparages the roll-your-own school, a few misfits who approach DXCC status through homebrewing or altering rare "QSLs" . . . . . Eighty and 160 meters estivate DXwise but good old 40 stays awake with DU1MB, FG7XA, HR1AZ, VK9XK and others available . . . . . Twenty c.w.'s summer fare is sumptuous enough: AP2N, C3s AB FA, CR8CC, ET3Q, FL8AM, FN8AD, H1AHR/M1, KH6KL/KP6, LB5Q, LX1JW, MB9BJ, MD2s BC JB, MT1BA, OE13RL, OQ5s AA RA, PX1A, Crete's SV9FP, SU1FX, VK1BS, W7JMZ/KG6 and XU8SR . . . . . Twenty phone offers CS3AA, EK1s AD DD, EQ3FM, HC8GI, KC6AA, VS2AA and 3V8BA . . . . . Ten phone's sparse late-summer DX crop is topped by EL10A . . . . . The Monaco eruption of W8PQQ brought 699 3A2AC QSOs to DXers in more than 100 countries, and we hear that EA3HL did quite well from Andorra as PX1A. Ifni next? . . . . . This year's VK/ZL DX Contest is announced, to be held in conjunction with Australia's Commonwealth Jubilee . . . . . Jeeves is all up in the air about antennas, while photos of CT3AA, SVØWX-FØQN, Rabaul's VK9GB and VP5BP (VE3CJ) supplement the file for October, 1951. QST



YV5AGS typifies the amateur radio boom now under way in Venezuela. Juan shoots for WAS on 10-, 15- and 20-meter phone and c.w., and occasionally signs YV5AGS/4. (*Photo via WV6ORS*)



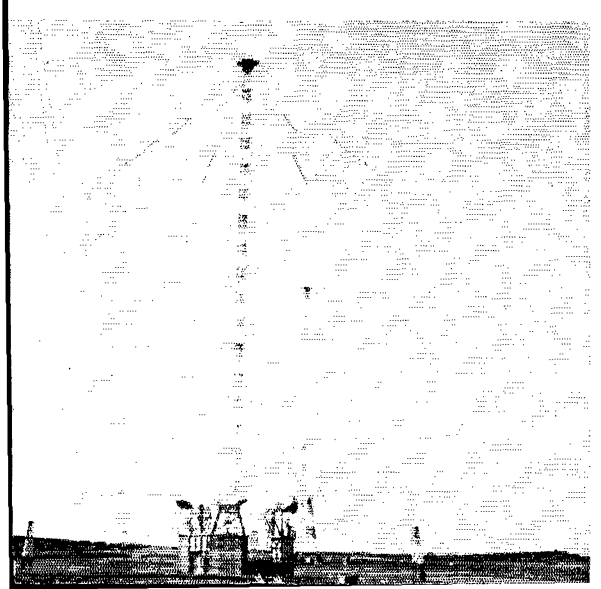
NAA—1961

BY RICHARD L. BALDWIN,* W1IKE

THERE are many famous names in Naval history — names of ships, names that live on and on. Sometimes the particular ship is lost in combat or retired because of age, but the heroic name is passed along to some new ship. So it is with the Navy's famous radio call NAA. In the earliest days, many an aspiring amateur learned the code by listening to NAA, and it was indeed the very first station that many people heard. Located in Arlington, Va., it transmitted time signals, weather, and various other Naval traffic. As we have reported in *QST* [1], it was finally retired, with honors, from active service to the fleet. Later, for a short time, it was used in connection with the Navy's reserve training program. Now, however, it has been recalled to active duty. What could be more fitting than the use of the call NAA by the Navy's newest shore radio station — the most powerful radio station in the world, U. S. Naval Radio Station, Cutler, Me.

* Managing Editor, *QST*.

[1] *QST*, Sept., 1956, p. 9 and p. 17.



This thousand-foot tower, guyed at three levels, supports the center of each star-shaped pattern. The "helix" house at the bottom contains the loading coils which match the coax cable to the antenna itself.

Very Low Frequency

Two million watts! The words alone are overwhelming, but at first sight the actual installation is almost beyond comprehension. Everything is king-size.

When operating at full power the antenna is fed by four separate 500-kw. final amplifiers, each with eight ML-6697 air-cooled tubes operating in push-pull parallel. The antenna consists of some 62 miles of one-inch copper cable supported by 26 towers in a double star pattern, with the towers ranging in height from 800 to 980 feet. The antenna insulators are 75 feet long. The coax cable is a foot in diameter! The antenna loading coils and variometers, located in an aluminum-lined house at the base of each down lead, tower some 50 feet above an awed spectator. Four huge diesel engines of some 3850 horsepower each drive the generators to develop the necessary power. This required power reaches a peak of some 12 million watts when deicing of the antenna is required during storm conditions.

This is a fabulous installation!

Familiar Techniques

Every aspect of NAA is so immense that a little time elapses before you suddenly realize that most of the techniques in use are right in *QST* and other League publications. Here are a few examples.

The v.l.f. antenna system makes one of the most impressive horizons you will ever see, stretching some three miles from north to south, and as you stand in the midst of that antenna farm and look up, it is quite overwhelming. But hold on a minute — this turns out to be

nothing more or less than a highly efficient Marconi antenna. The general layout is shown in the photo on page 80. The horizontal wires serve as a capacitive top loading, while the vertical leads actually do the radiating. Efficiency is increased by the presence of some 2200 miles of No. 6 copper wire radials, buried beneath the towers and extending off into the sea on three sides.

When all four finals are on the air, the output impedance is about four ohms. This is matched two 100-ohm coaxial cables (each feeding one-half of the array) by means of an L network. Norm Matlack, K5SYL, senior project engineer for Continental Electronics, told us that when he was first tuning this monster up, his constant guide was a series of articles[2] on impedance matching written by ARRL Technical Director George Grammer, W1DF.

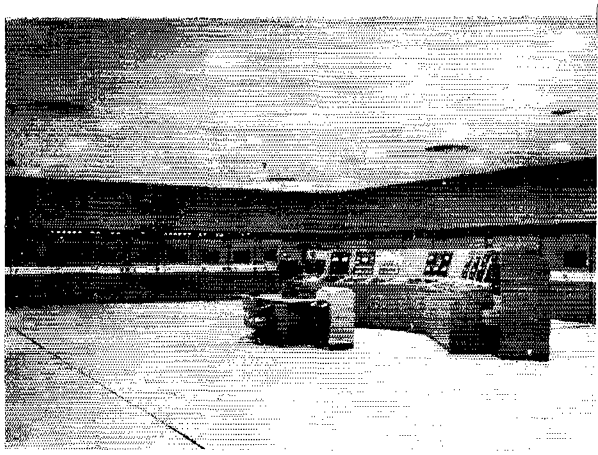
The Navy calls one a helix and the other a variometer, but together these two large items are simply for the purpose of providing bottom loading of the antenna. The matching section to the bottom end of the loading coil is gargantuan in aspect, but is right out of the *Antenna Book*.[3] The last 600 feet of the coax cable to each array (and each run is about a mile) go through a seven-foot concrete-pipe tunnel which has been lined with copper. The coax cable has a slot in it, and a motor-driven contactor controlled by the operator on watch a mile away. We use the same thing in ham radio, only we have ½-inch coax (for high power!) and 1-inch pipe for the folded skirt.

So it is with the entire v.l.f. transmitter. It's big and it's complicated; but it uses techniques that are familiar to each of us. But familiar as the techniques may be, it isn't every day that you can stand in front of a transmitter console and see one meter that reads 12,000 plate volts and another one that shows some 200 plate *amperes!*

Power like this calls for many safety precautions. An intricate interlocking system prevents entry into any of the transmitter spaces while power is on — this protects the personnel. There are also a multitude of devices to protect the equipment in case of component failure, and at 12,000 volts a component failure can mean fireworks! (I wandered into the v.l.f. building one morning but neglected to mention to the chief electronic technician who is in charge of maintenance at the v.l.f. station and who was making some tests at the time that I intended to take flash pictures. I was out of sight of the chief when I made the first exposure, and the instant that flashbulb ignited, there was a thunder of feet as Chief Miller and a couple of his men dashed over to see what had happened. Chiefs don't often chew out commanders, but I think he had it in mind!)

High-Frequency Transmitter

NAA exists solely to transmit traffic to the fleet and although the two-megawatt v.l.f. transmitter and its antenna are the more spectacular parts of the station, we mustn't overlook the importance of the h.f. section.



This is the control console for a two-megawatt transmitter. Driver stages and final amplifiers along the rear walls, with the "guts" of the units well-protected against accidental access.

In a separate building are a slew of lower-powered high-frequency transmitters. These run only 50 kw. or so(!) and are a production-line item used by many different services. These rigs operate between 2 and 30 Mc., and usually are transmitting simultaneously the traffic being broadcast on v.l.f.

Also at the h.f. transmitter site are some receivers, some corner-reflector receiving antennas for as low as 4 Mc., and various types of straightforward transmitting antennas.

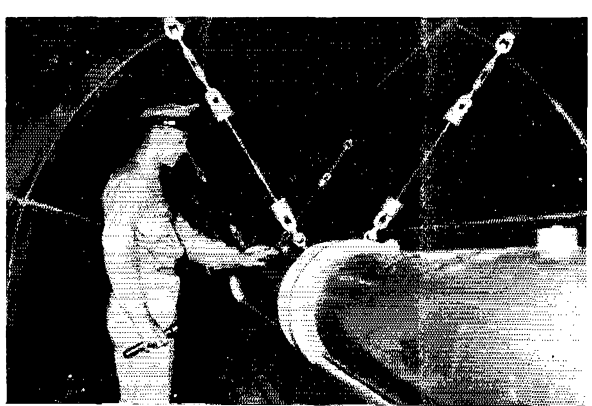
Personnel

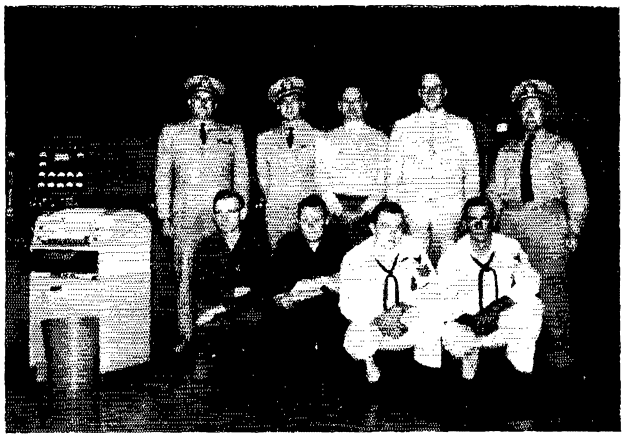
Wherever there is radio there are hams, and NAA is no exception, We ran across some eight hams during our visit there.

The commanding officer is W5HKP, Joe Zammit, Commander, USN. CDR Zammit has been deeply interested in amateur radio and the Navy for many years,[4] and before this assignment he was stationed at the Pentagon for nearly four years. There he initiated and carried to comple-

[2] "Simplified Design of Impedance-Matching Networks," Grammer, in three parts, *QST* March, April, & May, 1957.
[3] *ARRL Antenna Book*, Ninth Edition, p. 237.
[4] "Operation Deep Freeze," Zammit, *QST*, March, 1957, p. 48.

Ever see a man standing inside a coax matching section? Now you do! Master Chief Electronic Technician Swan, who is in charge of all maintenance at NAA, stands inside the copper-lined concrete tunnel mentioned in the text.





Personnel at NAA during July. Back row, l. to r.: Cdr. J. J. Zammit, W5HKP, commanding officer; Chief Warrant Officer "Pete" Ellison, K1QMK, operations officer; Norm Matlack, K5SYL, chief project engineer for Continental Electronics; Gene Gildow, K9JKL, Continental Electronics; Cdr. R. L. Baldwin, W1IKE, temporary duty. Front row, l. to r.: Bernard Ross, W1BSB, public works department; Russell Crossman, K1GWX; Bobby Barrymore, RM1, K1TBB; and Ted Miller, RM3, K2UTU.

tion such programs as ICT (Individual Craftsman Training), which pried loose surplus Navy electronics gear and got it into the hands of active naval reservists and amateurs, who used it for training purposes. He was a leading proponent of the Individual National Naval Reserve Radio Net, which is now functioning weekly [5] on Navy frequencies and which provides operating experience for radio amateurs who are naval reservists. And Cdr. Zammit pushed the shipboard use of amateur radio, something which had been taboo in the Navy for many years. Now, however, authority *can* be obtained to operate an amateur station on board a Navy ship.

Putting NAA into operating trim has been a busy job, and so W5HKP/1 doesn't get on the air very often yet. However, a kw. rig is all set to go, and sometimes you'll find him on 20 sideband, working his son, K4MJZ.

[5] "Strays", *QST*, Oct., 1960, p. 17.

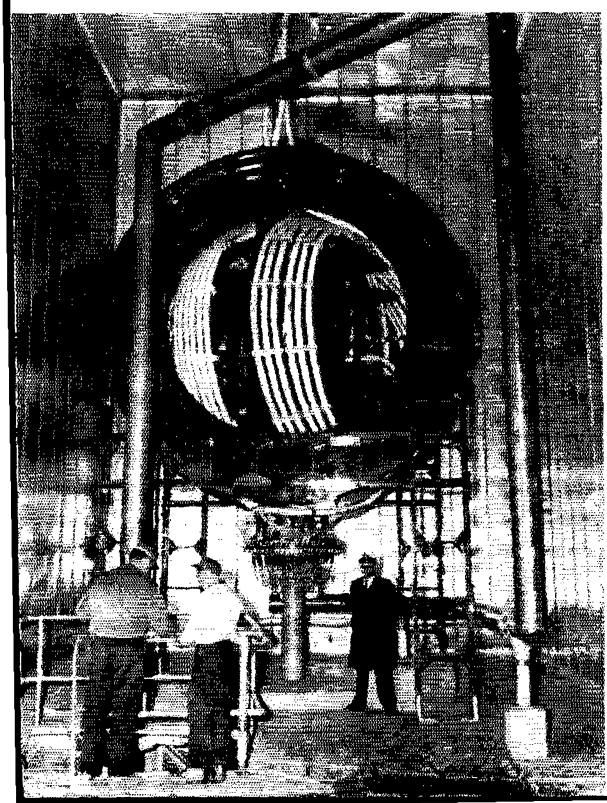
The operations officer, who is in charge of keeping the traffic moving, is Warrant Chief Officer "Pete" Ellison, K1QMK. Pete is pretty active on sideband with a kw. and a multiband vertical, and you may run across him on any of the phone bands between 40 and 10 meters.

K2UTU, Ted Miller, RM3, stands watches at the v.l.f. transmitter, and in his spare time has been running code and theory classes for would-be hams on the staff. K1TBB, Bobby Barrymore, RM1, stands watches in the operations room, which is the nerve-center of this radio station. Neither of these two fellows is on the air at the moment, but with aid of the skipper they are getting some gear together, along with a surplus house trailer, and will have a ham shack set up on the base before very long. The amateur call K1NIA has already been assigned.

The senior project engineer for Continental Electronics Mfg. Co. of Dallas, Texas, designers and builders of the two-megawatt rig and prime contractors for the whole station, is Norm Matlack, K5SYL. He has lived with this installation right from the beginning and, as we have mentioned earlier, found some *QST* articles of help in the initial tune-up. His right-hand man on the job is Gene Gildow, K9JKL. Both of these fellows have spent too much time on the world below 50 kc. the past couple of years to have much time left over for the world above 50 Mc.

Two civilian hams on the base are Red Ross, W1BSB, who has general supervision of all electrical maintenance at the station, and Russ Crossman, K1GWX, who also works on electrical maintenance. What with the lights for 26 towers, a power-generating plant big enough to supply a city of 50,000, and all the other electrical facilities, they have plenty to keep them busy.

(*Continued on page 168*)



Old-timers will recognize this monster as a variometer. It's used to tune the bottom end of the v.l.f. antenna, and is controlled by the operator on watch a mile away.

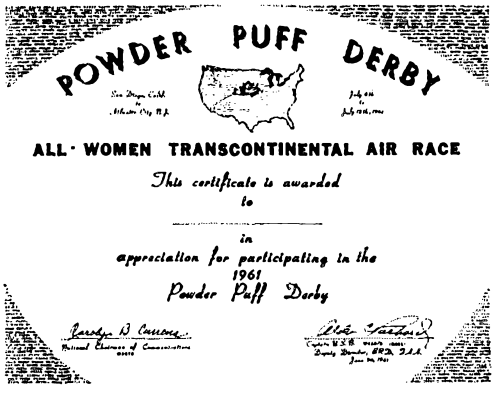
YL NEWS AND VIEWS

CONDUCTED BY ELEANOR WILSON,* W1QON

1961 AWTAR

Despite widespread adverse weather conditions and the crash landing of one plane, the fifteenth annual All Woman Transcontinental Air Race was pronounced a success by Air Chairman of the Board, Betty Gillies, W6QPI.

Ninety-seven TAR contestants flew the 1961 race route from Montgomery Field, San Diego, California, to the National Aviation Facilities Experimental Center airport near Atlantic City, New Jersey. Twelve airports along the flight route were designated as official refueling stops. Period of the race, known by the press as the "Powder Puff Derby," was July 8 through July 12.



Since 1947 the All Woman Transcontinental Air Race has been closely associated with the Ninety-Nines, Inc., an organization founded by Amelia Earhart in 1929 for women pilots. The only race of its kind in the world, the AWTAR is for stock aircraft only, not exceeding 350 horsepower, crewed entirely by women, and flown with the main object of beating one's own handicap "par" speed. It is flown during daylight hours only and under CAA visual flight rules. The race is financially supported by contributions from aircraft companies, industrial companies, Ninety-Nines members, and from cities and organizations at the start, terminus, and at the various route stops.

Among the diversified group of contestants are flight instructors, commercial pilots, former military service pilots, engineers, nurses, housewives, and grandmothers. The women hold all types of aviation licenses from private to commercial licenses, with single and multi-engine sea and land ratings, various types of instructor licenses and Airline Transport Pilot licenses. Three of this year's contestants have logged more than 10,000 flying hours apiece.

Mrs. Frances Bera of Long Beach, California won the race for the fifth time, having piloted winning aircraft in 1953, 1955, 1956, and 1958. Mrs. Bera flew a Beechcraft Bonanza E-35 at an average ground speed of 158.5 m.p.h.

Amateur Liaison

For the tenth consecutive year amateur radio operators engaged in special net operation to assist TAR contestants. Carolyn Currens, W3GTC, of Norristown, Pa., served as General Chairman of amateur operations for the fourth year. Amateur chairmen at each stopover city were aided by scores of operators along the flight route, who relayed such information as take-off and arrival times, weather conditions, progress reports, and personal messages.

Of the amateur assistance, Betty Gillies, AWTAR Chairman of the Board of Directors for the eleventh year and a ham herself (W6QPI) summarized "Carolyn, through her ham network, always knew where every flier was — a tremendous help to us!" Betty invited TAR contestant #59, Nancy Bird Walton of New South Wales, Australia, who was impressed by the amateur network, to jot down her views of the ham tie-in with the race.

"Who's where? How goes it? Ask the ham! Part of the interest and fun of flying the race is to know each evening who is out in front, where so and so is, who landed at an undesignated field — in short, who did what?

"The ham operators play an important part and add to the excitement of the race by keeping us up-to-date. Often inconspicuous, tucked away in a corner of an airport building, in a hotel bedroom, or in a caravan, one had to dig them out, but when you found them it was always worthwhile.

"It was at Tucson I first met this efficient team. Fifty-nine of us decided to stay the night there waiting for the westerly tailwind that never arrived. I found the hams behind the weather office — four or five of them who knew where everybody was, what time they had taken off, when they had landed, etc. On a long list was every jolly aircraft. What fun it was to have this information — and what a saving in long distance telephone calls for the fliers and the Air Race Board.

"'Would you like to send a message?' asked a ham as I landed at El Paso. At Dallas a ham had a message from Montgomery, Alabama. One of the fliers had left her handbag behind. Would I bring it to her?

"Some of the operators had almost become part of the race, like Evelyn Ewing, K5TXQ, at Shreveport. Evelyn was at her rig for five days. She watched fogged-in airports like a cat watches a mouse, and the minute they were open Evelyn was going to have "her girls" in the air. There were 87 aircraft between Shreveport, Jackson, and Montgomery airports. When one plane took off five hundred miles away, we knew immediately because Evelyn told us.

"At *every opportunity the hams were on the spot*, trying to be as helpful as possible. How much we fliers appreciate all that they did for us throughout the 1961 Powder Puff Derby."

*YL Editor, *QST:* Please send all news notes to W1QON's home address: 318 Fisher St., Walpole, Mass.

Report from W3GTC

From General Radio Chairman Carolyn Currens, W3GTC, comes the following brief summary of amateur activity that accompanied this year's race.

"At last the 15th annual AWTAR is history. Everything that could possibly happen did. For the first time the time of the race had to be extended twice. As far as communications are concerned, we had an aurora, thunderstorms, long skip on 40 meters and one day the bands all went dead for several hours.

"There were some nice things, however. For four years I have tried to get the whole net on sideband. This year I finally did it. Also, the 20-meter schedules with the west coast at night worked very well. Many of the fliers commented on how well the net worked and how glad they were that we had an amateur net.

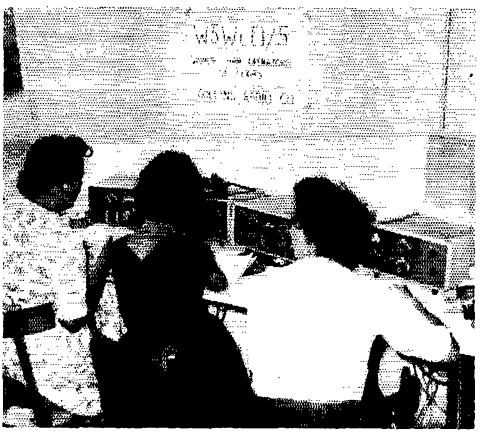
"This year we are sending a certificate to all amateurs who participated. These were designed at NAFEC, where we had our terminus, and I think they are worth having. I will be handling the race again next year."

In Montgomery, Ala., Betty Collier, K4ZNK, was radio chairman. *(Photo by K4DOL)*

Standing by for contestants' arrival and departure times at Dannelly airport in Montgomery were Jack Giddens, K4DMN, Ken DeBardelaben, W4FHH, and John Plott, K4PFM. *(Photo by K4DOL)*

Getting communications rolling at the race start in San Diego were Kathy Kresyler, K6AWP (left), and local chairman Barbara Davis, W6VSL.

Three of the El Paso team—Wade Williams, K5ILG, local chairman, Betty Behan, K5YOY; and Erv Williams, W5KOK (l. to r.). *(Photo courtesy El Paso Times)*



The backs belong to Pat Hubert, W5SPV, Bernell Johnson, K5GBX, and Jean Olds, K5PLC (left to right), three of the WHOOT club members who maintained communications at the Dallas stop-over.

(*More on page 168*)

Correspondence From Members-

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

THE RIGHT TRACK

I wish to express my thanks to the League and *QST* for all the help they have given me in my work with amateur radio.

At the age of eight years, I decided amateur radio was for me. I got a set of the "Gateway to Amateur Radio," and I began to study with the help of many friends, the League books, and W1AW. I finally acquired the Novice license in July, 1959, at the age of twelve. I used the *License Manual* and the *Handbook*, and I copied W1AW every night to get my code speed up. In July, 1960 at age thirteen, I received my General license.

During my Novice Class days, the League had been helping me with its books and *QST* to improve my operating ability and the operation of my station. Every *QST* article continued to be of value to me, whether it was a technical article which increased my knowledge of theory; a construction article which I could not use or could not afford, but which increased my knowledge of circuitry, or a construction project which I built.

Recently in the "Correspondence from Members" column, I've read several letters condemning *QST* for certain articles. No article will directly benefit every reader, but if we try to find something of value in each article, we all get the maximum value out of what we read. — *S. Merrill Weiss, WA2HJD, Paulsboro, N. J.*

I wish to thank you for your letter of welcome to the amateur ranks and the booklet *Operating an Amateur Radio Station*.

Perhaps some might think I got the cart before the horse by taking membership in the ARRL before becoming an amateur. I have been an associate member about two years and before that I bought *QST* from the newsstand. *QST* has been a great help to me and I always look forward to the next issue.

My first transmitter, which is under construction, will be from *QST*. — *Robert L. Williams, WN8ABX, Charleston, W. Va.*

DECEMBER INDEX

It gets tiresome to see letter after letter in which people complain about what is published in *QST*. I think that they forget how diversified our hobby is. That is what makes it so wonderful — there is something for everybody, no matter what their interests. It is a shame that some fellows have to get so cynical because a certain issue of *QST* might not be devoted completely to their little corner of the hobby.

I think that everyone concerned would be more than a little surprised with how much is really in *QST* if they pick up the December issue and scan the complete index in the back. In 12 months there are many more interesting items to look back on than what one might find in the single issues, even if they read them "cover to cover." — *Daniel F. Onley, K4ZRA, Owensburg, Kentucky.*

THE SIMPLE THINGS . . .

I'd like to congratulate you for including in the August issue "My First Transmitter" by K4VGQ. I'm sure a great many readers were as impressed as I. This brief narrative is indeed a symbol of ham radio's very essence. It is a literary masterpiece of simple integrity which even makes the accompanying photograph unnecessary in conveying an impact which should endure as long as there is ham radio.

The work deserves repeated reading, especially by those about to run off to buy a piece of commercial gear — just so as to "keep in touch," as it were. — *Donald F. Meadows, W6ZGM, Richmond, California.*

SOUTHERN NEIGHBORS

I've come to notice how rare it is for a U. S. station working DX to even attempt speaking a few words of that DX station's own language. Since I take Spanish in school, I've tried to converse with our southern neighbors, usually with little real success! Even so, it seems to bring us closer, by having him realize that we just might be trying to understand his world and the way he lives. Yet more important is the establishment of an attitude of mutual respect.

Since it is impossible to learn most languages of the world fluently, we could write the basic words and phrases used in a QSO in this DX station's native tongue on paper or 3 × 5 cards. Of course, if you get involved in a long ragchew you might say you're just learning! For those languages not using our alphabet, the English equivalent should be sufficient. — *James Talens, K3MNJ, Philadelphia, Pa.*

I'm a sophomore in high school and only a Novice who probably shouldn't be speaking up in church yet but I wanted to agree wholeheartedly with K8HFJ (Correspondence," August *QST*). If a radio amateur can speak a foreign language he should be permitted to operate outside the U. S. fone bands. As I mentioned, I'm only a Novice but I have worked over a dozen Spanish-speaking amateurs. They're all overjoyed when I can come back in Spanish, even as poor as mine is. Why not have endorsed licenses for those who can handle foreign languages with reasonable fluency that would permit the holders to operate in sections of the 10/15/20 meter bands other than the U. S. fone bands, possible in special segments? To qualify for the endorsement the applicant would have to show proof of having passed at least 2 years of the language in school or would have a sworn statement from someone who had that the person was reasonably fluent in the particular language. . . . The FCC could think up some devilish penalty for non-endorsed off band operation. Any suggestions, group? — *Lowell Ponte, WV6ORS, Redlands, Calif.*

I firmly stand behind K8HFJ, most of it at least. I am also a junior in high school and did study first-year Spanish. Although I didn't take it out to such extent, I do *try* to speak their language. I do not, however, believe in the proposal in that we be given certain segments or power limitations. — *Judson F. Whatley, W4NZJ, Cedartown, Georgia.*

WIDE SIGNALS

I read in your magazine about suspensions and revocations, etc., because of illegal tickets, Novices working 75-meter phone, etc. Do the hams with extra-wide a.m. phone rigs ever get their wrist slapped?

Listening (I do a lot of that), I read the mail on some that are better than 20 kc. wide!! My equipment is up to par enough so I can check very accurately and they are not locals with our antennas tied together.

I've checked them on a scope and listened to their "hen scratching" 15 and 20 kc. wide. Whatever happened to the old 6-kc. slots? — *Jack Patterson, K2RJU, Jamesville, N. Y.*

WHICH COMES FIRST?

Regarding the letter from VK3AKZ, Victoria, Australia, it would seem that "their" system makes more sense than "ours," since the units of time are in sensible progression. However, it also seems as though the only objection to using the "29 Jul 61" system would be that languages other than ours would have different abbreviations for the months. Any other objections? — *David E. Earls, W9BCZ, Indianapolis, Indiana.*

DO SOMETHING ABOUT CB

Been reading all the QRM lately concerning amateur gripes about Citizens Band operations.

Some of the statements by fellow "Hams" are on the extreme side. I would remind all amateurs that the "Ether" is the property of all the citizens. The FCC acts as "agent" for the people by making rules and allocating frequencies, etc.

The amateur fraternity could follow the lead of the Petersburg Amateur Radio Club of Petersburg, Virginia and do something about CBrs.

The PARC made a drive for all interested CBrs to attend

(*Continued on page 168*)

The World Above 50 Mc.

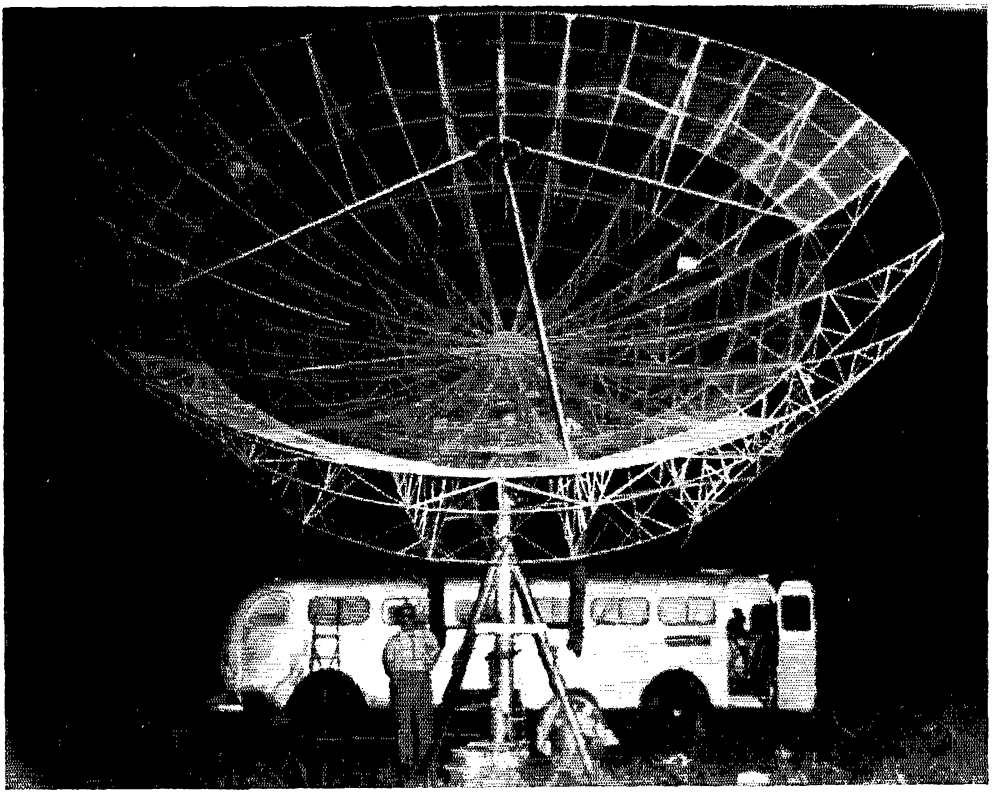
CONDUCTED BY SAM HARRIS,* W1FZJ

PERHAPS the old argument about how much power is enough will never be settled. Surely the low-power transceiver boys will never be happy when their high-power neighbors come on and blank out their whole band. Oddly enough, the use of high power by stations at least 100 miles away is considered perfectly acceptable by the same stations, their complaint now taking the tack "that guy ought to fix his receiver so he can hear me." I guess a case could be made for the type of operators who are only interested in low-power local type of operation, but I was reared on a sterner diet. It seems to me that a genuine ham-type fellow has a duty to the pioneers who went before him.

Are we to believe that the sweat and tears put into the v.h.f. by the Ross Hulls and Boyd Phelps of yesteryear were for naught? Should efforts to advance the art stand still while a couple of ersatz hams discuss the merits of the latest type of push button? I think not. I believe that anyone worthy of the title of "Ham" should be willing to protect himself in the clinches. Ignorance is surely, in this case, no excuse. The number of dissertations, papers, articles and talks rendered on the noble art of receiving signals through interference is as long as ham radio itself. I do not think that every ham should be an expert on it but if he isn't, he should be willing to admit that he is deficient in the technical aspects of his hobby. It doesn't take a Ross Bateman to figure out why a Communicator drops dead when a high-power station comes on in the same half megacycle. And blaming the high-power station for your troubles is about as sensible as blaming an s.s.b. station for not having a carrier.

Now it is (unfortunately) true that there is no regulation which requires you to have a receiver, (and, believe me, if you are experiencing overload problems, you don't have one), but there is a

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



W8LIO's almost-completed 26-footer for 1296 Mc.

little item about having an independent means of checking your frequency. What this regulation means is that you are supposed to be able to tell whether your transmitter is operating within the band limits or not. If your "independent means" has an accuracy of 50 kc., then you should never operate any closer than that to the edge of the band. The number of A3 stations operating on or below the edge of the six-meter phone sub-band is positively appalling. One of the proud traditions of amateur radio has always been our ability to police our own bands. (There is a dire need for qualified Official Observers to perform a public service on the 50-Mc. band. Your local SCM will be happy to supply you with the details on how to apply for this appointment.) The contemporary tendency to treat it as a joke is insulting to the honest amateur. Please be advised that the frequency printed on your crystal is to be treated only as a guide to which portion of the band that you are likely to be in. It does not constitute an independent means of checking your frequency. But it could be. If you don't know how, I would suggest you read Chapter 21 of the *Handbook* and find out.

Here and There on 6 and 2

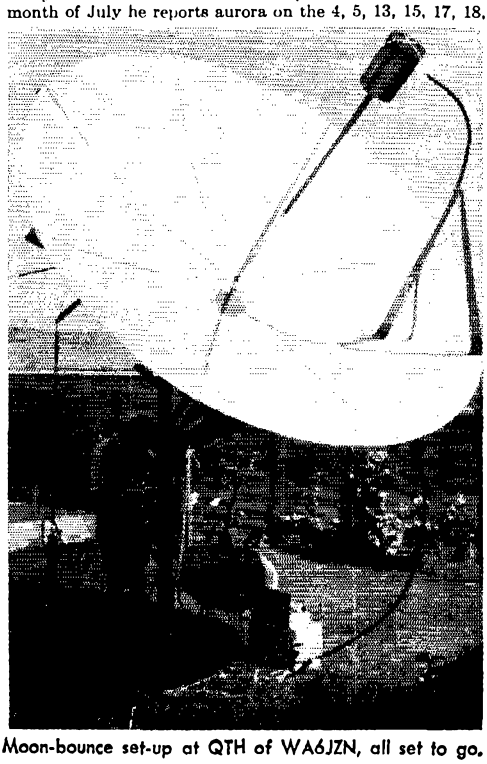
Our thanks to Rosalind, W9LGR, for the following information concerning a six-meter DX station: "Doug, W9ADM/KC4AAB, has asked me to drop you a line and let you know what's happening on 50 Mc. down at Ellsworth Station, Antarctica. He has recently put a kw. station on 50.015 with an automatic keyer that puts out a combination of dots and dashes. This is a 24-hour-a-day operation." We don't know what kind of antenna, receiver, etc., that Doug is using but a kw. sounds good, and I'm sure a lot of antennas will be turned "that-a-way" for a while.

In Virginia, K4VWH, Don, worked K1OAA for number 48 during the v.h.f. contest and is probably the first Virginia station to get that No. 48. Now, as Don says, after getting the 48 in nineteen months, he'll probably just have to "sit and wait" for the hard ones. On the week end of July 1, 2, and 3, W3BWU worked KP4AWL, KP4CK, KP4AZP, XE1OE, TI2NA and VE1BC *on* 50 Mc., all on *phone*. Ed suggests that the v.h.f. gang pay more attention to propagation and they'll probably get a lot more out of operation. Highlights from a letter received from Bob, W9MIVM, report (as many others do) that this has been a good year for sporadic *E*. Bob also mentions the great amount of s.s.b. activity, centered mostly between 50.1 and 50.12. A few of the highlights from Bob's letter state that on May 28 he worked K5VFY, who QSLed immediately, thus making it 47/47 for W9MIVM. On that same date he heard VE6OQ, VE5XP, VE6UV and VE6MO. VE5XP and VE6UV were the ones worked. (At least he did manage to snag one from each call area.) June 4, according to Bob, was one of those "wild openings" with all areas heard except 6 and 7 lands. Even heard VE3 and VE5. June 29 VE4QZZ was heard. Between June 29 and July 16 more s.s.b. stations were worked by W9MIVM than a.m. stations, and many times were good copy in Madison, Wisconsin, when no a.m. stations were being heard at all. Some of the rumors heard by Bob during the recent openings are reports of KL7AUV being worked in Florida and New England, FA 5 being heard in New England, and scattered reports of stations either hearing or working TI, KZ5, KV4, VP5, CO, and northern South America. We've heard some of these rumors too, but have had no such reports from the stations involved. Fact or Fiction! We just don't know! Second-, third- or fourth-hand reports just don't support the facts on most occasions; we'd like to report 'em all but can't do it without reports from the stations who "dood it".

An active sidebander on 50 Mc. from the west coast is K6QXY, who is presently doing quite a lot of scatter work on six meters. Bob works W6FZA regularly, about 230 miles, and gets many, many "pings" from the boys out of Los Angeles. Another of Bob's frequent contacts is K7JTG, 600 miles, on meteors. Frequency of K6QXY is 50.110 and operating times are 0800 to 1000 PDT on Saturdays and Sundays, and he will be happy to make and keep schedules with any s.s.b.ers interested. To date Bob's score is 49 confirmed with Alaska still to go on a.m., and 20 on 2-way s.s.b. Pretty good score! Another active s.s.b. station who is doing scatter work at the present time is Ken, K6HCP, who has hopes of a constant path to Phoenix, Arizona, and K7JTG. Ken and K7JTG have contacted with good reports both ways but because of conflicting schedules have not as yet been able to make it a regular thing. Skeds with W6FZA, 220 miles, have also been quite successful every week end. Ken would like to set up skeds with anyone on 50-Mc. s.s.b. within a radius of 1000 miles.

For the many stations needing New Mexico we're glad to let you in on the fact that K5IQL, Frank, is now on s.s.b. running 30 watts but expects to have a kw. on s.s.b. very shortly. We slipped a bit when we said that Ken, K6HCP, is on 220-Mc. s.s.b. — he is *not*; only on 50-Mc. s.s.b. Word from W8MBH, Reg, in Detroit, Michigan, says that numerous six-meter men in that area are getting set for s.s.b. He also passes along the info that during the storm of July 23 (tornado alert) several towers were toppled over. A faithful news sender is Ray Clark, K5ZMS, who sends detailed reports of his activity on the air. One of the most interesting things we've heard of during the present season, taken directly from Ray's letter, follows: "On July 13, 1961, at 0608 GMT, heard a JA1 on approximately 49.975 on a.m. for about 15 seconds. Was so shook could not even speak English right, let alone Japanese. Called and called, using both, but no results. Beam headed approximately 312 degrees. No one on the band but me at the time. Would very much like to know who the JA1 was. The first letter of his call was either a C or a V." Hope you do find out, Ray, and that you do it by working him via six meters — soon. The end of the month of July found Ray with a "States Worked" total of 40 worked and 36 confirmed. He also mentions that he frequently hears stations above 51 Mc., that activity is definitely "going up in the band".

Most complete report received on aurora for the month of July was sent in by Dick, K1CXX/1, Winthrop, Maine. Don't know whether it's 'cause he's farthest north or if he just listens more than the rest of the gang, but Dick reports many more auroral sessions than any other station. For the month of July he reports aurora on the 4, 5, 13, 15, 17, 18,



Moon-bounce set-up at QTH of WA6JZN, all set to go.

Taken at the "6 Meter Club of Chicago" picnic on August 6, and reading from left to right: Unidentified YL whom we suspect is XYL of K9LTC who is next to her (Pres. of Club), next W9JFP in "Moon-Bounce" hat, which he claims "gets the girls"; then Brownie, W9ROS; Steve, W9EAN; Gil, K9WUI.

and 27. Dick was one of the many who worked VE8BY and on that same night, July 4, also heard VE4CV and VE4YW and worked VE4YW for a new VE district. Almost worked VE5VL (50.4) but band left before reports could be exchanged. According to Dick all the VEs had one thing in common; rapid QSB and with the b.f.o. on, a T9 carrier with no trace of aurora. Dick was also one of the fortunate ones to work K3MJV/VO2 during the evening of July 13, with 5/7 reports both ways. WA2HFI, Fred, mentions that during the auroral sessions of July 4 and 9, he was hearing Florida stations and during aurora on the 10th into the Gulf area. W9MVM also mentioned the auroral session of July 17, but replies he received after calling CQ were on a.m. and too garbled to copy. Dave, KØLCB, worked W9QUV during the aurora of July 27 at 1500 CST. He also heard several A3 signals from 9 land. On July 21 Dave observed auroral *Es* to Brandon, Manitoba (VE4YW) and then to Yellow Knife, N.W.T. (VE8BY). Later the same night he worked VE5DA. WA2BAH has set up shop for the summer in Niskayuna, New York (near Schenectady), and has gear set up for 50 Mc., 144 Mc., and 220 Mc. During the June contest, Stan worked four new states, Texas, Arizona, California and Idaho; and then on July 4 worked XE1OE and WØCOE in South Dakota for state number 39. Stan is using an NC303 with converters for 50, 144 and 220 Mc.; the 6N2 (100 watts phone, 150 watts c.w.) for transmitting. Antennas consist of 4 elements on six, 18 elements on two and 2 220-Mc. yagis stacked (10 elements each), these all stacked atop a 40-foot tower.

We have it on good authority (W7RT) that Sunday, July 16, can now be called "Texas Day". Between 5 and 7 P.M. PDST on that date, John had QSOs with 33 different W-K5s in Texas. At the same time he was hearing a few stations in Florida, Colorado, Nevada, Nebraska and Minnesota plus many California stations. John sez it has been possible to work 48 states during the last few months and that he has heard 'em, mostly on sporadic *E*, single and double hop. Down Madison, Tennessee, way, Julian, W4YRM had his share of DX during July when he worked Pennsylvania, New Jersey, Texas, Colorado, Nebraska, Massachusetts, Connecticut, New York, Virginia; all of these between July 8 and 17. Julie runs 150 watts c.w. and 125 watts on phone on 50 Mc. K6SIX sez there were quite a few band openings during July but due to a heavy work load was unable to operate very much. He's hoping to get the six-meter beam back up in the air very shortly. I've noticed that a number of the gang have said practically the same thing "Due to the heavy work-load I've not been very active" or "Although six is still very good, I haven't done too much operating this month"; wonder if it could be 'cause they're trying to get caught up on the things they neglected to do during May and June while the band was really "hot". Helen gives the same reasons for not being on the air quite so much during July. K4FLR tells us that he now has eleven states confirmed on 50 Mc. with about ¾ watt final power from the antenna. He has them as far as New Hampshire, Oklahoma and Louisiana. Dick also mentions that there are two hams in Gainesville, Georgia, now, himself and K4UVD. K4UVD is using a Gonset and K4FLR uses a Heath Sixer. Another Georgia observation, this time from Walt, W4FWH, who sez there were not as many openings as during June, but some rather unusual openings.

Walt, W8BAN, and his XYL, K8YKW, both worked VE8BY on July 28; first time for K8YKW but a re-do for Walt. Walt would like to hear from anyone in West Virginia, Kentucky or Tennessee who would like to work out skeds on six and two meters. He is presently working on stacked 6-meter long-john beams for 6. We do skip around the country (an' isn't six jus' won'erful! — *Helen*), this time Dave, K7BBO, from Tacoma, Washington, sez that he heard W6NLZ on forward scatter on July 16 and 23. Sez it's been a good year for him for hearing the 5s and 6s, but expects the band to start dropping out soon. Another Dave heard from is WA6BFC who sez that the band has been open 50% of the time (during July) to Texas, Mexico, and the east in general. He is using a six-element 6-meter beam 85-feet high and says "amazing what height will do!" W4UVU/W4RWG is operating a beacon transmitter on 50.72 Mc. 50 watts to a 4-element beam usually directed north. Often changed to NE and West. No specific times of operation but

220- and 420-Mc. STANDINGS

220 Mc.				420 Mc.			
W1AJR	11	4	480	W9EQC	11	5	740
W1AZK	9	3	412	W9JCS	5	2	340
W1HDQ	11	5	450	W9JEP	9	4	540
W1OOP	12	4	400	W9OVL	6	3	475
W1RFU	15	5	480	W9UED	4	4	605
W1UHE	11	4	385	W9ZIH	10	5	500
W2AOC	13	5	450	KØDGU	5	3	425
K2AXQ	8	3	230	KØITF	6	3	515
K2CBA	13	6	650	KH6UK	1	1	2540
K2DIG	4	3	140	VE3AIB	7	4	450
W2DWJ	15	6	740				
W2DZA	12	5	410	W1AJR	10	4	410
K2KIB	12	4	300	W1HDQ	8	3	210
W2LRJ	10	4	250	W1MFT	8	3	170
W2LWI	12	4	400	W1OOP	11	3	390
W2NTY	12	5	300	W1RFU	7	4	410
K2PIZ	11	4	190	W1UHE	6	4	430
K2QJQ	13	5	540	W2AOD	6	4	290
W2SEU	4	2	150	W2BLV	12	5	360
K2UUR	4	3	105	K2CBA	5	3	225
W3AHQ	4	3	180	W2DWJ	10	4	198
W3FEY	10	5	350	W2DZA	5	3	130
W3JYL	8	4	295	K2KIB	4	2	100
W3JZI	4	3	250	W2NTY	3	2	100
W3KKN	10	4	255	W2OTA	9	3	200
W3LCC	8	5	300	K2UUR	7	3	175
W3LZD	15	5	425	K3EOF	6	3	250
W3RUE	9	5	450	W3FEY	7	3	296
W3UJG	13	5	400	W3RUE	2	2	96
W3ZRF	5	4	112	W4HHK	5	4	550
K4TFI	8	4	400	W4VVF	7	4	430
W4TLC	4	1	165	W5HTZ	3	2	400
W4UYR	7	5	220	W5RCI	9	3	600
W5AJG	3	2	1050	W6GTG	1	1	180
W5RCI	8	5	700	W7LHL	2	1	180
K6GTG	2	1	240	W8HCC	3	2	355
W6MMU	2	2	225	W8HRC	3	2	250
W6NLZ	3	2	2540	W8JLQ	4	2	275
K7ICW	1	1	250	W8NRM	3	2	390
K8AXU	10	5	1050	W8PT	5	3	310
W8IJG	9	5	475	W8RQI	4	2	270
W8LPD	6	4	480	W8TYY	7	4	580
W8NRM	8	4	390	W8UST	3		255
W8PT	10	5	660	W9GAB	9	4	608
W8SVI	6	4	520	W9AAG	5	3	375
W9AAG	9	4	660	W9OJI	6	3	330

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

usually in the afternoons and evenings. W9AQW reports extended ground-wave on July 5 when he heard five states, the farthest being Iowa. Another from Indiana, K9PNP, reports openings of July 10, 11, 12, 18, 20 and 28. On the 10th to 2 and 3 lands plus Florida; the 11th to Arkansas, Texas and Louisiana; the 12th to Colorado; the 18th to Texas; the 20th ground wave into Ohio; and the 28th into California. Cheryl says he's tinkering with a cubical quad for six which has worked fairly well. Just one difficulty — mounting! He has to take his 4 element down from the top of the tower by hand to mount the other one. Oh well! Just one of the fun things of ham radio!

Report through Dot, K9GIC, that KØIPB heard KL7AG calling a VO1 on the night of July 13 at 0445 GMT. VE4CV, Cass, was on or near the frequency and made the KL7 rough copy. VE4CV getting through to Kansas like a local. Dot gives us a detailed report of the July openings into Wichita, Kansas — just wish we had space to print the entire report. However, the band was open in her area for fourteen days during July and during that time she copied or worked 35 states plus XE1 and VE4. According to K9CDK, Forest Park, Illinois, six meters was open almost every day during the first two weeks in July. Most of the openings were to the west but a few were to the east extending from Florida to Maine. During the opening of July 8 he worked into Oklahoma City running 2 watts on six meters to a 3-element beam and received a 5–9 report. From Indiana K9TFJ says that July was less active than June (we're all all worn out!) for long skip but Florida and Texas were in for a part of each day. As almost everyone says: "Skip is far better than last year so far.". — Jim. We've had this comment in just about every card, note, letter or report received and are inclined to go along with it, but — remember the activity! Compare the number of active six-meter stations in your area against the number in the same area a year ago. It's difficult to say for sure, but there are definitely many, many more active stations on six meters than there were a year ago. Jim has worked and confirmed 35 states to date.

DXpedition

Word received directly from Charlie O'Brien, W2EQS/FP8AS, tells of his coming trip during the last week of September and the first two weeks of October to St. Pierre. Due to the generosity of the Johnson Company, Charlie will have the use of their newest rigs, the Ranger II, and will thus be able to operate on 50 Mc., on both c.w. and phone. He does not know as yet the exact frequency he'll be using but says it will undoubtedly be very close to the c.w. edge for phone. Charlie will be using an 11-element Telrex beam but will be unable to rotate it, so-oo-o it will be headed down W1 and W2 way for the duration of his visit to St. Pierre. (Sorry, fellas!) We sure all hope that you have the best of luck, Charlie, and you can bet that most of the 1s and 2s will have their beams glued up your way during that period of time.

This one we received "first-hand" from W8NOH: "On July 3 at about 1500Z, heard CO2EG coming in loud and clear 5/9 plus for about 15 minutes on 50.850. KP4AYZ on c.w., 50.060; unable to raise either. Called CQ and PJ2BR on c.w. came back from Aruba! First Michigan QSO!"

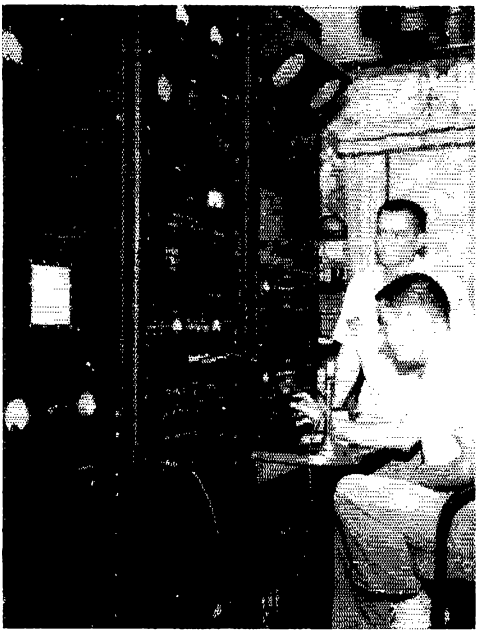
Perseids Meteor Shower

Most of the schedulers amongst the 144-Mc.DXers had some luck during the recent Perseids. Don, W1AZK, reports that results were very poor although he heard from the station he least expected to hear, WØENC, Rapid City, South Dakota, came through with pings and short bursts and complete calls on the 11th, 12th, 13th and 14th during their 2300 to 2400 EST skeds. Complete calls were received from W5JWL on August 10 and not a single "ping" after that. Also through Don we learn that W5FYZ made contact with W4WNH and WØBFB and received complete calls on a sked with W1JDF. K2LMG "made it" with W5JWL on their first sked on August 10. Thanks, Don, for the information. W2ALR brought his total on 144 Mc. up to 24 states when he worked W5FYZ during the Perseids. Larry sez he'd like to report something interesting but it's been rather quiet in his part of New York. Other than the tropo of August 17 (nothing new worked) when W9GIR was the loudest station coming through, and lots of other 9s and 8s coming through, nothing to report from W2ALR. Rex, W5RCI, brings us up to date on his 144-Mc. activity with his Perseids report. He worked George, W1MMN, in Vermont during their Perseids sked, for state number 37, on August 10. W5KFU reports great progress on his "states worked" total after successful skeds during the Perseids with K2GQI, W4WNH, WØMIOX and K4EUS. This gives Mike 11 states, 4 call areas and 1300 miles, which I'd say is a pretty good listing for the first one in the "2-Meter Standings" box. From Chester, Virginia, K4EUS, Sam, we received his report of the successful contact with Mike, W5KFU, bringing his total up to 25 states worked. Mike sez this is his first m.s. contact after about four years of

2-METER STANDINGS

W1REZ	32	8	1300	W5YYO	7	4	1330
W1AZK	28	8	1205	W5UNH	6	3	1200
W1KCS	24	7	1150	W6WSQ	15	5	1390
W1RFU	24	7	1120	W6NLZ	12	5	2540
W1AJR	23	7	1130	W6DNG	9	5	1040
W1HDQ	22	6	1020	W6AJF	6	3	800
W1MMN	21	7	1090	W6ZL	5	3	1400
W1IZY	20	7	1180	K6HMS	4	3	850
K1CRQ	19	6	800	K6GTG	4	2	800
W1AFO	18	6	920	W6MMU	3	2	950
K1AFR	17	5	450				
				K7HKD	13	5	1130
W2NLY	37	8	1390	W7JRG	12	4	1040
W2CXY	37	8	1360	W7CJM	5	2	670
W2ORI	37	8	1320	W7LHL	4	2	1050
W2GQI	33	8	1200	W7JIP	4	2	900
W3BLV	30	8	1020	W7UJ	4	2	235
W2AZL	29	8	1050				
K2IEJ	27	8	1060	W8KAY	38	8	1245
K2LMG	25	8	1160	W8PT	38	9	1260
W2AMJ	25	6	960	W8SDJ	27	8	1220
K2CEH	24	8	1200	W8IFX	35	8	980
W2ALR	24	8	1100	W8SFG	34	8	1040
K2DWJ	23	6	860	W8LOF	33	8	1060
K2HOD	23	7	950	W8RMH	32	6	910
W2PAU	23	6	753	W8GGH	32	8	1180
W2RXG	23	8	1200	W8BAX	32	8	960
W2SMX	23	7	1090	W8NOH	31	8	1090
W2LWI	21	6	709	W8SVI	30	8	1080
K2KIB	21	5	900	W8EHW	30	8	860
W2ESX	21	6	750	K8AXU	29	8	1050
W2WZR	19	7	1040	W8LPD	29	8	850
W2UTH	19	7	880	W8WRN	28	8	680
W2RGV	19	8	720	W8DX	26	8	720
K2RLG	17	6	980	W8ILC	25	8	800
				W8JWV	25	8	940
W3RUE	33	8	1100	W8WNM	25	8	900
W3GKP	31	8	1180	W8GFN	23	8	540
W3SGA	31	8	1070	W8KCV	22	7	880
W3TDF	30	8	1125	W8BLN	21	7	610
W3KCA	28	8	1110	W8GTR	17	7	550
W3BYF	28	8	1070	W8NRM	17	7	550
W3EPH	22	8	1000				
W3LNA	21	7	720	W9KLR	41	9	1160
W3NKM	20	7	730	W9WOK	40	9	1170
W3LZD	20	7	650	W9GAB	34	9	1075
				W9AAG	33	8	1050
W4HJQ	38	8	1150	W9REM	31	8	850
W4HHK	37	9	1280	W9ZIH	30	8	830
W4ZXI	34	8	950	K9AAJ	29	8	1070
W4LTU	34	8	1160	W9PBP	28	8	820
W4MKJ	33	8	1149	W9LVC	27	8	950
W4AO	30	8	1120	W9EQC	27	8	820
W4VLA	26	8	1000	W9OJL	27	8	910
W4EQM	25	8	1040	W9ZHL	25	8	700
W8AIB	25	8	900	W9BPV	25	7	1030
K4EUS	25	7	1130	K9AQF	24	7	900
W4WNH	24	8	850	W9LF	22	7	825
W4JCJ	23	6	725	W9KPS	22	7	690
W4VYE	22	6	720	W9CUX	21	7	800
W4RMU	21	7	1080	W9PMN	19	6	800
W4TLV	20	7	1000	W9ALU	18	7	800
W4IKV	20	6	720	WØBFB	37	9	1350
W4OLK	20	6	720	WØIHD	31	8	1030
W4RFR	18	9	820	WØSMJ	29	9	1075
K4YUK	18	8	830	WØLFE	28	7	1050
W4LNG	18	7	1080	WØQDH	27	9	1300
W4CPZ	18	6	650	WØRUF	23	7	900
K4VWH	18	6	597	WØINI	21	6	830
W4MDA	17	6	750	WØTGC	21	7	870
				WØRYG	20	8	925
W5RCI	37	9	1215	WØIC	19	7	1245
W5AJG	32	9	1360	WØMOX	19	6	1150
W5FYZ	29	9	1275	WØJAS	18	6	1130
W5JWL	29	7	1150	WØAZT	17	6	1100
W5DFU	28	9	1300	KØAQJ	16	6	1120
W5PZ	27	8	1300	WØIFS	16	6	1100
W5LPG	25	7	1000				
W5KTD	23	8	1200	VE3DIR	30	8	1330
W5ML	16	5	700	VE3AIR	28	8	1340
W5FSC	12	5	1390	VE3BQN	19	7	700
W5HEZ	12	5	1250	VE3AQG	18	8	1300
W5CVW	11	5	1180	VE3DER	17	8	1340
W5NDE	11	5	625	VE3HW	17	7	1350
W5KFU	11	4	1300	VE3BPR	14	6	715
W5VY	10	3	1200	VE2ABF	10	4	580
W5SWV	10	3	600	VE7FJ	2	1	365
W5EDZ	8	5					
W5YYO	7	4	1330	KH6UK	1	22	2540

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



K6QXY, Bob, at the controls with his OM, K6YIL, Frank, giving moral support.

working at it, and that more power, better receiver and bigger antenna put up higher, finally paid off. Jack, W8PT, didn't find the Perseids as good this year, although he had a QSO with WØENC, South Dakota, within six minutes of their first sked. (It was a new state for him.) Jack did work W5KXD for state number 38 on 144 Mc., and heard a few pings from W7LEE but no contact. Nothing heard from schedules with K7IDD in Utah, or K5TQP in New Mexico. Old regular, Leroy, W5AJG had two skeds during the showers; the one with WØIFS in Minnesota paid off and brought Leroy's two meter total up to 32 states worked. No luck on the sked with W1REZ in Connecticut. Three out of eleven skeds proved to be successful for Ernie, W5FYZ; the successful ones being W2ALR, New York; W4WNH, Kentucky; WØBFB, Iowa. Many long bursts were copied from K4EUS and WØAZT but just couldn't put them together for a legitimate contact. A 20-second burst was heard from W1JDF and a number of pings from W1AZK but that was it. Nothing at all heard by Ernie of WA6MLX or K7ICW although K7ICW reported hearing one complete call sequence from Ernie. We're very sorry to hear of the death of a well-known v.h.f.er in Louisiana circles; Martin Colvin, W5KTD, suffered a heart attack while aboard a survey ship off the Bahama Islands. If there are any 144-Mc. stations in Indiana, West Virginia, Delaware and North Carolina who would like to try m.s. skeds during the coming showers, Ernie, W5FYZ, in Louisiana, would be happy to hear from them.

Moon Bounce

K1HMU at Farmington, Connecticut, has his 144-Mc. moon-bounce set-up completed and is in operation on a more or less regular schedule. Operation is on 144.252 (give or take 3) kc. The antenna has 176 elements in clockwise circular polarization. Naturally, reception should be attempted using counter-clockwise circular polarization. Actually, as long as Ned has done all the work on his end to provide a solution to the faraday rotation problem, his signals can be heard on either of the popular linear polarizations as well. (Assuming sufficient gain, etc.) Transmitter is running 1 kw. input, and receiver has adequate selectivity and a good paramp in front. Unfortunately, by the time you read this his advance schedule will have been completed. If you weren't on his advance mailing list and are interested, I would suggest writing him for further information. W6MMU informs us that "The Two Meter and Down Club" have completed their 1296-Mc. moon-bounce receiving set-up and are in a position to start listening as of the 25th of August. Their set-up includes a paramp by Don and is using an eight-foot parabolic reflector on an equatorial mount. Details are hard to come by but will probably filter out of the boondocks as soon as they have had some success.

Meanwhile, at the other end of California, we have WA6JZN and W6AXN who have completed 10- and 16-foot polar-mounted dishes and are ready to listen. Gene, WA6JZN, has a W6MMU paramp feeding a W1OOP converter. I.f. is 16 Mc. to 455 kc. with crystal-lattice filter giving 400-cycle selectivity. An audio filter of the bridge type allows variable selectivity down to 8 c.p.s. Receiver lo string starts at 5 Mc. Ten-foot parabola is built using a system worked out by W6AXN. Mike has his 16 footer (made by the same process) ready to go and will be transmitting by the time you read this.

In Ohio W8LIO has completed the enlarging of his dish and now has a 26-footer in operation. Preliminary tests have been very gratifying and it is very likely that the first s.s.b. voice transmission will be accomplished in the next month. Jack has one of the UPX-4 transmitters and will soon have 300 watts of c.w. feeding his antenna. The UPX-4 uses 6 2C39A's in a ring amplifier and looks like the answer to a moon-bouncer's dream, as far as the transmitter is concerned.

One European effort on 1296 is nearing completion. Karl, DL3FM, says that the only remaining big effort is to get his ten-foot dish mounted on its roof-top polar mount. Karl plans to enlist the aid of a helicopter in moving the dish to its final resting place. HB9RG has been listening daily on schedule for W1BU. Transmission schedule at W1BU is too variable to supply a list. We operate on a twenty-minute notice and only as requested to do so. So far there are five active listening installations in the U. S. Only one active transmitter, however. QST

Strays

Boy Scouts in Canada will hold their fourth annual Jamboree-on-the-air October 21 and 22. Listen for VE3JAM on 3750, 7210, 14,196, 21,195, and 28,490 kc. Scouts who make contact with VE3JAM or other individual Scouts during this Jamboree will receive special "participation" cards, if they report their work to "Jamboree-on-the-air," Boy Scouts International Bureau, 77 Metcalfe St., Ottawa, Canada.

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The barge *Arizona Sword* sank in the Atlantic off West Palm Beach, Fla., on Jan. 13, 1961, and seven seamen lost their lives. If any hams happened to hear the radio communications between the barge and its towing tug prior to the sinking, please communicate with Attorney John R. Parkhill, 308 Tampa St., Tampa 2, Fla.

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The International Ham-Hop Club was designed to help amateurs on one side of the Atlantic visit with amateurs on the other side — cutting down the expense of foreign vacationing. The Club particularly wants members in North America. For further info, write to R. I. Gunther, W6THN-4, Biology Department, Brown University, Providence 12, R. I.

Operating News

F. E. HANDY, W1BDI, Communications Mgr.
GEORGE HART, W1NJM, Natl. Emerg. Coordinator
JOHN F. LINDHOLM, W1DGL, Ass't. Comm. Mgr., C.W.
ROBERT L. WHITE, W1WPO, DXCC Awards
LILLIAN M. SALTER, W1ZJE, Administrative Aide
ELLEN WHITE, W1YYM, Ass't. Comm. Mgr., Phone

Operation NCEF. In August *QST* we asked for comment on the National Calling and Emergency Frequencies. Thanks for all your responses and various ideas. One group is anxious to have the NCEF at 50.55 Mc. patronized widely "to better populate the upper part of 'six!'" Of course we're all for that. Another NCEF booster says to give an extra point for *receiving* messages via an NCEF to encourage more listening there. The dividends from general use of the *national calling and emergency frequencies* are ample without extras. That is, (a) ARRL message-points (for receiving a message, and relaying or delivery for a second point) come *easier* through use of an NCEF, and (b) finding states, for WAS or other purpose, is the reward for correct calling and consistent NCEF-plan listening sessions. W4IYT summed it up when he said: "The NCEF plan is an ideal mechanism to help make contacts with any locality at any time."

Like any doctor's prescription, there is no benefit, except to those who follow through on the directions. *For emergency*, after we find a given net or sked can't help, a QRRR on an NCEF is appropriate. The Red Cross and many c.d. Hq. will have monitoring receivers on the spots for local and statewide coverage. *For daily calling purposes*, an NCEF, since it has more listeners tuning back and forth across it, or monitoring receivers sitting there, will net better results. Short calls (3 x 3 suggested) with frequent breaks to listen and 15-minute spaced calls that hit new groups coming on the air, are calculated to get the answers. Let us also put the directional CQ, specific of direction, N-E-S-or-W, or of place, to work on the NCEF for a given band. We must do our personal share of keeping an ear bent to the NCEF in our favored bands at all times practicable too.

Here's to Your Test With the NCEF's (on the National Calling and Emergency Frequencies, that is).

C.w.:	3550 7100 14,050 21,050 28,100 50,550 kc.
Phone:	3875 7250 14,225 21,400 29,640 145,350 kc.

Note: Canadian frequencies are 3535, 7050, 14,060 kc. on c.w. and 3765, 14,160, 28,250 kc. on phone.

Prescription:

1. Use daily. Or each day you are in your shack and can be on.

2. Activate your regular or surplus monitoring receivers on an NCEF (above) to become part of a constant-alert amateur communications pattern.

3. If and whenever you hear pertinent calls, warm up your transmitter and make the contact. As soon as you are in QSO, shift to *any frequency other than* a C and E frequency to carry-on. (This is to leave the NCEF's for other stations and calls — only.)

4. Give yourself special reasons, objectives or purpose in a transmitting work-out on any or all the C and E's too — all during October, all during November. FILE AND START A FORMAL MESSAGE, AMATEUR RADIOGRAM. See if you can move it by NCEF's . . . either by relay or direct. LOOK FOR A GIVEN CITY OR A NEW STATE. See how nearly you can hit your selected communications objective, and how long it takes.

NCEF TIME-TEST — Oct. 1 to Nov. 30, 1961

In August *QST* we asked if you wanted an NCEF point-contest. We interpret your responses as for a test but without point formalities. We'll be glad to compile a report on results. This column then announces OPERATION NCEF . . . QSL cards or radiograms *only* required for reports. YOUR REPORT INVITED.

Eligibility and objectives: 'Tis a station operating test *for each amateur who is on the air.* Are we or are we not amateur communicators? Can we do a spot job of communicating, or only go off casually in all directions? How well can each of us make the NCEF's serve us?

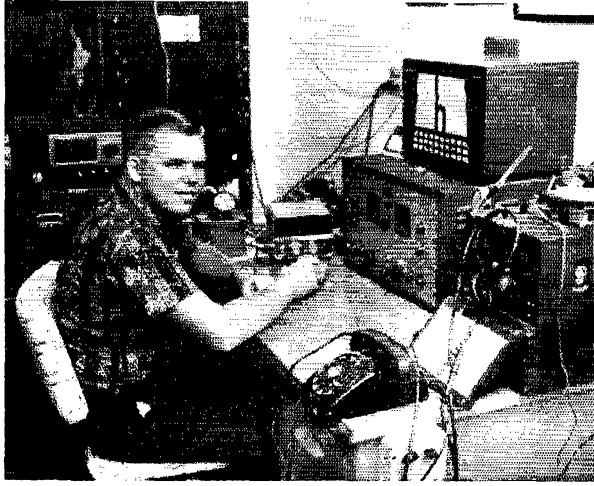
The test! Take one of the two following problems *to be solved exclusively by NCEF means.* REPORT how you made out with (1) or (2) to ARRL. (1) Select three states at random. Note the starting time and date, ANY TIME YOU PLEASE Oct. 1 to Nov. 30. Contact any amateur you can reach over the air from your own individual station in three states (one of which may be your own). (2) Prepare, start and move-by-radio one amateur radiogram, complete as to check and correct as to order of parts. Send it by radio to a preselected state, NOT your own, *by the NCEF method* of finding stations to relay or handle it reliably.

Report — QSL to ARRL! On your own QSL, or by radiogram give ARRL the following information.

Section Emergency Coordinators of the Amateur Radio Emergency Corps

The Section Emergency Coordinator is appointed by the SCM to take charge of the promotion of the Amateur Radio Emergency Corps organization throughout the Section. He acts as the SCM's executive in the furthering of provisions for emergency amateur radio communications in every community likely to suffer in case of a communications emergency. One of the duties of the SEC is to recommend the appointment of Emergency Coordinators for the various communities in his Section. Does *your* town have an EC? If not, recommend the name of a likely prospect to the SEC. The SEC invites your questions concerning the status of the AREC in your Section.

ATLANTIC DIVISION				
Eastern Pennsylvania	W3DUI	Emmet W. Kuehner	242 E. Broad St.	Hazelton
Maryland-Delaware-D. C.	W3CVE	Conan W. B. Barger	7512 Foster Ave., S.E.	District Heights, Md.
Southern New Jersey	K2ARY	Morris J. Mundell	315 Laurel St.	Carneys Point
Western New York	W2LXE	John S. Tyler	193 Avon Rd.	Tonawanda
Western Pennsylvania	W3OMA	Walter P. Remele	20 N. Howard Ave.	Bellevue 2
CENTRAL DIVISION				
Illinois	W9PSP	Jack Stanton	2632 E. 74th St.	Chicago 49
Indiana	W9SNQ	Leonard M. Chalk	815 West Arch St.	Portland
Wisconsin	W9BCC	Frank L. Guth	428 Ellis St.	Stevens Point
DAKOTA DIVISION				
North Dakota	KØKBV	Robert H. Dexter	514 First Ave., E.	Dickinson
South Dakota	W0SCT	Lester R. Lauritzen	Rt. 3, Box 32	Centerville
Minnesota	KØJYJ	Byron S. Malehow		Wilder
DELTA DIVISION				
Arkansas	K5CIR	Odia L. Musgrove	1321 W. Barraque Ave.	Pine Bluff
Louisiana	W5MNQ	A. L. Powell	224 Hollywood Drive	Metarie
Mississippi	K5QNF	Ed Russell	1322 Chambers St.	Vicksburg
Tennessee	K4OUK	Donald V. Goodin	109 Upsal Rd.	Oak Ridge
GREAT LAKES DIVISION				
Kentucky	W4BAZ	J. B. Wathen, III	391 Mockingbird Valley Rd.	Louisville 7
Michigan	W8ELR	Howard P. Estes	4010 Beach Rd.	Troy
Ohio	W8HNP	Arlington A. Garn	2979 Pemberton Dr., Apt. 2	Toledo 6
HUDSON DIVISION				
Eastern New York	W2KGC	William L. Stahl	Shirley Ave.	Fishkill
N. Y. C. & Long Island	W2ADO	Maurice Mulligan	Box 134	Westbury
Northern New Jersey	WA2APY	Daniel Earley	216 Grove Ave.	Metuchen
MIDWEST DIVISION				
Iowa	KØEXN	Ronald M. Schweppe	609 W. 9	Spencer
Kansas	KØIZM	William Peat	1623 W. Central St.	El Dorado
Missouri	KØLTP	Henry Miller	2033 Eureka	Springfield
Nebraska	KØTSU	John Spahr	705 W. 28	Kearney
NEW ENGLAND DIVISION				
Connecticut	W1EOR	John L. Henley	RFD 1	Andover
Maine	W1GRG	Robert Curtis		North Jay
Eastern Massachusetts	W1AOG	Donald F. Guptill	17 Park St. Court	Medford 55
Western Massachusetts	W1BYH/ K1APR	Norman Rivers	18 Saari Pkwy.	Fitchburg
New Hampshire	K1GQK	Howard Hook	RFD 5	Penacook
Rhode Island	W1PAZ	Thomas C. McCormick	1934 Smith St.	Centerdale 11
Vermont	K1DQB	Gerald E. Wood	RFD	Ferrisburgh
NORTHWESTERN DIVISION				
Alaska	KL7BES	Herbert R. Tresidder	1710 Snowcap Drive	Anchorage
Idaho	W7IWU	Alan K. Ross	2105 Irene St.	Boise
Montana	W7BOZ	Arthur L. Jaques	803–6th Ave., No.	Great Falls
Oregon	W7WKP	Jesse E. Parrish	P.O. Box 11	Sweet Home
Washington	W7HMQ	Everett E. Young	2217–5th St., S.E.	Puyallup
PACIFIC DIVISION				
Hawaii	W7JU	Ray T. Warner	539 Birch St.	Boulder City
Nevada	W6ZRJ	Jean A. Gmelin	1089 Huntington Drive	San Jose
Santa Clara Valley	WA6HYU	Mary Anne Eastman	210 Castle Hill Ranch Road	Walnut Creek
East Bay				
San Francisco				
Sacramento Valley	K6IKV	Antone F. Buzdas	4308—38th Ave.	Sacramento
San Joaquin Valley	W6EBL	F. E. Robinson	Sonora Motor Hotel	Sonora
ROANOKE DIVISION				
North Carolina	W4RRH	B. Riley Fowler	Box 143	Morganton
South Carolina	K4PJE	Woody Brooks	Box 355	Andrews
Virginia	W4VMA	Roy E. Ridgley	114 Patrician Drive	Hampton
West Virginia	W8SSA	E. Keith Chambers	P.O. Box 62	Bluefield
ROCKY MOUNTAIN DIVISION				
Colorado				
Utah	K7BLR	Ronald B. Twelves	1450 Harvard Ave.	Salt Lake City 5
New Mexico	W5BQC	Thomas A. Nichols	500 Capitan Ave.	Santa Rosa
Wyoming				
SOUTHEASTERN DIVISION				
Alabama	K4JDA	Leighton W. Steele, III	212 Murphy Drive	Birmingham 6
Eastern Florida	W4IYT	Andrew C. Clark	11 Lenape Drive	Miami Springs
Western Florida	W4MLE	George Thurston	3407 Brock Drive	Tallahassee
Georgia	W4PMJ	Harold M. Rosser	P.O. Box 146	Harlem
West Indies (Cuba-P.R.-V.I.)	KP4AAA	Ernesto Viera	170 Arizmendi St.	Rio Piedras, P.R.
Canal Zone	KZ5RM	Roger M. Howe	Box 462	Balboa Heights
SOUTHWESTERN DIVISION				
Los Angeles				
Arizona	K7NIY	George Mezey	P.O. Box 814	Sun City
San Diego	W6LYF	Harold Lindsay	4126 Falcon St.	San Diego 3
Santa Barbara				
WEST GULF DIVISION				
Northern Texas	K5AEX	Robert G. Bender	c/o OCDM Civil Defense	Denton
Oklahoma	K5KTW	Bill Lund	1220 South Owasso	Tulsa 20
Southern Texas	W5AIR	G. D. Sears	5634 Eskridge	Houston 23
CANADIAN DIVISION				
Maritime	VE1BL	C. A. Smith	Transmitter Bldg., R.R. 1	Lakeburn, N. B.
Ontario	VE3AML	Rowland Beardow	1899 Lakeshore Rd.	Sarnia
Quebec	VE2QN	Felix Edge	2604 de la Falaise Ave.	Sillery 10
Alberta	VE6FS	Walter Jordan	443 — 19th St., N.	Lethbridge
British Columbia	VE7FS	M. Don Hughes	P.O. Box 584	Kelowna
Manitoba				
Saskatchewan	VE5IG	Harold Gronsdahl		Congress



Contest and CD Party stalwart K4BAI, shown here at the rig, really came through in the July c.w. CD Party to outscore other brasspounders with 213,200 points. John (OO, ORS, and OBS) likes DX, traffic, and ragchewing as well as contests. His ability in the latter is backed up by four section awards in Sweepstakes.

(a) Is your report for NCEF-ONE or NCEF-TWO?

(b) Names of the 3 states *

(c) Calls of the three * you worked.

(d) Band(s) used or give NCEF frequency.

(e) Total elapsed time (days, hrs., minutes).

(f) Operating time spent at the rig using NCEFS.

(*N.B. One state and one call on NCEF-TWO reports.)

Either problem, one or two, or each separately, should be good fun. This is a time test and one that must be done on the NCEF's It's a fair shake to select the best band for the distances involved, if you can work all bands, as every amateur should aim to. We owe it to ourselves to be just as versatile as possible. But this test is not unduly to weight versatility, as such. It's fair, as we see it, if presently we are on one band only, to set our selection of objective one or two in that band, and see and report how we make out . . . for personal credit and to help evaluate each NCEF in the list.

Simulated Emergency Test — Oct. 7–8. ARRL's start-of-season demonstration is a must for every amateur. The test is to show our capabilities for Public Service. The kind of test is strictly up to you and your Emergency Coordinator as is the exact day, hour, and simulated contingency. It can be a quiet exercise that examines deployment of mobiles, tests the activation of emergency power at fixed stations, re-registers and expands the Amateur Radio Emergency Corps membership throughout the nation, and improves planning and execution.

Your Section Emergency Coordinator's name appears on the facing page. You can find the name of your local EC from him, if you don't already know. Our Emergency Unit Placards and AREC decals, available to AREC members from their EC, should be freely used by groups actively in the S.E.T. ECs should get statements from city, state, or agency officials if possible, as part of the exercise. Our S.E.T. should be but the first of a number of local radio exercises during the year to achieve the very best plans and radio coverage for possible disaster uses. Each group should review its own results and recruit and better the communications capabilities, whatever they are. Radiograms will be prescribed in the test and for reporting; all amateurs are here reminded that while some Oct. 7–8 traffic will come by section nets and National Traffic System channels, there will be many messages floating around. Give the National Calling and Emergency Frequencies a full workout in and after the S.E.T.

— *F. E. H.*

RESULTS, JULY CD PARTIES

With the summer noise level at its highest, and 80-meter conditions at its poorest, both in the phone and c.w. CD July Parties, you either worked the high bands or you were just plain out of luck as far as raising the CD gang was concerned. Twenty meters, hotter 'n a pistol, proved to be the mainstay, while the real high scorers made excellent use of 10 and 15 meters. Who says these bands are dead? For example, comparative youngster and CD veteran K4BAI with 649 QSOs in 65 sections was tops in the c.w. Party with 213,200 . . . helped greatly by 81 contacts made on 21 Mc. Another young ORS W8IBX was second with 205,590 points and tied three-ways with W4YE and K4BVD for high section total of 66. Old Timer W4YE also crashed through 200K with 202,290. On phone K2EIU was tops with 28,800 via 154/36 . . . Ken too made much use of 21.3 and 29.6 Mc. to scare out those rare sections. K5MDX scored high section total with a sizzling 42 sections on phone. Of course, in October we look for better 80-meter conditions to up our contact totals, but keep that good ear peeled also to 10 and 15 again. It just might be the "save" it was this time.

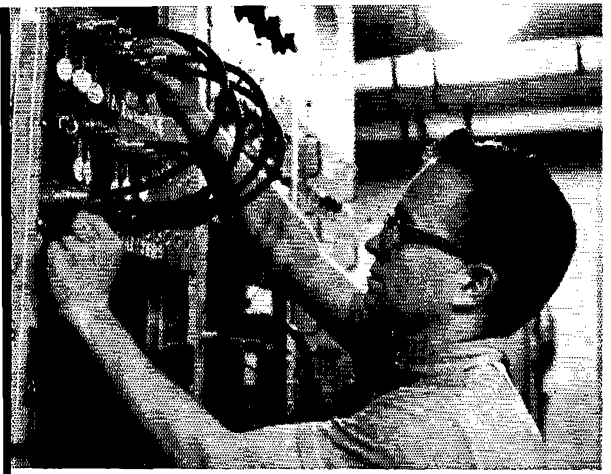
The following are the high *claimed* scores. Figures show the score *claimed*, number of QSOs, and the number of different sections worked. Final and complete *official* standings will appear in the *October CD Bulletin*.

— *W1DGL*

C.W.

K4BAI	213,200-649-65	K4YEP	114,165-382-59
W8IBX	205,590-617-66	K4KWQ	113,300-371-6C
W4YE	202,290-606-66	K5OCX	112,855-365-61
K2EIU	185,620-596-62	K9RFW	112,320-345-64
K2SSX	181,475-590-61	K2KIR	112,230-380-58
K4BVD	168,300-503-66	W2OPB	112,206-401-55
K5BSZ	167,375-510-65	K1IFJ	110,000-394-55
W8AEB	166,005-522-63	K4OGG	108,385-404-53
W1JYH	157,170-500-62	W6ASH	107,605-334-63
K4RAD	155,700-514-60	K4FPZ	106,248-369-57
K0QCQ	151,150-461-65	WA6ECF	105,920-325-64
K2PHF	148,050-463-63	WA2EDG	105,205-391-53
K4AMC	145,205-508-57	W4BZE	105,060-407-51
K4ZRA	143,290-453-62	K3ALD/3	104,440-367-56
K4RIN	142,130-462-61	W2GKZ	104,440-366-56
W1NJL	141,000-464-60	K2IMK	102,520-371-54
K5ABV	140,725-428-65	W1AW[2]	100,440-365-54
W1EOB	134,550-407-65	W8VPC	100,100-329-55
W3EIS	134,505-435-61		
W4AKC	130,820-415-62	PHONE	
W3GYP	130,240-402-64	K2EIU	28,800-154-36
W9YT[1]	129,920-442-58	K5MDX	27,090-129-42
W9MAK	127,490-411-61	W9YT[3]	25 740-137-36
K7CHH	123,840-382-64	K2PHF	16,935-116-29
K4PUZ	120,350-411-58	W1NJL	14,750-112-25
W3MSR	119,770-397-59	W8NOH	14,000- 75-35
W6WX	119,700-392-60	K4BAI	12,450- 76-30
K4TKM	118,030-403-58	K2SSX	11,050- 80-26
K3ANU	117,660-437-53	K2QDT	7590- 85-23
W9LNQ	116,550-365-63	K8RMK	7360- 59-23
K2KTK	116,280-401-57	K2KIR	5900- 52-20
K3JJG	114,570-402-57	K4TEA	5600- 52-20
		K2JTU	5355- 48-21

[1] K9ELT, opr.; [2] W1WPR, opr.; [3] W9SZR, opr.



The control center for the Los Alamos, N. M., Operation Alert exercise was established at the club station, W5PDO. These two pictures were taken inside the "shack." At right, a message clerk busily types messages while W5HFW (seated), W5SOT and W5MYQ engage in serious discussion. At left, K5RHR patches in another rig.

We are getting a great deal of material for this column, these days — more than we have room to print. The stack of it facing us at this writing is formidable, and even more awesome is the task of deciding what is usable and what is not and trying to forget about any angle but the unadulterated merit of each. First priority is given to accounts of operation in an actual *communications* emergency. Now an emergency isn't always a communications emergency, and often amateurs participate in such activities; so, we give these second priority. Third priority goes to alerts, when an emergency is expected and amateurs are deployed and even start operating but the expected emergency doesn't develop. Fourth priority goes to non-emergency activities such as AREC participation in public events. And last priority goes to reports of routine tests, drills and simulated emergencies. Needless to say, occasionally one or two items in the last two categories never see the light of the printed page because they become obsolete with age and are scrapped.

Then we get items that don't fall within any of the above categories, so we mark them "special" and look for an opportunity to use them, meanwhile holding them in our source material file. When they become yellowed with age, we have to throw them out to make room for more current material.

Well, we doubt if you are much interested in our editorial problems, but we can't help pleading for your understanding and cooperation. Sometimes material submitted is so incomplete (we don't require you to be a master with the pen, but we do need facts) that it just has to be blue-pencilled. If you sent us something that never got printed, there was a reason for it — a *good* (we think) reason. Maybe you won't think it's so good. But of one thing we can give you absolute assurance: the reason had nothing to do with who you are, what you are, or where you are. We take all material as it comes and judge it strictly on its own merit. Our judgment is not perfect, but it's all we have to go on. You fellows have been swell about submitting material you think might be usable; there is no dearth of it for this column. Keep it coming. We promise to use as much of it as we can in the space allotted to us. — *WINJM*

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On the North Dakota snowstorm writeup (July *QST*, page 80), delete the calls WØZCM and WØGCI and add the calls WØCZL, WØCZM and KØGGI.

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At approximately 2330 GMT on June 13, the city of Plattsburgh, N. Y., and several nearby communities in Clinton County were hit by a storm with gale-velocity winds, lightning and torrential rain, uprooting trees, downing power and telephone lines and leaving many areas without electricity or telephones. Immediately following the storm, acting EC K1BVI/2 made contact with WA2JOI/mobile, who was already heading toward the major damage area, and within minutes AREC services had been offered to and accepted by fire, police and sheriff's departments and news agencies. As more mobile units became active, they were utilized to the fullest extent. One unit supplied temporary communication to the Fire Dept. control center; others patrolled the city, reporting damage areas, blocking off traffic, placing emergency flares. Some patrolled rural areas looking for possible fires, controlling official and re-routing tourist traffic. A country-wide AREC emergency net was called to assist the mobiles, with K2VXR and K1BVI/2 alternating NCS duties. Mobiles participating were K2MEB, *WA2s* MSA LSJ IISB JOH JJY CRC and JKC. Fixed stations included K2UYM, WA2s NVT RLW and GNZ. — K1BVI/2, Acting EC, Clinton Co., N. Y.

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We can now supplement the saga of XE2PAY, reported in this column, Sept. *QST*, with a report direct from XE2LR, who owned and operated the equipment. The unit left from Monterrey on June 18 en route to Del Rio, Texas, via Eagle Pass (not Laredo, as previously reported). During the trip, contact was maintained with *XE2s* CY CZ OA DB BF as far as Saltillo (get yourself a road map of Mexico, if you want to follow this). After that, as far as Sabinas, contact was maintained with *XE2s* WS and TJ. At Sabinas, the unit had to cross the railroad bridge because the highway bridge was under water. From this point, communication was maintained on 7060 kc. with *XE2s* DS KH and IA. The entire trip was fraught with difficulties caused by torrential rains, heavy winds and landslides.

At 0110, June 19, XE2PAY crossed into Eagle Pass, Texas and was met in person by K5OFR, and an overnight stop was made. The following day the trip to Del Rio was continued, with XE2PAY listening to emergency operations on 7280 kc. but being unable to transmit. Arriving at 1030 in Del Rio, using blind transmissions of W5ABB as a guide, they proceeded to the International Bridge where they parked their car and crossed the bridge on foot (it had been closed to auto traffic) to locate the general in command of troops assisting in the emergency area of Villa Acuna. Unable to find him, they returned to the U. S. side, where it was revealed that XE2PAY had been given temporary permission to operate in the emergency-declared frequencies of 7275–7285 kc. An antenna was erected and operation commenced, with contact with Monterrey, Reynosa and Saltillo, assisted by W5ABB. Operation was suspended at 1930.

We assume that it was the Mexican city of Villa Acuna, just across the border from Del Rio, Texas, that was hardest hit by the flooding and that the Mexican amateur mobile unit was unable to reach it without crossing at Eagle Pass and approaching from the American side. We also assume that it was W5TRY, Texas c.d. communications officer, who wangled permission from FCC for XE2PAY to operate from the U. S.

The crew of Mexican mobile XE2PAY (XE2LR, left, and XE2LI, center) are greeted upon arrival at Del Rio, Texas, by W5ABB in front of his service shop.

On July 16, a cigarette carelessly tossed into dry brush by a passing motorist near Crescent City, Calif., caused a blaze that endangered the home of W6SIY and surrounding national forest. W6SIY got on the air and called for help and was answered by K7HBA/7, who contacted his local forestry office, which in turn contacted the forestry office in Crescent City and two pumper trucks were sent to fight the blaze. W7IQS later helped get a message to the sheriff's office in Crescent City so that the character who started the trouble could be apprehended. — *The Oregon Netter, June, 1961.*

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On July 28 a tornado caused considerable damage in Sidney, Troy and Greenville, Ohio, and the Miami Valley Emergency Net was activated to assist with communications. Streets in Troy were blocked by fallen trees, power and communications lines. Participating amateurs were K8COJ/mobile, K8VDE, *W8s* CTO JDQ FEX HPG FW ALZ HZV. — *W8PFC, Asst. EC and W8THJ, EC Miami County, Ohio.*

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At 1800 GMT, July 30, W8FNI alerted Huntington (W. Va.) EC W8FUM that a flash flood was reported in the Paintsville, Ky., area. County AREC and RACES stations were immediately alerted and the county control station was put on the air under the call W8FUM/8. The six-meter stations were unsuccessful in raising the flood area, but W8FNI succeeded in doing so on 75-meter phone. *W4s* QPB SKY WE and K4ZHO in the flood area handled emergency traffic with him. At 2300 a request was received to send a c.d. rescue unit to the scene of a drowning at Beech Fork. K8NHM/mobile went along to supply communications, and when contact was lost with W8FUM/8, W8AFX provided a relay. The body was found at 0055 and K8NHM returned to Huntington. *W8s* AFX and NJL also assisted at the control center. W8FNI reported that radio was no longer needed in the flood area and operations were secured at 0330. The following additional amateurs were known to have been active: *K8s* DKK OVI BEL IYU IFB GMV W8FJJ, W4LGB. — *W8FUM, EC Cabell County, W. Va.*

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On Aug. 5 at 1400 GMT, W8FUM was alerted by civil defense that a search for three small missing boys required communications assistance. W8FUM/8, Cabell County (W. Va.) c.d. control station was activated at 1430. Stations reporting into the net included K3MXT/8, K4MRT/mobile, K3NGL/8, K4ETA, *K8s* BEL OVI IXU/mobile TKR/mobile IYU/mobile, *W8s* AFX NJL. Mobiles reported to c.d. officials in charge of search units at 1455. The missing boys were found at 1535 and operations ceased at 1600. — *W8FUM, EC Cabell County, W. Va.*

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The Kansas Storm Warning Net was activated at 1815, June 3, when a severe storm was forecast for the area of Liberal and Meade, Kans. The net tracked the storm and Associated tornado funnel cells until it headed north and was lost sight of, at which time communities to the north were notified of possible trouble. A total of 19 amateurs took part in the activity. — *KØIZM, SEC Kansas.*

The Newton (Kans.) Amateur Radio Club activated the local storm net on June 17 at 0900 in order to help handle traffic associated with the cleaning up of Sand and Slate Creeks to prevent flooding of the city following heavy rains. Two mobile units and three fixed stations were used, including club station W0BZN. More than 12 local amateurs were active all day long, and the net was closed at 1700. — *KØEMB, Asst. EC Zone 3, Kans.*

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Late in the afternoon of July 7, a freak weather condition produced a rapidly-moving tornado that struck Kenmore and Tonawanda, northern suburbs of Buffalo, N. Y. Assistant EC W2QJJ reported to Kenmore c.d. headquarters and alerted the six-meter AREC net. Within 15 minutes seven stations were on the air at strategic locations and three fixed stations were standing by for possible relay traffic, with W2QJJ as base station. These stations remained on location until it was determined that normal services had the situation under control. — *W2LXE, SEC Western N. Y.*

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Amateur radio kept a worried grandfather in Jersey City, N. J., in touch with the condition of his small grandaughter, who was critically burned in an accident in Miami. Upon hearing of the accident, K2JXR, who lives in the same building, contacted K4DJW in Miami, enabling the man to talk with his daughter, mother of the child. Other amateurs "reading the mail" assisted and some have sent good wishes and even donations to the mother of the child.

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On June 15, amateurs in the Cupertino area of the Santa Clara Valley, Calif., were called upon to assist city officials in asking people to conserve water. EC WA6EIC called for volunteers on the c.d. net. Later, other towns in the affected area were also covered, and the Santa Clara County C.D. Net on 145.29 Mc. was activated along with the c.d. headquarters station. Water pressure returned to normal around midnight and operations were suspended. — *W6ZRJ, SEC Santa Clara Valley.*

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The tally of SEC reports for June is 26, representing 12,657 AREC members. This is the lowest number of reports of any single month this year, and a great deal lower than last June's record 32. However, the number of AREC members represented is almost a thousand higher. Sections heard from: Mich., NYC-LI, E. Mass., S. Texas, Ind., Wash., E. Fla., Ohio, N. Texas, Iowa, Utah, Nevada, Colo., S. Dak., Santa B., Ore., Ga., Md.-Del.-D. C., Tenn., Okla., E. Pa., Va., Kans., W. Va., W. Fla., Santa Clara Valley.

This brings us up to mid-year, so let's whomp up a comparison. So far, we have received 176 reports (185 last year) from 42 different sections (39 last year). Fourteen sections have 100% reporting records so far this year (22 at this time last year): E. Mass., Ga., Ohio, Ind., Nev., Colo., E. Fla., Mich., NYC-LI, Ore., S. Dak., E. Pa., SCV, Iowa.

The following sections have *not been heard from* this year, as far as standard reports are concerned: S. N. J., W. N. Y., West Pa., N. Dak., Ark., La., Miss., Ky., E. N. Y., Nebr., Conn., N. H., R. I., Alaska, Idaho, Mont., Hawaii, San Fran., N. C., S. C., N. M., W. I., C. Z., Ariz., Que., Alta., B. C., Man., Sask.

RACES News

We have a supplementary report on OPAL-1961 to end all supplementary OPAL reports. This one comes from Los Alamos, N. M., complete with nine beautiful glossy 8 x 10 prints of the boys in action. At this late date, it is regrettable that we cannot do them more justice, but we'll try to get two of the pictures in, and summarize the operation, to wit:

Official notification of the beginning of the exercise was received from local c.d. at 1510 GMT, April 26. AREC and RACES personnel were notified and those responsible for out-of-town operations packed and checked their gear. At 1300 on April 27, 7 mobiles and 12 operators were dispatched to relocation centers in Durango, Pagosa Springs, Monte Vista and Alamosa, Colo., with an additional operator at state c.d. headquarters in Santa Fe. Operation was begun at noon (1900 GMT) on Apr. 27 and continued until 1700 Apr. 29. Continuous communication was maintained among the relocation centers on 3985 kc. and traffic was handled for local Colorado c.d. officials as well as for the Los Alamos c.d. group.

The Los Alamos club station, W5PDO, was activated on Apr. 27 and maintained contact with the mobile units until they reached their destinations, then served as NCS for the N. M. RACES net on 3993. Five other nets were met, including an AEC Emergency Net on 7 Mc., ECDM Region 5 Net on 7100, the Los Alamos net on 3985 and two v.h.f. nets to local and state c.d. headquarters. An actual evacuation of the city was conducted on Apr. 28, involving approximately 5300 people, 1700 vehicles and 30 c.d. officials. The remainder of the drill was directed from emergency headquarters at Alamosa, Colo. W5PDO closed down and four operators were dispatched to Alamosa to handle the additional traffic. Communications for c.d. officials en route were handled by a mobile unit. A total of 32 Los Alamos amateurs participated in OPAL 61.

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We are informed by K5TRY, Texas state c.d. communications officer, that Texas now has a state RACES plan, and we believe this completes the roster of all 50 states now in the RACES fold. Operationally, the state is divided into 20 RACES districts, each under a district radio officer. Each of the 254 counties in Texas has a station operating in a District Net. As of June 1, the state boasts 20 approved local plans, with many more in the works; they are aiming at a local plan in each county by June 1, 1962.

K5TRY is RACES radio officer as well as state communications officer — a big job for a big man in a big state!

ELECTION NOTICE

(To all ARRL members residing in the Sections listed below.)

You are hereby notified that an election for Section Communications Manager is about to be held in your respective Section. This notice supersedes previous notices.

Nominating petitions are solicited. The signatures of five or more ARRL full members of the Section concerned, in good standing, are *required* on each petition. No member shall sign more than one petition.

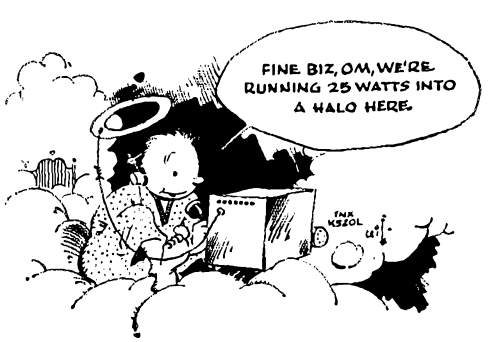
Each candidate for Section Communications Manager must have been a licensed amateur for at least two years and similarly a full member of the League for at least one continuous year immediately prior to his nomination.

Petitions must be in West Hartford, Conn., on or before noon on the closing dates specified. In cases where no valid nominating petitions were received in response to previous notices, the closing dates are set ahead to the dates given herewith. The complete name, address, and station call of the candidate should be included with the petition. It is advisable that eight or ten full-member signatures be obtained, since on checking names against Headquarters files, with no time to return invalid petitions for additions, a petition may be found invalid by reasons of expiring memberships, individual signers uncertain or ignorant of their membership status etc.

The following nomination form is suggested. (Signers will please add city and street addresses to facilitate checking membership.)

Communications Manager, ARRL. [place and date]
38 La Salle Road, West Hartford, Conn.

We, the undersigned full members of the.....
.....ARRL Section of the.....
Division, hereby nominate.....
as candidate for Section Communications Manager for this Section for the next two-year term of office.



Present at a meeting of the King County (N. Y.) AREC 2-meter group were (l. to r.) K2SLD, WA2GAB, K2OKX (Asst. EC), W2GSK, K2HAM and K2LOE (Asst. EC).

Elections will take place immediately after the closing dates specified for receipt of nominating petitions. The ballots mailed from Headquarters to full members will list in alphabetical sequence the names of all eligible candidates.

You are urged to take the initiative and file nominating petitions immediately. This is your opportunity to put the man of your choice in office.

— *F. E. Handy, Communicaitons Manager*

Section	*Closing Date*	*SCM*	*Present Term Ends*
Wisconsin	Oct. 10, 1961	George Woida	May 12, 1961
San Joaquin Valley	Oct. 10, 1961	Ralph Saroyan	Oct. 10, 1961
East Bay	Oct. 10, 1961	B. W. Southwell	Oct. 14, 1961
Maryland-Dela-ware-District of Columbia	Oct. 10, 1961	Thomas B. Hedges	Dec. 10, 1961
Manitoba	Oct. 10, 1961	M. S. Watson	Dec. 10, 1961
Saskatchewan	Oct. 10, 1961	H. R. Horn	Dec. 10, 1961
Mississippi	Oct. 10, 1961	Floyd C. Teetson	Dec. 10, 1961
Alabama	Oct 10, 1961	William D. Dotherow	Dec. 14, 1961
Western Florida	Oct. 10, 1961	Frank M. Butler, jr.	Dec. 15, 1961
Illinois	Oct. 10, 1961	Edmond A. Metzger	Dec. 15, 1961
New Mexico	Dec. 11, 1961	Newell F. Greene	Feb. 10, 1962
Eastern New York	Dec. 11, 1961	George W. Tracy	Feb. 10, 1962
Virginia	Dec. 11, 1961	Robert L. Follmar	Feb. 11, 1962
Maritime	Dec. 11, 1961	D. E. Weeks	Feb. 15, 1962
South Carolina	Dec. 11, 1961	Dr. J. O. Dunlap	Mar. 4, 1962
Alaska	Jan. 10, 1962	John P. Trent	Mar. 10, 1962
Georgia	Jan. 10, 1962	William F. Kennedy	Mar. 18, 1962
Ohio	Jan. 10, 1962	Wilson E. Weckel	Mar. 28, 1962

ELECTION RESULTS

Valid petitions nominating a single candidate as Section Manager were filed by members in the following Sections completing their election in accordance with regular League policy, each term of office starting on the date given.

West Indies	William Werner, KP4DJ	Aug. 10, 1961
Kentucky	Elmer G. Leachman, W4BEW	Aug. 10, 1961
San Francisco	Wilbur E. Bachman, W6BIP	Aug. 14, 1961
West Virginia	Donald B. Morris, W8JM	Sept. 18, 1961
Indiana	Donald L. Holt, W9FWH	Oct. 14, 1961
Utah	Thomas H. Miller, W7QWH	Oct. 28, 1961

In the Maine Section of the New England Division, Mr. Albert C. Hodson, W1BCB, and Mr. L. George Clark, W1EPN, were nominated. Mr. Hodson received 122 votes and Mr. Clark received 104 votes. Mr. Hodson's term of office began July 26, 1961.

In the Western Massachusetts Section of the New England Division, Mr. Percy C. Noble, W1BVR, and Mr. David L. Welch, W1DXS, were nominated. Mr. Noble received 187 votes and Mr. Welch received 71 votes. Mr. Noble's term of office began Aug. 11, 1961.

In the Southern New Jersey Section of the Atlantic Division, Mr. Herbert C. Brooks, K2BG, and Mr. Edward G. Raser, W2ZI, were nominated. Mr. Brooks received 244 votes and Mr. Raser received 153 votes. Mr. Brooks' term of office began Aug. 26, 1961.

CODE PROFICIENCY PROGRAM

Full details on the ARRL Code Proficiency Program appear on page 64B, this issue of *QST*. The next qualifying run from W1AW will be Oct. 19 at 0130 GMT. The next qualifying run from W6OWP will be transmitted Oct. 5 at 0400 GMT. *CAUTION:* Note that since the dates are given per GMT, Code Proficiency Qualifying Runs in the United States and Canada actually fall on the evening previous to the date given. *Example:* In converting, 0130 GMT Oct. 19 becomes 2130 EDST Oct. 18.

Date	Subject of Practice Text from August *QST*.
Oct. 3:	*An Introduction to the Klystron*, p. 11
Oct. 11:	*An S.S.B. Product-Detector Adapter*, p. 22
Oct. 14:	*The Grounded-Grid Linear Amplifier*, p. 16
Oct. 20:	*Six Meters . . . Amplifier*, p. 24
Oct. 25:	*A Multioutput . . . Power Supply*, p. 27
Oct. 27:	*A Two-Band Station . . .* p. 30

BRASS POUNDERS LEAGUE

Winners of BPL Certificate for July Traffic:

Call	*Orig.*	*Recd.*	*Rel.*	*Del.*	*Total*
K3IMP	5243	216	171	41	5671
W3CUL	213	2369	1758	591	4931
WØLGG	218	1515	1444	69	3246
K6BPI	86	1234	1170	64	2554
W6YDK	2421	70	40	21	2552
K3JYZ	39	1179	27	1151	2396
KØONK	122	655	634	12	1423
W9DYG	43	669	584	45	1341
W7BA	7	655	611	44	1317
W8UPH	19	638	546	89	1292
WØLCX	20	645	615	0	1280
W3IVS	9	579	540	28	1156
W9JOZ	5	546	543	3	1097
W6WPF	21	526	520	6	1073
WØSCA	6	541	509	0	1056
KØOZM	19	503	353	143	1018
W6GYH	396	309	238	8	951
K4AKP	41	441	400	40	922
K4SJH	91	461	348	13	913
W3VR	43	423	398	11	875
K7IEY	24	391	375	12	802
WØBDR	98	373	323	0	794
K6KCB	12	398	343	27	780
WA6ROF	18	387	358	16	779
W3EML	22	361	320	39	742
K6LKD	24	377	329	7	737
W8DAE	19	371	279	57	726
K2UAT	62	305	313	5	685
W6EOT	9	355	289	25	678
W7DZX	11	324	305	20	660
W1SMU	20	333	258	43	654
W5ZHN	37	307	208	91	643
K2UCY	96	254	225	29	604
KØVTG	95	254	222	22	603
K5QWR	51	279	233	32	595
WØDUA	31	281	265	14	591
W9ZYK	32	290	186	79	587
WA2CCF	232	174	168	10	584
W2EW	170	208	85	114	577
WØOHJ	4	283	258	15	560
K2UFT	35	287	226	8	556
WA2GPT	16	267	226	32	541
KØORK	18	258	227	26	529
WA6LVX/6	28	257	197	29	511
W3WRE	47	233	203	26	509
WA2GQZ	21	247	230	10	508
Late Reports:					
WØLCX (June)	23	1065	950	115	2153
WØLGG (June)	244	422	371	34	1071
WØPZO (June)	20	411	371	38	840
WØSCA (June)	1	344	342	1	688
K9LIT (May)	119	182	208	34	543
WØPDR (June)	19	295	208	0	522
W9DO (June)	19	236	224	31	510

More-Than-One-Operator Stations

Call	*Orig.*	*Recd.*	*Rel.*	*Del.*	*Total*
W6IAB	68	2554	2550	4	5176

BPL for 100 or more *originations-plus-deliveries*

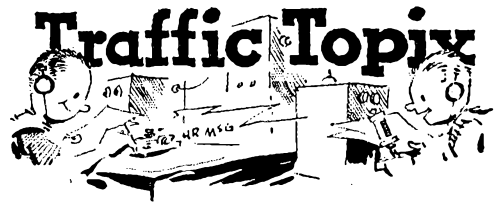
W4SHJ	196	K9RMI	124	K8AAG	110
W4FOR	173	WN4BMC	116	K4DOR/VDU	104
K3KTE	164	W5SMK	116	K1PPF	102
K2GAO	157	W2GKZ	115	K4VDN	101
W1TXL	136	W4CNZ	115	Late Report:	
K2HHS	131	KØVPH	113	K1MZM (May)	150
KP4WT	124	K2YMU	112		

More-Than-One-Operator Stations

W1PGQ 139

BPL medallions (see Aug. 1954 *QST*, p. 64) have been awarded to the following amateurs since last month's listing: K3IPK, WA6GKK, W8BZX, K9ISP.

The BPL is open to all amateurs in the United States, Canada, and U. S. Possessions who report to their SCM a message total of 500 or more or 100 or more originations plus deliveries for any calendar month. All messages must be handled on amateur frequencies within 48 hours of receipt, in standard ARRL form.



We're sort of running out of subjects for this column heading — that is, subjects that haven't been treated before. Anyone want to "guest" write? We'll save it for next summer when we're going on vacation, just like they do on the big newspapers.

Guess we'll just have to harp on some of the things we have talked about before. One thing we have noticed a great deal lately is that about half the messages we handle are incorrectly "checked," or have no word count on them at all. How come, gang? What's so doggone difficult about counting the words as you copy them and making sure your count agrees with the check as in the preamble? The least we could do is make sure the count is correct when the message leaves our station, even if it is wrong when we receive it. After all, the "check" is *not* an optional part of ARRL procedure, as is the filing time. You don't just drop it overboard, any more than you do the number, station of origin or any other part of the preamble.

Most of us copy our traffic by pencil, either because that's all we have, or because we haven't learned to copy with a typewriter. Personally, we use both or either, depending on whether or not the "mill" is set up at the time someone says "QTC, QRV?" Frankly, we think that pencil copy is one of the reasons for some of the garbling we have been howling about — but okay, if you can't copy by mill, *use* a pencil. Now, if counting up to five while you're copying is too great a strain on your mental capacities, make yourself up some message blanks with specific spaces for copying five words per line. Once the message is copied, it's then easy to count the words quickly for a "check."

But this is a nuisance. Copying and counting is easy. We learned to do it in less than a week. Shucks, you don't even *have* to count; you can single out five words at a time with a single glance. If you find this difficult, practice a little. Have someone write down a *different* number of words of different lengths on different pieces of paper, then have them flash

A.R.R.L. ACTIVITIES CALENDAR

(Dates shown are per GMT)

Oct. 5: CP Qualifying Run — W6OWP
Oct. 7–8: Simulated Emergency Test
Oct. 14–15: CD Party (c.w.)
Oct. 19: CP Qualifying Run — W1AW
Oct. 21–22: CD Party (phone)
Nov. 3: CP Qualifying Run — W6OWP
Nov. 11–13, 18–20: Sweepstakes Contest
Nov. 17: CP Qualifying Run — W1AW
Dec. 7: CP Qualifying Run — W6OWP
Dec. 16: CP Qualifying Run—W1AW

OTHER ACTIVITIES

The following lists date, name, sponsor, and page reference of *QST* issue in which more details appear.

Sept. 30–Oct. 1: VK/ZL Phone DX Contest, WIA (p. 75, last month).
Oct. 7–8: VK/ZL C.W. DX Contest.
Oct. 21–23: World-Wide RTTY Sweepstakes, RTTY, Inc. (p. 65, this issue).
Dec. 4–5: 21/28 Mc. Telephony Contest, RSGB (next issue).
Dec. 9–10: Kansas Centennial QSO Party.
Dec. 9–10: New England QSO Party.

them at you. In a surprisingly short time (if not immediately) you will find yourself able to tell at a very quick glance whether there are four, five or six words in a group. Of course if you write like some of you send, running all your words together, then you're in trouble. This is a lesson in message-checking, not handwriting. You should have learned the latter in grade school.

If you write small enough (or your message blank is large enough) you can write *ten* words to a line, instead of five. This makes it even easier to check the word count. No, you don't have to count up to ten in this case; you count up to five, leave a somewhat larger space than usual, then count up to five again on the same line. If some of the words are longies and you go off the edge of the page (for heaven's sake don't start writing down the edges!), put the excess on the next line, but *indent*, so you can easily count the number of ten-word lines.

Maybe your sense of thrift rebels at this waste of space. In that case, you can make a mark in your copy every tenth word, then just count the marks to check.

There are a number of ways to do it, most of them ridiculously simple. All it requires is a little extra care, which very shortly becomes automatic. *Make it a point of pride that no message goes out of your station without a correct (or corrected) word count.* — *W1NJM.*

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Net reports:

Net	*Sessions*	*Check-ins*	*Traffic*
Early Bird Transcon	30	...	134
Eastern Area Slow	31	124	46
Northeast Area Barnyard	26	713	8
7290 Traffic	40	1029	506
Interstate SSB	31	679	209
20 Mtr Interstate SSB	..	423	1034

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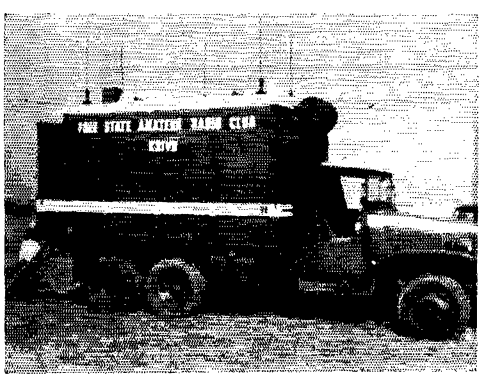
We think the "passing" (only temporarily, we hope) of the *Pacific Area Net News* from the traffic scene should be recorded in this column. We're sure that very few traffic men need be told about *PANN*, because it was distributed far and wide in traffic circles throughout the country, as well as on the west coast. In his last editorial, Editor Vic Gish, W7FIX, said: "Until this editor retires for the fourth time, this will be the last issue of *PAN News*." He then promised to make refunds of all donations on hand as soon as he returned from a long-awaited vacation.

We have never considered *PANN* as a rival publication; quite the contrary, we have often praised it and quoted from it in these pages. What's more, we say without much fear of contradiction that *PANN* has probably done more for traffic handling in general and the National Traffic System in particular than any other amateur publication — outside, of course, *QST* itself. In fact, because *PANN* has been able to devote more space to traffic matters than has even *QST* itself, it has therefore served as a very valuable supplement to this small-print column. We don't know what we'll do without it.



This communications van of the Free State Amateur Radio Club (K3IVO) at Fort Meade, Md., can operate on 2, 6, 10 or 80 meter amateur bands and several MARS frequencies.

We're not saying that *PANN* hasn't had its own editorial policies and opinions. That it has. Critics of ARRL traffic policies were allowed full sway, and this was a *good* thing. Progress cannot be made without diversification of opinion and free expression of same.

Vic, W7FIX, was and still is eminently qualified to edit such a paper. He was one of the earliest supporters of NTS, the first manager of the Pacific Area Net of NTS, served several terms as SCM of Washington, and is fortified with a wealth of experience in traffic handling — amateur, military and commercial. His wisdom and guidance, expressed through *PANN*, have been an inspiration to us all. We know that all traffic men will join us in wishing him an enjoyable and relaxing vacation, a restful respite from the gruelling task of grinding out the pages of *PANN* each month in his own time and sometimes at his own expense, and a return, in good time, to the active position of respect and leadership he will always have in our ranks, both personally and editorially.

—•••—

National Traffic System. Like just about everyone else, we're often prone to forget that those traffic men holding leadership jobs in NTS are doing what they're doing (which is plenty!) not for the material rewards they get, but for the sheer joy and pleasure of doing it. This outlook is well illustrated by the fact that hardly ever, in our eleven years of administering region and area nets and the TCC, has a leader at that level demanded to know why we didn't send him his special hand-lettered certificate which we promised when he took the job — although very often one has become impatient with our slowness in sending him blank certificates to be issued to his net members.

The other day, in going through our NTS files (we do this every so often, because we don't trust ourselves), we noticed that some NTS net managers at region, area and TCC level were appointed as long as six months ago and have still not received their special certificates. We ought to be red-faced in making such an admission (and we are, a little), but *not one* of the several appointees concerned has so much as uttered a peep about his missing certificate. It is pretty obvious, from this, that they consider the certificate a mere frill and of no importance compared to getting the job done. We're sure this same attitude prevails at section level, at which the SCM issues the certificates.

So, fellows, don't take your net manager for granted and don't give him too hard a time. His job is no cinch. It will be easier if you give him the maximum of cooperation and make all criticism friendly and constructive, not mere griping.

July net reports.

Net	*Sessions*	*Traffic*	*Rate*	*Average*	*Representation (%)*
EAN	30	1286	.826	42.9	98.3
CAN	31	1625	1.050	53.7	98.9
PAN	31	1272	.644	41.0	98.9
1RN	61	621	.349	10.2	72.6
2RN	60	654	.458	10.9	88.4
3RN	62	982	.441	15.9	100.0
4RN	60	460	.277	7.6	89.3
RN5	62	536	.323	8.6	77.8
RN7	60	602	.360	10.0	46.0
8RN	61	359	.179	5.9	79.8
9RN	62	1246	.801	20.1	72.1
TEN	81	1129	.543	13.9	49.6
ECN	17	82	.181	4.8	80.4[1]
TWN	31	436	.449	14.0	74.2[1]
Sections[2]	1209	6235			
TCC Eastern	101[3]	552			
TCC Central	82[3]	1111			
TCC Pacific	115[3]	932			
Summary	1918	20120	CAN	9.1	3RN
Record	1710	20350	.928	15.2	100.0

[1] Region net representation based on one session per night. Others are based on two or more sessions.

[2] Section nets reporting: WVN (W. Va.); Nebr. Emerg. Noon Phone; NJQ, SDN (S. Dak.); S. Dak. 75 Phone; Wolverine & QMN (Mich.); BUN (Utah); MDDS (Md.-Del.-D. C.); CCW (Colo.); RISPN (R. I.); SCN & SOCAL 6 (Calif.); WIN & WSSN (Wis.); OSN (Ore.); NLI (NYC-LI); CN & CPN (Conn.); VN, VFN & VSN (Va.); AENT, AEUP Eve, AENP Morn, AENO, AENM & AENB (Ala.); ILN (Ill.); WSN (Wash.); NTTN (Tex.); TN (Tenn.);

SCN (S. C.); MSN, MSPN Eve, MSPN Noon, MJN (Minn.); GBN (Ont.); GSN (Ga.); KYN & MKPN (Ky.).

[3] TCC functions reported, not counted as net sessions.

Very good reporting, for a midsummer month. One missing region net report and a bit of a dearth of traffic kept us from breaking the total July traffic record made in 1959. The previous record number of sessions, beaten by a mile this month, was also made in 1959. The previous record July "rate," beaten this month by CAN, was made in 1959, also by CAN. Breaking the records of overall traffic per session is a practical impossibility in these days of multiple reports of section nets, most of which have very low averages; the average of 15.2, which stands as the record for July, was made in 1951. Everything considered, NTS has posted another good month.

W9DYG points out that July was the worst month, condition-wise, that CAN has ever experienced; we hope we don't get *any good* months, or CAN will leave us all behind. PAN is doing well on 40 meters, with RN7 posting consistent 100% representation despite difficulties. W2EZB says 2RN is having "growing pains" because of change in schedule (to normal NTS pattern), but expects it will iron out. W3UE challenges any region net to equal 3RN's record of 100% representation from all sections twice per night for six straight months. K4AVU turned the reins of 4RN back to W4SHJ at the end of July. RN5 certificates have been issued to K5UBL and K4JDW; heat and summer QRN have plagued the net. W8DAE complains that lack of West Va. representation is still dragging 8RN down. W9ZYK has issued 9RN certificates to K9YTJ, K9UOV and W9KQB. WØLCX wants to be relieved of TEN managership the end of October. VE3BZB is spending his vacation in VE1-land, where he hopes to smoke out some recruits for ECN. Long working hours keep WØFEO out of TWN, but the net keeps right on running.

Transcontinental Corps. These TCC fellers, and especially the directors, can't even go on vacation without making a lot of arrangements about "Who's going to tend the store?" Now if each function had a good, sound alternate, this would be pretty much taken care of automatically. However, TCC is doing pretty well for itself. Here is the July summary:

Area	*Functions*	*% Successful*	*Traffic*	*Out-of-Net Traffic*
Eastern	101	90.1	1586	552
Central	82	89.0	2266	1111
Pacific	115	93.9	1851	932
Summary	298	91.3	5703	2695

The TCC roster: Eastern Area (W1SMU, Dir.) — *W1s* AW EMG NJM OBR SMU WEF, WA2APY, *K2s* SSX UFT, *W3s* EAIL FAF WG WRE, K3IMP, W4DVT, *W8s* ELW UPH, VE2AZI/W1.

DX CENTURY CLUB AWARDS

HONOR ROLL

PY2CK....313
W3JNN....312
W8JIN....312
W3GHD....311
W4DQH....311
W6AM....311
W6CUQ....311
KV4AA....311
W9NDA....311
W2AGW....311
W9RBL....310
W9YFV....310
W2HUQ....309
W7GUV....309
W1ME....309
W3KT....309
W1GKK....308
W8DMD....308
W8BRA....308
W5ASG....307
LU6DJX....306
CE3AG....306
W8BKP....306
W8BF....306
W5ADZ....306
W8UAS....306
W7GBW....306
W6EBG....305
WØQVZ....305
W6ENV....305
W3BES....304
ZL1HY....304

Radiotelephone

PY2CK....313
W8GZ....307
VC4ERR....305
W9RBI....305
W8BF....304
W3JNN....304
W8KML....301
W8PQM....301
W7PHO....301
4X4DK....300
CX2CO....299
W6YY....299
W4DQH....298
W6AM....298
ZL1HY....295

From July 1, to August 1, 1961 DXCC Certificates and endorsements based on postwar contacts with 100-or-more countries have been issued by the ARRL Communications Department to the amateurs listed below.

NEW MEMBERS

GI3NPP....216
WØVAF....168
PAØVDV....161
OH1SN....149
KH6ACU....132
W1PH....116
K2KNV....110
W9OD....110
KR6CR....108
K2LGJ....107
IT1ZDA....107
K5WAH....106
UB5KIU....106
WØTDH....105
G3LCS....105
W4EEU....104
UA1AI....104
KØJPL....103
K5TXQ....102
KØDUA....102
OH2SC....102
ZL2AWJ....102
K1CAU....101
K5PCW....101
W6DFR....101
W9IBC....101
W9NVJ....101
YO3FD....101
WA2EGK....100
WA2HXC....100
K2UVQ....100
K9OYD....100
DL1TA....100
LA3SG/P....100
OZ4WR....100
PAØDB....100

Radiotelephone

HB9TL....232
HK3LX....173
GI3NPP....166
K6MLS....161
F8PI....128
K9LTN....124
DL1BS....122
W2VDC....118
KP4APW....107
LA3SG....102
W5WAH....101
YV3DV....101
UA9KOG....100

ENDORSEMENTS

W7PHO....303
W6YY....300
WØAIW....300
W4GD....292
W6BZE....291
VK3KB....291
K2BZT....288
W2AYJ....284
W6BVM....281
W2YTH....280
W6KEV....280
W6TXL....276
W6NJU....271
W4PLL....270
W6GMF....270
WØSYK....270
G3DO....270
G8KS....270
W9KXK....266
W7YGN....264
W2DGW....263
W6EPZ....262
K2SHZ....261
W9HCR....260
W4YWK....260
VE3BWY....260
VE3RE....259
W1KXU....254
W6SQP....254
WØBSK....252
W2DBS....251
W1OOS....250
K5ADQ....250
W5QVZ....250
W8JSU....250
G6XL....250
W1TX....242
W4WDI....242
W9PQA....242
EA2CA....242
K4ICK....240
W5PSB....240
W9WFS....240
W2TP....233
DL6EN....232
W4UKA....230
G3AIZ....229
K9CJK....226
DL3BK....226
W9EHW....224
W7CMO....222
F8PI....222
LA5HE....221
ZL2AFZ....221
W2GDX....214
KH6QH....214
W2ZKQ....213
K8LSG....213
DL3ZL....211
W2KIR....210
K4ASU....210
W6MUM....210
W4WM....203
K5KES....201
KØPPX....201
W4DXI....200
W4TP....200
W7BA....200
DL1BS....197
W4IKL....192
W8YCP....190
WØSLB....190
W4IUO....184
W1ICV....183
WØCU....183
W8JRG....181
K2GUN....180
W4MS....180
W6VVR....180
DL9KP....180
WA2DIG....178
W8KAK....178
W6BZ....173
W1GVZ....172
W4GMR....171
W8QHW....171
W1CV....170
W2QDY....170
VE1EK....170
G8PL....170
W4CWW....169
K8ONV....163
W2BXC....162
T12CMF....162
K2TQC....160
K4JQR....160
K6ANP....160
K7CEV....160
K2YXY....159
DL3AR....157
G2KL....157
K8DTZ....156
W2HDW....155
SP5HS....153
W6WX....151
W3INH....150
W4HTV....150
W4PDP....150
CN8IF....150
ZL2GH....150
W8MTQ....146
EL4A....145
W4HUE....143
K8OHG....143
W2JWK....141
OH3SE....141
Z81ACD....141
W6JNX....140
WØGTU....140
LU1DJU....140
W2VDC....139
W2KOY....138
K4GLA....138
W2VCB....137
ZF9AY....133
K2OUS....132
K2IQP....132
K8VDV....132
EA1GZ....132
SV0WI....132
W1FJJ....131
DJ1WT....131
KA2DE....131
K1GUD....130
KØHWB....130
VE4OX....130
DL3FL....130
G3ZY....125
G4QK....124
W1JVZ....123
W7CNL....123
OZ6RL....122
K1IMP....121
Z85KU....121
K3DCP....120
K6EXO....120
W6VUN....120
K4TKM....118
W8KSR....112
K5OGP....110
K7BJE....110
K9ELT....110

Radiotelephone

W9NDA....291
PY4TK....290
G5VT....273
W8UAS....270
W9RNX....262
W4QCW....256
W9LNM....242
W1DCE....241
W2LV....237
ZS1DO....233
G8KS....232
W1LLF....230
W2BQM....220
WØSYK....217
W6NJU....212
K2BZT....203
PY2JU....202
ON4PJ....201
LA5HE....197
PAØWWP....195
W2HMJ....193
9M2DQ....193
W2TP....192
W4CWV....192
W1BIH....191
K5MDX....191
HB9FE....186
K9KYF....184
W1ICV....183
K8CFU....182
W2YBO....179
W6YMV....178
W3VSU....171
G2MI....170
W4MS....161
K9LUI....155
W9ILW....153
W3ALB....151
K9EMG....151
DL3RK....151
W1YDO....143
DL6EN....140
W4WM....139
CX2AY....138
KG4AO....137
DL3BK....130
HB9RB....127
W7YGN....126
W9GPI....123
W4IUO....122
K2IQP....120
W3YZI....120
K6EXO....120
W1YQF....113
G3NRZ....110

U.S.-Canada Call Area and Continental Leaders

KH6CD....261
KL7PI....261
VE1PQ....260
VO1DX....255
VE2WW....285
VE3DIF....284
VE4XO....200
VE5RU....220
VE6NX....256
VE7ZM....302
VE8AW....195
ZS6BW....294
G2PL....301
4X4DK....303

Radiotelephone

W1FH....289
W2ZX....286
W5BGP....265
KH6OR....261
KL7AFR....190
WØAIW....288
VE1PQ....166
VO1DX....141
VE2WW....231
VE3QA....241
VE4RP....102
VE5RU....203
VE6TF....190
VE7ZM....282
HAMU....277

Station Activities

• All operating amateurs are invited to report to the SCM on the first of each month, covering station activities for the preceding month. Radio Club news is also desired by SCMs for inclusion in these columns. The addresses of all SCMs will be found on page 6.

ATLANTIC DIVISION

EASTERN PENNSYLVANIA—SCM, Allen R. Breiner, W3ZRQ—SEC: DUI. RM: AXA. PAM: IVS. New appointments: QFK as a V.H.F. OO in the Susquehana Valley Area, K3JCT as an OES. The 20-meter beam mentioned in the last report for K3CNN did not arrive in one piece. Launching was unsuccessful. K3LKQ and LKR vacationed in the 2nd district with 6- and 2-meter gear. K3LKQ is the new EC for Lehigh County. K3KEL is getting better activity reports from his 6-meter ground-wave work. K3NCD is assisting with MARS as NCS. K3GBD is in dire need of information regarding an apartment-style antenna. K3JJG placed first in the VP9 Contest in the W3 Area. ZJD has been operating portable at Camp Akiba near Stroudsburg. K3HTZ got his first PY7 on 40 meters. UIU still is mike shy yet pounds plenty of brass and does plenty of traffic-handling. HNK is 2-meter mobiling to Illinois. EML and K3IMP were recipients of the "Order of the Lid" Award at a recent 3RN clan gathering. The award was presented by WRE, visiting from our neighboring section, Western Pennsylvania. K3NZD switched from a five- to a six-element beam for 6 meters resulting in extra DX. New Gear Dept.: K3KTE, a new 100-watt home-brew 80-through 10-meter rig; K3KNL, the Michigan Week Award plus a trap-type antenna; BUR, a 160-, 80- and 40-meter vertical; K3MVO, a new QTH, Emmaus proper; K3DKC, a receiver, home-brew, patterned after NNL's; K3LNM, a 6CW4 preamplifier for 6 meters; K3KZG, an s.w.r. bridge and antenna coupler; K3HEC, a seventeen-element beam on 2 meters. K3HIN will have an XYL on Oct. 8. IVS was donated a 417A converter for 2 meters by K4QIX. K3IPA has a new job which is cutting into his hamming time. K3PNP, the Haverford Junior High School RC, is active on 40, 10 and 2 meters. New officers of the Adams County ARC are K3EYK, pres.; K3EWC, vice-pres.; K3JFR, secy.; K3EYL, treas.; K3EUE, act. mgr. K3NDW, using a DX-100, is a new member of the PFN. Your SCM visited EU's QTH and confirms his reports. He is "either shoveling snow or cutting grass." Wow, watta ranch! Traffic: K3IMP 5671, W3CUL 4931, IVS 1156, VR 875, EML 742, FAF 397, K3MNT 275, W3HNK 208, K3KTE 164, W3AXA 120, UIU 119, W4DVT 109, W3ZRQ 74, K3HTZ 62, W3DVB 60, K3EUG 52, CAH 50, IPA 32, KNL 29, BHU 27, DCB 27, W3HZZ 25, K3KTC 25, W3BUR 17, EAN 16, K3MVO 16, W3EU 14, K3JSX 14, W3NNL 10. K3KZG 8, JJG 6, W3NQB 6, BFF 5, K3AUT 4, W3DJW 4, PVY 4, K3GSU 1, W3GYP 1, K3NZD 1.

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA—SCM, Thomas B. Hedges, W3BKE—Asst. SCM Delaware: M. F. Nelson, K3GKF. SEC: CVE. MDD Traffic Net meets at 1915 EST Mon.-Sat. on 3650 kc.; MDDS (slow) Net at 2030 EST daily on 3650 kc.; MEPN (phone) Mon.-Wed.-Fri. at 1800 and Sat.-Sun. at 1300 EST on 3820 kc. It is a pleasure to welcome K3GKF as Asst. SCM of Delaware. "Skip" intends to prod the Diamond State boys into a higher level of organized section activity with the ultimate goal of establishing a separate Delaware section. Let's give him our support! July appointments: K3CNI and K3MDL as OBSs, OHI as OPS. The FSARC has completed and filed its new Emergency Plan. This may provide an outline for other area clubs to do likewise. The RCARA had color shots of its FD setup at the July 14 meeting, and also had LU2AL as a visitor. K3BRS has his new station going on 50 Mc. BUD says St. Mary's AREC has moved to 2 meters. K3BYJ helps keep Delaware active in MDD and provides a good Delaware traffic outlet. CDQ expects to do some hamming in Colorado. K3CNI worked into Texas on a 6-meter opening. New officers of the BARC are KFM, pres.; K3EFR, vice-pres.; UOV, secy.; and EMZ, treas. The club will hold free Novice code classes each meeting night. K3DCP says K3KHN and K3HRJ created a midnight stir walking around the neighborhood testing 6-meter rigs. EOV checks in from Ocean City and while there met OT BAK who was SCM back in the '30s. 4EXM/3 checks in again from Okinawa and soon will be joined there by KØPIV/3. K3GBV has completed his 6-meter mobile. WZL says that GQF at Johns Hopkins is planning a "Worked all Colleges" Award. K3GZK is active in the MDDS Slow Speed Net. K3HDW renewed his OES appointment. The FARC held its July meeting at the QTH of IQK. HKS checks in from Wilmington. K3HPG reports that Hagerstown hams had a big time during the Powder Puff Derby. K3JIQ is trying 20-meter c.w. with a new rig and beam. K3JYB sends in a nice 6-meter OES report. Congrats to K3JYZ on making BPL with a record MDD traffic total. JZY was busy rebuilding during the summer. KHA is glad to be back in civilian life again. K3KHK operated portable 4 from Florida during vacation. K3KPZ was on another TV show with K3MDL and other Baltimore hams. KTR is back on MEPN after 4½ years European duty and extends greetings to all. K3LFD would like to establish a Maryland phone traffic net. K3LLR likes to work m.c.w. on 6 meters. K3LWD is installing push-to-talk on his Challenger. MAZ is organizing a master AREC plan for Baltimore City. Contact Ray for details. MCG has big plans with the new 10/15 beam and 75A-4. K3MXJ has dropped the "N." KN3NFJ is studying for his General Class license. KN3NKE is an XYL at the Library of Congress. OHI is glad to be back on MEPN. KN3PHV is a new Bethesda station. KN3PRN is another newcomer to Baltimore with a DX-40. TN keeps up his solid traffic activity. MSK was host to the PVRC at its July meeting. Ed is leaving for temporary duty in Australia. UE says K4TDN/3 and IVC are newcomers to MDD. K3WBJ keeps Walter Reed Hospital on the traffic map. ZAQ maintains the lead in MDDC OO activity. ZNW filed a good traffic total. Traffic: K3JYZ 2396, LFD 191, W3TN 109, UE 92, GQF 79, K3WBJ 79, W3ZNW 50, MCG 46, K3JIQ 45, GZK 27, MDL 26, W3EOV 20, K3BYJ 16, W3BKE 9, K3DCP 9, KHK 9, W3BUD 2, JZY 2, OHI 2.

SOUTHERN NEW JERSEY—SCM, Herbert C. Brooks, K2BG—SEC: K2ARY. RMs: W2BZJ, W2HDW and W2ZI. Many thanks for your support in the recent election. Your continued support during my fifth term is solicited. K1CIF/2, Haddon Heights, formerly of N.H., has been appointed ORS. W2ZI has just returned from a southern trip, having visited W4PPZ, W4KL and W4AA. N.J. Emerg. Phone & Tfc. Net July totals were 30 sessions, QNI 583 and traffic 207. W2IU, Absecon, has completed his tower. WA2KWB operated with the DVRA Field Day group. WA2MEQ worked 50 sections in the recent CD drill. W2BZJ Pennington, is 2RN's representative to EAN on Tue. The Gloucester County ARC is sponsoring instruction classes for Novice and General license candidates. In the Southern Counties ARC Area WA2SNN and WA2JPA have new 2-meter antennas and WA2AWD and K2YZY are building new QTHs. The SJRA's new meeting place is the Delaware Twp. High School, the 4th Thurs. of each month. The SJRA's Field Day chairman reports a higher club score than ever before. WA2BLV is back in circulation after a hospital stay. July was a quiet month with K2MKD, WA2PWI, W2BV, WA2GSO, WA2GJE and K2BG vacationing in various call areas. The SJRA's July issue of *Harmonics* contains a fine article on "Transmitter Hunting" by W2HBE, C.d. Hq. at Woodbury is installing a 100-ft. tower. W2WKI, of Moorestown, Burlington County Radio Officer for several years, is being transferred to W1-Land. K2ECY, Riverton/Burlington County EC, and K2MOV, Delanco, expect to operate from Kwajalein as KX6NJ. The SJRA and the Gloucester Co. ARC are both sponsoring "home-brew" building contests in the interest of personal design. No reports were received from clubs in Salem, Mercer and Cape May Counties. With regret we report the passing of W2FQ, Moorestown. Traffic: W2RG 234, W2BZJ 58, W2ZI 38, K1CIJ/2 36, K2SOX 34, K2RXB 28, W2IU 20, WA2KWB 20, WA2MEQ 20, WA2HJD 18.

WESTERN NEW YORK—SCM, Charles T. Hansen, K2HUK—SEC: W2LXE. RMs: W2RUF, W2EZB and W2FEB. PAM: W2PVI. NYS C.W. meets on 3615 kc. at 1900, ESS on 3590 kc. at 1800, NYSPTEN on 3925 kc. at 1800, NYS C.D. on 3510.5 kc. and 3993 kc. (s.s.b.) at 0900 Sun., TCPN 2nd call area on 3970 kc. at 1900, IPN on 3980 kc. at 1600. 2RN at 2345 and 0230 GMT on 3690 kc. W2RUF is recovering from a recent serious operation. Appointments: W2OMV, as Wayne Co. EC; W2ZRC,

(Continued on page 102)

AMATEUR PUBLIC RELATIONS, CHICAGO STYLE

The International Trade Fair recently concluded in Chicago was an example of the ability of the ARRL, 23 local Amateur radio clubs and 128 "hams" in Chicago, plus an inestimable number of 20 meter sidebanders across the nation, to organize quickly and lend each other full cooperation.

W9TEM was on the air for 17 days at the Fair, twelve hours a day, morally rock bound. It was a real credit to the side banders that the frequency was kept clear nearly 100% of the time. Over half a million visitors attended the Fair and had an opportunity to see and hear ham radio in action. The station gave Chicago Amateur Radio a much needed public relations shot in the arm.

The Fair exhibit started with an idea by Mel, K9HVE, in an executive conference of Fair officials two weeks before the doors opened. Kap, W9QKE, president of the Chicago Area Radio Club Council, Inc., agreed to obtain the equipment and organize the radio clubs of Chicago comprising the council. Eve, K9EMS, was asked to organize the Ladies Amateur Radio Klub to handle the stations during the day time hours. Several manufacturers and distributors contributed sufficient equipment for the exhibit to have two 1KW stations. Over 2500 contacts were made and over 3000 pieces of visitors' traffic were handled during the Fair. Bud, W9QVA, designed two mike mixers for the stations which permitted the public to hear both sides of the QSO through a public address system. The mixers also had provisions for a second mike which allowed visitors to talk to given stations and yet permitted the operator to control the station.

Several of the more versed members of the CARCC TVI committee were always on hand to answer questions from the visiting public concerning problems with individual amateurs.

It is doubtful that Chicago amateurs have ever had the public understanding that exists today. ARRL sent the exhibit many reprints from magazines and ARRL publications which greatly contributed to the public knowledge and understanding of amateur radio.

Hallicrafters is very pleased to have been able to supply equipment to this worthwhile cause of amateur radio.

— HAROLD A. CHARVAT, K9BPO

Burl Hallicrafter Jr. W. J. Hallicrafter W9AC for hallicrafters

(Continued from page 100)

W2EMW and K2RYH as ORSs; K2RTQ and K2TDG as OPSs; K2RTQ as OBS; K2EQB as OO. ZL2GX attended an NFDXA meeting and the Rochester DX Club members were guests in July. W4BPD visited the group in August. Sorry to announce W2VSE as a Silent Key. K2MLT is on 75 meters with a KWM-2 and a GSB-201. The RAGS elected WA2KQK, pres.; W2VSP, 1st vice-pres.; K2DXV, 2nd vice-pres.; WA2AWK, treas.-corr. secy.; and K2SSX rec. secy. The CVARC held a ham picnic. WA2ROW and WA2OMK passed the General Class exam. K2DNN has a Valiant transmitter. His XYL is now WV2TCZ. K2YZR has a new zip-up mast for the 6-meter beam. Remember, your ARRL appointment requires regular monthly reporting of activities. All amateurs are invited to report to the SCM monthly. Convenient report forms are available from ARRL upon request. Don't forget the Syracuse V.H.F. Roundup to be held at Three Rivers Inn Oct. 7. K2GAO made the BPL. Traffic: (July) K2GAO 491, WA2CIG 391, W2OE 333, WA2HGB 254, W2FEB 222, K2SSX 216, K2MBU/2 133, K2QDT 78, K2OFU 61, WA2KUS 48, WA2GLA 36, WA2CRH 31, WA2CEA 27, K2RYH 23, W2RQF 19, K2HOH 18, WA2KZQ 17, W2PVI 16, K2TDG 13, W2ZRC 11, W2MPM 10, WA2HEC 8, K2EE 6, K2QKK 6, W2EMW 2, K2MQA 2. (June) W2ZRC 13.

WESTERN PENNSYLVANIA—SMC, Anthony J. Mroczka, W3UHN—SEC: OMA, RMs; KUN, NUG and GEG. The WPA Traffic Net meets Mon. through Fri. at 000 GMT on 3585 kc. The Keystone Slow Speed Net (KSSN) meets at 2330 GMT on 3585 kc. Mon. through Fri. SYY's dad received his call, K3QBL. LXQ moved to Portage so he can put up an antenna farm. SMV is being plagued with severe line noise at his QTH. The Huntingdon County ARC reports: K3JMR is currently stationed in Italy and operating IIAFS; a new licensee is K3OVY; KN3PMB is doing an FB job on the Novice band. MFX and K3HJK are operating /9 on 7050 kc. from Chicago and are interested in working the Pittsburgh Area. The Juniata Valley ARC reports via *The Static Blast*: K3ONE has a new antenna up, thanks to the efforts of K3s KDK and DOL; PVZ is working DX with his new beam; K3GOH received his Armed Forces Day certificate. The RAE communication truck, GV, was busy furnishing communications for the Legion Parade and radio demonstrations. A new ham from Wesleyville is K3QAY. K3ENV now is in W6-Land. K1LQD spent the summer in W. Pa. and QNIed regularly in the WPA Net. SUK is operating s.s.b. on 6 meters. ZQU's editorial in the Cumberland Valley ARC *Valley QRM* was worth reading. The following is an extract: "Personally I don't think Old Noah ever heard of ham radio or he would have had a separate definition. To me it means, one who performs experiments with radio for the purpose of personal satisfaction and advancement of the art of radio communications. How can anyone get any satisfaction out of operating a nice box full of parts and tubes that some engineer developed in a laboratory. Especially if the operator doesn't understand what goes on inside the box." K3KMO moved to a new QTH. The Etna RC reports via *Oscillator*: The club received a 20- and 15-meter beam from KXU, who is leaving the state; LMM spent some time on the West Coast; SIR has a cubical quad antenna; K3LIY received his General Class license. Traffic: W3WRE 509, K1JAD/3 34, K3DKE 29, W3KUN 26, NUG 20, UHN 12, K3GHH 10, W3GJY 6, K3LEV 5, COT 4, W3SMV 1.

CENTRAL DIVISION

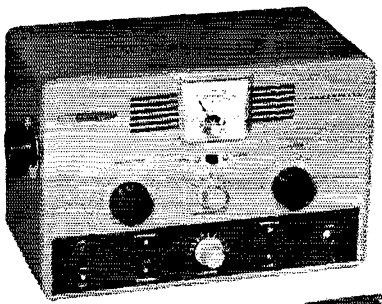
ILLINOIS—SCM, Edmond A. Metzger, W9PRN—Asst. SCM: Grace V. Ryden, 9GME. SEC: PSP, RM: USR, PAM: RYU. EC of Cook County: HPG. Section net: ILN, 3515 kc. Mon. through Sat. at 1900 CDT. The Chicago Area Radio Club Council received a great amount of praise and publicity for its participation in the International Trade Fair at McCormick Place in Chicago. The LARKS operated the two-station setup, using the call K9TEM, with K9EMS, K9IVG, K9BWJ, LOY, K9TRP and K9TVN as chief operators. WIRY is the new call of old 9FO (editor of *Call Book* 1927-36). He can be heard on 14-Mc. c.w. and 28-Mc. phone. ESP passed away July 15 at McLeansboro. K9RUC is sporting a new Valiant transmitter. The New Trier Radio Club of Winnetka and the River Park Amateur Radio Club, Inc., have been approved by the ARRL Executive Committee for League affiliation. JJN has been appointed president of the Telemotive Corp. K9LXG and AXV have new "Two-ers" on the air and are looking for DX. K9OKD is a new member of the Certificate Hunter's Club. UA has a newly-remodeled radio room. The Hancock County AREC's new frequency schedules are 29.64 and 3.940 Mc. on Sat. at 9:00 CDT. HOA's son-in-law, K2GAX, is being assigned by the Army to Argentina and is taking along a Valiant and a beam. K9TVA has a new 40-meter dipole and is making FB contacts. A new call heard is WA9ACU. BUB, K9ZOO and K9RHC are 6-meter s.s.b. stations. AUI, winner of the tower at the SARA, is using it for 2-meter communications. K9QMJ received the "S6S" Award from Czechoslovakia. Two new Brookfield stations are KN9IDL and KN9ILJ. New appointments: K9YYR, K9PBJ and K9KDI as Official Observers. The North Central Phone Net handled 150 messages during July. USR, the NCS for the ILN, asks that more of the down-state and particularly the far southern-end amateurs check into the net. K9CIL reports that the recent Breakfast Club Picnic held at Palmyra had the best attendance to date. Central Division Director GPI and SCM PRN were guest speakers. The committees of the Central Division Convention wish to thank all those who were in attendance and also the various speakers and participants who helped to make it a successful event. Traffic and station activity reports are slack because of vacation schedules and K9OZM is the only recipient of the BPL award. A late BPL is awarded to DO for June traffic. Traffic: (July) K9OZM 1018, W9UGY 267, MAK 213, IDA 191, K9BTE 173, W9JXV 100, K9TVA 70, RAS 62, QYW 35, OAD 19, W9PRN 10, SXL 10, K9CRT 8, IVG 5, OWQ 4. (June) W9DO 510, K9UOV 31, KEG 5, OCU 1.

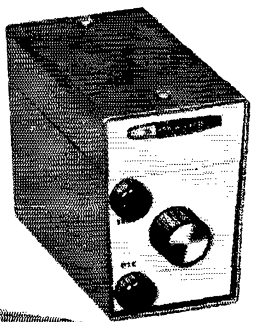
INDIANA—SCM, Clifford M. Singer, W9SWD—Asst. SCM: Arthur G. Evans, 9TQC. SEC: SNQ. PAMs: K9GLL, MM and RVM. RMs: DGA, TT and VAY. Net skeds: IFN, 0900 daily and 1800 M-F on 3910 kc. ISN (s.s.b.), 1930 daily on 3920 kc.; QIN (training), 1800 M-W-F on 3745 kc.; QIN, daily at 1900 and RFN, 0700 Sun. on 3656 kc. For information concerning the Hoosier V.H.F. Net in your locality, contact K9GLL. New appointments: MM as PAM of the ISN, VZF as EC of Harrison County. The hamfest and family picnic sponsored by the Indiana Radio Club Council, with the RCA Radio Club acting as host, was well represented by amateurs throughout the state. The Council's annual and most coveted award, the Hoosier Outstanding Amateur Award, was awarded to SNQ at this hamfest in recognition of his loyal and constant contribution to amateur radio and excellent work and service as SEC. The IRCC Field Day plaque for the highest scoring transmitter went to the Michiana ARC (AB), which scored 3336. The 6-meter award with a score of 1944 and the 2-meter award with a total of 756 were both awarded to the South Bend RC, K9DIP, who is 16 years old, now holds a 2nd-class radiotelephone license. K9RMI has made BPL three consecutive months on 6 meters. New officers of the RCA RC are CRS, GVT, DCD and BBE. The new club call of the Winslow ARS is CZH. The Wabash Valley ARA held another successful V.H.F. Hamfest with 300 attending. The organization of the Hoosier V.H.F. Net is progressing well under the direction of PAM K9GLL. The new editor of *PARASITIC*, paper of the Michiana V.H.F. Club, is K9YIC. New officers of the Fayette County RC are K9AIJ and K9WEO. *Amateur radio exists as a hobby because of the service it renders.* Those making BPL: JOZ, K9RMI and ZYK. July net reports: MM reports 322 for the ISN; RVM reports that the IFN total was 267; QIN (training) did not report, RFN totaled 54, reports TT; QIN traffic was not reported. Traffic: (July) W9JOZ 1097, ZYK 587, K9RMI 179, W9MM 175, VAY 130, BUQ 119, K9OET 89, CMG 75, W9BDG 64, HTK 58, K9HYV 55, W9GJS 53, K9WET 51, W9RVM 50, FWH 44, DOK 38, QYQ 38, K9GBB 37, W9TT 36, K9SOA 33, W9OG 32, NZZ 30, UQU 26, KN9FOG 25, W9SWD 23, QWI 21, K9ZKV 21, W9CC 18, K9HMC 18, KTL 18, W9IMU 16, K9CRS 15, W9EJW 15, K9JSI 15, W9RTH 13, UQP 12, K9ILK 11, AHE 10, OFG 10, W9BDP 9, VYX 9, K9YJW 8, QVT 7, W9SNQ 7, K9GEL 6, W9DZC 5, K9IXD 5, W9FJI 4, K9CFG 3, DFK 3, JKG 3, W9AQW 1. (June) K9GBB 28, JSI 12, CFG 2, YQA 2.

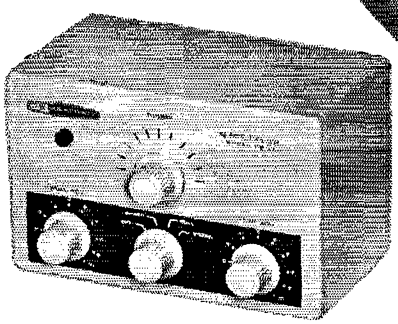
WISCONSIN—SCM, George Woida, W9KQB—SEC: BCC. PAMs: NGT and NRP. RMs: VHP and VIK. Ninth Regional Net certificates were received by K9YTJ and KQB. A total of 106 notices were sent by OOs RKP, VSO and K9HDL during July. Milwaukee AREC, K9KJT EC, reported furnishing communications for the State American Legion Convention, the South Milwaukee Music Festival, the Milwaukee Open Golf Tournament and the South Shore Water Frolic. Over 100 persons who fainted because of the heat were assisted. UXW now is in Iowa as an announcer for radio and TV station WOC. Congratulations to Scout Units #61 Amateur Radio Club of Milwaukee on its affiliation with the ARRL. Two new calls in the club are KN9FQA, age 13, and KN9FPY, age 14. Add to the list of ham stamp collectors, ZB. New officers of the Waupaca Club include DPN, pres.; VWX, vice-pres.; DYC, secy-treas.; KXK, act. mgr. The Outagamie Club elected FBC, pres.;

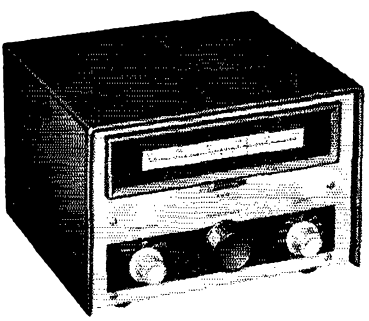
(Continued on page 108)

EVERYTHING IS NEW at HEATH









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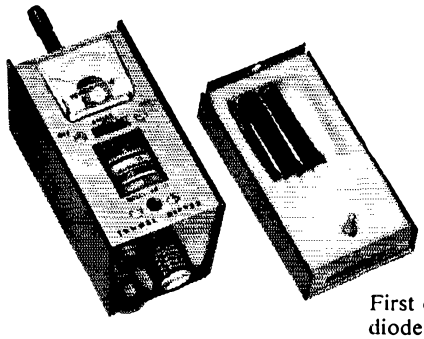
Kit HX-11 . . . $5 mo. **$43.50**



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- **Solid-state circuitry**
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- **Covers 160 to 1¼ meters**

Kit HM-10 . . . $5 mo. **$34.95**

Improve your receiver performance with this new Heathkit "Q" MULTIPLIER

May be used with any receiver having an IF frequency between 450 and 460 kc. This "electronic filter," with effective "Q" of approximately 4,000, provides either a sharply-peaked IF curve for CW, a broad peaked IF curve for AM or SSB, or a deep sharp notch for rejecting heterodynes on CW, AM and SSB. Both peak or notch positions are tuneable to any point in the receiver's IF bandpass. Ideal for CW reception and heterodyne rejection on receivers or transceivers employing fixed bandwidth mechanical filters such as the Collins 75S-1. Power supply is built-in. 2 lbs.

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- **Rotating slide-rule tuning dial**
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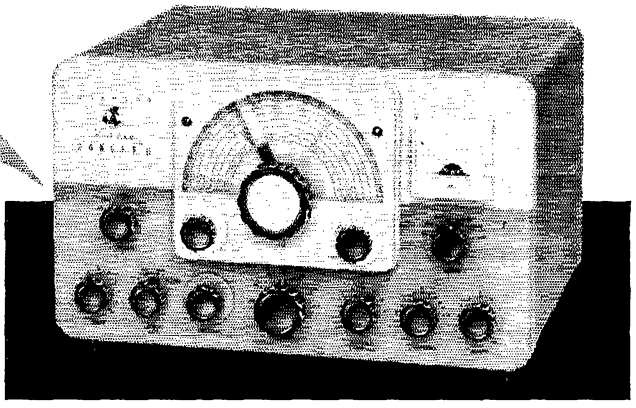
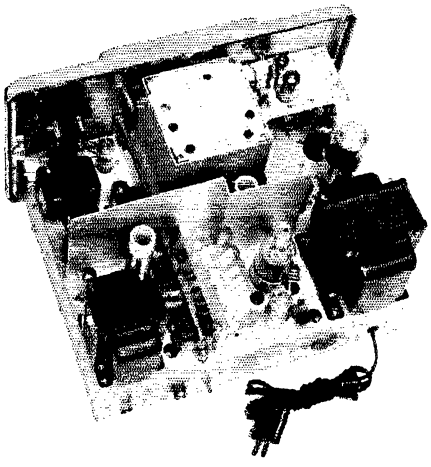
NOW COVERS 6 METERS IN ADDITION TO 160, 80, 40, 20, 15, 10



75 watts CW input
. . . 65 watts AM!



Now—a new version of the popular Viking "Ranger" . . . the "Ranger-II" Transmitter/Exciter! Completely self-contained in a handsome re-styled cabinet, the "Ranger II" now covers 6 meters! As a transmitter, the "Ranger II" is a rugged and compact 75 watt CW input or 65 watt phone unit. Pi-network coupling system will match antenna loads from 50 to 500 ohms and will tune out large amounts of reactance. Single-knob bandswitching on six amateur bands: 160, 80, 40, 20, 15, 10 and 6 meters—built-in VFO or crystal control. Timed sequence (grid block) keying provides ideal "make" or "break" on your keyed signal, yet the "break-in" advantages of a keyed VFO are retained.

As an exciter, the "Ranger II" will drive any of the popular kilowatt level tubes, provides a high quality speech driver system for high powered modulators. Control functions for the high powered stage may be handled right at the exciter—no modification required to shift from transmitter to exciter operation. Nine pin receptacle at the rear brings out TVI filtered control and audio leads for exciter operation. This receptacle also permits the "Ranger II" to be used as a filament and plate power source, and also as a modulator for auxiliary equipment such as the Viking "6N2" VHF transmitter. Unit is effectively TVI suppressed . . . extremely stable, temperature compensated built-in VFO gives you exceptional tuning accuracy and velvet smooth control. Complete with tubes, less crystals, key and microphone.

Cat. No. 240-162-1
Viking "Ranger II" Kit . . . . . **Amateur Net** **$249.50**

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The finest SSB signal on the air!

Here's the transmitter with the sharp, penetrating signal you've been waiting for—plus more exclusive operating and convenience features than any other SSB Transmitter on the market today! Instant bandswitching coverage 80 through 10 meters—no extra crystals to buy—no realigning necessary—delivers a solid 200 watts CW input; 200 watts P.E.P. SSB input; 90 watts input on AM! Unwanted sideband suppression is 60 db or better! Built-in VFO is differentially compensated. Exclusive RF controlled audio AGC and ALC (limiter type) provide greater average speech power—high gain push-to-talk audio system has plenty of reserve gain for either crystal or dynamic microphones. VOX and anti-trip circuits are extremely smooth in operation—built-in anti-trip matching transformer—adjustable VOX time delay circuit. Mixer-type shaped keying is crisp, sharp—click and chirp free. Single knob wide range pi-network output circuit—fully TVI suppressed.

Cat. No. 240-302-2 Wired and tested with tubes, crystals and crystal filter . . . **Amateur Net** **$619.50**

INVADER-2000—All the fine features of the "Invader", plus the added power and flexibility of an integral linear amplifier and remote controlled power supply completely wired and tested. Rated a solid 2000 watts P. E. P. (twice average DC) input on SSB; 1000 watts CW; and 800 watts input AM! Wide range output circuit (40 to 600 ohms, adjustable.) Final amplifier provides exceptionally uniform "Q". With multi-section power supply, tubes and crystals.

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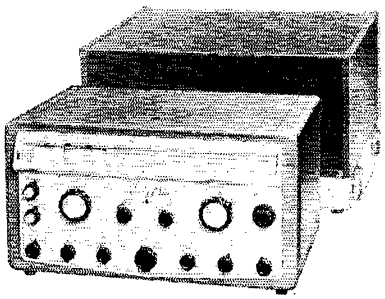

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RNH, vice-pres.; VTM, secy.; K9WNZ, treas. Club members are active on 2-meter mobile f.m. and KN9GAD is a new call in the group. More monthly traffic reports are solicited from the phone net operators. FZC has added servicing teletype to his duty of c.w. operator with the State Traffic Patrol. The Sun Prairie Club has three new calls on its roster, KN9HWA, KN9HUB and KN9FXH. K9YTJ has a new HT32A. Jim operates the Milwaukee c.d. station IJT as liaison to the state traffic nets. K9ZPJ now is operating a new HX-500 and an HQ-180C, and WYS is sporting a new HT-40 and an SX-140. Join the AREC and the Wisconsin section's traffic nets, all members of the NTS. Traffic: (July) W9DYG 1341, KQB 335, CXY 239, VHP 97, K9YTJ 83, W9YT 82, SAA 68, K9JXW 49, WIE 37, VSO 35, W9ZB 30, K9GYQ 29, W9NRP 29, CBE 25, VIK 24, K9SQV 23, W9MWQ 21, OTL 20, K9GDF 16, W4VRD/9 14, K9DTK 13, HDL 8, W9APB 6. (June) K9VSO 74, ZYU 10, GDF 7, GIL 3. (May) K9LIT 543.

DAKOTA DIVISION

NORTH DAKOTA—SCM, Harold A. Wengel, WØHVA—PAM: KØKJR. RM: KTZ. The North Dakota 75-Meter Phone Net reports 23 sessions with 305 check-ins; maximum check-ins 22, minimum 6; 43 pieces of formal traffic handled, 25 informal with 12 relays. The North Dakota Post Office Net reports 5 sessions for July with 31 check-ins; maximum 10, minimum 5; 4 pieces of formal traffic and 5 informal. One appointment was renewed: CAQ as ORS. Five EC appointments were cancelled and one ORS, KØTFB has taken a job in Bismarck. Traffic: (July) KØITP 41, AJW 28, MPH 26, TVI 11, WØCZL 9, AQR 8 KØPVH 5, WØTHM 4, YCL 3, BHF 1. (June) KØIVQ 151.

SOUTH DAKOTA—SCM, J. W. Sikorski, WØRRN—SEC: SCT. KØZLF has passed the Technician Class exam. KØYVC has been appointed ORS and OPS. Three weeks after receiving his General Class ticket, YVC had worked all states and 31 countries. A new call in Sioux Falls is KNØJTS. In May Activities, it's PHR (not PHY) who has worked more than 200 countries. KØALU has a new Invader and KØALT a Valiant. KØESC, Sioux Falls, and KØFKJ, Dell Rapids, are on six meters. OOZ has moved to Madison. KNØEEZ has a new jr. operator—it's a boy. Traffic: WØSCT 199, KØBMQ 70, YVC 52, WØDVB 43, KØYNR 18, WØZWL 16, KØDUR 9, WØFJZ 4, KØSEJ 3, WØAYJ 2, KØVYY 1.

MINNESOTA—SCM, Mrs. Lydia S. Johnson, WØKJZ—Asst. SCM: Charles Marsh, ALW. SEC: KØJYJ. PAMs: OPX and KØEPT. RMs: KLG and KØIZD. Having received no reports from TUS for three months, or letter in indicating that he wished to carry on as SEC, I have appointed a new SEC since Bob's term expired July 1. Our new SEC is KØJYJ, of Wilder. All ECs, please take note of this and forward your monthly reports to him. Congratulations and best wishes and success to you, Byron. To TUS, our outgoing SEC, my most sincere appreciation and thank you for three years of dedicated service. You and our many ECs are to be commended for a job well done on behalf of AREC and ARRL. KØVTG applied and qualified for ORS appointment. The Rochester Hamfest was attended by 150. KØDHH won prizes for all four c.w. tests, plus the QSL and DX Contest at the 'fest. There were 160 present at the Mankato Annual Picnic. BNR has a DX-40 transmitter, a Knight R-100 receiver and a dipole for an antenna. EC FIT reports that the *Spidernet* Amateur Radio Association celebrated its tenth anniversary with 30 active members. The club has served over 100 in the instruction of code and theory classes. KØBYX/6 will return to Minneapolis in January. He can be heard on all bands s.s.b. with a Johnson Invader and an RME receiver. ECs IKU, KKQ and FIT renewed their appointments. KØKRT, age 73, applied for AREC membership transmitter. His is a DX-35 and an SX-76 receiver. EC KØMEQ reports that KØs UJV and JVS are new XYL operators. BDO built a 500-watt 6-meter transmitter with a pair of 4X-150s in the final. KØAOZ has a Communicator III and a ten-element 6-meter beam. New MJN members are KØWWW and KNØFHA. KØVPP and DQL vacationed in the West as far as W6YDK. Asst. SCM ALW and family have returned from Virginia. KØs VTG and ORK made BPL. KØLNJ is assembling an s.s.b. linear. BBY piloted his new Cessna 4 to Alexandria with guests WVT and TOF. KØKMI returned from a European tour. KØJYC has accepted an engineer's position in Sheboygan, Mich. Our deepest sympatry goes to Lil, IRD, whose husband passed away recently. Traffic: (July) KØVTG 603, ORK 529, WØKJZ 215, KØYCQ 95, WØHEN 90, LST 88, KØAKM 75, UKU 74, PML 69, KLG 60, OPX 57, BUO 43, KØIKU 38, GPI 37, WØDQL 34, UMX 33, KØVPP 31, ZKK 31, JYJ 22, WØKYG 20, KØLWK 20, IDV 17, WØFGP 16, SLD 16, KØRDA 15, EUH 13, MGT 12, WØMXQ 10,

(Continued on page 122)

Wherever you live throughout the world, an authorized Hy-Gain Amateur Antenna Systems Dealer is at your service. These Distributors stock the Hy-Gain lines, can offer you service and assistance. Glance through the list below and note the Dealer nearest to you. The next time you're shopping for antenna equipment displayed in the following catalog, ask him for the complete information.

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Birmingham—Ack Radio

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Anchorage—Yukon Radio

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Demambro Radio
Radio Shack
Brockton—Demambro Radio
Fall River—Demambro Radio
Hyannis—Demambro Radio
Lawrence—Alco Electronics
Demambro Radio
Leominster—Demambro Radio
Medford—Demambro Radio
Randolph—Graham Radio
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Elmira—Chemung Electronics
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NORTH CAROLINA
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NORTH DAKOTA
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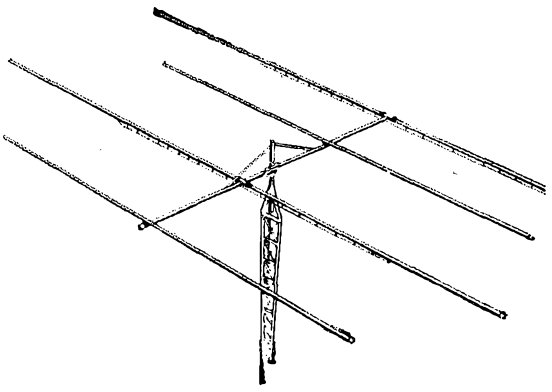
EASY TO ENTER! NOTHING TO BUY!

The Hy-Gain Duobander was designed specifically for the 20 and 40 Meter bands since sun spot activity has caused fewer openings on the 10 and 15 Meter bands. This beam consists of three full-sized elements on 20 Meters and two reduced-sized elements on 40 Meters in a lightweight, compact antenna.

DUOBANDER

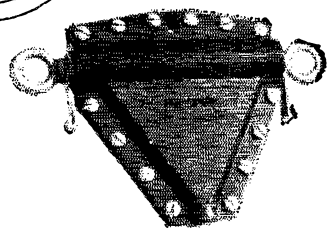


Two band operation is made possibile through a new Hy-Gain development — the linear decoupling stub, eliminating the use of inductance and capacity traps, yet performs extremely efficient decoupling of the various Duobander sections. The decoupling stubs also perform the second function of reducing the overall length of the 40 Meter element to about ⅔ normal size.

The linear loading principle replaces the loading coil for increased efficiency, while the Hy-Gain Beta matching system makes possible maximum gain and low SWR into a single 52 ohm coax feedline. Perfect pattern symmetry is accomplished through a broad band balun.

Power capabilities: 5KW P.E.P., 3 KW AM; forward gain over a tuned dipole 20M - 8.1 db; forward gain over a tuned dipole 40M - 4.9 db; F/B ratio, 20M - 20 to 30 db; F/B ratio, 40M - 15 to 20 db. Boom is 24 ft, longest element approx. 40 ft. All aluminum construction with hardware iridite treated to military specifications. Turning radius: 24.2 ft. Weight: 54 lbs. **Model DB-24, $149.50.**

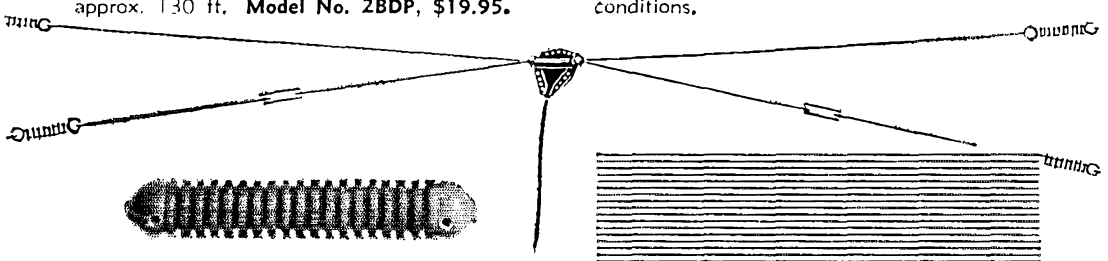
DOUBLET



The SWR is less than 1.5 to 1 on both bands. Net wt. only 3 lbs. Overall length approx. 130 ft. **Model No. 2BDP, $19.95.**

HY-FAN DOUBLET TAKES UNLIMITED POWER ON 40 & 80 M

The new Hy-Gain HY-Fan doublet is a complete antenna system designed for efficient operation on 40 and 80 meters. It is fed with a single 52 ohm coax transmission line and will handle unlimited power on both bands. The HY-FAN is constructed of the highest quality copper clad steel stranded wire and cycolac insulators, and is furnished complete with the Hy-Gain coaxial center insulator assembly. The fan configuration eliminates traps, increases bandwidth and the HY-FAN is virtually inpervious to all weather conditions.

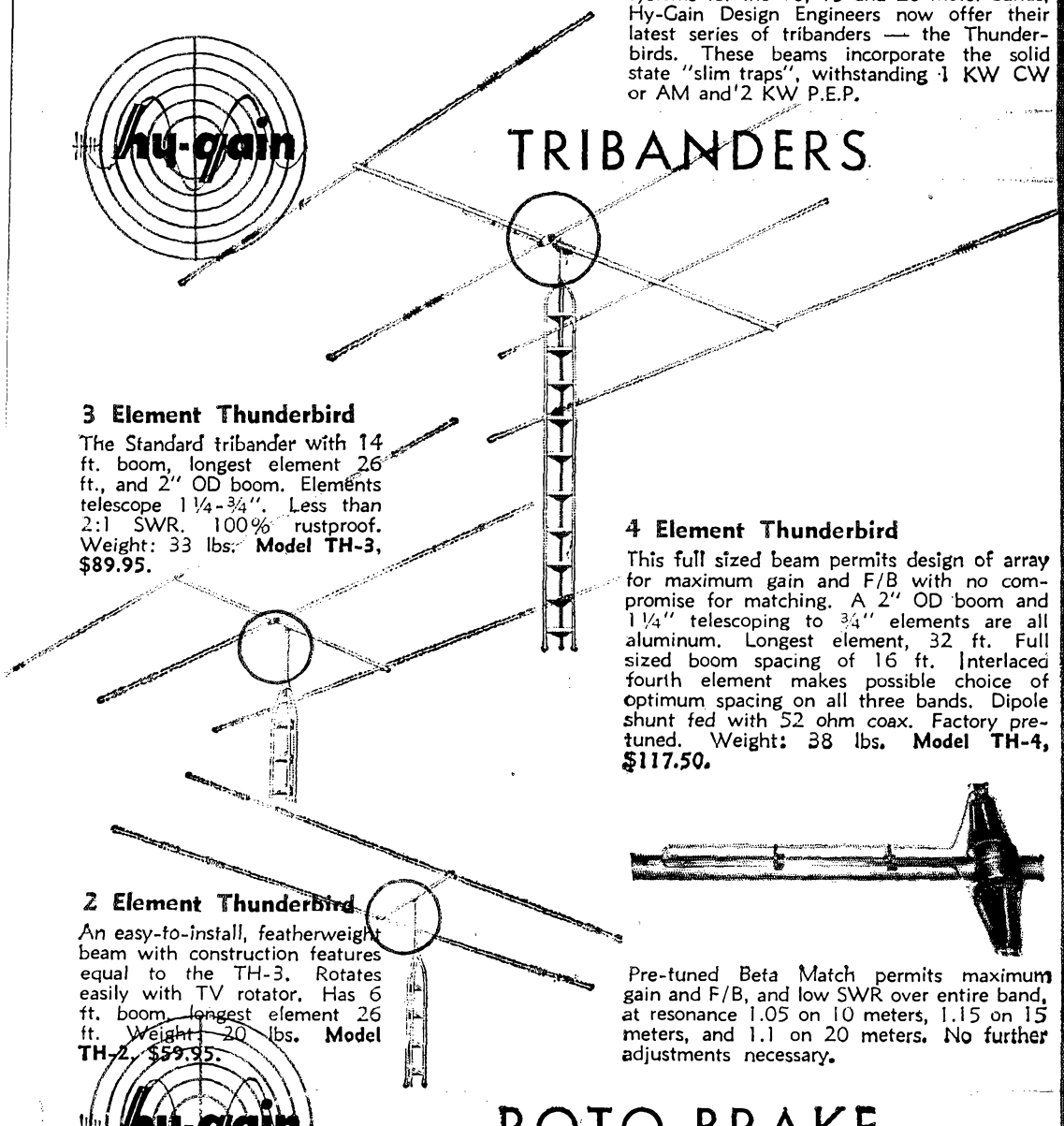


GRAND AWARD: 3.5-500mc ANTENNA SYSTEM!

First to mass produce three band antenna systems for the 10, 15 and 20 meter bands, Hy-Gain Design Engineers now offer their latest series of tribanders — the Thunderbirds. These beams incorporate the solid state "slim traps", withstanding 1 KW CW or AM and 2 KW P.E.P.

hy-gain

TRIBANDERS



3 Element Thunderbird

The Standard tribander with 14 ft. boom, longest element 26 ft., and 2" OD boom. Elements telescope 1¼-¾". Less than 2:1 SWR. 100% rustproof. Weight: 33 lbs. **Model TH-3, $89.95.**

4 Element Thunderbird

This full sized beam permits design of array for maximum gain and F/B with no compromise for matching. A 2" OD boom and 1¼" telescoping to ¾" elements are all aluminum. Longest element, 32 ft. Full sized boom spacing of 16 ft. Interlaced fourth element makes possible choice of optimum spacing on all three bands. Dipole shunt fed with 52 ohm coax. Factory pre-tuned. Weight: 38 lbs. **Model TH-4, $117.50.**

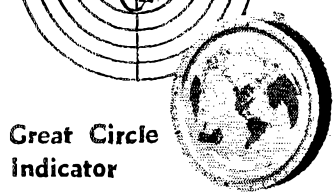
2 Element Thunderbird

An easy-to-install, featherweight beam with construction features equal to the TH-3. Rotates easily with TV rotator. Has 6 ft. boom, longest element 26 ft. Weight: 20 lbs. **Model TH-2, $59.95.**

Pre-tuned Beta Match permits maximum gain and F/B, and low SWR over entire band, at resonance 1.05 on 10 meters, 1.15 on 15 meters, and 1.1 on 20 meters. No further adjustments necessary.

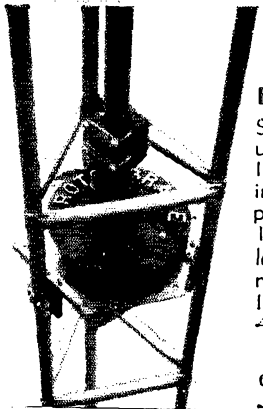
hy-gain

ROTO-BRAKE



Great Circle Indicator

Multi-colored 16" Wall Map with beam width and direction shown by moving wedge of light, 10° at perimeter. Centered East, West, or Midwest. Compass rose also available. Countries and call areas outlined and labeled.



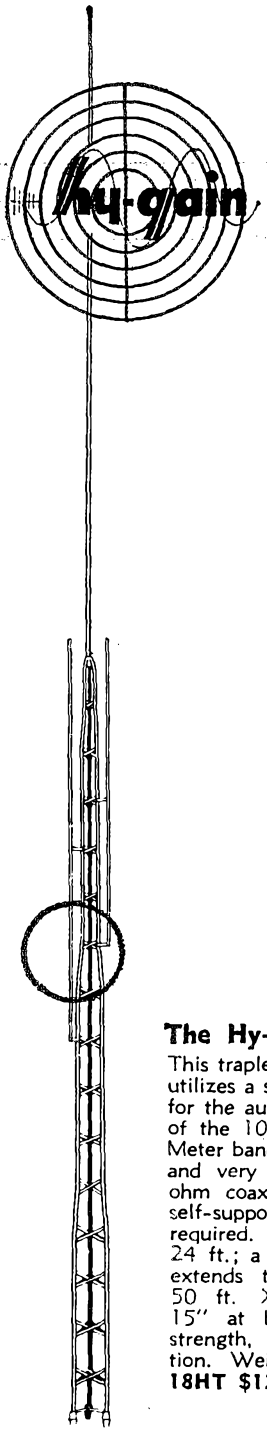
Brake and Rotator

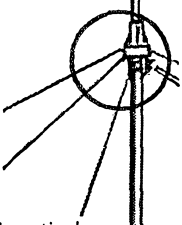
Spring actuated, solenoid released braking unit with 1000 In. Lbs. rotating power, 5 In. Tons braking power. High capacity starting torque motor assembly. Limit switches prevent continuous rotation. Mounts in 10-18" steel tower. Mount kits available for less than 10" dia. towers, pole or pipe masts, or telephone pole masts, $34.50 each. Includes control box and Indicator. Weight: 42 lbs. **Model RBX-1, $199.95.**

CONTEST CLOSES OCT. 31, 1961!

The popular Hy-Gain Multiband Verticals are self-supporting and require very little space for installation. As with all Hy-Gain antenna systems, top grade construction has been used throughout, with additional emphasis on handsome appearance.

VERTICALS





Trap Verticals

The Hy-Gain AVS Series incorporate the solid state "slim traps" which offer minimum wind loading and clean line silhouette. These antennas are completely factory pre-tuned with no further adjustment necessary, maintaining an SWR of 2:1 or less across the entirety of each band. 52 ohm coax feed line. True ¼-wave marconi resonance on each band makes possible low angle DX radiation pattern. The Trap Verticals may be ground or roof mounted.

10-20 Meter Verticals

This Trap Vertical operates on the 10, 15 and 20 Meter bands with excellent efficiency and SWR of 2:1 or less. Completely weatherproof nylon base assembly makes the antenna self-supporting. It is 13.5 ft. high and weighs 9 lbs. **Model 12AVS, $21.95.**

10-40 Meter Verticals

Operating on the 10, 15, 20 and 40 Meter bands, this Vertical includes the Hy-Gain Capacity Hat feature, as well as the weather-resistant nylon base mount. It is 21 ft. high, weighing 10 lbs. **Model 14AVS, $27.95.**

The Hy-Tower

This trapless, multi-band vertical utilizes a stub decoupling system for the automatic band selection of the 10, 15, 20, 40 and 80 Meter bands with high efficiency and very low SWR. It is 52 ohm coax fed, and completely self-supporting with no guy lines required. The tower height is 24 ft.; a 2"-¾" OD top mast extends the overall height to 50 ft. X-braced steel tower, 15" at base is of maximum strength, commercial construction. Weight: 100 lbs. **Model 18HT $129.50.**

Base Support

Three cycolac vertical base insulator assemblies insulate and support the Hy-Tower.

Accessories

Roofmounting kits are available for each of these Trap Verticals, the Model 12RMK for the 12AVS, weighing 6 lbs. **($9.50)** and the 14RMK for the 14AVS, weighing 7 lbs. **($11.95).**

The Model LC80 Loading Coil kit will add 80 Meter operation to the 14AVS, weighs 4 oz., and sells for **$7.95.**

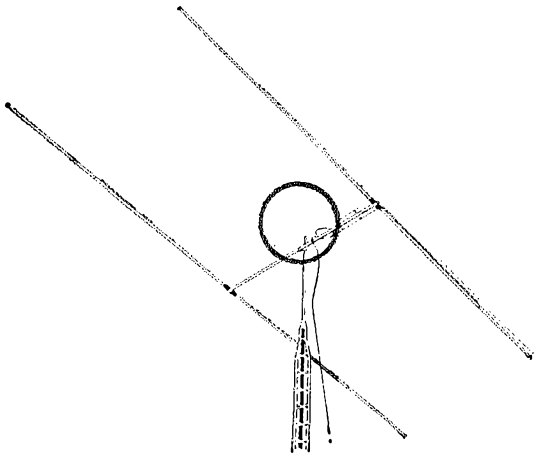
The Model 6MK kit will add 6 Meter operation to either the 12 or 14AVS, weighs 6 oz., and sells for **$4.95.**

ENTER OPERATION "SKYHOOK" TODAY!

Each of the Hy-Gain Monobanders incorporates the exclusive Beta matching system, factory pre-tuned for an SWR of 1.5:1 or less. They are 52 ohm coax. fed, allowing tuning for maximum gain and F/B. The 40 Meter "Hy-Seven" also uses the "linear loading" concept which reduces element length and maintains generally higher efficiency than coil loading.

hy-gain

MONOBANDERS



40 Meter Monobander

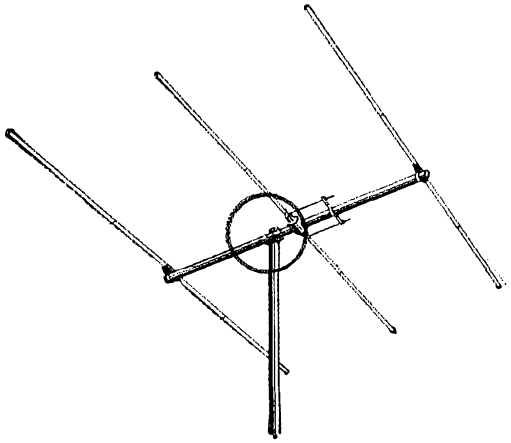
Hy-Gain's "Hy-Seven" is a 2-Element, reduced size antenna due to incorporation of the "linear loading" concept which also increases its efficiency. Boom is 16 ft.; longest element, 43 ft., all aluminum. SWR 1.0:1. Also available tuned to commercial frequencies. Can be stacked with existing installations; extremely light weight. Weight: 24 lbs. 5.2 db gain; 15-30db F/B ratio. **Model 402B, $99.75.**

20 Meter Monobander

A full size 20 Meter array of commercial construction, with elements adjustable over entire 20 Meter band. Elements are telescoped three times to minimize sag. Boom is 212 in.; longest element, 35 ft. 9 in. Weight: 29 lbs. All aluminum construction. 8 db gain; 25 db F/B ratio. **Model 203B, $65.95.**

15 Meter Monobander

A rugged built antenna adjustable over the entire 15 Meter band, yet may be rotated by heavy duty TV rotators. Quick to assemble and install. Boom is 142 in.; longest element 23 ft. 10 in. Weight: 30 lbs. 8 db gain; 25 db F/B ratio. **Model 153B, $38.50.**



10 Meter Monobander

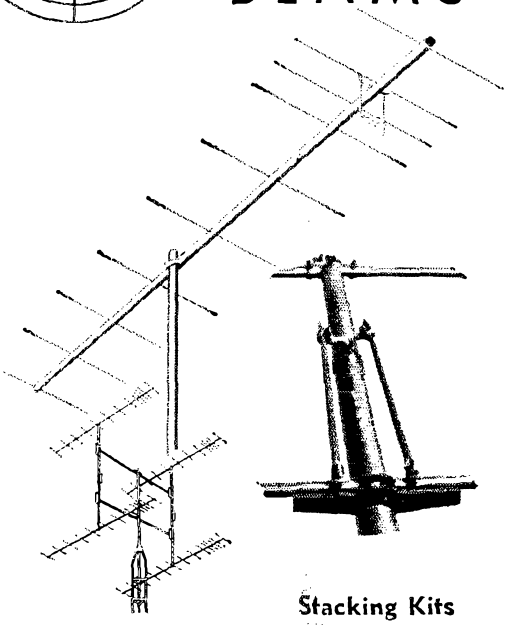
Weighing only 18 lbs., this antenna is small enough to be rotated by any TV rotator. Elements are adjustable for maximum gain over entire 10 Meter band. Easy to assemble; no further adjustments needed. Boom is 104 inches; longest element, 17 ft. 10 in. 8 db gain; 25 db F/B ratio. **Model 103B, 32.95.**

All Hy-Gain Monobanders may be stacked in the conventional manner.

ANY LICENSED AMATEUR MAY ENTER!

hy-gain VHF BEAMS

All Hy-Gain VHF Hi-banders* are constructed of heavy wall 1¼" dia. heat treated alloy aluminum tubing booms and 3/16" dia. solid rod elements. They are built to withstand extremely high wind velocities and heavy ice loading conditions. Optimum spacing and advanced high Q element design result in tremendous forward gain and excellent F/B characteristics. All VHF antennas match any impedance coaxial or parallel transmission line (52 and 72 ohm coax plus 200, 300 and 450 ohm parallel line).



2 Meter, 5 Elements

Ideal for semi-permanent or portable applications, this beam is extremely light weight, factory pre-tuned and easy to assemble. Can be either coax or parallel fed. Beta matching system. Boom is 5 ft. 4 in.; longest element 41¾ in. 9.0 db gain. Weight: 2 lbs. **Model 25, $8.95.**

2 Meter, 10 Elements

Tremendous forward gain and excellent Front-to-Back characterize this light weight, popular 2 Meter beam. Can be rotated by any TV rotator. Coax or parallel fed. Boom is 12 ft.; longest element, 41¾ in. Beta matching employed. 13.4 db gain. Weight: 5 lbs. **Model 210, $14.95.**

1¼ Meter, 11 Elements

Pre-tuned folded ratio dipole is used for low loss 450 ohm open wire transmission lines in this 220 mc beam. Optimum spacing and high Q element design. Boom is 12 ft.; longest element, 27 in. 14.2 db gain. Weight: 4 lbs. **Model 111, $13.95.**

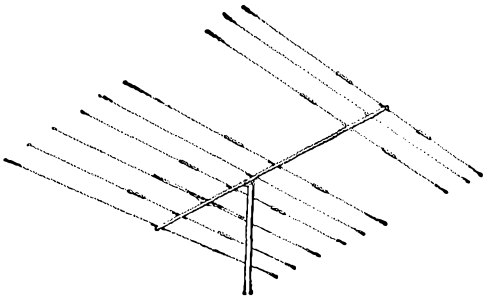
¾ Meter, 13 Elements

One of the highest gain and efficient extended multi-element Yagi's ever commercially manufactured for the amateur. Specifically designed for 430 mc operation, this beam has a boom length of 8 ft.; longest element 13¾ in. 16.1 db gain. Weight: 2¼ lbs. **Model 313, $12.95.**

Stacking Kits

Kits are available for stacking any two of these beams for adding 3 db gain, any four of the beams for adding 6 db gain, as well as stacking frames for mounting four stacked beams. The Dual Stacking Kits (**Model DS**) are **$4.95.** Quad Stacking Kits (**Model QS**) sell for **$15.96.** Quad Stacking Frames (**Model SF**) are **$59.50.** Beam Model Numbers must be specified when ordering these kits.

hy-gain 6 and 2 METER BEAM



4 Elements on 6 Meters
18 Elements on 2 Meters

The new Hy-Gain Model DB-62 is a single transmission line beam antenna system for 6 and 2 meter operation. It is fed with 52 ohm coax transmission line and develops a forward gain of 8.0 db on 6 meters and 15.0 db on 2 meters.

The front to back ratio averages 15 to 20 db and SWR will remain below 1.5 to 1 on both bands.

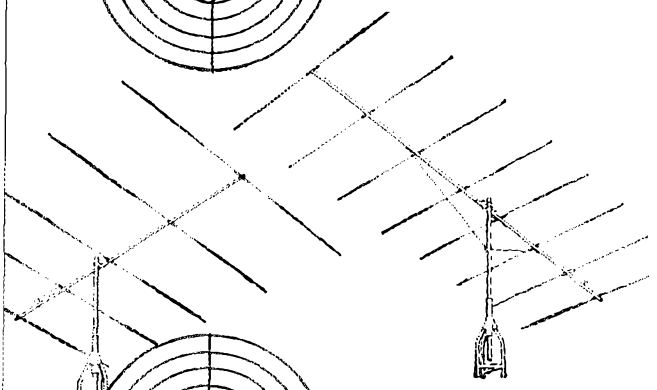
The antenna is ruggedly constructed of 1¼" O.D. aluminum boom and 7/16" O.D. elements and is factory preassembled.

Net wt. 8.5 lbs.; boom length 10 ft.; longest element 10 ft. **Model DB-62, $32.95.**

SEE YOUR HAM DEALER FOR ENTRY BLANK!

Completing the Hy-Gain Ham line are the Hy-Gain 6 Meter Beams, Halos and Ground Planes, specifically designed for specific purposes. These antenna systems share the same top construction attention afforded every model in the Hy-Gain Antenna Series.

6 METER BEAMS



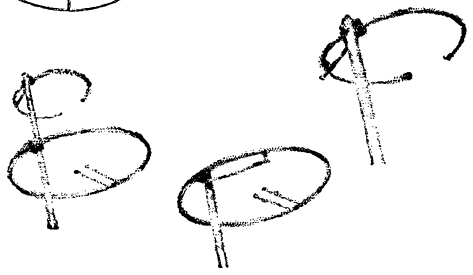
6 Meter, 8 Elements

Factory pre-assembled, this beam may be rotated with any TV rotator and includes the Hy-Gain exclusive Beta match. SWR less than 1.5:1. 52 ohm coax fed. Boom is 18 ft. long; longest element, 9 ft. 8 in. 10.1 db gain; 25 db F/B ratio. Stacking instructions included. Weight: 8 lbs. **Model 68B, $32.95.**

6 Meter, 5 Elements

Simple and easy to install, this beam is easily rotatable. Elements and boom are factory pre-assembled. Include all details for stacking. Hy-Gain Beta matched for 9 db gain; 25 db F/B ratio. Boom is 9 ft.; longest element, 9 ft. 8 in. Weight: 5 lbs. **Model 65B, $18.95.**

HALOS



2 Meter Halo

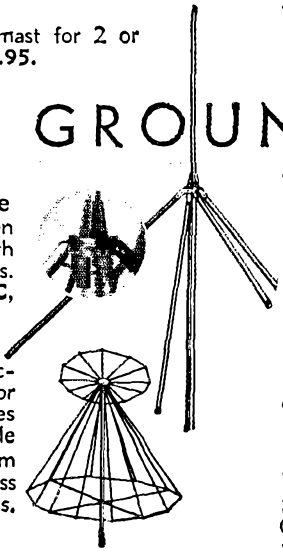
A 52 ohm Beta matched halo configuration, 14" in dia. of heavy wall, ½" dia. aluminum tubing. Cycolac bracket accepts any 1" mast. Factory pre-tuned but adjustable over entire 2 Meter band. No external matching. Up to 15 db gain over vertical whips on horizontally polarized signals. May be stacked for additional gain. **(Model HHS-2 Stacking Kit, $3.00).** Weight: 1 lb. **Model HH-2, $5.95.**

6 Meter Halo

High mechanical stability and minimum wind resistance with 1" dia. aluminum tubing halo, Beta matched, and mounts on any 1" mast. Tune to resonance quickly any frequency in 6 Meter band. Thoroughly weatherproof. Weight: 3 lbs. **Model HH-6, $12.95.**

Heavy duty 5 ft. telescoping mast for 2 or 6 Meter Halo, **Model HM, $4.95.**

GROUND PLANES



100-500 Mc Ground Plane

Covering any frequency between 100 and 500 megacycles, with solid ¼" aluminum rod radials. Weight: 3 lbs. **Model GP-3C, $14.97.**

50-500 Mc Discone

Vertically polarized, omnidirectional broad band antenna for covering 50 to 500 megacycles without adjustments. Low angle radiation, unity gain, 50 ohm nominal impedance, SWR less than 1.5:1. Weight: 9 lbs. **Model DS-1, $29.97.**

The Hy-Gain Ground Planes are of heavy duty commercial construction with radiator and ground plane elements of heat treated aluminum alloy and all hardware iridite treated. Cycolac base insulator adjusts to masts ¾"-1⅝" dia. 52 ohm nominal impedance. Better than 1.2:1 SWR. Radiation patterns are omnidirectional with unity gain. Complete instructions for easy, quick assembly.

25-50 Mc Ground Plane

Covering any frequency between 25 and 50 megacycles, with telescoping radiator and radials ⅞" to ¾". Weight: 8 lbs. **Model GP-1C, $32.70.**

50-88 Mc Ground Plane

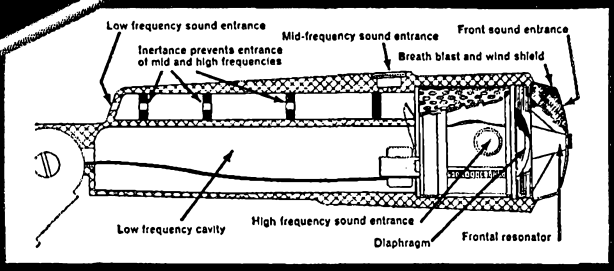
Covering any frequency 50 - 88 megacycles, with telescoping radiator and radials ⅞" to ¾" Weight: 5 lbs. **Model GP-2C, $21.90.**

WIN ONE OF 55 PRIZES!

The Least Expensive Way to Increase

Flat response penetrates QRM more effectively because it permits an actual increase in RF power output! More effective cardioid pattern, essential for SSB, cuts accidental tripping of VOX circuit!

MODEL 664



HERE'S HOW IT WORKS

Exclusive E-V Variable-D* (Variable Distance) provides three sound-cancelling entrances at different fixed distances in back of the diaphragm. These entrances, utilizing the proper acoustical impedances, combine to form an effective front-to-back spacing which varies in distance from the diaphragm inversely with frequency. The resulting phase and amplitude conditions provide a uniformly true cardioid pattern at all frequencies. **Pat. Pending*

Here's What the Top Radio Amateur Operators in the World Say About These E-V Microphones:

CX2CO "My new 664 resulted in better and more consistent QSO's."

W8KML "The 664 surpasses its claims in difficult operational environments."

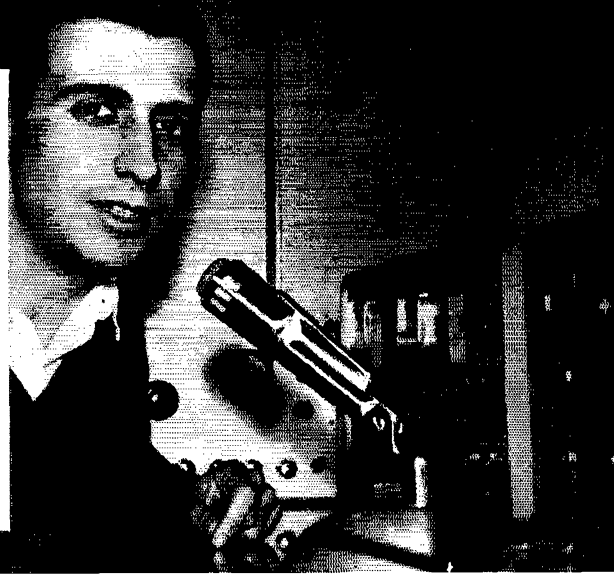
ZL1HY "During QSO's . . . everyone preferred the 951."

W3JNN "I am really sold on the 664."

W8BF "I have had many unsolicited compliments since using the 729."

VQ4ERR "The performance of the 664 matches its thoroughbred appearance."

PY2CK "My 664 microphone vastly improved my SSB transmission."



Average Peak-Power and Intelligibility!

CHOOSE AN Electro-Voice® MICROPHONE

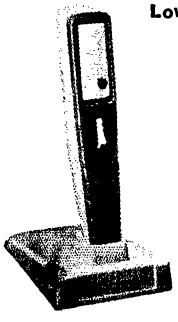
Model 664 for Highest Front-to-Back Discrimination Manufactured, Plus Peak-Free Wide-Range Response!

The effective strength of all sounds arriving at the sides of the 664 are reduced by as much as 50%, and arriving directly at the back of the microphone by as much as 90%. This uniquely effective design permits you to work at twice the distance from the microphone . . . a perfect invitation for "arm chair" QSO's—with no VOX tripping problems.

Smooth, peak-free response guarantees maximum P.E.P. Remember, a peak in response in or *out* of the voice range will limit maximum modulation and result in reduction of P.E.P. You do not have to talk with your lips on the mike. For best results, sit back and talk naturally.

Virtually indestructible Acoustalloy® diaphragm withstands high humidity, temperature extremes, corrosive effects of salt air and severe mechanical shock. Extra ruggedness means extra service, year after year.

MORE 664 FEATURES: Output—55 db. On-off switch (can be wired for relay control). 150 ohms or Hi-Z output selected at cable connector. Satin chromium finish. High-pressure die-cast case. Pop-proof filter plus magnetic shield. 90° swivel mounting. 18 ft. cable. 7 1/16 in. long (less stand coupler) by 1 1/8 in. diameter. Net Weight 1 lb., 10 oz. Amateur Net, $51.00. Matching desk stand with DPDT switch. Model 419S, $9.00. Less switch. Model 419, $6.00.



MODEL 729SR

Lowest-Cost Ceramic Cardioid Available ...Includes Every Feature Essential For SSB Operation. Flat, Smooth Response From 300 To 3,000 CPS!

Rugged enough for mobile operation, the slim, small Model 729 fits easily in your hand or slips into the desk stand or floor stand adapter provided, without any hardware adjustments. Hi-Z output -60 db. Two-tone grey, pressure die-cast and plastic construction. Shielded, 8½ ft. cable. 7¾ in. long by 1½ in. wide. Net weight 1 lb. Ceramic element unaffected by high heat, humidity. Model 729. Amateur net, $14.70. Model 729SR with relay-control switch. Amateur net, $15.90.

MODEL 951

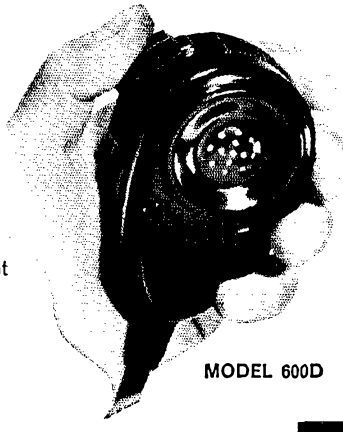
First True Crystal Cardioid With Variable-D Design. Combines High Output With Excellent Noise Rejection At Modest Cost!

Finest crystal microphone available for SSB. Variable-D design of Model 951 cuts room noise, interference from receiver speaker to a minimum. Allows greater working distance to microphone. Peak-free rising response for high intelligibility. Hi-Z output -60 db. High-pressure, die-cast finished in Metalustre grey. On-off switch. Shielded, 18 ft. cable. 5¾ in. long (less stand coupler) by 1¾ in. diameter. Net weight 1¼ lbs. Model 951 Amateur net, $32.70. Matching desk stand with DPDT switch. Model 418S, $9.00. Less switch. Model 418, $6.00.

The World's Finest Mobile Microphone. Model 600D Dynamic Widely Known As Military Types T-50 And M-105/U!

Designed for high articulation under rugged mobile conditions, the Model 600D provides all the advantages of a dynamic element with peak-free, flat response for maximum P.E.P.

High-impact case soaks up physical abuse, feels comfortable at any temperature, fits hand naturally. Extremely high output of -55 db. is ideal for mobile equipment with severe audio requirements. Available in 50, 250 ohms or Hi-Z. DPDT switch. 6 ft. coiled cord. Panel mounting bracket included. Model 600D Amateur net, $28.50.



MODEL 600D

See your Electro-Voice distributor and choose an Electro-Voice Microphone . . . For the fastest, easiest and least expensive way to boost the efficiency and quality of your rig! Satisfaction is guaranteed or your money refunded!

ELECTRO-VOICE, INC., Commercial Products Division
Department 1012Q, Buchanan, Michigan

Electro-Voice®

IS K6INI THE WORLD'S CHAMPION DX OPERATOR?

Judge for yourself! Read his letter and count the DX he has worked—with only 65 watts and a $16.95 Gotham V-80 Vertical Antenna.

2405 Bowditch, Berkeley 4, California
January 31, 1959

GOTHAM
1805 Purdy Avenue
Miami Beach 39, Florida

Gentlemen:

I just thought I would drop you a line and let you know how pleased I am with your V-80 vertical antenna. I have been using it for almost two years now, and am positively amazed at its performance with my QRP 65 watts input! Let me show you what I mean:

I have worked over 100 countries and have received very fine reports from many DX stations, including 599 reports from every continent except Europe (589)! I have also worked enough stations for my WAC, WAS, WAJAD and ADXC awards, and I am in the process of working for several other awards. And all this with your GOTHAM V-80 vertical antenna!

Frankly, I fail to see how anyone could ask for better performance with such low power, limited space and a limited budget. In my opinion, the V-80 beats them all in its class.

I am enclosing a list of DX countries I have worked to give you an idea of what I have been talking about.

Wishing you the best for 1959, I am

Sincerely yours,
Thomas G. Gabbert, K6INI (Ex-T12TG)

OR IS K4ZRA THE NEW CHAMP?

Read his letter, and see his diagram of a typical installation and what it achieved:

2539 Christie Place
Owensboro, Kentucky

GOTHAM
Miami Beach, Florida

Gentlemen:

While I was at home last summer, I had occasion to use your GOTHAM vertical antenna on the air for about two months. I was quite amazed with the excellent performance of that inexpensive and simply installed antenna. It did everything you, K6INI, and others said it would, in spite of the generally poor band conditions during the summer months.

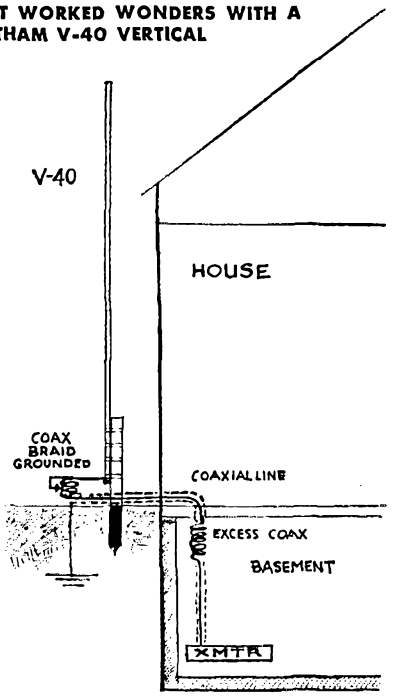
During the time I used this antenna, I worked well over 100 DX stations in 44 different countries, earned a WAS certificate, and worked the necessary stations for WAVE, receiving very fine signal reports from all. My rig ran from 75 to 100 watts plate input and the receiver was an old military ARR-7 (Hallicrafters reboxed SX-28.)

The above mentioned contacts were made with the vertical mounted several inches off the ground, without radials, with only a simple ground connection to the coaxial shield. Later I raised the antenna up about 20 feet and installed the radials and this improved the already good signal pattern and enabled me to pick off another 12 DX countries and other DX contacts in a couple of weeks of good band conditions. In the latter part of August I used several single-band vertical and ground plane antennas and found that the single GOTHAM vertical equalled all these individual antennas.

Another attractive feature is the versatility of installation. It works high or low on ground, with or without radials,

K4ZRA's INSTALLATION

THAT WORKED WONDERS WITH A GOTHAM V-40 VERTICAL



mounted in any space. Of course I did find that the best installations were the two mentioned above, but they were fairly simple to arrange, especially the first one!

The GOTHAM vertical is also a superior receiving antenna and I would strongly urge you to recommend that it be used for receiving as well as transmitting.

I just wanted to tell you how pleased I was with the overall performance of your antenna. For an inexpensive, easy-to-install, dependable antenna that really works for both DX and "local" W/K contacts, I don't see how one could ask for more and I would certainly recommend a GOTHAM V-40 to anyone desiring these features. Good luck in 1961 with those FB antennas!

Sincerely,
Daniel F. Onley, K4ZRA

FREE

Send a card for our valuable catalog of 50 different antennas with specifications and characteristics. Gives bands and frequencies covered, element information, size of tubing used, boom length, shipping weight, feed line used, polarization, and other data.

FACTS

ON THE GOTHAM

V-80 VERTICAL ANTENNA

- If K6INI can do it, so can you.
- Absolutely no guying needed.
- Radials not required.
- Only a few square inches of space needed.
- Four metal mounting straps furnished.
- Special B & W loading coil furnished.
- Every vertical is complete, ready for use.
- Mount it at any convenient height.
- No relays, traps, or gadgets used.
- Accepted design—in use for many years.
- Many thousands in use the world over.
- Simple assembly, quick installation.
- Withstands 75 mph windstorms.
- Non-corrosive aluminum used exclusively.
- Omnidirectional radiation.
- Multi-band, V80 works 80, 40, 20, 15, 10, 6.
- Ideal for novices, but will handle a Kw.
- Will work with any receiver and xmitter.
- Overall height 23 feet.
- Uses one 52 ohm coax line.
- An effective modern antenna, with amazing performance. Your best bet for a lifetime antenna at an economical price. ONLY $16.95.

73.
GOTHAM

YOU COULD WORK WONDERS WITH A GOTHAM VERTICAL ANTENNA!

FILL IN AND SEND TODAY!

Airmail Order Today — We Ship Tomorrow

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1805 PURDY AVE., MIAMI BEACH, FLA.

Enclosed find check or money-order for:

☐ V40 VERTICAL ANTENNA FOR 40, 20, 15, 10 AND 6 METER BANDS. ESPECIALLY SUITED FOR THE NOVICE WHO OPERATES 40 AND 15..... $14.95

☐ V80 VERTICAL ANTENNA FOR 80, 40, 20, 15, 10 AND 6 METER BANDS. MOST POPULAR OF THE VERTICALS. USED BY THOUSANDS OF NOVICES, TECHNICIANS, AND GENERAL LICENSE HAMS... $16.95

☐ V160 VERTICAL ANTENNA FOR 160, 80, 40, 20, 15, 10 AND 6 METER BANDS. SAME AS THE OTHER VERTICAL ANTENNAS, EXCEPT THAT A LARGER LOADING COIL PERMITS OPERATION ON THE 160 METER BAND ALSO..... $18.95

HOW TO ORDER. Send check or money order directly to Gotham. Immediate shipment by Railway Express, charges collect. Foreign orders accepted.

Name.....

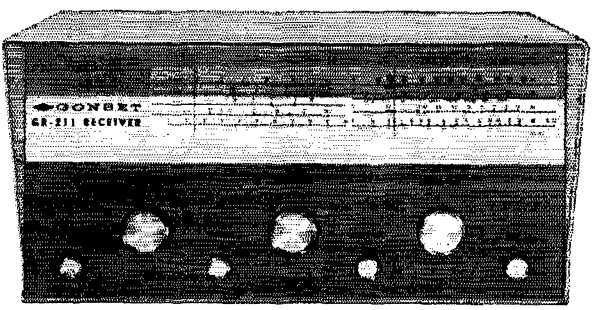
Address.....

City.....Zone.....State.....

...From Gonset

FEATURE FOR FEATURE THE BEST ALL-BAND BUY!

GR 211



The GR 211 assures outstanding all-band reception. It is designed for general coverage from standard broadcast through 34 mc band, including WWV, foreign & Voice of America.

Compare these quality features:

- Printed circuit techniques and advanced design for extra sensitivity, better, quieter reception, even on highest frequency bands.
- 6 tubes, transformer-powered *(NOT AC/DC)* for higher over-all gain, better signal-to-noise ratio.
- Circuit features leading to higher sensitivity include quality, high-Q, permeability-tuned coils.
- Two full-vision, illuminated, slide-rule type dials provide instant identification of broadcast and short-wave frequencies.
- Vernier tuning knob counter-weighted for smooth, non-critical short-wave tuning.

Amateur net price **$69.50**

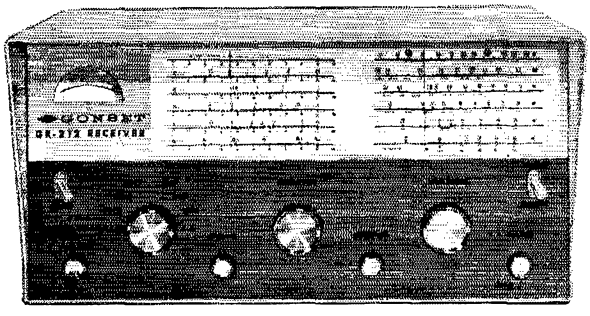
GONSET®

DIVISION OF YOUNG SPRING & WIRE CORPORATION

801 SOUTH MAIN STREET, BURBANK, CALIFORNIA

From Gonset...

THE ONLY DUAL CONVERSION RECEIVER PRICED UNDER $100!



GR 212

The new GR 212 is a deluxe dual conversion receiver that offers the radio amateur a host of highly-desirable features. In handsome industrial-designer styling, the GR-212 provides superlative performance at modest cost!

Compare these deluxe features:

- Dual conversion for increased selectivity.
- Variable BFO.
- Sensitivity: At least 6db S+N/N at 1 μv. (Mod. 30% at 400 cps.) Input on all H.F. Bands.
- Two full-vision, illuminated, slide-rule type dials provide instant identification of broadcast and short-wave frequencies.
- Panel-mounted "S" meter.
- Band-spread tuning knob is inertia fly-wheel weighted for smoothest tuning.
- Separate band-spread dial for amateur bands.

Amateur net price **$99.50**

GONSET®

DIVISION OF YOUNG SPRING & WIRE CORPORATION

801 SOUTH MAIN STREET, BURBANK, CALIFORNIA

RLQ 10, THY 10, WMA 10, ALW 9, KØKYK 9, VPJ 9, WØATO 7, KØBAD 7, ZRD 7, WØLIG 4, KØAOZ 2, FRC 2, ISV 2, KNØFHA 1. (June) WØKLG 27, KØBYX 5.

DELTA DIVISION

ARKANSAS—Acting SCM, Odia L. Musgrove, K5CIR—PAM: DYL, RM: K5TYW. A check with the ECs shows that 6-meter activity has doubled in the past year and there is quite a bit of 2-meter activity over the state. The CAREN had a very successful emergency drill. A tornado hit Little Rock two hours before the planned drill was to be held. The S.E. Arkansas Radio Club finally got the wave guides for its radar. RDY wrote more than fifty letters before some could be located. Chief technicians are CIX, OXZ and QBQ. It's good to see K5ABE without his crutches. CAM has a new HT-37. With the help of VQD, WUM has his RTTY working FB. RDY and K5KRO each have a new 10-kw. power plant, and K5KKO has a new 3-kw. power plant. K5CIX has a new shack with a lot more room. The Mississippi County Radio Club has three new Generals and 14 new Novices. Those code classes really pay off in a big way. The wind got K5QYH's 50-ft. crank-up tower and 6-meter beam. DYL has returned from a week's vacation in Hot Springs and EC spent a week up in W9-Land. Three new ECs are K5VOL, K5YEP and KKO. Traffic: K5MEA 6, ABE 4, CIR 4, W5NLL 4, K5VOL 4, GTN 2.

LOUISIANA—SCM, Thomas J. Morgavi, W5FMO—The Louisiana Tech. Radio Club is back in operation and would like to hear from other college clubs in the state. Its mailing address is Box 653, T. S., Ruston, La. Rain every day, squalls and thunderstorms had a lot to do with the low activity on the lower frequency bands in the area. HHA complains about this condition and his traffic count shows it. K5QXV and K5MOS are organizing a Delta Chess Net for Sat. at 0900 CST on 7240 kc. Forty-nine amateurs and amateur groups contributed $151.00 to "Project Carville." An Apache transmitter was purchased and presented to the U.S. Public Health Service Hospital at Carville, La. Presentation was made by CIT, EDV, WZR, K5CTR and WGT. The Greater New Orleans Hamfest, promoted by four area clubs, New Orleans, Jefferson, Westside and M.T.A., tentatively is set for Oct. 7 and 8. CEZ has been using the 6N2 he won at the Monroe Convention to check into the RACES Net. K5LZA was active in the recent CD Party. UQR reports excellent propagation conditions for the 6-meter band with daily openings to many sections of the U.S., Canada, Mexico and the Carribean Area. Sporadic-*E* propagation this year continues to be phenominal. He is building an 829B linear to be used on 6-meter s.s.b. in conjunction with a Heath SB-10. The North Lake V.H.F. Net meets on 51 Mc. Sun. GQS, recently licensed, is building a 100-watt rig for 6 meters. Two well-known amateurs passed away in August, JFZ, Covington; and GAD, Metairie. Traffic: W5CEZ 217, MXQ 68, K5QVX 58, W5HHA 2.

MISSISSIPPI—SCM, Floyd C. Teetson, W5MUG—The Jackson Club put on a very fine hamfest this year. The S.S.B. Supper on Saturday night also was very successful. K5IGW won an HT-37, K5PPI won the beam and K5AUR won the voltmeter. K5ZLI is on from Brookhaven with a Heath HW-10. K5AFP reports he won a DX-60 at the Indianola Hamfest. 9CTJ/5 has a new 6-meter beam. K5MDX reports that he had a fine time in the recent CD Party with 129 contacts. K5RUO and K5UBL are brothers. Check their traffic report. Not bad. K5UBL reports that he will be on 6 meters soon. JR is building a super-duper exciter and hopes to have it on soon. NNZ is building a new home. Don't spend too much time on yard work, Charlie. Traffic: K5RUO 204, UBL 52, AFP 15, W9CTJ/5 11, K5MDX 3.

TENNESSEE—SCM, R. W. Ingraham, W4UIO—SEC: K4OUK. PAMs: W4UVP, W4PQP and W4VQE. RM: K4AKP. K4HBU has been off the air because of illness in the family and transmitter trouble. K4CNU is NCS for the Oak Ridge Emergency Net Fri. W4MKX is being heard from Memphis using an Apache SB-10 and a Mohawk. K4LPW is chasing DX but says he is not catching much. W4UVU is operating 50.72 Mc. with 50 watts and a four-element beam. New appointment: K4AMC as EC of Davidson County. Renewed: W4JVM as EC and OPS, W4YRM as OES. OBS activity was reported by W4VJ, W4TDW and K4AKP; OO activity by W4TDW and K4RIN; OES activity by W4YRM; AREC activity by K4OUK. Net reports were made by W4PQP, W4UVP and K4AKP. Club bulletins were received from Oak Ridge and Chattanooga. Oak Ridge reported on an FB Hamfest held at Crossville and new calls in Chattanooga were listed as WN4BUP, WN4BUT, WN4BWZ, WN4BUU, WN4BWY and W4WHG. Traffic: (July) K4AKP 922, W4PL 446, W4FX 273, W4PQP 107, K4BWS

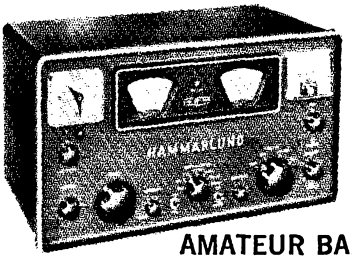
(Continued on page 124)

AMATEUR RADIO AT ITS HAMMARLUND BEST

HQ 100A
GENERAL COVERAGE

Separate, Variable BFO—Separate Q-Multiplier. An outstanding general coverage receiver loaded with high-price features. 10 tube superheterodyne — automatic noise limiter, Auto-Response—continuous tuning from 540 KCS to 30 MCS. only **$189** Amateur Net

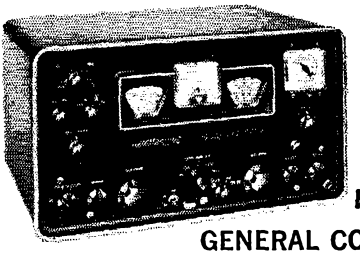
*24 hr. clock-timer optional—**$10**



HQ 110
AMATEUR BANDS ONLY

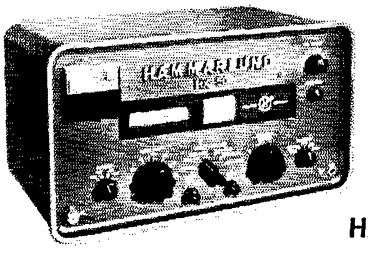
Dual conversion, 12 tube superheterodyne receiver designed with the amateur in mind. Optimum selectivity and excellent image response rejection — a quality-packed multi-purpose receiver. Covers all amateur bands—6, 10, 15, 20, 40, 80, and 160 meters.

*24 hr. clock-limer optional—**$10** **$249** Amateur Net



HQ 145X
GENERAL COVERAGE

New design now includes single crystal-controlled fixed-frequency channel—a must for many applications where crystal-controlled stability is required. Exclusive Hammarlund crystal filter and adjustable 60 db slot filter promotes solid contacts. **$269** Amateur Net



HX 50

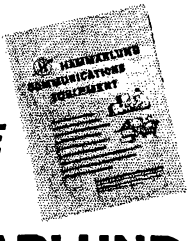
The first **BIG STEP** in transmitter history—Hammarlund quality-plus features that literally burst forth in this new, compact filter-type transmitter. Power input 130 watts, P.E.P. Two tone output 50 watts at 10 meters, 75 watts or better at 80 meters. **$399.50** Amateur Net

HQ 170

The amateur band SPECIALIST—the finest SSB unit on the market today! For a general coverage receiver, turn to the **HAMMARLUND HQ-180.** Both receivers feature dual and triple conversion, separate linear and AM detectors—in fact, everything most wanted by the radio amateur. HQ-170 **$359,** HQ-180 **$429** Amateur Net

*24 hr. clock-timer optional—**$10**

NEW HAMMARLUND CATALOG FREE



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Hammarlund Manufacturing Co., Dept. 100,
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Send me the new Hammarlund catalog containing complete descriptions of all Hammarlund receivers, transmitters, and accessory items.

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101, W4VJ 83, K4PKO 55, W4UVP 54, K4AMC 25, K4YFC 21, W4TZG 18, W4TYV 17, W4JVM 14, W4SGI 12, W4MKX 9, K4LPW 7, K4OUK 7, W4UVL 6, W4UIO 3, K4CNU 2, W4VNU 1. (June) K4YFC 38. (May) K4OUK 9.

GREAT LAKES DIVISION

KENTUCKY—SCM, Robert A. Thomason, W4SUD—Asst. SCM: W. C. Alcock, W4CDA. SEC: W4BAZ. RM: K4KWQ. PAM: W4SZB. V.H.F. PAM: K4LOA. KNN manager: WN4AGH. K4WOT reports Kentucky representative Hoyt Barnett is drafting a new bill for automobile license plates for amateurs to be introduced in the 1962 section of the General Assembly. Your support, suggestions or comments will be fully appreciated and should be directed to K4WOT. K4HOY is working 6-meter DX. Station activity in MKPN broke all records for July. New members are K4VUD, W5GTN, W4IWD, K4PEQ, K4UMN, W4BDC and K4KWQ. KNN reports a traffic total of 27. K4DFO hopes to be active next year from U.K. on the club station. Bill's DXCC now stands at 99. A new Novice from Maysville is WN4CEV. K4HSB is looking for a prop-pitch to turn his new quad. WN4AGH has remote control on his rig. OO reports were received from K4ZRA and K4ZQR. You may obtain a copy of the new *Kentucky Net Procedures Manual* from the net managers. As most of you now know my term as SCM ended Aug. 15. It has been a real pleasure working with the amateurs in this section and I wish to thank everyone for their support. At this writing my successor has not been selected. However, I hope you will continue your support through him. Traffic: K4VDN 208, K4CSH 89, W4BAZ 63, K4KWQ 62, W4CDA 36, WN4AGH 29, W4KJP 26, K4LOA 21, W4RNF 21, K4VDO 16, K4DFO 10, K4ZQR 8, W4SZL 6, K4HSB 4, K4OLT 4, W4SUD 4, K4DFZ 3, W4WVU 2.

MICHIGAN—SCM, Ralph P. Thetreau, W8FX—SEC: ELR, RMs EGI, SCW, QQO and FWQ. PAMs: K8CKD and JTQ. V.H.F. PAMs: NOH and PT. Appointments: MBH, FZ and PT as OESs; PT, AHV, IWV and K8NHC as OBSs; K8BQD, DSE, IBB, ILP, PXA and WVL as ORSs. FDO has a ruptured disc in his spine. We are all pulling for you. New officers of the Michigan 6-Meter Club are K8QXU, pres.; K8VRJ, K8BOU, MBH and MQ, vice-pres.; K8JGF, secy.; K8LUY, treas. This club offers certificates to all outstate hams who have worked 5 Michigan 6-meter stations in the past year. Send logs to K8JGF. The 6-Meter Net operates each Sun. at 0300 GMT. K8SMV and HKL are working 1200 Mc. The MCRC now is pushing RACES, not AREC. Why not both? The 6-meter AREC Net is doing O.K. NOH works PJ2BR, Aruba, on 50 Mc. Michigan YLs held a hamfest in Midland July 9. The BR/MEN had a nice picnic July 16 at Jackson. The Lansing gang seems to be going for Heath Two-ers. WYC is back from his California trip. ZZ sports a new emergency trailer, thanks to K8AMH. VPC had a '57 Chevvie wagon stolen from his driveway and found it in Chicago. K8IUZ operated from the Manchester Fair. K8KMQ made the U.P. Hamfest. JTQ likes the Heath Warrior. K8KQV likes his "new" BC-342. NOH is using a vertical antenna on 80 and 40 meters. TPB also is using a vertical. K8GJD has a new tower for the beam. K8GOU has a new antenna for 40, 20, 15 and 10 meters. EGI says "No 204A sockets." QQO set up the Blossomland RC station, MAI, in a new QTH. THZ tries c.w. again. K8PKU has a new Gonset G-76 mobile. The Betsie Bay Fish Net meets on 3880 kc. Sun. from 1730 to 1830 GMT. KN8BXH/K8BXH (Kalamazoo) wants to hear from all Novices interested in forming a Novice net. Write Walt, suggesting your preferred days, times frequency. Traffic: (July) K8IUZ 242, W8ELW 172, K8KMQ 159, HLR 132, W8OCC 119, JTQ 102, FWQ 63, K8KQV 53, W8NOH 48, ZHB 45, TBP 35, FX 30, K8GJD 26, W8HKT 23, AUD 20, IXJ 19, WQH 19, RTN 16, K8GOU 14, JED 13, NHC 13, W8DSE 11, K8PYW 11, W8EU 10, EGI 8, UFS 8, K8CKD 6. (June) K8PKU 54, W8DSW 29, DSE 10, UFS 3, K8KVM 1.

OHIO—SCM, Wilson E. Weckel, W8AL—Asst. SCM: J. C. Erickson, 8DAE. SEC: HNP. RMs: BZX, DAE, VTP and K8ONQ. PAM: K8MFY. Field Day is past and already plans are being made for next year. The Canton ARC's *Feedline* is really a work of art, containing 14 pictures of the club's FD operations and it states that KN8s BBE, BRK, BZI and DIP are new Novices, K8s UKH and YLK received their General Class licenses, K8POL received his Eagle Scout badge, OYV joined the QCWA, K8EML and YAB vacationed on the West Coast, K8JZN vacationed in Florida and the club won the Ohio Council's 1960 Sweepstakes Trophy. Dayton ARA's *R-F Carrier* reports the club held an auction, K8JQD joined Silent Keys, and a mobile foxhunt was held. Massillon ARC's *M.A.R.C.* tells of its FD setup. The item of news in Findlay RC's *The W8FT News* is that QC had

(Continued on page 126)

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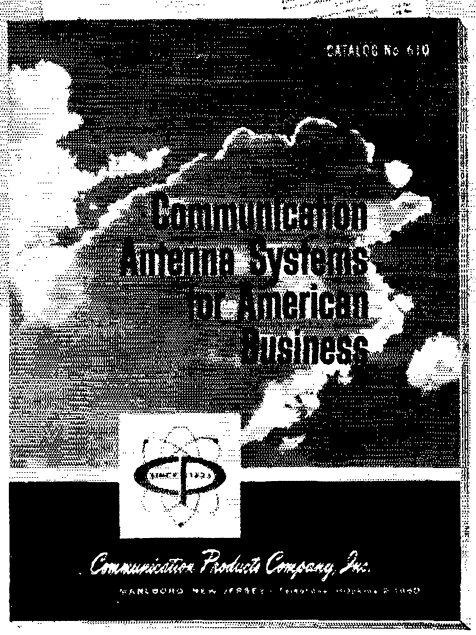

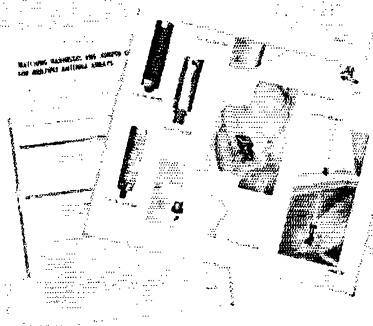

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his tower blown down in a wind storm and K8EJX's father gave her a Navy 40- and 80-meter transmitter. Parma RC's *P.R.C. Bulletin* informs us that the club held FD on the Crile VA Hospital grounds. K8BVI is in Korea. TGX displayed and discussed telephoto and facsimile systems, and the Cleveland V.H.F. and the PRC held a picnic. Cincinnati ARA's *The Mike and Key* tells us club members were shown a color movie, the Nike-Hercules Story. OH-KY-IN V.H.F. Society's *Q-Fiver* says it held an auction and enclosed a club directory. Warren ARA's *The Q-Match* informs us that KN8s AHC, BOP, BNY, CXX, CYI, CYP, CYQ, CYY, CZE, CZF and DJJ are new Novices. There was enclosed a Trumbull County Ham Directory compiled by K8NCV and the writer will say he did a wonderful job on it. 1BX received his HILO award No. 153. Toledo's *Ham Shack Gossip* named K8OFW as its Ham of the Month. the Custer V.H.F. RC held a hamfest. Teen Hams Toledo's 1961 officers are K8JWR, pres.; K8YAF, vice-pres.; K8HVN, secy.; and K8NCS treas.; thirty amateurs from the Toledo Area took part in providing communications in the Mills Trophy race with OFG as chairman. TSD in charge based stations with BCQ, CZH, DJC, DN, FDU, GJS, HSW, HYE, IME, ITT, JVS, KIX, NBD, PXK, QLV, PZM, RZQ, SDZ, TZO, VJO, WDL, ZIZ, K8s DHU, EUC, GOP, ISE, IUA, LFI, LUE, and VYG participating, the stork brought a baby girl to K8DOF. Your Director and SCM attended the Buckeye Net Picnic at Mt. Vernon with DZX, DAE, FYO, IBX, LZE, OPU, OPV, PMJ, UPB, K8s AZQ, DDG, HFL, HGI, HTM, KHS, MYG, ONQ, PBZ, QHH, UQW and YKK attending, many with their families. The Ohio Novice Net began operation Sept. 4 on 3710 kc. at 2300 (1800 EST) with K8VKK as net manager. For full details write K8VKK. KN8s BHH and DEG are new Novices in Alliance. K8PYD received his WAS and s.s.b. WAC phone certificates. 1KM has a new HT-37. KN8s AEI, AHE and ZTR are new Novices in the Cleveland Area. The Worked Ohio Ladies Award (WOLA), sponsored by the Ohio Council of Amateur Radio Clubs, is given for working 25 Ohio ladies. Send your list with call, name, date and band to K8MZT. This list has to be certified by two licensed amateurs. WOLA certificates have been issued to K8MZT, AL1, HWX and K8PSE in this order. KN8DGL is a new Novice in Cadiz and has a DX-20 and an SX-110. Ex-9FO-8RY-W1ONV is now W1RY. BFL is a new amateur in East Sparta. Those who made BPL in July were DAE, UPH (his 50th) and K8AAG. DAE visited K2s GQU and RYH. Traffic: (July) W8UPH 1292. DAE 726, BZX 237. K8QHH 177, SQK 170, RYU 146, AAG 125, OEX 102, ONQ 100, W8HCR 83, K8PFD 45, W8CXM 42, AL 39, IBX 27, K8RUC 25, KSN 23, W8PMJ 20, K8-VKK 20, PBE 15, LUP 14, WOC 12, HTM 9, BNL 5, DDG 5, W8EEQ 4, LMB 4, WYS 2, K8CQA 1. (June) K8PFD 82, KSN 39, LUP 28, W8QHH 13, EQN 11, K8-DDG 9, W8YGR 3. (May) K8KSN 83.

HUDSON DIVISION

EASTERN NEW YORK—SCM, George W. Tracy, W2EFU—SEC: W2KGC. RMs: W2PHX and K2QJL. PAM: W2IJG. Section nets: NYS on 3615 kc. at 1900; NYSPTEN on 3925 kc. at 1800; ESS on 3590 kc. at 1800; UHT (Novice) on 3716 kc. Sat. at 1300. Endorsements: W2KGC as SEC; K2DEM as OO and OPS. Sorry to report the passing of W2NOC in Catskill. Hal was a fine traffic man for many years and a staunch supporter of the Rip Van Winkle Club. We'll miss him. WA2IRK reports a new operating console and center-fed doublet with open feeders. The Dutchess Co. AREC received a half-page spread in the *Poughkeepsie Journal*, Sunday, July 30. It was excellent publicity and well written. WA2AKK, home from Stevens Tech., reports Peekskill RACES is mapping the local area for 2-meter dead spots from control center to mobile unit. These will be filled in by relay stations. W2VRE has moved to Wisconsin. Using a Nuvistor preamplifier ahead of his converter, WA2BAH/2 has been working 144-Mc. DX from a Niskayuna location. Stan also operates 50 and 220 Mc., plus the l.f. bands. WV2REO is operating regularly on 40 and 80 meters. Vacationing week ends near Beacon, WA2NWG/2 handled traffic with his Ranger and SX-101. Another Nuvistor preamplifier for 50 and 144 Mc. is reported by WA2IMG. WA2HLH reports a new General and using VF-1 with SX-40 to Windom. K2DEM reports from camp that W2TGD is his junior counselor. K2SJN says that K2RRZ's GHF 1-X is short for "Gawd Awful High Frequency First Experimental" rig on 3500 Mc. from early *QST* design. W2URP is using 50 watts breadboard on 20-meter c.w. while the HT-32 is being repaired. Traffic: WA2HGB 254, K2MBU 133, WA2NWG/2 123, WA2KUS 74, W2EFU 54, W2PKY 39, W2URP 28, WA2HLH 26, WA2IMG 18, WA2DWU 14, WA2IRK 14, K2MPS 5, WA2DRP 4, K2HNW 3, K2-DEM 2.

NEW YORK CITY AND LONG ISLAND—SCM, Harry J. Dannals, W2TUK—SEC: W2ADO. RM: K2-

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UFT, PAM: W2UGF. V.H.F, PAM: W2EW. Section nets: NLI, 3630 kc. at 0030 GMT nightly and 0015 GMT on Sat. NLI (late), 3630 kc. at 0245 GMT nightly. NYC-LIPN, 3908 kc. at 2230 GMT nightly. V.H.F. Traffic Net, 145.8 Mc. at 0100 GMT Tue.-Wed.-Thurs. (All net times are based on EST) This is my 72nd consecutive column and it closes out my third term as your SCM. Next month you will hear from W2OBU. I'd like to take a few lines to thank all those who have made these six years possible. At the head of the list is my XYL, Kay, whose understanding of my SCM responsibilities has been a great help. To the SEC, RMs and PAMs through these years go my thanks for their fine support and thanks also to our OBS, OES, OPS, ORS and OO appointees. Keep up the fine work! BPL cards have been earned by K2UAT, W2EW, K2UFT, WA2GPT, W2GKZ and K2YMU, the latter two on originations plus deliveries. WA2GPT now has a new Communicator IV on 144 Mc. WA2NCE is adding a pair of 6146s to his 25-watt "peanut whistle" to produce a louder "toot"! W2OBU added another certificate next to his new SCM appointment. Congratulations on your membership in the OTC, George. K2HTX is running .07 watts to a CK760 on 80-meter c.w. and finds that contacts come a little harder this way. WA2KIK worked VO1-Land with his 7 watts on 50 Mc. A new Johnson Invader is driving a B&W LPA-1 at W2BO. WA2NRR dropped the "V." A new call on 6 meters from Bellerose is WA2UGL. W2-VDT is installing a mobile rig in his boat. K2JWT added an all-band exciter and 300-watt amplifier and Wally can now work from 3.5 to 432 Mc. K2MUB confirmed state No. 44 on 50 Mc. and has joined the married ranks. Congratulations, Mario! WA2BJK is active on 21 Mc. with a DX-40 and converter-equipped BC-342N. After many moons on v.h.f, W2QPQ is venturing forth on 40-meter c.w. W2SEU wants to know if the 220-Mc. gang retired for the summer and hopes to see increased fall activity. WA2IKL is active with an HQ-170, an HT-37 and an 800-watt linear. The V.H.F. Traffic Net reports a 689 traffic total. How's that for a net in July! W2EW, net manager, would like to see more. Have you 2-meter guys 'n gals reported in yet? New officers of the Bronx HS of Science RC are K2OFD, pres.; WA2KSJ, vice-pres.; WV2QJI, secy.; and WA2JIU, act. mgr. The club is on the air with the Collins S/Line. The Hicksville HSARC has joined the ranks of ARRL-affiliated clubs. Is your club affiliated? The station at K2OEI underwent a big change with the addition of a Ranger and a 75A-2. W4JQG/2 installed a new vertical to improve nightly skeds with OM K4GG. K2CMV built a "Twoer" for mobile operation. Well, gang, this is so long for now. Please remember to put a little something back into amateur radio for all the enjoyment you derive from this fine hobby. Support the ARRL and its programs and remember PICON. Hope to BCNU on the air, 1.8 Mc. to 225 Mc., a.m., c.w. or s.s.b. 73. Traffic: (July) K2UAT 685, W2EW 577, K2UFT 556, WA2GPT 541, W2-GKZ 324, K2YMU 322, WA2BWO 302, K2CMJ 223, WA2-QJU 125, K2THY 72, WA2NCE 66, WA2HCD 60, WA2-GAF 45, WA2EFN 40, K2QBW 34, WA2BPK 21, W2EC 16, K2PHF 16, K2UYW 15, W2OBU 13, K2YQK 13, W2-DBQ 11, K2HTX 9, W2PF 9, W2DID 6, WA2CZG 5, W2MDM 4, WA2KIK 1, K2OVN 1. (June) K2UFT 217, W2DUS 17, WA2CZG 8.

NORTHERN NEW JERSEY—SCM, J. Sparks Remeczky, K2MFF—SEC: WA2APY. RM: K2VNL. PAM: K2SLG. V.H.F. PAM: K2KVR. Section nets: NJN daily at 2300 GMT on 3695 kc., NJPN Mon. through Sat. at 2200 GMT and Sun. at 1300 GMT on 3900 kc., N.J. 6 & 2 at 0300 GMT Thurs. and Sun. on 51.15 Mc. and at 0200 GMT Wed. and Sun. on 147.75 Mc. The above times are based on EDT. New appointees are WA2EMA as OES and K2YFE as OO. The NJN reports 31 sessions held, attendance 505 and traffic 476. The NJPN reports 30 sessions, attendance 583 and traffic 207. The N.J. 6 and 2 nets report 22 sessions, attendance 159 and traffic 33. K2CSY and WA2MDT received the East Coast V.H.F. certificate. K2HHS received the Zephyr V.H.F. Award. K9ERU and W9SQP visited K2UFM. The 6220 V.H.F. RC has become an ARRL affiliate. K2-BNU is now active on 40 meters from his new QTH in South Plainfield. WA2OLZ has a new DB-23 preselector. Appointments renewed: K2AGJ as OO, W2BVE as ORS, WA2CCF as OO and OPS, WA2GQI as ORS, WA2GQZ as ORS. K2PTI has a new Mon-Key. WA2NMX, WA2-NOM, WA2NOW and WA2UNP are new Technicians in the section. K2SCD has completed construction of an 8-ft. parabolic dish. Now he needs some coax for 1296 Mc. W2NIY says he has contacted over 3000 different Novice stations. BPL cards were awarded to the following for July traffic: WA2CCF, WA2GQZ, K2HHS and K2UCY. W2GFR has moved to Oakland. K2RHN is operating mobile from Ohio. WA2APT has worked 13 states with his v.f.o. on 40 meters. K2VZJ has a new WRL DSB-100. K2UKQ has to cross the county line to pick up her mail. Traffic: (July) K2UCY 604, WA2CCF 584, WA2GQZ 508, WA2GQI 287, K2VNL 265, WA2APY 165, W2QNL 142, K2HHS 136, K2PVH 114, W2OPB 110,

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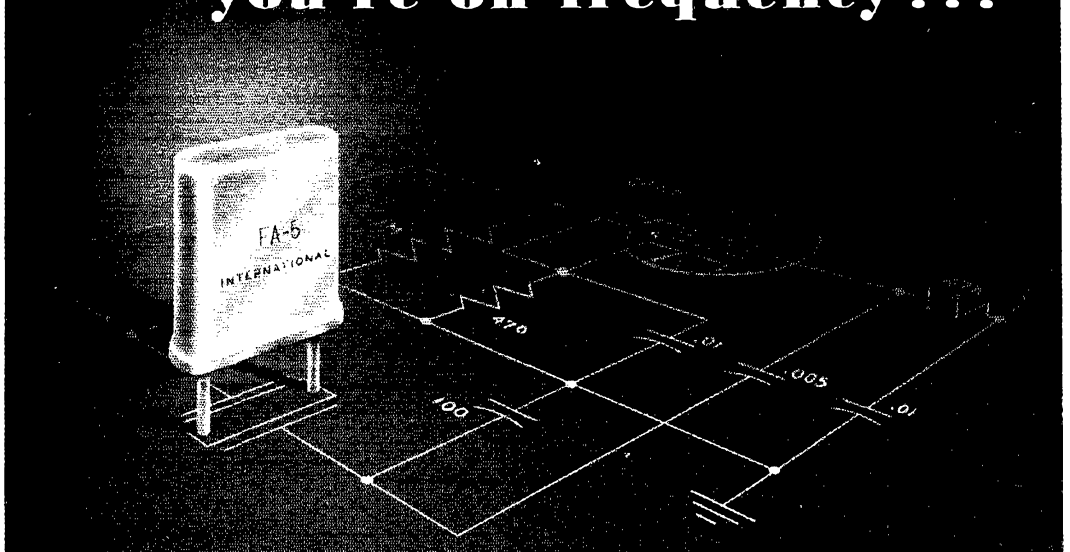

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MIDWEST DIVISION

IOWA—SCM, Dennis Burke, WØNTB—SEC: KØEXN. Thanks to BDR, our retiring SCM, for his valuable assistance. III, EC for Story County, reports Project OSCAR has been organized with what it takes in men and material. His Corps is active in civic projects. New hams are KNØJYF, KNØJYA and KNØJXZ. Field Day was the best ever with 526 contacts. Benton County reports KNØIUP KNØIUR and EAF as new hams. NWX, Mid West Division Director, spoke at Marshalltown recently. KØEXN, an SEC, is busy organizing our 99 counties and doing a splendid job—the best. QVZ, our No. 1 DX man, still has time to perform his OO duties. I am very proud of our many teenage hams. IO has been working UAs on the new Tribander beam. Congratulations to John, Gene and Arnold. I understand the Sioux City Club was high on the totem pole in FD activities. I would like reports from the 8 RACES districts. Thanks to all who sent me congratulations. 75-Meter Phone Net report for June: QNI 1078, QTC 123 sessions 25. Traffic: (July) WØLGG 3246, LCX 1280, SCA 1056, BDR 794, DUA 591, PZO 383, CZ 273, NTB 84. KØKAQ 75. BFL 33, WØBLH 15, YDV 15, KØZLN 11, WYK 9, WØFDM 7, KØIHC 7, UAA 7, WØPTL 6, SFK 6, KØTCZ 6, WØQVZ 5. KØEVC 4, QWM 4, OTV 3, POI 3, VSV 2. (June) WØLCX 2153, LGG 1071, PZO 840, SCA 688, BDR 522, NWX 3.

KANSAS—SCM, Raymond E. Baker, WØFNS—SEC: KØIZM. RM: QGG. PAM: KØEFL. V.H.F. PAM: HAJ. Section nets: KPN, 3920 kc. Mon., Wed., Fri. at 1245Z, Sun. at 1400Z NCS KØQKS. FHU, IFR, reports 17 sessions, QNI 388, high 41, low 10, average 22.8; QTC 75, high 16, low 0, average 4.4. QKS, daily on 3610 kc. at 0030Z, NCS KØBXF, IFR, SAF, TOL; 27 sessions, QNI 146, high 8, average 5.4; QTC 119, high 27, low 0, average 4.4. KSN, 3925 kc. Mon. through Sat. at 0001Z. KØEMB NCS (Weather Net). YL Net, 3940 kc. at 1530Z, NCS KØHEU. HBN Area), 7280 kc. Mon. through Fri. at 1800Z, NCS KØWNZ, ANT, KØHGI, YWT, LTJ; 15 sessions, QNI 161, QTC 50. The Second Centennial QSO Party will be held Dec. 9 and 10. A Sunflower Centennial Certificate will be awarded to U.S.A. stations with 25 contacts, non-U.S.A. stations 10 contacts. These awards are very nice and celebrate the State of Kansas 100-year birthday. For further information contact the Sunflower Centennial Certificate Committee, 1203 East Douglas, Wichita, Kan. We understand Kansas is falling down badly on 20 meters in making and answering calls for contacts. Endorsements: WYK and DEL as Class I OO. We may call a Kansas section meeting the latter part of October sponsored by Wichita Clubs, WARC and ACARC. The date will be announced later. The Newton Club names KØEMB as Ham of the Month. Red does a splendid job of handling the Kansas Storm-Weather Net. MARS (Kansas) names KSY as Station of the Month. Phil holds ORS, is State Military Director and is Asst. Adj. General in the Kansas Nat. Guard. Traffic: (July) WØOHJ 560, ABJ 104, ORB 39, IFR 32, QGG 29. KØHVG 19, EFL 15, WØWFD 9, KØLHF 8, WØFHU 7, KØGIG 2, QKS 2. (June) KØLHF 7. WØWFD 4.

MISSOURI—SCM, C. O. Gosch, WØBUL—Net reports (July): MEN (3885 kc., 2400 GMT, M-W-F), 13 sessions: QNI 324; QTC 124; NCSs KØONK 4, KØVNB 4, KØVPH 3, KØMMR 2. MSN (3715 kc., 2200 GMT, M-F) 22 sessions, QNI 143; QTC 180; NCSs KNØGFA 4, KØONK 8, KØFPC, KØVPH 5 each. MON (3580 kc., 0100 GMT, M-F) 26 sessions; QNI 109; QTC 100; NCSs, OUD 16, KIK 4, RTW 3, KØQCQ, RPH, VPH 1 each. SMN (3580 kc., 2200 GMT, Sun.) 5 sessions; QNI 9; QTC 0; NCS OUD. HBN (7280 kc., 1805 GMT, M-F) Reports of activity on this net will appear in the Kansas activity report column for the next six months. Appointments: KØFPC as ORS. Endorsements: TOD and OVV as OBSs; RTW and KØVXU as ORSs; OVV as OPS. Cancellation: KØRPH as OO (by request). The Southwest Missouri Amateur Radio Club, Inc. (Springfield), offers a WAM Certificate (Worked All Missouri Counties) with a minimum of 35 counties required of the 100 odd in the state. Additional information may be obtained by contacting club members or by writing the club at P. O. Box 291, Springfield, Mo. KØMAU reports construction of a 500-watt rig. KØPFF will be attending Rice U., Houston, Tex., the next five years, he says. KP4BCA, ex-KØQHF (Ft. Leonard Wood), will be looking for contacts on the 14- and 21-Mc. bands. ECC and EBZ, two members of the faculty at Ozark College (Carthage) are from 5-Land. LFE's V.H.F. Hamfest July 9 at Bowling Green, had 275 attending, 225 registrations and 45 v.h.f. mobiles. The

(Continued on page 132)

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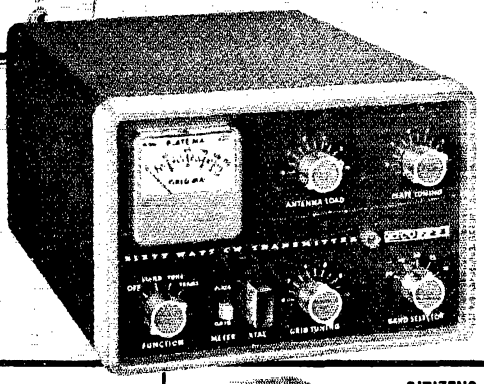

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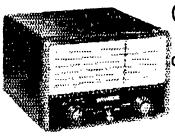

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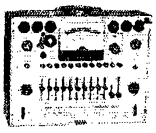

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RF SIGNAL GENERATOR #324
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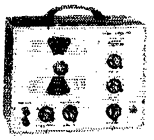
Wired $39.95



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Kit $69.95 Wired $119.95

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Missouri Picnic, July 30 at Eldon, had 200 attending and 30 mobiles. The latter was in the nature of an experiment with no registration fee and no prizes. The SCM was happy to be in attendance at both and glad to have an opportunity to address both groups on League matters. Traffic: (July) KØONK 1423, VPH 251, RPH 234, WØOUD 181, MKJ 110, KØQCQ 97, WØANT 72, KIK 70, OMM 68, KØWNZ 65, WØBUL 44, KØFPC 43, WØBVL 33, OVV 31, RTW 30, KØVNB 29, MMR 26, KNØGFA 15, WØPXE 11, EPI 6, (June) KØRPH 344, VPH 165, QCQ 101, WØAYB 30, KØMMR 15, WØEPI 7, KØPFF 5, VXU 3, (May) KØMAU 3.

NEBRASKA—SCM, Charles E. McNeel, WØEXP—SEC: KØTSU. Please send your AREC registration forms to John. The Western Nebraska Net, on 3850 kc. at 0700 MST, NIK as NC, reports QNI 546, QTC 55, 100 per cent check-in KØTUH, GGP, OCU and KØALY. The Nebraska Morning 75-Meter Phone Net, KØDGW as NC, reports QNI on 619, QTC 98. The Nebraska Emergency Phone Net, on 3983 kc. at 1230 CST, EGQ as NC, reports QNI 628, QTC 55, 59 informal. The North Platte Annual Ham Picnic was held in Cody Park July 6 with about 60 in attendance. Those from out of the state attending were KPJ, Norton, Kans. and KØVRC Derby, Colo. SXR/6, from Santa Ana, was in Nebraska on vacation for two weeks. BNF and KØTSU are still in casts but recuperating nicely at home in Kearney. Traffic: (July) WØOKO 76, KØMSS 62, DGW 53, WØVZJ 36, DDT 33, EGQ 32, NIK 28, KØWEP 18, KTZ 16, WØOCU 16, KØDSU 15, WØLOD 15, WØRJA 15, KØRRL 15, DFO 14, WØGGP 13, JFJ 10, UOV 10, LJO 8, KØUWK 8, WØBOQ 7, HTA 6, VEA 6, KØKJP 3, WØYFR 3, KØALY 2, ELU 2, WKP 2. (June) WØOKO 51.

NEW ENGLAND DIVISION

CONNECTICUT—SCM, Henry B. Sprague, jr., W1CHR—SEC: EOR. RM: KYQ, H.F. PAM: YBH, V.H.F. PAM: FHP. See the May issue for traffic skeds. K1GUD is now in the Navy. APA has a triband cube quad that's giving him fabulous results. K1PKQ took the Conditional Class exam. K1IVR bemoans summer conditions on 40 and 80 meters. BFS looked at his ticket which he carried in his billfold and found it had expired. A word to the wise. . . . YBH says the CPN had 31 sessions and handled 221 messages for an average of 7. Daily attendance averaged 20 and net time 51 minutes. High attendance stations were FHP, YBH, YXB and K1s PPF, MBA and BSB. The CVN held 11 sessions with 42 stations handling 19 messages. K1KSH is now at 203 Coleman Rd., W. Haven, and is active again. K1LTU is experimenting with 420-Mc. TV. ELG built his own bug. ADW is temporarily in New York City and operates a 144-Mc. Goony box with a halo. Most ARRL appointments require monthly reports to the SCM for renewal. We all miss once in awhile but consistent *non-reporting* hardly justifies renewal. *Your* activities are interesting to others as commonplace as they may seem to you. LIG, who is on 6 meters a lot, gets the same impression and writes "And then, when you eavesdrop, you hear the most interesting things" and cites this example. K1BTC found Gov. Dempsey's car on one side of him, Mayor Tedesco's on the other. The Governor said about K1BTC's halo, "That must be a shower ring and, in the sake of modesty, I'm going to buy you a shower curtain." K1GGG, a CN regular, has a ten-element beam on 2 meters. K1KQR is building a 1-kw. 6-meter rig. OJR and WKW are DX-hunting. K1IVK is building a sideband job. K1MZM added 8 new countries in addition to traffic activities. K1OAP is working on an Apache. RFJ has a new 6-meter beam. The Stratford RC has given 80 exams to new hams and gives instruction in code and theory every Wed. night before its meetings. K1ICD conducts classes for new hams. Reports received: OO from K1GUD and K1IVR, OES from FVV and K1s PKQ and MNX. Appointments renewed: K1GUD as OO, BIH as ORS, EBW as OPS. Traffic: (July) K1IFJ 251, W1KYQ 194, K1PGQ 177, W1AW 159, K1PPF 155, MZM 135, W1YBH 93, BDI 58, FHP 53, NTH 44, RZG 40, K1HEJ 34, MBA 25, AQE 22, W1CHR 21, K1GGG 21, W1APA 14, YBI 14, K1EIC 11, DGK 10, W1RFJ 10, QV 8, K1BSB 7, W1BNB 6, K1IVR 6, PKQ 5, W1PUG 5. (June) K1JAD 69, GGG 27, W1RFJ 24. (May) K1MZM 457.

MAINE—SCM, Albert C. Hodson, W1BCB—Thanks to the many who voted in the election. Your further participation by submitting items of interest, activities and constructive criticism is welcome. The York Beach cottage of ZEN, RCJ and jr. op. was the nest of Chipmunks for a day: GRG, XYL and jr. operators; VYA and XYL; ZJS; 4COW; K1JDA, OM and Mom; K1ANM and XYL; K1GUU; K1EKO and jr. operator; K1IZT and jr. operator; K1KRX and XYL. New mobiles are K1DUG, K1DTX, K1IAA, K1DTW. K1ITZ now is chief of the Liberty Fire Dept. K1HAX is mobile with

(Continued on page 134)

A 30-SECOND QSO (ALMOST)

: QRZ?

: Vy QRN hr! Sri,
no copy! Pse QRZ?

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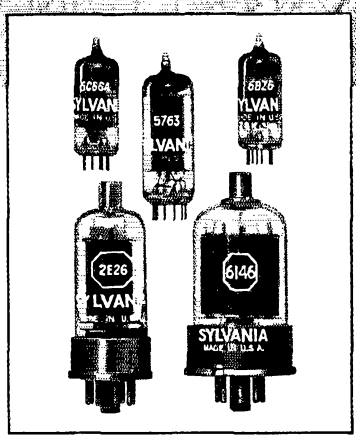
b bd condx!



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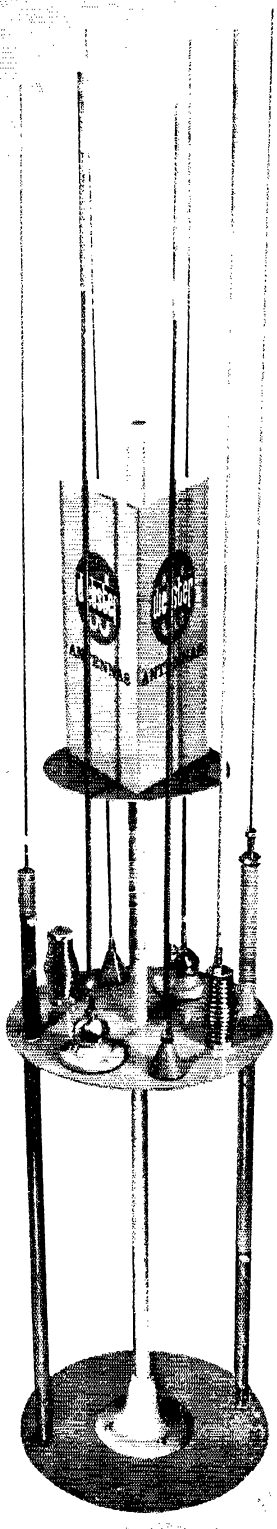
3 watts in his Casco Bay lobster boat. Radio and electronics classes begin again in Bangor about Oct. 1. See Bangor amateurs or the School Dept. for details. The Bangor AREC/RACES Net conducts weekly mobile hunts Wed. at 1900 on 29.520 Mc. The Augusta Chapman family now is an all-ham family: WTH, WTG, K1KTJ and K1OKC. Togus V. A. Hospital reports several recent visitors to K1MDM, the V.A. station, thanks to K1BZD, station manager. K4SGB/1, Capt. Dick, has reactivated the Dow Air Force Base MARS station. The St. Croix Valley Amateur Radio Club had a gathering at Calais-St. Stephen Frontier Week. Those who have appointment certificates should check their expiration dates and send them in to the SCM for endorsement. All clubs are urged to become ARRL affiliates. Contact your SCM or GRG, your SEC, for details. Traffic: K1-MZB 87, IMI 54, JNN 35, W1SWX 33, K1KSG 28, MBM 22, MDM 17, DUG 12.

EASTERN MASSACHUSETTS—SCM, Frank L. Baker, jr., W1ALP—AOG is our SEC. IAU is EC for Whitman. Appointments endorsed: AOG as OPS; HLQ Stow, YHY Fall River, as ECs; BGW and AYG as OOs; LMZ as OES, DFS as PAM for 75-meter phone. BNS has moved to Medfield. RY is the new call of ex-1ONV-8RY-9FO. WQH hopes to be home in October from England, where he has been for four years. AQE now is in Chelmsford. K1PHJ has a DX-40, an SX-101A and a three-element beam. K1CLL is on 2 meters from Vermont. K1IEB, KJ, WTK and PSG are on 2 meters. BJE, Magnolia, has his old call back and is on 2 meters. Heard on 75 meters: FRX, JBI, AQV, ZOO, AIR, K1OCG and W8IHB/1 mobile. ZC, M/M, has an Apache NC-183D and a Mosley vertical. K1LJN is act. mgr. of the club at National Co. The Eastern Mass. 2-Meter Net had 21 sessions, 293 stations, 142 traffic. K1-KYQ has a Gonset III and a three-element Hilltopper on 6 meters. K1MVN is secy.-treas. of the King Philip ARS. K1JBD moved to Florida. KN1TCE is the 12-year-old brother of K1MVN. K1MEM has a new HRO-50. NF worked EP2AF and 5N2LKZ. K1NTS is on 2 meters with a three-element beam and will have 50 watts on 2-6 meters. The North Attleboro RACES will have a "Field Day" to test emergency capability. K1s JML and GOE worked KP4CK on 6 meters, and are hearing VOs and VE8s. K1QJT is building a v.f.o. for 6 meters. TQS has quite a list of equipment: Viking 2/V FO, pair 4-400s 1 kw., NC-303, several beams and dipoles. NJL has been endorsed as ORS/OPS, was active in the CD Party, has WAS and is a member of CHC. The Nortronics ARC is now an ARRL affiliated Club. E. Hoyt is secy. K1MHC says VE1QS is coming through on 2 meters. K1KKS went to Florida for two weeks and is building a 2-meter transceiver. K1QOJ has a 2-Meter Net certificate. OFK was on vacation. SIV is now district Chief in the Somerville Fire Dept. K1GVR got married out in California. K1EKO spent a week in Maine. OFK has a ground-plane and a cubical quad. Also as our PAM he sent out a new listing of members of our 2-Meter Net. K1AII has 1-kw. rig on 160-10 meters built and on the air. PTR made a CQ wheel for contests. K1DIO had some nice DX contacts on 6 meters. K1JIU has a separate antenna for all bands. New officers of the Reading High School ARC K1HOA are K1JIU, pres.; K1JAW, vice-pres.; Bill Kimball, secy.-treas. K1QNQ has a Globe Hi-Bander for 2 meters and an eleven-element beam. K1JAW spent two weeks in New Hampshire. AUQ is on the air very little. K1LCQ has a new HQ-170. HHO is mobile on 75 meters. KN1TDT is DFS's nephew. The North East States Traffic Net had 246 stations and 127 traffic. KN1SMF, Rowley, has a DX-20 and an AR-3 receiver. Traffic: (July) W1EMG 184, K1BYV 182, W1EAE 118, K1AII 108, W1PEX 102, DFS 86, OFK 85, K1BUF 80, W1ZSS 59, PTR 31, SIV 31, DOM 29, K1DIO 28, JIU 26, QNQ 23, W1TWG 22, K1GYM 21, JAW 12, CUI 9, GKA 7, GTX 7, QOJ 7, W1VYS 7, AUQ 5, NJL 5, K1CMS 4, MHC 4, LCQ 2. (June) W1EAE 204, K1AII 48, W1VYS 16, K1CMS 10.

WESTERN MASSACHUSETTS—SCM, Percy C. Noble, W1BVR—SEC: BYH/K1APR. RM: K1IJV. PAM: DXS. Thank you very much for reelecting me as your SCM for another two-year term. I shall do my best to continue to fulfill the duties of the office. RM K1IJV with her husband, K1IJU, and children, spent the month of July on the Cape with no ham radio at all. PAM DXS sent out a bulletin to the Mass. Phone Net announcing a get-together at his summer cottage Aug. 13. AVK is hospitalized at Springfield Hospital. Our sincere sympathy to LDE who lost his father recently. K1DAJ has returned to Cornell University as a sophomore. WWA is operating MM from the steamship *African Pilot* and is scheduling AUF, DGJ and LDE on 15- and 20-meter s.s.b. K1IQZ is sporting a new Viking Ranger. During the RM's July vacation, WMN was held together by K1LBB, K1DAJ and BVR, with valuable assists by MNG. Traffic: W1BVR 131, LDE 109, K1LBB 94, DAJ 34, W1FAB 18, K1LRB 8, W1DVW 5, K1IQZ 3.

(Continued on page 136)



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NEW HAMPSHIRE—SCM, Ellis F. Miller, W1IIQ—SEC: K1GQK. PAM: KVG. RM: K1ITS. The GSPN meets Mon. through Fri. at 2300 and Sun. at 1330 on 3842 kc. CNEN meets Mon. through Sat. at 1045 on 3842 kc. NHN (c.w.) meets Mon. through Sat. at 2330 on 3685 kc. Appointments: K1ITS as RM. Let's all get behind Kurt and help increase the NHN membership. Our sincere wishes for your success, Kurt. Endorsements: GAH and MUJ as ECs, MDP as OO Class I, YHI as OBS and OPS and QGU as ORS. Thank you all for your continued interest and support. AGM is back with us for the summer and fall. Your support as GSPN net control is really appreciated. QGU has also returned and the excellent traffic report proves his unfailing interest in NHN. Many thanks to you both. K1KOB reports that he now has made 270 initial contacts in 20 states on 6-meter phone and has just received the Michigan Week Operating Award. Congratulations, Ralph, a very fine job indeed. It would be appreciated if more of you would send in your monthly station activity reports. Traffic: W1QGU 136, TA 110, K1ITS 68, W1CUE 35, JNC 9, K1IIK 8, W1AGM 4, EVN 4, K1SYF 3.

RHODE ISLAND—SCM, John E. Johnson, K1AAV—SEC: PAZ. RM: SMU. PAM: TXL. RISPN report: 31 sessions, 325 QNI, 66 traffic. OBS reports were received from TXL, SMU and WED. The NCRC of Newport held its Annual Dinner July 29 with a large crowd in attendance. Reports received from members show that everyone had a fine time and the food was excellent. The AQ Club of Rumford reports KN1THE as a new Novice. A Family Outing Committee was nominated with KN1THE as chairman, assisted by K1NSY, K1CZD and K1CZB. K1LDK was appointed chairman for an R.I. QSO Party Committee, assisted by K1HMO and K1JYN. K1PAM has worked 15 states with his Lincoln receiver and an HT-40 on 6 meters. K1LPL has been working DX on 40 meters from his vacation spot in New Hampshire. K1ABE has completed a new tower installation consisting of a new motorized control switch so the tower can be loaded for 40 or 80 meters as well as controlling the new TA-33 Jr. beam. K1LRP requests that anyone in the Providence Area interested in 1296 Mc. contact him. Traffic: (July) W1SMU 654, TXL 331, K1DZX 40, PZY 30, GRC 28, AAV 14, GRA 10, PNI 10, W1WED 6. K1PAM 4. (June) K1PNI 5.

VERMONT—SCM, Miss Harriet Proctor, W1EIB—SEC: K1DQB. PAM: HRG. RM: KRV. Amateur activities in Vermont should start the new season with vigor. Let's have all responsibilities well handled. DFU has moved from Wallingford to Rutland and is now active. K1BQB has been riding the polio bus in her area since June. The Wind Hams RC had a picnic in Rockingham and is planning to build 6-meter rigs. VSA has moved to Charlotte. K2MHD and family are at their camp in Ripton. The Burlington and Middlebury Clubs have worked together again on the Waterama at Lake Champlain. K1MPN has mimeoed a roster of amateurs in the Central Vermont Area. It has 57 names. We would like volunteers to assist with four issues per year of the *Green Mt. Signal*. Our first colored slides of amateur activities in Vermont are coming from the Burlington Club. We wish to include a picture of every operator and his station.

NORTHWESTERN DIVISION

IDAHO—SCM, Mrs. Helen M. Maillet, W7GGV—K7KBY has been appointed ORS, and new ECs are K7CLK, K7OAL and K7NDX. K7BWV requested cancellation of his OO appointment as he, QEL and K7EMC moved to Puerto Rico to open an electronic servicing business. DPD and his CAP Sqdn. of Arco were awarded the "Lady of Freedom" Award from the French Government for hospitality shown two French leaders and 5 cadets while visiting AEC and the area. W1MU Hamfest officers for 1962 are K7KBY, THB and K7KBV, all of Idaho Falls. Sponsors of transmitter hunts at the hamfest were DWE, a special for YLs, the Shelley Tubers, the Pocatello Club and the Idaho Radio Amateurs Inc. of Boise. KN7PYW is a new ham. K7NMS and K7ORS dropped the "N" from their calls. Newcomers to Idaho are RZW and K7PNS, formerly K6RNT. The FARM Net held 20 sessions during July and reports 91 traffic handled, 348 check-ins and 49 members on the roster. The FARM Net has returned to its winter schedule of 1900 hours. Traffic: K7KBY 151, GGV 13, EEQ 12, VQC 10.

MONTANA—SCM, Ray Woods, W7SFK—SEC: BOZ. PAM: YHS. RM: K7AEZ. The MPN meets M-W-F at 1800 hours on 3910 kc. The MSN meets T-T-S at 1830 on 3530 kc. Montana amateurs are saddened by the passing of LOD, of Three Forks. Jean was a well-known operator who had been bedridden for many years and a fine ham who will be missed very much. The Glacier

(Continued on page 138)

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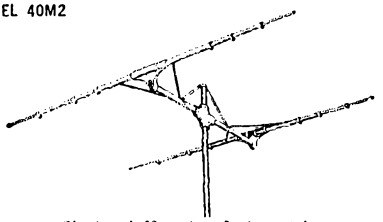

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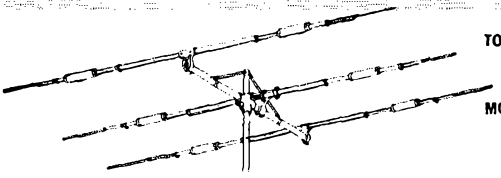

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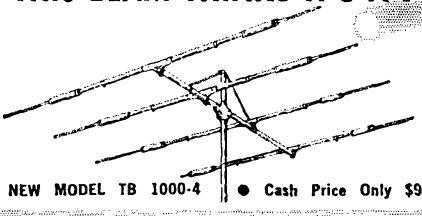

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Park Hamfest held at Waterton was a huge success with JFR as pres., NML as secy., and FL as vice-pres. for the 1962 hamfest to beheld at Apgar on the south end of Glacier Park. K7OGF went to Wisconsin for a visit. New calls in Harlowton are K7s MEK, MFV and MGE. K7MED, Donna, is a new call in Forsyth. K7JAZ is heard from Lewiston. NPV reports that nine hams stopped in Harlo to see him in July. K7MFU received her license at Harlo. Many of the Montana hams attended the Big Springs Hamfest in Idaho. Some Montana hams took part in a man hunt near Lincoln and were instrumental in capturing the person. Montana hams are requested to join with AREC or if possible with RACES. WA6RHX and RHV, who were with us for a while went back to California. Sorry to lose them. Traffic: (July) K7BKH 109, LDZ 75, W7NPV 30, K7OGF 5. (June) K7BKH 232.

OREGON—SCM, Everett H. France, W7AJN—New appointment: UQI as EC for Clackamas County. EC certificates have been endorsed for RCL, TMF and K7BEV. AJN had one meeting with WKP, the SEC, and two meetings with a representative of the Portland Area V.H.F. AREC Net. Net and membership problems were discussed. A meeting was held by the Affiliated Council of Radio Clubs. Plans still are being made for the National ARRL Convention and a final report should be coming through soon. DEM reports the passing of WA6MTW/7. DIC has been very busy providing communications and reports for people in hospitals, and on an air crash in Alaska. REG is in the hospital with two crushed vertebra as a result of falling from an antenna mast. WKP and K7CNZ furnished communications between the pit area and the starting line for outboard motor races. K7IWD has a new vertical antenna. OSN BRAT Awards were issued to ZFH, MTW and K7IWD. ESJ held low-powered dry runs on 3800-kc. c.w. Stations participating were SMR, MUS, AAI, MAO, DIE, K7CVX, K7NTS, K7AJB, K7EPH and K7IWD. All participants also are MARS members. Your SCM cannot pad these reports. He has no crystal ball or Ouiji board and is not a mind-reader, so please send in your reports, gang. Thanks. Traffic: (July) K7AXF 304, W7BDU 169, K7IWD 92, JVN 92, W7ZB 81, DEM 25, DIC 25, ZFH 13, MTW 12, AJN 9, K7CLL 6, W7DTT 6, ESJ 4, K7CNZ 3. (June) W7DIC 13.

WASHINGTON—SCM, Robert B. Thurston, W7PGY—SEC: HMQ. RM: AIB. PAM: LFA. The Tacoma Radio Club (DK) now holds code and theory classes Tue., Wed. and Thurs. of each week. K7HBO, operating from the Vets Hospital in Seattle, is on 6 meters and would like lots of contacts. CZK seems to have the inside track on the hidden transmitter hunts in the Tacoma Area. ZTG is out of the hospital and active again. KN7ONA passed the Tech. Class exam. KN7ONB and KN7ONF passed the General Class exam. K7INE recieved his appointment to the Military Academy at West Point and hopes to operate from a club station. Efforts are being made to put some activity on 2 meters in the Prosser Area. VPW reports vacation and summer outings cutting in on his operating and net skeds. JEY will locate in Redmond for the coming year. K7GBW operated portable from Sumas for the summer months. JC and K7CHH were active in the recent CD Test. K7MFF has a Valiant transmitter and is operating portable from Enumclaw while working for the Dept. of Natural Resources. IEU is back in traffic after a long lay-off. OEB left for vacation in W6-Land. NNF is the first W7 to receive the Kroonstad South Africa Award. AMC returned from vacation at Waterton Lakes, Canada. While there he attended the hamfest and won a rack of moose horns with an oil painting to adorn his new shack. K7NAR, the club station at Naval Air Station, Seattle, now is operating on 6 meters. K7EOZ is being transferred to Illinois by Boeing Airplane Company. K7MVN really is having a ball with 6-meter DX K7KHW is looking for c.w. contacts on 6 meters. The Seattle mobile frequency is 3882 kc. The local Army MARS boys had a meeting and get-together at Ft. Lawton recently. The Washington Section Net had 21 sessions with 176 QNIs and 101 QTCs for July. The net frequency is 3535 kc. and the time is 0200Z Mon. through Fri. KZ and IEU renewed their ORS appointments. TMO, an ex-Seattle-lite, was a recent visitor from Reno, Nev. BA received his 200th endorsement on his DXCC. VI built a new electronic keyer and is getting excellent results. OEX has a new Invader. PGY is awaiting a new Tribander. The Northwest Amateur Radio Communications System, Inc. and the Boeing Employees Amateur Radio Society (Bears) have been given affiliation in the ARRL. HMQ, the SEC, is planning on a trip around the eastern and northern areas of the state. Traffic: W7BA 1317, K7IEY 802, W7DZX 660, QLH421, APS 100, ACA 97, K7MFF/7 92, W7IST 76, OEB 74, GIP 31, AMC 24, AIB 17, IEU 12, K7CKK 10, W7YFO 8, BTB 3.

(Continued on page 140)

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New wide space deluxe antenna coil. Greater efficiency on individ. bands. Easily handles 750 W. P.E.P. Lightest coil of its kind commercially available. Use with 36" base sect. 60" whip.

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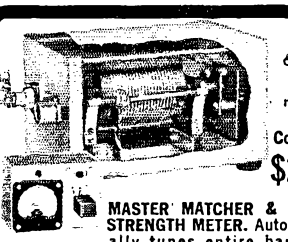

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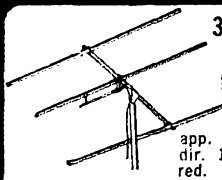

Power gain app. 5 (7DB) fwd. dir. 10 to 1 inter. red. from sides & rear. VSWR-1.1 to 1 at band center when fed with 52 ohm coax.

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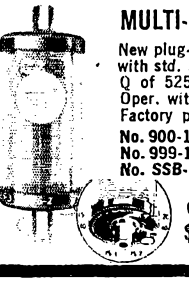

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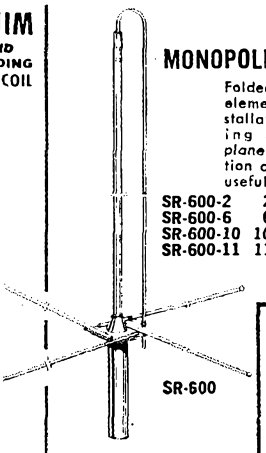

SR-600

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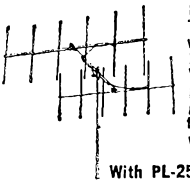

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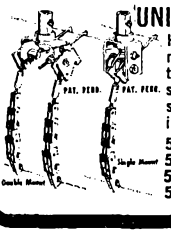

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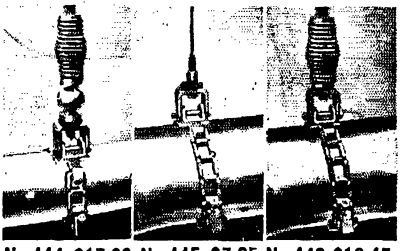

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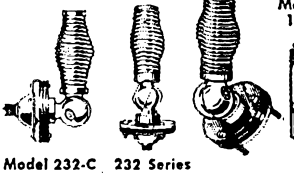

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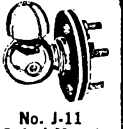

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PACIFIC DIVISION

HAWAII—SCM, John E. Montague, KH6DVG—Novice classes are being conducted by AFM and CLD, AFM being responsible for the code and CLD taking care of the theory. With deep sorrow we note the death of ANT. K6MNI/KH6, at Kaneohe MCAS, makes his presence known on s.s.b. BG and IJ are keeping the public informed about ham radio with articles every Sun. in the Honolulu newspapers. DVC left for W6-land Aug. 12. K2KFF/KH6 has returned to Johns Hopkins University after a 6-week visit. Some interest has been shown in section traffic nets, both a.m. and c.w. Anyone interested in such a net, please contact DVG. DVD is getting ready for the fall season on 160 meters with a new antenna setup. Please send in your station activity and traffic reports every month. This column relies on your reports for information. Traffic: (July) K6MNI/-KH6 51. (June) KH6DVD 3.

NEVADA—SCM, Charles A. Rhines, W7VIU—Ex-5CIN now is 7PBV in Boulder City. The SNARC is hoping to get its reorganization going. Plans are being made for a 2-meter repeater in the Las Vegas-Boulder City Area. K7NVE is clearing house for the IBEW proposed ham net. UPS is back from a four-month trip to Denmark. His bride arrives in September. VYC and LVP have Heathkit "Two-ers" on 145.875 Mc. K7DEB has ordered a "Two-er." VYC is active on the MCAN-7 Net with an AF-67 and an HQ-110. His XYL, YNF, fills the spot for him when he's away from home. Traffic: (July) W7PBV 4. (Apr.) W7VYC 9.

SANTA CLARA VALLEY—SCM, W. Conley Smith, K6DYX—Asst. SCM: Edward T. Turner, W6NVO. SEC: W6ZRJ. PAM: W6ZLO. RM: W6RSY. The OOs have been complaining that out-of-band conditions make second-harmonic-hunting tough. RN6 has been having trouble with vacations as well. WA6LVX and WA6OLQ report new activity on the NCN. Besides traffic they plan a training course for new traffic-handlers. The Northern Calif. Traffic and Emergency Assn. held a breakfast meeting in Los Gatos July 16. W6ZRJ MCeed. There are new Gotham verticals at the shacks of WA6MIV, W6JLB, W6BEX, W6RGO, W6SAN, WV6OXM and WV6SOK. W6ISQ reports QRL for July and Aug. but he will be there with OO reports in Sept. W6QMO has been ill but is doing well now. Jerri made the A-1 Operator Club. WA6EIC organized RACES nets in Gilroy and Morgan Hill and tied them into the Santa Clara County RACES Net. On July 24 the SCARS had a pot-luck dinner for members and their families. On Aug. 13 a joint PARRA-SCARS Picnic was held. K6DYX got back from vacation in time to see this report going in. He will write it next month. The SCARA invited the MBRC to help plan a joint picnic soon. The MBRC is QRL with plans for participation in the county fair and with plans for next year's Field Day. Most of the club publications complain of no news being sent in. Get busy, fellows. Traffic: (July) K6KCB 780, WA6OLQ 276, WA6HZM 197, K6GZ 164, W6AIT 117, W6YBV 110, W6DEF 74, W6FON 54, K6YKG 52, W6ZRJ 30, W6ZLO 15, W6WX 12. K6MTX 10, K6VQK 10, WA6KRG 4, K6TEH 2. (June) K6KCB 632, W6ASH 24, W6ZRJ 20, W6MMG 14, KØBYZ/6 5, WA6KRG 4.

EAST BAY—SCM, B. W. Southwell, W6OJW—SEC: WA6HYU. ECs: K6VXK, K6ESZ, W6FAR, W6WAH and K6HTJ. WA6LVX/6 is working on a 200-watt ship-to-shore rig. WA6LSP is moving to Bakersfield. K6GK has been traveling around California and Nevada. New officers of the Livermore Amateur Radio Klub (LARK) are WA6JCF, pres.; K6EKD, vice-pres.; WA6KLL, secy.-treas. K6EKD is mobile on 75 meters. W6KZN is sweating out his QSLs for DXCC. W6GMQ is changing his QTH. W6AIL/6 and W6CX/6 made 6885 and 4284 points, respectively, in Field Day. WA6LVX/6 made BPL again. WA6SQJ is the XYL of WA6QEJ and is a new call in San Leandro. The CCRC held its Aug. 2 meeting at the QTH of W6LGW. MDARC held a picnic July 23 at Martinez Municipal Park. The NBARA helped with communications at the 2nd Annual Vallejo All American Regatta on July 7, 16 and 23. W6WAH was Communications Coordinator and W6LRT was net control. The club call W6HTB was used on 50.4 Mc. by the NBARA with K6BYQ, WA6CAP, WA6CVU, WA6DOU, K6EHR, WA6FJX, W6GKR, WA6IEB, WA6IEC, W6IZU, W6KHR, WA6KLK, W6KOJ, WA6LGD, WA6LGE, K6MAS, K6MIS, WA6MWJ, WA6MXI, K6OIK, K6OKO, K6ORB, K6QXY, K6RZR, WA6SCT, WA6SCU, W6TIG, K6TWT, K6USW and W6ZJD assisting. WA6MHJ has been ill but is up and around again. WA6HKD is a Castro Valley maintstay on NCN. W6LGW spent July 4th in the High Sierras. K6DX is back from his trip to the Far East. K7NUO was a visitor at WA6CNV's QTH. W6RVC is resigning as MDARC TVI Committee Chairman. The HARC saw a movie on Cosmic Rays

(Continued on page 142)

great response

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presented by the Telephone Company at its July meeting. WA6KUU is collecting parts for a modulation scope. WA6NGH is now General Class. W3WAU/6 is taking a course at U.C. WA6KUN has a new Heath mobile rig. K6TWB is looking for a Viking Ranger. K6YBS has been working the "Top Band" (160). K6VXJ attended the mobile breakfast in Palo Alto. K7IDH is now W6IIF again. WA6GSE has a new Heath Pawnee 6-meter transceiver. WV6QDQ has a new jr. operator. WV6NPC is now WA6NPC, General Class. K6JNW is on s.s.b. and is building a Heath hi-fi to keep his XYL happy. K6UHV is the 13-year-old jr. YL of K6VXJ. W6PIR was finally heard on 75-meter phone and was worked with 5S9 signals by ve SCM. W6OT/6, ORC, made 5076 points in Field Day. The ORC reports its Worked All California Counties certificate is very popular. W6JUB spent four weeks summer training with the Air Force. W6OJW got the Kroonstad 6X6 Award certificate and PSA for all phone. W6BEZ is in the hospital. WA6ECF is working DX for a 60/57 score, and got the HTH Award Class G and F and CP-30. W6NBX is QRL a QTH change. Now is the time to check over that AREC gear for possible winter use. Traffic: (July) WA6LVX/6 511, WA6ECF 362, K6GK 135. (June) K6OSO 27.

SACRAMENTO VALLEY—SCM, George R. Hudson, W6BTY—SEC: K6IKV. EC: K6BNB, K6GOT and K6BYS. OBSs: K6AF WA6CJU and W6WGO. PAM: W6GQS. OOs: W6WLI, W6GDO, K6ER, W6ZJW and K6EIL. ORSs: W6WGO and W6CEI. OES: W6PIV. OPSs: W6WGO, K6EIL, W6PIV and W6GQS. The Annual Stockton to Colusa Outboard Motorboat Marathon again was provided communications via 2 meters with W6GDO ramrodding the affair and W6MIW, K6VOU, K6PBG, K3MEB/6, WA6OXX, WA6JTO, W6KME, K6BJV, K6SRF, K6BNB, K6ENK, K6HHD, K6QIF and W6PIV assisting at the repeater station on Mount Vaca and at the reporting points along the route. W6ZJW is busy on 40-meter c.w chasing DX. K6EIL has his WAS and WBE certificates and still has time to turn in a fine record on the traffic nets. W6QYX has finished the power supply for the home-brew 20-watt rig and is checking into the Trinity County C.D. Net Mon. at 8 P.M. on 1990 kc. WA6PCI and W6QYX held down the civil defense booth at the Trinity County Fair handling traffic and selling ham radio to the visitors. W6AF is on vacation in the Pacific Northwest. WA6CJU is active in the NCN and RN6 traffic nets. NCN meets at 0400Z on 3635 kc. and RN6 at 0500Z-0700Z on 3615 kc. W6MPE, up Alturas way, has applied for an AREC certificate. WA6OXK has joined the AREC. A new ham in Sacramento is WA6TBV. K6SXX, former Valley OO, OBS and ORS sends regards from W4-Land. Your SCM and SEC showed the Northhills Radio Club the "Project Hope" film depicting the operation of W8OLJ/mm on the S.S. *Hope* during its stop-over in Indonesia. K6GUU is "Ham of the Month" of the Sacramento RAMS. Thanks to all the traffic men for the swell reports and a short reminder for all to support *your* traffic systems. Traffic: WA6CJU 178, K6EIL 80, W6WGO 43. K6YZU 17.

SAN JOAQUIN VALLEY—SCM, Ralph Saroyan, W6JPU—W6NCG, K6PPI, W6NAS and others are working on a repeater system that should work from one end of the San Joaquin Valley to the other. W6EFB is operating on the Mission Trail Net and is enjoying it. K6ROU gave up all traffic liaison for the summer and will be back in the fall. K6ROU received his WAC-YL Award. W6ARE and the Tulare Radio Club hosted a picnic at Mooney's Grove, Aug. 13. W6OUX traded his Drake 1A for an SX-111 receiver and likes it fine. W6FXV is working on his S.S.B. transceiver for 75 meters. K6YDU is being heard on 75-meter mobile. W6QON is working on his s.s.b. exciter. K6LKJ got a new Collins 30L amplifier and is using it on 20 meters. W6UBK still is knocking over DX with his rhombic and 100 watts a.m. W6LOS says that every TV set in the apartment house jumps when he turns his 813 amplifier on. K6PPI is working on an antenna tuner for his TCS. The mayor of Kingsburg, W6HKV, is on 20-meter s.s.b. K6ROU has his beam on a 40-ft. tower. W6ADB is operating on the NCN at 7 P.M. on 3635 kc. K6OZL is taking a summer vacation from ham radio. WA6DAU and K6CPQ are operating on the NCM. K6CPQ has been appointed an RN6 job for the summer. WA6VLX would like to start a c.w. training period for hams interested in traffic. Anyone interested, please contact WA6VLX. K6RAU is vacationing in Yosemite and is checking in NCN. Traffic: (July) W6ADB 42, K6OZL 30, K6ROU 30, W6ARE 24, W6EFB 14. (June) K6ROU 51.

ROANOKE DIVISION

SOUTH CAROLINA—SCM, Dr. J. O. Dunlap, W4GQV—K4WJR and K4NZE have qualified for and been issued net certificates on SCN, one of the finest

(Continued on page 144)

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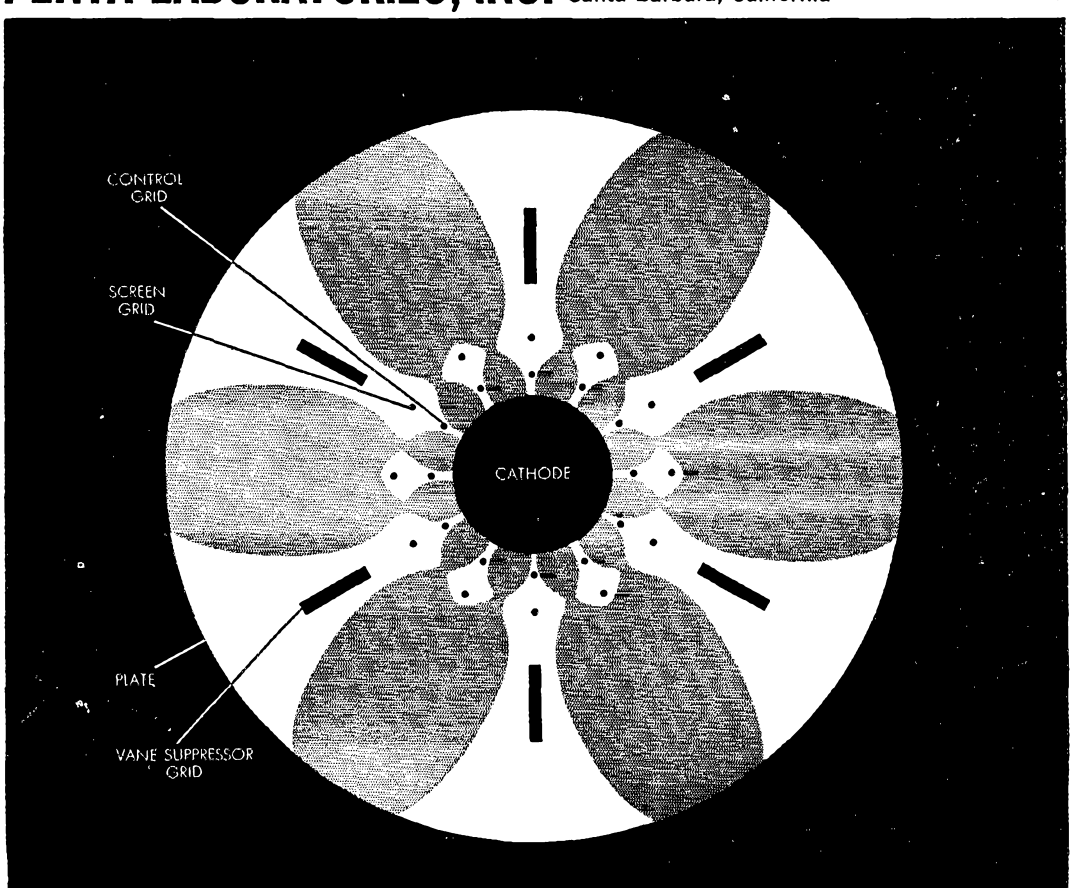
Santa Barbara, California



nets in the country. K5JVV reports 378 stations on the S.S.B. Net in July with 31 formal traffic. Those handling communications for the All Woman Transcontinental Air Race or "Powder Puff Derby" were W4BHR, W4CPX, W4VIW, K4DJE, K4FYS, K4JNT, K4LBV, K4LXH, K5PFI, K4VCA and WA4BRW. K4VVT is out of the hospital and doing well with the assistance of his many friends in A.R. An effort to form a State Radio Council will be made Oct. 7 prior to the Rock Hill Hamtest by State League Officials and representatives from all clubs. K4KCO has been appointed as PAM to succeed K4IIE, who served well for two years and accomplished much with the big phone net which had 800 stations participating in July. The Rock Hill RC held a hot-dog roast for the Belmont (N. C.) RC members but they failed to show up in the rain storm. The S.S.B. Net has completed plans for its annual supper on Oct. 7 prior to the Rock Hill Hamfest. The picnic at the Isle of Palms was well attended and enjoyed by hams in the area. Traffic: K4WJR 153, K4BRP 70, K4KIT 68, K4AVU 62, K4HDX 61, W4AKC 50, W4PED 26, K4OCU 23, W4CHD 20, W4VIW 17, W4TWW 16, W4GCB 13, K4NZE 13, K4PIA 2, K4VUH 2.

VIRGINIA—SCM, Robert L. Follmar, W4QDY—Asst. SCM: H. J. Hopkins, 4SHJ. SEC: W4VMA. New ORSs are W4NVX and K4PQL. W4FOR is Radio Officer and EC of Princess Ann County and is busy setting up equipment and holding drills. W4AMP, ex-KL7BPK, now has his WAS and WAC and is 74/54 for DXCC. K4ZVT now is in Germany awaiting a DL4 call. W4DLA has a new antenna and is coming on the nets with 300 watts. K4JQO reports that KC4USV is active passing traffic on 7202-kc. s.s.b. at 0600 GMT. K4MLD reports into VFN on c.w. while the modulator is kaput. Old VFN and VN member W4CGE is back on VN after a long absence because of rig trouble. W4JUJ received the QCWA Award and took first place (Va.) in the Delaware QSO Party. K4JKK is back on the air from a new QTH in Catawba. The new RVARC is going strong and still is negotiating with the old BRARS in the Roanoke Area. The Virginia S.S.B. Net turned in a nice traffic total in spite of the general traffic slump. We still are a long way from one hundred per cent reporting of all ORS and OPS appointees. Let's hear from all appointees, even if your total is a goose egg. Many reported enjoying the summer weather and vacations; we hope by the time this is in print you will all be ready for another bang-up season. W4FOR, W4SHJ and K4DOR/VDU made BPL, all by originations. Traffic: (July) K4DOR/VDU 378, K4PQL 247, W4FOR 219, W4SHJ 211, K4QIX 154, W4DLA 143, W4RHA 103, K4KNP 66, W4LK 63, K4JQO 58, K4MXF 38, K4DCN 34, K4UVT 30, K4FSS 26, W4TE 21, K4MLD 15, K4YZT 15, K4IAN 10, K4IIP 7, W4KX 7, W4NVX 7, K4AL 6, W4CGE 4, K4LTK 4, W4OWV 3, W4BZE 2, K4ELG 1. (June) W4BGP 21.

WEST VIRGINIA—SCM, Donald B. Morris, W8JM—Congratulations to the following amateurs on their work during the Charleston Flood: K8BIT, CLX, K8CSG, K8DZU, K8GLH, K8HID, MLX, K8MNF, K8MNG, K8MQB, K8MQS, K8NYE, K8PPW, K8PQC, PQQ, K8SJG, TVO, VMP and VYI. Other amateurs were ready if their services had been required. The East River ARC visited Greenbank Telescope. The Opequeon Radio Society of Eastern Panhandle has applied for affiliation with ARRL and is active with the State Radio Council. JM visited this club as well as IAW and ARRL Headquarters. NTV operated portable from Morgan County during vacation. K8PJC is the newest member of WACWV. K8MMZ won the 160 award for West Va. and attends Marshall. K8CSG prepared an excellent report on the Charleston Flood. K8UQY has stepped up activity, working morning c.w. nets on 40 meters. GQE has a new mobile rig. K8UJO has a new 6-meter mobile rig. Remember, the West Va. C.W. Net meets on 3570 kc. at 7 P.M. and the W. Va. Phone Net on 3890 at 6:30 P.M. Also look for state s.s.b. stations on 3905 kc. Traffic: W8FNI 81, NYM 65, K8CSG 30, UQY 29, W8HZA 28, K8HID 22, LOU 16, W8MFF 9, JM 6.

ROCKY MOUNTAIN DIVISION

COLORADO—SCM, Donald S. Middleton, WØNIT—SEC: SIN. PAMs: CXW and IJR. RM: MYB. OBSs: KØDCC and KØEPD. Irene, KQD, writes that a good friend moved an antenna pole to get her back on the air. JHP mobile, U.S. Navy retired, participated in his first transmitter hunt July 23 while passing through his home town, Pueblo. The Steel City Amateur Club was having its monthly transmitter hunt on 29.4 Mc. The PARA honored ex-SCM DML with a cake and a *QST* membership-subscription at its monthly meeting. Gene moved to LaJunta Sept. 1. WWJ reports finishing a Heath walkie-talkie unit on 29.624 Mc. and says it works real fine. FEO is taking over as manager of CCW for MYB. MYB has had a change in work hours. The Col-

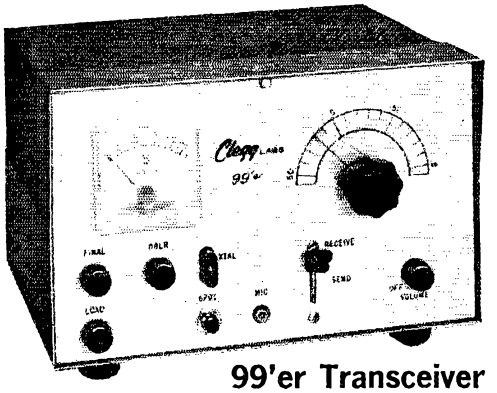
(Continued on page 146)

"Terrific!...Unbelievable... Best rig – ever"!

Here are a few unsolicited comments from owners of Clegg VHF equipment

Clegg Zeus VHF Transmitter FOR 6 AND 2 METERS

A highly efficient, 185 watt AM, high power VHF transmitter for full coverage of the amateur 6 and 2 meter bands and associated Mars frequencies.
Automatic modulation control with up to 18 db of speech clipping provides magnificent audio with "talk power" greater than many kilowatt rigs.
This beautiful unit with its ultra-stable VFO is the ultimate in VHF equipment for amateur and Mars operation.



99'er Transceiver FOR 6 METERS

This completely new transmitter-receiver is ideal for both fixed station and mobile operation. Small in size, low in cost, and tops in performance, the 99'er offers operating features unequalled in far more costly equipments. The double conversion superhet receiver provides extreme selectivity, sensitivity and freedom from images and cross modulation. The transmitter section employs an ultra-stable crystal oscillator which may also be controlled by external VFO. An efficient, fully modulated 8 watt final works into a flexible Pi network tank circuit. A large S meter also serves for transmitter tune-up procedure.

From Ohio:
". . . I am a quality control supervisor with a leading electrical manufacturer and this Zeus transmitter is to me the finest piece of workmanship that I have ever purchased or inspected . . ."
Richard E. Hayes, K8UXU

From New Hampshire:
". . . We feel that our new Zeus is the best thing that ever happened to us since we have been in ham radio (5 years) . . ."
Hazen & Beatrice Bean, K1JFQ

From Florida:
". . . We are well satisfied with the results of this unit as we have worked forty DX contacts in little more than three hours on May 23, 1961, including six new states which we were unable to work in the past two years with a 120 watt, 6 & 2 transmitter of a different mfg. . . ."
Jack Edlow, K4YIW

From California:
". . . Never before have I been more pleased with a piece of gear than I am with my Zeus. In two days I have worked 24 states with several contacts in each, (phone) on six meters. And the signal reports — yow! For the most part unbelievable . . ."
Jeanne & John Walker, WA6GEE

From Pennsylvania:
"Words cannot express the pleasure and performance of ZEUS. I have worked 5 states 5-9, plus I have given you $1,000,000 advertisement . . ."
Dr. A. Schlecter, K30EC

From Puerto Rico:
". . . I want to inform you of the excellent results obtained with the Zeus Transmitter I bought one month ago. Taking advantage of the band opening, I have been able to work up to the present thirty-eight states, including California . . ."
Pedro Fullana, KP4AAN

From New Jersey:
". . . I would like to tell you I am more than delighted with the operation of the Zeus. Have had nothing but good reports from other Ham's . . ."
Donald E. Gillmore, WA2QCQ

From Georgia:
". . . This set is terrific. I've had terrific results with it. It's the best rig — ever."
George E. Missback, K4QOE

K8CHE in Ohio tells about 99'er
". . . with the 99'er haywired in from a four element beam, through 100 feet of coax, through a matching network, through a length of 72 ohm twinlead, and then through a length of 300 ohm twinlead to reach the 99'er, we could read the Michigan stations Q5! and back through the above haywire we were able to put 4.4 watts into the antenna as measured by a RF ammeter! . . ."
Ken Phillips, K8CHE

Clegg LABORATORIES

502 Route 53, Mt. Tabor, New Jersey Oakwood 7-6800

orado Springs gang did a bang-up job on July 4 with mobiles timing the Pikes Peak Hill Climb. Denver mobiles, including SIN, helped with the Annual High Altitude Burro Race. At the suggestion of FEO each Colorado traffic net is being asked to provide its own liaison to the next higher net. The Western Slope Radio Club reports a campaign to get all club members in the League. RJD is the new EC for the Grand Junction Area. MOX reports working 19 states on 144 Mc. and hopes to add 5 more during the Aquarids and Perseids meteor showers. MOX is a new Colorado OES. Our congrats to the DRC on a successful hamfest. The BARC is making '62 FD plans. Traffic: WØCWD 25, MYB 18, KØWWJ 6.

UTAH—SCM, Thomas H. Miller, W7QWH—Asst. SCM: John H. Sampson, jr., 7OCX. SEC: K7BLR. BUN had a rough month as usual with OCX and K7BGU receiving BRAT Awards. OCX also received a BRAT Award for his work on TWN. K7s DJQ, DJT and DOT have been appointed Assistant ECs for Weber County AREC. NHQ is the new president of the Ogden ARC, moving up to fill the vacancy left by HYV, who is retiring from the Navy and moving to a new QTH. BAJ received OO forms from Headquarters and is making up for lost time. BAJ also made 100 QSOs in the recent CD Test. OCX gave an excellent talk on the ARRL at the UARC meeting in Salt Lake. DQW has moved to a new QTH and is already on the air. Traffic: W7OCX 110, QWH 16.

NEW MEXICO—SCM, Newell F. Greene, K5IQL—Asst. SCM: Carl W. Franz, 5ZHN. SEC: BQC. PAM: ZU. V.H.F. PAM: FPB. RM: ZHN. CA is a new OO. The Albuquerque Chapter of the Certificate Hunters has the Worked All New Mexico Counties Award ready. The Los Alamos Club is losing its fine club house. A new school building is to occupy the site. K5UYF has a new Invader to aid him in his contesting. YPC/M, at National Guard Camp, handled plenty of traffic for fellow guardsmen sending messages back home. The lineup of calls changes as nets move back to winter schedules. The Breakfast Club meets daily Sun. at 0700 MST on 3838 kc. *K5GOJ should be back in harness at* his new QTH after several months at school. Traffic: W5ZHN 643, UBW 47.

WYOMING—SCM, Lial D. Branson, W7AMU—The Pony Express Net meets Sun. at 1800 MST on 3920 kc. The YO Net is a c.w. net on Mon., Wed. and Fri. at 1830 MST on 3610 kc. AEC is starting single sideband with a Drake receiver. BKI is covered up with typewriters to be repaired. TQU, of Wheatland, honeymooned at the Wyoming Hamfest. The Wyoming Hamfest was a big success, with 98 hams registered and a total of about 200, including XYLs and harmonics, attending. Thanks to K7AHO and his helpers for the fine banquet, program and entertainment. The Cheyenne hams had a picnic at Veedavoo Lodge Aug. 27. K7MAT is in Idaho on business. HH demonstrated the sloping "V" dipole antenna at the hamfest in Deerhaven. Traffic: W7BHH 21, HH 21, CQX 5, AEC 4, AMU 3, CQL 1, ION 1.

SOUTHEASTERN DIVISION

ALABAMA—SCM, William D. Dotherow, K4AOZ—SEC: K4JDA. RM: W4RLG. PAMs: K4BTO, K4PFM. New appointments: K4GRA as OBS and OO, Class IV. W4TOI *has a new shack.* W4OXU *reports new stations* in Springville are WN4BSE, WN4BQW, WN4BYF, WN4BYZ, WN4BQI, WN4AZK and WN4AZJ. KN4WSK passed the General Class exam. WN4BYF (father) and WN4BSE (son) have an Apache transmitter and an SX-110 receiver. WN4ABX has a new call, WA4ABX. Welcome to new Huntsville station WN4BUZ. K4AAU reports reactivation of the Birmingham ARC Mobile Net, which meets Thurs. at 1900 CST on 29,560 Mc. K4PHH is on s.s.b. with a new 20-A. WN4ABX has a new SX-71 receiver. K4ANB is now with Western Electric in Winston-Salem, N.C. W4RLG welcomes to AENB K4ZUW in Birmingham and K4RYI in Mobile. Congrats to K4LNA on receiving an AENB certificate. K4CFD/4 has a new Drake 2B receiver and a 20-A s.s.b. exciter. K4GRA also has a new Drake 2B. K4TVZ is mobile on 75 meters. K4WHW has traded the DX-40 for a Valiant and is the new president of the Decatur ARC. W4OQG reports a new AENT contest now is in progress which runs from Aug. 1 to Oct. 31. All teenagers are invited to check in with AENT, 3965 kc., 1630 CST daily. The following received AENT certificates: K4OGV, K4TRJ, K4WHV and K5WSY. K4DJJ was voted the most outstanding member of the AENT for the past 3 months. W4OQG welcomes to AENT K4ZYO, K4ZUW, K4YWA, K4FTC, K5RSI, K5ZLZ and K5VAN. W4BFM and his XYL enjoyed a marvelous vacation to *Niagara Falls and other points East. The following* received AENM certificates: K4KJD, K4YKA, W4USM,

(Continued on page 148)

LEE PAUL, K1LCV, covers the non-business aspect of his Raytheon activity via QSO with other members of the company's world-wide field team.

FIELD ENGINEERING WITH A FUTURE

Hustling for 'Hustler'

The smiling ham above is Lee Paul, K1LCV, energetic engineer-in-charge of the B-58 'Hustler' product support group at Raytheon's Sudbury, Mass. laboratory. From his command post, Lee maintains contact on technical problems with various field groups situated throughout the country.

Lee's Raytheon experience typifies the organization's field-engineering-with-a-future concept. Since joining Raytheon three years ago, he has filled a variety of challenging assignments, including depot overhaul, reliability studies and systems test activities at Fort Worth, Texas, Long Island, New York, and other field locations. Now he heads "home support" at Sudbury.

Perhaps you too can qualify for a Raytheon field engineering future. Requirements are previous experience plus an E.E. degree or equivalent in practical know-how in guided missiles, fire control, ground and bombing radar or sonar.

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ELECTRONIC SERVICES DIVISION

K4HAK, W4FQQ, W4PAC, K4IKR, K4RSB, W4ANT, W4SX, K4RIL and W4MAM, K4KDE called a very successful simulated emergency session of the AENP July 29. The Montgomery ARC offers a beautiful certificate for working 25 Montgomery stations. Consult members of the Montgomery ARC for details. *Six Meter News*: K4YFX, in Haleyville, is on 6 meters with a 50-ft. tower and eight-element beam. W4HSU has a new 60-ft mast on a high hill. The XYL of K4DJR is now WN4BQK. W4CIN reports two new hams for Birmingham, WN4AWW and W4WTD. W4CIN holds a nightly sked with K4MBM, K4FQA and K4LZO on 432 Mc., and is building an s.s.b. rig for 144 Mc. W4CIU reports lots of Walker County 6-meter activity with W4CIU, W4GYT, W4GYW, K4UGP, K4QMH, K4IYM, W4AOJ, W4WAN, K4DJR and W4YER all very active. W4UAR has worked 20 states on 6 meters since Feb. K4IQU announces the formation of the Tennessee Valley V.H.F. Society which meets the 1st Mon. in the month at 7:15 P.M. at his house. All interested are invited to attend. *RACES News*: Birmingham RACES Chief W4DFE announces the C.D. 10-Meter Net meets every Tue. at 8 P.M. on 29.560 Mc. This will be Network "B," and those stations calling in should use their c.d. designator. Traffic: (July) W4RLG 110, K4PFM 104, K4AOZ 98, K4YUD 76, K4GXS 49, W4PVG 49, W4OXU 32, K4HJM 26, K4PHH 24, W4MI 22, K4WHW 16, K4KDE 15, K4BTO 13, W4CIU 11, W4WHW 10, K4JDA 9, K4DJR 8, K4RIL 8, KN4BRZ 6, K4CFD/4 5, K4TVZ 5, K4HVN 4, K4GRA 3, K4KJD 3, WN4BSE 2, K4FTC 2, K4TDJ 2, K4UMD 2, K4ZNI 2, W4ZSH 2, WA4ABX 1, W4TOI 1. (June) K4DSO 11, W4OXU 9, K4MEQ 3, W4ZSH 1.

EASTERN FLORIDA—SCM, Albert L. Hamel, K4SJH—SEC: W4IYT, RM; K4KDN, RM RTTY; W4EHU, PAMs: 40 W4SDR, 75 K4LCF, V.H.F. W4RMU, S.S.B. W4CNZ. Section nets: FPTN, 3945 kc. M/S 0700; FMTN, 7230 kc. M/S 1200; TPTN, 3945 kc. daily 1730; GN, 7115 kc. daily 0830; QFN, 3650 kc. daily 1830 and 2200; FEPN, 3910 kc. Tue. 1830; FSBN, 3940 kc. Sun. 1700; FAST, 3940 kc. M/F 1930; NHN, 3725 kc. Sun. 0730; MCEN, 3900 kc. Sun. 1330. In order to conserve space net listings will be eliminated except where a new net is formed. The Net Directory contains full information. A copy may be obtained from ARRL. W4EXM and his XYL KN3NKE will be in the Miami Area bout Nov. 1. Art is now KR6AM. W4UBS is going north and into the Navy. Once again ham radio operators did a fine job assisting the Coast Guard with the Gold Coast Marathon Boat Race. The XYL of K4LLI is now WN4BSH. WN4BMC's OM is now WN4AZZ. W4DDW got his first 10-year certificate for WARN service from the WX Bureau. The S.S.B. Emergency Net now has over 100 stations listed as active. A.M. stations who shun the FEPN A.M. Net, please take note. S.s.b.-ers now are more active emergency-wise than a.m. stations. Get on the AREC boat and be prepared to serve when needed. Summer QRN and bad skip has not slowed down E. Fla. traffickers noticeably. K4-BSS/4 has gone to a new station in Maine. Class I and II OO appointees, take note. Besides qualifying twice a year in FMTs you are expected to put this knowledge to use in monitoring bands and reporting such activity to the SCM. K4MHX and W4UBS reported with no traffic. W4QVJ reported no traffic for June. Traffic: (July) K4SJH 913, W8LDU/4 253, K4DBT 246, K4EHY 203, W4CNZ 187, K4LCF 154, K4BY 144, WN4BMC 132, W4TUB 114, K4KDN 111, K4FMA 101, K4AX 88, K4COO 82, W4IYT 76, W4FE 74, W4DVR 70, W4AKB 67, W4ARV 65, K4AKQ 64, W4TRS 63, K4ENW 54, K4-BSS/4 51, K4ILB 51, W4NGR 50, K4DAX 48, K4OZS 35, K4DAO 29, K4RNS 29, W4TAS 28, W4YCX 27, W4EHW 26, W5ESB/4 26, K4RDX 25, W4BKC 24, W4HTH 24, K4YSN 24, K4ANR 23, W4TRU 22, K4YOQ 20, W4LSA 18, K4GUE 17, K4JZU 17, W4OVE 17, W4EAT 16, K4ZIF 15, W4DDW 14, W4HRC 14, K4MTP 14, K4JJZ 13, K4LVE 12, K4BZS 11, K4GSD 11, K4OSQ 11, W4AYD 10, K4BZ 10, W4DQS 10, K4JZX 10, K4QQE 8, K4YPN 7, W4QVJ 6, K4VGD 6, W4AB 4, WN4AZZ 4, W4DPD 4, K4LLI 2, W4SVB 2. (June) W4PJU 28, K4LVE 2. (May) K4LVE 64.

WESTERN FLORIDA—SCM, Frank M. Butler, jr., W4RKH—SEC: W4MLE. PAM: W4WEB. RM: K4UBR. A fine picnic was held in Fort Walton by members of the phone and c.w. nets. Many thanks to K4QOJ, W4BPJ, K4LOL and others who made it a success. K2AZT/4 is now OES in Fort Walton, on 6 and 2 meters at present with plans for 220 and 432 Mc. W4KQP and W4MLE attended the Weather Bureau-Civil Defense Hurricane Conference in Tallahassee and presented amateur net facilities. W4SJP has moved from Carrabelle to Tarpon Springs but remains active in WFPN. Tallahassee: W4CMG led a crowd to 29,560 by getting a Heath Tether. Two new hams are WN4AZR and WN4-BMA. K4VLE has left to take a job in Broward County. A 2-meter Communicator has been placed at the Tallahassee Weather Bureau to provide a direct link to

(Continued on page 150)

W4GAA, the s.s.b. base station in the AREC Plan. W4HBK, from Pensacola, is attending F.S.U. W4YUU, formerly in Tallahassee, is now working in Orlando. Pensacola: The NAS Club is starting code and theory classes again. Several graduates of the last class, including WN4BWN, are now on the air. The Corry Field Club is active again, using the call W6KXN/4. K4JDW has been awarded an RN5 certificate for his participation. W4AXP now has all the bugs out of the DX-100B. The V.H.F. Club will provide all communications at the Fiesta Sports Car Races. Traffic: (July) W4WEB 87, K4VND 48, K4LOL 23, K4BDF 21, K4QAC 20. (June) K4QAC 22.

GEORGIA—SCM, William F. Kennedy, W4CFJ—SEC: W4PMJ. PAMs: W4LXE and W4ACH. hM: W4DDY. OCEN meets on 3995 kc. at 1830 EST Tue. and Thurs., 0800 on Sun.; GSN meets Mon. through Sun. on 3595 kc. at 1900 EST and 2200 EST, W4DDY as NC.; the 75-Meter Mobile Net meets Sun. on 3995 kc. at 1330 EST, K4YID as NC.; the GPYL Net meets Thurs. on 7260 kc. at 0900 EST, K4ZZS as NC.; the Atlanta Ten-Meter Phone Net meets Sun. on 29.6 Mc. at 2200 EST, W4BGE as net mgr.; the Georgia S.S.B. Net meets Mon. through Fri. on 3972 kc. at 2000 EST, K4RHB as net mgr.; the Atlanta Radio Club Phone Net meets Sun. at 2100 EST on 21.36 Mc., W4DOC as NC. At the meeting of the Georgia Cracker Radio Club held near Atlanta July 6, K4VGI was elected president, K4DNH Sun. morning net control, W4PMJ Tue. evening net control, W4FYH Thurs. evening net control, W4ZD historian, and for the tenth straight time W4MZC was elected treasurer. All the hams in Georgia were sorry to learn of the passing of K4SEN, Aug. 2. Doug lived in Columbus, Ga., and will always be remembered by his fellow amateurs. We also were sorry to hear of the passing of K4PGZ's mother and K4ICW's father. Station WALB-TV gave the Albany Radio Club 30 minutes of free time to show the film "CQ-QRZ" during National Radio Week. Traffic: K4ZYI 105, K4TKM 51, K4FJD 41, W4HYW 32, K4BAI 27, K4QPL 25, W4DDY 23, K4FPZ 16, K4BVD 8, K4VTH 5.

WEST INDIES—SCM, William Werner, KP4DJ—C.D. RAdio Officer: MC. Present at the first meeting of amateurs with c.d. authorities on July 7 were TIN and ASY, Aguadilla, CH and ALY Rio Piedras, DJ Hato Rey, CL and CK Villa Caparra, MC Caguas. TIN was chosen as NCS on 3825 kc. each Wed. at 8 P.M. CK is NCS on 50.5 Mc. each Mon. at 8 P.M. and AXN is NCS on 7205 kc. each Sat. at 1 P.M. All KP4 stations are urged to cooperate in this increasingly important work. Contact CH or MC for RACES procedure books. Vacation visitors to KP4-Land were VP2KP, K4WKS, K7BWV and WA2PHF. CH's son is now WP4BRV, mostly on 15 meters with a DX-40 and a long wire antenna. CH has a new Drake 2A, which WP4BBV also uses. KQHF, at Ft. Buchanan, is now BCA. AAM is now K7MTW at Enid, Okla., where he is taking jet pilot training. AZ vacationed in Miami. ABD vacationed in Canada. JS left Aug. 15 to live in Miami. ACF returned from Biloxi, Miss. SV has a new Drake 2A and assembled a Health Warrior amplifier. AEB, NCS of the Antilles Weather Net, transmits and receives simultaneously on 3815 and 7245 kc. to reach more weather reporting stations. AEB has set up RTTY receiving and transmitting equipment and is testing with ES. AER has a 50-kw. emergency power plant. VP2SI is on 7245 kc. with a DSB-100. AMG is back on 20-meter s.s.b. with a kw. and a three-element beam. ASK monitors all received signals with an oscilloscope and received an SWL card from Turkey. AWH has a new Cheyenne and Comanche fastened together to be carried anywhere in emergency along with 6- and 12-volt power supplies. AEB reports a group of VP stations have an emergency disaster net with NCS in Trinidad on 7030 kc. 1000-1200 GMT and on an 80-meter frequency 1800-2400 GMT. No third-party traffic can be accepted from them until the Island Federation and U.S. Governments meet. AEB applied for an OPS appointment. ASK built a low-level negative peak suppressor for more audio without overmodulation. DJ skeds W6NUN on 14050 kc. Sat. at 9 P.M. AST. The PRARC's address is Box 3533, San Juan. The PRARC is sponsoring a KP4 QSO Contest during Sept. and Oct. AWH suggests a ham swap some Sat. API is operating W2CXM at Cornell U. in Ithaca. Traffic: KP4WT 210. AWH 5, DJ 4.

SOUTHWESTERN DIVISION

LOS ANGELES—SCM, Albert F. Hill, jr., W6JQB—RMs: W6BHG, WA6ROF and K6LVR. PAMs: W6BUK, W6ORS and K6PZM. The following stations earned BPL for July: W6WPF, W6GYH and WA6ROF. Congrats, fellows! The very heartiest wishes from the gang in the Los Angeles Section on a well-deserved retirement to Mr. Bernard H. (Pop) Linden, who was in charge of the Los Angeles Office and District 11 of the FCC for 26 years and for 45 years in Government Service. We

(Continued on page 152)

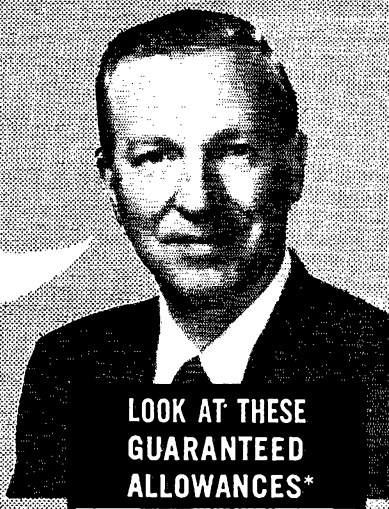
Now! You can go SSB at a profit!

Right now I can allow you a lot more for your present gear than it is worth–in many cases even more than you paid for it!

These extra-high allowances make a new Gonset GSB-100 a real worth-while investment – one that will pay you big dividends in greater operating pleasure.

Now, everyone can graduate up to SSB, especially with Harrison low terms on the balance! Join the gang having more fun, with SSB. Send the coupon to me today!

73, Bil Harrison, W2AVA



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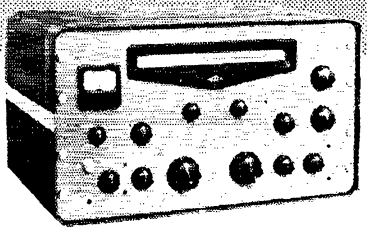

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☐ I am shipping my _____ to you for

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expect to hear you on the air soon, Pop! WA6DJB reports fine liaison between the SoCal 6 Net and RN6. WA6OUK is learning Braille in order to help sightless children in radio. W6BES reports a nice CD Party score but poor conditions. W6BUK is making some skeds on 15 meters. K6UYK moved the rig from Long Beach to North Hollywood. WA6HUO is working KH6-Land stations like locals on 15 meters. WV6QNN has a new NC-303! WA6JDB is fresh back from vacation in Yellowstone. W6AM has the new country, Damao! K6CDW is heading for the High Sierra country for vacation. WA6-OWM will be mobiling round trip to New Jersey! W6VOZ is working MM on the San Diego-Coronado Ferry! The SoCal 6 Net is looking for liaison stations for work between 80-meter c.w. and 6-meter phone. Contact K6PZM or WA6DJB. WA6BFC reports some work to San Diego on 220 Mc. WA6KVS reports excellent reception of the OSCAR Fly-over Test. K6COP has a new one confirmed, CN8JE! K6SIX reports some good openings on 6 meters. K6LJY, in Riverside, has worked WA6-GHW in Manhattan Beach on 1215 Mc. over a 60-mile path through the smog! Support your section nets: On C.W., the Southern California Net (SCN) on 3600 kc. at 0300 GMT daily; on phone the SoCal 6 Net on 50.4 Mc. at 0300 GMT daily. Traffic: (July) W6WPF 1073, W6GYH 951, WA6ROF 779, K6OZJ 286, W6EXB 170, WA6DJB 161, WA6MFH 154, WA6BCZ 148, K6SIX 119, WA6OUK 104, WA6KQN 91, WA6QFC 80, W6BHG 64, K6PZM 54, WV6QNN 54, WA6KAW 48, K6HOV 46, WA6JOC 44, WA6CKR 36, WA6JDB 30, WA6KVS 20, W6USY 17, K6MGO 10, WA6OWM 3, W6CK 2, W6VOZ 2, WA6DWP 1. (June) K6YVN 32, WA6CKR 31, WV6-QNN 27, WA6LPS 14.

ARIZONA—SCM, Kenneth P. Cole, W7QZH—Asst. SCM/SEC. George Mezey, K7NIY. PAM: OIF. RM: LND. The Copper State Net meets at 1930 MST Mon. through Fri.; The Grand Canyon Net Sun. at 0800 on 7210 kc.; the Tucson AREC Net Wed. at 1900 on 3880. The state of Arizona has lacked, for a long time, a c.w. net. Many have been started, but all have failed because of lack of attendance. It behooves us all, as ardent amateurs to fulfill the FCC requirements. One of those requirements, as you all know, is to be able to send and receive *at least* 13 w.p.m. Good c.w. men are at a premium. In order to upgrade the quality of the amateur radio operator in the state of Arizona, a meeting is being held in Phoenix under the supervision and direction of your RM, LND. This meeting is to be a nucleus of c.w. operators which eventually will include all the amateurs in the state of Arizona. A c.w. net will be established. This time it will not fall by the wayside. News items are a problem. The news comes from *you*, the amateur radio operator in the state of Arizona. The only news publications received by your SCM are *Splatter*, published by the Arizona Amateur Radio Club, and *Zero Beat*, published by the Catalina Radio Club. Let's get items of interest to all Arizona amateurs published so hams in one part of the state will know what amateurs in the other part are doing. K7IBX reports 268 contacts made on Field Day. This included 40 states, Canada and Washington, D.C. Traffic: W7CAF 373, WØWHG/7 373, W7LND 219.

SAN DIEGO—SCM, Don Stansifer, W6LRU—The following official ARRL appointments were in effect in the San Diego section on Aug. 1. SCM: W6LRU. Asst. SCM: W6EWU. SEC: W6LYF. ECs: K6HQJ, K6RYI, W6EWU, W6KSI, W6KUU. RM: W6EOT. OPSs: W6CHV, K6TXS. ORs: W6EOT, K6LKD, WA6-ATB, WA6CDD. OBSs: K6BTI, K6TFT, K6TXR, W6JVA, W6LRU. OESs: W6IEY, K6BTO, K6RCK. OOs: K6BX, K6BVV, K6BHM, K6EC, K6IQ, K6STZ, K6TFT, W6CAE, W6HU, W6LRU, W6VIV, W6WNN, WA6ABA, K6RCK, in Santa Ana, still is getting over the effects of two major operations and now has three rigs on 6 meters and two on 2 meters. WA6CDD reports his new DX-100 gets out much better than his old DX-35. W6IAB, with four operators, had a traffic count of 5176 for July, with K6BVV, OO, as chief operator. K6LKD made the BPL in July, with school out and more time for net work. K6BTO, OES in National City, now has a 21-inch dish instead of a waveguide on 1220 Mc. The Newport Club enjoyed a family picnic in June at Doheny State Park. The South Bay Amateur Society held Field Day in the swamps at the foot of G Street in Chula Vista. The July meeting of the San Diego DX Club was held at the home of WA6EPQ and WA6IPY. WA6EPQ is now in college at Cornell University. Both WA6BUX and WA6FJD back-packed into the High Sierra on the John Muir Trail during August. W6BKZ also fished and camped near Bishop. Traffic: W6IAB 5176, K6BPI 2554, W6YDK 2552, K6LKD 737, W6EOT 678, WA6CDD 75, WA6BDW 16, K6RCK 5.

WEST GULF DIVISION

NORTHERN TEXAS—SCM, L. L. Harbin, W5BNG—Asst. SCM: E. C. Pool, 5NFO. SEC: K5AEX. RM: LR.

(Continued on page 154)

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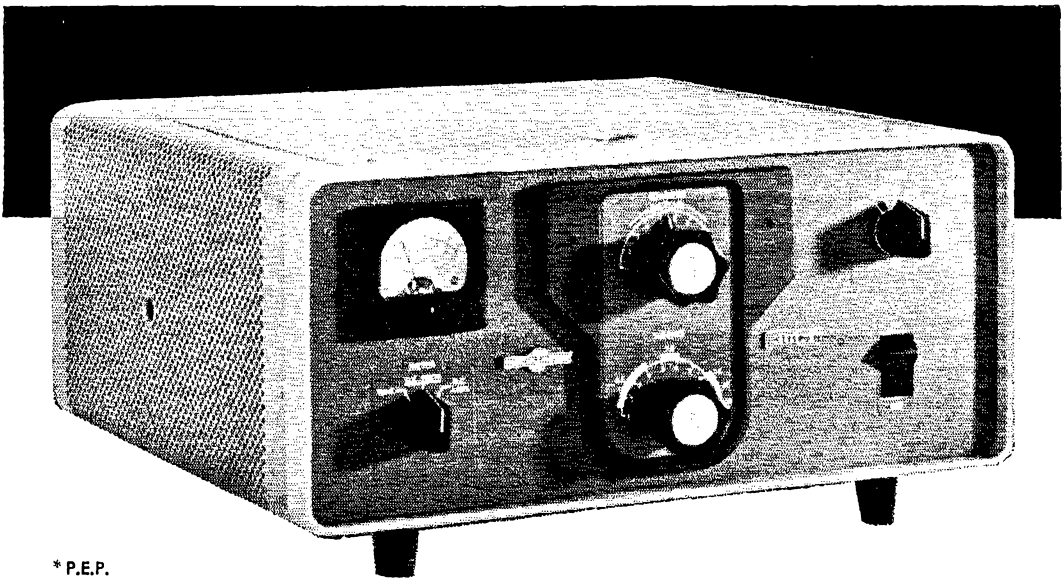

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One month I failed to make a report and I received so many queries as to why, I decided that I would make a report if I had to quote FCC regulations. I think the FCC should add a few questions on Safety First before granting a license of any kind. I heard on the air recently that a ham climbed a telescoping antenna tower while it was fully extended—result, two broken legs and one broken arm. Don't take a chance and remember that no job is so important that it cannot be done safely. BOO has resigned as PAM. Jim is to be congratulated on the fine job he has done in that position and as EC for his county. YUO was on vacation in California, attended the San Fernando Valley Hamfest and won first place in the 75-meter transmitter hunt. Seems like Walt is a natural hunter regardless of where he is. K5QWR has made BPL for the second month. Looks like Ben is trying for the medallion. Don't forget the West Gulf Division Convention to be held in Kerrville Oct. 13-15. I hope to see you there. With the world situation as it is I would suggest that every amateur make an effort to become affiliated with a civil defense organization. Don't forget—*it can happen here.* Traffic: K5QWR 595, ILL 281, W5BOO 135, SMK 126, LR 109, K5RAV 90, W5GY 85, K5ZOM 78, W5GNF 37, K5AVZ 36, YPO 36, SXK 21, W5ANK 10, K5PXV 8, QPG 7.

OKLAHOMA—SCM, Adrian V. Rea, W5DRZ—SEC: K5KTW is looking for reports from you ECs. His address is 1220 S. Owasso, Tulsa, Okla. New RMs are: OLZ, K5JGZ, SSZ, K5OCX. New PAM is K5JOA. K5GNX and K5OCX have just received ORS appointments, and K5OOV an OBS appointment. Hats off to the Tulsa v.h.f. boys for a good convention. Ed Tilton, of Headquarters, was present and made this an outstanding occasion. QKF, West Gulf Division Director, also was present and made a good contribution to the convention. New officers of the Muskogee Amateur Radio Club are WAX, pres.; K5ZEP, vice-pres.; K5GIP, secy.; K5WPP, act. mgr. Others on the executive committee are RST, EJK and RCW. K5YRO is a new amateur in Temple. The Southeastern Oklahoma boys are showing the amateur world how to get a crowd at a hamfest—on-the-air talk. K5SWA is the champion talker. In the Field Day contest between the Enid and Kay County Clubs, it turns out that the Kay County boys must entertain the Enid Club. We have just learned that DXI, well-known in Southeastern Oklahoma has become a Silent Key. Our sympathy to Vic's folks. Traffic: (July) K5IBZ 145, W5DRZ 47, K5JGZ 43, OCX 37, MBK/5 35, ZCJ 31, W5WDD 26, K5DLP 25, W5MFX 24, K5AUX 20, W5CCK 15, K5ZEP 15, GNX 14, W5PNG 14, K5LZF 13, W5VLW 9, K5JOA 8, OOV 5, VYY 5, CBG 4, VNJ 4, ECH 3, W5WAX 3. (June) K5JGZ 65, W5JXM/5 30.

SOUTHERN TEXAS—SCM, Roy K. Eggleston, W5QEM—SEC: AIR, The Gulf Coast Amateur Radio Council has been organized in Houston with the following officers: K5PEQ, chairman; CE, vice-chairman; PM, publicity; and K5PAP, secy.-treas. Now is the time to begin making plans to attend the West Gulf Convention to be held at Kerrville, Tex., Oct. 13, 14 and 15. QKF, UYQ, DRZ, BNC, AIR, QEM, K5KTW, K5AEX and K5TRY, together with the communications for c.d. from Oklahoma, had a meeting at Region 5 Headquarters for OCDM in Denton, Tex. This was a very informative meeting and we got some good information to carry to the clubs on our visits. According to FCC regulations and OCDM Rules, the amateurs are being given the chance to head up all c.d. communications and we all should get in and help, not only for amateur radio, but we owe it to our country. K5VEN is back on the air with a new HT-37. The El Paso gang handled the communications for the recent Powder Puff Derby, and as usual did an excellent job with it. K5TRY, State Communications Officer, visited the Corpus Christi Amateur Radio Club. Frank will have a communication system in the state second to none if we will get in and help out. So let's go. HQR is on the air with a new S/Line. AQK has a new KWM-2. QKF is mobile with a new KWM-2. Traffic: K5WIC 175, ABV 55, SCT 15, FPJ 1.

CANADIAN DIVISION

MARITIME—SCM, D. E. Weeks, VE1WB—Asst. SCMs: H. C. Hillyard, VO1CZ, and A. E. W. Street, VE1EK. SEC: BL. Deepest sympathy is extended to the relatives and friends of JE, KL and ex-1AX, who have joined the ranks of Silent Keys. Newly-elected officers of the NBARA include WF, pres.; BL and LX, vice-pres.; MZ, secy.-treas. VO2HB reports that VO2-AW and VO2JH have been transferred from Goose Bay. Bert also reports that he and VO2WW provided communications for the Goose Bay Wolf Cub Camp while it was in session and handled 58 messages. 3CLJ (ex-1ET) recently visited the section. Congratulations to

(Continued on page 156)

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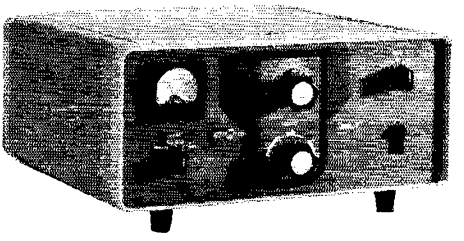

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VC and ACJ and their XYLs on the arrival of new daughters. Your correspondent, for personal reasons, does not wish to be renominated for the coming SCM term. I would like to take this opportunity to thank the many who have kindly assisted in the work of this office. Details regarding nominating procedure are contained elsewhere in this issue. VO1EX has been transferred to Dartmouth. K2SQM/VE1 has been active from his summer home at Peggy's Cove. The Sydney Club has established beginners' classes for young amateurs. Those interested should contact AGT. Traffic: VO2HB 58, WW 58, VE1OM 29.

ONTARIO—SCM, Richard W. Roberts, VE3NG—The Niagara ARC held its Annual Weiner Roast at Port Weller recently. DPO is on vacation and will be seen at the Ontario ARRL Convention in Windsor. The Nortown Old Timers Assn. is now an ARRL affiliate. 100 per cent. How about that? The executives of the Gateway ARC, North Bay, are DKA, pres.; EAW, secy.-treas.; BEY, EGP and DXG, directors. DFE is now in Milgrove and has moved all his gear from Burlington. He has a new Thunderbird beam. The Scarboro ARC and the Nortown ARC combined for a hidden transmitter hunt in Toronto. Registration forms and programs for the Ontario ARRL Convention may be had from your SCM or CXK, Windsor, Ont. His QTH is 361 Glidden Ave., Windsor. Executives of the Ottawa Valley Mobile Radio Club are BCJ, pres.; BST, vice-pres.; BYT, secy.-treas. CEZ has a new 2-meter beam. BCJ will be mobile soon. ASZ is moving to New Brunswick. ECN is leaving Canada for a few years. BEB is back mobile. DTO is in VE6-Land. AJA is enjoying his new QTH at North Bay. ARF and DVM are portable at Lake Mazinaw, Ont. DXZ has returned from W6-Land. He had an FB trip and met many members of the YLRL. RN is back on mobile. AML is mobile for the summer and will be at the Ontario ARRL Convention. Our ARRL Canadian Director, Noel Eaton, has been very active in all phases of ham radio during the summer. Noel also will be at the ARRL Ontario Section Convention in Windsor. DVG is vacationing at Meaford, as are DZA and NG. DRF is now Class A. 3LK visited VE1OM in Nova Scotia. C.U. at Windsor. Traffic: VE3AIL 220, CWA 124, BAQ 99, NG 90, EHL 80, CYR 78, AML 60, RN 43, BUR 33, DWN 26, CP 17, DU 14, OJ 4.

QUEBEC—SCM, C. W. Skarstedt, VE2DR—We were delighted to attend the R.A.Q.I. Provincial Convention, held at La Tuque on Aug. 5 and 6. Some 100 hams with their families attended. A dance on Sat. evening was a great success, and the hidden transmitter hunt on Sun. was won by ABV. Election of officers took place and fine prizes were distributed. You are reminded to support your traffic nets: OQN (c.w.) on 3535 kc. at 1900 daily, and the Que. Fone Net on 3780 kc. at 1845 daily. The golf game long planned by VV, BR, BK and GK unfortunately was called in the "seventh inning" by rain. VV has a fairly complete file of *QST*s back to 1917 if anyone is interested. While most clubs QRT for summer months, the Lake Shore Club carries on. The agenda, consisting mostly of cool 807s, always entices an enthusiastic group. At the Aug. meeting 4LJ visited. He is now living in Montreal. Many of the boys enjoyed fine vacations. YA and family flew to HB-Land, rented a car and saw much of the country. IL went South, dropping in at the Bahamas and Bermuda. BB and his XYL visited London, England. AXU believes in leisure, lounging on his veranda while using the new s.s.b. gear. ATL was married July 25. WT also took the fatal step on Aug. 5. ADG is fishing in Ontario. News of the month is a forthcoming v.h.f. experiment conducted by ABE and friends. An airborne transmitter via a balloon is contemplated. A sad note: KJ died suddenly on July 13. His son, XJ, will carry on skeds with EC. Traffic: VE2DR 146, WT 44, EC 35, AGM 24.

ALBERTA—SCM, Harry Harrold, VE6TG—SEC: FS, PAM: PV, OO: HM, OBS: HM, ORS: WG, OES: DB. At present the Alberta section is disorganized and I need the help of all of you. On my recent trip I did get a chance to meet some of you and now that you have had time to think things over I hope to hear from you. I need reports, also we have lots of appointments open. If I don't hear from you I am not of much use to you or the position that I hold. I will be visiting the different clubs when they start in the fall, so hope to meet more of you then. Our membership at present is very low so, fellow, let's see what can be done about bringing it up. My recent trip took in as far away as Grand Prairie. Also we attended the International Hamfest at Waterton Lakes with some 525 present and it was a howling success. Next year's hamfest will be held at Apgar, Montana. HM is very busy with traffic from the north. WG is on 40-meter c.w. and is active with traffic. Let's hear from you, fellows. Traffic: VE6HM

(*Continued on page 158*)

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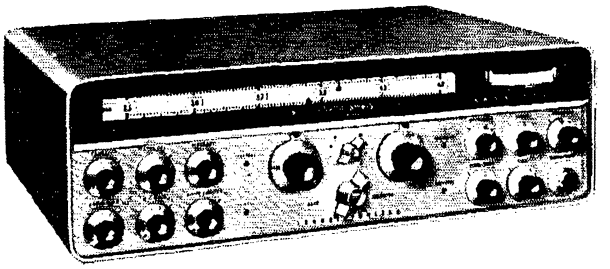

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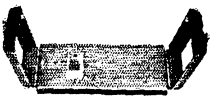

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195, FS 10, TG 5, KG 4, YE 4, AEN 3, BA 3, PZ 2, SF 2, VE 1.

BRITISH COLUMBIA—SCM, H. E. Savage, VE7FB—The British Columbia Emergency Net held its Gabfest over a Chinese Dinner with a good attendance and discussed the affairs of c.w. traffic-handling. AAF, RM, won V.O.M. Meter. The Okanagan International Hamfest held at Okanagan Falls was a real hamfest. Some 75 licensed amateurs from both sides of the line had a real time with their families. A mention should be made to the organizers on how well they kept to the program and to the time of events. Thanks to FS, AQW, XW, the XYL of BQ, and others. It sure was nice to see JD, who had just received his license, at the hamfest. SL is not improving after his stroke. BFU will be an active YL with a DX-100. GR has a 2-meter pipeline into Vancouver, fixed and mobile. July nets were plagued with summer static and fading so the traffic count is down. Traffic: VE7FK 79, BDP 76, AQD 33, JQ 10, AMW 7.

MANITOBA—SCM, M. S. Watson, VE4JY—The ARLM has announced it will sponsor a hamfest at Winnipeg in 1962. KP was the recipient of a handsome gift at a gathering of hams at the home of KN at Brandon. Ken was married on July 22 and is making his home with his XYL in Winnipeg. AN, our OBS, is having a time installing a new Cheynne in his Buick. A ham picnic was held Aug. 13 at St. Laurent Beach. EC TL reports a novel and lively activity on July 22 as follows: At the request of the trainer of Lake Winnipeg swimmer Claudia McPherson the AREC group set up EC from Grand Marais to the boats accompanying the swimmer. The Redboine Boating Club with FG, the club commodore, with CF were markers at mid-lake. Under the direction of KF the group set up an emergency station, battery operated on 6 meters with operators RE, LZ, KF and EC TL participating. Mobile units also were operated and a 6-meter walkie-talkie loaned by FY also was used. A total of 58 contacts were completed. Full cooperation was given to the local radio stations and TV station and hundreds of questions by the public were answered by KF. Much favorable comment was heard on this phase of amateur radio. Traffic on the net seems to be taking a holiday along with the members.

NAA—1961

(Continued from page 82)

All of these people are enthusiastic hams working together at a pretty amazing Naval radio installation.

As a Matter of Fact . . .

. . . all of communications is fascinating, and the advances made in recent years are quite startling to those of us who can remember how things were done in the "good old daze." There is much more being done at NAA than we have room to tell you about, but there and elsewhere in the Navy there are some mighty interesting communications assignments which offer a challenge to everyone taking part.

If you still have your military service ahead of you, you'll find that your amateur license and experience can stand you in good stead. You will have to pardon the writer for being slightly prejudiced toward the Navy[6], although he will admit that interesting communications assignments are also plentiful in the other services. The real point is that your amateur radio experience can be a real asset both to yourself and to the country.

This is certainly true at NAA, from the commanding officer right on down the line. QST

[6] The author, a Commander in the Naval Reserve, recently spent two weeks' training duty at the new NAA.

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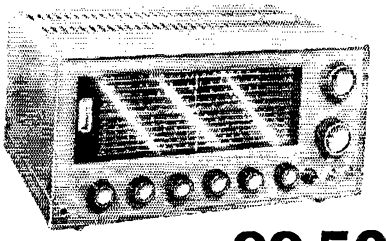
THE LAFAYETTE HE-30

Professional Quality Communications Receiver



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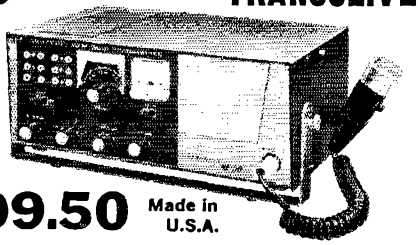
- TUNES 550 KCS TO 30 MCS IN FOUR BANDS
- BUILT-IN Q-MULTIPLIER FOR CROWDED PHONE OPERATION
- CALIBRATED ELECTRICAL BANDSPREAD ON AMATEUR BANDS 80 THRU 10 METERS • STABLE OSCILLATOR AND BFO FOR CLEAR CW AND SSB RECEPTION • BUILT-IN EDGEWISE S-METER

Sensitivity is 1.0 microvolt for 10 db, Signal to Noise ratio. Selectivity is ± 0.8 KCS at —6db with Q-MULTIPLIER. TUBES: 6BA6—RF Amp, 6BE6 Mixer, 6BE6 OSC., 6AV6 Q-Multiplier—BFO, 2-6BA6 IF Amp., 6AV6 Det-AF Amp. ANL, 6AQ5-Audio output, 5Y3 Rectifier.

New! LAFAYETTE HE-50 10 METER AMATEUR TRANSCEIVER



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A significant step forward in 10-meter communications. The Lafayette HE-50 transceiver sets new standards of flexibility and performance in the 10-meter band.

• Superhet Receiver Section • Sensitivity 1 μv • Image Rejection 45db • 12 Watts. Input To Final • Use on both 117 VAC & 12 VDC• Built-in Mobile Power Supply • Uses Standard 7 MC Fundamental Crystals with Sockets on Front Panel • Provision for External VFO on Front Panel • Adjustable Pi-Network • Contains Spotting Switch • Built-In Illuminated S Meter • Variable Tuning • Extremely Effective adjustable Noise Limiter • Complete with Rugged Push-To-Talk Ceramic Mike • Tubes: 1—6BA6 RF, 1—6BA6 IF, 1—6U8/6EA8 IF, 1—6U8/6EA8 IF, 1—6U8/6EA8 Transmit Osc. & Buffer, 1—2E26 Transmitter Output, 1—6AQ5 Audio Output, 1—6CN7 Det. & Noise Limiter.

TOP VALUE COMMUNICATIONS RECEIVER

KT-200WX in Kit Form **64.50**

HE-10 WIRED AND TESTED **79.95**

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The Communications Receiver that meets every amateur need—available in easy-to-assemble kit form. Signal to noise ratio is 10 db at 3.5 MC with 1.25 microvolt signal. Selectivity is —60 db at 10 kc, Image reflection is —40 db at 3 MC. Tubes: 3—6BD6, 2—6BE6, 2—6AV6, 1—6AR5, 1—5Y3.

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Measures SWR & Relative Power up to 1 KW. 150 watts full scale—built in dummy load—Wattmeter ±5% to 50 mcs. SWR ±5% for in line use.

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DX Contest Results

(Continued from page 44)

New Hampshire

W1FZ.....102,213-123-177- C- -

Rhode Island

W1QCO....12,206- 34-120- B- -

[NORTHWESTERN DIVISION

Alaska

K1IFS/KL7..8103- 37- 73- A-25

Montana

W7FIN.....2280- 19- 40- A-14

Oregon

W7DLR.....396- 11- 12- C- 8

Washington

W7MH.....936- 13- 24- A-24

PACIFIC DIVISION

Hawaii

KH6IJ....87,453- 79-369- C-42
W5BJZ/KH6 37,647- 47-267- A-58

Nevada

W7FCY.....714- 14- 17- B- -

Santa Clara Valley

K6UXV.....9102- 41- 74-AB-24
K6ERV.....7548- 37- 68-AB-33
K6CQM.....5292- 36- 49- C-22
W6FYM.....1554- 33- 46- C-15
W6CBE.....4128- 32- 43- C-17

East Bay

W6LDD....14,904- 54- 92- C-50
W6VNH.....3657- 23- 53- A-10
W6IPH.....1404- 18- 26- A- 6

San Francisco

W6ZKM.....2904- 22- 44- A-31
W6ERS.....3- 1- 1- C- -

Sacramento Valley

W6SIA....21,420- 70-102- B-33

San Joaquin Valley

W6KJS.....8946- 42- 71- C-20
W6BVM.....440- 11- 14- - -

ROANOKE DIVISION

North Carolina

W4LOC.....7203- 49- 49- C-25
W4LMK (6 oprs.) 73,062- 99-255- A-96

South Carolina

K4HHL....37,401- 91-137- B-30
K4YYL.....750- 10- 25- B-18

Virginia

W4QCW..133,950-150-299- C-65
W4OM..101,160-120-281-ABC- -
W4BVV....71,980-118-206- A- -
W4JFE....30,056- 68-148- A-36
W4KFC....12,992- 56- 78- B-11
W4IUO.....360- 10- 12- B- 2
W4ZM.....75- 5- 5- - 1

West Virginia

W8UMR...33,810- 80-141- A-15

ROCKY MOUNTAIN DIVISION

Colorado

KØVCK.....1254- 19- 22- B- 7
WØCDP.....546- 13- 14- B- 4

New Mexico

W5PQA....19,458- 69- 94- C-36
W5LEF.....3108- 28- 37- C-20
K5UYF.....960- 16- 20- B- 5

SOUTHEASTERN DIVISION

Alabama

W4DS.....10,080- 48- 70-BC-25
W4LZW.....4851- 33- 52- C-12

Eastern Florida

W4LNE....75,600-105-245- C-70
K4UHF....23,808- 64-124- B-70
K4AJ.....17,271- 57-101- C-32
W4LIU....12,831- 47- 91- A-46
K4CTU.....7749- 41- 63- B- 9
K4LWI.....7379- 47- 53-AC-12
W4MVB.....6930- 42- 59- A-41
W4EEO.....1380- 20- 23- A-12
W4HVD.....810- 15- 18- A-10

Georgia

K4HMX...13,932- 54- 86- A-31
W4MCM...12,636- 52- 81- C-27

SOUTHWESTERN DIVISION

Los Angeles

K6EVR...127,118-133-320- C-65
WA6HQR..52,155- 95-183- C-70
K6CTV....35-594- 74-161- C-30
WA6EYP..12,000- 48- 81- C-47
W6YMV...10,725- 55- 65- C-35
W6BUD.....9849- 49- 67- C-12
K6CT.....8280- 30- 92- A-37
K6UFX.....1865- 35- 47-AC-17
W6DQH....3510- 30- 39- C-29
W6WWQ....1026- 18- 19- C-16
K6CQF.....3- 1- 1- A- 1
K6EXO (K6s EXO YRA) 49,941- 93-179- C-52

Arizona

K7CLA.....1539- 19- 27- A-11
W7ENA.....828- 12- 23- A-17
K7HID.....12- 2- 2- A- -

San Diego

K6LAS/6...15,453- 51-101- C- -
K6MSK.....27- 3- 3- A- 3

Santa Barbara

W6YK..... 1368- 19- 24- B-13
W6UWL.....75- 5- 5- A-24

WEST GULF DIVISION

Northern Texas

W5DJH....19,899- 67- 99- C-10
K5BDX.....363- 11- 11- B- 3

Oklahoma

W5JME....11,178- 54- 69- B-45

CANADIAN DIVISION

Maritime

VE1PQ.....11,952- 48- 83- B-16
VE1EK.....882- 14- 21- A- 5

Quebec

VE2UI.....13,432- 46- 98- B-32

Ontario

VE3BOG...47,763- 87-183- B-32
VE3EHR...40,977- 87-157- B-31
VE3PE.....35,040- 80-146- B-48
VE3AO....12,792- 52- 82- - -
VE3PV.....12,240- 48- 85- A-12
VE3ES.....3645- 27- 45- A-20
WØAIH/VE3.3483- 27- 43- B- -
VE3CYX.....585- 13- 15- A- 6
VE3UOT.....168- 7- 8- C- 6

Manitoba

VE4SD.....16,560- 60- 92- A-45

Alberta

VE6TP.....5664- 32- 59- C- 9
VE6HG.....4896- 34- 48- A-25

British Columbia

VE7BBG....6888- 28- 82- B-22

AFRICA

Mozambique

CR7ES.....738- 9- 28- A- -

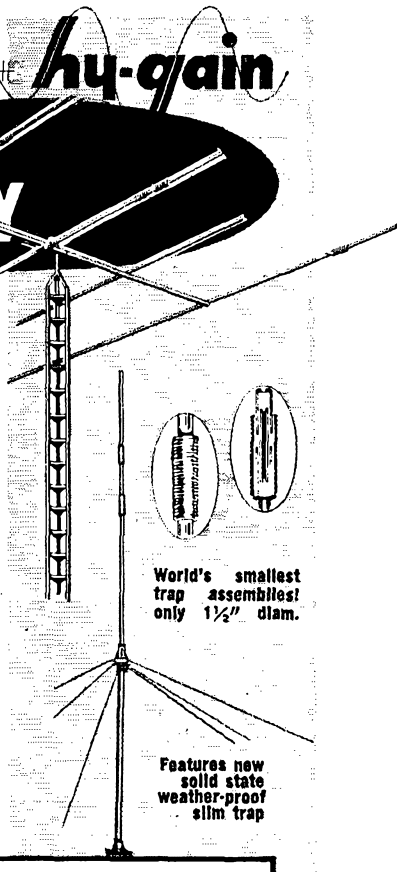
Spanish Morocco

EA9AQ.....900- 10- 30- A- 6

(Continued on page 162)

RADIO SHACK *headquarters for* THE hy-gain

Get ready for Wintertime
HAM BAND ACTIVITY



FAMOUS Thunderbird TRI-BANDER

For 10, 15 and 20 Meters Model TH-2

2-element Thunderbird is extremely light and easy to handle; installs in minutes. Develops maximum gain possible for 2 elements. Boom length 6'; longest element 26'. Ship wt. 23 lbs. No. 29DX302.

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No. 29DX301. Model TH-3: 3 elements; 14' boom; longest element 26'. Ship wt. 36 lbs. $89.95

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World's smallest trap assemblies! only 1½" diam.

SELF-SUPPORTING 50' hy-TOWER

$129.50 Covers 10, 15, 20, 40, 80 Meters

Unique stub decoupling for high radiation efficiency and less than 2:1 SWR without traps! No guying required. Mounts on only 2 sq. ft. Ship wt. 100 lbs. **No. 29DX758.**

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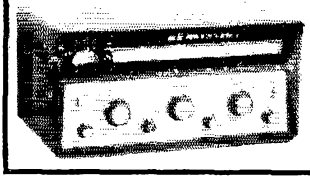

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BRAINTREE, MASS. South Shore Plaza Victor 3-9200
STAMFORD, CONN. 29 High Ridge Road DAvis 5-4371
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Liberia

EL8D.....44,496- 36-412-AB-32
EL4A.....3525- 25- 47- A- –

Mauritania

FF7AB.....17,732- 26-230- B- 8

Kenya

VQ4HX.....21,420- 30-238- A-20

Swaziland

ZS7P.....12,780- 20-214- A-11
ZS7L.....5292- 12-147- A-14

Ruanda-Urundi

9U5PD.....2176- 17- 43- A- 3

ASIA

Japan

JA1BWA....3180- 10-106- A- 9
JA2JW.....1260- 10- 42- A- 6
JA7JU.....936- 8- 39- A- –
JA7JW.....887- 9- 33- A- 9
JA8BY.....420- 5- 28- A- 4
JA1AAT.....180- 4- 15- A- –
JA1BAR.....108- 3- 12- A- 3
JA8LN.....90- 2- 15- A- 5
JA1ANA.....72- 3- 8- A- –
JA5HT.....33- 1- 11- B- –
JAØIX.....24- 2- 4- A- –
JA1LN.....18- 2- 3- A- 1
JA8AAC.....3- 1- 1- A- 2

Asiatic Russian S.F.S.R.

UAØKIA5.....936- 8- 39- B- –
UA9KOG.....522- 9- 20- B- 6

EUROPE

Germany

DJ3KR....33,750- 25-452- B-14
DL7EN.....558- 6- 31- B- 4

Spain

EA3JE....87,492- 46-631- A-40
EA4GT....11,752- 26-154- A- 8
EA3LL.....7812- 21-124- A- –
EA7JT.....3060- 20- 52- A-12

France

F7BI.....73,188- 38-642- A-24
F3OX.....15,457- 29-182- A-18

England

G2DYY....21,528- 39-181- A-33
G3NFV.....7875- 21-129- A-14
G3OOU (G3s OGO OOU OPC)
4030- 13-107- A-20

Northern Ireland

GI3JIM....15,066- 31-162- A-11

Switzerland

HB9DX.....1482- 13- 38- A- –

Italy

I1UA.....49,039- 29-567- A- –
I1TDJ.....5454- 18-101- A- –

Norway

LA5HE.....8475- 25-113- A- –

Luxembourg

LX1HM.....1512- 12- 42- A- 2

Austria

OE1RZ....117,855- 45-874- A-55
OE1DH....34,752- 32-363- B- –

Finland

OH5SL....24,219- 27-300- A-32
OH5SM....23,976- 24-333- A-21
OH2KO.....1064- 7- 51- A- –

Belgium

ON4LX....25,056- 36-232- A-20
ON4UQ.....2808- 12- 78- A- 9

Denmark

OZ5JT....24,255- 35-231- A-27
OZ3KE.....1128- 8- 47- A- 6

Netherlands

PAØHBO...22,041- 31-237- A-20
PAØLRF.....5085- 15-133- A- –
PAØBF.....3036- 11- 92- A- –
PAØLV.....1620- 15- 36- A- –
PAØADP....1365- 13- 35- A- 5

Sweden

SM5BLA...91,728- 42-728- B- –
SM5CHA....672- 8- 28- B- –
SM5BFE.....18- 2- 3- B- –
SM6VQ (SM6s VQ VR)
2310- 14- 55- B- 9

Poland

SP5PO.....216- 6- 12- A- –

European Russian S.F.S.R.

UA1NA.....504- 6- 28- A- –

Ukraine

UB5KBA (3 oprs.)
5681- 19-102- B- –

White Russian S.S.R.

UC2AA.....2145- 11- 63- A- –

Estonia

UR2AR....75,424- 32-786- B-22
UR2BU.....3213- 17- 65- B-12
UR2KAE (3 oprs.)
7874- 17-154- B- –

NORTH AMERICA

Cuba

CO8RA....39,096- 36-364- A-24

Haiti

HH2ML.....2762- 11-116- A-10

Dominican Republic

HI8DGC..202,565-55-1233- A-47

Panama

HP1SB.....28,332- 36-266- A-12
HP1AC....24,024- 33-244- A-12

Puerto Rico

KP4AVQ..293,037-57-1716-BC-68
KP4AWH..60,624- 18-422- A-22
KP4AQY.....836- 11- 26- A- 1

Canal Zone

KZ5DF....56,826- 42-451- A-22

Greenland

OX3DL.....1700- 20- 45- A- –

Guatemala

TG5HC....54,250- 62-293- A- –

Turks and Caicos

VP5AB.....16,926- 21-269- A- –

Bahamas

VP7NT....49,014- 42-389- A- –
VP7BP.....792- 11- 24- A- 3

Mexico

XE2DS....57,564- 54-365- B-18

Nicaragua

YN4CB....43,516- 44-331- A-30

OCEANIA

Kure

KH6ECD (KH6DEL, KM6s BJ BU CC) 225,918-66-1141-AC-93

Wake Island

KW6DG...55,695- 47-395- C-13

Australia

VK3SX.....7332- 13-188- A- –
VK2VN.....2750- 11- 84- A- 5
VK5NQ.....1408- 11- 13- A- 4

Fiji Islands

VR2BC....12,884- 32-134- A-12

Cook Islands

ZK1AR....11,072- 32-116- A-20

New Zealand

ZL1NG.....5094- 27- 74- A- 9
ZL3RT.....1518- 11- 46- A- 2

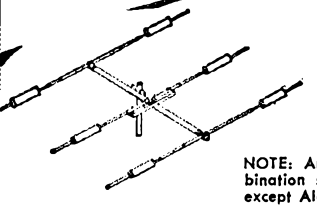
SOUTH AMERICA

Chile

CE1AD.....6348- 23- 92- B- 5

(Continued on page 164)

BULLSEYE BUYS at ARROW!



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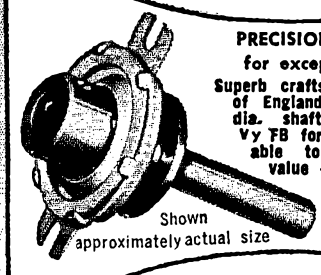
MOSLEY	TA-36	$129.50	TELREX	TC-99	$159.00
HY-GAIN	TH-3	$89.95			
HY-GAIN	TH-4	$117.50			



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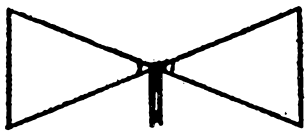
for exceptionally fine tuning

Superb craftsmanship by Jackson Bros. of England. Ball bearing drive, ¼" dia. shaft, 1⅛" long, 6:1 ratio, Vy FB for fine tuning. Easily adaptable to any shaft. Comparable value — $5.95.

Amateur Net $1.50 ea.
10 for $13.50



"Wonder Bar" 10 Meter Antenna

As featured in Nov. 1956 QST. Complete with B & W 3013 Miniductor. Only 8 ft. long for 10 meters. Wt. 5 lbs.

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Versatile Miniature Transformer

Same as used in W2EWL SSB Rig — March 1956 QST. Three sets of CT windings for a combination of impedances: 600 ohms, 5200 ohms, 22000 ohms. (By using center-taps the impedances are quartered.) The ideal transformer for a SSB transmitter. Other uses: interstage, transistor, high impedance choke, line to grid or plate, etc. Size only 2" h. x ¾" w. x ¾" d. New and fully shielded.

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3 for $3.49 **10 for $10.75**

ARROW Authorized distributor of HEATHKIT equipment

TO SAVE C.O.D. CHARGES, PLEASE INCLUDE SUFFICIENT POSTAGE WITH YOUR ORDER. ANY EXTRA MONEY WILL BE RETURNED.

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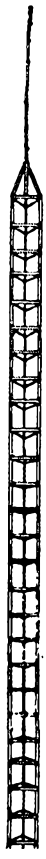

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30 ft. Rohn tower complete with fabulous HAM-M Rotator, hinged base plate and inside tower mounting rotor plate.

Reg. **$185.95**

Save $31.00 on PACKAGE DEAL

PRICE

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Additional accessories available only with package

10 ft. tower sections, add **$15.65** each

8 conductor rotor cable.....@ **5¢** ft.

RG-8U Coax.....@ **10¢** ft.

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TRADE-INS WELCOMED

Uruguay

CX2CN	8280	23-120-	A- 6

Ecuador

HC1KA	99,104	38-870-	A-28

Colombia

HK4KZ	62,640	45-464-	A-36
HK3TZ	3915	15- 87-	B- -

Argentina

LU1DAB	60,564	42-481-	AB-29
LU5DIF	19,926	27-246-	B-22
LU2DGO	7815	15-176-	A- -
LU7MAY	2574	13- 66-	A- -

Peru

OA4AO	34,359	39-300-	A-28
OA1W	27,552	41-224-	A-29
OA4BR	20,804	31-228-	B- -

Netherlands West Indies

PJ3AI	69,600	56-464-	A-29

Brazil

PY1ADA	5080	20- 85-	B- 3
PY7GV	2544	16- 53-	A- 7
PY4AXN	1496	11- 47-	B- 5

Netherlands Guiana

PZ1AX	79,532	59-450-	B-21

British Guiana

VP3HAG	46,598	46-338-	A-18

Trinidad and Tobago

VP4TP	12,159	21-193-	B- -

Venezuela

YV5AGD	38,796	53-246-	AB-31
YV2CJ	27,528	37-249-	A-33
YV5ANS	12,913	37-117-	A-16
YV5AKP	10,368	27-129-	A- -
YV5ABL	48 8	17- 95-	B-13

Paraguay

ZPØBM (ZP8 5DL ØBK)	5103	23- 74-	A-36

[1] W9RYU, opr. [2] W1WPR, opr. [3] Hq. staff — not eligible for award. [4] VE3AYR, opr. [5] UA3IW, opr.

Check logs: *C.W.* — *W1s* RFN RWU *W2s* LNB NBU RDD VUM ZYR *W3s* VKD K4SCT *W4s* HVQ QAR *W5s* ARJ RX *W6s* BGF VAT W7BTH K8EEN *W8s* HA YCT VE1AE VE3AWE G3WP LU7JI OH5SK *OAs* IADP ITW 2KFK 2KOS 2LN OZ5WJ PY1AZZ SM5EPJ *VKs* 2VN 3HL 5JT 5RX VQ2WR ZK1AK; *Phone* — W1RWU K2QHL W3AKG W6UYE W7BTH K8TBQ K9MTY W9MDG *VEs* 1WL 6IN CT1EY HK3LX LA5UG LA6CF/MM VP7BM.

A Complete Two-Band Station

(Continued from page 53)

amplifier plate and mixer grid circuits, C_2-L_3 and C_3-L_4 have only a minor effect on noise figure, so they can also be "stagger-tuned" to some extent to achieve uniform response.

A fair final check on the 144-Mc. converter performance is to detune the diode multiplier circuit, L_8C_5, and note its effect on the signal-to-noise ratio. If the r.f. amplifier is working properly it should be possible to detune this circuit so that the gain drops an S unit or two, before there is any effect on the signal-to-noise ratio observable on weak signals.

Receiver Considerations

Selecting a communications receiver is a special problem for the v.h.f. man. He needs a good general-coverage dial, if he is going to tune the entire 14-to-18-Mc. range for v.h.f. reception with converters. Most receivers are deficient in this respect, and some are almost useless. A good readable scale and a slow tuning rate are important attributes not likely to be found in low priced receivers. Often a used receiver of good quality is a better investment for the v.h.f. man than a new one of moderate price.

The ham-bands-only receiver is out, as it will not tune enough frequency range on any amateur band to give satisfactory i.f. coverage when used with these converters. The crystal oscillator and i.f. output circuits of the converters can be modified to permit use of the 10-meter range on such receivers, but performance and dial characteristics of some communications receivers are not particularly good on the 28-Mc. range. Even the best do not cover the four-megacycle spread

(Continued on page 166)

Order Now from WRL's Supermart of Values

VALUES EVERY HAM CAN USE! BUY TODAY!

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VERTICAL ANTENNA KIT

Self-supported, Ground or Roof mounted, 10-80 Meter Vertical Antenna, handling up to 1 KW. No Guys. Easily installed. No Radials needed. 23 ft. overall height. 52 ohm Coax fed.

Model WVG of highest quality, heavy wall aluminum tubing with heavy duty base assembly and steel mast mounting bracket. Mounts at any convenient height. All hardware irridite treated. Order today!

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A beautiful desk designed for the Ham and Experimenter. Constructed of durable Nova-Ply which is free from warp and shrinkage, the DesKit is easily assembled without difficulty from step by step intructions in a few minutes. Mar-Proof finish with beautiful Wood-Mosaic appearance . . . Full size: 49½" wide, 29¾" deep x 31". Shp. wt. 99 lbs.

Stock # 66Q007 Shipped Truck or Express Collect

IMMEDIATE DELIVERY

- Functional Sloping Top
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WE HAVE IT! WE FINANCE IT! YOU SAVE!

SAVE 70%

Streamlined Cabinet with unpunched cadmium plated chassis and panel. For transmitters, receivers, amplifiers, etc. 15x7x9". Wt. 9 lbs. Was $12.

Stock # XQ104

Only **$3.95**

PHANTOM ANTENNA! Dummy Antenna! **ONLY $1.98**

Gives 52 ohm load up to 170 mc. Rated at 10w RF power. Complete with PL-259 plug. 1½" high excluding plug. Silver plated . . . 1⅝" diameter. Shp. wt. 10 oz. Stock # XQ113.

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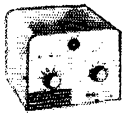
Lowest Price Anywhere WRL'S NEW ANTENNA TUNER



Only **$10.95**

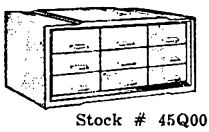
Mini-Matcher MM-100

For Xmttrs. with input power of 100w SSB/CW, 75w Fone or less. Matches most Xmttrs. to high impedance antennas. Unbalanced input & output. Steel cabinet for TVI-prevention. Std. 831R coax to Xmttr.; ceramic antenna wire post. Completely self-contained. 5x4x4". 4 lbs.

Stock # 66Q006

Special ! UTILITY CABINET Special !

$1.99 Each



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Versatile, plastic Handybin for storing small items. Breakproof styrene frame dividing drawers . . . Easily stacked. Only 10x5x6¼". Wt. 2½ lbs. Lots of 6, $1.79 ea.

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Enclosed is my check for: _____ plus postage
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CITY & STATE _____

needed to tune an entire v.h.f. band with a single converter crystal, with the exception of those which have a special range just for this purpose.

Some receivers cover 14 to 15 Mc. on one range. With these you can change converter crystals in order to tune successively-higher 1-megacycle segments of a v.h.f. band. Examples: For 50 to 51 Mc., you use the 36-Mc. crystal shown. To cover 51 to 52 Mc., you merely put in a 37-Mc. crystal. To cover 144 to 145 Mc., you need the 43.333-Mc. crystal specified. Replacing this with one at 43.667 Mc. gives a 131-Mc. injection frequency, and coverage of 145 to 146 Mc. No change other than the crystal need be made for at least two megacycles coverage with such a receiver.

Many experienced v.h.f. men use a special technique with two-dial general-coverage receivers. They tune the low end of a v.h.f. band with their dials set the same as for tuning the 14-Mc. band, and they tune with the bandspread dial. (14.000 Mc. is 144 Mc., 14.1 Mc. is 144.1 Mc., and so on.) When they reach the high end of the bandspread range, they reset the general-coverage dial higher, so that a full turn of the bandspread dial gives another 300, 400 or 500 kc. of calibrated coverage. This will not give exact dial calibration in tuning progressively higher ranges, but it makes tuning for weak signals easier than when the fast-moving general-coverage dial is used. With receivers having crystal calibrators, it is a simple matter to keep a fairly accurate check on the frequency being tuned in this manner.

So there you have it — the first complete v.h.f. station to be described in many a year, if we exclude the simple transceivers of the self-contained type. You can build the works yourself, receiver and all, and you will have the base on which to build for more power or better receiver performance later on. "Will it work?" the newcomer may ask. Perhaps the best answer is the results that the rig has delivered to date.

At various stages of its design and construction, the station was used, as a whole or in parts, for many hours of operation both 50 and 144 Mc. at the home stations of W1HDQ and W1YDS. Some practice with the simple tuner is needed to learn how to use it with maximum effectiveness, but we both agree that it is capable of hearing at least anyone we could work on either band with 15 watts input. The voice quality with the transmitter is good, and the c.w. signal is above reproach. And the simple receiver is quite capable of handling c.w. and s.s.b. signals in usable fashion, which is more than can be said for some v.h.f. "packaged stations" now available commercially.

As we write, requests for drilling templates are coming by the dozen in every Headquarters mailbag. Nobody builds anything any more? Don't you believe it — there are plenty of hams who like to build gear, and hundreds of them are already at work on all or part of this station. They will be better hams for it. QST

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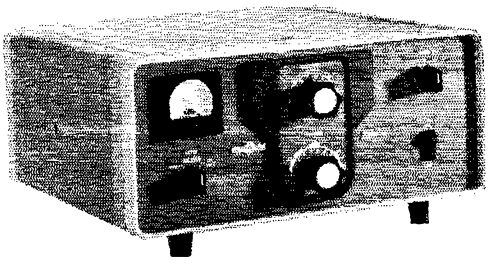
COLLINS KILOWATT LINEAR

NEW 30L-1

order it now for early delivery. Collins new 30L-1 Linear Amplifier is a compact unit with 1 KW PEP input. It's the same size as the famous Collins KWM-2. The 30L-1 is compatible with any 100 watt exciter. Other Collins features include: RF inverse feedback; automatic load control; self-contained power supply; silicon rectifiers; and high/low power switch. **Amateur net price: $520.** The demand for this unit makes it necessary for you to place your order with Electronic Wholesalers now for early delivery.



Stop in soon and see the complete Collins line of amateur equipment. Invest in equipment that protects your investment—Collins.

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Correspondence from Members

(*Continued from page 86*)

classes in code and theory as well as extending help on an individual basis. This has resulted in a batch of new amateurs, myself included. Ailing clubs take note! — *Emory L. Phifer, WA4AYP, Colonial Heights, Virginia.*

BEST REGARDSES

¶ Whys dos sos manys hamses insists ons sendings "73s" whens "73" ises alreadys plurals? Whos starteds thises anyways? — *James H. Demler, WØDSU, Hastings, Nebraska.*

MORE ON QRP

¶ I'm happy to sign up in K6JSS's QRP Communications Club. (Correspondence, August, 1961).

In 15 years in ham radio I've never run over 18 watts. Sure, I've been steamrollered by many a gallon or half-gallon and had to QRT in disgust; but I also note among the last 30 lines in my log book are confirmed QSOs, both phone and c.w., with the four corners of the continent, LU9, and ZL, some of them in direct competition with the big ones.

The power limitations were set when the population of the bands was possibly 1% of what it is today: receivers were crude and insensitive: directional beams were the toys of the wealthy: and s.w.r. bridges, clipping, s.s.b., etc., were a long way over the horizon. It should be a real challenge to us to see what could be done with 25 or 50 watts Too many of the fraternity are missing the point that a clean signal, freedom from TVI, a good fist, and a safe and dependable station are among the marks of the careful workman. The ability to bawl a stentorian "CQ" on any frequency, occupied or not, is not much of a distinction. Many competent and respected hams own and use high power rigs: but unfortunately the converse (that possession and use of a high powered rig indicates competence and earns respect) is often assumed, too seldom true.

I am firmly of the opinion that a legal limitation to 25 or 50 watts would bring a flowering of amateur radio science that would flabbergast us all. This might well be modified in the v.h.f. and u.h.f. bands where there is a good *technical reason* for needing more power. Aside from *this*, there *is*, at any given moment, entirely too much RF ricocheting around this globe. — *Frank Gue, VE3DPC, Burlington, Ont., Canada.*

"THE AMATEUR'S CODE"

¶ In the United States, you will find around a quarter of a million amateur radio operators. Some of these people like to experiment with such things as television, v.h.f., u.h.f., s.h.f., and beyond; others, however, like to work DX, handle traffic, and ragchew. All of these people have different interests. Why then, must a few try to tell others what they should or shouldn't do? If there is a "mess" on one band and you don't like it, then there are other bands made-to-order for you. There is one thing that some people don't seem to realize. A few of this quarter million like to get in there and battle for their QSO's. They seem to like the competitive spirit created in these crowded bands. If someone doesn't like it there, he should stay away and leave those already there alone.

I'm afraid that amateur radio is full of little cliques. If we are going to get anywhere, we are going to have to stick together as a group and support our sponsoring group, the ARRL. We should respect other's interests and try to help them along rather than finding fault with them. I think that we should pick up the nearest copy of the ARRL Handbook and read "The Amateur's Code" and above all, go by it. — *Richard A. Stalls, K4KYO, Hendersonville, Tennessee.* QST

YL News and Views

(*Continued from page 84*)

Stop-Over City Chairmen

At each official refueling stop along the flight route a radio chairman was in charge of amateur communications for the race. Working closely with W3GTC as stop-over city chairmen were:

San Diego, Calif. — Barbara Davis, W6VSL; Yuma,

(*Continued on page 170*)

FORT ORANGE
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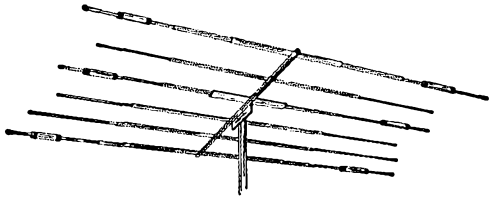
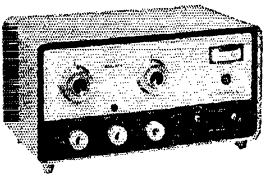
OCTOBER IS THE BEAUTIFUL FOLIAGE MONTH AND UNCLEDAVE, W2APF, SUGGESTS THAT WHEN YOU TAKE YOUR DRIVE TO ENJOY NATURE'S BEAUTY YOU STOP IN AND SEE TINY, WA2KNH. HE WILL SHOW YOU THESE NEW UNITS NOW IN STOCK.



MOSLEY TA-36

4 Elements on 10
3 Elements on 15
3 Elements on 20

Price.....**$129.50**



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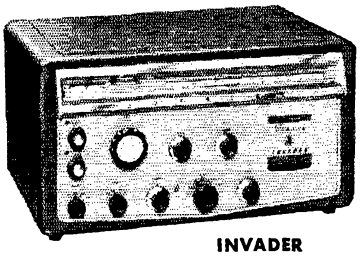
HT-40
Transmitter

Complete coverage of all amateur bands 80 through 6 meters
Maximum d.c. power input, 75 watts
Price (wired and tested).....**$109.95**
Price (kit)..... **89.95**

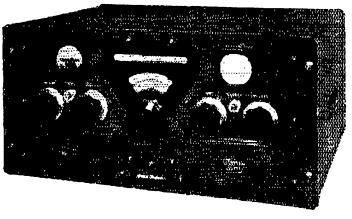


JOHNSON

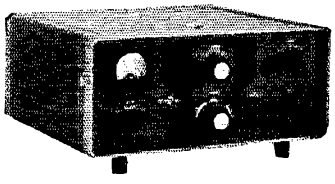
INVADER
Power input: 200 watts PEP, 200 watts CW, 90 watts AM
Price.....**$619.50**

INVADER 2000
Power input: 2000 watts PEP (twice average d.c.), 1000 watts CW, 800 watts AM
Price.....**$1229.00**

CENTRAL ELECTRONICS 200V

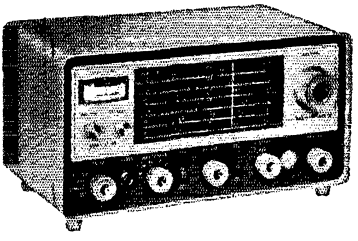


Power input: 200 watts PEP on SSB; 175 watts on CW, FSK and PM; 100 watts on AM
Price.....**$795.00**



COLLINS
30L-1
Linear

Power output 500 watts PEP
Price.....**$520.00**



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Complete coverage of all amateur bands 80 through 6 meters
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Report from El Paso

From Chairman Wade Williams, K5ILG: "The El Paso sector of the Powder Puff Derby communications was a 100% perfect operation. The cross-country frequency, 7210 kc., was handled by Pat Parrish, W5PSB. He was assisted by Al Temple, K5UXP. Being a project of the El Paso ARC, the club station, W5ES, was set up in Pat's shack on 3850 kc. for local relay work from the airport. This station was manned by Bill Behan, K5TUT, and Bill Rodgers, K5TLU. Mobile stations were assigned to two-hour shifts at the official time clock at the airport, and the arrival and departure times were relayed to the East and West coast stations within seconds, via W5PSB. Mobiles participating at the airport were Erv Williams, W5KOK; Betty Behan, K5YOY; George Nail, K5GSA; Bob Stubbs, K5HOD; Ralph Wood, K5DGZ; John Ambrose, W5CSB; Trev McNutt, W5KBP; Dick Martin, K5LUG, and Wade Williams, K5ILG, chairman.

"The national radio chairman Carolyn Currens, W3GTC, did a wonderful job of coordinating the communications network."

Montgomery Stop-Over

From Chairman Betty Collier, K4ZNK "It was a wonderful and exciting experience being net chairman for Montgomery. I was asked to serve as chairman when the Montgomery ARC (W4WOO) chose to take the operation.

"W4ECI of Ack Radio Supply Co. graciously sent down and installed for us a KWM-2 and also sent W4ORX to assist in the installation and entire operations. K4UTP and K4DPR did yeoman service erecting two towers and stringing antenna at Dannelly Field. Bad weather hindered the movement of planes cross country, but by Wed., July 12, a 135-h.p. plane landed in Montgomery and then traffic really began to roll. That night 71 aircraft were on the ground. Operations were in four hour shifts, two operators each shift from 4:30 A.M. to 7:30 P.M. Traffic count was 57 formal pieces from pilots, 1442 arrivals, departures and RONs, 7 radio searches for unaccounted-for planes, and many informal pieces of traffic.

"Amateurs who actively participated in the Montgomery operation were K4s DMN, DPR, ETF, FHH, OVG PFM, QJF, RST, TBO, TCZ, TJM, UJH, UTP, WQO YNR, ZAJ, ZXA; W4s ATF, AUP, HWI, IOZ, OHQ, OLN OWQ, PEV, SCZ, VEK and W4ORX, from Birmingham who was with us five days from sunup to way past sundown doing an excellent job as net coordinator." (Report submitted by Jack Dotherow, K4AOZ, SCM, Ala.)

Miscellaneous Reports

Participating at the start of the race in San Diego under Barbara Davis, W6VSL, chairman, were YLs K6s AWP, JZA, UHI, UTO, VRH; W6s GGX, WA6CBN, WA6CQS, and VE3AZK/W6. The girls worked two meters from hotel to airport during the entire race period.

In Dallas the WHOOT YL club operated 40-meter sideband during the race. Club members who participated were K5s DLI, GBX, GHX, KDY, MTF, PLC, UIH; KN5GDA; W5s RYX, SPV, WLO, and ZUT. Mr. George Handwook was in charge of setting up the ham station at Addison airport.

Other YLs reported to have helped W3GTC with communications are W3UUY/2, K3GSU, and K3NMB.

If anyone has been omitted from our reports of those who helped with race communications, please let us know and we'll be glad to make additional notes next month. (The individual reports from the various stopover city chairmen were volunteered without solicitation.) W3GTC summarized that an excellent job was done by all stop-over city chairmen and their teams from West to East.

(*Continued on page 172*)

BARRY ELECTRONICS CORP.

BRAND NEW SEALED FACTORY CARTONS:

NC303 — $449 Johnson Viking Valiant #240-104-2 (factory wired) $439.50
NC400 — $895 Johnson Viking Courier $289.50 HQ145C Receiver — $279.00
Sonotone Rechargeable Battery — $6.00 (for flashlight).
B & W. #850A 1 KW Pi-Netw'k (coil in popular home-built rigs) **$35.00.**
B & W R.F. Filament Chokes: FC-15 (15 Amps.) **$7.50;** FC-30 (30 Amps.) **$9.90.**
Waber Model 20 Multiple Outlet Box (on/off Switch controls 6 outlets). **$6.75.**
Stancor P6457 Xfmr Pri: 117 50/60 CPS; Sec: 7½ VCT 21 Amps. **$12.69.** (Ideal for 4-1000A).
HQ-105TR Transceiver: General coverage receiver incorporating C.B. or 10 Mtr xmtr. tunes fr 540KCS-30 MCS. Xtal controlled. 1 Channel. **$219.50.**

TRADE-INS-LAB CHECKED:

SX-101 Recvr. *$225* B & W *#5100S* Xmtr *$200*
APR-1 Recvr. w/2 tuning units (tunes 74-300 Mcs.) Oper. fr 115 V. 60 CPS. **$85.00**

RBV-1 Panoramic Radio Adapter $90.
Precision #E400 Sweep Gen. $84.00.
Dumont 224A Scope (3") $70.
RCA WR-41 UHF Sweep Gen. (470-900 mcs) **$95.**
Coax cable 4' 2" length RG58A/U w/2 UG88B/U connectors. **$1.00.** Order cord #CG-426A/U.
350 Watt Class B Mod. Xfmr: Pri: 6600 Ohms. Ideal for pair 805's. Sec: 4600 or 2300 Ohms (pr. 813 or single 304TH — Class C final). New, unused **$29.95.**
Sprague Pwr. Resistor: 120,000 Ohms @ 120 Watts. Ceramic base. For med. & hi volt. pwr. supply. **85c** (10 for **$7.50**).

SPECIAL LOT

RG11/U Coax Cable — 2-500' lgths. per reel — **$40**/reel FOB, Ga.
W2EWL SSB Xmfr 95c (3/2.50)

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Premax Antenna Masts 40' approx. **$9.95.** Ltd. qty.
6" Tapered Antenna Whips — $1.00.
Mosley TA-36 Beam Antenna (10, 15, 20 Mtr. Beam) **$129.50.**

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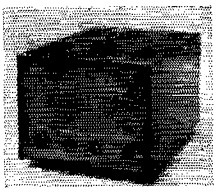

EML MODEL M-10 MODULATOR

Perfect for Mobile and VHF Rigs up to 25 watts • Crystal or carbon microphone input • 13 watts output • Speech clipping for maximum audio power • Easily modified for 18 watts output and low idling current • 4¼" high x 5⅝" wide x 7¼" deep.

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WRITE FOR COMPLETE SPECIFICATIONS

M-10-K kit	$33.50
M-10-6 wired for 6 v.	48.50
M-10-12 wired for 12 v.	48.50
Matching A.C. power supply 300 v. at 200 Ma. P-30-K kit	35.95
P-30-W wired	40.95

102 Westport Ave., Norwalk, Conn.

11 METER

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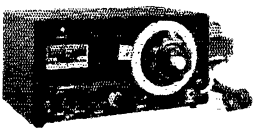

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ON YLRL CONTESTS

YLRL Vice President Onie Woodward, W1ZEN, has asked that the following material be published in order that all contestants in YLRL contests may have a better understanding of the procedure used in checking contest logs. Onie cautions that this is the first attempt of a YLRL vice president to set up a standard procedure for checking YLRL contest logs and that some changes may still be required. Suggestions are invited. The standard procedure that follows is the result of a questionnaire sent to current YLRL officers, the vice president's committee, and past vice presidents.

1. Score multiplication on contest logs will be very carefully checked.

2. Logs will be checked for duplicate contacts and duplicate multipliers.

3. Logs should show station worked, number (given and received), RST or RS, and section or country. If any one of these items is missing, the contact *may* be considered incomplete. (Time and band are also required.) (The numbers are used for crosschecking. The log you submit should show contacts numbered consecutively. Once a number is given or skipped, never change the other numbers. Make a note at the end of your log of any irregularities.)

4. Carbon copies of logs must be completely legible. An illegible carbon copy log may be disqualified.

A list of ARRL sections is available from V.P. Onie Woodward, W1ZEN, 14 Emmett St., Marlboro, Mass. Send s.a.s.e. (See also p. 6, any issue of *QST* — *Ed.*) All contest participants should be familiar with the various ARRL sections.

The prime point to be made here is that contest rules must be explicitly followed, otherwise logs are apt to be disqualified. Log-checking for the Vice President and her committee gets to be a harder task with each contest. As contest participants, be exact, be neat, be considerate, and be sure to have fun in the 22nd YLRL Anniversary Party!

CONTEST FOR ALL YLS
22nd YLRL ANNIVERSARY PARTY

CONTEST PERIOD

C.W. —
Starts: October 25, 1961, 1700 GMT
Ends: October 26, 1961, 2300 GMT

PHONE —
Starts: November 8, 1961, 1700 GMT
Ends: November 9, 1961, 2300 GMT

ELIGIBILITY: All licensed YL and XYL operators throughout the world are invited to participate. YLRL members only are eligible for cup awards; non-members will receive certificates. Only YLRL members are eligible for the Corcoran award. Contacts with OMs will not count.

OPERATION: All bands may be used. Cross-band operation is not permitted. Only one contact with each station will be counted in each contest.

PROCEDURE: Call "CQ YL".

EXCHANGE: Station worked, QSO number, RS or RST, ARRL section or country. Entries in log should also show time, band, date, transmitter, and power. (Please know your own ARRL section. List available for s.a.s.e. to W1ZEN).

SCORING: (a) C.w. and phone sections will be scored as separate contests. Submit separate logs for each contest. (b) Multiply number of contacts by total number of ARRL sections and countries worked. (c) Contestants running 150 watts input or less at all times may multiply the results of (b) by 1.25 (low-power multiplier).

AWARDS: Highest C.W. score — gold cup. Highest phone score — gold cup. Highest phone log and c.w. log in each district and country will receive a certificate. Highest combined phone and c.w. score, YLRL member only, will receive Corcoran Award.

LOGS: Copies of all logs must show claimed score, be signed by the operator and postmarked no later than Nov. 22, 1961, and received no later than Dec. 2, 1961, or they will be disqualified. Send copies of logs to Onie Woodward, W1ZEN, 14 Emmett St., Marlboro, Mass. No logs will be returned. Be sure it is a *copy* of your log you send for confirmation.

(Continued on page 174)

QRL?

Reprinted from September 1922 *QST*

Sure you are. You're busy working traffic on the nets, you're busy building new gear from *QST*, the Handbook, the Mobile Manual, the Sideband Manual, busy working DX or contests or just busy ragchewing. While you are busy doing all of these things a staff of 65 folks at the League Headquarters is busy, too. They are busy helping you enjoy your hobby to its fullest.

Thousands of hams appreciate what the League is doing for amateur radio and make their appreciation known through their support and membership in the League. Surprisingly enough, though, there are lots of hams who don't know about the advantages which they are missing. It's up to you, the member, to do a fellow ham a favor by signing him up for membership. At the same time you will be helping to broaden the foundation of amateur radio that makes it possible for you to continue to enjoy the advantages which we currently possess.

QST and ARRL membership $5 (additional Family members at the same address $1) $5.25 in Canada, $6 elsewhere.

THE AMERICAN RADIO RELAY LEAGUE, INC.

38 LA SALLE ROAD WEST HARTFORD 7, CONN.

COMING EVENTS

YLRL Anniversary Party — The 22nd annual party for all licensed YLs. The c.w. section starts Oct. 25 at 1700 GMT and ends Oct. 26 at 2300 GMT. The phone portion starts Nov. 8 at 1700 GMT and ends Nov. 9 at 2300 GMT. Complete rules this column.

TYLRUN Anniversary Party — The seventh anniversary party of the Texas YL Round-Up Net will be celebrated Nov. 4 at Brownfield, Texas. The net, which includes some 170 members from several states, has been extended the invitation to converge at Brownfield by the GABS (Gals at Brownfield), a new YL club. Contact GAB Secy. Irene Lewis, K5LSO, 1004 South 6th St., Brownfield, Texas.

Alamo YL Week — The Alamo YL Club of San Antonio, Texas has designated the week of Nov. 5-11 as Alamo YL week. Club members will be active on several bands. The Alamo Certificate will be awarded to U. S. and DX stations who contact 3 club members and to Texas stations who contact 4 club members. Send list and 10 cents to Inez Cole, W5WXT, 320 Meadowbrook Dr., San Antonio, Texas.

QST

Happenings of the Month

(Continued from page 72)

identification transmission the teleprinter(s) at the other end of the circuit run "open" and uncontrolled, and awkward operating procedures are necessary to remedy this difficulty.

8. The application of the present rule to lesser-used modes of emission, such as television, or to special cases such as the use of American Morse telegraphy for the body of communications is a logical principle. In the League's opinion, however, this principle no longer applies to amateur teleprinter emission at its present stage of growth and development. There are an estimated 3000 amateur stations equipped for teleprinter operations.

WHEREFORE, The American Radio Relay League, Inc., requests that the Commission institute a rule making proceeding to amend Section 12.82 (a) (2) of the Commission's Rules and Regulations in the manner hereinabove first set forth in order to promote the efficiency of amateur teleprinter operations.

Respectfully submitted,
The American Radio Relay League, Inc.
By PAUL M. SEGAL
Its General Counsel

JOHN HUNTOON,
General Manager
August 17, 1961

Strays

Never mind that fancy cover picture this month. Here's what the ARRL lab *really* looks like! *(Photo by Gary Davis, who visited the Hq. in July)*

K3PNC came to this country five years ago as a refugee from Rumania. He received his U. S. citizenship papers on April 13 of this year, and on April 14 he passed his General Class exam!

Technical Correspondence

(Continued from page 50)

conditions. Rather than write the whole project off as another inexplicable failure, let us examine some of the terms and definitions commonly applied to mixer crystals. Perhaps we are not all speaking a common language; the amateur may differ with the radio astronomer in his definition of noise figure, for example.

Consider first a crystal-mixer superheterodyne having no image-rejection capability. A broad-band noise source, such as a temperature-limited diode, is applied to the receiver input terminals. Noise power from the external source will enter the receiver through both the signal and image channels, since the front end has no selectivity. Assuming an i.f. noise figure of 1 db., the indicated over-all noise figure should be about 6 db., when using a 1N21F crystal. A noise figure measured under these conditions is termed "broad-band."

Now, suppose that an ideal image-rejection filter is inserted between the noise source and the receiver input terminals. Power from the noise source will now enter only the signal channel, and the indicated noise figure will be 9 db., precisely 3 db. higher than the broad-band value. A noise-figure reading taken under these conditions is termed "narrow-band."

If the readings are now repeated, using a c.w. source, identical noise figures of 9 db. will be recorded in both cases. The discrepancy is readily explained. A broad-band mixer, i.e., one that has no image rejection, will accept image-channel noise input as "intelligence." When the "intelligence" is confined to the signal channel, through the use of a preselector and/or a c.w. input signal, the indicated noise figure will exceed the broad-band value by 3 db. Radio-astronomy receivers take full advantage of the broad-band noise figure, since the "intelligence" consists of broad-band noise, which occupies both signal and image channels.

Let us turn now to a brief examination of the mechanism of crystal-mixer noise generation. In the presence of local oscillator excitation, the mixer crystal generates noise sidebands which heterodyne with the l.o. signal to produce noise at the intermediate frequency. Since the image frequency noise is internally generated, it cannot be filtered out or removed by selective circuits unless special precautions are taken to provide a proper termination at the image frequency. In order to make the narrow-band noise figure equal to the broad-band value, *it is necessary to place an image frequency short circuit across the rectifying junction of the crystal.* It is theoretically possible to adjust the length of the line which connects the crystal to the preselector, so that a short circuit is reflected back to the crystal at the image frequency. In practice, this adjustment is quite difficult to achieve. A careful series of measurements at the wartime M.I.T. Radiation Laboratory indicated that only about 1-db. improvement in the narrow-band noise figure was obtainable by using a line stretcher to vary the short position. Several workers have reported that the mixer conversion loss, hence the noise figure, is critically dependent on the nature of the image-frequency termination.

Measurements on carefully-constructed narrow-band mixers were recently carried out by the author, using an argon discharge noise source and automatic noise-figure meter. The best noise figure was 8.8 db., with a 1-db. noise figure i.f. strip and 1N21F crystals. Without preselection, the mixers were checked out at 6.5 db.

It seems safe to draw these conclusions:

1) The crystal mixer has nothing to offer at 432 Mc. Its performance is easily equalled by a Nuvistor or 6AN4 r.f. amplifier.

2) At 1296 Mc. and above, the simple broad-band balanced crystal mixer is as good as anything else. The use of a sharply-resonant preselector will buy nothing but mechanical complexity. Image response should not prove troublesome at these high frequencies. Any filter insertion loss must be added to the noise figure.

4) Vacuum-tube mixers at 432 Mc. are subject to the same limitations as crystal mixers. Theoretical considerations indicate that a 7077 should give a noise figure of 12 db., while a 6AN4 will be no worse than 15 db. When used with a good r.f. stage, even a 15-db. triode mixer will not contribute more than 0.5 db. to the over-all receiver noise figure, while providing a modest conversion gain.

— *Walter S. Glazar, W2NQZ*

(Continued on page 178)

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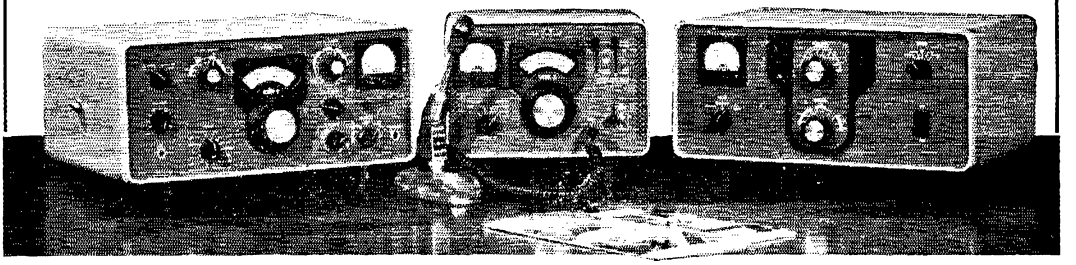

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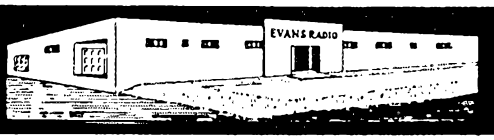

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ON Q MEASUREMENT

132 Irvington St., S.W.
Washington 24, D. C.

Technical Editor, *QST*:

In the article by W7LHZ on measuring coil Q, which appeared in November *QST*, the point was made, in footnote 2, that most Q-measuring schemes, W7LHZ's included, do not in fact measure true Q, but rather an apparent Q, Q', which is lower than the true Q by an amount depending upon the ratio of distributed capacitance of the coil to the external capacitance required to tune the coil to a particular frequency. Amateurs attempting to measure coil Q with simple equipment may not be aware of the reason for this.

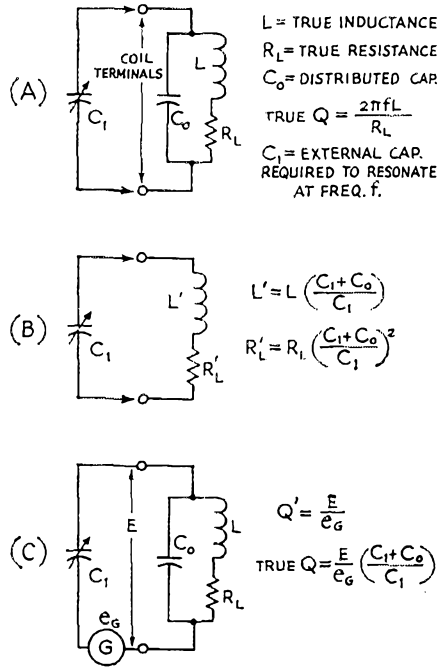
Fig. 1A represents a coil of inductance L, distributed capacitance C_0, and loss resistance R_L. Viewed at the terminals of the coil, the net impedance may be represented as in Fig. 1B. In terms of L, C_1 and C_0 it can be shown that

$$L' = L\left(\frac{C_1 + C_0}{C_1}\right)$$

$$R'L = R'_L\left(\frac{C_1 + C_0}{C_1}\right)^2$$

$$\text{Then, } Q' = \frac{2\pi fL'}{R'_L} = \frac{2\pi fL}{R_L}\left(\frac{C_1}{C_1 + C_0}\right) = Q\left(\frac{C_1}{C_1 + C_0}\right).$$

Therefore, any measurement of coil Q that measures the resistive and reactive components of its impedance at the terminals of the coil, or injects a known reference voltage



in series with the terminals of the coil and proceeds to measure the resonant rise in voltage across the tuned circuit, as in Fig. 1C (which is the scheme employed in most commercial Q meters), will be more or less inaccurate. The result will always be on the low side and may or may not be significant, depending upon the relative magnitudes of C_0 and C_1 for a particular frequency.

— *C. E. W. Hobbis, W3EWI*

75-40-METER DIPOLE IN LESS THAN 80 FEET

4091 South Land Park Drive
Sacramento 22, California

Technical Editor, *QST*:

What with the current sunspot activity messing up our higher frequency bands, this writer went back to the April, 1961, *QST* and reread W4JRW's article (on page 43) about

a two-band horizontal with loading coils. Only 77 feet plus insulators, no traps or capacitors! I decided to try it. Perhaps other city-lot fellows will be interested in my experiences and notes.

First, as to the two loading coils: Let me say that any good grade of enamel wire will do. W4JRW specified Nyclad, but this turned out to be the trade name used by the Belden Company, and, despite the suggestion that it is supposed to be something special, it, too, is simply the familiar enameled wire. I used No. 18 as directed and a one-pound spool was more than enough. For strength, however, my coil forms are clear plastic rods, 14 inches long, with a hole drilled one inch in from each end. Thus simple close winding from hole to hole produced the required 12 inches of coil. The plastic rod was available from a local hobby shop in the ⅝-inch o.d. size W4JRW specifies. If you cannot get ⅝ or want to use the more common 1-inch o.d., cut the rods 11 inches long and make the coil winding 9 inches. That will give you the identical 120 microhenrys and, incidentally, shorten the antenna by a half foot.

Next, as you will see from the graphs in the original article, there is some latitude in design lengths, depending on whether you are addicted to c.w., a.m., or s.s.b. I chose the lengths in Fig. 3 (April *QST*) as being closest to my usual sideband frequencies, built the antenna and coils in less than two hours, attached a random length of 52-ohm coax, and put it up across my roof at 30 feet above ground.

On 40 meters, my best resonance was at 7250. I took a guess and went topside to lengthen each center wire to 34 feet 9 inches. It wasn't critical, and I hit resonance at about 7212 where, with 100 watts of measured forward power, the reflected power rested at zero. At the far band edge, 7300, the reflected power showed 25 watts or so, and ditto over at 7100. Thus, within very acceptable limits, the 40-meter portion of this antenna is usable for at least 50 kc. each side of resonance.

Thus encouraged, I tried 75 meters and the story was quite the same. For sideband, I was slightly short, with resonance close to 3750 where as I wanted about 3815. I soon found, however, that the 4-foot end wires were pretty touchy and that *one inch* equalled a shift of about 50 kc.! I finally settled for 48½ inches with resonance at 3814—provided I put the complete antenna back up at the fixed 30-foot height. Bandwidth on 75 proved to be much narrower than on 40, but I can move a good 20 kc. away on either side of 3814 before any objectionable amount of reflected power begins to show. That's very acceptable for the usual s.s.b. hangouts.

Raising or lowering the antenna will throw you off just like it's supposed to, only more so. Adjusting the 40-meter (long) wires had no discoverable effect on the 75-meter operation, and adjusting the 75-meter (short) wires did not affect my 40-meter conditions. The loading coils will take all the power you've got, but the outside end insulators are in quite a field and can crack (not from physical strain) with 2 kw. p.e.p. Dime-store or surplus insulators are quite OK up to 250 watts. No bazooka is necessary, and simple 52-ohm coax will do perfectly well at this height. If a radiation pattern exists I haven't found it, since my reports are all about one S unit better with this antenna than with an all-band vertical which is here on the premises.

All in all, it's a little trouble and costs about $10, but it's a good antenna. I'm permanently installed at the 30-foot height with less than 80 feet in total length, and I'm switching in on these low-frequency bands with the greatest of ease. The real credit, though, goes to W4JRW.

—"*Mac*," *W6BNK*

S.S.B. TRANSCEIVER

6114 N. Kimball
Chicago 45, Illinois

Technical Editor, *QST*:

There are many sidebanders using so-called "low-priced" s.s.b. equipment. This usually means a 9-Mc. exciter and a general-coverage receiver. Having used a rig of this type for several years, I came to the conclusion that the main difference between it and the more expensive s.s.b. stations was not in the transmitted signal or the receiver's sensitivity or selectivity, but rather it was the receiver's stability and the fact that transceiver-type operation is not available.

I designed and built a device that solved both these problems at once, at a total cost of less than $15. The block diagram, Fig. 2, shows the basic configuration. The BC-458

(*Continued on page 188*)

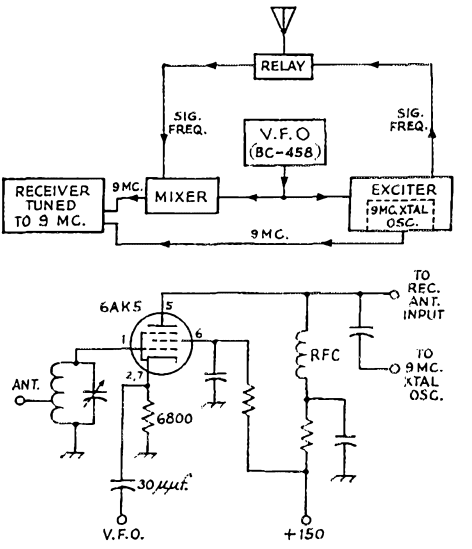


Fig. 2—S.s.b. transceiver circuit using conventional exciter and general-coverage receiver. Principle is shown in block diagram at top. Lower diagram shows circuit of pentode mixer.

(or similar) v.f.o. is used to control the frequency in both transmitting and receiving. On transmit, the v.f.o. drives the exciter normally, while on receive it drives a mixer that heterodynes the incoming sig to 9 Mc., where the general-coverage receiver is tuned. Thus on receive the mixer does just the opposite of whatever the mixer stage in the exciter does: that is, 9 Mc. + v.f.o. frequency = signal frequency when transmitting, and signal frequency − v.f.o. frequency = 9 Mc. while receiving.

Receiver stabilization is accomplished by using the 9-Mc. master oscillator in the exciter as the b.f.o. Thus the relationship between the suppressed carrier and the inserted carrier (the b.f.o.) is no longer affected by the receiver's high-frequency oscillator, and as long as 9 Mc. stays within the passband of the receiver, no drift will appear to take place. Of course, the over-all stability is only as good as that of the BC-458 v.f.o., but this is usually far more stable than the h.f. oscillator in most general-coverage receivers.

I operated this unit on 20 meters for several weeks with only minor difficulties — which I am sure could have been worked out had I not sold the general-coverage receiver.

— *Richard Sacks, K9QZF*

Strays

KG1CC at Camp Century, Greenland, gets its power from a nuclear power plant, and their first QSO using this nuclear power was with W4TZN KL7. At the time of the QSO the temperature at Point Barrow was 36 degrees below zero. Since Camp Century is known as "the city under the ice" this was obviously a real cool QSO.

—···—

Ever wonder how come so much Air Force surplus radio gear seems to be in use by some European stations? K3PNC, formerly of Rumania, says that during World War II local hams used to make every effort to reach a downed U. S. bomber and strip it of its radio gear before the government authorities had a chance to reach the scene.

A.R.R.L. QSL BUREAU

The function of the ARRL QSL Bureau system is to facilitate delivery to amateurs in the United States, its possessions, and Canada of those QSL cards which arrive from amateur stations in other parts of the world. All *you* have to do is send your QSL manager (see list below) a stamped self-addressed envelope about 4¼ by 9½ inches in size with your name and address in the usual place on the front of the envelope and your call printed in capital letters in the upper left-hand corner.

W1, K1 — G. L. DeGrenier, W1GKK, 109 Gallup St., North Adams, Mass.
W2, K2 — North Jersey DX Ass'n, P.O. Box 303, Bradley Beach, N. J.
W3, K3 — Jesse Bieberman, W3KT, P.O. Box 400, Bala-Cynwyd, Pa.
W4, K4 — Thomas M. Moss, W4HYW, Box 20644, Municipal Airport Branch, Atlanta 20, Ga.
W5, K5 — Brad A. Beard, W5ADZ, P.O. Box 25172, Houston 5, Texas.
W6, K6 — San Diego DX Club, Box 16006, San Diego 16, Calif.
W7, K7 — Salem Amateur Radio Club, P.O. Box 61, Salem, Oregon.
W8, K8 — Walter E. Musgrave, W8NGW, 1245 E. 187th St., Cleveland 10, Ohio.
W9, K9 — J. F. Oberg, W9DSO, 2601 Gordon Drive, Flossmoor, Ill.
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VE5 — Fred Ward, VE5OP, 899 Connaught Ave., Moose Jaw, Sask.
VE6 — W. R. Savage, VE6EO, 833 10th St., N., Lethbridge, Alta.
VE7 — H. R. Hough, VE7HR, 1291 Simon Road, Victoria, B. C.
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KP4 — Joseph Gonzalez, KP4YT, Box 1061, San Juan, P. R.
KH6 — John H. Oka, KH6DQ, P.O. Box 501, Aiea, Oahu, Hawaii.
KL7 — Alaska QSL Bureau, Box 6226, Airport Annex, Anchorage, Alaska.
KZ5 — Ralph E. Harvey, KZ5RV, Box 407, Balboa, C. Z.

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.
(3) The Ham-Ad rate is 35¢ per word, except as noted in paragraph (6) below.
(4) **Remittance in full must accompany copy, since Ham-Ads are not carried on our books. No cash or contract discount or agency commission will be allowed.**
(5) Closing date for Ham Ads is the 20th of the second month preceding publication date.
(6) **A special rate of 10¢ per word will apply to advertising which, in our judgment, is obviously noncommercial in nature.** Thus, advertising of bona fide surplus equipment owned, used and for sale by an individual or apparatus offered for exchange or advertising inquiring for special equipment, takes the 10¢ rate. Address and signatures are charged for. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and all advertising so classified takes the 35¢ rate. Provisions of paragraphs (1), (2) and (5), apply to all advertising in this column regardless of which rate may apply.
(7) **Because error is more easily avoided, it is requested copy, signature and address be printed plainly on one side of paper only. Typewritten copy preferred but handwritten signature must accompany all authorized insertions.**
(8) No advertiser may use more than 100 words in any one issue nor more than one ad in one issue

Having made no investigation of the advertisers in the classified columns except those obviously commercial in character, the publishers of QST are unable to vouch for their integrity or for the grade or character of the products or services advertised.

SYRACUSE VHF Club 7th Annual Roundup October 7, 1961. Three Rivers Inn; speakers, awards, floorshow, steak dinner. Write K2TXX, 236 Ester St., Minoa, N.Y.

WANTED: Early wireless gear, books, magazines, catalogs before 1922. Send description and prices. W6GH, 1010 Monte Dr., Santa Barbara, Calif.

MOTOROLA used FM communications equipment bought and sold W5BCO, Ralph Hicks, Box 6097, Tulsa, Okla.

RECEIVERS: Repaired and aligned by competent engineers using factory standard instruments. Factory service at reasonable prices on Collins, Hallicrafters, Hammarlund, Gonset, National, Harvey-Wells. Our 25th year. 90 day guarantee. Douglas Instrument Laboratory, 176 Norfolk Ave., Boston 19, Mass.

WE Buy all types of tubes for cash, especially Eimac, subject to our test. Maritime International Co., 199 Front St., Hempstead, L.I., N.Y.

DON'T Fail FCC tests! Check yourself with a time-tested "Sure-check Test". Novice, $1.50; General $1.75; Extra, $2.00. We pay the postage. Amateur Radio Specialties, 1013 Seventh Ave., Worthington, Minn.

TRIGGER. Cash paid for ham equipment. 7361 W. North Ave., River Forest, Ill. PR 1-8616. Chicago #TU 9-6429.

TOROIDS: Uncased 88 Mhy, like new. Dollar each. Five/$4.00 P.P. DaPaul, 309 So. Ashton, Millbrae, Calif.

WANTED: Cash for surplus tech manuals, one or one hundred. State condition and equipment type. W4FXQ, Box 2513, Norfolk, Va.

WANTED: Commercially-built transceivers and QST for any months of 1922, 1923, 1939 and 1940. Al T. O'Neil, Camp Lakeview, Lake City, Minn.

SOUTHERN California: Transmitters and receivers repaired, aligned. Bandwidth, frequency, harmonics measured. Used ham gear bought, sold, traded. Robinson Electronics, 922 W. Chapman, Orange, Calif. Tel. KEllog 8-0500.

WANTED: All types of aircraft or ground radios, 17L, 618S, 388, 390, 18S, 51V, 51X2 units. Especially any item made by Collins Radio whatsoever. Also large type tubes and test equipments. For fast action write Ted Dames, W2KUW, 308 Hickory, Arlington, N.J.

SAN Francisco and vicinity: Receivers repaired and realigned. Factory methods. Special problems invited, any equipment. Associated Electronics, 58 South P Street, Livermore, Calif. Skinner, W6KF.

ATTENTION Mobilcers! Leece-Neville 6 volt 100 amp. system, $50; 12 volt 50 amp system, $50; 12 volt 60 amp system, $60; 12 volt 100 amp syst. $100. Guaranteed no ex-police car units. Herbert A. Zimmermann, Jr. K2PAT, 115 Willow St., Brooklyn 1, N.Y. Tel. DEwey 6-7388.

WANTED: Military or Industrial laboratory test equipment. Electronicraft, Box 399, Mt. Kisco, N.Y.

WANT 1925 and earlier ham and broadcast gear for personal collection. W4AA, Wayne Nelson, Concord, N.C.

MICHIGAN Hams! Amateur supplies, standard brands. Store hours 0830 to 1730 Monday through Saturday. Roy J. Purchase W8RP. Purchase Radio Supply, 327 E. Hoover St., Ann Arbor, Michigan. Tel. NOrmany 8-8262.

HAM TV Equipment bought, sold, traded. Al Denson, W1BYX, Rockville, Conn.

SELL 2 mf, G-E capacitors, 4000V DC. $5.00 or 2 for $9.00. Guaranteed. Dawson, 5740 Woodrow Avenue, Detroit 10, Mich.

QSLS? SWLS? WPE? Big variety samples, 20¢ (refunded). Religious QSL samples (with bible verses), 20¢ Sakkers, W8DED, Holland, Mich.

C. FRITZ for QSLs that guarantee better DX returns! Samples 25¢ deductible. Box 1684, Scottsdale, Ariz. (formerly Joliet, Ill.)

QSLS. Twenty exclusive designs in 3 colors. Rush $3 for 100 or $5 for 200 and get surprise of your life. 48-hour service. Satisfaction guaranteed. Constantine Press, Bladensburg, Md.

QSLS. Kromekote 2 & 3 colors, attractive, distinctive, different. Free ball point pen with order. Samples 10¢. K2VOB Press, 62 Midland Blvd., Maplewood, N. J.

QSL-SWL-CB-WPE. Finest. Since 1946. Largest assortment. Priced right. Send 10¢ for samples to: Glenn Print, 1103 Pine Heights Ave., Baltimore 29, Md.

QSLS "Brownie." W3CJI, 3110 Lehigh, Allentown, Penna. Samples. 10¢ with catalogue. 25¢

QSLS-SWLS. Samples 10¢. Malgo Press, Box 375 M.O., Toledo, 1, Ohio.

QSLS. Best for less. Catalog 25¢ (Refundable), samples SASE. Crawford, K6GJM, Box 607, Whittier, Calif.

DELUXE QSLS. Petty, W2HAZ, Box 27, Trenton, N. J. Samples, 10¢

SUPERIOR QSLS, samples 10¢. Ham Specialties, Box 3023, Bellaire, Texas

CREATIVE QSL Cards. Personal attention given. Free samples and catalog. Bob Wilkins, Jr., Box 1064, Atascadero, Calif.

QSLS, 3-color glossy, 100—$4.50. Rutgers VariTyping Service, 7 Fairfield Rd., Somerset, N.J.

QSLS-SWLS. 100 2-color glossy, $3.00; QSO file cards, $1.00 per 100. Samples, 10¢. Rusprint, Box 7507, Kansas City 16, Mo.

PICTURE QSL. Cards of your shack, home, etc., Made from your photograph. 1000, $13.00. Raum's, 4154 Fifth St., Philadelphia 40, Penna.

QSLS, 300 for $3.95. Samples 10¢. W9SKR, "George" Vesely, Rte. #1, 100 Wilson Road, Ingleside, Ill.

QSLS, SWLs, XYL-OMs (sample assortment approximately 9¾¢) covering designing, planning, printing, arranging, mailing; eye-catching, comic, sedate, fantabulous, DX-attracting, prototypal, snazzy, unparagoned cards (Wow!). Rogers, KØAAB, 961 Arcade St., St. Paul 6, Minn.

QSLS-SWLS. Samples free. W4BKT Press, 123 Main, McKenzie, Tenn.

1⅛" Call QSLs (2 sides printed), 100, $2.75 samples free. Garicpy, 2624 Kroemer, Ft. Wayne, Ind.

QSLS. Samples free. Phillips, W7HRG, 1708 Bridge St., The Dalles, Oregon.

QSLS. Samples dime. Rubber stamps: name, call and address $1.35. Harry Sims, 3227 Missouri Ave., St. Louis 18, Mo.

QSL: samples 25¢ (refundable). Schuch, W6CMN, Wildcat Press, 6707 Beck Ave., North Hollywood, Calif.

QSLS. $2.50 and up. Samples 10¢. RBL Print M.R. 12 Phillipsburg, N.J.

QSLS. Samples 10¢. W7IIZ, Wines, Box 183, Springfield, Oregon.

QSLS. SWL's that are different, colored, embossed card stock, and "Kromekote". Samples 10¢. Home Print, 2416 Elmo, Hamilton, Ohio.

QSL's 100 glossy 4 color $3.70 Postpaid. Samples 10¢, or send 25¢ for large assortment and free "Danger, High Voltage" sign. Dick, W8VXK, Rt. 1, Gladwin, Michigan.

QSLS. Stamp and call brings samples. Eddie Scott, W3CSX, Fairplay, Md.

QSLS. Samples, dime. Printer, Corwith, Iowa.

RUBBER Stamps for hams, sample impressions, Hamm, W9UNY, 542 North 93, Milwaukee, Wis.

HUNDREDS QSLS: 80¢, Meininger, Jesup, Iowa. Samples 10¢.

DON'T Buy QSLS-SWLs until you see my free samples. Bolles, 7701 Tisdale, Austin, Texas.

YLRL Specials, OM's, reasonable, nice designs. Samples dime. W2DJH Press, Warrensburg, N.Y.

QSLS. Large selections styles including photos. Lowest prices. Fast service. Samples dime. Ray, K7HLR, 679 Borah, Twin Falls, Idaho.

QSL'S. Real eyecatchers. Dime. Filmcrafters, Box 304, Martins Ferry, Phio.

CANADIANS! QSLs in fluorescent colors, by silk screen process. Free samples. Martin, 8 Kensington St., Woodstock, Ont., Can.

CHICAGOLAND Amateurs! Factory authorized service for Hallicrafters, Hammarlund, Globe, Gonset. Service all amateur equipment to factory standards. Heights Electronics, Inc., 1145 Halsted St., Chicago Heights, Ill. Tel. SKyline 5-4056.

COLLINS KW-1, like new, many extras, terms to responsible purchaser. Lloyd Norberg, W7EHQ, 2502 Jefferson Ave., Tacoma, Wash.

WANTED: Tektronix scope. Cash or trade. H. T. Cervantes, W2DB, 190 Croton Ave., Mt. Kisco, N.Y.

SSBers! Keep up with SSB news and views! Join the Single Sideband Amateur Radio Association, dedicated to furthering good SSB operating; promoting advancement of SSB equipment; and disseminating SSB technical information. Read "The Sidebander", official publication of the SSBARA. Dues $3.00 yearly. Write for membership application sample "Sideband-er" to SSBARA Membership, 1385 Richmond Court, East Meadow, N. Y.

SELL magazines in mint condition: QST issues 1937 to 1956 inclusive (1946 to 1956 in QST binders); CQ issues 1947, 1948, 1949, 1950, 1955, 1956, (2 in CQ binders); best cash offer takes lot. Brush Soundmirror professional tape recorder, mahagany cabinet, technical manual, top condition, $48. RCA 630 TV chassis, perfect operating, less kinescope, $42. S. A. Tucker, W2HLT, 51-10 Little Neck Pkwy, Little Neck 62, N.Y.

HT-37 Demonstrator, $365; Drake 2B demonstrator, $225. First certified check takes freight collect. Always lowest prices. SASE for lowest quotation on your needs. H D H Sales Co., P. O. Box 73, Rowayton, Conn.

BEGINNERS: Code bothering you? Not learned in one hour. New Method. Quick approach towards ham ticket. Used in Armed Services, Ham Radio, Scouting. "Ketchum's Hour Code Course" $1.00. postpaid. Guaranteed. Oaks Ketchum, 10125 Flora Vista, Bellflower, Calif.

A-5 on inch Vidicon deflection components. 5 piece model VK-100 tube type or transformer type kit: Has deflection yoke, focus coil, alignment coil, horizontal and vertical output transformers. $99.00 net. Also 3-piece model VK-200 direct drive or transistorized kit: has deflection yoke, focus coil and alignment coil. $89 net. Components available only as above kits. Send check or money order. 10 day unused-undamaged return privilege. Cleveland Electronics, Inc., Deflection Components Div., 1974 E. 61st St., Cleveland 3, Ohio.

WANTED: QSTs for personal collection: January through September, 1916. W1CUT, Box 1, West Hartford 7, Conn.

QSLS-SWLS Free Samples, David Spicer, 4615 Rosedale, Austin 5, Texas.

RUBBER Stamps, $1.00 Call and Address. Clint's Radio, W2UDO, 32 Cumberland Ave., Verona, N. J.

COMPLETE Service—Transmitters and receivers. QSLS reasonable. KØDGX, Keith, 601 E. 4th St., So. Newton, Iowa.

BETTER Than anything you have seen: Craftsman-built British communication receivers. Eddystone Mod. 888A for ham band only; other models for general coverage from $115 to $1270. Spec sheets from Maurice, VE3CZG, Top Television Service, Ltd., Elliot Lake, Ont., Canada.

SP-600 JX26 Hammarlund revr .54-54 Mc., $295.00; SP-600 JX17, $3.95; HRO-60, $299.00; 75S2, $499.00: Collins 51J2, 51J3. R390A, etc. Teletype Kleinschmidt printers. RTTY converters. Alltronics-Howard Co., P.O. Box 19, Boston 1, Mass. Tel. Richmond 2-0048.

SELL: Two meter Gonset III, xtal, first offer over $185.00 takes it. K1MIZ, Riverbank Road, Stamford, Conn.

SELL: 75A3 with 3.1 and 6 kc. filters. Gud condx. $375.00. Jerry Squillaro, 212 Phelps Ave., Glen Burnie, Md.

WANTED: Tower, heavy duty, crank-up 40-60 ft. W3EO, Glenn West, 4305 Chestnut, Bethesda, Md.

FOR Sale: KWM-1, in perf. condx. First $450.00 gets it. K5AON, 867 Berkinshire, Dallas, Texas.

FOR Sale: SX-101A (40 hours), with R-47 spkr. $275.00; 14AVS vertical, radials $20.00; 200 various xmtg tubes. K1DZH, 45 Hollow Tree Ridge Road, Darien, Conn.

COLLINS S/Line for sale: 30S-1, brand new, factory sealed; 32S-1 with supply, used 5 hours; 75S-1 with C-B xta's, used 4 weeks; E-V good microphone, used 5 hours. All: $2250.00. F..ob. Radio KP4HH, Box 5124, Puerta de Tierra Sta., Puerta de Tierra, Puerto Rico.

SELL: 75A4 Serial 5806 and HT32, in mint condx. Best offer. W1SMI, 74 Hoyt Ave., Lowell, Mass.

YL, General License, seeks position, NYC or vicinity, where office skills can be applied. Write: Y4, c/o G.P.O. Box 1894, New York 1, N.Y.

AMATEUR Radio and citizens radio equipment installed and serviced. Mystic Electronics, 119 New London Road, Mystic, Conn.

JUST Published: "DXer's QSO Handbook" listing scientific techniques and favorite operating time and frequencies of over four thousand DX stations operating on forty, twenty, fifteen, ten meter bands using SSB, CW, AM modes. Earn diplomas quickly and QSO DX stations the easy way. Order today, $3.25 postpaid, send check, cash or monch-order to John Grady, K4TUA, 404 Briarcliff Road, Warner Robins, Ga.

TUBE Bargains: All are new unless otherwise noted: 3B25, $2.00; 4-125A, $15; 4-250A, $8.00 (used); 4E27, $3.00 (used); 592/3-200A-3, $15.00; 813, $4.00 (used); 829B, $5.00 (with sockets); 836, $1.00, 150 assorted new receiving tubes. $30.00: 2 new exact duplicate Lafayette KT200 superhet wired and aligned, $40.00 eac.,. 1 modernized Model SP400 Hammarlund with power supply, $75. All F.o.b. WA2QCB, Box 1336, Griffiss AFB, Branch P.O., Rome, N.Y.

DX-40 Heathkit transmitter, in perfect condx. Assembled and tested but never used. New kit price, $65.00 Will sell for $50 or any reasonable offer. Also, four RCA 8025 tubes in perfect electrical and mechanical condition. New price, $22.00 apiece. Buy these at $4.50 apiece or $15.00 for all four. Richard Marder, 1116 Inwood Place, Plainfield, N.J.

SELL A F-67, good condition, with extra case, crystal mike, 600V dynamotor, $125.00; Pierson KE-93 receiver, in exc. condx, w/extra case, AC and 6.12 volt pwr. supp., $250.00. WØCAV, P.O. Box 215, Boulder, Colorado.

FOR Sale: Transmitter DX-100 with relay switch and balun coils, $160. Steve Bedell, 260 Autumn Ave., Brooklyn 8, N.Y.

SELL: Johnson Thunderbolt. F/W used 5 months. Absolutely mint condx. College forces sale. $445.00, original cartons. F.o.b. Detroit, K8KCO/1, c/o 150 South York, Dearborn 7, Mich.

HEATH Mohawk w/matching spkr, like new condx, $250.00 chirpless Hi-Bander, in exc. condx. $90.00. K3JEX, 6 Paul Rd., New Castle, Del.

FOR Sale: F/W Viking Challenger, $110.00: SX-110, $110.00, or complete station including VFO, mike, relay, vertical, low pass, and coax, $250.00 or make offer. Jeff Falk, K9WVD, 7250 Merrill, Chicago, Ill.

FOR Sale: Package deal only: Globe Scout Deluxe, Model 755 VFO, National VFO 62, Vibroplex DeLuxe key, Bud LF-601 filter, Guardian co-ax antenna relay, Hy-Gain multiband doublet, Gonset Model G-63 receiver, all like new in orig. cartons. $300 cash, you pay transportation. W4BIR, 3611 Wimberly Lane, East Ridge 11, Tenn.

KWM-2 with all latest modifications, orig. carton as received from factory. Used approximately 60 hours. W5PQA, 3912 Anderson Ave. S E, Albuquerque, New Mex.

FOR Sale: HQ-170C clock and Dampp Chaser, like new condx. $275; Viking I, TVI suppressed, with Johnson VFO and spare 4D32, $130.00. Elmac PMR-6A rec. 6V, 12V, 110V supplies, $85.00. Johnson Matchbox $35.00. F.o.b. Edwin F. Wheeler, K4ADD, 351 Swallow Dr., Miami Springs, Florida. Tel. TU 8-3977.

COLLINS 75S1, Serial 3076. Used total 8 hours. In mint condx. Orig. carton, $390.00. C. E. Pankenier, 36 Violet Ave., Poughkeepsie, N.Y. Tel. GLobe 2-0411.

SELL: Collins 32V3 like new; Lakeshore Phasemaster II-B SSB (with Bandhopper VFO). Elenco SS-75 SSB exciter; Ham M rotator complete with 100 ft. cable; all to best offer. W9IQW, 930 Second St., Port Edwards, Wis.

SAVE Over $100 on a Collins 516-1 12V. DC pwr. supply. Used only a few hours. With warranty cards. $165.00. K3KAW, Dick Burne, 1728 Jefferson Ave., Scranton, Penna.

SELL As unit: In exc. condx, complete A.M. station: Viking II VFO, mike, Deluxe bug, ant. relay, B&W I.p., NC-98 spkr. Q-multip., sacrifice—$350.00. W2JGQ, Isaacs, 231 E. 11th St., N.Y.C.

SELL: RME 4350A, in gud condx; DX-100B, needs work; Heath SWR indicator, QF-1 (kit), best offer. Need money for engagement ring. Ferguson, K4ROB/9, 2606 N. Spaulding, Chicago 47, Ill.

COMPLETE KW SSB Station: HT-32, HT-33, SX-101, R46A spkr, Johnson TR switch, D-104 mike, Jones SWR indicator, Johnson low-pass filter; all manuals and cables included, $1200. Buying Collins S-Line. Brownie, W3CJI, 3110 Lehigh, Allentown, Penna. Tel. SWift 7-0650.

GONSET IV, in original carton, 2M, $295.00; Gonset 101 linear; $245.00; Heath MR-1, wired and aligned, $99.00; P & H AFC-2, $30. K2MII, 58 Joyce Rd., Hartsdale, N.Y.

WANTED: Pair 701-A, state price and condition. R. Lloyd Mize, W4HUI, R.F.D. 4, Versailles, Kentucky.

HQ110C, perfect, $165.00; ART-13 with D-104, fair, $25.00; home brew power supply for ART-13. Has Variac, $50.00. Plus shipping. K3JQO, William Casteel, Rd. 5, Somerset, Penna.

COLLINS 30S-1 linear, $1050; 32S-1, $475.00; 516F2 AC supply, $75; used 4-100CA, $30. D. Mitchell, R1, B59, Winnebago, Ill.

KITS Professionally wired. Half factory charges; others, 25 percent plus shipping. Garrahan, W3QZ, 1445 1/2 Wyoming, Forty Fort, Penna.

HQ-110, $165.00; DX-40, VF-1, D-104, plate mod., $145.00; whole rig: $300. Shipped C.o.d. For information, write: Laurens Kennedy, K5SSL, P.O. Box 2269, State College, Miss.

WANTED: Urgent! R390A recvr. All offers considered. Mr. Pfeiffer, RO 1-0657, 30 Miller Terr., White Plains, N. Y.

MOBILE Station, complete 80-10. Mike thru antenna. Wife sez no holes in new car. AF67, PMR7, M1070, etc. Will sell or trade all or part. Write for info. John Piercy, W6QDI, 215 St. Marys S.E., Minneapolis 14, Minn.

DX-20, almost new. Good rig. $33.00. K9ZVT, Box #332, Versailles, Ind.

SALE: Collins KWS-1, spotless in like-nu condx, spare tubes, $975; Collins 75A4 with 500 cy. filter and 312A1 speaker control console and light. Latest serial number 5466, $595. 80 ft. Spaulding commercial tower, guyed, one year old, new condx. will easily support half a tone, complete with guy wire, $150.00: 12 volt DC alternator and regulator, complete. New from '61 Chrysler. 25 amps at idle, 55 amps road speed, rectifiers built into alternator. Ready to go into any auto, $55. Radiart Ham-M rotor with 100 ft. wire, $75. W8HMI, Frank Smith, RFD 3, Paw Paw, Mich.

KWS-1, perfect, $900.00. Hugh A. Cover, WA6EJI, 449 Edgerton Dr., San Bernardino, Calif. Tel. TU 3-4547.

HEATH Apache and SB-10, $300. W8LKM, Jerry Maslowski, 3523 Pickwick Place, Lansing, Mich.

WANTED: DX-100, also have Globe Chief Dux, for sale, perf. condx, $55.00. Write to Lee, Brooksville, Miss.

COMPLETE Set QST, 1939 through 1960, less April, 1946. Also CQ April 1947 through 1960, less Jan. 1954, plus 9 duplicates. Best cash offer or trade for receiver. C. A. Baldwin, W4JAZ, 1306 So. 28th St., Apt. 5, Arlington 6, Va.

CRYSTALS Airmailed: SSB, MARS, Net, CD Commercial, etc. Custom finished F-243, .01% any kilocycle 3500 to 8600. $1.49 (10 or more same freq., FT-243 99¢); 1700 to 20000, $1.95; 20001 to 300000. $2.25. Add 50¢ ea. for .005%. Add 65¢ for HC-6/u hermetics. QST packaged crystals: "SSB Package", June 1958 and SSB Handbook; "Phasing" November 1959; "IMP" May 1960: DCS-500 February 1960: Listed sets (5-FT-243), $9.95, hermetics, $13.95. Filter, "SSB Package", seven matched $7.95. Multiband receiver, February 1961, $17.95. Crystals for all projects, write. Airmailing 9¢ per crystal, surface 5¢. Crystals since 1933. C-W Crystals. Box 2065Q, El Monte, Calif.

TRANSMITTER (6 and 2 meter). The Perseids Powerhouse, with 4X250Bs, Oct. 1959 QST; VHF-126 converter. Model 15 Teletype, sell or trade. Want HQ-180 recvr, K8TIF, G. W. Roper, 2937 Barth St., Flint 4, Mich.

HQ-110, in gud condx: $150.00. Rick Merwin, WA2AQB, Staatsburg, N.Y.

SELL: Unfinished SSB KW and VFO. Write for details. Going away to school. KØUZR, 23 Orchard Lane, Kirkwood, Mo.

SLOW Scan. Cleaning shack, have few new CRT 5ADP7 with base sockets, $20 postpaid. K6GOX, 4476 N. Van Ness Blvd, Fresno, Calif.

DRAKE 1-A receiver. Late serial number with crystal calibrator and latest AVC circuit. A fine receiver. Very hot, stable and selective on all bands. Exceptionally clean. Looks and works like brand-new. Will pack carefully and ship. $195.00. C. Brooner, P.O. Box 261, Morton, Ill.

FOR Sale: 75S1, 32S1, 312B2 console, $1000: E-Z Way 40 ft. tilt tower with ground post and Hy-Gain RBX-1 rotator with East coast indicator, $350.00. Firm. W2AOM, 1235 E. 40th St., Brooklyn 10, N.Y.

NATIONAL HRO-50T1 receiver excellent including Central Electronics Sideband Slicer. A.B.C.D coils. 100 kc. calibrator, matching speaker $225.00. Murray Howe, W8NYL, 1220 Forest Court, Cincinnati 15, Ohio.

THUNDERBOLT F/W like new, Bill Jessee, W4GMN, Box 371, Lebanon, Va. Tel. 171-M.

MUST Sell rig, leaving for 3rd year of college. DX-100 with single function switch controls all modes, SB-10 with separate pwr. supply for stability, 75A3 with reduction knob. All units were in console, guaranteed to be best looking and performing DX-100 and SB-10 combination on the air. All construction done by holder of first-class commercial and amateur extra ham licenses. Best offer over $600 takes all, plus T-R switch and all cables. K2ODT, Dick Lodwig, 1060 Carukin St., Franklin Square, L. I., N.Y. Tel. FL 2-0567.

MUST Sell: 1-Heath KS-1 power supply, you pick up, $100.00; 1-RCA Kw mod. transformer, 2-810's with sockets and filament transformer, 1-Stancord #4763 transformer, you pick up, $60.00; 1-Heath CA-1 Conelrad Monitor kit, $5.00; 1-BC453, untouched, $6.00; 1 0-3500V voltmeter, $2.00; 1 2.5V at 10a filament transformer, $2.00. Keith Sutter, Box 415, Hermosa Beach, Calif.

PREMIUM Quality used equipment. Over 1,000 units. Reconditioned with trial plan and full 90-day guarantee. Terms available. Write for free lists and top trade-in offer on your present equipment. World Radio Laboratories, Box 919, Council Bluffs, Iowa.

KWS-1 Ser. 1267, $1095; 75A-4 Ser. 3531, $550; H354 Tri-Ex 60 ft. crank up TA-33 rotor guy wire insulators, $250. Bob Cava, 113 Wood St., Salinas, Calif.

COLLINS 75A-4, vernier dial instruction book, like new, $550. KØDRU, 2690 14th Ave., Marion, Iowa. Tel. DR 7-3405.

TRADE: BC-610 and BC-614 in xclnt condx for Valiant or equiv. or best cash offer. Dick, K8HRX, 959 Kohler St., Kenton, Ohio.

SELL: 75-watt, 4-band homebrew xmtter, in vy gud condx. $20.00. Knight R/C tester, vy gud condx, $13.00. Fico capacitance decade box, exclnt. $10. Tim Truitt, Vevay, Ind.

RANGER, with "push-talk" relay, factory-wired, $185.00; National NC-300, $240.00; both in exc. condx. Heckman, W2BOM, 92 Lagoon Blvd., Massapequa, L. I., N.Y.

WANTED: 6 to 12, 304TL tubes. Callanan, W9AU, P.O. Box 155, Barrington, Ill.

SELL: 20A with 458 VFO, $225.00; NC-300; $225.00; kit wired Ranger, $150; BC-221, $65; RME DB-20 Preselector, $25.00. Money order or cashier's check. W5RY, R. H. Sneed, 4049 Berkley Drive, Jackson, Miss.

MOBILE: PMR-6, $85; A-54H, $75. Also Excellent NC-183D, $195. K4LFR, #3 Waynel Circle, Ft. Walton Beach, Fla.

COLLINS 32V-1, 150 watt transmitter, like new, Dan Pang, K7NQT, 7126-86th St., Tacoma 99, Wash.

SELL: Bud 100 Kc. calibrator, self-powered $11. WØNUI, Henderson, Minn.

NO Time to operate. HT-32, $450.00; SX-101 MK III, $250.00; new April 1959. Less than 50 hours. Guaranteed perfect. Will ship in original cartons with manuals. F.o.b. W6HEP, Reid, 539 Graceland, Laguna Beach, Calif.

WANTED: Tower, heavy-duty, crank-up 40-60 ft. W3EO, Glenn West, 4305 Chestnut, Bethesda, Md.

BROOKLYN Hams! Postcard for list items left. Melvin Weiner, 5714 Farragut Road, Brooklyn 34, N.Y.

SALE: EV mdl 664 mic with desk-stamd $30. BW 380B TR switch $14.00. Moseley tote-tenna with coax $45. William Matulaitis, WA2IAR, 1060 East 39th St., Brooklyn 10, N.Y.

SWAP-Band W 5100-B, 51SB-V, LPA-1, LSP-1, Matchmaster and two spare 813s. All like new condx. Deliver within 200 miles. Will not ship. W2CM, 1526 Maple Ave., Haddon Heights, N.J. Want: KWM-2 with 12V supply.

FOR Sale: QST 1951 thru 1957, CQ 1954 thru 1960, others, will not break year. 20¢ each: S-53A, $60; 211 freq. meter, $55; Onan electric power plant, 400 watts, $45.00; power transformer 6000 ct at 500 Ma., 4700 ct at 350 Ma. $15.00 each; 2300 ct at 500 Ma., $10; filament transformer 2.5 at 10 amp., $4.00; Sola constant voltage transformers one 250 watts. $15, one 500 watts, $20; Aircraft communications set AVT-112A, AVR-20A and AVA-120, $35; 6 or 12 volts Vib. pwr. supply, $10; transmitter blower 110 v. $6.00; 10 h choke, 400 Ma., 12 h 400 ma., $5.00 each; high voltage filter condensers, $5.00 each. WIZOU, Box 574, Belton, Mo.

FOR Sale: First check or m.o. for $365.00 receives my Collins 32S-1 transmitter shipped express prepaid. Excellent condition, instruction book and cables. Frank Layton, W7IQS, 731 W. Dana, Mesa, Ariz.

DX-60, $75.00; SB-10, $75; both in excellent condition. K8DCE, 1020 Lausman Dr., St. Joseph, Michigan.

GLOBE Scout 65B, $50.00. KN3NQK, 316 Weatherbee Rd., Towson 4, Md.

BEGINNERS: Code bothering you? Now learned in one hour. New Method. Quick approach towards ham ticket. Used in Armed Services, Ham Radio, Scouting. "Ketchum's Hour Code Course", $1.00 postpaid. Guaranteed. Oaks Ketchum, 10125 FloraVista, Bellflower, Calif.

FOR Sale: Collins' ART-13 w/PS and book, $125.00; 2E26 6m transmitter w/PS, modulator and TR circuitry, $50; BC-221 w/AC PS no book, $35.00. Richard Taylor, K2HQY, 308 Stratford Rd., Brooklyn 18, N.Y.

FOR Sale: Hallicrafters receiver S108. Used 3 hours. New condx, $100. Gilbert Scholz, W9TPO, 8320 W. Montana, West Allis 19, Wis.

SELL Heath AM-2 reflected power meter, $15.00; Heath VX-1 electronic voice control, $15.00; Johnson coil and switch (new) as used in Matchbox, $7.00. Thiede, W2EC, 169 Buckingham Rd., West Hempstead, L.I., N.Y.

FOR Sale: Viking II, Viking VFO, LPT, PT, sequence keying, $180; Gonset G66-B, matching AC/DC power supply spkr, $125.00; BC221-B, regulated built-in power supply, $50.00; 6-meter converter, regulated built-in pwr. supply, 26-30 Mc. IF, $18.00; 60 watt speech amp., pwr. supply, $25.00; 10 watt 10 meter transmitter, built-in pwr. supply, and audio, complete with handset mike, $20.00. F.o.b. Chippewa Falls, Wisconsin. W. J. Moulton, W9DSP, Rte. 4. Phone PA 3-3000.

COMPLETE Station HQ-170C used 10 hrs. Long John beam, Variac with control box, 6 meter 50-watt xmttr, with new pwr. supply, first $325 takes all. K1APW, 13 Wetherell St., Worcester, Mass. Tel. PL 2-3211.

NATIONAL HRO-60T receiver with amateur and broadcast coils complete, speaker, crystal calibrator, NBFM adaptor, select-O-ject all cost new over $600.00 and still looks new. Make your best offer. F.o.b. W2QJT.

FOR Sale: SX-100 in exc. condx. Need money for collete: $215.00. Write: Gary Fay, R.F.D. #1, Box 139, Mansfield Center, Conn.

WILL Sell: DX-40 transmitter with AC-1 antenna coupler and three crystals: $60.00. Prefer that it be picked up rather than shipp. Ridgley A. Tyrrell, 26 Wintergreen Ave., Newburgh, N.Y. WA2JED.

HEATH HW20 Pawnee, complete. Excellent. Latest modifications. Sacrifice at $275. For quick sale, Telrex 8-el. 2M beam, new, in carton, $12.00. Cush Craft halo and mast, $4.00; PR 2M xtals, $1.00 apiece; Heath VP1-6 6 DC 260V 60 mil., $8.00. WA2BPL, Phelps, 6 Edwards St., Apt. 2D, Roslyn Heights, L.I., N.Y.

NO Time. Sell: BC610E xmtr, with speech amplifier and 10, 20, 40, 80 meter tuning units and coils. Modified for 10. Complete with coax antenna relay, line and output filters. A real AM hole-puncher. $350.00. Hammarlund Super Pro SP400X receiver with power supply and speaker, $150.00. Both bought new and in excellent condition. W9DP, Salem, Wis.

CASH For your gear! We buy, trade and sell. We stock Hammarlund, Hallicrafters, National, Johnson, RME, Hy-Gain, Mosley and many other lines of ham gear. Ask for used equipment list. H & H Electronic Supply, Inc., 506-510 Kishwaukee St., Rockford, Ill.

SELL: KWM-2, A.C. and mobile power supplies, noise blanker, $1,000; GSB-101 linear amplifier, $27.50; SC-100 receiver, $175.00. K2JNJ, 70 Plymouth Drive, Iselin, New Jersey. LI 8-2320.

DX-100 for sale, like new, used only a few hours, $170. Also National NC-98 receiver, excellent condition, $100 or best offer. Need money for school. Mike Marlies, 322 Allaire Ave., Leonia, N.J.

COLLINS 32V3, ex. condx, $325.00; SC-99 and Heath Q multip., $95.00; Viking mobile and new p/s, $100.00; Viking Mobile VFO, $20.00; Gonset Super 12 converter, $45.00. Don KØYWV, Odell, Nebr.

SWAP—Good Vidicon 6198a and 100 ft. new RG-252/U aluminum coax—50 ohm—½ inch—RG-8/U adaptors both ends. Coax is low loss high power type. What have you? All letters answered. Wells Chapin, 942 Arden Lane, Birmingham, Michigan.

SX 101 Mark III as used by SWL 18 months and Johnson 6 & 2 Converter just completed. Professionally tested, $350.00. Simpson VTVOM, Brand New, $60.00. Brooklyn, N. Y. Area. Call After 6 P.M. Tel.: DE 2-9465.

CENTRAL Electronics 600L broad band linear for less than half new cost. All inquiries answered. W. M. McDonald, Dadeville, Alabama.

SELL: SB-10, in exc. condx, $70; linear, Pr. 4-65A's, 600W, $90.00; pwr. supply, 2200V., 400 Ma., regulated screen and bias, $85. All for $225. Aker, 1314 Broome St., Tallahassee, Fla.

SALE: Collins 30S-1 linear amplifier, brand new. In perf. condx. Never used! Best offer. No shipping, sry! W2NBZ.

GOING SSB on 2; Swap Johnson Thunderbolt, in new condx, 5 air hours, for 6N2 Thunderbolt or sell for $375.00. Amertran 3140/1570, 2.36 KVA, 110 single phase with filter. You pick up. $35.00. K9STI, 241 Oakwood, Woodale, Ill.

FOR Sale: 4-1000A's, $30; 4-250A's, $15; 4-125A's, $10; 4-65A's, $6.00; 4X500A's, $20.00; 4X-150A's, $10; 832's, $3.00; 829B's, $5.00; 833A's, $20.00; VT-127A's, $3.00; 417A's, $3.50; 416B's, $5.00; 404A's, $2.50; 357B, $15.00; 5762/7G24, $40; GL2C43, $5.00. Peter W. Dahl, KØBIT, 5331 Oaklawn Ave., Minneapolis 24, Minn.

SELL: BC-779 Super Pro for $75 and a BC-348-R for $50. Both 115 AC, in gud condx, F.o.b. Syracuse. K2RKR, 901 Lancaster Ave., Syracuse 10, N.Y.

VIKING Ranger, in exc. condx, complete with P.T.T. and brand-new Shure 520SL, grip-to-talk mike, $220 F.o.b. K9TNA, Box 67, Cairo, Ill.

FOR Sale: NC-98 receiver with Q-multiplier. In gud condx, $95. W8TVO, Spratley, 1454 Sattes Circle, Nitro, W.Va.

FOR Sale: Johnson Thunderbolt transmitter, in exc condx. Less than 25 hours operation! Lost high-power antenna location. First check for $350.00 takes. Will box to ship. W/SEO, 1731 South Tenth, Fargo, North Dakota.

SALE: Johnson Valiant. Looks and operates like-new condx, $275.00. Jerry Chenoweth, 6940 "Y" St., Lincoln, Nebr.

MUST Sell, need money for college. SX-99 used 10 hours, like new condx; Tecraft CC5/50 converter, never used; also pr. 2C39's. Best offer takes all or part. WA2FNG, 1470 Mark Dr., East Meadow, N.Y.

FRANCISCAN Seminarians ask help in starting a radio club. Equipment needed. KN8AUC, Our Lady of Carey Seminary College, Carey, Ohio.

SELL: KWS-1 perfect, $957; will throw in several boxes of new or good usable parts, transformers, coils, tubes, etc.; V3VDE 1219 Yardley Rd., Morrisville, Penna.

WANTED: Used Hallicrafters SX-62A, all-wave receiver, Franklin, 3500 W85, Leawood, Kansas.

ALUMINUM For every ham need! Write to Dick's, 62 Cherry Avenue, Tiffin, Ohio, for list of tubing, angle, channel, castings, plain and perforated sheet, and complete beam kits.

GLOBE SCOUT 680A transmitter with 755A VFO, JT-30 microphone; Dow-Key antenna changeover relay and accessories for $100; postage paid. Complete mobile station: Gonset Super-Six converter, noise clipper, Palco Bantam 65 xmtr (65 watts phone) with built in VFO, modulator, PE-101 dynamotor, all-band antenna for $200. Additional information supplied on request. All equipment in excellent condition. Tony Morris, 1669 Yale Station, New Haven, Conn.

FOR Sale: DX-100 with "B" revision complete with JT30C make, $150.00; Heath balun coils; Hammarlund Super Pro rcvr, all for $215.00, in exc. condx. K4TVZ, 2211 11th St., Decatur, Ala.

WANTED: Signal generator, below 100 Kc; V.T.V.M., 6 meter transmitter; 12th edition ARRL Handbook or schematic for Mallory inductuner; signal tracer; sell or trade RBL 4 receiver (15-600 kc). George Lindemulder, 2585 Knapp St., Grand Rapids, Mich.

VALIANT, HRO-50T with 7 coils, Sideband Slicer B, Viking I and Tri-Band beam traps for sale. Make offer to W3PRU.

SELL: Used 200V. Like new, $639.00. Organs & Electronics, Lockport, Ill.

VIKING Ranger, factory-wired, excellent, best offer. W2SHC, Beckwith, 151 Whitney Ave., Pompton Lakes, N.J.

GENERAL Radio Model 805A. Lab standard signal generator, covering 16 kc. to 50 mc. fundamental. Less output cable, working OK, but needs calibration. Orig. cost over $1500; selling price, $250.00. Includes packing and freight paid anywhere in U.S.A. Paul Miller, W9REW, RR #2, Roanoke, Indiana.

PACEMAKER, $219; Thunderbolt, $379; Hallicrafters 101-X Mark III with #47 speaker, $239.00; Hy-Gain Tri-band beam (slightly damaged), $45.00; CDR rotor Type M, $70; Mosley 40-80 vertical antenna, $45.00; Johnston TR switch, lo-pass filter, S.W. meter and coupler, $50.00—all coax connected. W3CJP, H. A. Stoudt, 125 Girard Ave., Hyde Park, Reading, Penna.

BC-312 receiver, parts for power supply, $50.00; BC-221AK frequency meter with modulation, original calibration book, spare tubes, manual, $60.00. Harold Feldman, 83-60 Victor Ave., Elmhurst 73, N.Y.

NC-300 with xtal calibrator, exc. condx. First check for $225.00 gets it. F.o.b. Williamson, West Va., K8VWJ, Box 1438.

6000 Mc. band Motorola Micropackage Waveguide Sets including sockets for xmtr and local osc. Klystrons and mixer diode, power cables. Best offer. M. Penick, WØHFG, 6 Terrace Circle, Mexico, Mo.

SELL Bound CQ, QST, 1955 through 1959. Highest bid. Wagger, 3241 Eastwood Rd., Sacramento 21, Calif.

WANTED: Johnson Kilowatt, unmodified. Cash for best offer at lowest price. Prefer with desk and audio amplifier. KØARG, Evans, Colo.

HT-33, $275.00; CE-20A w/VFO/QT, $150.00. Both $400. Like-new condx. W9JS, Wheaton, Ill.

SELL: Viking "500" transmitter kit: cartons (2) sealed. Unopened. Sacrifice: $550. Selling because of other interest. Will ship freight prepaid. Emil Grieco, 54 Andrew St., Meriden, Conn.

ELECTRONIC Kits wired and tested, finest quality work. KØHWE, Hammond, 1533 D Avenue Northeast, Cedar Rapids, Iowa.

CASH for new or used Collins 312B-5. Must be bargain. F. Price, 4620 Magnolia, Chicago 40, Ill.

MOBILE: All Heathkit, MR-1, MT-1, HP-10, floor mount, speaker and mike. Complete, less antenna and mount. In exc. condx and barely used. $275 or best offer, going v.h.f. Carl D. Moje, K2JQE, 139 Congress St., Jersey City, N.J. Tel. OL 3-3651.

SELL: 75A-2 w/spkr, $300. 304TL's, $10 apiece. K8PSV, Lowell, Mich.

NC-188 vy FB with Heath Q-Multiplier. $120.00 postpaid in U.S. K1NKV.

BARGAIN: NC-109, $110; Adventurer $35; radio controlled boat, $40, all excellent. K4UHO, 1507 Spalding Rd., Savannah, Ga.

SELL: Hammarlund HC-10 converter, in mint condx, $95. Wanted: Collins vernier tuning knob, 4D32 tube. W8OPA, 3820 Elsmere, Cincinnati 12, Ohio.

RME VHF 126 converter, like new condx, in box, $145.00; Gonset 6-meter mobile converter, A-1 condx, BW5100 and 51SB, A-1. Make offer. W5KPZ, Box 1024, Tyler, Texas.

CLEANING Shack! Test equipment, mobile transistor supply, transistor stereo preamp., SSB, odds and ends, list. W4API, 1420 S. Randolph, Arlington 4, Va.

SX-101 Mark III, guaranteed like-new condx: $250.00. W. R. Hempkins, 1001 Armstrong, Denison, Texas.

KWM-2 and AC power supply new last Xmas, $900; e-el. Telrex Xmas Tree beams, $150.00; Thunderbolt, $350.00. All for $1350.00 cash F.o.b. K1GAA/1, Benjamin, 10 Hemlock Dr., Portsmouth, N.H.

JOHNSON 6N2 transmitter, $100; 6N2 VFO, $30; both new May 1951: Meissner Signal Shifter, $20.00. K3LBW, Traver, 825 Harrison City Road, Greensburg, Penna.

813 roller-coil final with 2500-volt supply, $60; 175-watt speech amplifier modulator with supply, $30; 80% finished 150-watter, new parts, $40. K2KGU. Tel. MO 6-8513.

FOR Sale: Johnson Valiant transmitter 4 months old, in like-new condx. Factory-wired. Hammarlund HQ-100-C rcvr; Globe Chief Deluxe xmtr factory-wired; screen modulator for Globe Chief, Hy-Gain 3-el. 15 mtr. beam. Write to Ross Houston, K4WIS, 2053 North Bay Road, Miami Beach 40, Fla. Tel. JEfferson 4-2754.

FOR Sale: G-66B with Universal power supply, AF-67 with Universal power supply, push-to-talk mike, all-band whip, rack mounts and all instruction manuals: $300. Skip Agard, K5LUW, Box 34, Starkville, Miss.

SELL: Collins 30S-1 linear, with vy little use: $1250; KWM-2 modified to date, never used mobile, $955; 516F-2 AC pwr. supp., $95. All these units in perfect condx. Sry, will not ship linear. Lynn F. Johns, K8DOM, 223 Concord Ave., Newark, Ohio.

COMPLETE Mobile Rig: Elmac AF-67; Elmac PMR-6A with 12V pwr. supply; all-band whip, chrome plated spring and whip mount; 12V, Dynamotor, 600V at 200 Ma. All for $185.00. Dave Dossin, 10 Smart Road, W. Acton, Mass.

HEATH DX-20 transmitter, $36.00 and B-1 balun coils, $9.00. Works perfectly. In excellent condition. Used less than 5 times. John Ambler, R.D. #3, Muncy, Penna.

A-1 RECONDITIONED equipment. On approval. Trades. Terms. Hallicrafters S-85 $79.00. SX-99 $99.00, SX-100 $199.00, SX-111 $199.00, SX-101A, HT-32, HT-37; Hammarlund HQ-100 $129.00. HQ-129 $129.00, HQ-110 $179.00. HQ-145 $199.00, HQ-150 $199.00. HQ-160 $259.00. HQ-170 $289.00; National NC-270 $179.00. NC-183D $199.00. HRO-50T1 $199.00. NC-60, NC-173. NC-300. HRO-60; Central 20A $159.00. 600L $199.00; Collins 75A-2, 75S-1, 32S-1, KWS-1. KWM-2; Elmac, Globe, Gonset, Heath, Johnson, RME, other items. List free. HENRY RADIO COMPANY, Butler, Missouri

SELL: Collins, line new, 75S1 rcvr, 32S1 transmitter, 516F2 supply, 312B3 Spkr, $900. W3NWK, 2150 Greenleaf, Allentown, Penna.

TRADE: BC-348 rcvr. built-in AC p/s, plus cash for BC-779 Super Pro. K9MAJ, 815 S. E. 2nd St., Washington, Ind.

SELL: Heath Apache in exc. condx. $225.00. R. W. Mowery. K8QYR, 3591 Clearview, Columbus 21, Ohio.

FOR Sale: DX-100 in excellent condition, professionally wired for years of trouble-free service: $160.00. John A. Malo, W5AFU, 11333 E. 6th St., Tulsa 28, Okla.

WANTED: Hallicrafters S-27 or S-36 FM receiver. Chas. Hyde, R.D. 2, Ballston Spa, N.Y.

75A-2 Collins rcvr, in perf. condx, seldom used, original owner, $250.00. F.o.b. W2FLG, 136 Voorhis Ave., River Edge, N.J.

FOR Sale: Hy-Gain TH-4 beam, $70; 48 ft. heavy duty Telvue crank-up tower, $85; these items same as new condx. Will ship tower motor freight prepaid within reasonable distance. Other first line SSB equipment, send for list. W8DYA, 613 Pearl St., Bluefield, W.Va.

SX-111, rec., perfect, $195.00; HRO-60 with coils A,B,C,Dax AB, and C,E. sideslicer, $375.00. K8UAZ, Jess Conlon, 3221 Badger S.W., Grand Rapids, 8, Mich.

JOHNSON 6 and 2 meter Thunderbolt kilowatt, FW, factory new condx, used only 3 months: $405.00. J. W. Gregory, 3000 S.W. 103 Court, Miami 55, Fla. K4OCK.

FOR Sale: Hammarlund HQ-110C in orig. carton, $145.00. Hammarlund SP400X and pwr. supply; excellent, $90. Both with manuals. F.o.b. A. C. Cogle, 1667 Varina Ave., Petersburg, Va.

POTRZEBIE! Cleaning house. Surplus gear, homebrew gear, KW components, power supply parts, and lots of other miscellaneous junk. Send for list. K4KYO. Sequoyah Trail, Hendersonville, Tenn.

SELL Gotham V-80 ant. one month old. $14.95 ppd. Want: Triband beam trade Polaroid camera complete. K3MDY, 217 Linnview, Pittsburgh 10, Penna.

SALE: Linear amplifier, 4-811A, 1 kilowatt; P.E.P. with pwr. supply, all in HT-33 cabinet, $135.00. Dr. Charles E. Thompson, 103 West Main, Napoleon, Ohio.

DX-100B for sale, excellent condition, need money for college, best offer over $190. W7GBF Robert Ball, McGill, Nevada.

SELL: Johnson 250-39 T-R switch, $20.00; Johnson 250-23 Matchbox, $40.00; Sprague KT-1 in-circuit condenser tester, $10; Collins 2-3 Mc. PTO $30; Bud FCC-90 100 Kc calibrator, $10; B&W 550A coaxial switch, $5.00; Bud LF-601 low-pass filter, $11.00; all in excellent condition, need parts for Bendix LM-18 freq. meter, Robert Ireland, Pleasant Valley, N.Y.

KILOWATT Johnson with desk. Bargain at $700. Pick-up only. W2PZS. Telephone Trenton, N.J. Tel. JUniper 7-3509.

COMPLETE SR-500 station with HT-30, HT-31, SX-100 in console. In perf. shape. Just plug in 110v and operate. All modes. 400 watts. $747 f.o.b. KØTKG, Box 545, Independence, Kans.

SALE: 75A4 serial 2375, in exc. condx, with 3.1 Kc filter and reduction knob, $485.00; 500 cycle filter, $35.00 additional. No shipping, sry. W2TB, Gardiner, 39-20 220th St., Bayside, L.I., N.Y.

SACRIFICE: National NC-270 receiver, $159.00. Also HE-25 Voyager transmitter, $75, both units in original cartons, cannot use because of apartment house lease restrictions. Gilbert Steinberg, 140 Cabrini Blvd., New York, N.Y. Tel. WAdsworth 7-7697.

SELL: QSTs 1923 to 1938 run, also 3 doz. Edison talking machine cylinders. Best offer. Want: QSTS 1915 to 1922. W2DYU, 36 New Lawn Ave., Kearny, N.J.

"Horse-Trader" Ed Moory Offers following reconditioned and Guaranateed Equipment for Sale Used, GSB-101 $249.00, 30S-1 $995.00. KWM-2 $895.00. 75S-1 $349.00. 32S-1 $459.00. Drake 2-B $229.00. 200-V $629.00. Viking Valiant $319.00. HQ-129-X $89.00. NC-300 with Xtal Calibrator & Speaker $195.00. 20A-$159.00. Johnson Pacemaker $199.00. 100-V $495.00. Also Thunderbolt Linear Factory reconditioned $349.00. New Collins 75S-3's & 30L-1 Immediate delivery. Terms: Cash and no trades, Ed Moory Wholelsale Radio, Box 506, DeWitt, Arkansas. Phone Whitney 6-2820.

SELL: Teletype Corporation Model 14 transmitter distributor, black, 125VAC governed motor, tight tape stop; AC-DC release magnet. In perf. operg. condx, appearance gud. $80.00 or trade for FRXD, 0-5B/FR, 0-5C/FR, 0-39/TRA-7 or possibly other teletypewriter equipment or ham gear. Baser, 344 South Franck Ave., Louisville 6, Ky.

GONSET Mobile Twins, 6-12 v.d.c. 115AC, 10 thru 80, $380.00. K8ERZ, 327 Neal, Dayton, Ohio.

SACRIFICE: Collins 75A2 receiver, in A-1 condx, $249.00; Kilowatt All-Band amplifier with pair 4-250As, $225.00. Will ship F.o.b. W6SRF, 1204 N. Alamo St., Anaheim, Calif.

WANTED: KWM-2. KWM-1, pay cash. WØEER, LaCrosse, Kansas. For sale: BC-610E complete. Boils 160 10 meters.

COLLINS Receiver 75A-1 with matching speaker and manual, in exc. condx, $225.00. Kenneth Engstrom, W5CUM, 833 Oak Forest Dr., Dallas 32, Texas.

WANTED: 10 and 15 meter coils for HT-9. Jewell Moore, Stirling City, Calif. P.O. Box 43.

FOR Sale: Johnson Valiant transmitter: $325.00; NC-303 with xtal calibr. $385.00. Both in like-new condx (both for $650.00 f.o.b.). Jim, K5VYY, 434 South Osage, Ponca City, Okla.

FOR Sale: Heath SB-10 Sideband Adapter, best offer over $70 gets it. Graening, W9KHS, Tremont, Ill.

PHENOMENAL Ham Sellout! Receivers, transmitters, parts, all too numerous to advertise. Send addressed, stamped envelope for complete list of bargains. Box 262, Glenridge, N.J.

NC-183D plus matching spkr, in mint condx, equal to new, little used. $200. S. Silverman, 716 N. 3rd St., Philadelphia, Penna.

RME-6900, $275; Johnson Navigator, $130.00; Vibroplex Original Deluxe, $12.00; CDR AR-22, $18. All equipment in a like-new condx. Kenneth W. Meyers, W5HTN, 259 Redrock Dr., San Antonio, Texas.

MODEL 15 teletype complete with sync. motor table and cover, vy clean, perf. uprtg. condx. Melvin G. Marsley, W8UUS, 2242 Stevens Ave., Kalamazoo, Mich. Phone FI 4-8152.

SELL: Complete KW xmttr. Band-switching ECO to pair 250TH Final. Pair 250TH modulators. Complete 80 to 10 meters in two Par-Metal cabinets with spare 250TH. All Stancor transformers except 3 KW RCA mod. xfrmr. Best offer over $250.00 for complete rig. WØHNG, Box 485, Coffeyville, Kansas.

FOR Sale: "S" Line, in mint condx: 75S1 with c.w. F.L. BFO xtal es noise blanker; 32S1 with 516F2 P.S.; lists for $1500. Selling for $950 to go SSB mobile. HT-30 in exc. condx, $185.00; SX-101 MkIII, like-new condx, $245.00. W3QKW.

FOR Sale: Hallicrafters HT-32 and B&W L-1001-A linear, $575. In exc. condx. Local buyer preferred. G. A. Diehl, W2IHA, 20 Wilson Ave., Chatham, N.J.

SELL: Gonset Twins: G66 with 3-way power supply and speaker, G77 with 2-way power supply and modulator, all plugs, cables, manuals. Master Mobile Mount, Slim Jim antenna, microphone. $260.00. Ross Ray, K4PXA, Rte. 1, Fort Mill, Sc.

FOR Sale: 100-watt linear, two 807s GG, pictures. $35.00; command receiver and transmitter, $8.00 each; receiver 384Q 110V, $35.00; Harvey-Wells X match antenna coupler, new, $65.00; power unit PE-214, $35.00; tubes 813, 3, $3.00 each; 4X150A, 3 $3.00 each; Chelsea 24 hour clock, $10.00; Viking Valiant, $350.00. KØACG, 125 N. Lake Ave., Sioux Falls, S.Dak.

TRADE For receiver or transmitter, new Eico stereo AF-4; 50 new recvg. tubes 6BA6, 12AT7, etc.; good 4-1000A; 50% good, you test 4-4X250B, 4-4X150A, 11-4X250F, 18-4X150F, 7609, 27 4X150D. R. E. Mann, 7205 Center Dr., Des Moines, Iowa.

SALE Or swap: Receivers NC-109, $135; HQ-110C, $175; 75S1, $390; frequency meters: BC-221, built-in 110 volt supply, $85; TS-175U 85 to 1000 mcs., new, $225.00; Millen Exciter, type 90801, $65.00; direction finder Navy type, DAG-1, 1.6 to 18.2 mcs. batteries, $75.00. W2LXD, 1381 Richmond Court, East Meadow, N.Y.

HRO 5TA1 receiver. Coils 1.7 to 30 Mc. Power supply, spkr, gud condx. $150.00. F.o.b. R. A. Eubanks, K9OTP, 601 E. 32nd St., Chicago 16, Ill.

COLLINS S/Line station in mint condition. Illness forces sacrifice sale: 75S-1 w/BFO filter and crystal, 32S-1, 30S-1 amplifier 2 Kw P.E.P., 312B-3 516F-2, cash & carry, $1895; Telrex Tribander 10-15-20, $95. Office mill, $30; new 416Bs, $20 ea.; new 417As, $10 ea. Zenith Transoceanic portable radio, $45.00; Turner S-90 mobile mike, $10; Collins 12" spkr, $15; earphones $5; VOM in case, $10; low frequency LP kw filter, $10; Collins antenna relay, $12. "Frank", WA2FMC, Hauppauge Rd., Smithtown, N.Y. Tel. ANdrew 5-6137.

BARGAINS! New tubes: 4E27, $7; 6146, $2.50; Johnson rotary inductors, $5.00. Many other items. Send for list. KØMVR, 424 Twentieth St., N.E. Cedar Rapids, Iowa.

ELMAC PMR7 recvr, $95, with 6m converter, $110. AF67 xmttr with 6m, $100; dual transistor power supply, $35.00. PS-2V AC supply, $25. W4NFS, 640 Capri Blvd., Treasure Island, Fla.

COLLINS KWM2 and matching AC pwr. supply. $925.00. Firm! No trades or payments! W8FHZ, T. Thompson, 2685 Breezy Way, Cincinnati 39, Ohio. Fone JA 2-2368.

DRAKE 2-A, in excellent condx. In orig. carton, $250.00 f.o.b. K6HTM, Charles G. Bird, 617 E. Pine, Fresno 4, Calif.

FOR Sale: Collins KWS-1 in excellent condx also coax relay. Prefer local sale, if possible. $1100. W6MSD, Dave DeArmond, 226 Hobart Ave., San Mateo, Calif. Tel. FI 5-3601.

SELL: Heath AM-2, $14.50; JT-30, $6.00. K1IIK.

SELL: 6C21s, $13; 304TLs with sockets, $10; Collins PTO, $45.00; BC221T, $60; Elenco compression preamp, $18; CX58B butterfly, accessories, $20; HDVL coils, large air variable condensers, 1-5' cabinet racks reasonable; 25 years QST, CQ, binders, offers? J. Gillson, W3GAU, 109 Mullin Rd., Wilmington 3, Del.

100V, Serial 709, $550.00; Drake 2A with xtal calibrator, $200.00. Both in mint condx. W3BFM, 5 Indian Valley Lane, Telford, Penna.

FOR Sale: GPR-90 receiver and matching spkr; guaranteed like-new condx. $325.00. Bruce MacPherson, K2OAS, 5 Washburn Rd., Pompton Plains, N.J.

COMPLETE mobile outfit, year old, original cartons, manuals, orig. cost, $540.60; Pierson KE93 recvr, pw supply, $215.00; Elmac AF68 xmttr, M1070, pw supp., $195.00; antenna relay, $9.00; Shure mike, 505C, $12.00; 96" antenna outfit, $9.50; R47 spkr, $8.50. F.o.b. destination, $449.00. W2FKF, Ted Meeker, 20 Greendale Rd., Cedar Grove, N.J. Tel. CEnter 9-4278 (night), PRescott 8-4700 (daytime.)

GENERAL License theory course will be given beginning October at New York City Board of Education Community Center 59, Springfield Gardens, L.I. For applications send self-addressed envelope or Contact W2HNG.

FOR Sale: HT-37, only year old, $350.00. W1GFH/5, Zuromski, 6580 ABG, Box 334, Holloman AFB, New Mexico.

TELREX 4-element 15m beam. Sell or swap for good Tri-Bander. W1DXS, 40 Dayton, Worcester, Mass.

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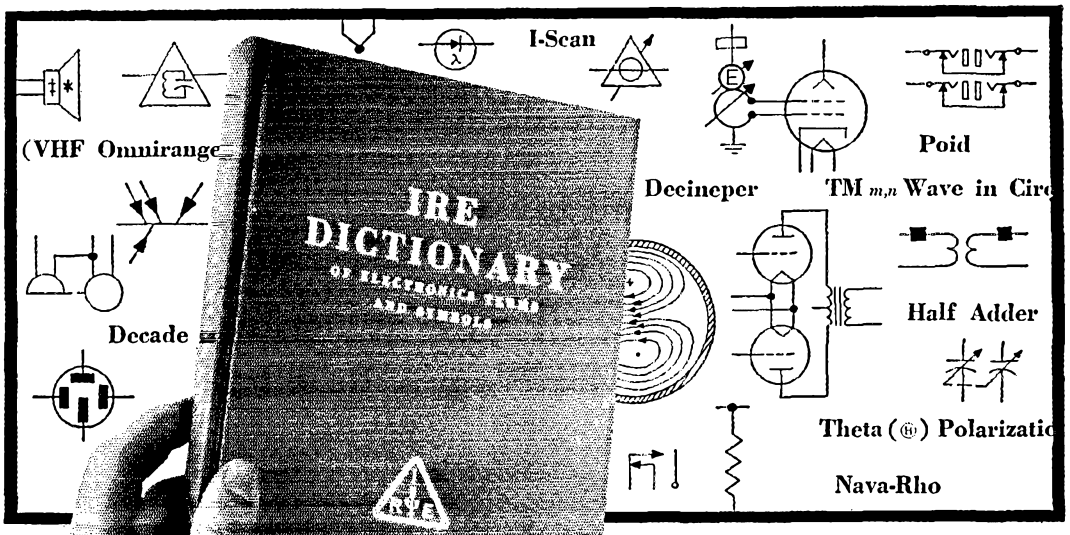

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PART II of this 225 page volume is a Dictionary of Symbols, made up of five IRE Standards: Letter Symbols for Electron Tubes; Letter Symbols for Semiconductor Devices; Graphical and Letter Symbols for Feedback Control Systems; Graphical Systems for Semiconductor Devices; and Graphical Symbols for Electrical Diagrams. A four-page index to graphical symbols is included.

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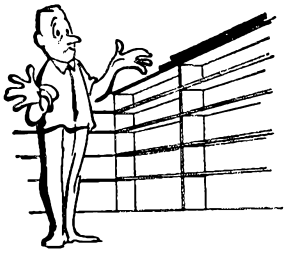

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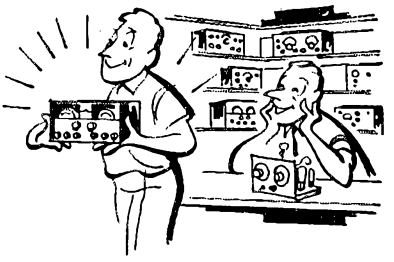
Allied Ham Manager



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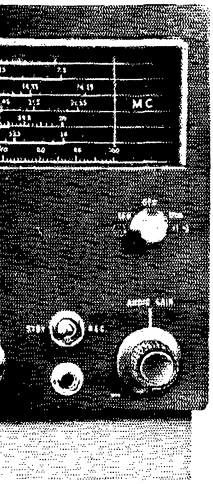

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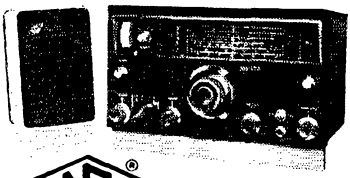

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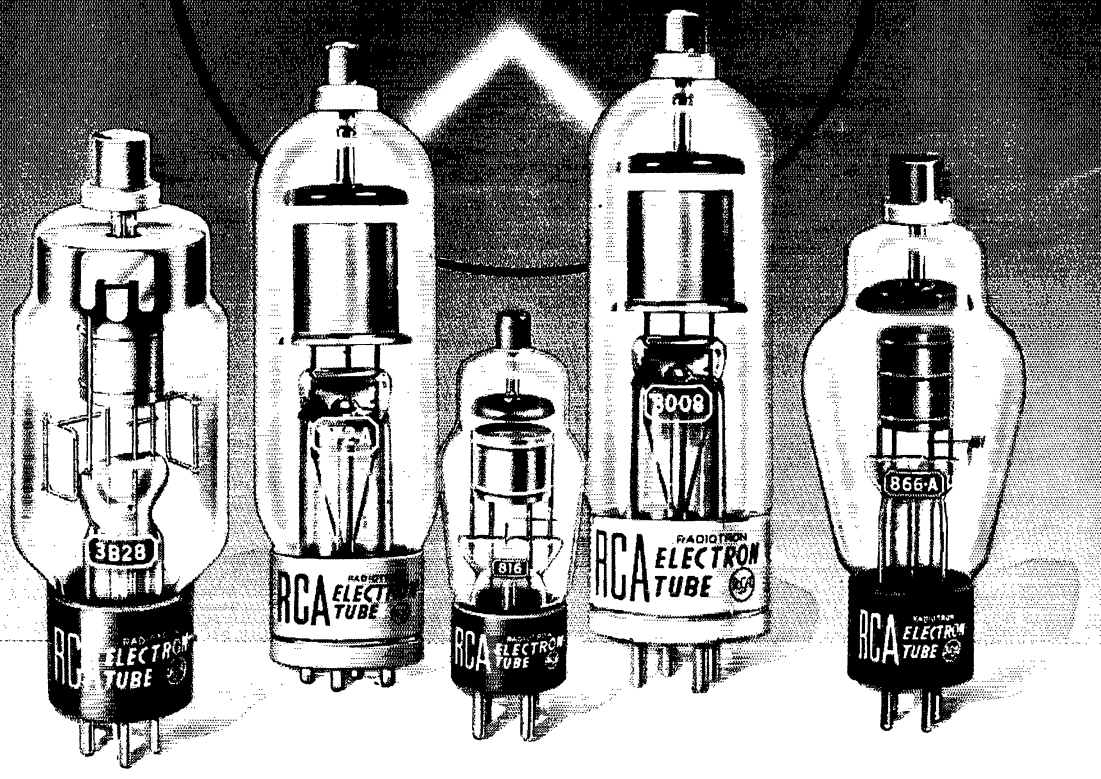

In accordance with RCA's continued policy to provide the radio amateur with the highest performance tubes consistent with the best engineering practice known, every rectifier tube shown here is now designed and built with the new, improved coated filament—N-85-R!

N-85-R filament design prolongs peak emission capability. Immediate "in-rig" benefits to you are; increased rectifier-tube reliability, and longer rectifier-tube life.

Check the chart for the types that fit your DC power requirements. Then order direct from your RCA Industrial Tube Distributor. For technical data on any of these types write: Section J-37-M, Commercial Engineering, RCA Electron Tube Division, Harrison, N. J.

RCA Rectifier Tubes—with the new N-85-R Filament
(Based on use of 2 tubes in full-wave circuit, choke-input filter)

Type	Name	Max. Transf. Sec. Volts (RMS)	Approx. DC Output Volts	Max. DC Output Amperes
RCA-3B28*	Half-wave, gas	3500 1700	3200 1600	0.5 1.0
RCA-816	Half-wave, mercury-vapor	2600	2400	0.25
RCA-866A	Half-wave, mercury-vapor	3500 800	3200 800	0.5 1.0
RCA-872A	Half-wave, mercury-vapor	3500	3200	2.5
RCA-8008†	Half-wave, mercury-vapor	3500	3200	2.5

*For low noise-level applications. †Same as RCA-872A, but has long-pin base.

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RCA

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Extract of Regulations

(Corrected to Sept. 1, 1961)

WHAT BANDS AVAILABLE?

Below is a summary of the U. S. amateur bands † on which operation is permitted. Changes will, as usual, be announced by W1AW bulletins. Figures are megacycles. AØ means an unmodulated carrier; A1 means c.w. telegraphy; A2 is m.c.w.; A3 is a.m. phone (n.f.m. may also be used in such bands); A4 is facsimile; A5 is television; F1 is frequency-shift keying; and f.m. means frequency modulation, phone (including n.f.m.) or telegraphy.

80 meters	3.500–4.000	A1
	3.500–3.800	F1
	3.800–4.000	A3
40 m.	7.000–7.300	A1
	7.000–7.200	F1
	7.200–7.300	A3
20 m.	14.000–14.350	A1
	14.000–14.200	F1
	14.200–14.350	A3
15 m.	21.000–21.450	A1
	21.000–21.250	F1
	21.250–21.450	A3
10 m.	28.000–29.700	A1
	28.500–29.700	A3
	29.000–29.700	f.m.
6 m.	50.0–50.1	A1
	50.1–54	A1, A2, A3, A4
	51–54	AØ
	52.5–54	f.m.
2 m.	144–147.9	AØ, A1, A2, A3, A4, f.m.
	147.9–148	A1
u.h.f.	220–225	AØ, A1, A2, A3, A4, f.m.
	420–450[1]	AØ, A1, A2, A3, A4, A5, f.m.
	1,215–1,300	AØ, A1, A2, A3, A4, A5, f.m.
	2,300– 2,450	AØ, A1, A2, A3, A4, A5, f.m., pulse
	3,500– 3,700	AØ, A1, A2, A3, A4, A5, f.m., pulse
	5,650– 5,925	AØ, A1, A2, A3, A4, A5, f.m., pulse
	10,000–10,500[2]	AØ, A1, A2, A3, A4, A5, f.m., pulse
	21,000–22,000	AØ, A1, A2, A3, A4, A5, f.m., pulse
	All above 30,000	AØ, A1, A2, A3, A4, A5, f.m., pulse

[1] Input power must not exceed 50 watts.

[2] No pulse permitted in this band.

NOTE: The bands 220 through 10,500 Mc. are shared with the Government Radio Positioning Service, which has priority.

In addition, A1 and A3 on portions of 1.800–2.000, as follows:

Area	*Band, kc.*	*Power (Watts) Day*	*Night*
Minn., Iowa, Wis., Mich., Pa., Md., Del. and states to north	1800–1825	500	200
N. D., S. D., Nebr., Colo., N. Mex., and states west, including Hawaii.	1975–2000	500*	200*
Okla., Kans., Mo., Ark., Ill., Ind., Ky., Tenn., Ohio, W. Va. Va., N. C., S. C., and Texas (west of 99° W *or* north of 32° N)	1800–1825	200	50

No operation elsewhere.

* Except in state of Washington, 200 watts day, 50 watts night.

† While the over-all bands for Canada are similar, the breakdown by modes is quite different. Canadians should refer to the list which was sent with their licenses.

Technician licensees are permitted all amateur privileges in 50 Mc., 145–147 Mc. and in the bands 220 Mc. and above.

Novice licensees may use the following frequencies, transmitters to be crystal-controlled and have a maximum power input of 75 watts.

3.700–3.750	A1	21,100–21,250	A1
7.150–7.200	A1	145–147	A1, A2, A3, f.m.

BANNED COUNTRIES

Article 41, Section 1 of the Radio Regulations attached to the Geneva Convention of 1959 says:

"Radiocommunications between amateur stations of different countries shall be forbidden if the administration of one of the countries concerned has notified that it objects to such radiocommunications."

The United States and Canada, as signatories to the Convention, would not be living up to their treaty obligations if they did not publish and enforce, among their amateurs, the provisions of this section.

Unfortunately, some of the countries have worded their notices to the I.T.U. somewhat ambiguously. The U. S. interpreted these one way, the Canadian government the other. Two countries notified the U. S. Department of State that they no longer objected to international amateur communications, but did not notify Geneva or Ottawa. Thus, we have the slightly confusing situation of one banned list for Canada, and another for the U. S.!

Canada

Canadian amateurs may not work amateurs in the following countries: LAOS, CAMBODIA, VIET NAM, INDONESIA, THAILAND, ROUMANIA, and JORDAN.

United States

The U. S. version of the list comprises CAMBODIA, VIET NAM and INDONESIA.

THIRD-PARTY TRAFFIC

The following countries have entered into third-party agreements with the United States, permitting amateurs to handle relatively unimportant messages:

CANADA	HAITI	NICARAGUA
CHILE	HONDURAS	PANAMA
COSTA RICA	LIBERIA	PARAGUAY
CUBA	MEXICO	PERU
ECUADOR		VENEZUELA

Canada has a third-party agreement only with the United States at present.

W1AW Schedules

(Effective October 29, 1961)

Operating-Visiting Hours

Monday through Friday: 3 P.M.–3 A.M. EST.
Saturday: 7 P.M.–2.30 A.M. EST.
Sunday: 3 P.M.–10.30 P.M. EST.

The ARRL Maxim Memorial Station welcomes visitors. The station address is 225 Main St., Newington, Conn., about 4 miles south of West Hartford. A map showing local street detail will be sent on request.

Frequencies

C.w.: 1820, 3555, 7080, 14,100, 21,075, 28,080, 50,700, 145,800 kc.

Voice: 1820, 3945, 7255, 14,280 (s.s.b.), 21,330, 29,000, 50,700, 145,800 kc.

Frequencies may vary slightly from round figures given; they are to assist in finding the W1AW signal, not for exact calibrating purposes.

Official Bulletins

Bulletins containing latest information on matters of general amateur interest are transmitted on the above frequencies according to the following schedule in Greenwich Mean Time:

C.w.: Monday through Saturday, 0100; Tuesday through Sunday, 0500.

Voice: Monday through Saturday, 0200; Tuesday through Sunday, 0430.

Caution: Note that in the U. S. and Canada, because times are GMT, bulletin hours actually fall on the evening of the previous day.

Code Proficiency Program

W1AW conducts code practice daily at 0230 GMT, on all c.w. frequencies listed (except 1820 kc.) with speeds of 15, 20, 25, 30 and 35 w.p.m on Tuesday, Thursday and Saturday, and at 5, 7½, 10 and 13 w.p.m. other days. *Caution:* In the U. S. and Canada, because times shown are GMT, code practice actually occurs on the evening of the previous day. Approximately 10 minutes' practice is provided at each speed. Current issues of *QST* carry data on source material for practice copy on some sessions, so that you can check your copy.

Twice each month special transmissions are made to enable you to qualify for the ARRL Code Proficiency Certificate. Dates of these certificate qualifying runs are announced each month in *QST* in the "Activities Calendar" and in "Operating News." Any person can apply. Neither ARRL membership nor an amateur license is required.

NATIONAL CALLING AND EMERGENCY FREQUENCIES (KC.)

3550	3875	7100	7250
14,050	14,225	21,050	21,400
28,100	29,640	50,550	145,350

During periods of communications emergency these channels will be monitored for emergency traffic. At other times, these frequencies can be used as general calling frequencies to expedite general traffic movement between amateur stations. Emergency traffic has precedence. After contact has been made the frequency should be *vacated immediately* to accommodate other callers.

The following are the National Calling and Emergency Frequencies for Canada: *c.w.* — 3535, 7050, 14,060; *phone* — 3765, 14,160, 28,250 kc.

SUGGESTED RTTY OPERATING FREQUENCIES

3620, 7040, 14,090, 21,090 kc.

GMT CONVERSION

To convert to local times subtract the following hours: ADST −3, AST −4, EDST −4, EST −5, CDST −5, CST −6, MDST −6, MST −7, PDST −7, PST −8, Honolulu −10, Central Alaska −10.

W1AW GENERAL-CONTACT SCHEDULE

W1AW welcomes calls from *any* amateur station in accordance with the following schedule:

GMT	*Sunday*	*Monday*	*Tuesday*	*Wednesday*	*Thursday*	*Friday*	*Saturday*
0030–0100	.....	.....	7255	.....	7080	.....	7255
0120–0200[1]	.....	.....	7080	3555	7080[2]	3555[2]	7080
0210–0230[1]	.....	.....	3945	50.7 Mc.	145.8 Mc.	3945	3945
0330–0430	.....	.....	3555	3945	7080	1820	3555
0440–0500[1]	.....	.....	3945	14,280	3945	14,280	3945
0520–0600[1]	.....	.....	3555[2]	7255	3555	7080[2]	3945
0600–0700	.....	.....	14,280	14,100	3555	14,100	.....
0700–0800	.....	.....	7255	3945	7080	3945	7255
2000–2100	.....	.....	14,280	21/28 Mc.[3]	14,100	.....	.....
2100–2200	.....	14,280	21/28 Mc.[3]	14,100	21/28 Mc.[3]	21,330	.....
2200–2300	.....	14,100	14,280	21,075[2]	14,280	14,100	.....

[1] General-contact period on stated frequency begins immediately following transmission of Official Bulletin which begins at 0200 and 0430 on phone and at 0100 and 0500 on c.w. Starting time is approximate.

[2] W1AW will first listen for Novices before checking the rest of the band for other contacts.

[3] Operation will be conducted on either 21,075, 21,330, 28,080 or 29,000 kc.